Developing an API for PanLex

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Topics

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2. Sample app
3. Under the hood
4. API benefits and costs
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0. Introduction

API: application programming interface

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http://www.programmableweb.com/apis

0. Introduction

API: application programming interface

Big Huge Thesaurus

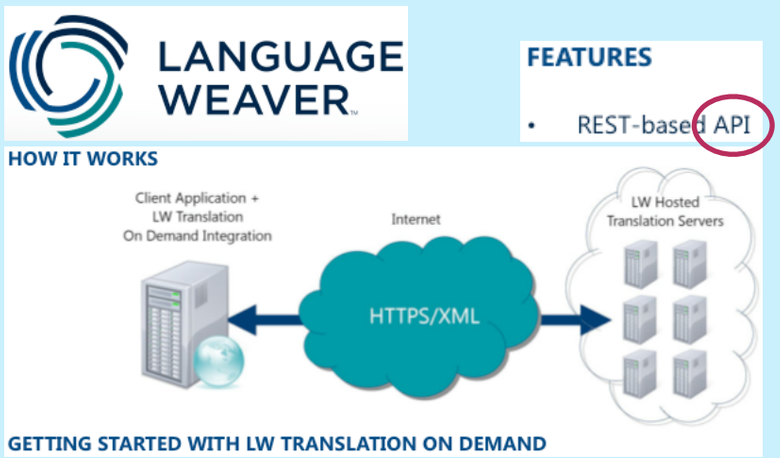
Synonyms, antonyms, and rhymes (oh my!)

API

This site sports a very simple API for retrieving the synonyms for any word.

Abbreviations.com

Our API interfaces let developers design computer programs and web applications that interact directly with the Abbreviations.com content and services.



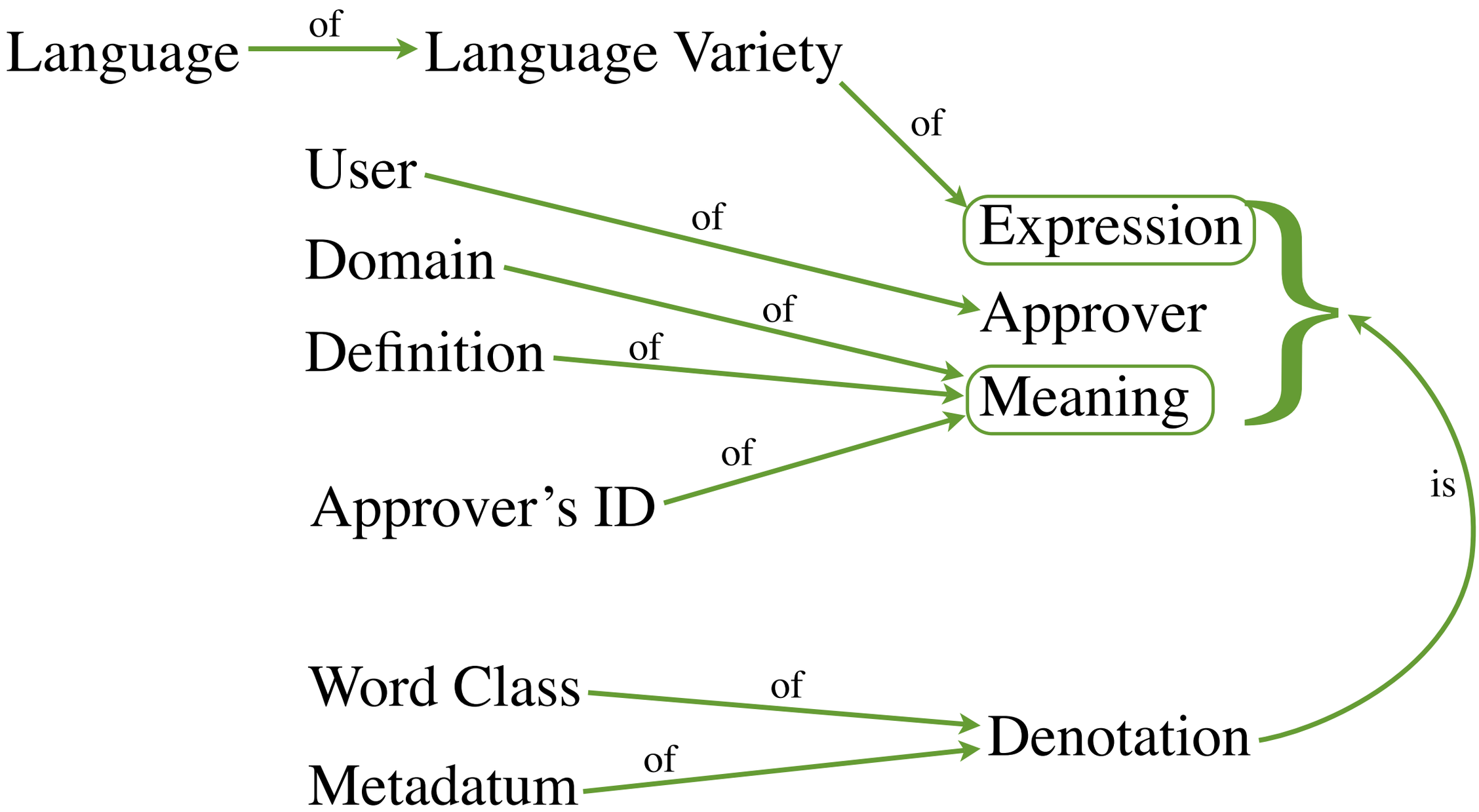
Translated.net

Human Translation Server © Web Service

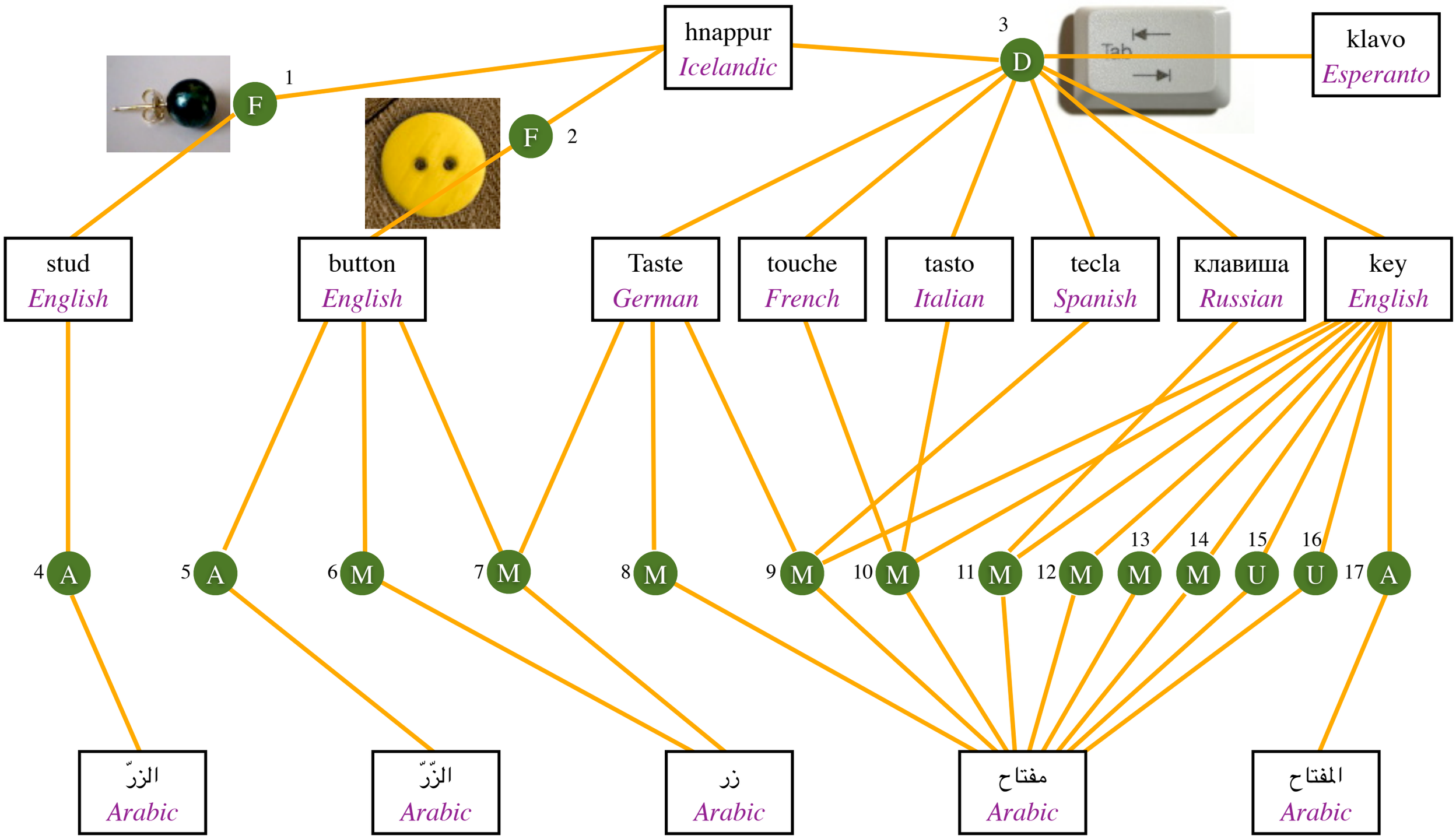
HTS™ is a set of API functions that allows you to integrate human translation into your content management workflow, your desktop environment and your server applications.

0. Introduction

PanLex: a panlingual lexical database



0. Introduction



0. Introduction

Database facts

Started 2006.
Versions:
- PostgreSQL/Linux with no inference (“PanLex”)
- SQL Server/Windows + peer-to-peer inference (“TransGraph”)
- SQL Server/Windows + centralized inference (“PanDictionary”)

Statistics by January 2009:
- 12 million lexemes
- 1,265 language varieties
- 600 lexical resources

Possibilities →

1. Possibilities

Games:

Panlingual “Free Rice”

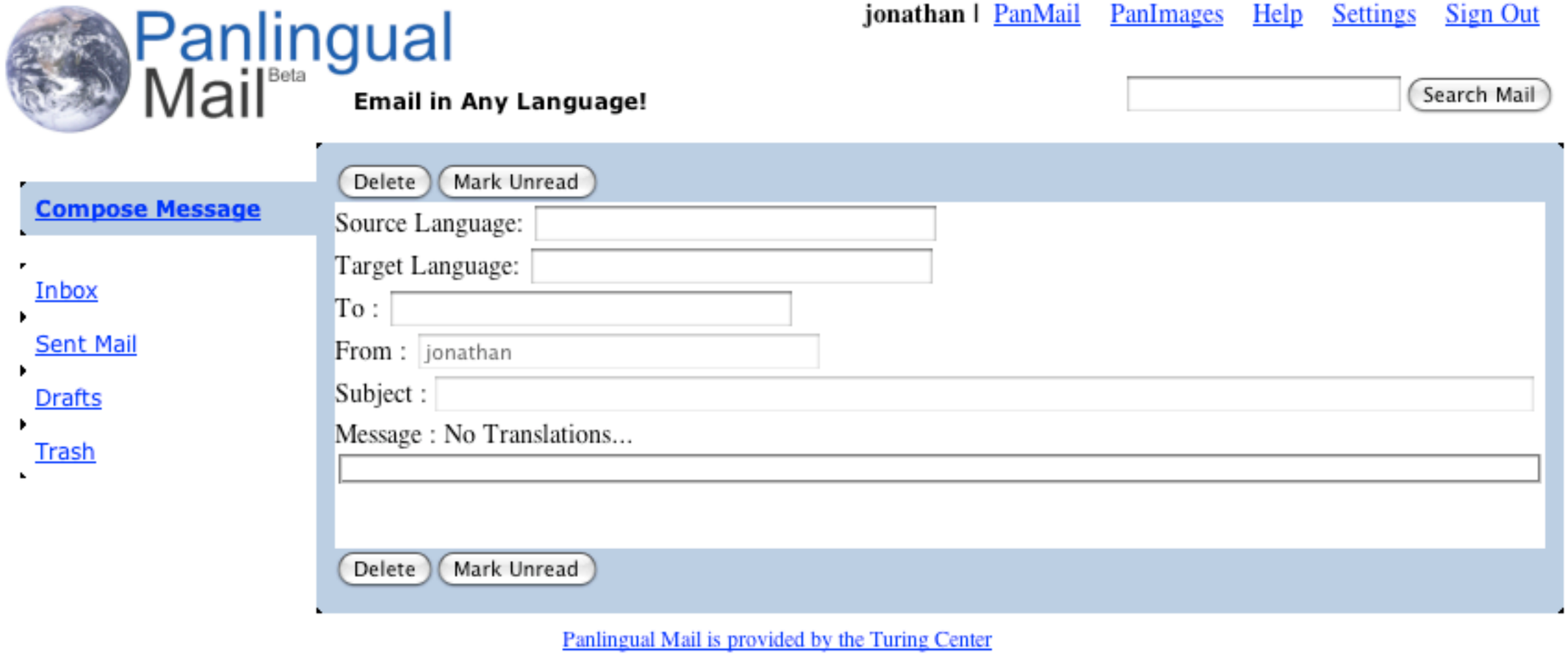
1. Possibilities

Social networking:

Panlingual personals

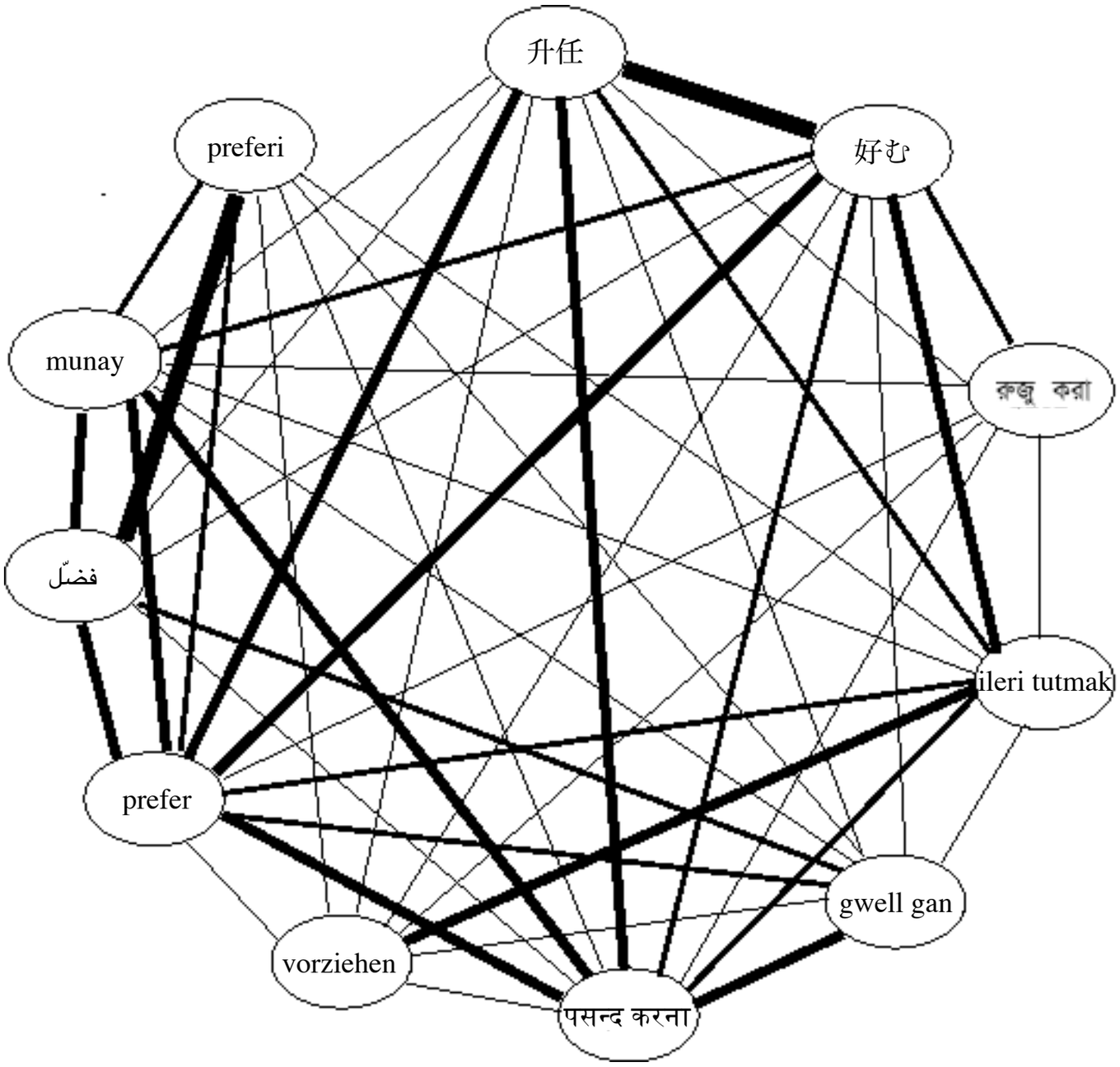
1. Possibilities

Messaging:



1. Possibilities

Science:



1. Possibilities

Translation:

Sample app →

2. Sample app

http://panlex.org/demo/trtur.html

Translate Turkish words into 1260 languages!

Enter a word or phrase:

Under the hood →

3. Under the hood

Case 1

Client

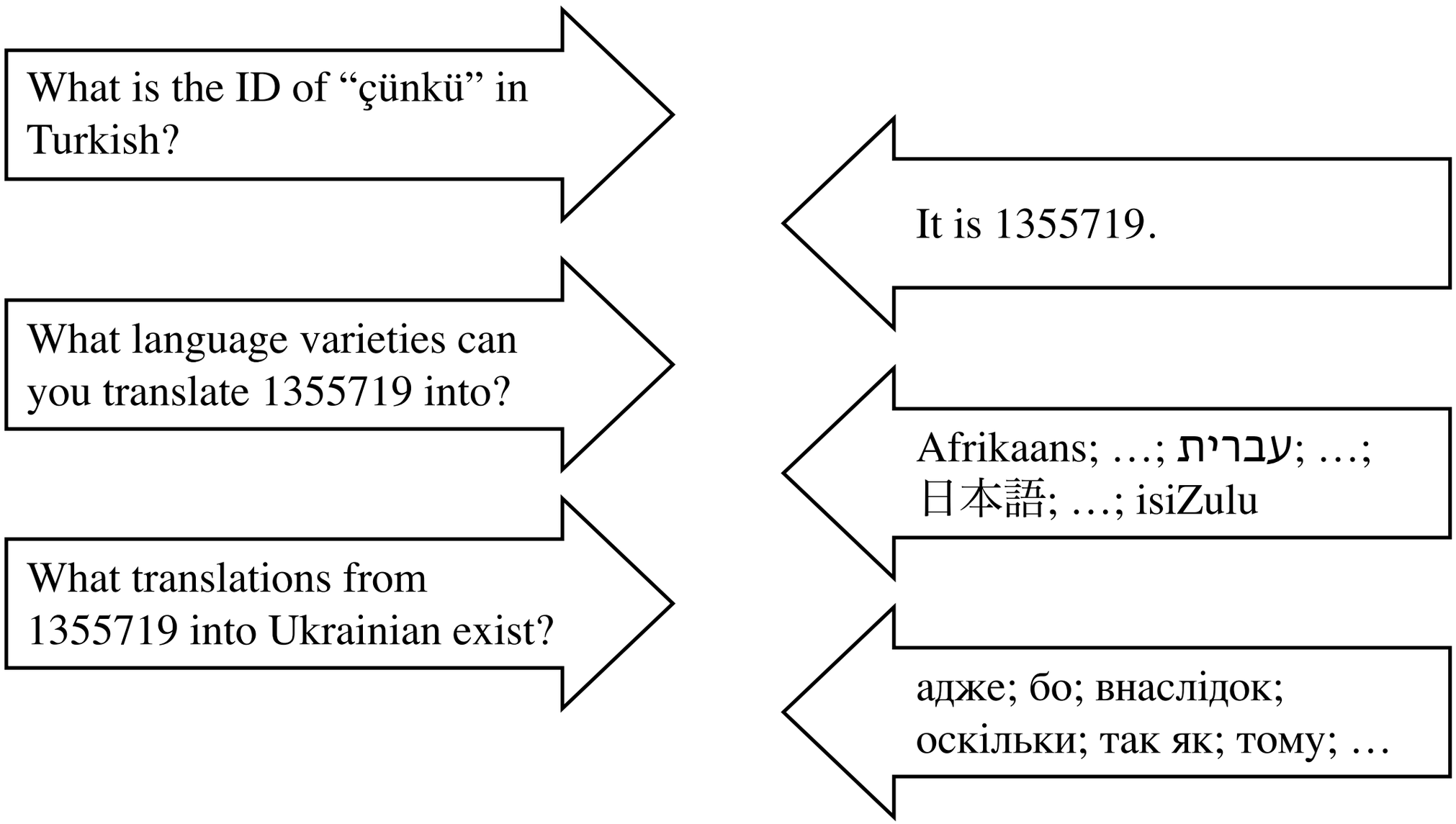
Server

What is the ID of “فراشة” in Turkish?

It doesn’t exist.

3. Under the hood

Case 2



3. Under the hood

Protocol: HTTP.
Server port: TCP 80.
Method: POST.
Content-type: XML.
Encoding: UTF-8.

Client → Server

```
POST http://panlex.org/p
Content-Type: application/xml; charset=utf-8

<?xml version="1.0" encoding="utf-8"?>
<data><vr>00</vr><op>ex-0</op>
<lv>738</lv><et>çünkü</et></data>
```

3. Under the hood

Protocol: HTTP.
Server port: TCP 80.
Method: POST.
Content-type: XML.
Encoding: UTF-8.

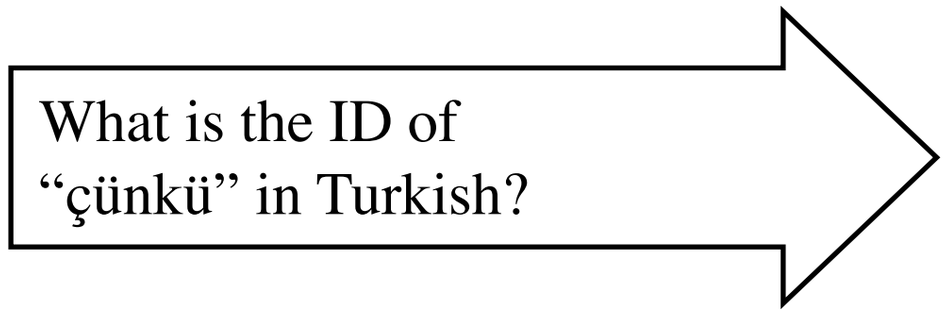
Server → Client

```
HTTP/1.1 200 OK
Content-Type: application/xml; charset=utf-8

<?xml version="1.0" encoding="utf-8"?>
<data><vr>00</vr><op>ex-0</op>
<lv>738</lv><et>çünkü</et><ex>1355719</ex></data>
```

3. Under the hood

Request syntax




```
<data>
  <vr>00</vr>                 API version
  <op>ex-0</op>               operation
  <lv>738</lv>                language variety
  <et>çünkü</et>              expression text
</data>
```

3. Under the hood

Response syntax

The ID of “çünkü” in Turkish is 1355719.

```
<data>
  <vr>00</vr>
  <op>ex-0</op>
  <lv>738</lv>
  <et>çünkü</et>
  <ex>1355719</ex>
</data>
```

request parameters

expression ID (if none exists, blank)

3. Under the hood

Error messages

```
<data>
  <err>In 2: Request content not UTF-8: 0fffd:000ef</err>
</data>
```

```
<data>
  <err>ex-0-DoArgs 3: No arg lv</err>
</data>
```

API benefits and costs →

4. API benefits and costs

Benefits

Total utilization of the data.
Diversity of applications using the data.
Freedom from the obligation to do everything.
Recruitment of partners.
Revenue based on the total value of the resource (e.g., grants).
Visibility of the project.

Costs

Control of look and feel.
Control of uses of the data.
Risk of claims of infringement on intellectual-property rights.
Revenue from human visitors to one's own service (e.g., advertising).
Freedom from the obligation to continue uninterrupted service provision.

Best practices →

5. Best practices

API pundits* say:

- Design APIs for simple, sequential request/response **turns**.
- Make rules **easy** and provide **templates**: Most developers are amateur or lazy.
- Offer **multiple** styles/formats/languages: Let each developer use familiar tools.
- Start **basic**: Let developers tell you what else they want.
- Don’t change a **version**: Never make developers change working apps.
- Write **multiple demos**: Force versatility on your API.
- **Manage** use: Human limits on traffic and abuse don’t apply.
- Follow general **programming** best practices: Document, modularize, hide, etc.

*Examples of API punditry:

Joshua Bloch (http://lcsd05.cs.tamu.edu/slides/keynote.pdf)
Nemetral (http://nemetral.net/2008/06/10/the-pursuit-of-apiness-part-1/)
Mashery (http://blog.mashery.com)
Alex Barnett (http://alexbarnett.net/blog/archive/2006/10/28/Web-API-Design-_2D00_-Keep-Some-of-it-Simple_2C00_-Stupid.aspx)

Strategic choices →

6. Strategic choices

- Protocol/style: DICT vs. REST vs. SOAP vs. XML-RPC vs. SQL.
- Server port: TCP 80 (HTTP) vs. TCP 2628 (DICT).
- Message medium: URI (GET) vs. standard input (POST).
- Encoding: UTF-8 re-encoding: no (multipart) vs. XML vs. URL.
- Content language: XML vs. JSON vs. token-sequence (DICT).
- Statefulness: yes (DICT) vs. no vs. partly (expiring details).
- Customization: stored settings.
- Utilization management: client keys, throttling, premium services.
- Limitations on resource-intensivity.
- Client hosting.
- Service elaboration.
- Aggregation of common service sequences.
- SQL as a service.
- Performance enhancement: caching, derivative tables, server clustering, EC2.
- Organization for durability.

6. Strategic choices

Popular protocols/styles

Dictionaries: DICT (RFC 2229*). Example:

```
C: DEFINE * shortcake

S: 150 2 definitions found: list follows
S: 151 "shortcake" wn "WordNet 1.5" : text follows
S: shortcake
S:   1. n: very short biscuit spread with sweetened fruit and usu.
S:      whipped cream
S: .
S: 151 "Shortcake" web1913 "Webster's Dictionary (1913)" : text follows
S: Shortcake
S:    \Short"cake`\, n.
S:    An unsweetened breakfast cake shortened with butter or lard,
S:    rolled thin, and baked.
S: .
S: 250 Command complete
```

*http://www.faqs.org/rfcs/rfc2229.html

6. Strategic choices

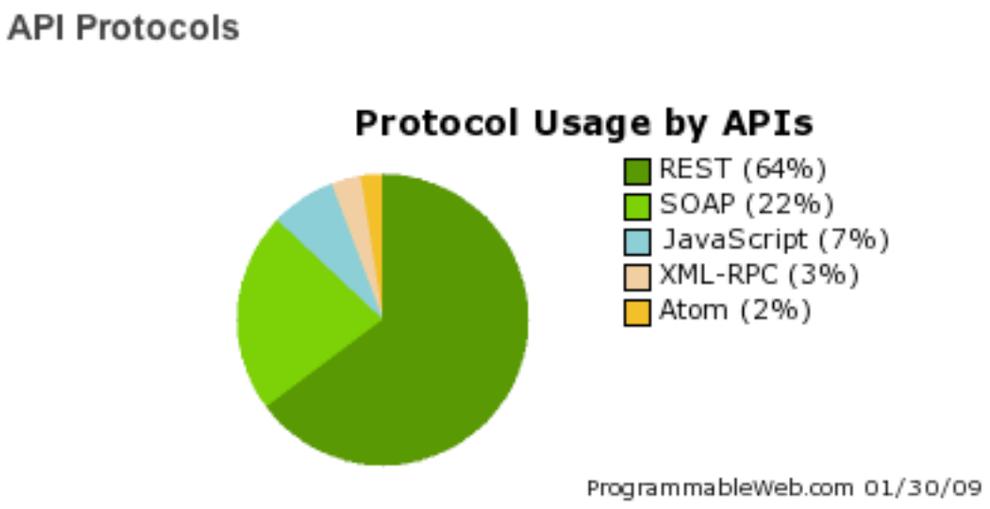
Popular protocols/styles

Everything else:

ProgrammableWeb* classifies 1,107 APIs by:
Protocol or style: 64% REST, 22% SOAP, 7% JavaScript.
Data format: 68% XML, 19% JSON, 7% RSS.

Of these, 57 are “reference” APIs. They are:
Protocol or style: 54% REST, 46% SOAP.
Data format: 81% XML, 18% JSON.

*http://www.programmableweb.com/apis/directory



6. Strategic choices

Popular message media

Standard input (less popular):

```
<data>
  <vr>00</vr>
  <op>ex-0</op>
  <lv>764</lv>
  <et>bươm bướm</et>
</data>
```

```
<data>
  <vr>00</vr>
  <op>ex-0</op>
  <lv>764</lv>
  <et>bÆ°Æ¡m bÆ°á»›m</et>
</data>
```

UTF-8

URI (more popular):

```
vr=00&op=ex-0&lv=764&et=bươm bướm
```

```
vr=00&op=ex-0&lv=764&et=b%c6%b0%c6&a1m b%c6%b0%e1%bb%9bm
```

URL-encoded UTF-8