

# WHERE **NODE.JS** MEETS **IOS**

Enabling Node.JS Technology for Mobile Applications



# HI!

- **Sam** (@periping)  
([github.com/srijs](https://github.com/srijs))
- CS Student at LUH
- Working at doctape  
(node.js & mobile)
- Javascript, Objective-C,  
plain C, Haskell





# WHERE **NODE.JS** MEETS **IOS**

Enabling Node.JS Technology for Mobile Applications

JAVASCRIPT  
ON MOBILE.

*BAD  
REPUTATION*

# *BAD REPUTATION*

I. “Slow”



# BAD REPUTATION

| .“Slow”

Rough “Benchmarks” on iPhone 4S:

- a) *Fill an array (NSMutableArray vs. Array) with 1.000.000 strings*
- b) *Call a function/method 1.000.000 times*

# *BAD REPUTATION*

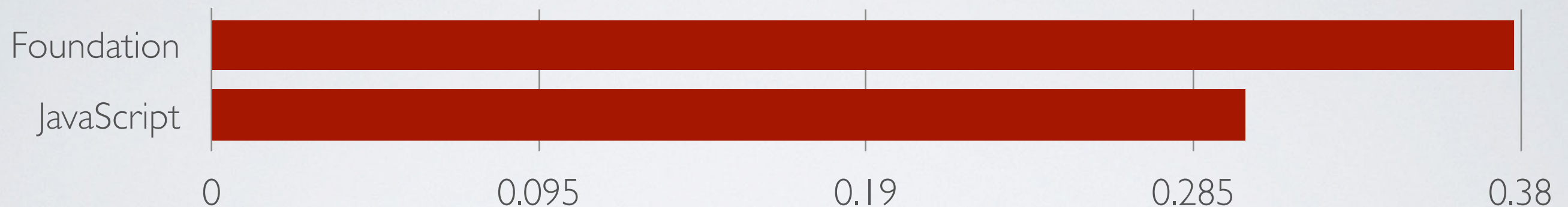
*Fill an array with 1.000.000 strings (sec.)*

*Call a function/method 1.000.000 times (sec.)*



# BAD REPUTATION

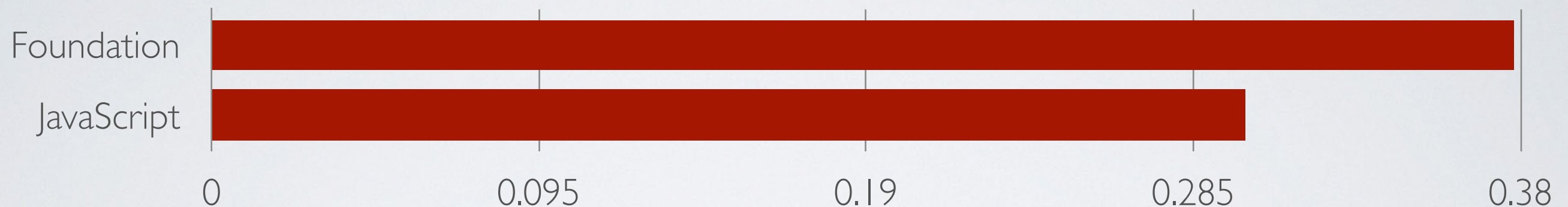
*Fill an array with 1.000.000 strings (sec.)*



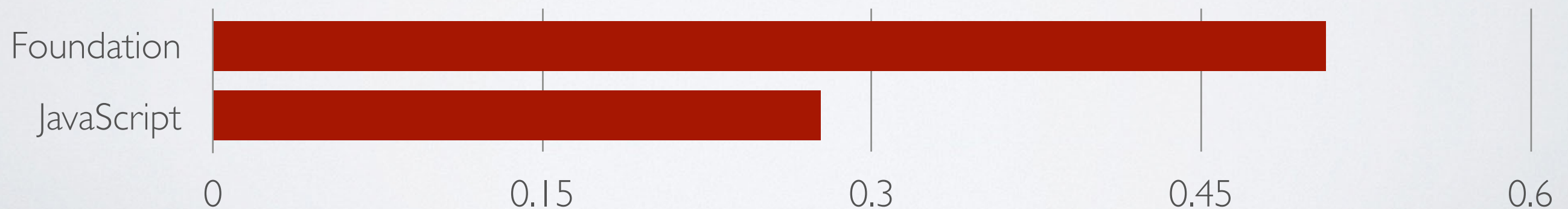
*Call a function/method 1.000.000 times (sec.)*

# BAD REPUTATION

*Fill an array with 1.000.000 strings (sec.)*



*Call a function/method 1.000.000 times (sec.)*



# BAD REPUTATION

```
NSMutableArray *a = [NSMutableArray new];  
for (int i = 0; i < 1000000; i++) {  
    a[i] = @"Hello World";  
}
```

```
(function () {  
    var a = [];  
    for (var i = 0; i < 1000000; i++) {  
        a[i] = 'Hello World';  
    }  
})();
```

```
for (int i = 0; i < 1000000; i++) {  
    [self exampleMethod];  
}
```

```
- (void)exampleMethod {  
    return;  
}
```

```
(function () {  
    var fn = function () {  
        return;  
    };  
    for (var i = 0; i < 1000000; i++) {  
        fn();  
    }  
})();
```



# *BAD REPUTATION*

*BAD REPUTATION*

2. “Bloated”

*BAD REPUTATION*

2. “Bloated”

3. “Memory  
Hungry”



# HOW TO JS / IOS

*HOWTO js ON IOS*

**Web View w/  
HTML/CSS/JS  
Content**

*HOWTO JS ON IOS*

# **Web View w/ HTML/CSS/JS Content**

A.

Slow start-up



*HOWTO JS ON IOS*

# **Web View w/ HTML/CSS/JS Content**

- A. Slow start-up
- B. Consumes lots of memory

*HOWTO JS ON IOS*

# **Bundle own JS Engine**

*HOWTO JS ON IOS*

# **Bundle own JS Engine**

A. Bloated Binary



*HOWTO JS ON IOS*

# **Bundle own JS Engine**

- A. Bloated Binary
- B. High memory footprint

*BAD REPUTATION*

2. “Bloated”

3. “Memory  
Hungry”

*HOWTO JS ON IOS*

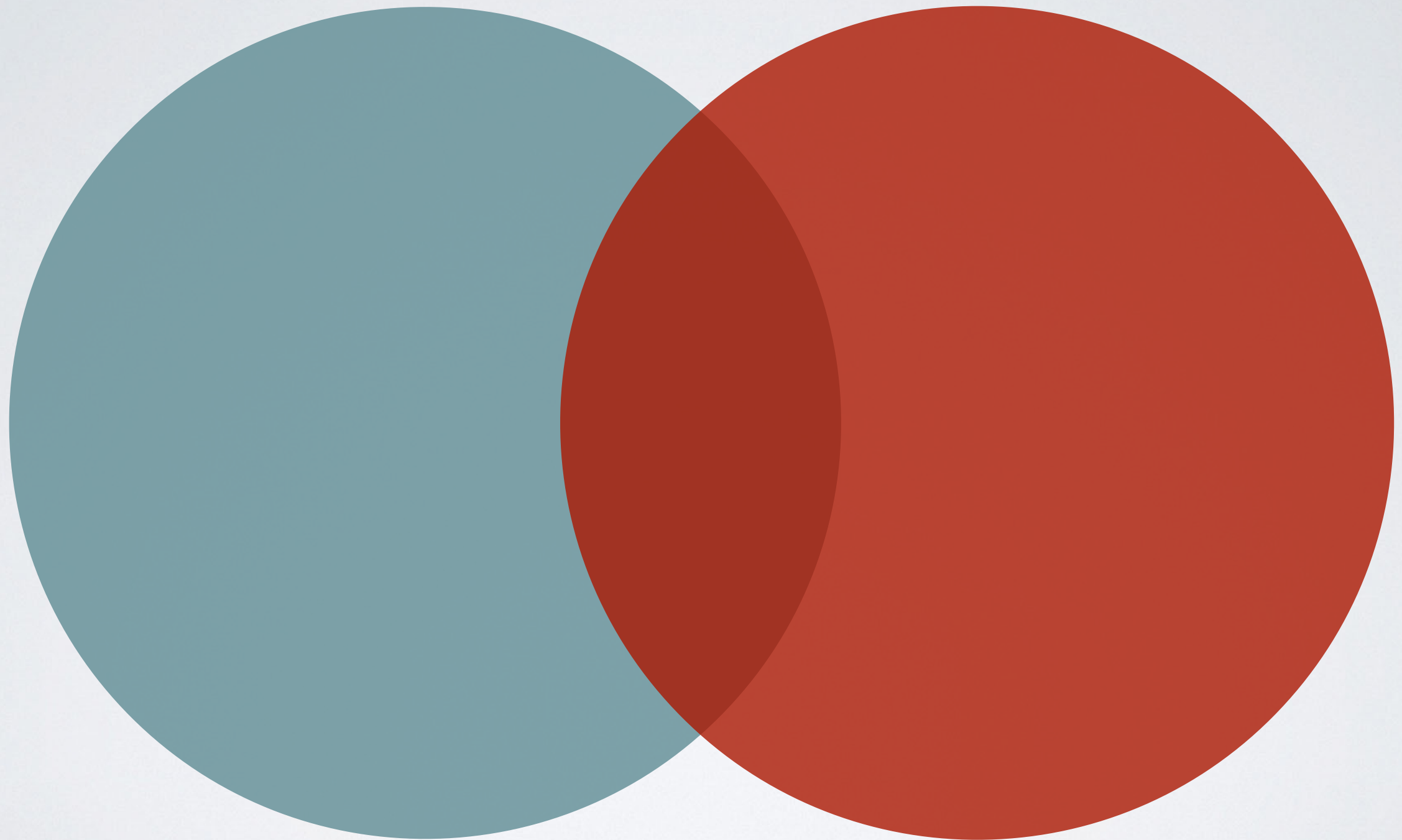
# **JavaScriptCore Framework on iOS7**

Low-overhead JS Context



EXISTING  
SOLUTIONS.

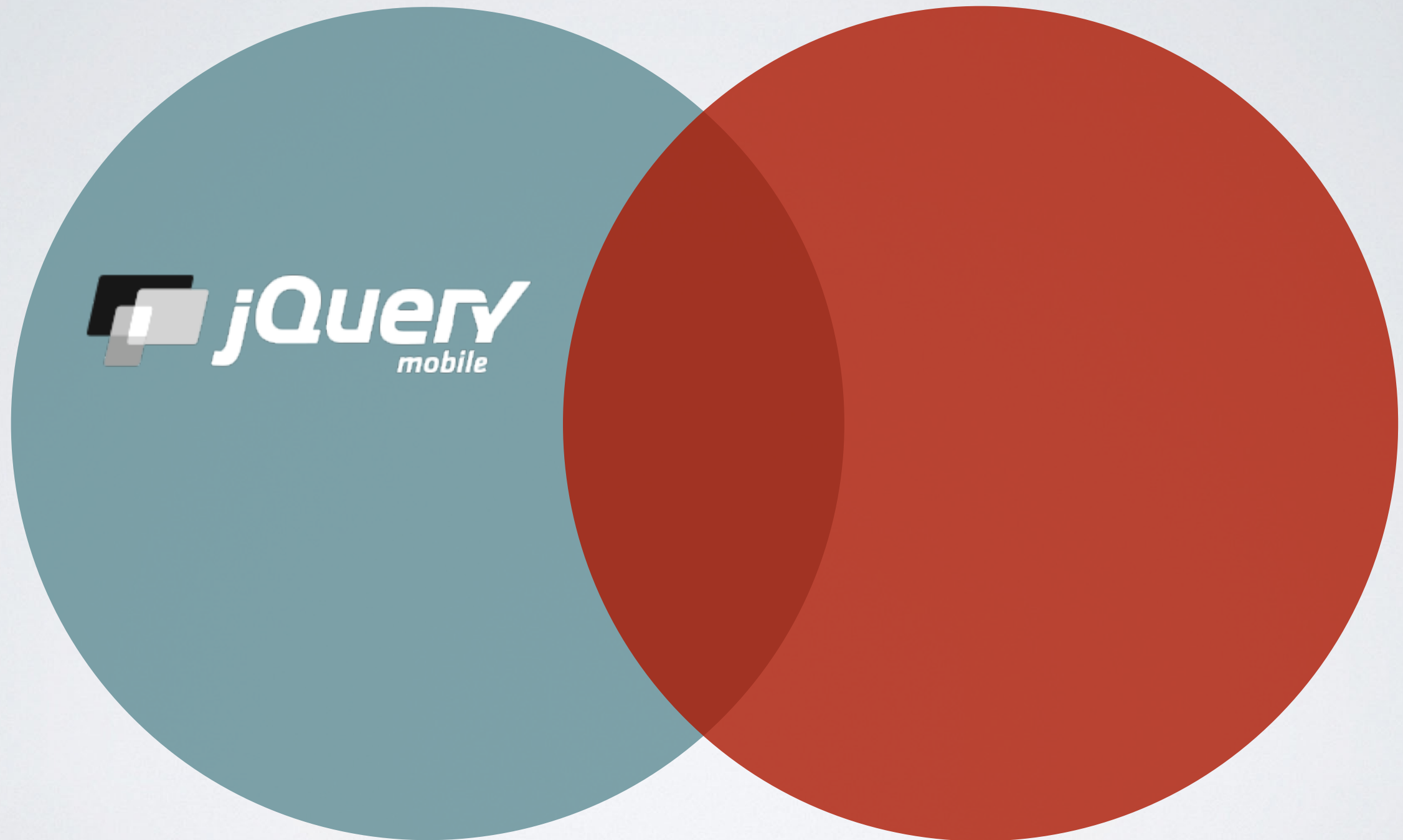
# *LANDSCAPE*



**HTML UI**

**Platform bridge**

# LANDSCAPE

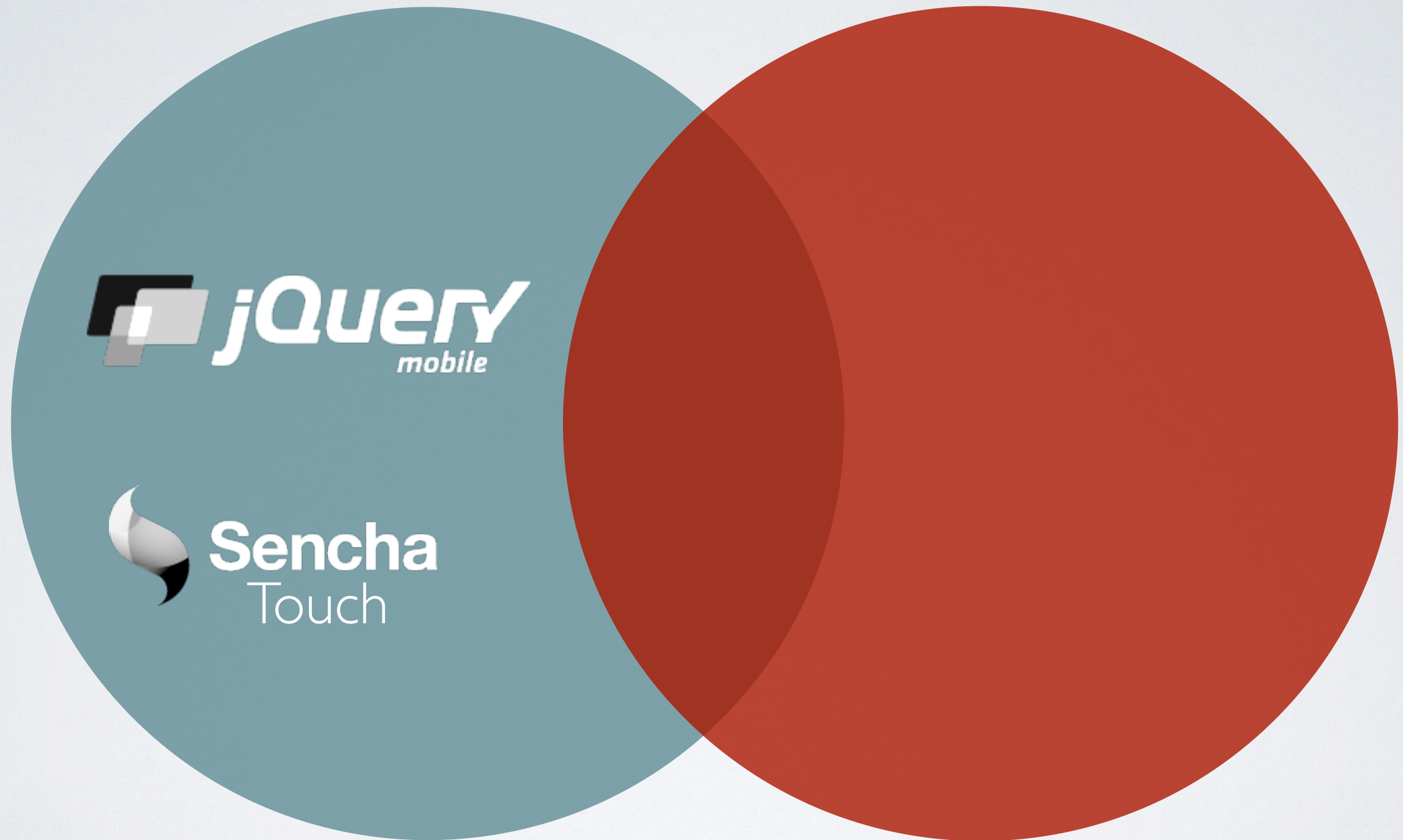


**HTML UI**

**Platform bridge**



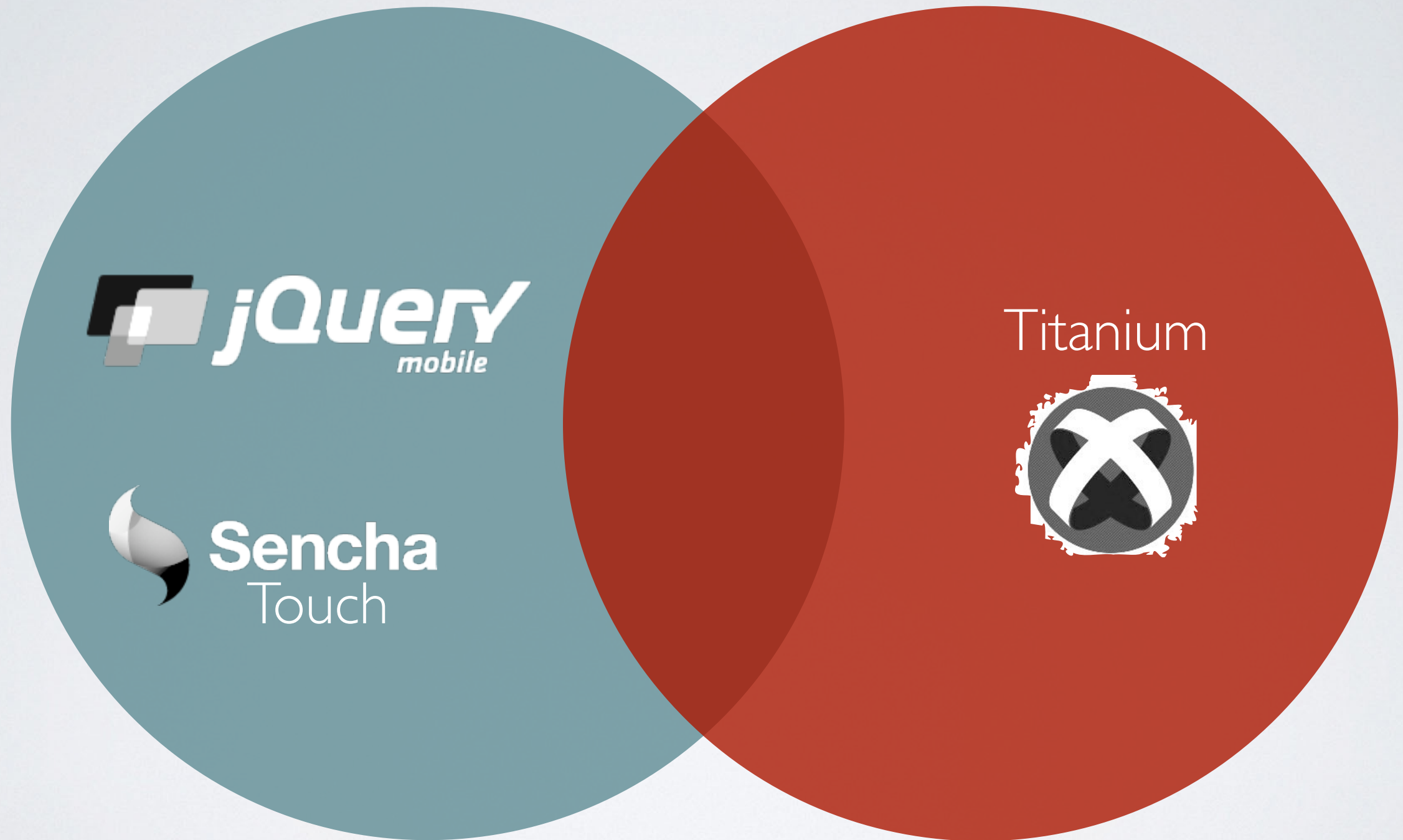
# LANDSCAPE



**HTML UI**

**Platform bridge**

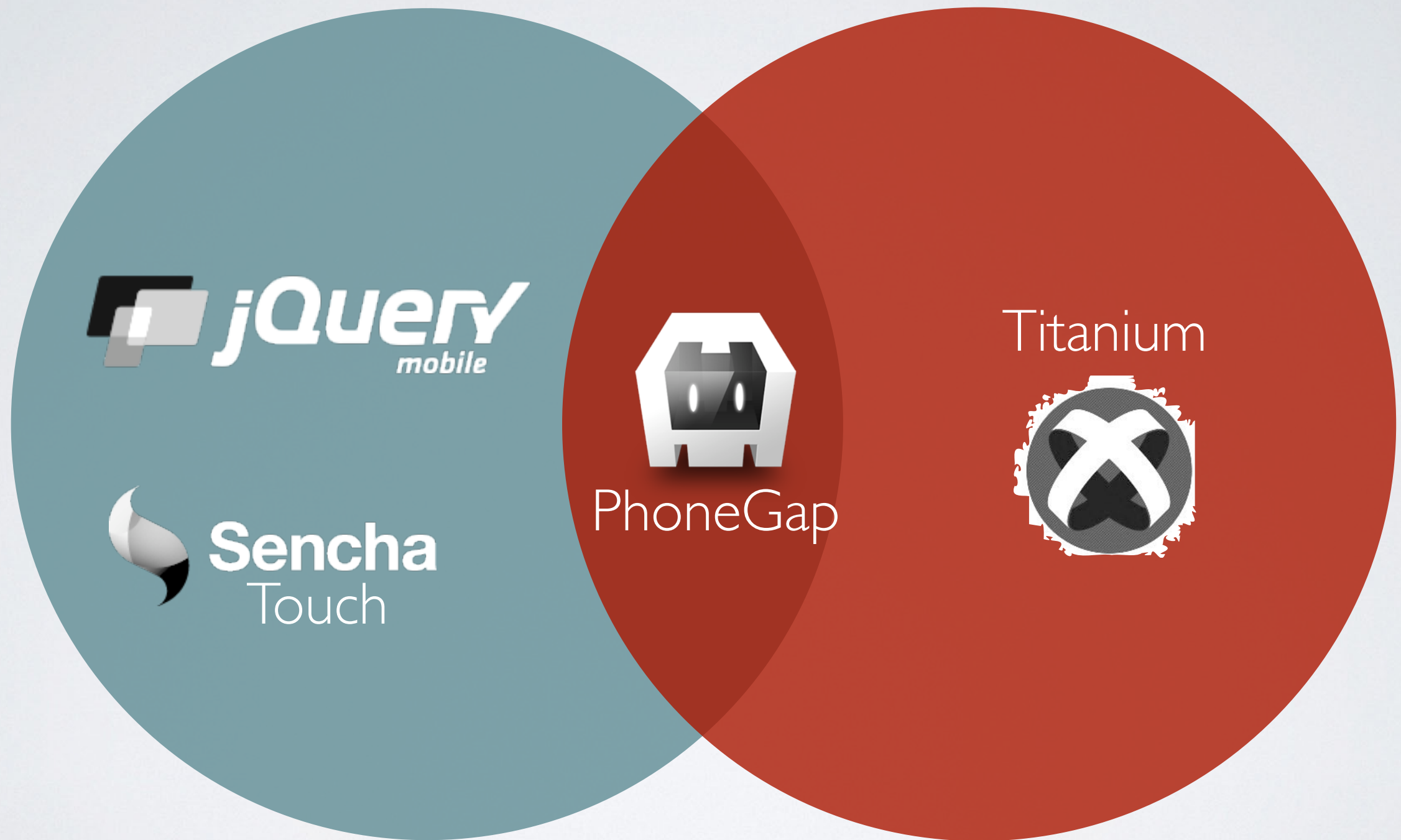
# LANDSCAPE



**HTML UI**

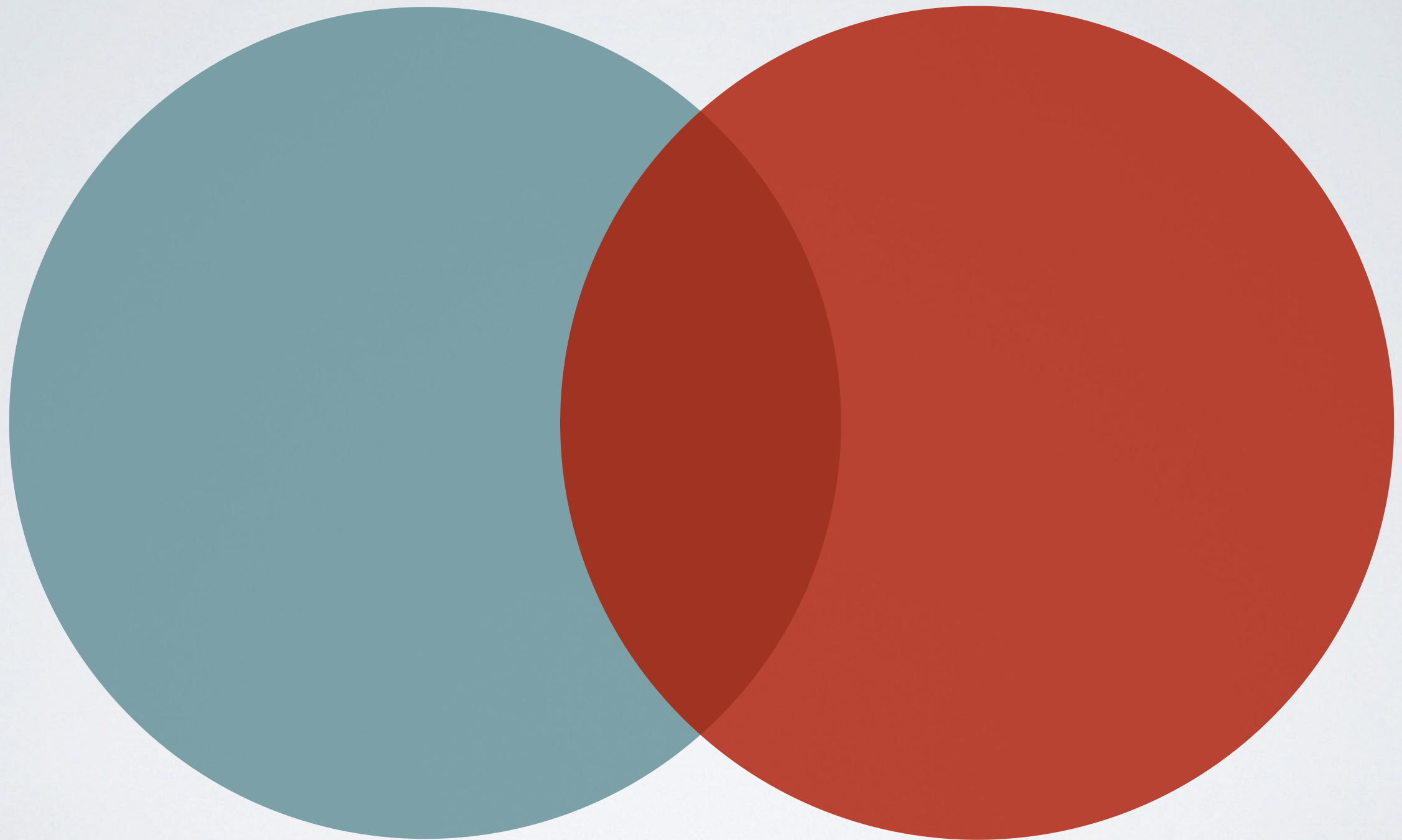
**Platform bridge**

# LANDSCAPE





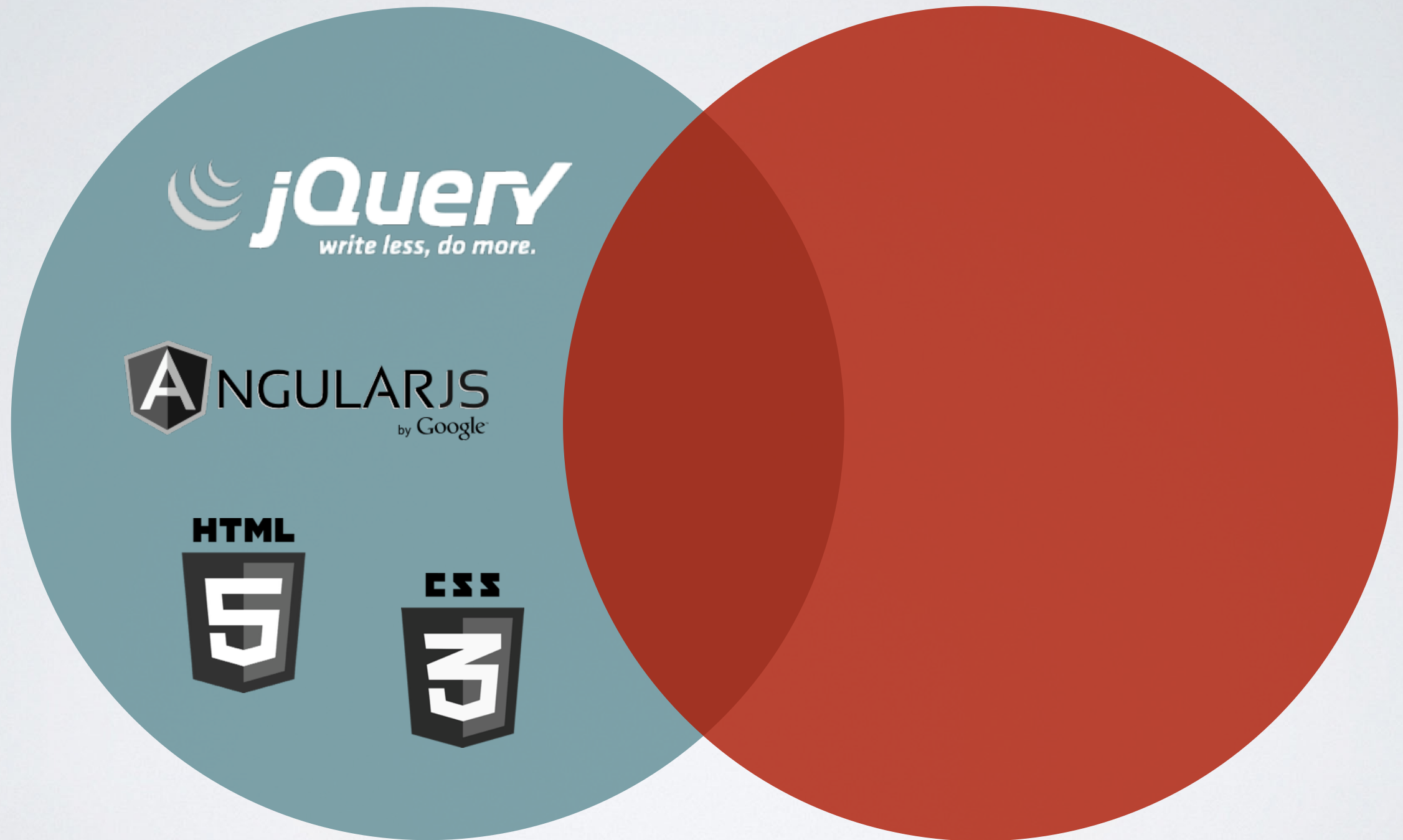
*TECHNOLOGY*



**HTML UI**

**Platform bridge**

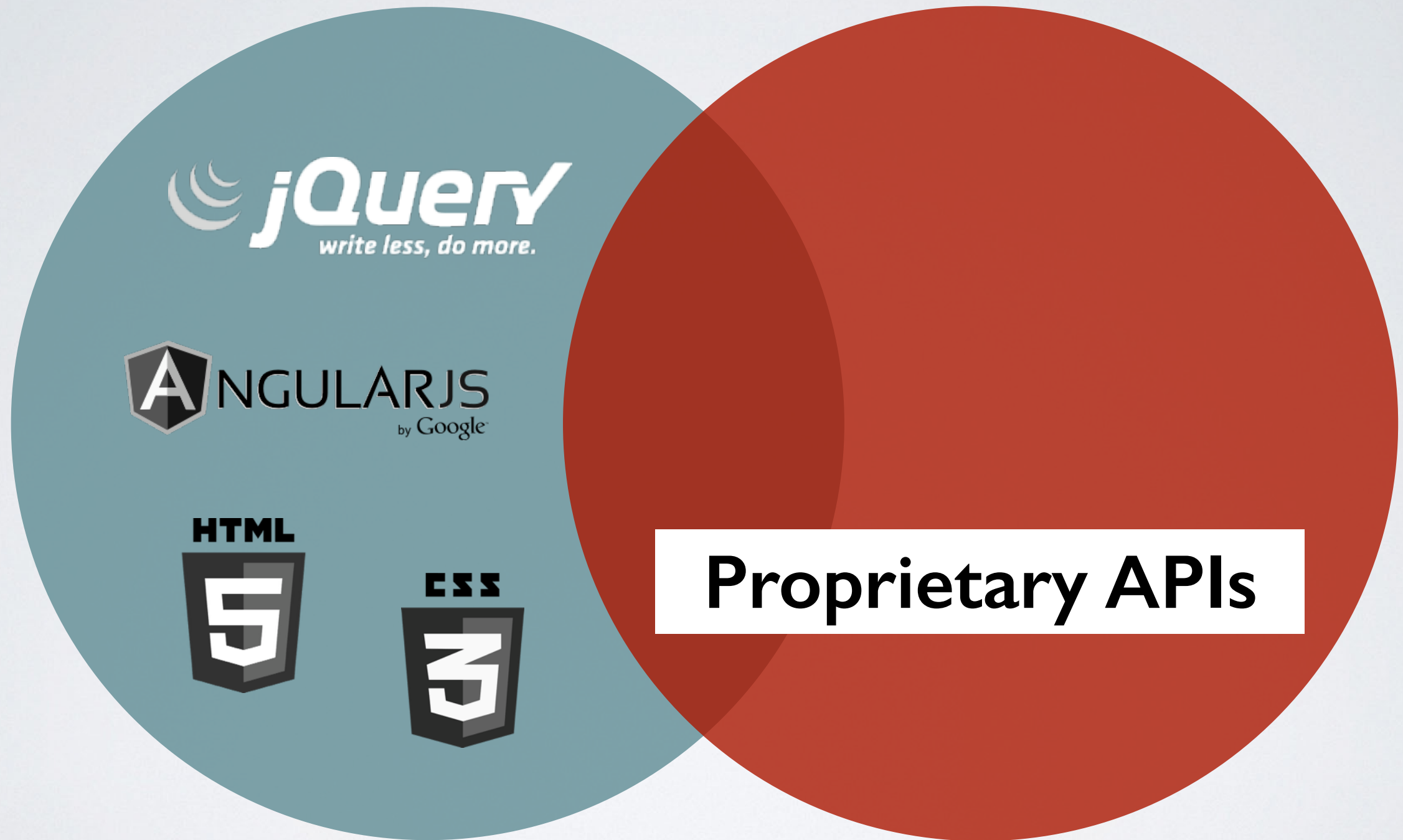
# TECHNOLOGY



**HTML UI**

**Platform bridge**

# TECHNOLOGY



**HTML UI**

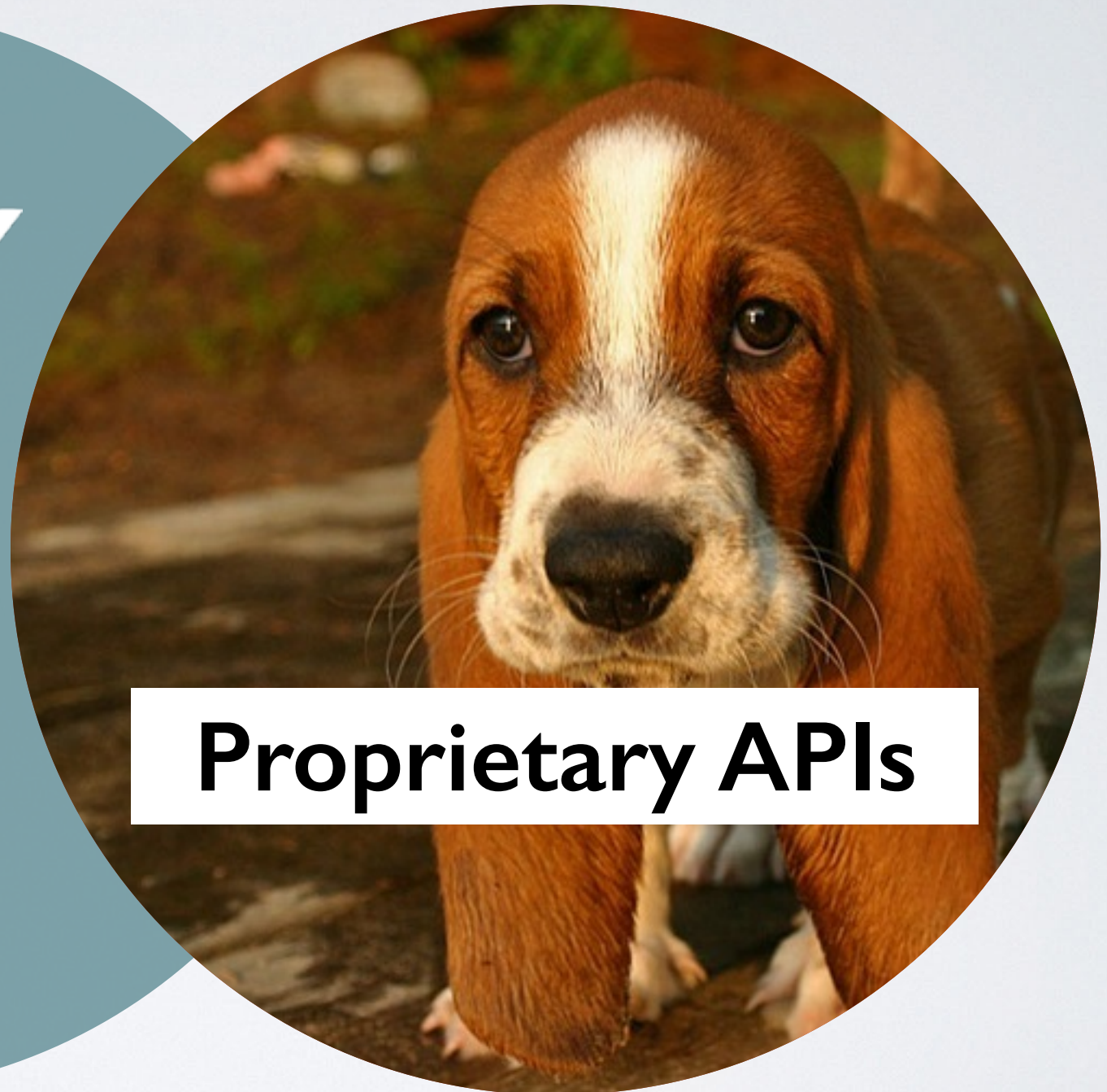
**Platform bridge**



# TECHNOLOGY



**HTML UI**



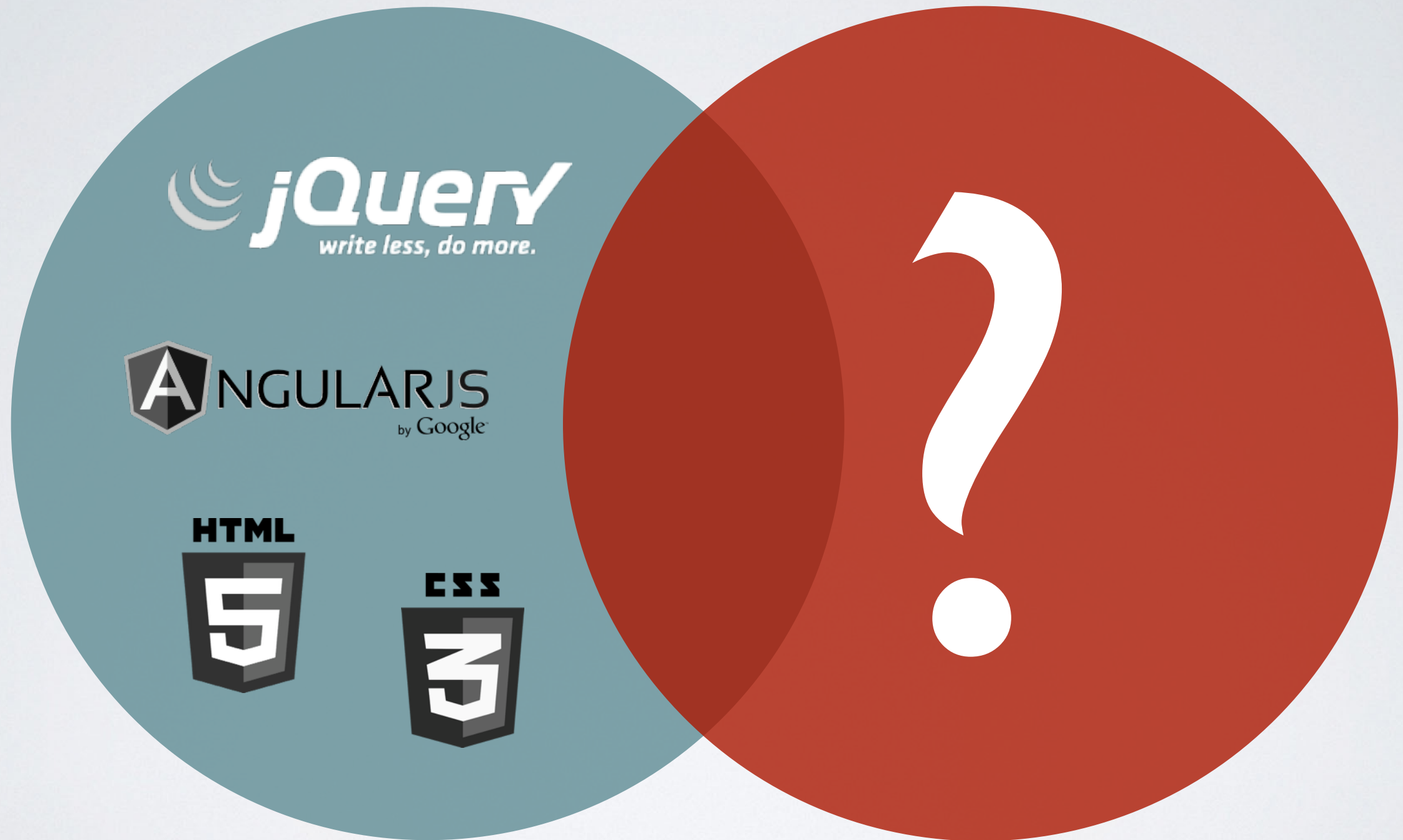
**Proprietary APIs**

**Platform bridge**

CAN WE  
DO BETTER?

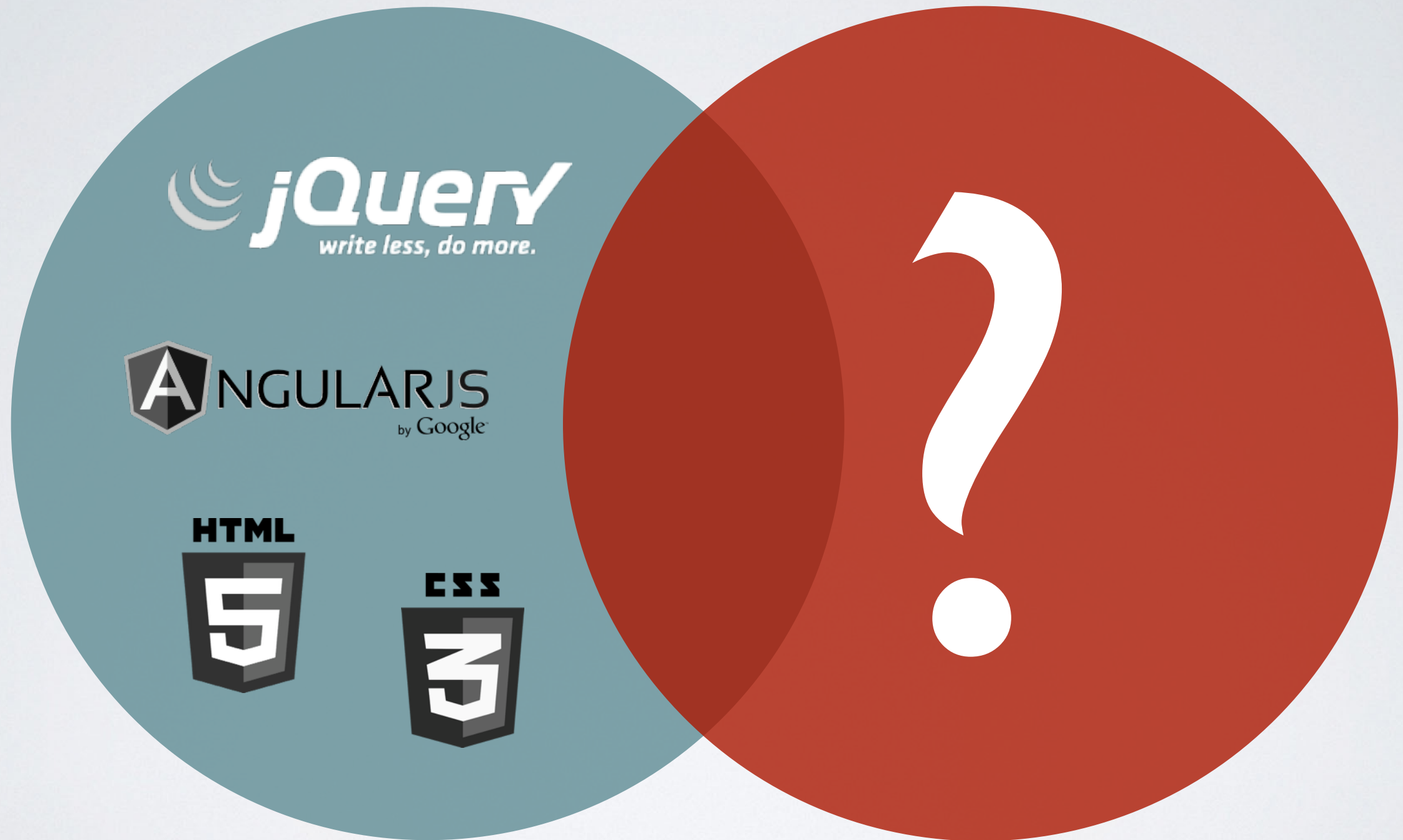


# TECHNOLOGY



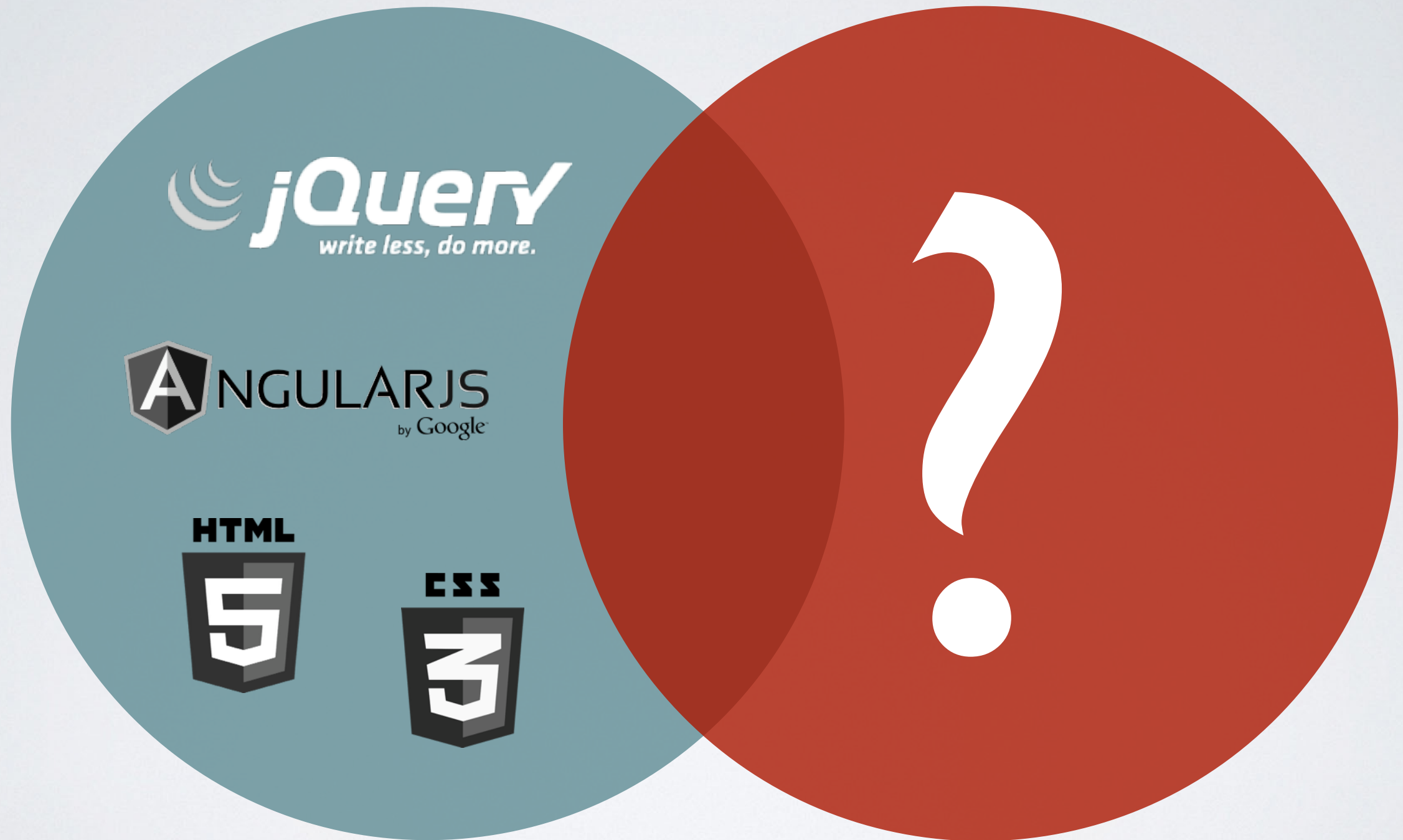


# TECHNOLOGY



**Frontend**

# TECHNOLOGY



**Frontend**

**Backend**

*Y U SO PROPRIETARY?*

```
Ti.Network.Socket.createTCP({  
  connected: function (e) {...}  
});
```



*Y U SO PROPRIETARY?*

```
Ti.Network.Socket.createTCP({  
  connected: function (e) {...}  
});
```

```
net.createServer(function (s) {  
  ...  
});
```

*Y U SO PROPRIETARY?*

```
Ti.Stream.write(e.socket,  
  Ti.createBuffer({  
    value: 'Hello World'  
  }), cb);
```

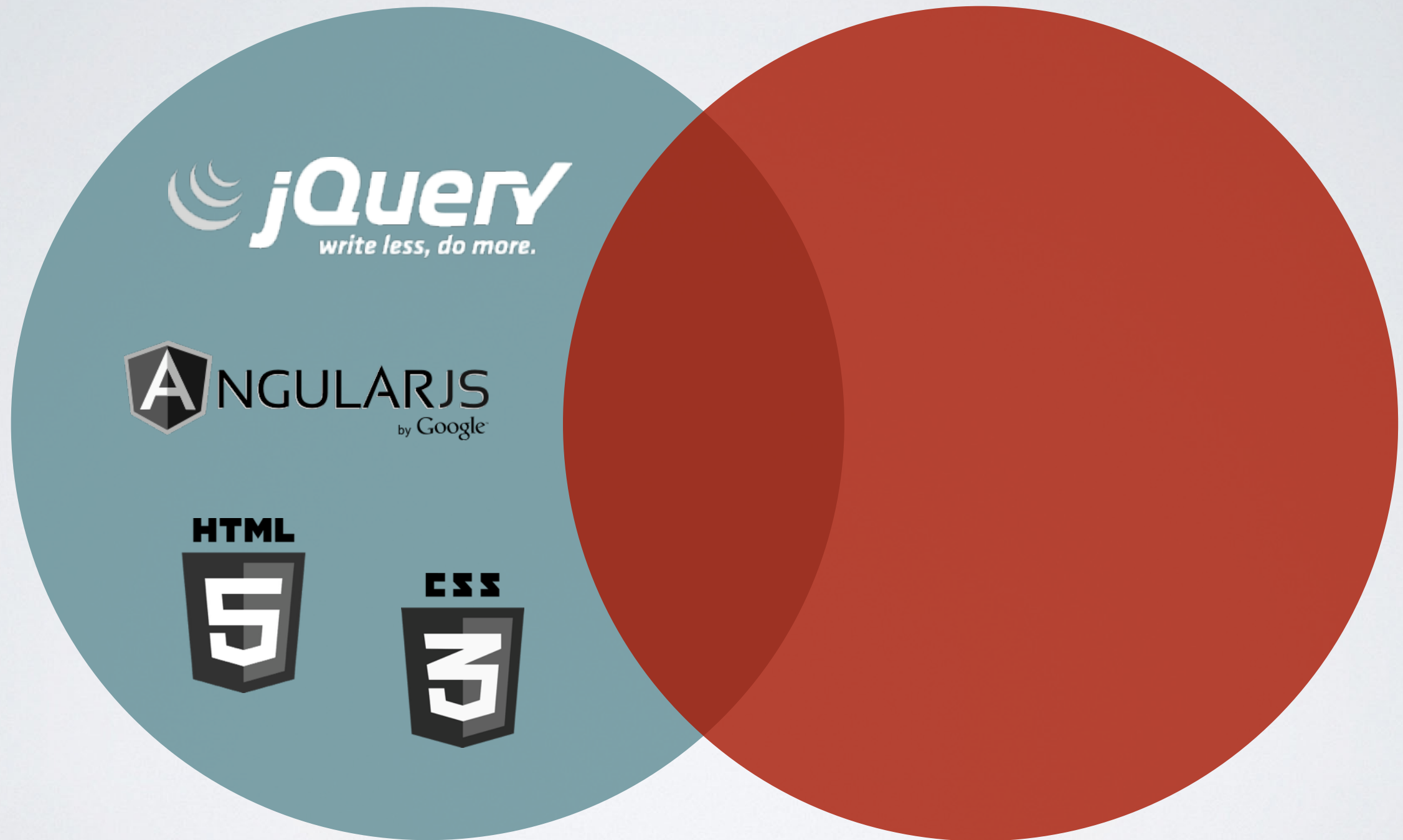
*Y U SO PROPRIETARY?*

```
Ti.Stream.write(e.socket,  
  Ti.createBuffer({  
    value: 'Hello World'  
  }), cb);
```

```
socket.write(  
  new Buffer('Hello World')  
);
```



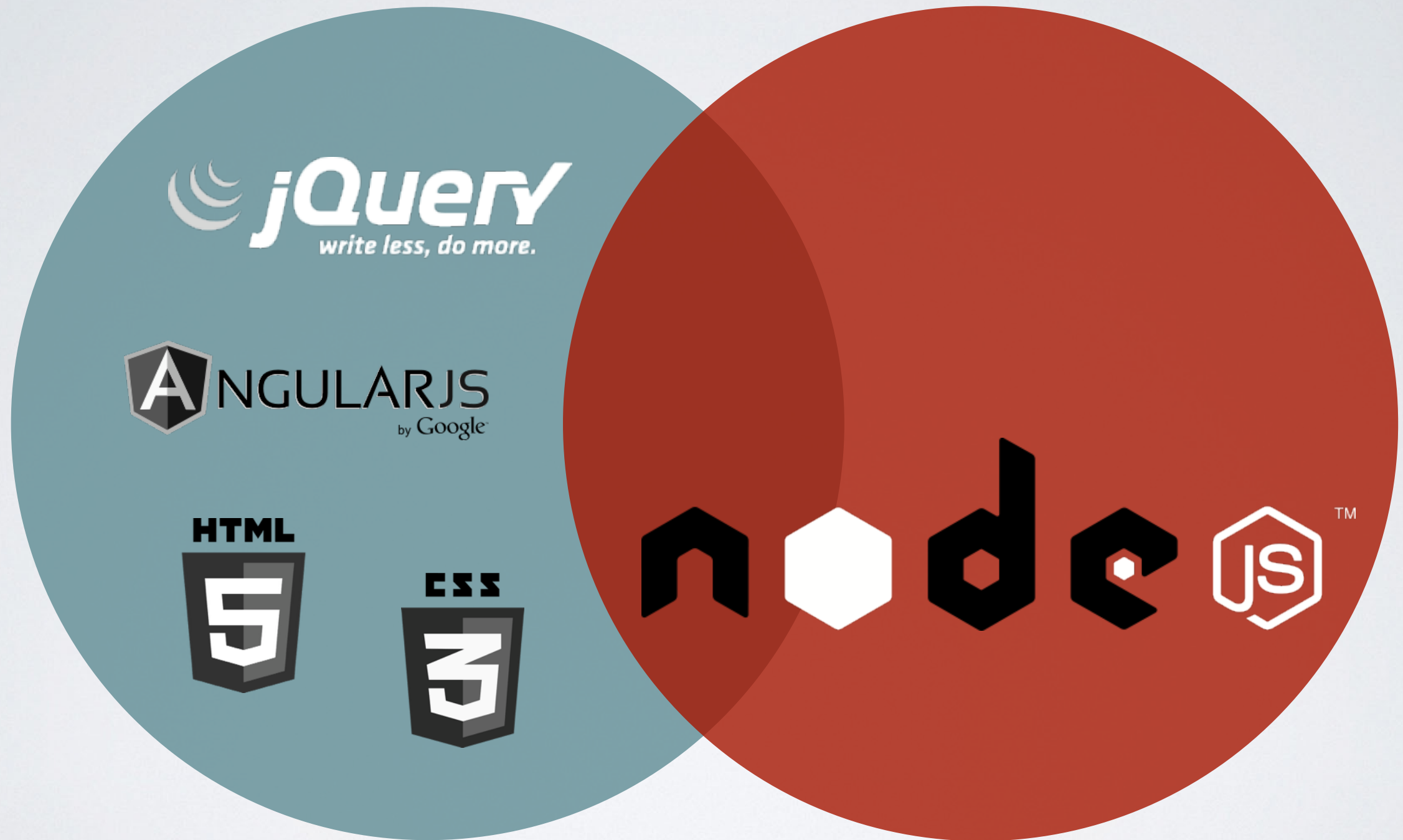
# TECHNOLOGY



**HTML UI**

**Platform bridge**

# TECHNOLOGY



**HTML UI**

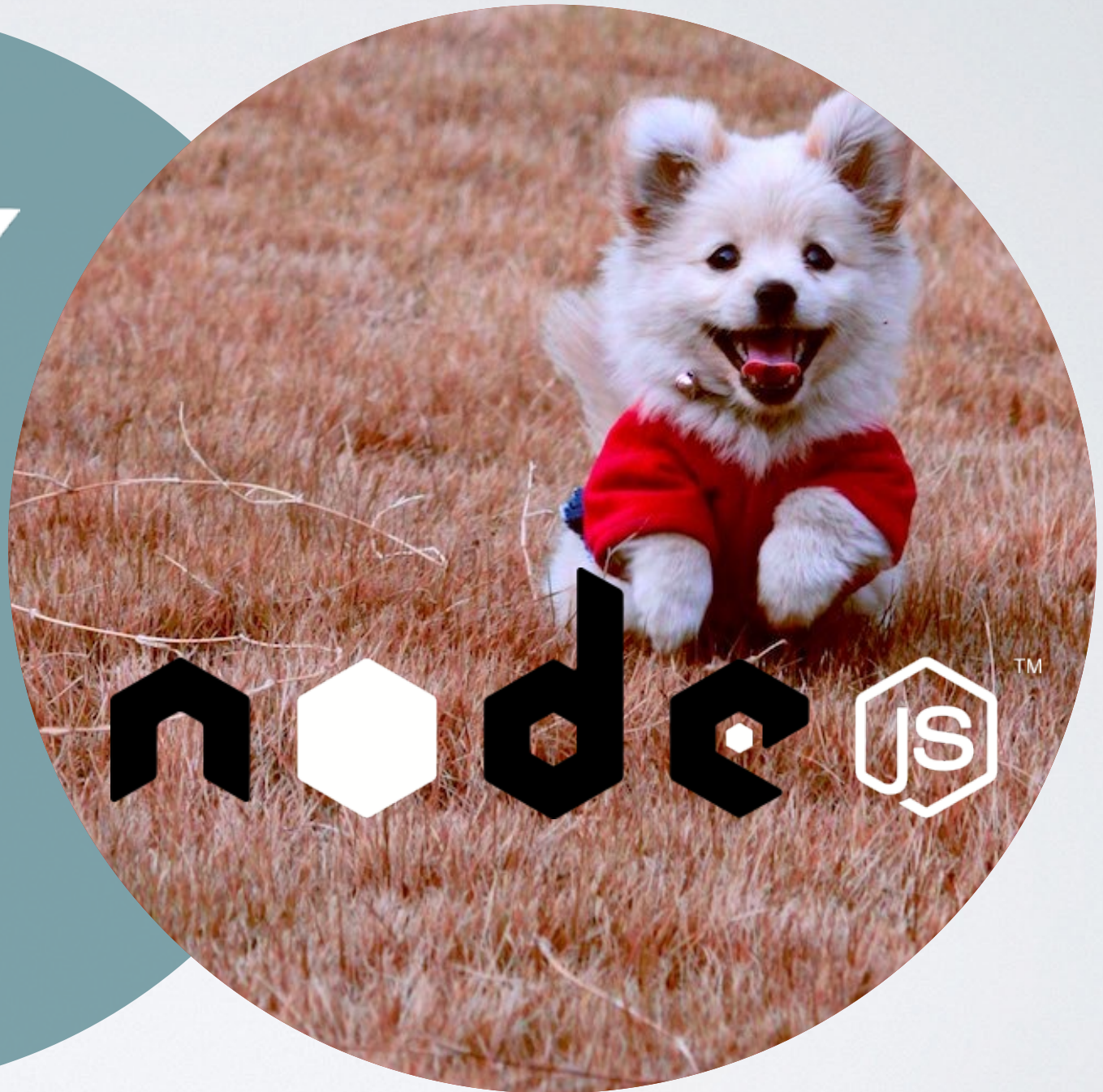
**Platform bridge**



# TECHNOLOGY



**HTML UI**



**Platform bridge**



*LET'S MAKE*  
**NODE.JS FOR**  
**MOBILE!**

AKA

“ARE YOU  
NUTS?!?”

# *PROOF-OF-CONCEPT*



# PROOF-OF-CONCEPT



## NODE.JS FOR IOS

**Node.app** is a low-footprint, Node.js-compatible JavaScript API for your mobile apps.

Interested? Subscribe and we'll keep you updated!

or visit us on GitHub



### Code Reuse

The best code is the code you already wrote. Use the code that reliably runs on your servers and your frontend to power your next great iOS 7 app, just like that.



### Tons of modules

In tens of thousands of modules there's a module for nearly everything you can imagine. The Node.js-compatible API allows you to use virtually every module available through [npm](#).



### Rapid Innovation

Node.app provides the familiar [Node.js API](#) which is well documented and extremely easy to use.



### Low-footprint

Your customers won't even notice you aren't developing native, unless you tell them. With Node.app you are using the same fast system functions just as with normal iOS code.

Developing iOS and OSX native applications using node.js API - Awesome!

— Roberto Sánchez (@rsc1975) December 4, 2013

Node.app - Javascript API for iOS finally!!

— dylan hassinger (@dylanized) October 29, 2013

Node.js for iOS - Node-like API for JavaScriptCore = AWESOME.

— Matias Plipari (@mz2) December 5, 2013

Build #io7 native apps with #nodejs. That's a fucking good news for #javascript developers !

— Florent Bourgeois (@florent\_b) December 6, 2013

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This looks really interesting: #nodejs-like api for #ios7 and #mavericks

— Keystone JS (@KeystoneJS) October 14, 2013

@periping well done on the #JavaScript Core Project using #iOS7, can't wait to see what comes out of it.

— Suyash Joshi (@suyashcjoshi) October 14, 2013

# PROOF-OF-CONCEPT



The image shows a landing page for 'Node.js for iOS'. At the top, there's a green hexagonal logo with a stylized 'PP' inside. Below it, the text 'NODE.JS FOR IOS' is displayed in a bold, sans-serif font. Underneath, a smaller line of text reads: 'Node.app is a low-footprint, Node.js-compatible JavaScript API for your mobile apps.' A white button with the text 'Interested? Subscribe and we'll keep you updated!' is centered below this. Below the button, it says 'or visit us on GitHub'. The main body of the page is dark green and features four white hexagonal icons, each representing a benefit: 'Code Reuse' (circular arrows), 'Tons of modules' (a building), 'Rapid Innovation' (a lightning bolt), and 'Low-footprint' (a paper airplane). Each icon is followed by a short paragraph explaining the benefit. At the bottom, there's a white section with four columns of user testimonials, each starting with a quote and followed by the user's name and the date.

**NODE.JS FOR IOS**

Node.app is a low-footprint, Node.js-compatible JavaScript API for your mobile apps.

Interested? Subscribe and we'll keep you updated!

or visit us on GitHub

**Code Reuse**  
The best code is the code you already wrote. Use the code that reliably runs on your servers and your frontend to power your next great iOS 7 app, just like that.

**Tons of modules**  
In tens of thousands of modules there's a module for nearly everything you can imagine. The Node.js-compatible API allows you to use virtually every module available through [npm](#).

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>20.000 Visits

>1.000 Subscribers

>900 Stars on GitHub



# PROOF-OF-CONCEPT



>20.000 Visits

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*“Can't wait to see where  
this goes.  
Hack on my man, Hack  
on!”*



*LET'S  
ACTUALLY  
DO THIS!*

# NODE.JS CODEBASE

Language Breakdown

	Language	Code Lines
	C++	716,387
	C	376,492
	JavaScript	280,350
	Assembly	155,191
	Perl	71,151
	Python	49,958
	Make	15,055
	HTML	10,910

Source: [ohloh.net/p/node](http://ohloh.net/p/node)

# NODE.JS CODEBASE

Language Breakdown

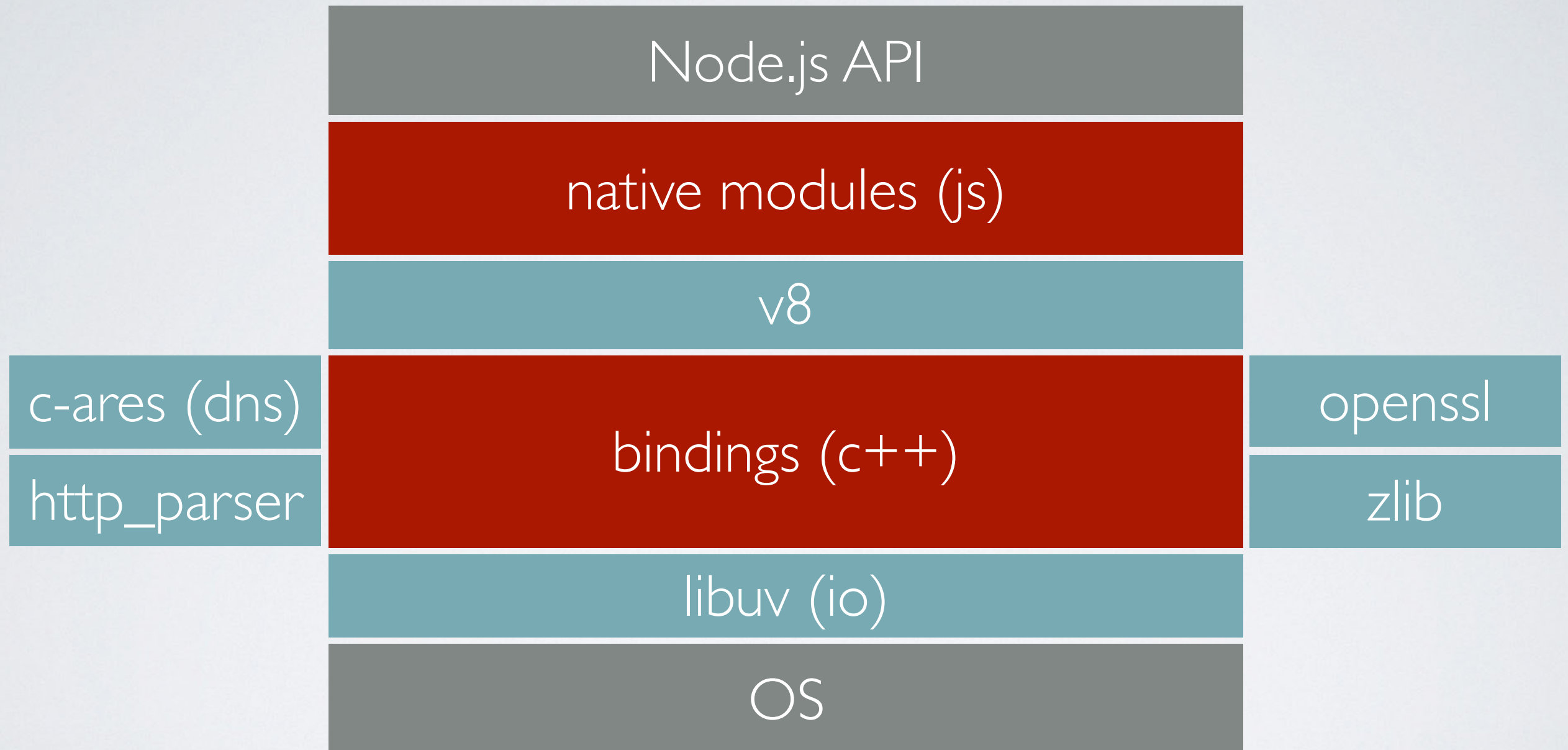
Language	Code Lines
C++	716,387
C	376,492
JavaScript	280,350
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~1.5M LOC

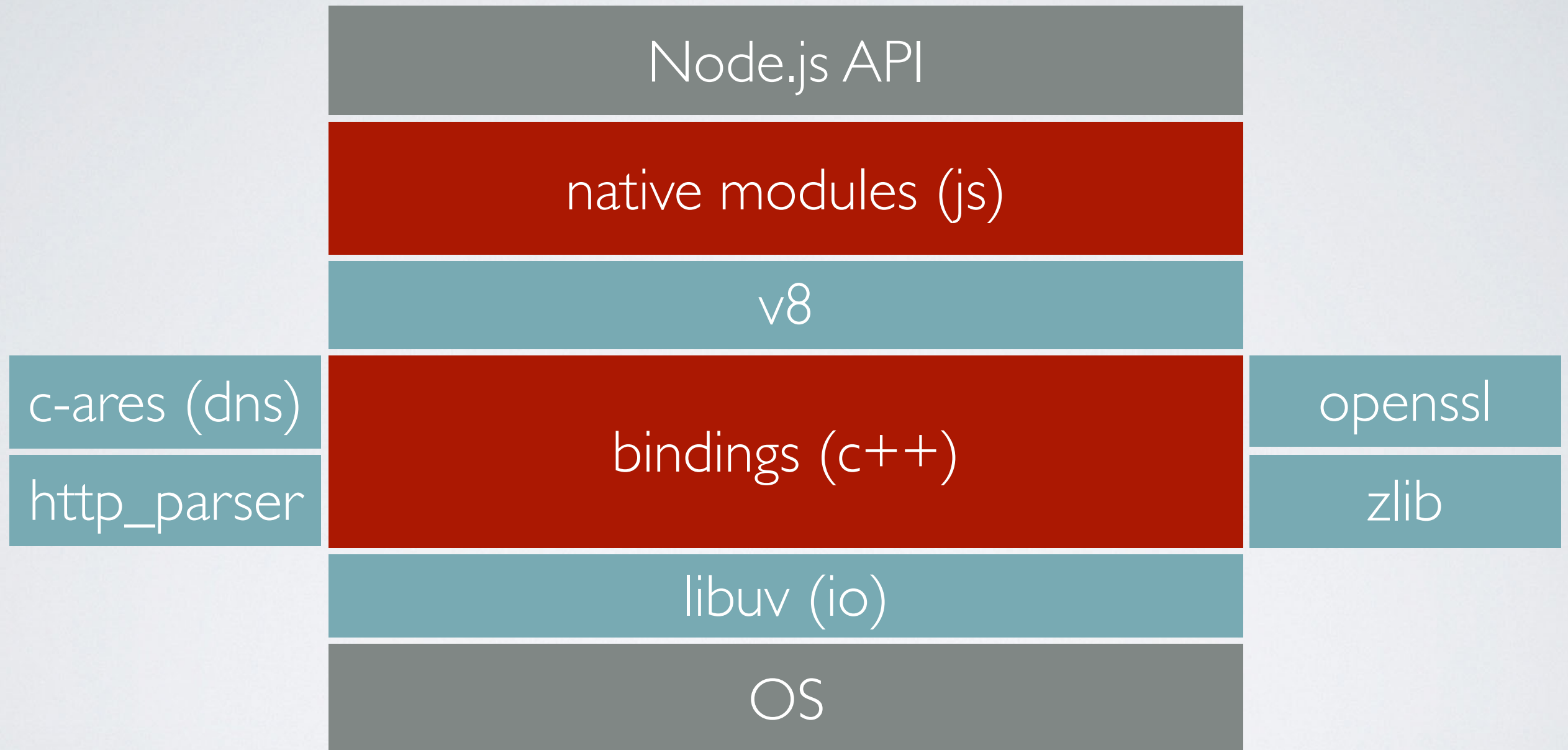
Source: [ohloh.net/p/node](http://ohloh.net/p/node)



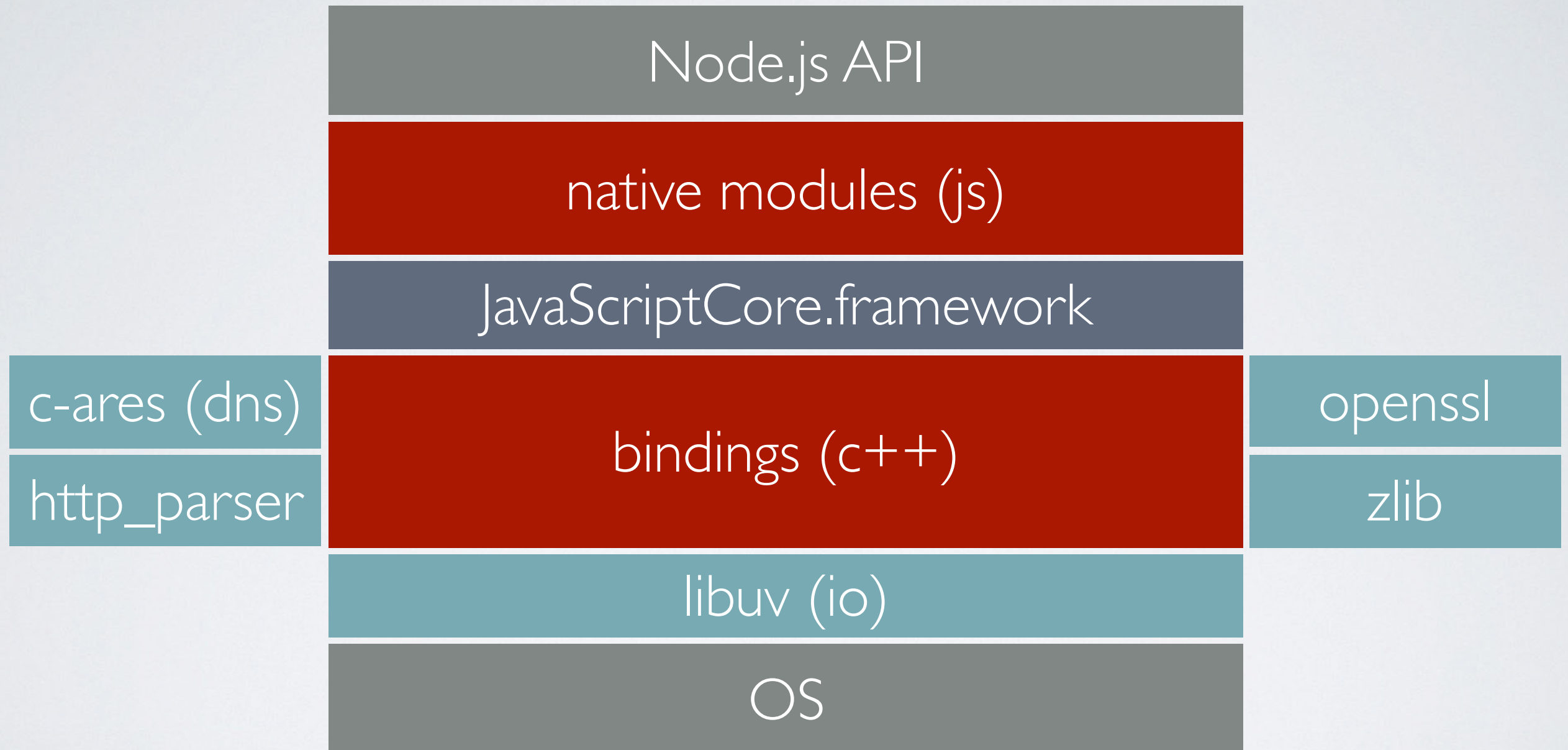
# NODE.JS CODEBASE



# NODE.JS CODEBASE

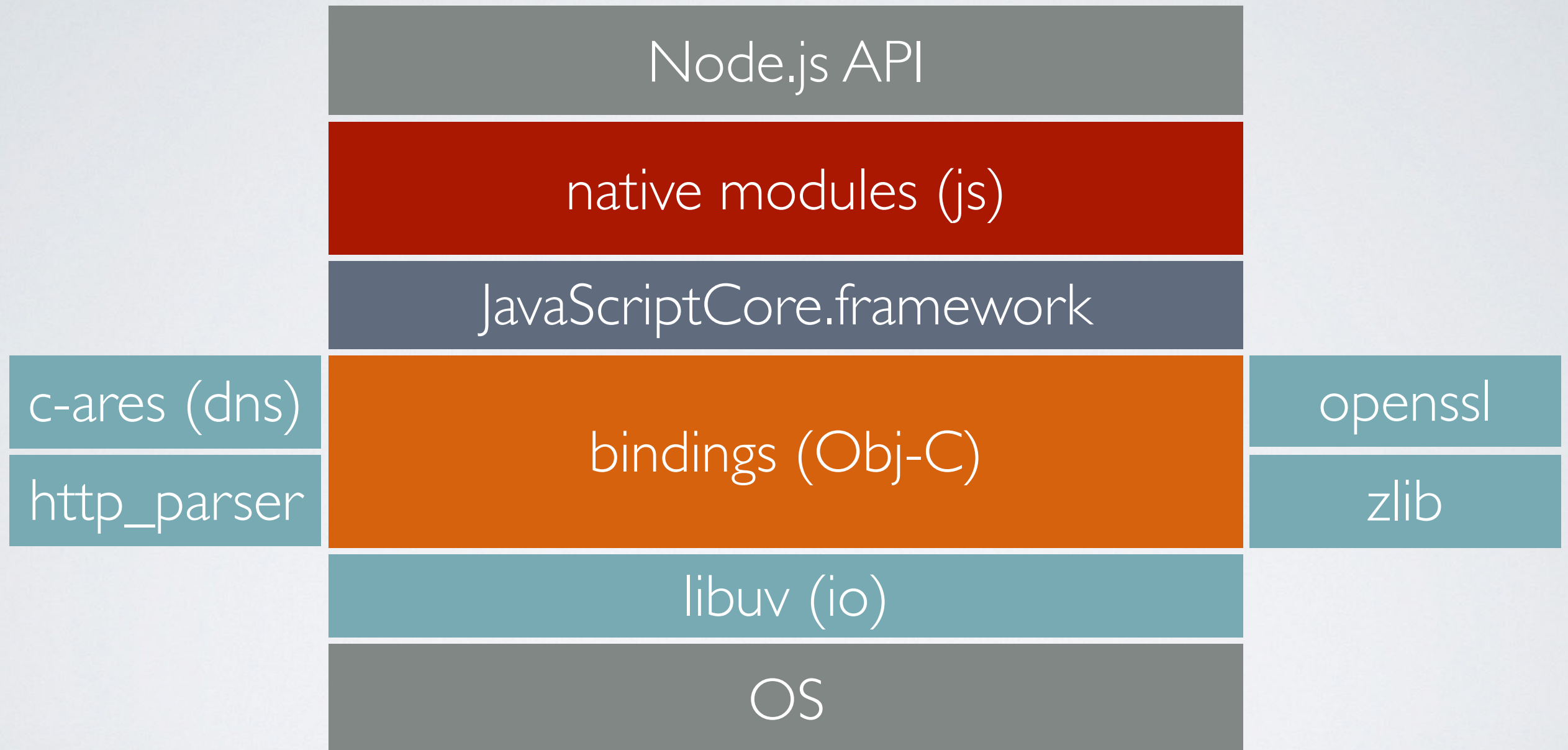


# NODE.JS CODEBASE





# NODE.JS CODEBASE



# APPROACH

bindings (c++)

~20.000 LOC

- Filesystem
- Crypto
- HTTP Parser
- zlib
- TCP
- Timer
- TLS
- UDP

```
src$ wc -l *.cc
1180 cares_wrap.cc
196 fs_event_wrap.cc
136 handle_wrap.cc
3442 node.cc
668 node_buffer.cc
1066 node_constants.cc
631 node_contextify.cc
141 node_counters.cc
4179 node_crypto.cc
449 node_crypto_bio.cc
265 node_crypto_clienthello.cc
327 node_dtrace.cc
68 node_extensions.cc
1100 node_file.cc
603 node_http_parser.cc
58 node_javascript.cc
67 node_main.cc
305 node_os.cc
143 node_stat_watcher.cc
99 node_watchdog.cc
206 node_win32_etw_provider.cc
335 node_win32_perfctr_provider.cc
611 node_zlib.cc
293 pipe_wrap.cc
296 process_wrap.cc
117 signal_wrap.cc
499 smalloc.cc
604 stream_wrap.cc
751 string_bytes.cc
464 tcp_wrap.cc
160 timer_wrap.cc
724 tls_wrap.cc
183 tty_wrap.cc
442 udp_wrap.cc
65 uv.cc
20873 total
```

# APPROACH

bindings (Obj-C)

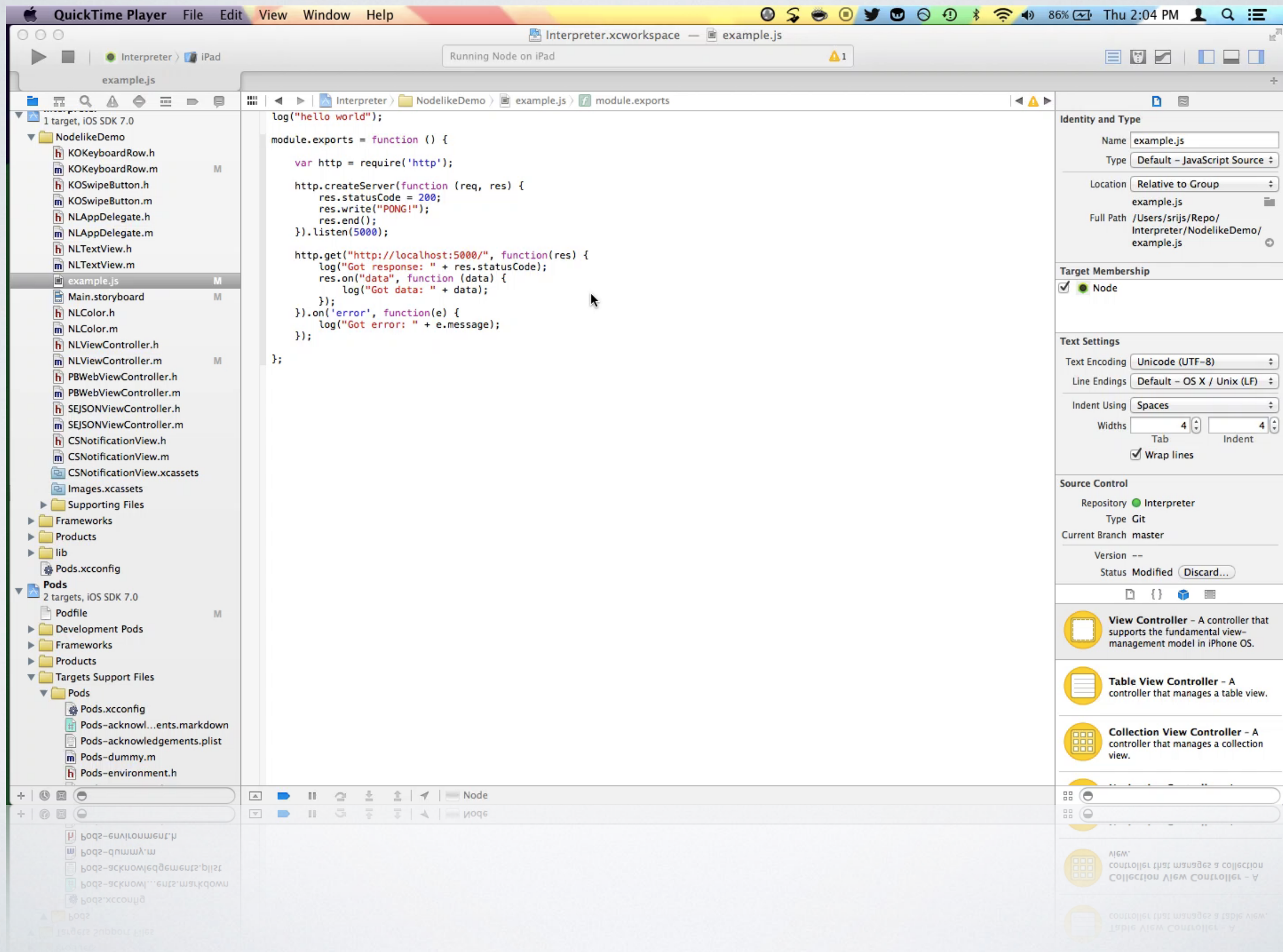
~2.000 LOC

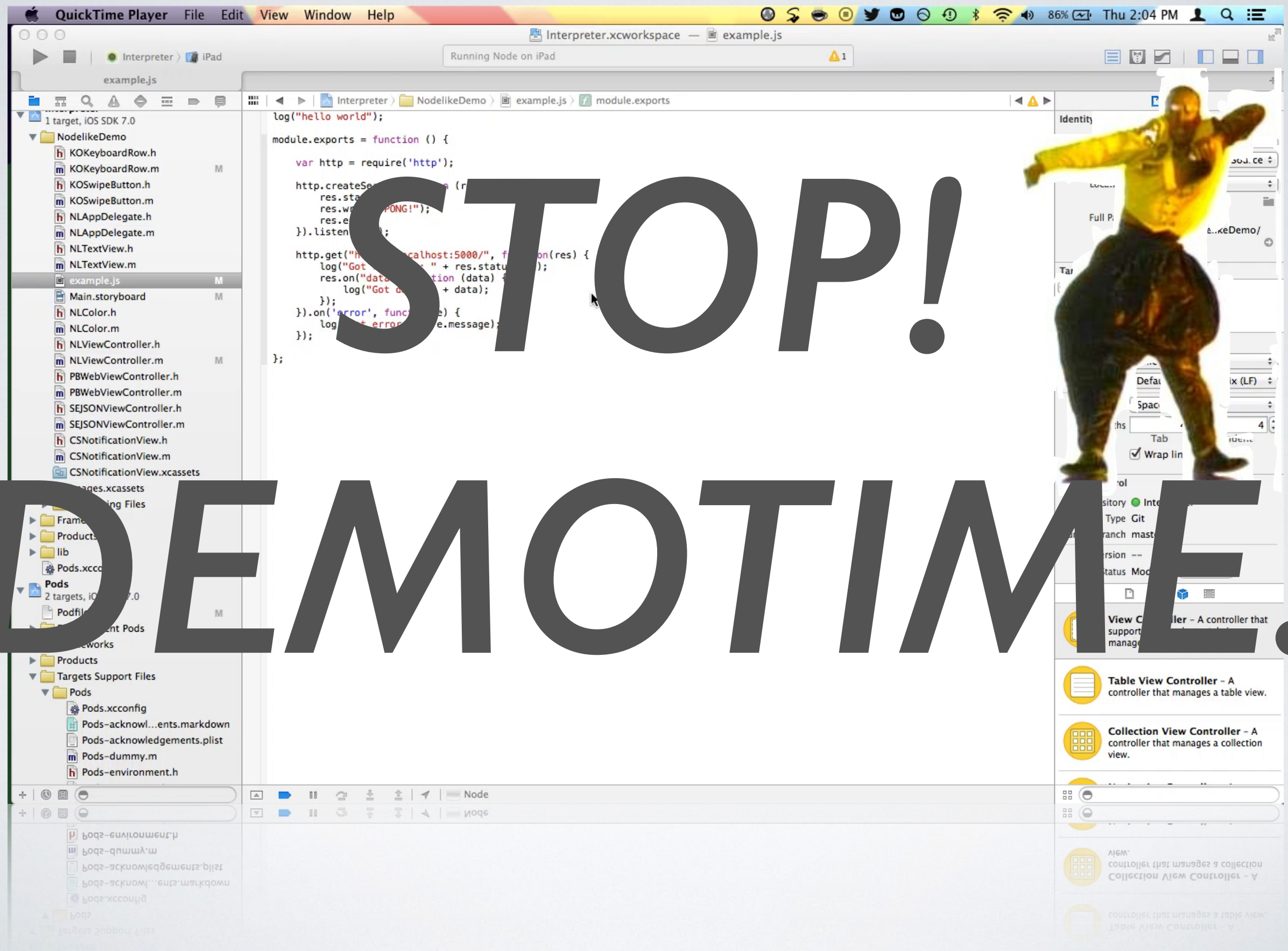
- Filesystem
- HTTP Parser
- TCP
- Timer
- Buffer

```
Nodelike$ wc -l *.m
  86 NLBinding.m
 119 NLBindingBuffer.m
 213 NLBindingConstants.m
 309 NLBindingFilesystem.m
  35 NLBindingSmalloc.m
  34 NLBindingUv.m
 162 NLCaresWrap.m
 187 NLContext.m
 364 NLHTTPParser.m
  83 NLHandle.m
  26 NLProcess.m
 254 NLStream.m
 197 NLTCP.m
  70 NLTimer.m
  33 NLUDP.m
2172 total
```



***BUT DOES  
IT WORK?***

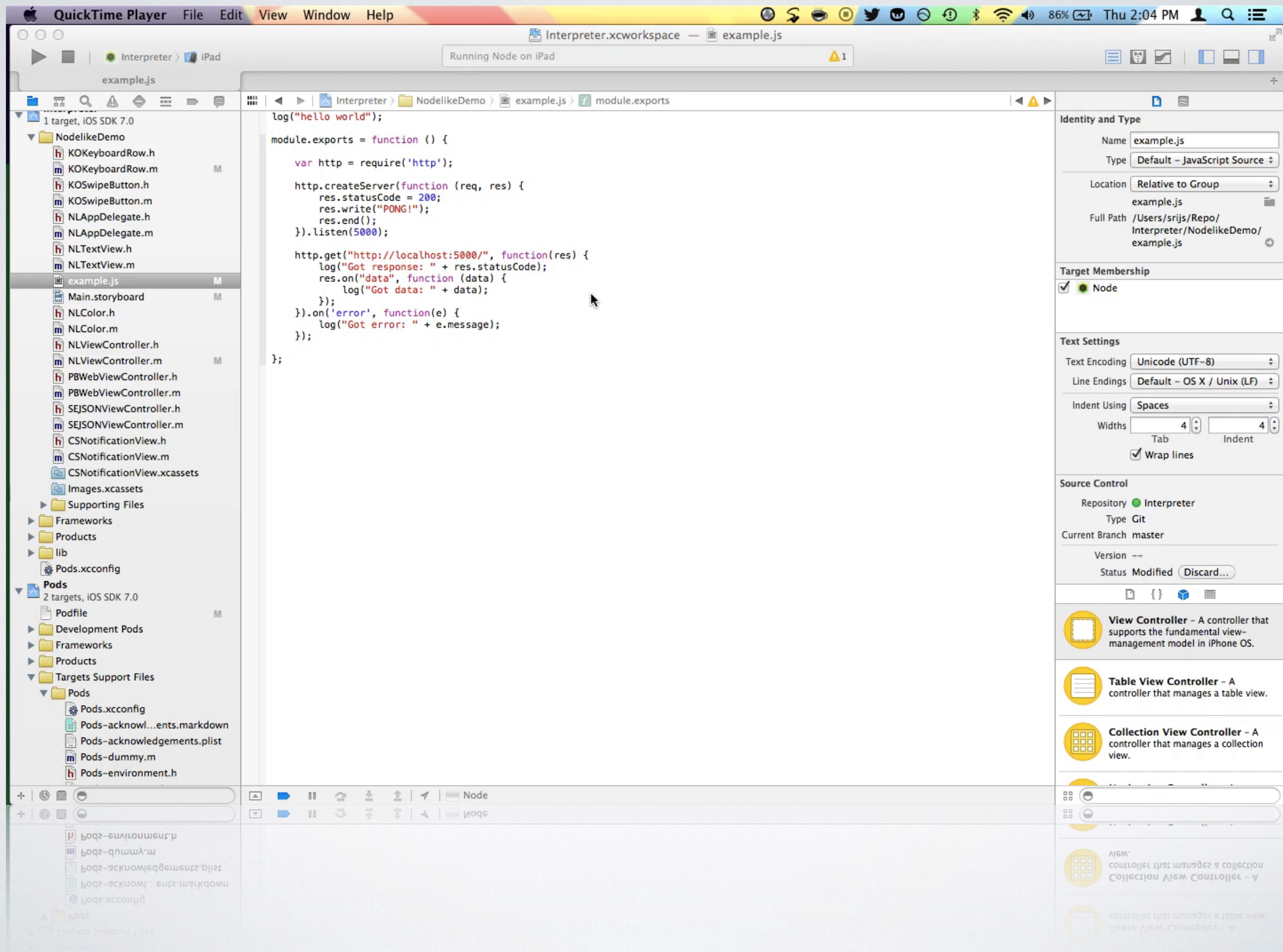




STOP!

DEMOTIME!





<https://itunes.apple.com/app/id793774475>

## iTunes Preview

[What's New](#)

[What is iTunes](#)

[iTunes Charts](#)

### Node – JavaScript Interpreter

By Marcus Kida

Open iTunes to buy and download apps.

[View More By This Developer](#)



#### Description

A Node.js compatible JavaScript interpreter for iPad, iPhone and iPod touch.

This is the perfect tool for learning, studying or just toying around with JavaScript and the Node.js API on the go.

[Node – JavaScript Interpreter Support](#) ▶

[...More](#)

[View In iTunes](#)

⊕ This app is designed for both iPhone and iPad

Free

Category: [Education](#)

Released: Jan 13, 2014

Version: 1.0

Size: 0.6 MB

Language: English

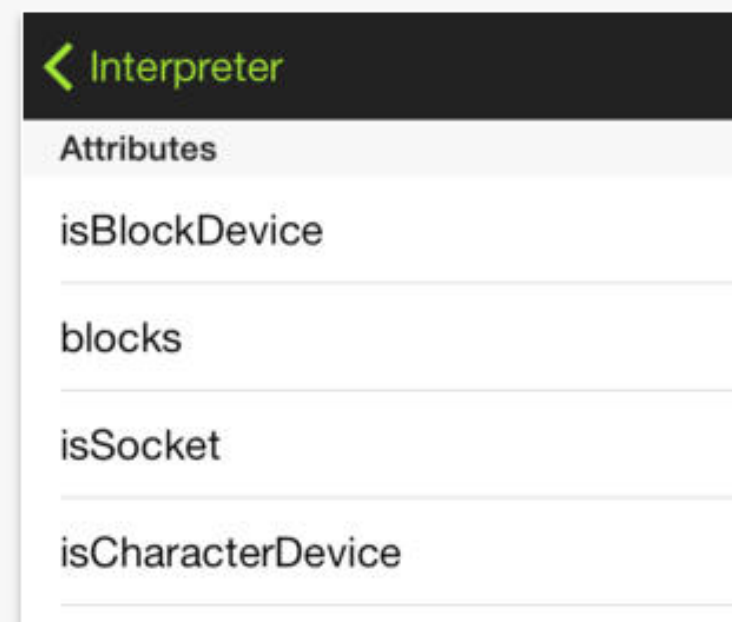
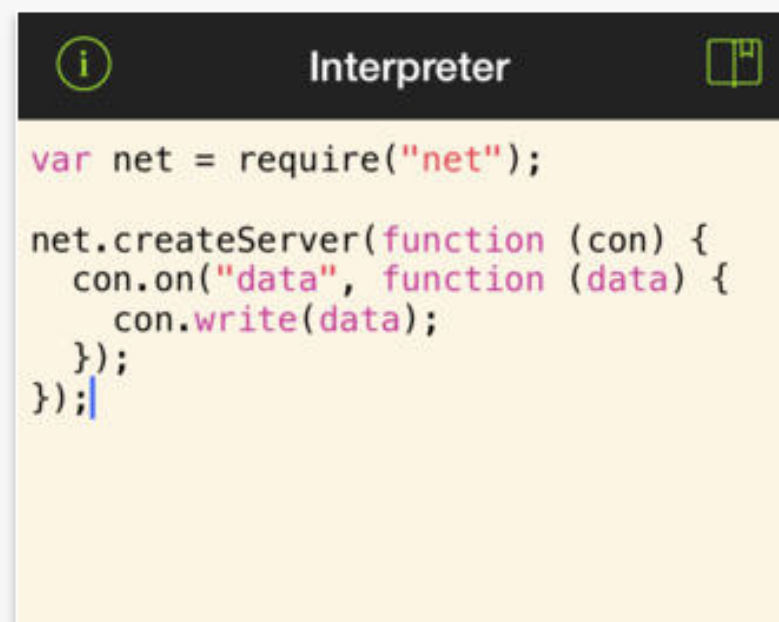
Seller: Marcus Kida

© Samuel Reis

[Rated 4+](#)

#### Screenshots

[iPhone](#) | [iPad](#)



*WHAT ALREADY WORKS...*



# WHAT ALREADY WORKS...

Assertion Testing

Path

Punycode

Query Strings

URL

Utilities

*Reliable*

# WHAT ALREADY WORKS...

Assertion Testing  
Path

Punycode  
Query Strings

URL  
Utilities

*Reliable*

Stream

Events

Buffer

*Reliable*

# WHAT ALREADY WORKS...

Assertion Testing  
Path  
Punycode  
Query Strings  
URL  
Utilities

*Reliable*

Stream  
Events  
Buffer

*Reliable*

File System  
Timers

*Reliable*



# WHAT ALREADY WORKS...

Assertion Testing  
Path  
Punycode  
Query Strings  
URL  
Utilities

*Reliable*

Stream  
Events  
Buffer

*Reliable*

File System  
Timers

*Reliable*

DNS

*Basic*

# WHAT ALREADY WORKS...

Assertion Testing  
Path  
Punycode  
Query Strings  
URL  
Utilities

*Reliable*

Stream  
Events  
Buffer

*Reliable*

File System  
Timers

*Reliable*

DNS

*Basic*

Net, HTTP

*Unstable*

*WHAT'S THE USE...*



# *WHAT'S THE USE...*

A. JavaScript Logic inside a  
native App

# *WHAT'S THE USE...*

- A. JavaScript Logic inside a native App
- B. Attach to a WebView (à la node-webkit)

*WHAT'S TO COME...*



# *WHAT'S TO COME...*

- More Core Modules (Crypto, Zlib,...)

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- libuv GCD integration

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- More Core Modules (Crypto, Zlib,...)
- libuv GCD integration
- Testing, testing, testing...



# *WHAT'S TO COME...*

- More Core Modules (Crypto, Zlib,...)
- libuv GCD integration
- Testing, testing, testing...
- Integration with Titanium, PhoneGap, others...

*PARTICIPATE*

# *PARTICIPATE*

- Download the App from the AppStore



# *PARTICIPATE*

- Download the App from the AppStore
- Test the modules that should work “reliably”

# *PARTICIPATE*

- Download the App from the AppStore
- Test the modules that should work “reliably”
- Subscribe to the Mailing List

# *PARTICIPATE*

- Download the App from the AppStore
- Test the modules that should work “reliably”
- Subscribe to the Mailing List
- File GitHub Issues



# *PARTICIPATE*

- Download the App from the AppStore
- Test the modules that should work “reliably”
- Subscribe to the Mailing List
- File GitHub Issues
- Spread the word

# *PARTICIPATE*

- Download the App from the AppStore
- Test the modules that should work “reliably”
- Subscribe to the Mailing List
- File GitHub Issues
- Spread the word
- Talk to me if you want to participate

Q?



nodeapp.org  
github.com/node-app

<https://itunes.apple.com/app/id793774475>

@periping  
github.com/srijs

Image Credits:

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<http://woofgallery.org/category/happy-dog-photos/>