

REST

JSON

SOAP

HTTPS

API Development

GET

PUT

Rob Richards

php|tek 2012

<http://xri.net/=rob.richards>

POST

DELETE

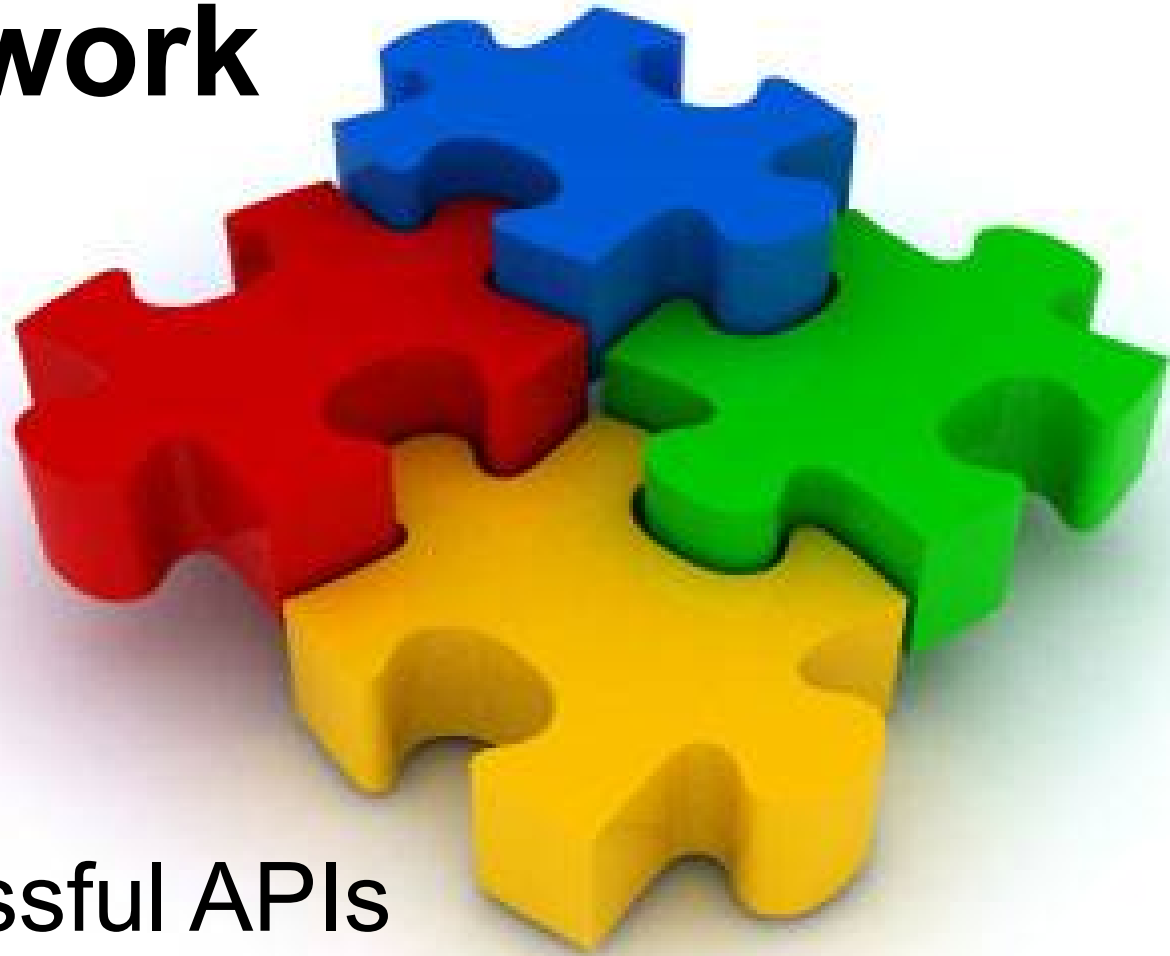
XML

HTTP



API Development Pipedreams

Teamwork



Successful APIs
Involve
The Entire Organization

- Define the API
- Design for Scale
- Design for Failures
- Design with Standards
- Design for the Future



User API



Manage system users

- Ability to search by first, last or ID
- Ability to add, update and remove users

But it's just a URL...

/user.php

/service.php

/user/search.php

/user/delete.php

/user/update.php

/user/create.php

/service

/user/

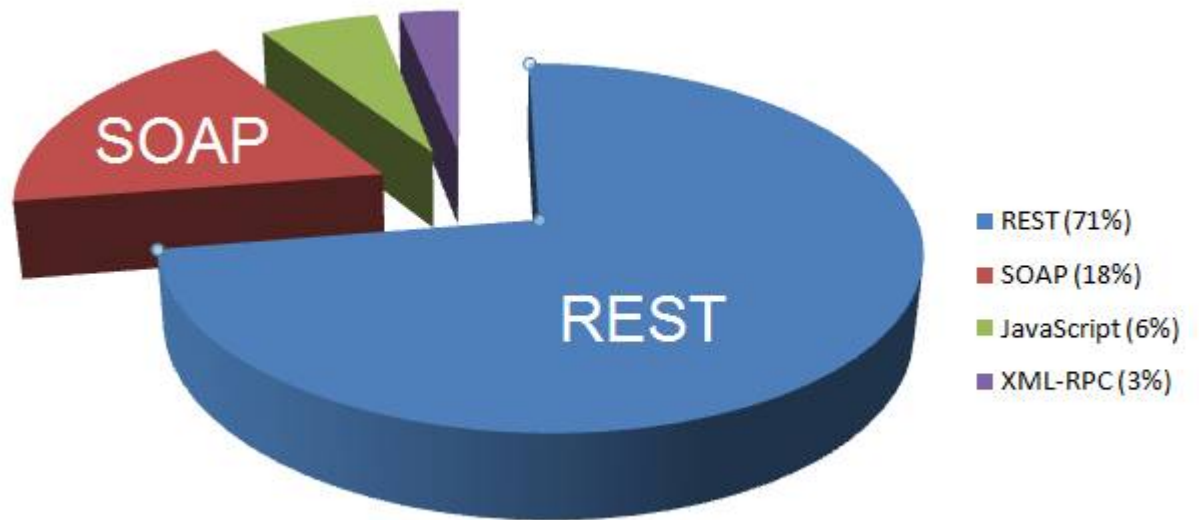


REST

SOAP

RPC

Pick Your Poison



RESTful



- Data oriented
 - CRUD
- Simple
 - Based on simple HTTP and URI standards
 - Easy to consume
- Flexible
 - Allows any type of data format
- Performance
 - Calls can be much faster
 - Easier to scale
 - Browser firendy and cacheable

RPC

- Operation (procedural) oriented
 - Natural to the developer
- Tools
 - Faster Development
 - Test suites
- Contractual
- Standard formats



JSON-RPC Example

Request

```
$response = $client->subtract(23, 42);
```

```
{  
  "jsonrpc": "2.0",  
  "method": "subtract",  
  "params": {  
    "subtrahend": 23,  
    "minuend": 42  
  },  
  "id": 3  
}
```

Response

```
{  
  "jsonrpc": "2.0",  
  "result": 19,  
  "id": 3  
}
```

SOAP

- Message oriented
 - Contractual
 - More tools
- Security and Identity standards
- Provides end to end reliability
- ACID capabilities for atomic operations
- Standard formats



```
<?xml version="1.0" encoding="UTF-8"?>
<soap:Envelope xmlns:soap="http://schemas.xmlsoap.org/soap/envelope/"
xmlns:mi="http://www.Monson-Haefel.com/jwsbook/message-id" xmlns:proc="http://www.Monson-
Haefel.com/jwsbook/processed-by">
  <soap:Header><!-- Header blocks go here --></soap:Header>
  <soap:Body>
    <po:purchaseOrder orderDate="2003-09-22"
      xmlns:po="http://www.Monson-Haefel.com/jwsbook/PO">

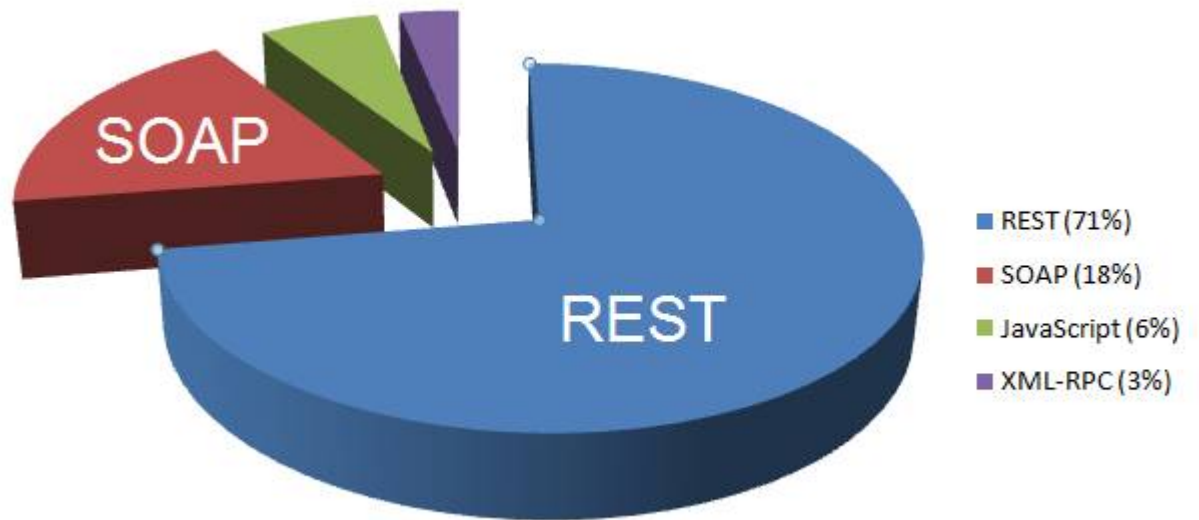
      <po:accountName>Amazon.com</po:accountName>
      <po:accountNumber>923</po:accountNumber>
      ...
      <po:book>
        <po:title>J2EE Web Services</po:title>
        <po:quantity>300</po:quantity>
        <po:wholesale-price>24.99</po:wholesale-price>
      </po:book>
    </po:purchaseOrder>
  </soap:Body>
</soap:Envelope>
```

REST

SOAP

RPC

Pick Your Poison



But it's just a URL...

/user.php

/service.php

/user/search.php

/user/delete.php

/user/update.php

/user/create.php

/service

/user/



But it's just a URL...

/user.php

/service.php

/user/search.php

/user/delete.php

/user/update.php

/user/create.php

/service

/user/



Plan for Change

Current Data Structure

	User
	id fname lname



Future Data Structure

	User
	id fname lname email

Versioning

/user/?v=1

V1 ==> **V2** ==> **V3**

/v1/user/

GET /user/ HTTP/1.1

Accept: application/vnd.company.api.user-v1+json

GET /user/ HTTP/1.1

X-API-Version: 1

Data Format

- **Pre-defined**

- JSON

SOAP

XML-RPC

- XML

JSON-RPC

- Other?

```
--> {"jsonrpc": "2.0", "method": "subtract",  
      "params": [42, 23], "id": 1}
```

```
<-- {"jsonrpc": "2.0", "result": 19, "id": 1}
```

Data Format

- Pre-defined
- **JSON**
- XML
- Other?

```
{  
  "items": [  
    {  
      "firstname": "john",  
      "lastname": "doe",  
      "id": "1"  
    },  
    {  
      "firstname": "jane",  
      "lastname": "doe",  
      "id": "2"  
    },  
    {  
      "firstname": "joe",  
      "lastname": "smith",  
      "id": "3"  
    }  
  ]  
}
```

Data Format

- Pre-defined
- JSON
- **XML**
- Other?

```
<?xml version="1.0"?>
<items>
  <item>
    <firstname>john</firstname>
    <lastname>doe</lastname>
    <id>1</id>
  </item>
  <item>
    <firstname>jane</firstname>
    <lastname>doe</lastname>
    <id>2</id>
  </item>
  <item>
    <firstname>joe</firstname>
    <lastname>smith</lastname>
    <id>3</id>
  </item>
</items>
```

Data Format

- Pre-defined
- JSON
- XML
- **Other?**

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Don't Believe the Hype!

A Bit Confusing

GET /v1/user/?searchby=fname&value=rob

POST /v1/user/
{"id":3,"fname":"rob","lname":"unknown"}

PUT /v1/user/
{"fname":"rob","lname":"richards"}

DELETE /v1/user/?id=3

More Precise

GET /v1/user/?fname=rob

POST /v1/user/
{"id":3,"fname":"rob","lname":"unknown"}

PUT /v1/user/
{"fname":"rob","lname":"richards"}

DELETE /v1/user/?id=3

Proper Resource Identifiers

GET /v1/user/?fname=rob

POST /v1/user/3

{"fname":"rob","lname":"unknown"}

PUT /v1/user/

{"fname":"rob","lname":"richards"}

DELETE /v1/user/3

But I Can't PUT or DELETE...

- Some Clients have no support for PUT/DELETE methods
- Common to use POST with `_method` parameter

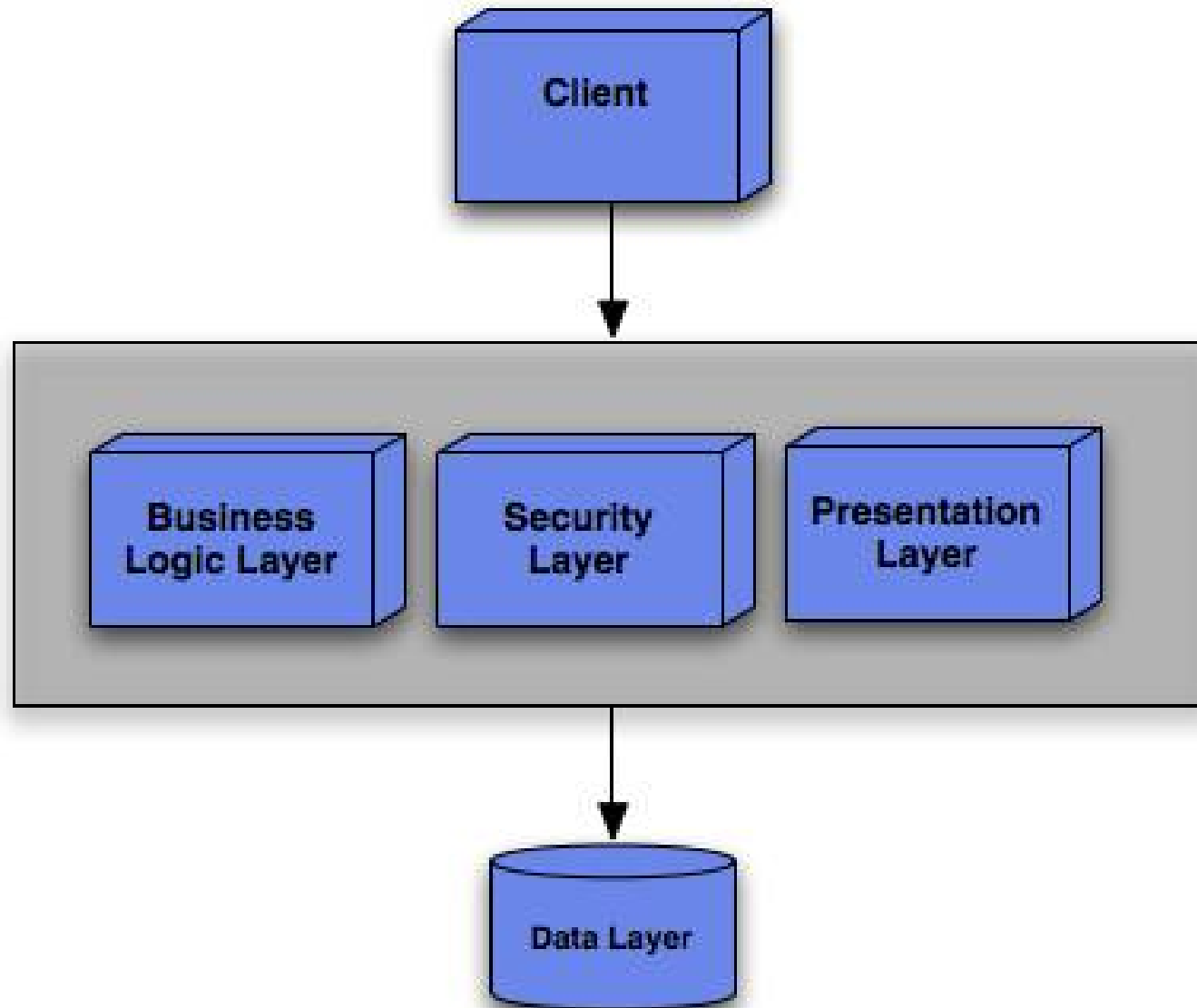
```
POST /v1/user/?_method=PUT  
{"fname":"rob","lname":"richards"}
```

```
POST /v1/user/?id=3&_method=DELETE
```

Data Structure – Get User

```
[{
  "id": 3,
  "fname": "rob",
  "lname": "unknown"
},
{
  "id": 4,
  "fname": "rob",
  "lname": "richards"
}]
```

Development



Test Calls

```
curl -v "http://fizzer/v1/user/index2.php?fname=j"
```

```
curl -v -d '{"id":3,"fname":"rob","lname":"unknown"}'  
"http://fizzer/v1/user/index2.php"
```

```
curl -v -X PUT -d '{"fname":"rob","lname":"richards"}'  
"http://fizzer/v1/user/index2.php"
```

```
curl -v -X DELETE "http://fizzer/newtek/index2.php?id=2"
```

```
curl -v -d '{"fname":"rob","lname":"richards"}'  
"http://fizzer/newtek/index2.php?_method=PUT"
```

```
curl -v -d "" "http://fizzer/v1/user/index2.php?  
id=2&_method=DELETE"
```

curl "http://fizzer/v1/user/index2.php"

```
[{"id":1,"fname":"john","0":"smith"},  
{"id":2,"fname":"jane","lname":"doe"},  
{"id":3,"fname":"rob","lname":"richards"}]
```

```
curl -d '{"id":3,"fname":"rob","lname":"unknown"}'  
"http://fizzer/v1/user/index2.php"
```

<No Content in Response>

```
curl -v -d '{"id":3,"fname":"rob","lname":"unknown"}'  
"http://fizzer/v1/user/index2.php"
```

```
< HTTP/1.1 200 OK
```

```
< X-Powered-By: PHP/5.3.13
```

```
< Content-type: text/html
```

```
< Content-Length: 0
```

```
< Date: Mon, 21 May 2012 21:07:33 GMT
```

```
< Server: Mashery Proxy
```

```
<
```

```
* Connection #0 to host fizzer left intact
```

```
* Closing connection #0
```



```
curl -v -d '{"id":3,"me":"rob","ln":"unkn"}'  
"http://fizzer/v1/user/index2.php"
```

```
< HTTP/1.1 200 OK
```

```
< X-Powered-By: PHP/5.3.13
```

```
< Content-type: text/html
```

```
< Content-Length: 0
```

```
< Date: Mon, 21 May 2012 21:09:01 GMT
```

```
< Server: Mashery Proxy
```

```
<
```

```
* Connection #0 to host fizzer left intact
```

```
* Closing connection #0
```

```
curl "http://fizzer/v1/user/index2.php?id=3"
```

```
[{"id":3,"fname":null,"lname":null}]
```

HTTP Response Codes

Status Code	Status Message
200	OK
301	Moved Permanently
302	Found
400	Bad Request
401	Not Authorized
403	Forbidden
404	Not Found
500	Internal Server Error
503	Service Unavailable

```
curl -v -d '{"id":3,"me":"rob","ln":"unkn"}'  
"http://fizzer/v1/user/index3.php"
```

```
< HTTP/1.1 400 Bad Request  
< X-Powered-By: PHP/5.3.13  
< Content-type: text/html  
< Content-Length: 0  
< Date: Mon, 21 May 2012 22:15:13 GMT  
< Server: Mashery Proxy  
<  
* Connection #0 to host fizzer left intact  
* Closing connection #0
```

Error Responses

- Some clients can not easily access status messages
- Not all servers can modify response status message
- Allows for verbose and descriptive errors
- Helps developer debug problems
- Keep error responses in same data format when possible

```
curl -v -d '{"id":3,"me":"rob","ln":"unkn"}'  
"http://fizzer/v1/user/index4.php"
```

```
< HTTP/1.1 400 Bad Request
```

```
< X-Powered-By: PHP/5.3.13
```

```
< Content-type: text/html
```

```
< Transfer-Encoding: chunked
```

```
< Date: Mon, 21 May 2012 22:25:53 GMT
```

```
< Server: Mashery Proxy
```

```
<
```

```
* Connection #0 to host fizzer left intact
```

```
* Closing connection #0
```

```
{"error":{"code":400,"message":"Bad Request"}}
```

Security

- Trust No One!
- Expect that you will be attacked
- Identity != Authentication
- Authentication != Authorization
- Security Posture Depends upon Exposed Data
- Enforce the use of SSL

Identity

apikey=2745529bacf89590115d3657ac9d0442

Typically Application Identifier

Good Practice: At least 22 characters

Authentication/Authorization

- Dependent upon the consumer, owner and visibility of the data
- Identifier and HMAC
- Username/Password
 - **Caution:** Typically not recommended
- Out of App authentication with token usage
 - OAuth
 - SAML
 - WS-Security

DISCLAIMER

For simplicity purposes and to demonstrate the inclusion of security in this exercise, the use of apikey and shared secret will be used to access the example API. In practice, something like OAuth should be used so the application access the data does not have access to the user credentials directly. The following events are fictional and not based on any actual events.

```
curl "http://fizzer/v1/user/index5.php?  
fname=rob"
```

```
< HTTP/1.1 403 Forbidden  
< X-Powered-By: PHP/5.3.13  
< Content-type: text/html  
< Transfer-Encoding: chunked  
< Date: Mon, 21 May 2012 23:22:42 GMT  
< Server: Mashery Proxy  
<  
* Connection #0 to host fizzer left intact  
* Closing connection #0  
{"error":{"code":403,"message":"Not Authorized"}}
```

```
curl -v 'http://fizzer/v1/user/index5.php?fname=j&
apikey=2745529bacf89590115d3657ac9d0442&sig=
'$(php -r '$time=time();echo hash_hmac("sha256",
"2745529bacf89590115d3657ac9d0442".$time,
"1234567890")."&timestamp=$time";')
```

```
< HTTP/1.1 200 OK
```

```
< X-Powered-By: PHP/5.3.13
```

```
< Content-type: text/html
```

```
< Transfer-Encoding: chunked
```

```
< Date: Tue, 22 May 2012 03:09:24 GMT
```

```
< Server: Mashery Proxy
```

```
<
```

```
* Connection #0 to host fizzer left intact
```

```
* Closing connection #0
```

```
[{"id":1,"fname":"john","0":"smith"},
{"id":2,"fname":"jane","lname":"doe"}]
```

Testing

- Unit Tests
- Replay access logs
- Validate Responses
- PhoneGen
- AppMobi



From HTML 5 to Native Apps

Apache Cordova

<http://incubator.apache.org/cordova/>

a platform for building native mobile applications using HTML, CSS and JavaScript

PhoneGap by Adobe

<http://phonegap.com/>

an HTML5 app platform that allows you to author native applications with web technologies and get access to APIs and app stores

appMobi

<http://www.appmobi.com/>

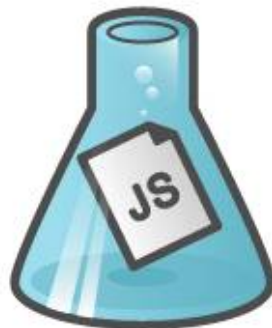
If you can write code using HTML5, CSS3 and JavaScript, you can use the XDK to build an application. There's no need to learn Objective C or download any other SDK's.

PhoneGap

<http://phonegap.com/>



Take advantage of **HTML5**
and **CSS3**



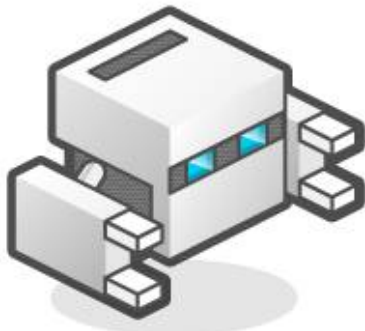
Use **JavaScript** to write
your code



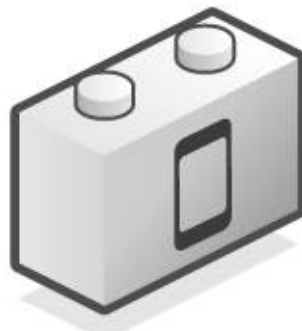
Access **Native Features**



Deploy your app to
Multiple Platforms



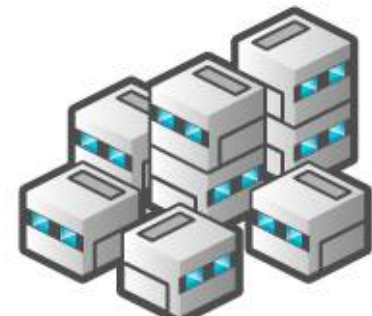
Take advantage of
PhoneGap Build



Add **PhoneGap Plugins** to
your project



Use **Tools** from the
community



Get help from the growing
Community

HelloPhoneGap | iPhone 4...

HelloPhoneGap - index.html

Build **Succeeded** | Today at 12:34 PM

No Issues

index.html

HelloPhoneGap > www > index.html > No Selection

HelloPhoneGap

1 target, iOS SDK 4.3

www

index.html

js phonegap.0.9.4.js

js phonegap.0.9.4.min.js

PhoneGapLib.xcodeproj

1 target, iOS SDK 4.3

Classes

Commands

JSON

Util

Plugins

PhoneGapDelegate.h

PhoneGapDelegate.m

PhoneGapViewController.h

PhoneGapViewController.m

Other Sources

Frameworks

Products

Classes

Plugins

Other Sources

Resources

Frameworks

Products

```
1 <!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
2 <html>
3   <head>
4     <!-- Change this if you want to allow scaling -->
5     <meta name="viewport" content="width=default-width; user-scalable=no" />
6
7     <meta http-equiv="Content-type" content="text/html; charset=utf-8">
8
9     <title>HelloPhoneGap</title>
10
11     <script type="text/javascript" charset="utf-8" src="phonegap.0.9.4.min.js"></script>
12     <script type="text/javascript" charset="utf-8">
13
14       function onBodyLoad()
15       {
16         document.addEventListener("deviceready",onDeviceReady,false);
17       }
18
19       /* When this function is called, PhoneGap has been initialized and is ready to ro
20       function onDeviceReady()
21       {
22         // do your thing!
23       }
24
25     </script>
26   </head>
27   <body onload="onBodyLoad()">
28
29   </body>
30 </html>
31
```


Debugging

- Access Logs
- Curl
 - <http://curl.haxx.se/>
- Wireshark
 - <http://www.wireshark.org/>
- Tcpdump
 - <http://www.tcpdump.org/>
- Charles
 - <http://www.charlesproxy.com/>
- ext/http
 - http://pecl.php.net/package/pecl_http



Capturing from lo0 - Wireshark					
File Edit View Go Capture Analyze Statistics Telephony Tools Help					
Filter: tcp.port eq 80 Expression... Clear Apply					
No.	Time	Source	Destination	Protocol	Info
16	38.323070	127.0.0.1	127.0.0.1	TCP	57860 > http [SYN] Seq=0 Win=65535 Len=0 MS
17	38.323133	127.0.0.1	127.0.0.1	TCP	http > 57860 [SYN, ACK] Seq=0 Ack=1 Win=655
18	38.323149	127.0.0.1	127.0.0.1	TCP	57860 > http [ACK] Seq=1 Ack=1 Win=81660 Le
19	38.323164	127.0.0.1	127.0.0.1	TCP	[TCP Dup ACK 17#1] http > 57860 [ACK] Seq=1
20	38.323243	127.0.0.1	127.0.0.1	HTTP	POST /v1/user/index5.php HTTP/1.1 (applica
21	38.323285	127.0.0.1	127.0.0.1	TCP	http > 57860 [ACK] Seq=1 Ack=260 Win=262140
22	38.326512	127.0.0.1	127.0.0.1	HTTP	HTTP/1.1 403 Forbidden (text/html)
23	38.326583	127.0.0.1	127.0.0.1	TCP	57860 > http [ACK] Seq=260 Ack=226 Win=8143
24	38.326735	127.0.0.1	127.0.0.1	TCP	57860 > http [FIN, ACK] Seq=260 Ack=226 Win
25	38.326766	127.0.0.1	127.0.0.1	TCP	http > 57860 [ACK] Seq=226 Ack=261 Win=2621
26	38.326776	127.0.0.1	127.0.0.1	TCP	[TCP Dup ACK 24#1] 57860 > http [ACK] Seq=2
27	38.326789	127.0.0.1	127.0.0.1	TCP	http > 57860 [FIN, ACK] Seq=226 Ack=261 Win
28	38.326804	127.0.0.1	127.0.0.1	TCP	57860 > http [ACK] Seq=261 Ack=227 Win=8166

▶ Frame 16: 68 bytes on wire (544 bits), 68 bytes captured (544 bits)
 ▶ Null/Loopback
 ▶ Internet Protocol, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)
 ▶ Transmission Control Protocol, Src Port: 57860 (57860), Dst Port: http (80), Seq: 0, Len: 0

```

0000  02 00 00 00 45 00 00 40 7a 7d 40 00 40 06 00 00  ....E..@ z}@.@...
0010  7f 00 00 01 7f 00 00 01 e2 04 00 50 f3 84 3c b6  ....P..<.
0020  00 00 00 00 b0 02 ff ff fe 34 00 00 02 04 3f d8  ....4....?.
0030  01 03 03 01 01 01 08 0a 16 ac ad 71 00 00 00 00  ....q....
0040  04 02 00 00  ....
  
```

Capturing from lo0 - Wireshark

File Edit View Go Capture Analyze Statistics Telephony Tools Help

Filter: tcp.port eq 80 Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Info
16	38.323070	127.0.0.1	127.0.0.1	TCP	57860 > http [SYN] Seq=0 Win=65535 Len=0 MS
17	38.323133	127.0.0.1	127.0.0.1	TCP	http > 57860 [SYN, ACK] Seq=0 Ack=1 Win=655
18	38.323149	127.0.0.1	127.0.0.1	TCP	57860 > http [ACK] Seq=1 Ack=1 Win=81660 Le
19	38.323164	127.0.0.1	127.0.0.1	TCP	[TCP Dup ACK 17#1] http > 57860 [ACK] Seq=1
20	38.323243	127.0.0.1	127.0.0.1	HTTP	POST /v1/user/index5.php HTTP/1.1 (applica
21	38.323285	127.0.0.1	127.0.0.1	TCP	http > 57860 [ACK] Seq=1 Ack=260 Win=262140
22	38.326512	127.0.0.1	127.0.0.1	HTTP	HTTP/1.1 403 Forbidden (text/html)
23	38.326583	127.0.0.1	127.0.0.1	TCP	57860 > http [ACK] Seq=260 Ack=226 Win=8143
24	38.326735	127.0.0.1	127.0.0.1	TCP	57860 > http [FIN, ACK] Seq=260 Ack=226 Win
25	38.326766	127.0.0.1	127.0.0.1	TCP	http > 57860 [ACK] Seq=226 Ack=261 Win=2621
26	38.326776	127.0.0.1	127.0.0.1	TCP	[TCP Dup ACK 24#1] 57860 > http [ACK] Seq=2
27	38.326789	127.0.0.1	127.0.0.1	TCP	http > 57860 [FIN, ACK] Seq=226 Ack=261 Win
28	38.326804	127.0.0.1	127.0.0.1	TCP	57860 > http [ACK] Seq=261 Ack=227 Win=8166

Frame 20: 315 bytes on wire (2520 bits), 315 bytes captured (2520 bits)

Null/Loopback

Internet Protocol, Src: 127.0.0.1 (127.0.0.1), Dst: 127.0.0.1 (127.0.0.1)

Transmission Control Protocol, Src Port: 57860 (57860), Dst Port: http (80), Seq: 1, Ack: 1, Len: 259

Hypertext Transfer Protocol

POST /v1/user/index5.php HTTP/1.1\r\n

[Expert Info (Chat/Sequence): POST /v1/user/index5.php HTTP/1.1\r\n]

[Message: POST /v1/user/index5.php HTTP/1.1\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Method: POST

Request URI: /v1/user/index5.php

Request Version: HTTP/1.1

User-Agent: curl/7.21.4 (universal-apple-darwin11.0) libcurl/7.21.4 OpenSSL/0.9.8r zlib/1.2.5\r\n

0000 02 00 00 00 45 00 01 37 c8 1c 40 00 40 06 00 00E..7 ..@.@...

0010 7f 00 00 01 7f 00 00 01 e2 04 00 50 f3 84 3c b7P.<.

0020 5c 7d e2 62 80 18 9f 7e ff 2b 00 00 01 01 08 0a \}.b...~ .+.....

0030 16 ac ad 71 16 ac ad 71 50 4f 53 54 20 2f 76 31 ...q...q POST /v1

0040 2f 75 73 65 72 2f 69 6e 64 65 78 35 2e 70 68 70 /user/in dex5.php

Frame (frame), 315 bytes Packets: 58 Displayed: 13 Marked: 0 Profile: Default

Capturing from lo0 - Wireshark

File Edit View Go Capture Analyze Statistics Telephony Tools Help

Filter: tcp.port eq 80 Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Info
16	38.323070	127.0.0.1	127.0.0.1	TCP	57860 > http [SYN] Seq=0 Win=65535 Len=0
17	38.323133	127.0.0.1	127.0.0.1	TCP	http > 57860 [SYN, ACK] Seq=0 Ack=1 Win=6
18	38.323149	127.0.0.1	127.0.0.1	TCP	57860 > http [ACK] Seq=1 Ack=1 Win=81660
19	38.323164	127.0.0.1	127.0.0.1	TCP	[TCP Dup ACK 17#1] http > 57860 [ACK] Seq
20	38.323243	127.0.0.1	127.0.0.1	HTTP	POST /v1/user/index5.php HTTP/1.1 (appli
21	38.323285	127.0.0.1	127.0.0.1	TCP	http > 57860 [ACK] Seq=1 Ack=260 Win=2621
22	38.326512	127.0.0.1	127.0.0.1	HTTP	HTTP/1.1 403 Forbidden (text/html)
23	38.326583	127.0.0.1	127.0.0.1	TCP	57860 > http [ACK] Seq=260 Ack=226 Win=81
24	38.326735	127.0.0.1	127.0.0.1	TCP	57860 > http [FIN, ACK] Seq=260 Ack=226 W
25	38.326766	127.0.0.1	127.0.0.1	TCP	http > 57860 [ACK] Seq=226 Ack=261 Win=26
26	38.326776	127.0.0.1	127.0.0.1	TCP	[TCP Dup ACK 24#1] 57860 > http [ACK] Seq

.....

▼ Hypertext Transfer Protocol

▼ HTTP/1.1 403 Forbidden\r\n

▼ [Expert Info (Chat/Sequence): HTTP/1.1 403 Forbidden\r\n]

[Message: HTTP/1.1 403 Forbidden\r\n]

[Severity level: Chat]

[Group: Sequence]

Request Version: HTTP/1.1

Response Code: 403

X-Powered-By: PHP/5.3.13\r\n

Content-type: text/html\r\n

Transfer-Encoding: chunked\r\n

Date: Mon, 21 May 2012 23:36:16 GMT\r\n

Server: Mashery Proxy\r\n

\r\n

▼ HTTP chunked response

▶ Data chunk (49 octets)

▶ End of chunked encoding

▼ Line-based text data: text/html

{"error":{"code":403,"message":"Not Authorized"}}

.....

0000 02 00 00 00 45 00 01 15 aa 7b 40 00 40 06 00 00E... {.@.@...

0010 7f 00 00 01 7f 00 00 01 00 50 e2 04 5c 7d e2 62P..}.b

0020 f3 84 3d ba 80 18 ff ff ff 09 00 00 01 01 08 0a ..=.....

Frame (281 bytes) De-chunked entity body (49 bytes)

Frame (frame), 281 bytes Packets: 85 Displayed: 13 Marked: 0 Profile: Default

Structure

Sequence

- ▼ http://fizzer
 - ▼ v1/
 - ▼ user/
 - ⚠ index5.php
 - ▶ http://safebrowsing.clients.google.com
 - ▶ http://safebrowsing-cache.google.com

Overview

Request

Response

Summary

Chart

Notes

Name	Value
URL	http://fizzer/v1/user/index5.php
Status	Complete
Response Code	403 Forbidden
Protocol	HTTP/1.1
Method	POST
Content-Type	text/html
Client Address	/0:0:0:0:0:0:1%0
Remote Address	fizzer/127.0.0.1
▼ Timing	
Request Start Time	5/21/12 8:53:43 PM
Request End Time	5/21/12 8:53:43 PM
Response Start Time	5/21/12 8:53:43 PM
Response End Time	5/21/12 8:53:43 PM
Duration	31 ms
Request Duration	24 ms
Response Duration	3 ms
Latency	4 ms
Speed	15.18 KB/s
Response Speed	72.59 KB/s
▼ Size	
Request Header Size	228 bytes

Structure Sequence

- ▼ http://fizzer
 - ▼ v1/
 - ▼ user/
 - ⚠ index5.php
 - ▶ http://safebrowsing.clients.google.com
 - ▶ http://safebrowsing-cache.google.com

Overview Request Response Summary Chart Notes

```
POST /v1/user/index5.php HTTP/1.1
User-Agent: curl/7.21.4 (universal-apple-darwin11.0) libcurl/7.21.4 OpenSSL/0.9.8r zlib/1.2.5
Host: fizzer
Accept: */*
Content-Length: 31
Content-Type: application/x-www-form-urlencoded

{"id":3,"me":"rob","ln":"unkn"}
```

Headers Text Hex Form Raw

Structure

Sequence

- ▼ http://fizzer
 - ▼ v1/
 - ▼ user/
 - ⚠ index5.php
 - ▶ http://safebrowsing.clients.google.com
 - ▶ http://safebrowsing-cache.google.com

Overview

Request

Response

Summary

Chart

Notes

HTTP/1.1 403 Forbidden
X-Powered-By: PHP/5.3.13
Content-type: text/html
Transfer-Encoding: chunked
Date: Tue, 22 May 2012 01:53:43 GMT
Server: Mashery Proxy

```
{"error":{"code":403,"message":"Not Authorized"}}
```

Headers

Text

Hex

HTML

JSON

JSON Text

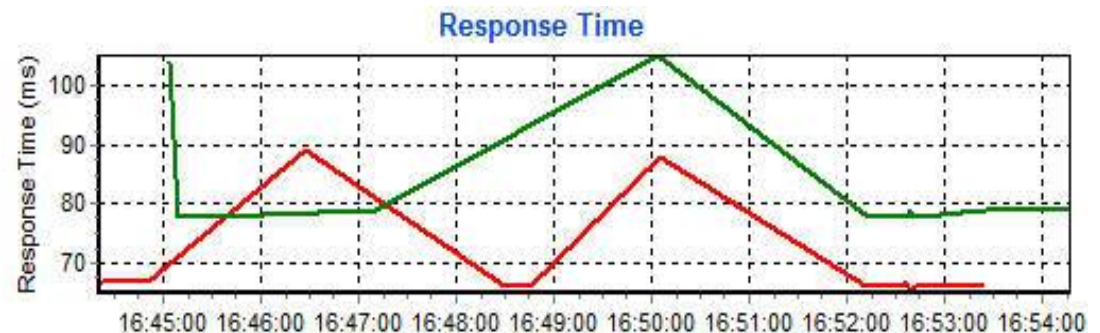
Raw

ext/http

- Pecl based extension
- Provides simple interface to capture and manipulate requests and responses
- Version 1.7.4 is latest stable
- Version 2.0.0 alpha is not backwards compatible with 1.x versions

Monitoring

- Continuous monitoring
 - Always know your API state before your consumers
- Understand usage patterns
 - Stay ahead of the trends and peak traffic times
- Pre-emptive communication
 - Be upfront when there are problems



Redundancy

Something is eventually going to fail

- Hardware
- DB or Cache
- Personnel (Admins or Remote Hands)
- Network interruptions
- Data Center failures

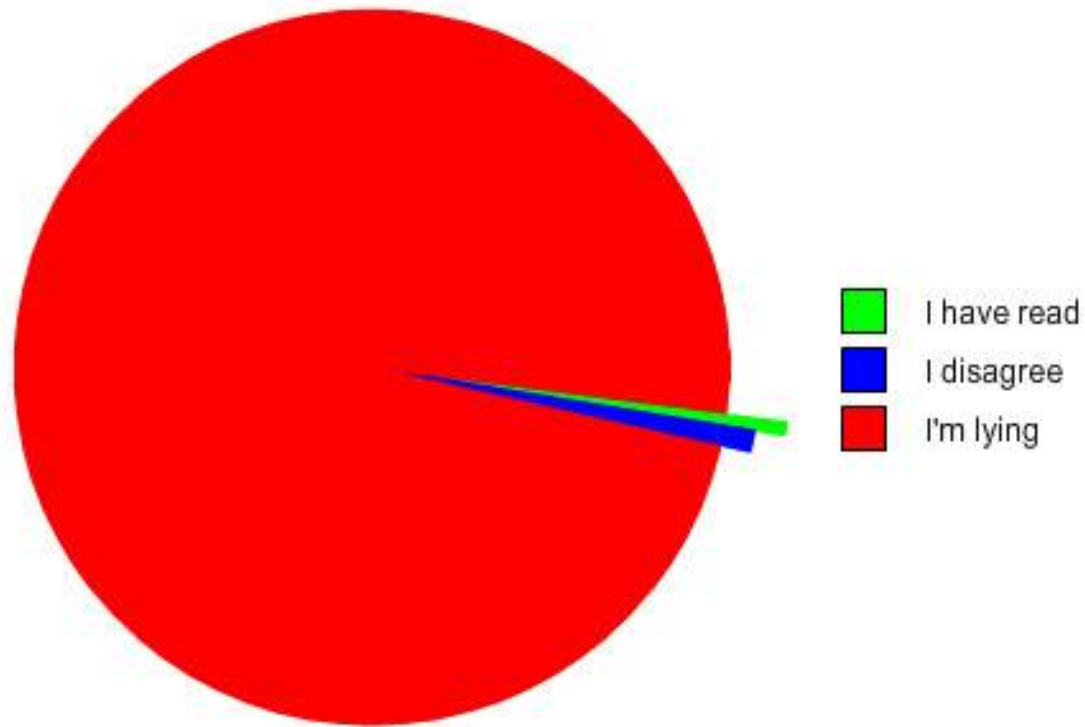
WHEN you fail, do so gracefully

Don't Piss Off Developers



Clear Terms of Service

I have read and agree to the terms of service.





Document! Document! Document!

Did I happen to mention to document your API?

Request parameters

Parameter	Value	Description
text	string (required if url parameter is not used)	The content to perform analysis (UTF-8 encoded).
url	string (required if text parameter is not used)	The url of the web page to perform analysis).
related_entities	boolean: <i>true</i> (default), <i>false</i>	Whether or not to include related entities/concepts in the response
show_metadata	boolean: <i>true</i> (default), <i>false</i>	Whether or not to include entity/concept metadata in the response
enable_categorizer	boolean: <i>true</i> (default), <i>false</i>	Whether or not to include document category information in the response
unique	boolean: <i>true</i> , <i>false</i> (default)	Whether or not to detect only one occurrence of an entity or a concept that may appear multiple times
max	integer: <i>100</i> (default)	Maximum number of entities/concepts to detect

Sample Text Request :

text:

Response fields

Field	Description
categories	List of categories. Not present when <code>enabled_categorizer="false"</code> .
categories/yct_categories	List of YCT categories.
categories/yct_categories/yct_category	YCT category. This element has a numeric score attribute. Categories are

Interactive Documentation

Documentation that not only explains how to use an API but also interactively allows one to make live test calls from it



Interactive Documentation

Documentation that not only explains how to use an API but also interactively allows one to make live test calls from it



I/O Docs

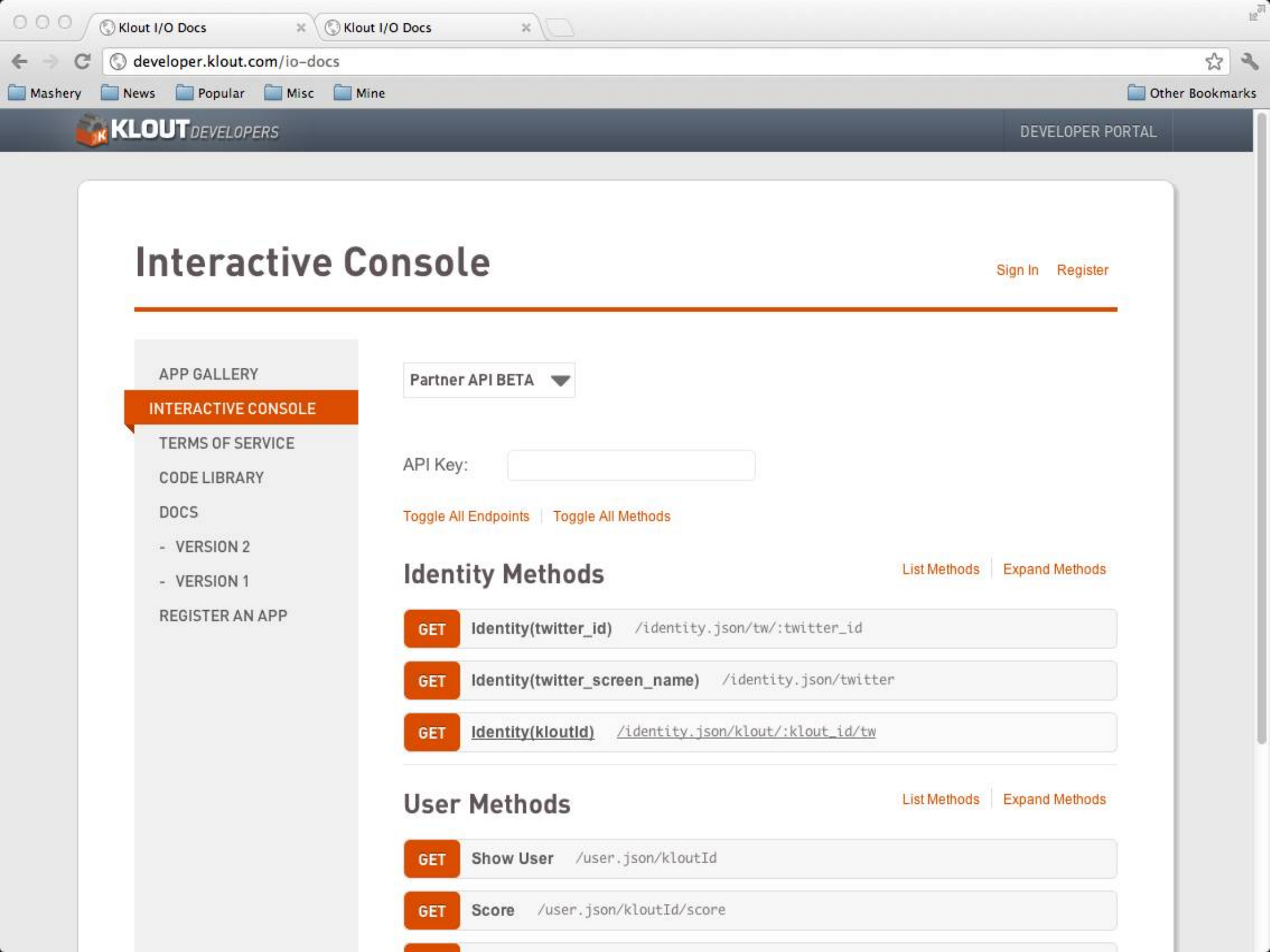
<https://github.com/mashery/iodocs>

Swagger

<http://swagger.wordnik.com/>

Interactive Documentation

DEMO



developer.klout.com/io-docs

Mashery

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VERSION 1

REGISTER AN APP

Identity Methods

GET

Identity(**twitter_id**)

/identity.json/tw/:twitter_id

GET

Identity(**twitter_screen_name**)

/identity.json/twitter

This method allows you to retrieve a KloutID for a twitter screen_name

Parameter	Value	Type	Description
screenName	Mashery	string	A twitter screen name (e.g. jtimberlake)

Try it!

Clear Results

Request URI

http://api.klout.com/v2/identity.json/twitter?screenName=Mashery&key=

Request Headers

Select content

{
 "X-Originating-IP": "67.158.171.203",
 "User-Agent": "Mashery IO Docs"
}

Response Headers

Select content

{
 "Content-Type": "application/json; charset=utf-8",
 "Date": "Fri, 18 May 2012 20:35:05 GMT",
 "Server": "Mashery Proxy",
 "X-Mashery-Responder": "prod-javaproxy-worker-us-west-1c-15.mashery.com",
 "Transfer-Encoding": "chunked",
 "Connection": "keep-alive"
}

Response Body

Select content

{
 "id": "454726",
 "network": "ks"
}

```

{
  "endpoints": [
    {
      "name": "Resource Group A",
      "methods": [
        {
          "MethodName": "Method A1",
          "Synopsis": "Grabs information from the A1 data set",
          "HTTPMethod": "GET",
          "URI": "/a1/grab",
          "RequiresOAuth": "N",
          "parameters": [
            {
              "Name": "param_1_name",
              "Required": "Y",
              "Default": "",
              "Type": "string",
              "Description": "Description of the first parameter."
            }
          ]
        }
      ]
    }
  ]
}

```

```

"lowercaseapi": {
  "name": "Lower Case API",
  "protocol": "http",
  "baseURL": "api.lowercase.sample",
  "publicPath": "/v1",
  "auth": "key",
  "keyParam": "api_key_var_name"
}

```

I/O Doctor

<http://www.iodoctor.net/>

I/O Doctor  Start Over  About

 Editor

 Output

- Endpoint1
 - test_meth



Endpoint: Endpoint1

+ Add Method

 Delete Endpoint

Method: test_meth

Method Name test_meth

 Delete Method

Synopsis My first test method

HTTP Method (GET,
POST, PUT, etc)

GET


URI http://example.org/testmethod

Requires OAuth? ☐ Yes
☒ No

+ Add Parameter

Parameter: apikey

Parameter Name apikey

 Delete Parameter

Description

Swagger API Explorer

petstore.swagger.wordnik.com/#!/_pet

Mashery News Popular Misc Mine Other Bookmarks

 **swagger**

[Explore](#)

/pet.{format}

[Show/Hide](#) | [List Operations](#) | [Expand Operations](#) | [Raw](#)

GET	/pet.json/{petId}	Find pet by ID
GET	/pet.json/findByStatus	Finds Pets by status
GET	/pet.json/findByTags	Finds Pets by tags

/user.{format}

[Show/Hide](#) | [List Operations](#) | [Expand Operations](#) | [Raw](#)

Sexy API documentation from [Swagger](#).

Implementation Notes

Returns a pet when ID < 10. ID > 10 or nonintegers will simulate API error conditions

Parameters

Parameter	Value	Description
petId	<input type="text" value="1"/>	ID of pet that needs to be fetched

Try it out!

Request URL

http://petstore.swagger.wordnik.com/api/pet.json/1

Response Body

```
{
  "name": "Cat 1",
  "id": 1,
  "status": "available",
  "tags": [
    {
      "name": "tag1",
      "id": 1
    },
    {
      "name": "tag2",
      "id": 2
    }
  ],
  "category": {
    "name": "Cats",
    "id": 2
  },
  "photoUrls": [
    "url1",
    "url2"
  ]
}
```

Response Code

200

Response Headers

Date: Fri, 18 May 2012 20:43:24 GMT
Transfer-Encoding: chunked
Content-Type: application/json
Access-Control-Allow-Origin: *

```
1  {
2    "apiVersion": "0.2",
3    "swaggerVersion": "1.0",
4    "basePath": "http://petstore.swagger.wordnik.com/api",
5    "resourcePath": "/pet",
6    "apis": [{
7      "path": "/pet.{format}/{petId}",
8      "description": "Operations about pets",
9      "operations": [{
10        "parameters": [{
11          "name": "petId",
12          "description": "ID of pet that needs to be fetched",
13          "dataType": "string",
14          "allowableValues": {
15            "valueType": "RANGE",
16            "max": 10.0,
17            "min": 0.0,
18            "valueType": "RANGE"
19          },
20          "required": true,
21          "allowMultiple": false,
22          "paramType": "path"
23        }],
24        "httpMethod": "GET",
```


Multi-Channel Support System

Show the world that you care and that you're invested



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- **Monitor Email**

Don't allow this to queue up and insure they are not falling into your spam buckets



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- Setup and Monitor Forums

Don't rely on the community to take care of itself



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Don't rely on the community to take care of itself

- Monitor Social Medium Channels

Twitter

Stack Overflow

Quova

<Insert favorite social medium channel here>



Multi-Channel Support System

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- **Monitor Email**

Don't allow this to queue up and insure they are not falling into your spam buckets

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Don't rely on the community to take care of itself

- **Monitor Social Medium Channels**

Twitter

Stack Overflow

Quova

<Insert favorite social medium channel here>

- **Respond Quickly!**





If you build it ... syndrome

Community

- Lead the community
 - Start Discussion
 - Provide Examples
 - Get Involved
- Show developers you care
 - And not just for your paying customers



Developer Outreach



DEVELOPER OUTREACH

Outreach Must be Tailored to the Individual Needs of Mature, Growth and Seed Developers

Where They Are

Where They're Not

Mature

Corporate Developers



Large scale conferences
User conferences
Trade shows

Developer events
Networking events

Growth

SMB Developers



Geo-local events
Large scale conferences
Networking events

Developer events (hacking)

Open/Seed Developers

Web Developers



Web App Events
Developer Events

Large scale conferences
Mobile events

Mobile Developers



Mobile Mondays
Developer events

Large scale conferences
Web Application events

LBS Developers



Geo-local events
Developer events

Large scale conferences

Questions?



We're Hiring!