Using Web Services

Chapter 13

Python for Informatics: Exploring Information
www.py4inf.com

open.michigan

University of Michigan

UMSI

Data on the Web

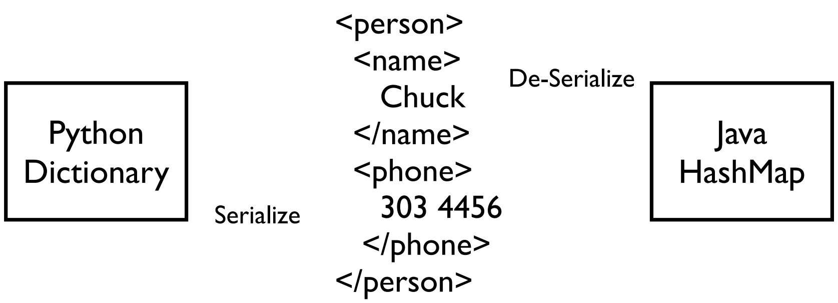
- With the HTTP Request/Response well understood and well supported there was a natural move toward exchanging data between programs using these protocols
- We needed to come up with an agreed way to represent data going between applications and across networks
- There are two commonly used formats: XML and JSON

Sending Data across the "Net"

Python Dictionary
Java HashMap

a.k.a. "Wire Protocol" - What we send on the "wire"

Agreeing on a "Wire Format"



Python Dictionary

Serialize

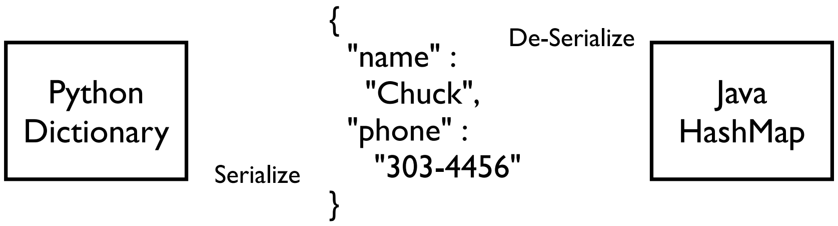
```
<person>
  <name>
    Chuck
  </name>
  <phone>
    303 4456
   </phone>
</person>
```

De-Serialize

Java HashMap

XML

Agreeing on a "Wire Format"



Python Dictionary

Serialize

```
{
  "name" :
    "Chuck",
  "phone" :
     "303-4456"
}
```

De-Serialize

Java HashMap

JSON

XML "Elements" (or Nodes)

- Simple Element
- Complex Element

```
<people>
  <person>
    <name>Chuck</name>
    <phone>303 4456</phone>
  </person>
  <person>
    <name>Noah</name>
    <phone>622 7421</phone>
  </person>
</people>
```

XML

Marking up data to send across the network...

http://en.wikipedia.org/wiki/XML

eXtensible Markup Language

- Primary purpose is to help information systems share structured data
- It started as a simplified subset of the Standard Generalized Markup Language (SGML), and is designed to be relatively human-legible

http://en.wikipedia.org/wiki/XML

XML Basics

- Start Tag
- End Tag
- Text Content
- Attribute
- Self Closing Tag

```
<person>
  <name>Chuck</name>
  <phone type=”intl”>
     +1 734 303 4456
   </phone>
   <email hide=”yes” />
</person>
```

White Space

```
<person>
  <name>Chuck</name>
  <phone type=”intl”>
     +1 734 303 4456
   </phone>
   <email hide=”yes” />
</person>
```

Line ends do not matter. White space is generally discarded on text elements. We indent only to be readable.

```
<person>
  <name>Chuck</name>
  <phone type=”intl”>+1 734 303 4456</phone>
   <email hide=”yes” />
</person>
```

Some XML...

```
<recipe name="bread" prep_time="5 mins" cook_time="3 hours">
  <title>Basic bread</title>
  <ingredient amount="8" unit="dL">Flour</ingredient>
  <ingredient amount="10" unit="grams">Yeast</ingredient>
  <ingredient amount="4" unit="dL" state="warm">Water</ingredient>
  <ingredient amount="1" unit="teaspoon">Salt</ingredient>
  <instructions>
    <step>Mix all ingredients together.</step>
    <step>Knead thoroughly.</step>
    <step>Cover with a cloth, and leave for one hour in warm room.</step>
    <step>Knead again.</step>
    <step>Place in a bread baking tin.</step>
    <step>Cover with a cloth, and leave for one hour in warm room.</step>
    <step>Bake in the oven at 180(degrees)C for 30 minutes.</step>
  </instructions>
</recipe>
```

http://en.wikipedia.org/wiki/XML

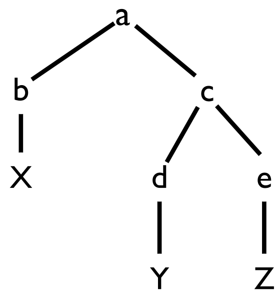
XML Terminology

- Tags indicate the beginning and ending of elements
- Attributes - Keyword/value pairs on the opening tag of XML
- Serialize / De-Serialize - Convert data in one program into a common format that can be stored and/or transmitted between systems in a programming language independent manner

http://en.wikipedia.org/wiki/Serialization

XML as a Tree

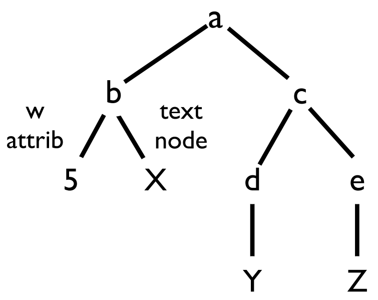
```
<a>
   <b>X</b>
   <c>
      <d>Y</d>
      <e>Z</e>
   </c>
</a>
```



Elements   Text

XML Text and Attributes

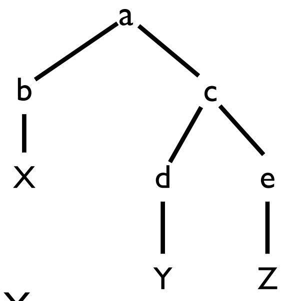
```
<a>
   <b w="5">X</b>
   <c>
      <d>Y</d>
      <e>Z</e>
   </c>
</a>
```



Elements   Text

XML as Paths

```
<a>
   <b>X</b>
   <c>
      <d>Y</d>
      <e>Z</e>
   </c>
</a>
```



/a/b	X
/a/c/d	Y
/a/c/e	Z

Elements   Text

XML Schema

Describing a “contract” as to what is acceptable XML.

http://en.wikipedia.org/wiki/Xml_schema

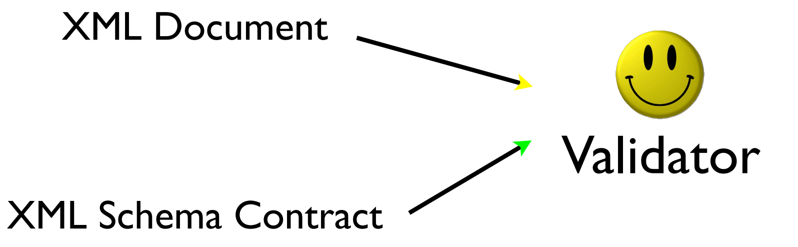
http://en.wikibooks.org/wiki/XML_Schema

XML Schema

- Description of the legal format of an XML document
- Expressed in terms of constraints on the structure and content of documents
- Often used to specify a “contract” between systems - “My system will only accept XML that conforms to this particular Schema.”
- If a particular piece of XML meets the specification of the Schema - it is said to “validate”

http://en.wikipedia.org/wiki/Xml_schema

XML Validation



XML Document

XML Schema Contract

Validator

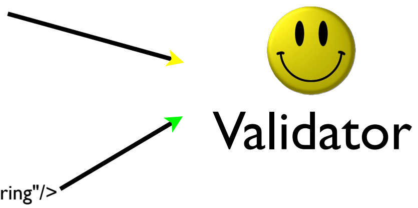
XML Validation

XML Document

```
<person>
   <lastname>Severance</lastname>
   <age>17</age>
   <dateborn>2001-04-17</dateborn>
</person>
```

XML Schema Contract

```
<xs:complexType name=”person”>
  <xs:sequence>
    <xs:element name="lastname" type="xs:string"/>
    <xs:element name="age" type="xs:integer"/>
    <xs:element name="dateborn" type="xs:date"/>
  </xs:sequence>
</xs:complexType>
```



Validator

Many XML Schema Languages

- Document Type Definition (DTD)
  - http://en.wikipedia.org/wiki/Document_Type_Definition
- Standard Generalized Markup Language (ISO 8879:1986 SGML)
  - http://en.wikipedia.org/wiki/SGML
- XML Schema from W3C - (XSD)
  - http://en.wikipedia.org/wiki/XML_Schema_(W3C)

http://en.wikipedia.org/wiki/Xml_schema

XSD XML Schema (W3C spec)

- We will focus on the World Wide Web Consortium (W3C) version
- It is often called “W3C Schema” because “Schema” is considered generic
- More commonly it is called XSD because the file names end in .xsd

http://www.w3.org/XML/Schema

http://en.wikipedia.org/wiki/XML_Schema_(W3C)

XSD Structure

```
<person>
   <lastname>Severance</lastname>
   <age>17</age>
   <dateborn>2001-04-17</dateborn>
</person>
```

- xs:element
- xs:sequence
- xs:complexType

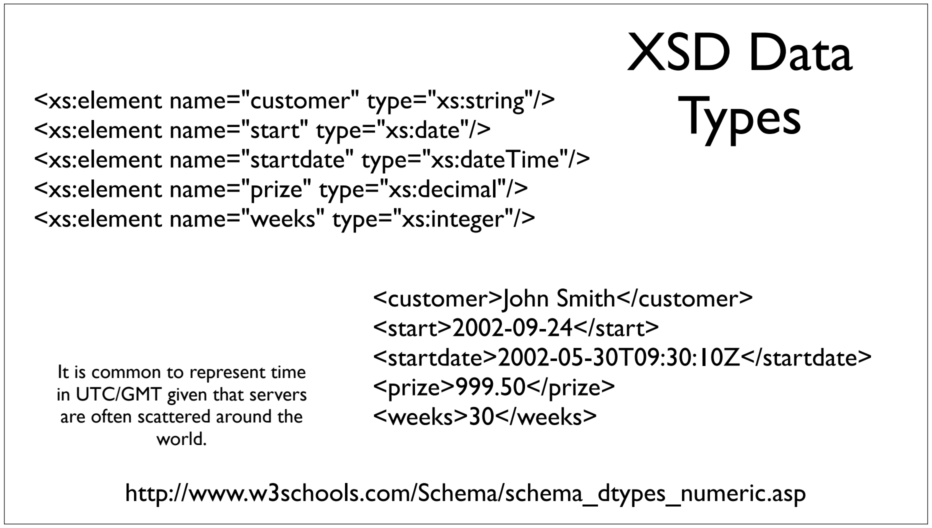
```
<xs:complexType name=”person”>
  <xs:sequence>
    <xs:element name="lastname" type="xs:string"/>
    <xs:element name="age" type="xs:integer"/>
    <xs:element name="dateborn" type="xs:date"/>
  </xs:sequence>
</xs:complexType>
```

XSD Constraints

```
<xs:element name="person">
  <xs:complexType>
    <xs:sequence>
      <xs:element name="full_name" type="xs:string"
           minOccurs="1" maxOccurs="1" />
      <xs:element name="child_name" type="xs:string"
            minOccurs="0" maxOccurs="10" />
    </xs:sequence>
  </xs:complexType>
</xs:element>
```

```
<person>
  <full_name>Tove Refsnes</full_name>
  <child_name>Hege</child_name>
  <child_name>Stale</child_name>
  <child_name>Jim</child_name>
  <child_name>Borge</child_name>
</person>
```

http://www.w3schools.com/Schema/schema_complex_indicators.asp



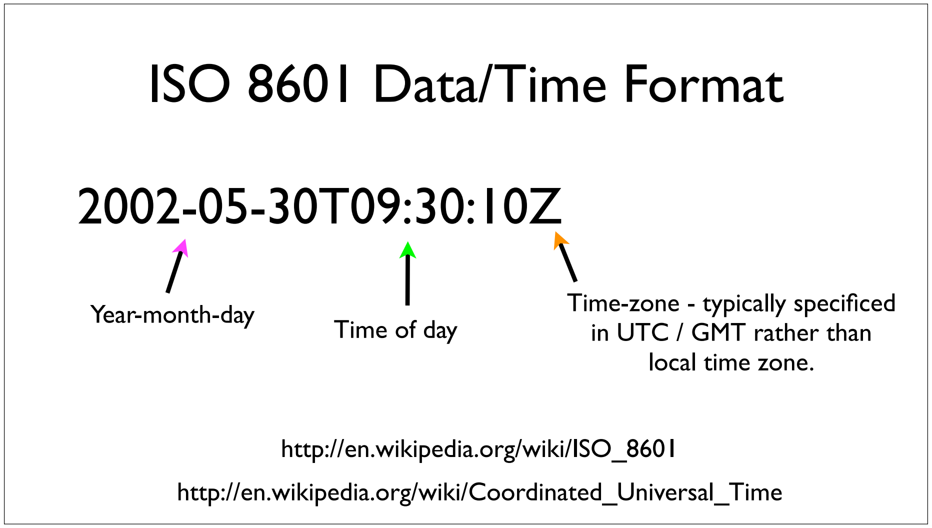
XSD Data Types

```
<xs:element name="customer" type="xs:string"/>
<xs:element name="start" type="xs:date"/>
<xs:element name="startdate" type="xs:dateTime"/>
<xs:element name="prize" type="xs:decimal"/>
<xs:element name="weeks" type="xs:integer"/>
```

```
<customer>John Smith</customer>
<start>2002-09-24</start>
<startdate>2002-05-30T09:30:10Z</startdate>
<prize>999.50</prize>
<weeks>30</weeks>
```

It is common to represent time in UTC/GMT given that servers are often scattered around the world.

http://www.w3schools.com/Schema/schema_dtypes_numeric.asp



ISO 8601 Data/Time Format

2002-05-30T09:30:10Z

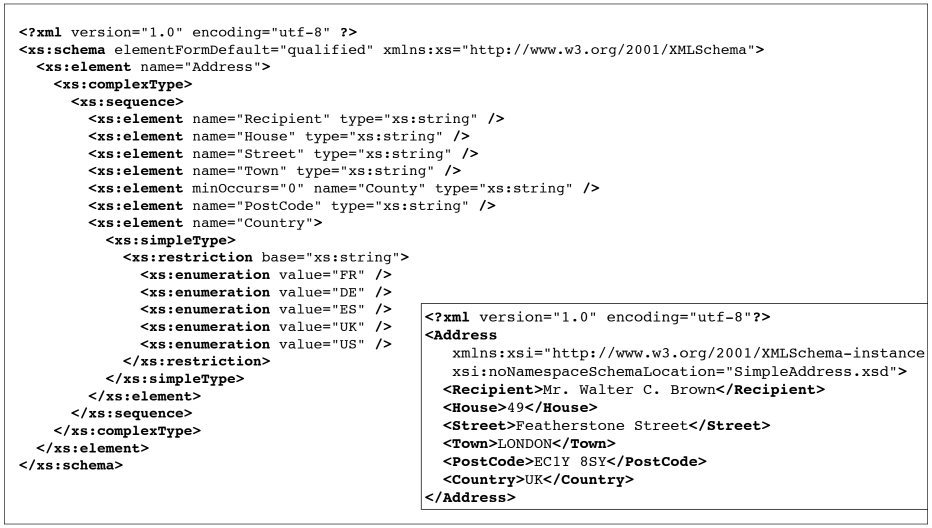
Year-month-day

Time of day

Time-zone - typically specificed in UTC / GMT rather than local time zone.

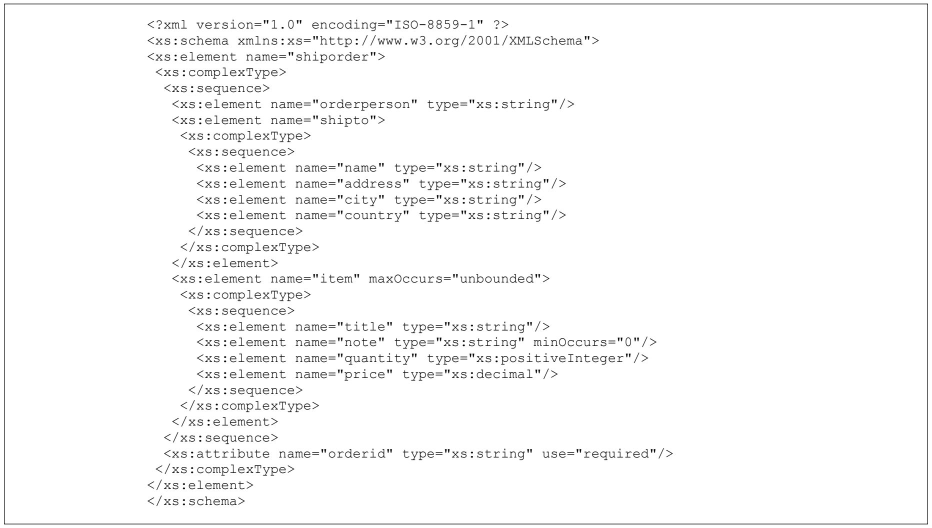
http://en.wikipedia.org/wiki/ISO_8601

http://en.wikipedia.org/wiki/Coordinated_Universal_Time



```
<?xml version="1.0" encoding="utf-8" ?>
<xs:schema elementFormDefault="qualified" xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="Address">
    <xs:complexType>
      <xs:sequence>
        <xs:element name="Recipient" type="xs:string" />
        <xs:element name="House" type="xs:string" />
        <xs:element name="Street" type="xs:string" />
        <xs:element name="Town" type="xs:string" />
        <xs:element minOccurs="0" name="County" type="xs:string" />
        <xs:element name="PostCode" type="xs:string" />
        <xs:element name="Country">
          <xs:simpleType>
            <xs:restriction base="xs:string">
              <xs:enumeration value="FR" />
              <xs:enumeration value="DE" />
              <xs:enumeration value="ES" />
              <xs:enumeration value="UK" />
              <xs:enumeration value="US" />
            </xs:restriction>
          </xs:simpleType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

```
<?xml version="1.0" encoding="utf-8"?>
<Address
   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance
   xsi:noNamespaceSchemaLocation="SimpleAddress.xsd">
  <Recipient>Mr. Walter C. Brown</Recipient>
  <House>49</House>
  <Street>Featherstone Street</Street>
  <Town>LONDON</Town>
  <PostCode>EC1Y 8SY</PostCode>
  <Country>UK</Country>
</Address>
```



```
<?xml version="1.0" encoding="ISO-8859-1" ?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
<xs:element name="shiporder">
 <xs:complexType>
  <xs:sequence>
   <xs:element name="orderperson" type="xs:string"/>
   <xs:element name="shipto">
    <xs:complexType>
     <xs:sequence>
      <xs:element name="name" type="xs:string"/>
      <xs:element name="address" type="xs:string"/>
      <xs:element name="city" type="xs:string"/>
      <xs:element name="country" type="xs:string"/>
     </xs:sequence>
    </xs:complexType>
   </xs:element>
   <xs:element name="item" maxOccurs="unbounded">
    <xs:complexType>
     <xs:sequence>
      <xs:element name="title" type="xs:string"/>
      <xs:element name="note" type="xs:string" minOccurs="0"/>
      <xs:element name="quantity" type="xs:positiveInteger"/>
      <xs:element name="price" type="xs:decimal"/>
     </xs:sequence>
    </xs:complexType>
   </xs:element>
  </xs:sequence>
  <xs:attribute name="orderid" type="xs:string" use="required"/>
 </xs:complexType>
</xs:element>
</xs:schema>
```

```
<?xml version="1.0" encoding="ISO-8859-1"?>
<shiporder orderid="889923"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
    xsi:noNamespaceSchemaLocation="shiporder.xsd">
 <orderperson>John Smith</orderperson>
 <shipto>
  <name>Ola Nordmann</name>
  <address>Langgt 23</address>
  <city>4000 Stavanger</city>
  <country>Norway</country>
 </shipto>
 <item>
  <title>Empire Burlesque</title>
  <note>Special Edition</note>
  <quantity>1</quantity>
  <price>10.90</price>
 </item>
 <item>
  <title>Hide your heart</title>
  <quantity>1</quantity>
  <price>9.90</price>
 </item>
</shiporder>
```

http://www.w3schools.com/Schema/schema_example.asp

xml1.py

```
import xml.etree.ElementTree as ET

data = '''
<person>
  <name>Chuck</name>
  <phone type="intl">
     +1 734 303 4456
   </phone>
   <email hide="yes"/>
</person>'''

tree = ET.fromstring(data)
print 'Name:',tree.find('name').text
print 'Attr:',tree.find('email').get('hide')
```

xml2.py

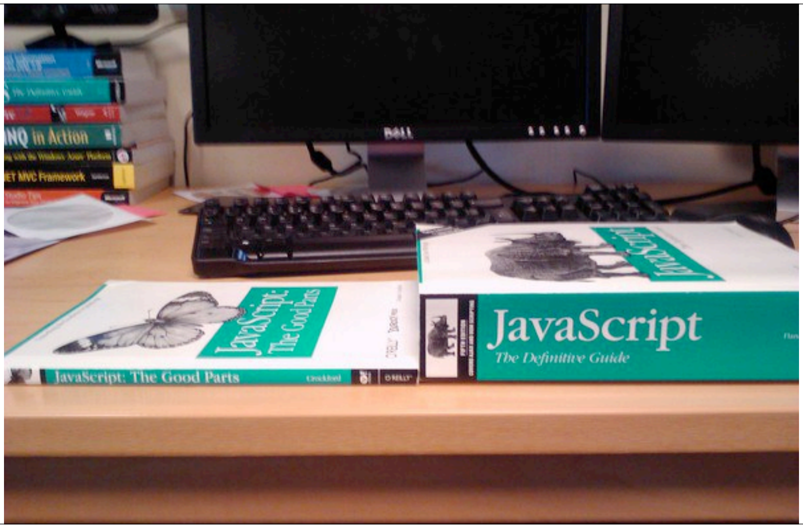
```
import xml.etree.ElementTree as ET

input = '''
<stuff>
    <users>
        <user x="2">
            <id>001</id>
            <name>Chuck</name>
        </user>
        <user x="7">
            <id>009</id>
            <name>Brent</name>
            </user>
        </users>
</stuff>'''

stuff = ET.fromstring(input)
lst = stuff.findall('users/user')
print 'User count:', len(lst)

for item in lst:
    print 'Name', item.find('name').text
    print 'Id', item.find('id').text
    print 'Attribute', item.get("x")
```

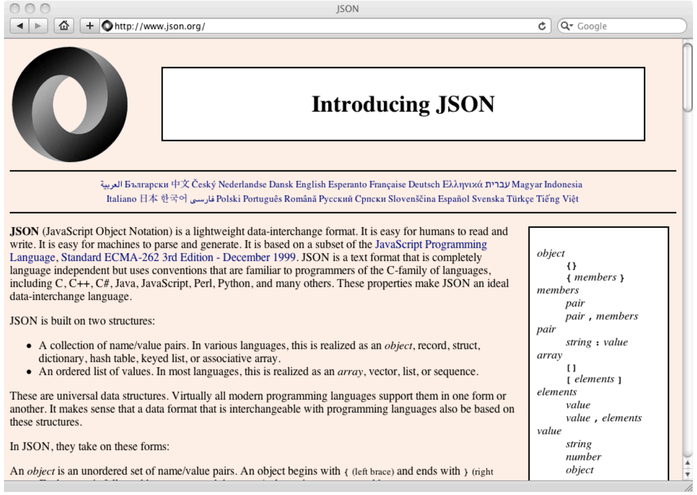
JavaScript Object Notation

JavaScript Object Notation

- Douglas Crockford - "Discovered" JSON
- Object literal notation in JavaScript

https://vimeo.com/38054451
http://www.youtube.com/watch?v=-C-JoyNuQJs





Introducing JSON

العربية Български 中文 Český Nederlandse Dansk English Esperanto Française Deutsch Ελληνικά עברית Magyar Indonesia
Italiano 日本 한국어 فارسی Polski Português Română Русский Српски Slovenščina Español Svenska Türkçe Tiếng Việt

JSON (JavaScript Object Notation) is a lightweight data-interchange format. It is easy for humans to read and write. It is easy for machines to parse and generate. It is based on a subset of the JavaScript Programming Language, Standard ECMA-262 3rd Edition - December 1999. JSON is a text format that is completely language independent but uses conventions that are familiar to programmers of the C-family of languages, including C, C++, C#, Java, JavaScript, Perl, Python, and many others. These properties make JSON an ideal data-interchange language.

JSON is built on two structures:

- A collection of name/value pairs. In various languages, this is realized as an *object*, record, struct, dictionary, hash table, keyed list, or associative array.
- An ordered list of values. In most languages, this is realized as an *array*, vector, list, or sequence.

These are universal data structures. Virtually all modern programming languages support them in one form or another. It makes sense that a data format that is interchangeable with programming languages also be based on these structures.

In JSON, they take on these forms:

An *object* is an unordered set of name/value pairs. An object begins with { (left brace) and ends with } (right

```
object
    {}
    { members }
members
    pair
    pair , members
pair
    string : value
array
    []
    [ elements ]
elements
    value
    value , elements
value
    string
    number
    object
```

json1.py

```
import json

data = '''
{
  "name" : "Chuck",
  "phone" : {
    "type" : "intl",
    "number" : "+1 734 303 4456"
   },
   "email" : {
     "hide" : "yes"
   }
}'''

info = json.loads(data)
print 'Name:',info["name"]
print 'Hide:',info["email"]["hide"]
```

JSON represents data as nested "lists" and "dictionaries" json2.py

```
import json

input = '''
[
  { "id" : "001",
    "x" : "2",
    "name" : "Chuck"
  } ,
  { "id" : "009",
    "x" : "7",
    "name" : "Chuck"
  }
]'''

info = json.loads(input)
print 'User count:', len(info)

for item in info:
    print 'Name', item['name']
    print 'Id', item['id']
    print 'Attribute', item['x']
```

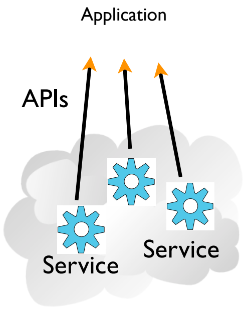
JSON represents data as nested "lists" and "dictionaries"

Service Oriented Approach

http://en.wikipedia.org/wiki/Service-oriented_architecture

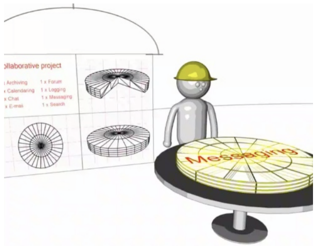
Service Oriented Approach

- Most non-trivial web applications use services
- They use services from other applications
  - Credit Card Charge
  - Hotel Reservation systems
- Services publish the "rules" applications must follow to make use of the service (API)



Multiple Systems

- Initially - two systems cooperate and split the problem
- As the data/service becomes useful - multiple applications want to use the information / application



http://www.vimeo.com/7591954

5:15

Application Program Interface

The API itself is largely abstract in that it specifies an interface and controls the behavior of the objects specified in that interface. The software that provides the functionality described by an API is said to be an "implementation" of the API. An API is typically defined in terms of the programming language used to build an application.

http://en.wikipedia.org/wiki/API

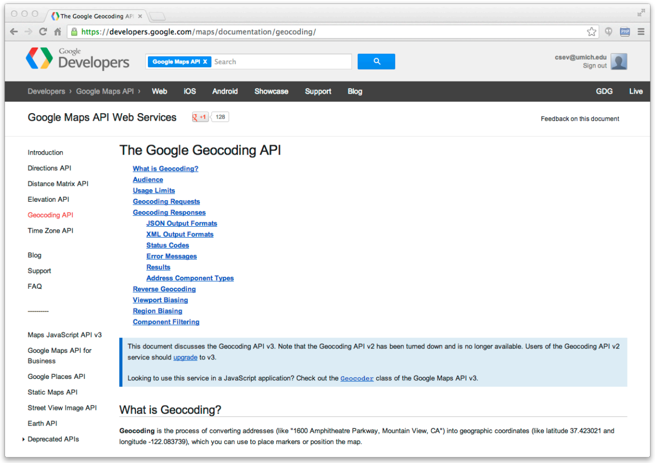
Web Services

http://en.wikipedia.org/wiki/Web_services

Web Service Technologies

- SOAP - Simple Object Access Protocol (software)
  - Remote programs/code which we use over the network
  - Note: Dr. Chuck does not like SOAP because it is overly complex
- REST - Representational State Transfer (resource focused)
  - Remote resources which we create, read, update and delete remotely

http://en.wikipedia.org/wiki/SOAP_(protocol)
http://en.wikipedia.org/wiki/REST



The Google Geocoding API

- What is Geocoding?
- Audience
- Usage Limits
- Geocoding Requests
- Geocoding Responses
  - JSON Output Formats
  - XML Output Formats
  - Status Codes
  - Error Messages
  - Results
  - Address Component Types
- Reverse Geocoding
- Viewport Biasing
- Region Biasing
- Component Filtering

> This document discusses the Geocoding API v3. Note that the Geocoding API v2 has been turned down and is no longer available. Users of the Geocoding API v2 service should upgrade to v3.
>
> Looking to use this service in a JavaScript application? Check out the Geocoder class of the Google Maps API v3.

What is Geocoding?

Geocoding is the process of converting addresses (like "1600 Amphitheatre Parkway, Mountain View, CA") into geographic coordinates (like latitude 37.423021 and longitude -122.083739), which you can use to place markers or position the map.

https://developers.google.com/maps/documentation/geocoding/

http://maps.googleapis.com/maps/api/geocode/json?sensor=false&address=Ann+Arbor%2C+MI

```
{
    "status": "OK",
    "results": [
        {
            "geometry": {
                "location_type": "APPROXIMATE",
                "location": {
                    "lat": 42.2808256,
                    "lng": -83.7430378
                }
            },
            "address_components": [
                {
                    "long_name": "Ann Arbor",
                    "types": [
                        "locality",
                        "political"
                    ],
                    "short_name": "Ann Arbor"
                }
            ],
            "formatted_address": "Ann Arbor, MI, USA",
            "types": [
                "locality",
                "political"
            ]
        }
    ]
}
```

geojson.py

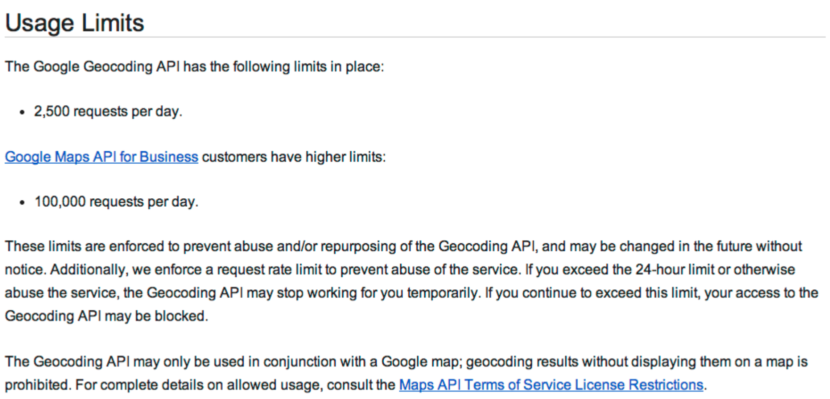
```
import urllib
import json

serviceurl = 'http://maps.googleapis.com/maps/api/geocode/json?'

while True:
    address = raw_input('Enter location: ')
    if len(address) < 1 : break

    url = serviceurl + urllib.urlencode({'sensor':'false',
          'address': address})
    print 'Retrieving', url
    uh = urllib.urlopen(url)
    data = uh.read()
    print 'Retrieved',len(data),'characters'

    try: js = json.loads(str(data))
    except: js = None
    if 'status' not in js or js['status'] != 'OK':
        print '==== Failure To Retrieve ===='
        print data
        continue

    print json.dumps(js, indent=4)

    lat = js["results"][0]["geometry"]["location"]["lat"]
    lng = js["results"][0]["geometry"]["location"]["lng"]
    print 'lat',lat,'lng',lng
    location = js['results'][0]['formatted_address']
    print location
```

```
Enter location: Ann Arbor, MI
Retrieving http://maps.googleapis.com/...
Retrieved 1669 characters
lat 42.2808256 lng -83.7430378
Ann Arbor, MI, USA
Enter location:
```

geojson.py

API Security and Rate Limiting

- The compute resources to run these APIs are not "free"
- The data provided by these APIs is usually valuable
- The data providers might limit the number of requests per day, demand an API "key" or even charge for usage
- They might change the rules as things progress...



Usage Limits

The Google Geocoding API has the following limits in place:

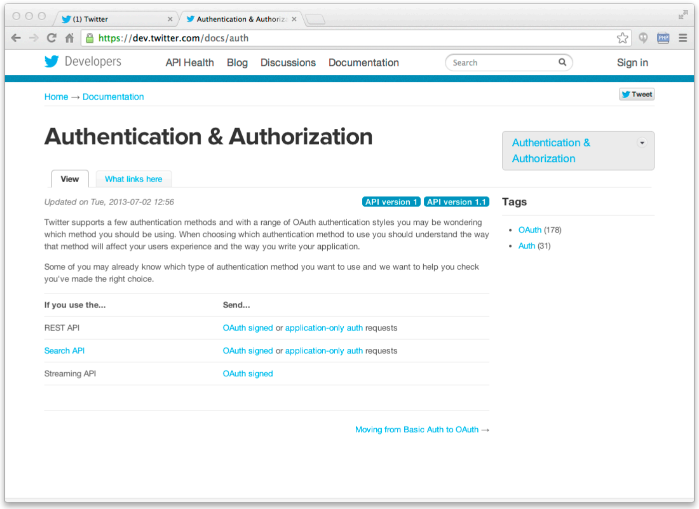
- 2,500 requests per day.

Google Maps API for Business customers have higher limits:

- 100,000 requests per day.

These limits are enforced to prevent abuse and/or repurposing of the Geocoding API, and may be changed in the future without notice. Additionally, we enforce a request rate limit to prevent abuse of the service. If you exceed the 24-hour limit or otherwise abuse the service, the Geocoding API may stop working for you temporarily. If you continue to exceed this limit, your access to the Geocoding API may be blocked.

The Geocoding API may only be used in conjunction with a Google map; geocoding results without displaying them on a map is prohibited. For complete details on allowed usage, consult the Maps API Terms of Service License Restrictions.



Home → Documentation

Authentication & Authorization

Authentication & Authorization

Updated on Tue, 2013-07-02 12:56

Twitter supports a few authentication methods and with a range of OAuth authentication styles you may be wondering which method you should be using. When choosing which authentication method to use you should understand the way that method will affect your users experience and the way you write your application.

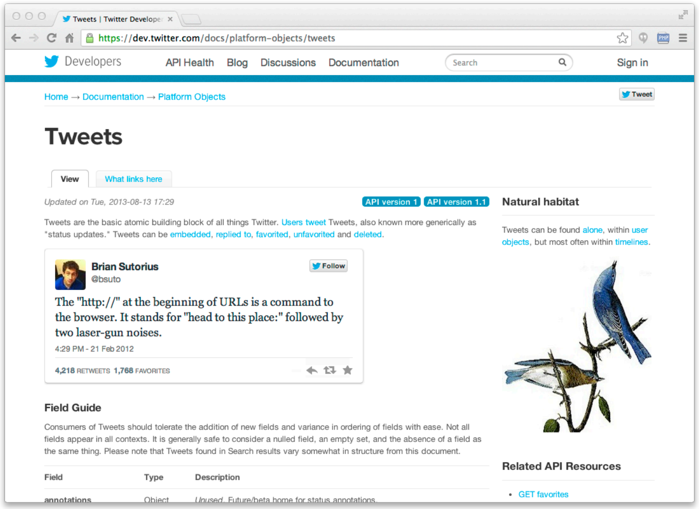
Some of you may already know which type of authentication method you want to use and we want to help you check you've made the right choice.

If you use the...	Send...
REST API	OAuth signed or application-only auth requests
Search API	OAuth signed or application-only auth requests
Streaming API	OAuth signed

Moving from Basic Auth to OAuth →

Tags

- OAuth (178)
- Auth (31)



Home → Documentation → Platform Objects

Tweets

Updated on Tue, 2013-08-13 17:29

Tweets are the basic atomic building block of all things Twitter. Users tweet Tweets, also known more generically as "status updates." Tweets can be embedded, replied to, favorited, unfavorited and deleted.

Brian Sutorius
@bsuto

The "http://" at the beginning of URLs is a command to the browser. It stands for "head to this place:" followed by two laser-gun noises.

4:29 PM - 21 Feb 2012

4,218 RETWEETS 1,768 FAVORITES

Field Guide

Consumers of Tweets should tolerate the addition of new fields and variance in ordering of fields with ease. Not all fields appear in all contexts. It is generally safe to consider a nulled field, an empty set, and the absence of a field as the same thing. Please note that Tweets found in Search results vary somewhat in structure from this document.

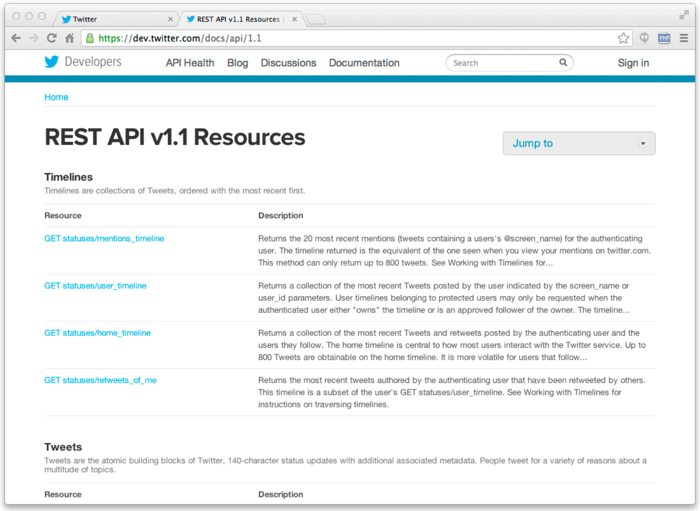
Field	Type	Description
annotations	Object	*Unused.* Future/beta home for status annotations.

Natural habitat

Tweets can be found alone, within user objects, but most often within timelines.

Related API Resources

- GET favorites



Home

REST API v1.1 Resources

Timelines

Timelines are collections of Tweets, ordered with the most recent first.

Resource	Description
GET statuses/mentions_timeline	Returns the 20 most recent mentions (tweets containing a users's @screen_name) for the authenticating user. The timeline returned is the equivalent of the one seen when you view your mentions on twitter.com. This method can only return up to 800 tweets. See Working with Timelines for...
GET statuses/user_timeline	Returns a collection of the most recent Tweets posted by the user indicated by the screen_name or user_id parameters. User timelines belonging to protected users may only be requested when the authenticated user either "owns" the timeline or is an approved follower of the owner. The timeline...
GET statuses/home_timeline	Returns a collection of the most recent Tweets and retweets posted by the authenticating user and the users they follow. The home timeline is central to how most users interact with the Twitter service. Up to 800 Tweets are obtainable on the home timeline. It is more volatile for users that follow...
GET statuses/retweets_of_me	Returns the most recent tweets authored by the authenticating user that have been retweeted by others. This timeline is a subset of the user's GET statuses/user_timeline. See Working with Timelines for instructions on traversing timelines.

Tweets

Tweets are the atomic building blocks of Twitter, 140-character status updates with additional associated metadata. People tweet for a variety of reasons about a multitude of topics.

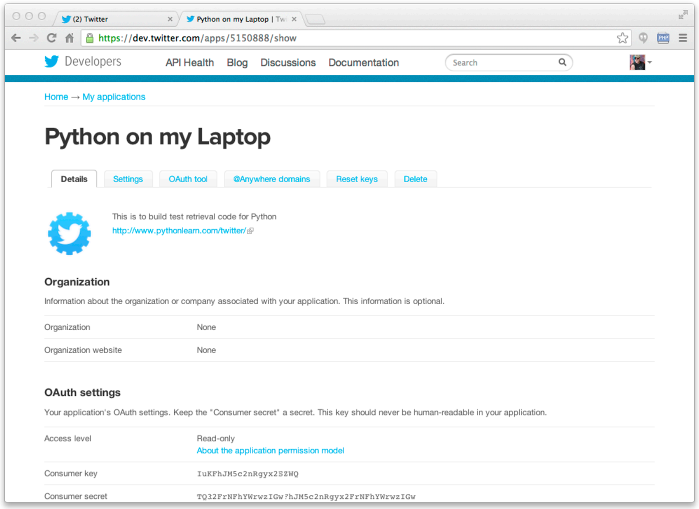
Resource	Description

twitter2.py

```
import urllib
import twurl
import json

TWITTER_URL = 'https://api.twitter.com/1.1/friends/list.json'

while True:
    print ''
    acct = raw_input('Enter Twitter Account:')
    if ( len(acct) < 1 ) : break
    url = twurl.augment(TWITTER_URL,
        {'screen_name': acct, 'count': '5'} )
    print 'Retrieving', url
    connection = urllib.urlopen(url)
    data = connection.read()
    headers = connection.info().dict
    print 'Remaining', headers['x-rate-limit-remaining']
    js = json.loads(data)
    print json.dumps(js, indent=4)

    for u in js['users'] :
        print u['screen_name']
        s = u['status']['text']
        print '  ',s[:50]
```

twitter2.py

```
Enter Twitter Account:drchuck
Retrieving https://api.twitter.com/1.1/friends ...
Remaining 14
{
    "users": [
        {
            "status": {
                "text": "@jazzychad I just bought one .__.",
                "created_at": "Fri Sep 20 08:36:34 +0000 2013",
            },
            "location": "San Francisco, California",
            "screen_name": "leahculver",
            "name": "Leah Culver",
        },
        {
            "status": {
                "text": "RT @WSJ: Big employers like Google ...",
                "created_at": "Sat Sep 28 19:36:37 +0000 2013",
            },
            "location": "Victoria Canada",
            "screen_name": "_valeriei",
            "name": "Valerie Irvine",
    ],
}
leahculver
   @jazzychad I just bought one .__.
_valeriei
   RT @WSJ: Big employers like Google, AT&amp;T are h
ericbollens
   RT @lukew: sneak peek: my LONG take on the good &a
halherzog
   Learning Objects is 10. We had a cake with the LO,
```



Home → My applications

Python on my Laptop

This is to build test retrieval code for Python

http://www.pythonlearn.com/twitter/

Organization

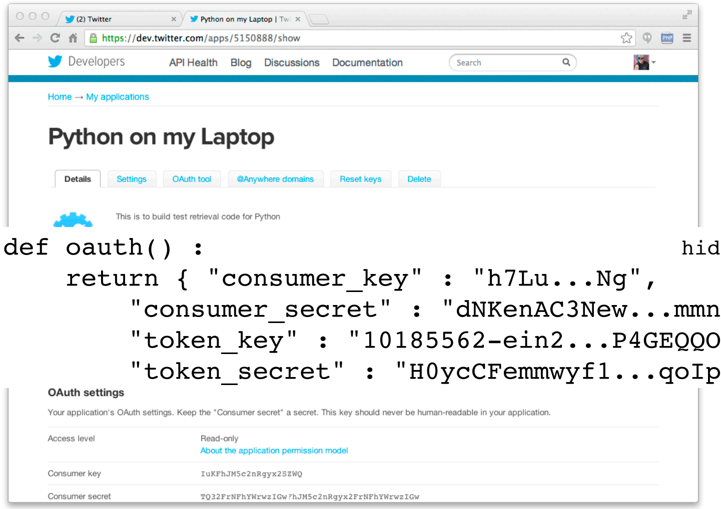
Information about the organization or company associated with your application. This information is optional.

Organization	None
Organization website	None

OAuth settings

Your application's OAuth settings. Keep the "Consumer secret" a secret. This key should never be human-readable in your application.

Access level	Read-only About the application permission model
Consumer key	IuKFhJM5c2nRgyx2SZWQ
Consumer secret	TQ32FrNFhYWrwzIGw?hJM5c2nRgyx2FrNFhYWrwzIGw



Home → My applications

Python on my Laptop

This is to build test retrieval code for Python

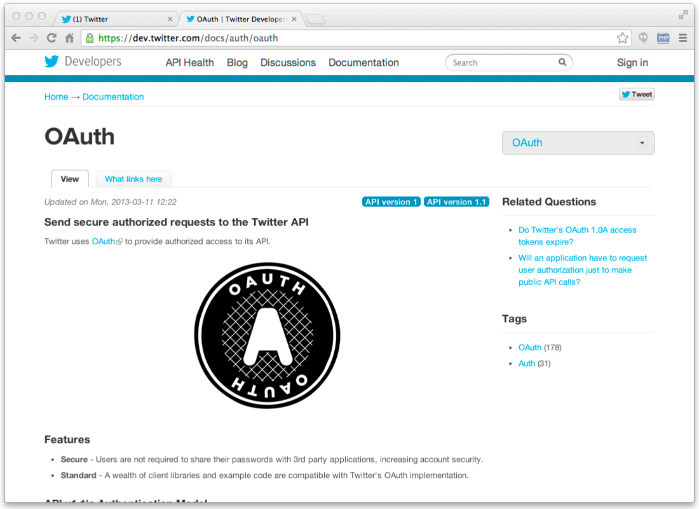
hidden.py

```
def oauth() :
    return { "consumer_key" : "h7Lu...Ng",
        "consumer_secret" : "dNKenAC3New...mmn7Q",
        "token_key" : "10185562-ein2...P4GEQQOSGI",
        "token_secret" : "H0ycCFemmwyf1...qoIpBo" }
```

OAuth settings

Your application's OAuth settings. Keep the "Consumer secret" a secret. This key should never be human-readable in your application.

Access level	Read-only About the application permission model
Consumer key	IuKFhJM5c2nRgyx2SZWQ
Consumer secret	TQ32FrNFhYWrwzIGw?hJM5c2nRgyx2FrNFhYWrwzIGw



Home → Documentation

OAuth

Updated on Mon, 2013-03-11 12:22

Send secure authorized requests to the Twitter API

Twitter uses OAuth to provide authorized access to its API.

Related Questions

- Do Twitter's OAuth 1.0A access tokens expire?
- Will an application have to request user authorization just to make public API calls?

Tags

- OAuth (178)
- Auth (31)

Features

- **Secure** - Users are not required to share their passwords with 3rd party applications, increasing account security.
- **Standard** - A wealth of client libraries and example code are compatible with Twitter's OAuth implementation.

twurl.py

```
import urllib
import oauth
import hidden

def augment(url, parameters) :
    secrets = hidden.oauth()
    consumer = oauth.OAuthConsumer(secrets['consumer_key'], secrets['consumer_secret'])
    token = oauth.OAuthToken(secrets['token_key'],secrets['token_secret'])

    oauth_request = oauth.OAuthRequest.from_consumer_and_token(consumer,
        token=token, http_method='GET', http_url=url, parameters=parameters)
    oauth_request.sign_request(oauth.OAuthSignatureMethod_HMAC_SHA1(), consumer, token)
    return oauth_request.to_url()
```

```
https://api.twitter.com/1.1/statuses/user_timeline.json?count=2
&oauth_version=1.0&oauth_token=101...SGI&screen_name=drchuck
&oauth_nonce=09239679&oauth_timestamp=1380395644
&oauth_signature=rLK...BoD&oauth_consumer_key=h7Lu...GNg
&oauth_signature_method=HMAC-SHA1
```

Summary

- Service Oriented Architecture - allows an application to be broken into parts and distributed across a network
- An Application Program Interface (API) is a contract for interaction
- Web Services provide infrastructure for applications cooperating (an API) over a network - SOAP and REST are two styles of web services
- XML and JSON are serialization formats