API Development

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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
/user/search.php
/user/delete.php
/user/update.php
/user/create.php
/user/

/service.php
/service
REST
SOAP
RPC

Pick Your Poison

[Pie chart showing REST (71%), SOAP (18%), JavaScript (6%), and XML-RPC (3%)]
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 friendly 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/"
  <soap:Header><!-- Header blocks go here --></soap:Header>
  <soap:Body>
    <po:purchaseOrder orderDate="2003-09-22"
      <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

- REST (71%)
- SOAP (18%)
- JavaScript (6%)
- XML-RPC (3%)
But it's just a URL...

/user.php
/user/search.php
/user/delete.php
/user/update.php
/user/create.php

/service.php
/service
But it's just a URL...

/user.php
/user/search.php
/user/delete.php
/user/update.php
/user/create.php

/service.php
/service
/user/
### Plan for Change

**Current Data Structure**

<table>
<thead>
<tr>
<th></th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>id</td>
</tr>
<tr>
<td></td>
<td>fname</td>
</tr>
<tr>
<td></td>
<td>lname</td>
</tr>
</tbody>
</table>

**Future Data Structure**

<table>
<thead>
<tr>
<th></th>
<th>User</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>id</td>
</tr>
<tr>
<td></td>
<td>fname</td>
</tr>
<tr>
<td></td>
<td>lname</td>
</tr>
<tr>
<td></td>
<td>email</td>
</tr>
</tbody>
</table>
Versioning

/user/?v=1

/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
- XML
- Other?

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

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

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

```json
{
   "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
<?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?
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
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"
}]
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/index22.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

<table>
<thead>
<tr>
<th>Status Code</th>
<th>Status Message</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>OK</td>
</tr>
<tr>
<td>301</td>
<td>Moved Permanently</td>
</tr>
<tr>
<td>302</td>
<td>Found</td>
</tr>
<tr>
<td>400</td>
<td>Bad Request</td>
</tr>
<tr>
<td>401</td>
<td>Not Authorized</td>
</tr>
<tr>
<td>403</td>
<td>Forbidden</td>
</tr>
<tr>
<td>404</td>
<td>Not Found</td>
</tr>
<tr>
<td>500</td>
<td>Internal Server Error</td>
</tr>
<tr>
<td>503</td>
<td>Service Unavailable</td>
</tr>
</tbody>
</table>
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 cannot easily access status messages.
- Not all servers can modify response status messages.
- Allows for verbose and descriptive errors.
- Helps developers debug problems.
- Keep error responses in the 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 fizzler 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**
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01//EN" "http://www.w3.org/TR/html4/strict.dtd">
<html>
  <head>
    <!-- Change this if you want to allow scaling -->
    <meta name="viewport" content="width=default-width; user-scalable=no" />

    <meta http-equiv="Content-type" content="text/html; charset=utf-8">

    <title>HelloPhoneGap</title>

    <script type="text/javascript" charset="utf-8" src="phonegap.0.9.4.min.js"></script>

    <script type="text/javascript" charset="utf-8">
        function onBodyLoad()
        {
            document.addEventListener("deviceready",onDeviceReady,false);
        }

        /* When this function is called, PhoneGap has been initialized and is ready to run */
        function onDeviceReady()
        {
            // do your thing!
        }
    </script>

  </head>

  <body onload="onBodyLoad()">
  </body>
</html>
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
### Wireshark Captured Data

Filter: tcp.port eq 80

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Source</th>
<th>Destination</th>
<th>Protocol</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>38.325679</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>57860 &gt; http [SYN] Seq=0 Win=65535 Len=0 MS</td>
</tr>
<tr>
<td>17</td>
<td>38.329139</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>57860 &gt; http [ACK] Seq=0 Ack=1 Win=65520</td>
</tr>
<tr>
<td>18</td>
<td>38.323149</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>57860 &gt; http [ACK] Seq=1 Ack=1 Win=81660</td>
</tr>
<tr>
<td>19</td>
<td>38.323164</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=1 Ack=260 Win=262140</td>
</tr>
<tr>
<td>20</td>
<td>38.323243</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>HTTP</td>
<td>POST /v1/user/index5.php HTTP/1.1 (application)</td>
</tr>
<tr>
<td>21</td>
<td>38.323285</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=1 Ack=260 Win=262140</td>
</tr>
<tr>
<td>22</td>
<td>38.326512</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=260 Ack=261 Win=262140</td>
</tr>
<tr>
<td>23</td>
<td>38.326589</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=260 Ack=261 Win=262140</td>
</tr>
<tr>
<td>24</td>
<td>38.326735</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http [FIN, ACK] Seq=260 Ack=261 Win=262140</td>
</tr>
<tr>
<td>25</td>
<td>38.326765</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http [FIN, ACK] Seq=260 Ack=261 Win=262140</td>
</tr>
<tr>
<td>26</td>
<td>38.326776</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=260 Ack=261 Win=262140</td>
</tr>
<tr>
<td>27</td>
<td>38.326789</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=260 Ack=261 Win=262140</td>
</tr>
<tr>
<td>28</td>
<td>38.326804</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=260 Ack=261 Win=262140</td>
</tr>
</tbody>
</table>

---

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
Capturing from lo0 - Wireshark

Filter: tcp.port eq 80

<table>
<thead>
<tr>
<th>No.</th>
<th>Time</th>
<th>Source</th>
<th>Destination</th>
<th>Protocol</th>
<th>Info</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>16:38:23:070</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>57860 &gt; http [SYN] Seq=0 Win=65535 Len=0</td>
</tr>
<tr>
<td>17</td>
<td>16:38:23:133</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [SYN, ACK] Seq=0 Ack=1 Win=6</td>
</tr>
<tr>
<td>18</td>
<td>16:38:23:149</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>57860 &gt; http [ACK] Seq=1 Ack=1 Win=81660</td>
</tr>
<tr>
<td>19</td>
<td>16:38:23:164</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=1 Ack=260 Win=26250</td>
</tr>
<tr>
<td>20</td>
<td>16:38:23:243</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>HTTP</td>
<td>POST /v1/user/index5.php HTTP/1.1 (appl)</td>
</tr>
<tr>
<td>21</td>
<td>16:38:23:285</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=1 Ack=260 Win=26250</td>
</tr>
<tr>
<td>22</td>
<td>16:38:26:512</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>HTTP</td>
<td>HTTP/1.1 403 Forbidden (text/html)</td>
</tr>
<tr>
<td>23</td>
<td>16:38:26:583</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>57860 &gt; http [ACK] Seq=260 Ack=226 Win=8750</td>
</tr>
<tr>
<td>24</td>
<td>16:38:26:671</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>57860 &gt; http [FIN, ACK] Seq=250 Ack=226 W</td>
</tr>
<tr>
<td>25</td>
<td>16:38:26:676</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>http &gt; 57860 [ACK] Seq=226 Ack=261 Win=26250</td>
</tr>
<tr>
<td>26</td>
<td>16:38:26:776</td>
<td>127.0.0.1</td>
<td>127.0.0.1</td>
<td>TCP</td>
<td>TCP  [TCP Dup ACK 17#1] 57860 &gt; http [ACK] Seq=1 Ack=260 Win=30000</td>
</tr>
</tbody>
</table>

Hypertext Transfer Protocol

HTTP/1.1 403 Forbidden

[Expert Info (Chat/Sequence): HTTP/1.1 403 Forbidden

[Message: HTTP/1.1 403 Forbidden

[Severity level: Chat]

[Group: Sequence]

Request Version: HTTP/1.1
Response Code: 403
X-Powered-By: PHP/5.3.13
Content-type: text/html
Transfer-Encoding: chunked
Date: Mon, 21 May 2012 23:36:16 GMT
Server: Mashery Proxy

HTTP chunked response
Data chunk (49 octets)
End of chunked encoding

Line-based text data: text/html

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

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

Frame (frame), 281 bytes   Packets: 85 Displayed: 13 Marked: 0   Profile: Default
<table>
<thead>
<tr>
<th>Name</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>URL</td>
<td><a href="http://fizzer/v1/user/index5.php">http://fizzer/v1/user/index5.php</a></td>
</tr>
<tr>
<td>Status</td>
<td>Complete</td>
</tr>
<tr>
<td>Response Code</td>
<td>403 Forbidden</td>
</tr>
<tr>
<td>Protocol</td>
<td>HTTP/1.1</td>
</tr>
<tr>
<td>Method</td>
<td>POST</td>
</tr>
<tr>
<td>Content-Type</td>
<td>text/html</td>
</tr>
<tr>
<td>Client Address</td>
<td>/0:0:0:0:0:0:0:0:1%0</td>
</tr>
<tr>
<td>Remote Address</td>
<td>fizzer/127.0.0.1</td>
</tr>
<tr>
<td><strong>Timing</strong></td>
<td></td>
</tr>
<tr>
<td>Request Start Time</td>
<td>5/21/12 8:53:43 PM</td>
</tr>
<tr>
<td>Request End Time</td>
<td>5/21/12 8:53:43 PM</td>
</tr>
<tr>
<td>Response Start Time</td>
<td>5/21/12 8:53:43 PM</td>
</tr>
<tr>
<td>Response End Time</td>
<td>5/21/12 8:53:43 PM</td>
</tr>
<tr>
<td>Duration</td>
<td>31 ms</td>
</tr>
<tr>
<td>Request Duration</td>
<td>24 ms</td>
</tr>
<tr>
<td>Response Duration</td>
<td>3 ms</td>
</tr>
<tr>
<td>Latency</td>
<td>4 ms</td>
</tr>
<tr>
<td>Speed</td>
<td>15.18 KB/s</td>
</tr>
<tr>
<td>Response Speed</td>
<td>72.59 KB/s</td>
</tr>
<tr>
<td><strong>Size</strong></td>
<td></td>
</tr>
<tr>
<td>Request Header Size</td>
<td>228 bytes</td>
</tr>
</tbody>
</table>

CONNECT https://na3.salesforce.com:443
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"}
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"}}
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.

I have read
I disagree
I'm lying

Did I happen to mention to document your API?
# Request parameters

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

Sample Text Request:

```
Italian sculptors and painters of the renaissance favored the Virgin Mary for inspiration.
```

**Response fields**

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>categories</td>
<td>List of categories. Not present when enabled_categorizer=&quot;false&quot;.</td>
</tr>
<tr>
<td>categories/yct_categories</td>
<td>List of YCT categories.</td>
</tr>
<tr>
<td>categories/yct_categories/yct_category</td>
<td>YCT category. This element has a numeric score attribute. Categories are</td>
</tr>
</tbody>
</table>
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/iiodocs

Swagger
http://swagger.wordnik.com/
Interactive Documentation

DEMO
Interactive Console

APP GALLERY

INTERACTIVE CONSOLE

TERMS OF SERVICE
CODE LIBRARY
DOCS
- VERSION 2
- VERSION 1
REGISTER AN APP

API Key:

Toggle All Endpoints | Toggle All Methods

Identity Methods

GET Identity(twitter_id) /identity.json/tw/:twitter_id
GET Identity(twitter_screen_name) /identity.json/twitter
GET Identity(kloutId) /identity.json/klout/:klout_id/tw

User Methods

GET Show User /user.json/kloutId
GET Score /user.json/kloutId/score
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**
---|---
screenName | Mashery

string | A twitter screen name (e.g. jtimberlake)

**Request URI**

http://api.klout.com/v2/identity.json/twitter?

screenName=Mashery&key=

**Request Headers**

```json
{
  "X-Originating-IP": "67.158.171.205",
  "User-Agent": "Mashery I/O Docs"
}
```

**Response Headers**

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

**Response Body**

```json
{
  "id": "454726",
  "network": "ks"
}
```
"lowercaseapi": {
  "name": "Lower Case API",
  "protocol": "http",
  "baseURL": "api.lowercase.sample",
  "publicPath": "/v1",
  "auth": "key",
  "keyParam": "api_key_var_name"
}

{
  "endpoints": [
    {
      "name": "Resource Group A",
      "methods": [
        {
          "MethodName": "Method A1",
          "Synopsis": "Grabs information from the A1 data set",
          "HTTPMethod": "GET",
          "URI": "/al/grab",
          "RequiresOAuth": "N",
          "parameters": [
            {
              "Name": "param_1_name",
              "Required": "y",
              "Default": "",
              "Type": "string",
              "Description": "Description of the first parameter."
            }
          ]
        }
      ]
    }
  ]
}
I/O Doctor
http://www.iodoxy.net/
### /pet.{format}

<table>
<thead>
<tr>
<th>Method</th>
<th>Endpoint</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>GET</td>
<td>/pet/{petId}</td>
<td>Find pet by ID</td>
</tr>
<tr>
<td>GET</td>
<td>/pet/findByStatus</td>
<td>Finds Pets by status</td>
</tr>
<tr>
<td>GET</td>
<td>/pet/findByTags</td>
<td>Finds Pets by tags</td>
</tr>
</tbody>
</table>

### /user.{format}

Sexy API documentation from Swagger.
Implementation Notes
Returns a pet when ID < 10. ID > 10 or nonintegers will simulate API error conditions

Parameters
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>petId</td>
<td>1</td>
<td>ID of pet that needs to be fetched</td>
</tr>
</tbody>
</table>

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

Response Body
```json
{
  "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: *
{
  "apiVersion": "0.2",
  "swaggerVersion": "1.0",
  "basePath": "http://petstore.swagger.wordnik.com/api",
  "resourcePath": "/pet",
  "apis": [
    {
      "path": "/pet.{format}/{petId}",
      "description": "Operations about pets",
      "operations": [
        {
          "parameters": [
            {
              "name": "petId",
              "description": "ID of pet that needs to be fetched",
              "dataType": "string",
              "allowableValues": {
                "valueType": "RANGE",
                "max": 10.0,
                "min": 0.0,
                "valueType": "RANGE"
              },
              "required": true,
              "allowMultiple": false,
              "paramType": "path"
            }
          ],
          "httpMethod": "GET",
        }
      ]
    }
  ]
}
Multi-Channel Support System

Show the world that you care and that you're invested
Multi-Channel Support System

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

• Monitor Email
  Don't allow this to queue up and insure they are not falling into your spam buckets
Multi-Channel Support System

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

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

• Setup and Monitor Forums
  Don't rely on the community to take care of itself
Multi-Channel Support System

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

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

- **Setup and Monitor Forums**
  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

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

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

● **Setup and Monitor Forums**
  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
Outreach Must be Tailored to the Individual Needs of Mature, Growth and Seed Developers

Where They Are

Mature
- Corporate Developers
- Large scale conferences
- User conferences
- Trade shows

Growth
- SMB Developers
- Geo-local events
- Large scale conferences
- Networking events

Open/Seed Developers
- Web Developers
- Web App Events
- Developer Events

- Mobile Mondays
- Developer events

- LBS Developers
- Geo-local events
- Developer events

Where They're Not

- Developer events
- Networking events

- Developer events (hacking)

- Large scale conferences
- Mobile events

- Large scale conferences
- Web Application events

- Large scale conferences
Questions?

We're Hiring!