

Hack Nights: APIs

FACTLab 2016

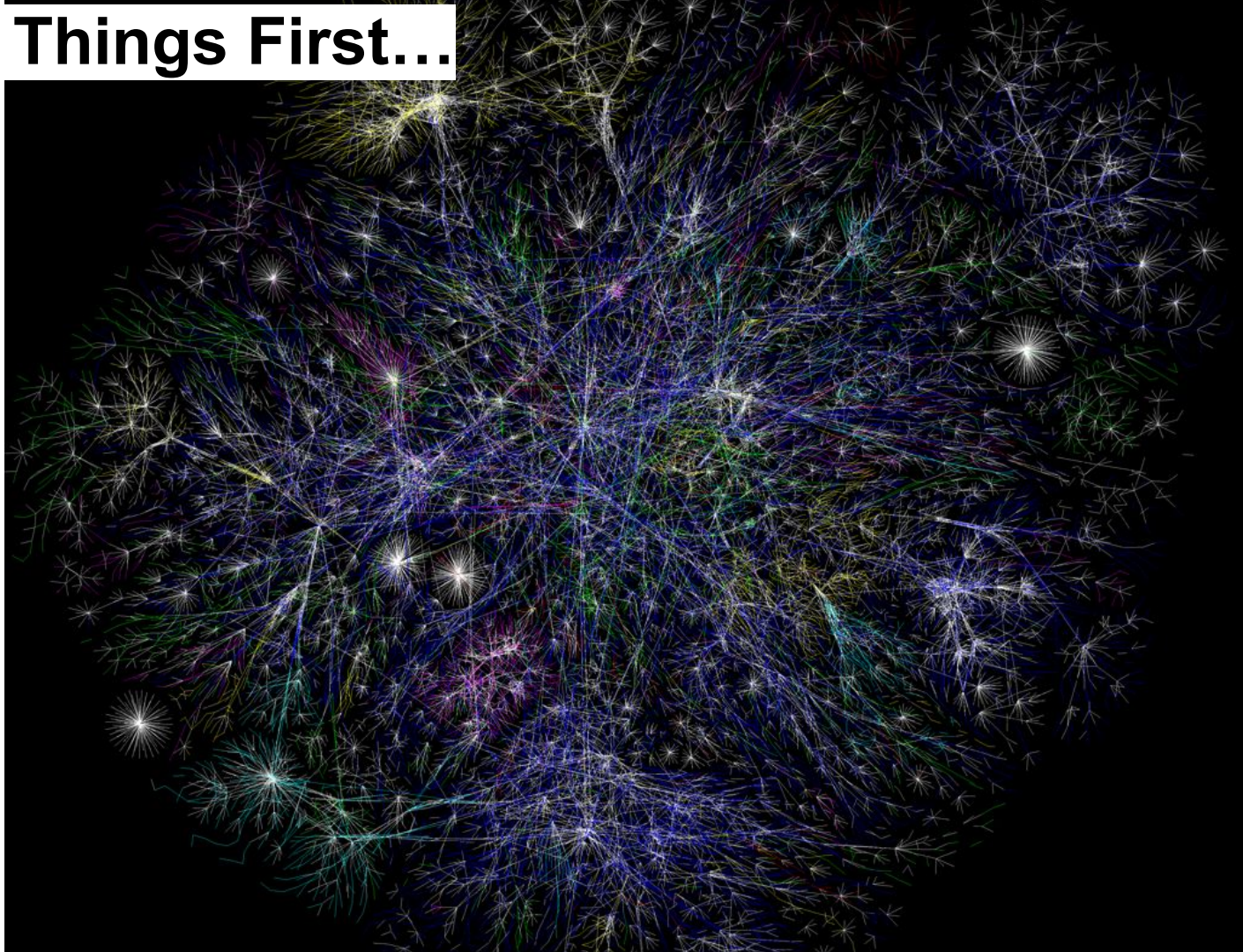
Radamés Ajna

radames.ajna@fact.co.uk

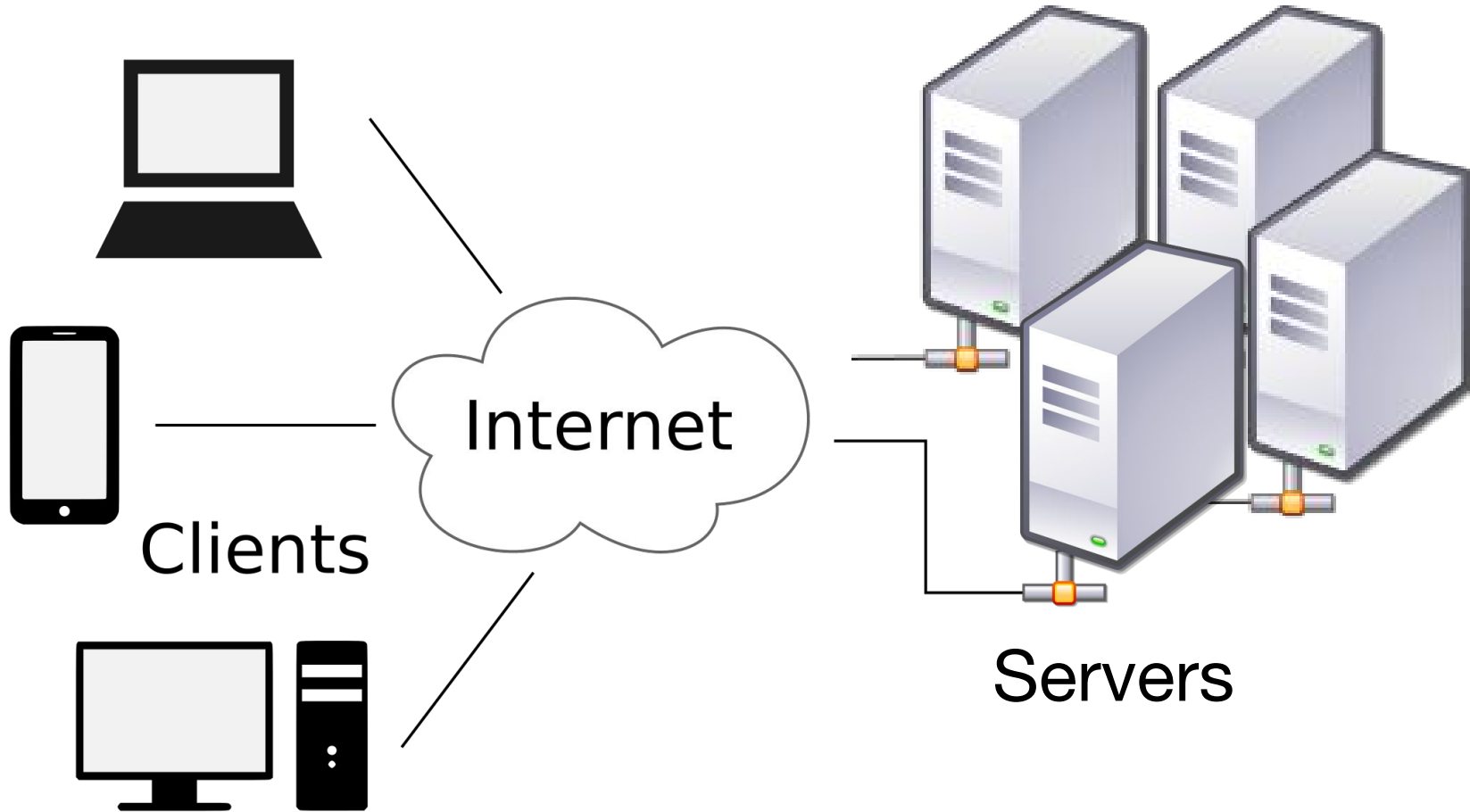
Thiago Hersan

thiago.hersan@fact.co.uk

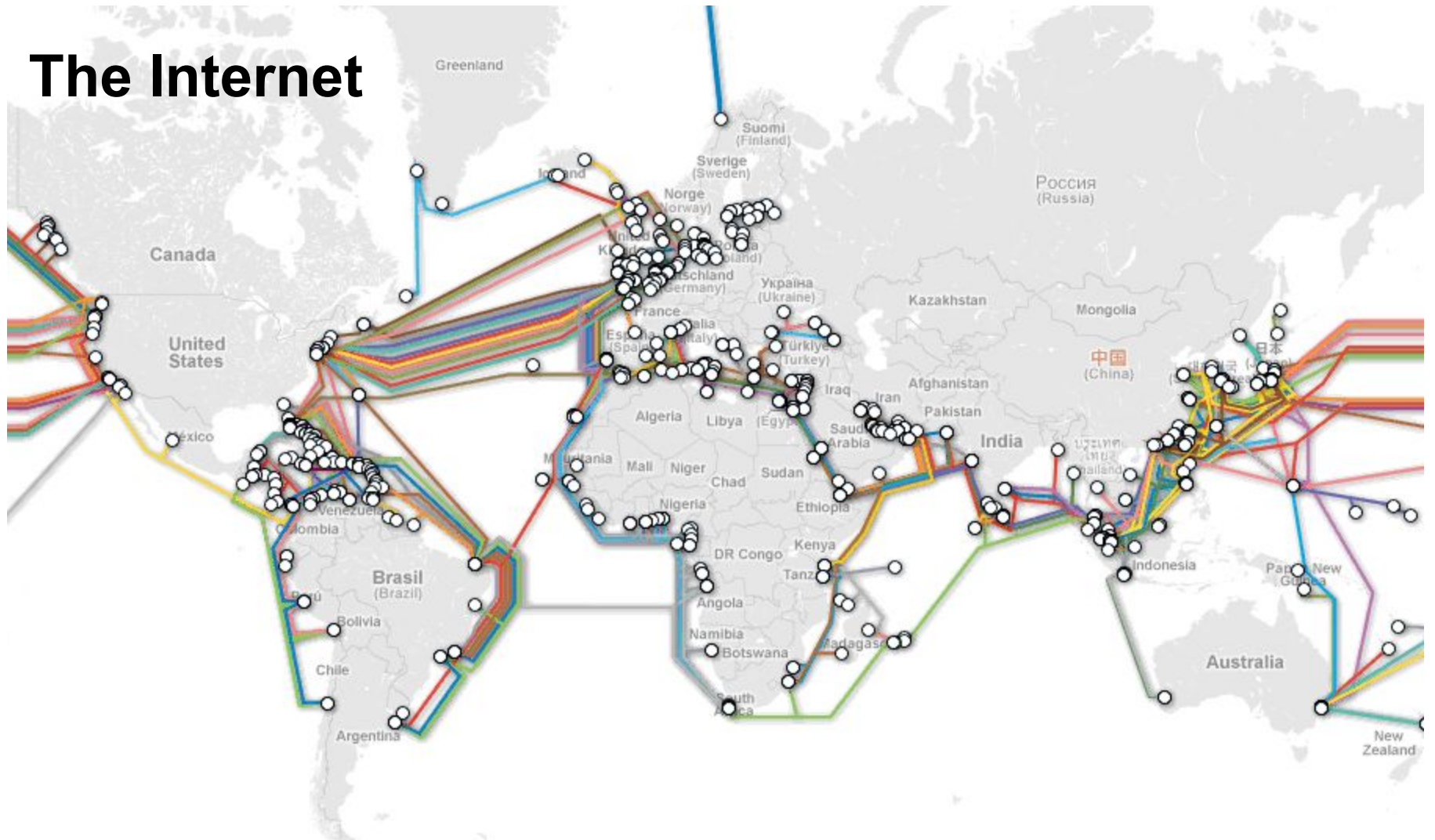
First Things First...



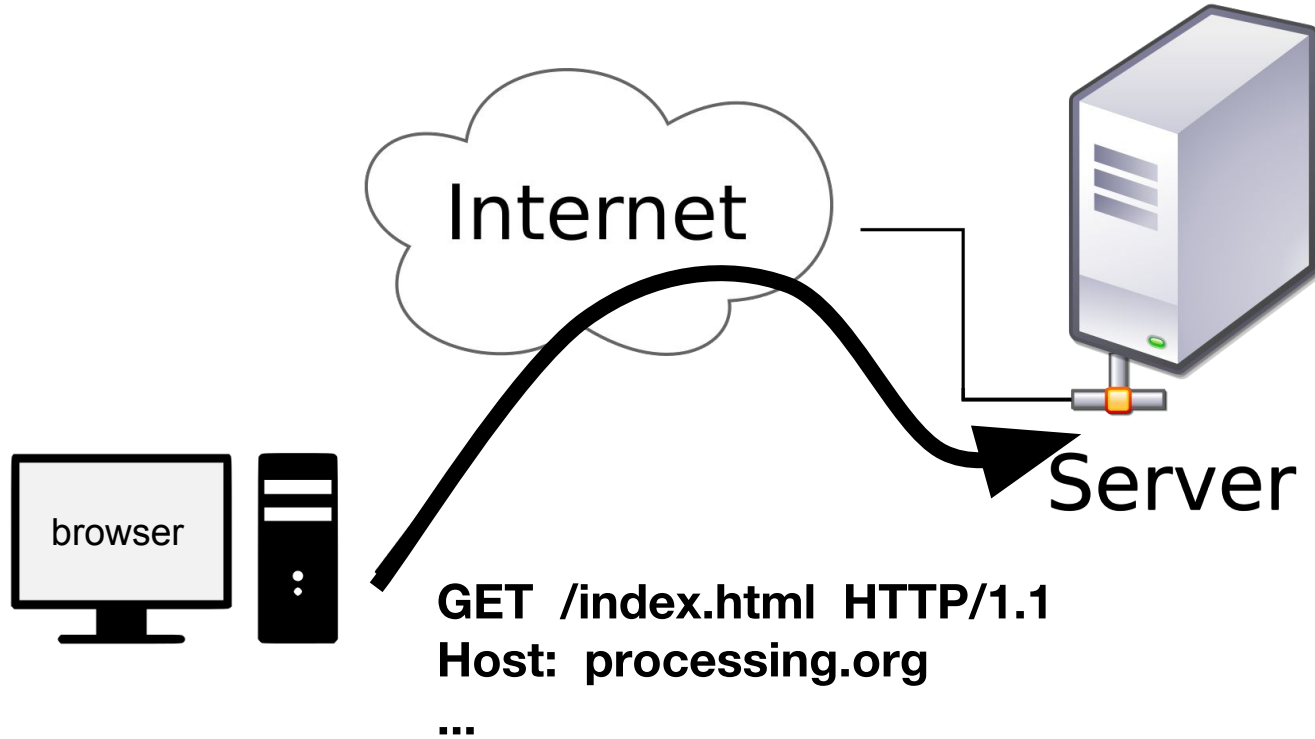
The Internet



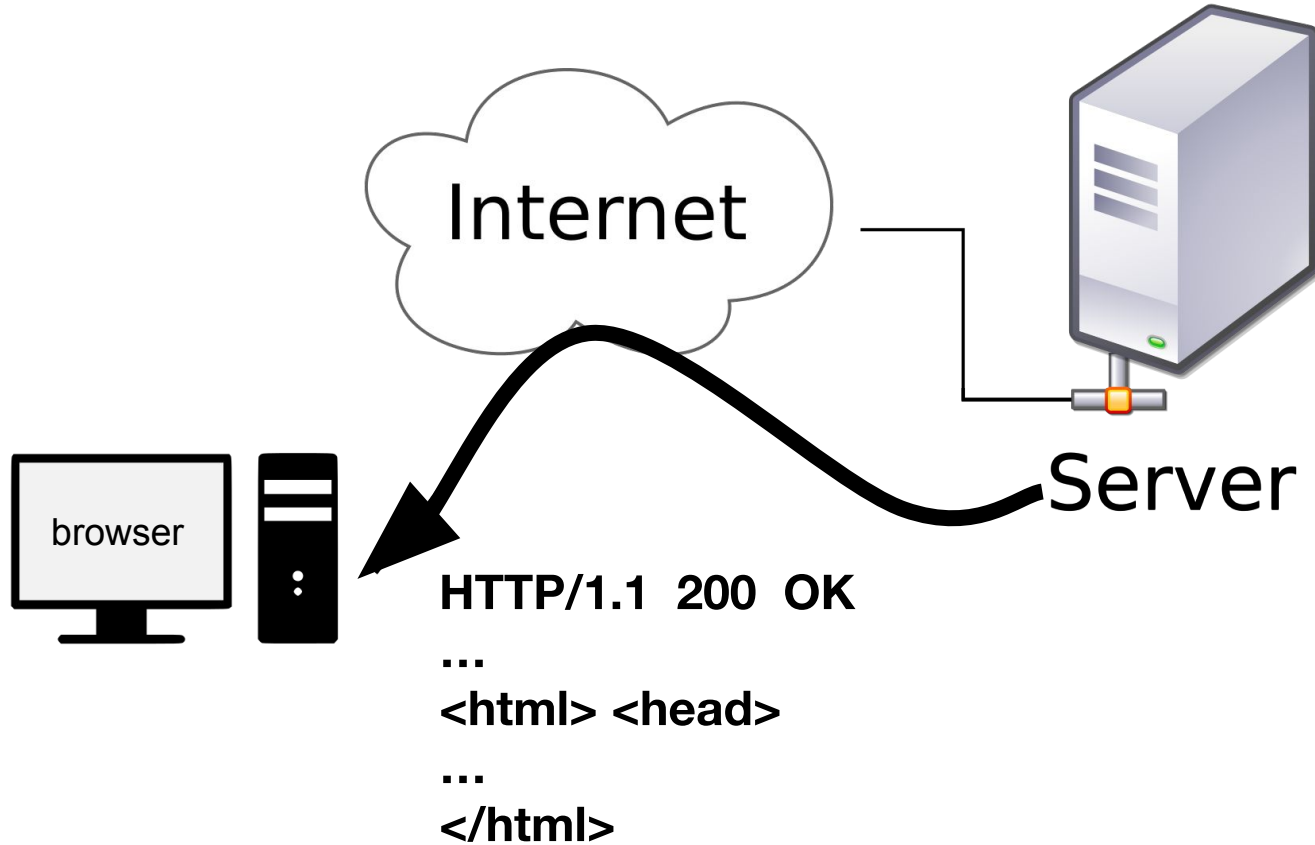
The Internet



Request



Response



Request in Processing

```
String responseText = "";

void setup() {
  size(1000, 700);
  String[] response = loadStrings("https://processing.org");
  for(int i=0; i<response.length; i++){
    responseText += response[i]+"\n";
  }
}

void draw() {
  background(0);
  fill(255);
  textSize(14);
  text(responseText, 0, 0);
}
```

Response (text to be decoded by browser)

```
<html xmlns="http://www.w3.org/1999/xhtml" xml:lang="en" lang="en">
<head>
<title>Processing.org</title>

<link rel="icon" href="/favicon.ico" type="image/x-icon" />



<meta http-equiv="Content-Type" content="text/html; charset=utf-8" />
<meta name="Author" content="Processing Foundation" />
<meta name="Publisher" content="Processing Foundation" />
<meta name="Keywords" content="Processing, Sketchbook, Programming, Coding, Code, Art, Design" />
<meta name="Description" content="Processing is a flexible software sketchbook and a language for learning how to code within the context of t
<meta name="Copyright" content="All contents copyright the Processing Foundation, Ben Fry, Casey Reas, and the MIT Media Laboratory" />




  <script src="/javascript/modernizr-2.6.2.touch.js" type="text/javascript"></script>
<link href="/css/style.css" rel="stylesheet" type="text/css" />
</head>
<body id="Cover" onload="" >

<!-- ===== PAGE ===== -->
<div id="container">
```


Not only humans interact with websites

Sometimes websites interact with other websites



Thiago

News

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CNN - 1 hour ago
(CNN) A man detained in the road rage killing of a 4-year-old girl this week in New Mexico has confessed to the shooting, authorities said.



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An Albuquerque police officer was shot multiple times and critically injured





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Bernie Sanders says he's open to legalizing marijuana use
Washington Post - 23 minutes ago







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Weather for England, UK

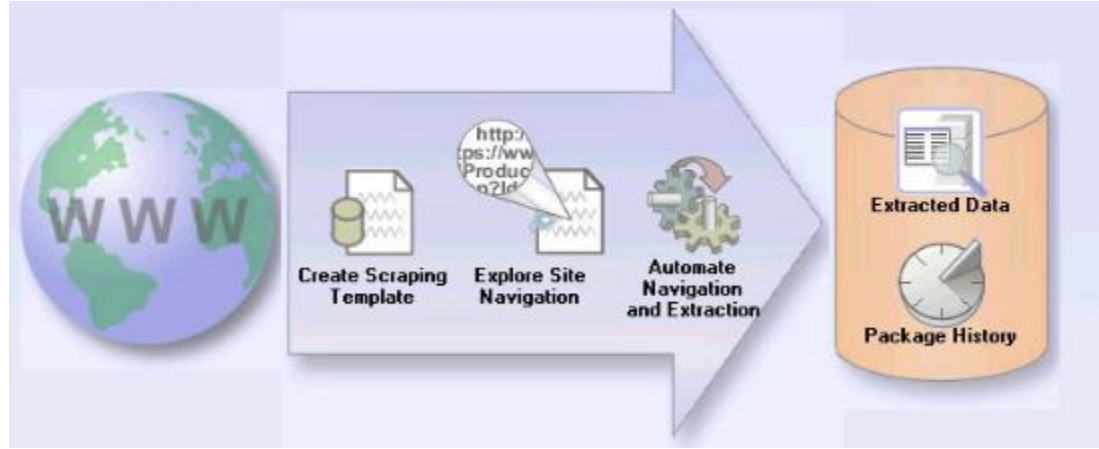
Today	Fri	Sat	Sun
			
14° 4°	14° 8°	13° 5°	13° 6°

The Weather Channel - Weather Underground - AccuWeather

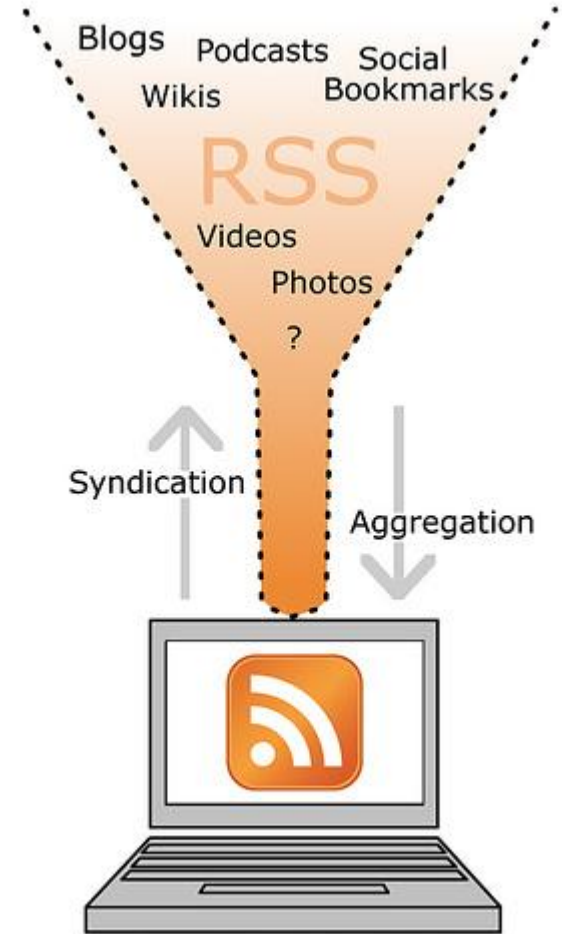
Sports scores

Today		Yesterday	
NHL			
	ARI 2 - 3 Final		NJ
	NYI 4 - 0 Final		CLS
	FLA 2 - 3 Final		PIT

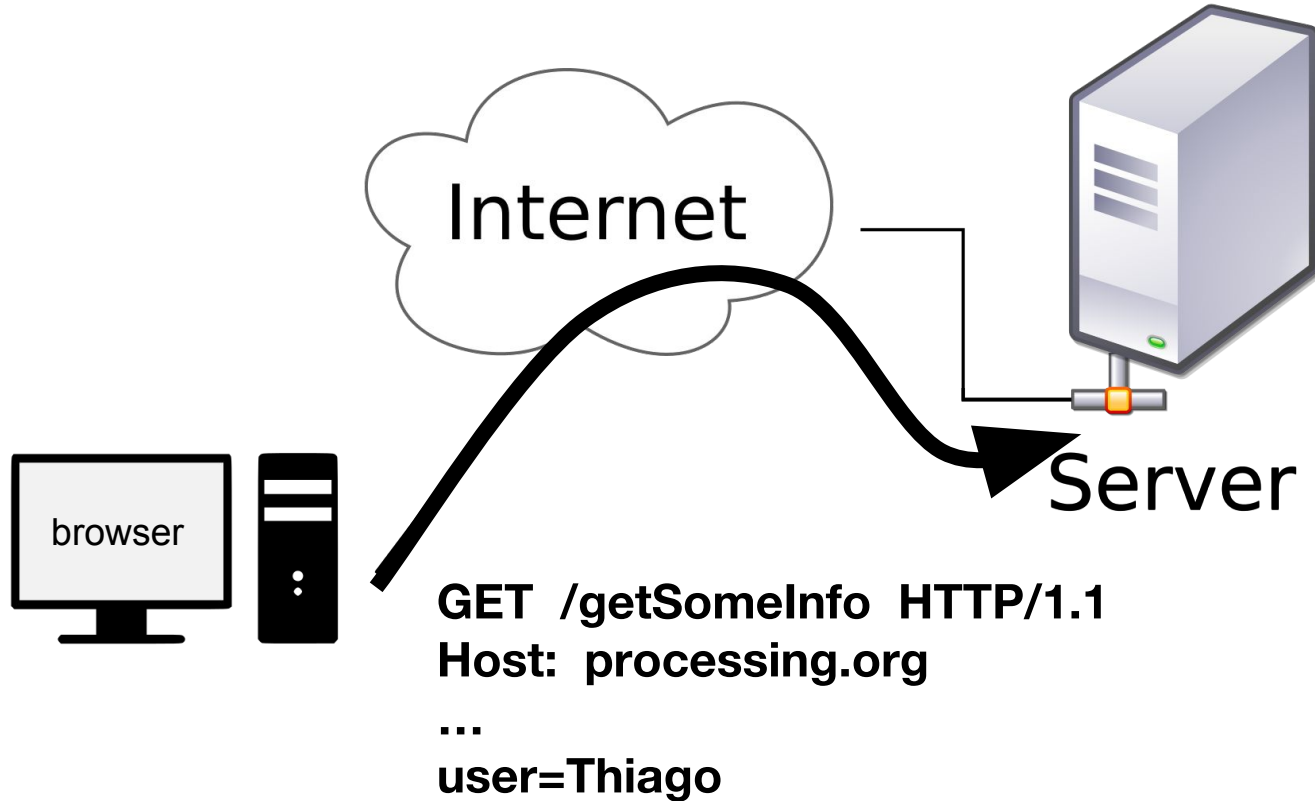
Website on Website



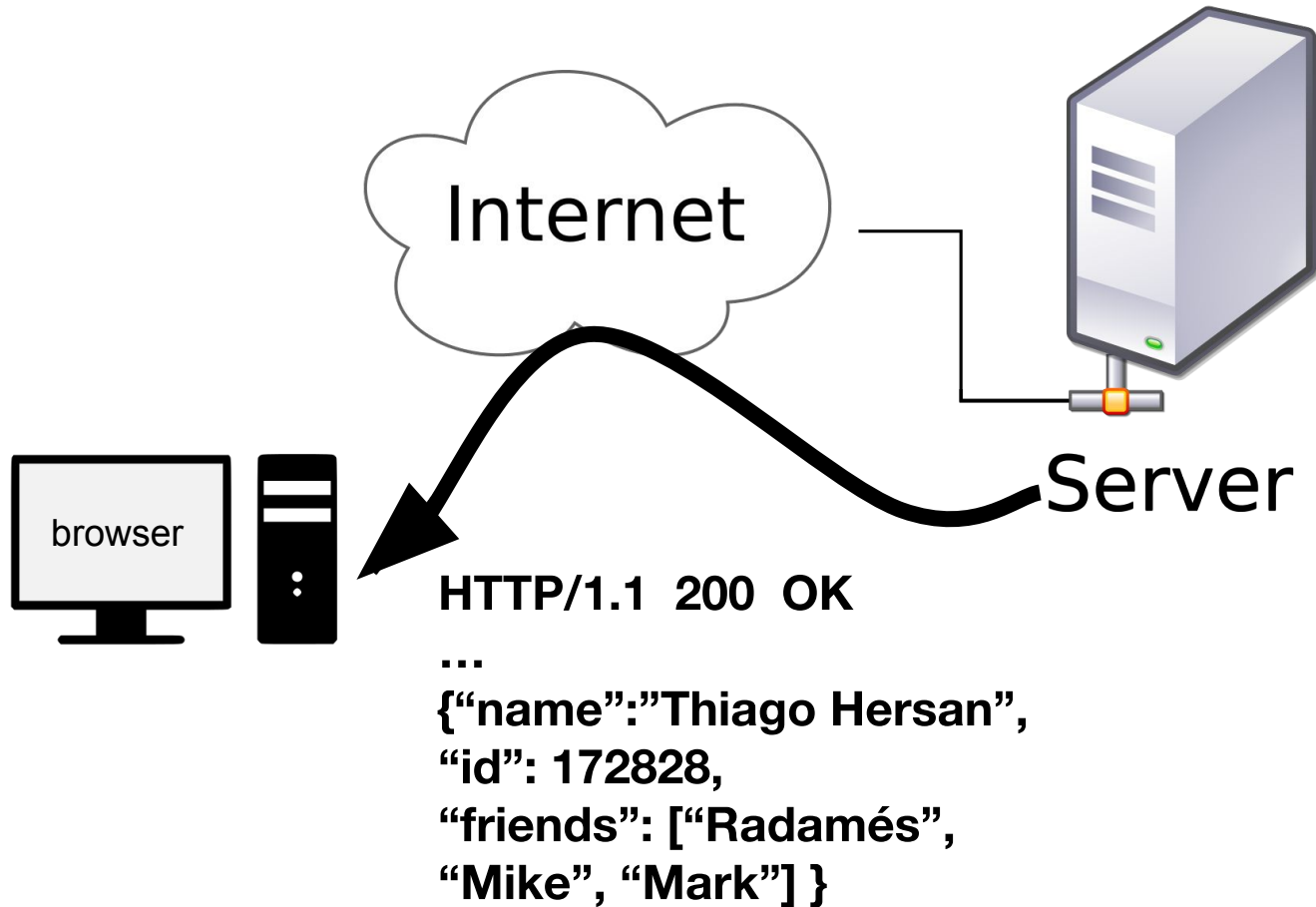
- Scraping
- RSS
- APIs



API Request



API Response (JSON)



API Response (XML)

<http://tinyurl.com/hngsapi>

<http://clients1.google.com/complete/search?hl=en&output=toolbar&q=I%20think%20I>

```
▼<toplevel>
  ▼<CompleteSuggestion>
    <suggestion data="i think i love you"/>
  </CompleteSuggestion>
  ▼<CompleteSuggestion>
    <suggestion data="i think i love my wife"/>
  </CompleteSuggestion>
  ▼<CompleteSuggestion>
    <suggestion data="i think i wanna marry you"/>
  </CompleteSuggestion>
  ▼<CompleteSuggestion>
    <suggestion data="i think i found a cheerleader"/>
  </CompleteSuggestion>
  ▼<CompleteSuggestion>
    <suggestion data="i think i can"/>
  </CompleteSuggestion>
  ▼<CompleteSuggestion>
    <suggestion data="i think i'm in love"/>
  </CompleteSuggestion>
  ▼<CompleteSuggestion>
    <suggestion data="i think i love you lyrics"/>
  </CompleteSuggestion>
```

More complicated API

```
String ACCESS_TOKEN = "CAACEdEose0cBAEalhEoiUJkTNggVEpm6tN4x7Y3lZAoMoOE";  
String USER_ID = "680143124";
```

```
JSONArray responseData;
```

```
void setup() {  
    size(500, 500);
```

```
    String request = "https://graph.facebook.com/v2.0/";  
    request += USER_ID;  
    request += "/friends?fields=name&limit=5000&offset=0&access_token=";  
    request += ACCESS_TOKEN;
```

```
    responseData = loadJSONObject(request).getJSONArray("data");
```

```
}
```


More complicated API

facebook for developers

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Graph API Explorer

Application: [?]

Graph API Explorer

Access Token:

CAACEdEose0cBAO4UIZBwWA3nJZCuygiuttLW4LUDQftZCyKp2SZA1sWVIYHvsKGLcCYZakxtSvJMNOCOGDQIf5Kg7umy

Get Token

Graph API

FQL Query



GET → /v2.5 /me?fields=id,name

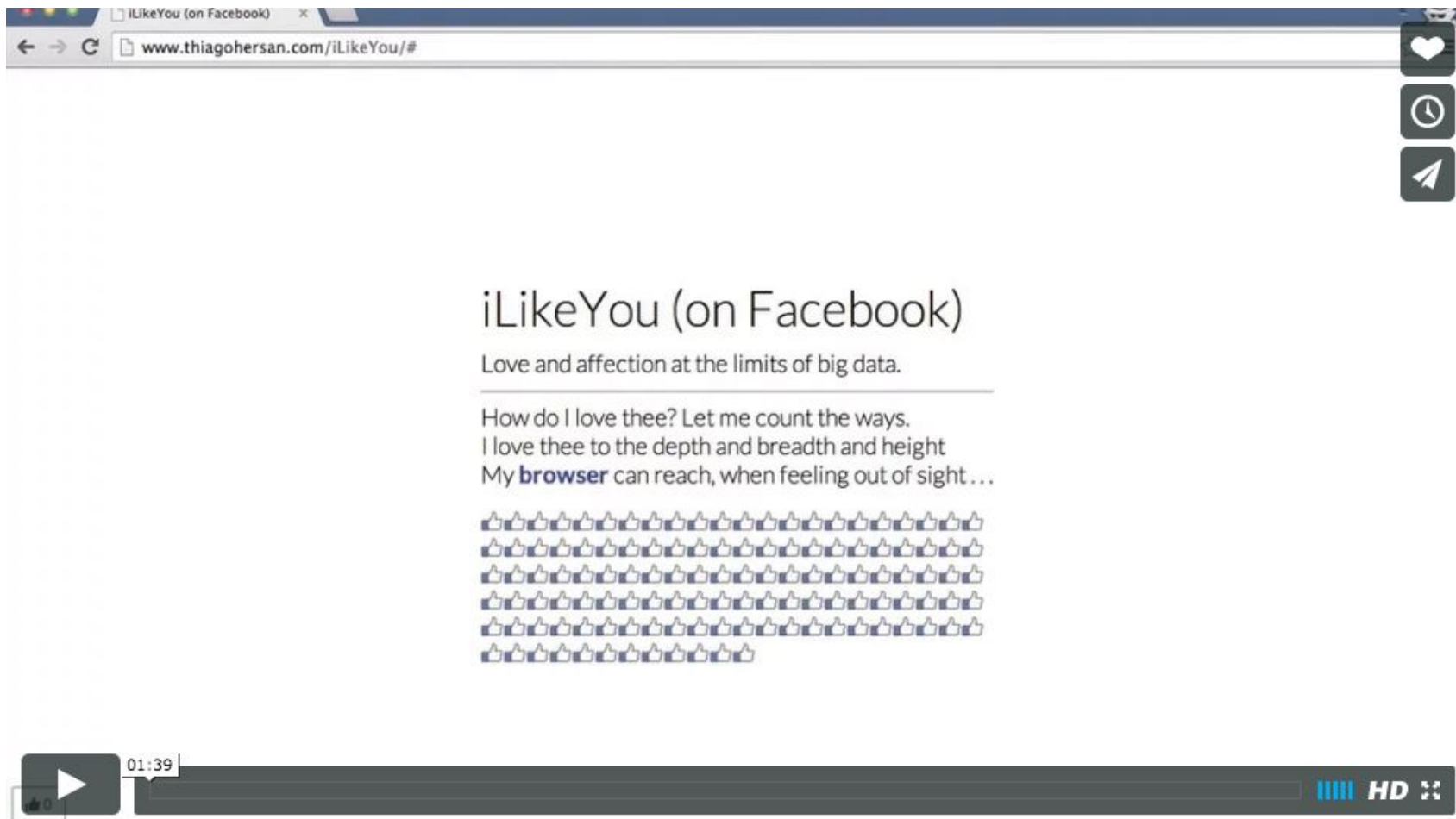


Debug Enabled

Submit

Learn more about the Graph API syntax

More complicated API



api.tumblr.com

<http://tinyurl.com/hntsapi>

http://api.tumblr.com/v2/tagged?tag=selfie&api_key=SVYcV0UUSsqF5CsuYkiNc7KSfEaRqsYuwEqtr3GYG0Owqb5lsw

```
{
  "meta": {
    "status": 200,
    "msg": "OK",
    "response": [
      {
        "blog_name": "normalsworthashot",
        "id": 131715219201,
        "post_url": "http://normalsworthashot.tumblr.com/post/131715219201/ginger",
        "slug": "ginger",
        "type": "photo",
        "date": "2015-10-23 00:08:23 GMT",
        "timestamp": 1445558903,
        "state": "published",
        "format": "html",
        "reblog_key": "HeVlU2wt",
        "tags": [
          {
            "redhead": "selfie",
            "short_url": "http://tumblr.co/ZJ3iDxIwgrhy1",
            "recommended_source": null,
            "recommended_color": null,
            "highlighted": false,
            "note_count": 0,
            "caption": "\u003Cp\u003EGinger.\u003C/p\u003E",
            "reblog": {
              "tree_html": "",
              "comment": "\u003Cp\u003EGinger.\u003C/p\u003E",
              "trail": [
                {
                  "blog": {
                    "name": "normalsworthashot",
                    "active": true,
                    "theme": {
                      "header_full_width": 640,
                      "header_full_height": 1136,
                      "header_focus_width": 532,
                      "header_focus_height": 299,
                      "avatar_shape": "square",
                      "background_color": "#B0EDFF",
                      "body_font": "Helvetica Neue",
                      "header_bounds": {
                        "x": 490,
                        "y": 590,
                        "width": 789,
                        "height": 58
                      },
                      "header_image": "http://static.tumblr.com/e26b193f766146b8d56de9240e507e9a/3ukeeyj/Akpnoks5v/tumblr_static.jpg",
                      "header_image_focused": "http://static.tumblr.com/e26b193f766146b8d56de9240e507e9a/3ukeeyj/01znoks5w/tumblr_static_focused_v3.jpg",
                      "header_image_scaled": "http://static.tumblr.com/e26b193f766146b8d56de9240e507e9a/3ukeeyj/Akpnoks5v/tumblr_static_2048_v2.jpg",
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                      "link_color": "#C0A4D2",
                      "show_avatar": true,
                      "show_description": true,
                      "show_header_image": true,
                      "show_title": true,
                      "title_color": "#444444",
                      "title_font": "Streetscript",
                      "title_font_weight": "bold"
                    }
                  },
                  "id": 131715219201,
                  "content_raw": "\u003Cp\u003EGinger.\u003C/p\u003E",
                  "content": "\u003Cp\u003EGinger.\u003C/p\u003E",
                  "is_current_item": true,
                  "is_root_item": true
                }
              ],
              "image_permalink": "http://normalsworthashot.tumblr.com/image/131715219201",
              "photos": [
                {
                  "url": "http://40.media.tumblr.com/ad52df60f8e351069adb72fd0bd0b64c/tumblr_nwnce0ojldlqjm9q5ol_1280.jpg",
                  "width": 1280,
                  "height": 1600
                },
                {
                  "url": "http://41.media.tumblr.com/ad52df60f8e351069adb72fd0bd0b64c/tumblr_nwnce0ojldlqjm9q5ol_500.jpg",
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                  "height": 625
                },
                {
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                  "width": 400,
                  "height": 500
                },
                {
                  "url": "http://40.media.tumblr.com/ad52df60f8e351069adb72fd0bd0b64c/tumblr_nwnce0ojldlqjm9q5ol_250.jpg",
                  "width": 250,
                  "height": 313
                },
                {
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                }
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                "width": 1280,
                "height": 1600
              },
              "exif": {
                "Camera": "iPhone 6",
                "ISO": 200,
                "Aperture": "f/2.2",
                "Exposure": "1/30th",
                "FocalLength": "2mm"
              }
            }
          },
          {
            "blog_name": "zlambertk",
            "id": 131715193436,
            "post_url": "http://zlambertk.tumblr.com/post/131715193436",
            "slug": "",
            "type": "photo",
            "date": "2015-10-23 00:07:55 GMT",
            "timestamp": 1445558875,
            "state": "published",
            "format": "html",
            "reblog_key": "83hSO2jc",
            "tags": [
              {
                "selfie": "selfie",
                "short_url": "http://tumblr.co/ZepCRjIwgrbfs",
                "recommended_source": null,
                "recommended_color": null,
                "highlighted": false,
                "note_count": 0,
                "caption": "",
                "reblog": {
                  "tree_html": "",
                  "comment": "",
                  "trail": [
                    {
                      "blog": {
                        "name": "zlambertk",
                        "active": true,
                        "theme": {
                          "header_full_width": 640,
                          "header_full_height": 1136,
                          "header_focus_width": 532,
                          "header_focus_height": 299,
                          "avatar_shape": "square",
                          "background_color": "#B0EDFF",
                          "body_font": "Helvetica Neue",
                          "header_bounds": {
                            "x": 490,
                            "y": 590,
                            "width": 789,
                            "height": 58
                          },
                          "header_image": "http://static.tumblr.com/e26b193f766146b8d56de9240e507e9a/3ukeeyj/Akpnoks5v/tumblr_static.jpg",
                          "header_image_focused": "http://static.tumblr.com/e26b193f766146b8d56de9240e507e9a/3ukeeyj/01znoks5w/tumblr_static_focused_v3.jpg",
                          "header_image_scaled": "http://static.tumblr.com/e26b193f766146b8d56de9240e507e9a/3ukeeyj/Akpnoks5v/tumblr_static_2048_v2.jpg",
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                          "link_color": "#C0A4D2",
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                          "show_description": true,
                          "show_header_image": true,
                          "show_title": true,
                          "title_color": "#444444",
                          "title_font": "Streetscript",
                          "title_font_weight": "bold"
                        }
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                    }
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                      "height": 500
                    },
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                      "width": 250,
                      "height": 313
                    },
                    {
                      "url": "http://40.media.tumblr.com/ad52df60f8e351069adb72fd0bd0b64c/tumblr_nwnce0ojldlqjm9q5ol_100.jpg",
                      "width": 100,
                      "height": 125
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                    {
                      "url": "http://41.media.tumblr.com/ad52df60f8e351069adb72fd0bd0b64c/tumblr_nwnce0ojldlqjm9q5ol_75sq.jpg",
                      "width": 75,
                      "height": 75
                    }
                  ],
                  "original_size": {
                    "url": "http://40.media.tumblr.com/ad52df60f8e351069adb72fd0bd0b64c/tumblr_nwnce0ojldlqjm9q5ol_1280.jpg",
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                    "height": 1600
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                    "Camera": "iPhone 6",
                    "ISO": 200,
                    "Aperture": "f/2.2",
                    "Exposure": "1/30th",
                    "FocalLength": "2mm"
                  }
                }
              ]
            }
          }
        ]
      }
    ]
  }
}
```

api.tumblr.com

```
String API_KEY = "SVYcV0UUSsgF5CsuYkiNc7KSfEaRqsYuWEgtr3GYG00wqb5lsw";
String TAG = "selfie";

int PERIOD = 1000;

String url = "http://api.tumblr.com/v2/tagged?";
url += "tag="+TAG;
url += "&api_key="+API_KEY;

long lastRequest = 0;
PImage lastSelfie;
String lastDate;

void getLatestPhoto() {
    JSONArray response = loadJSONObject(url).getJSONArray("response");
    for (int i=0; i<response.size(); i++) {
        JSONObject post = response.getJSONObject(i);
        if (post.getString("type").equals("photo")) {
            JSONObject original_size = post.getJSONArray("photos").getJSONObject(0).getJSONObject("original_size");
            lastSelfie = loadImage(original_size.getString("url"));
            lastDate = post.getString("date");
        }
    }
}
```

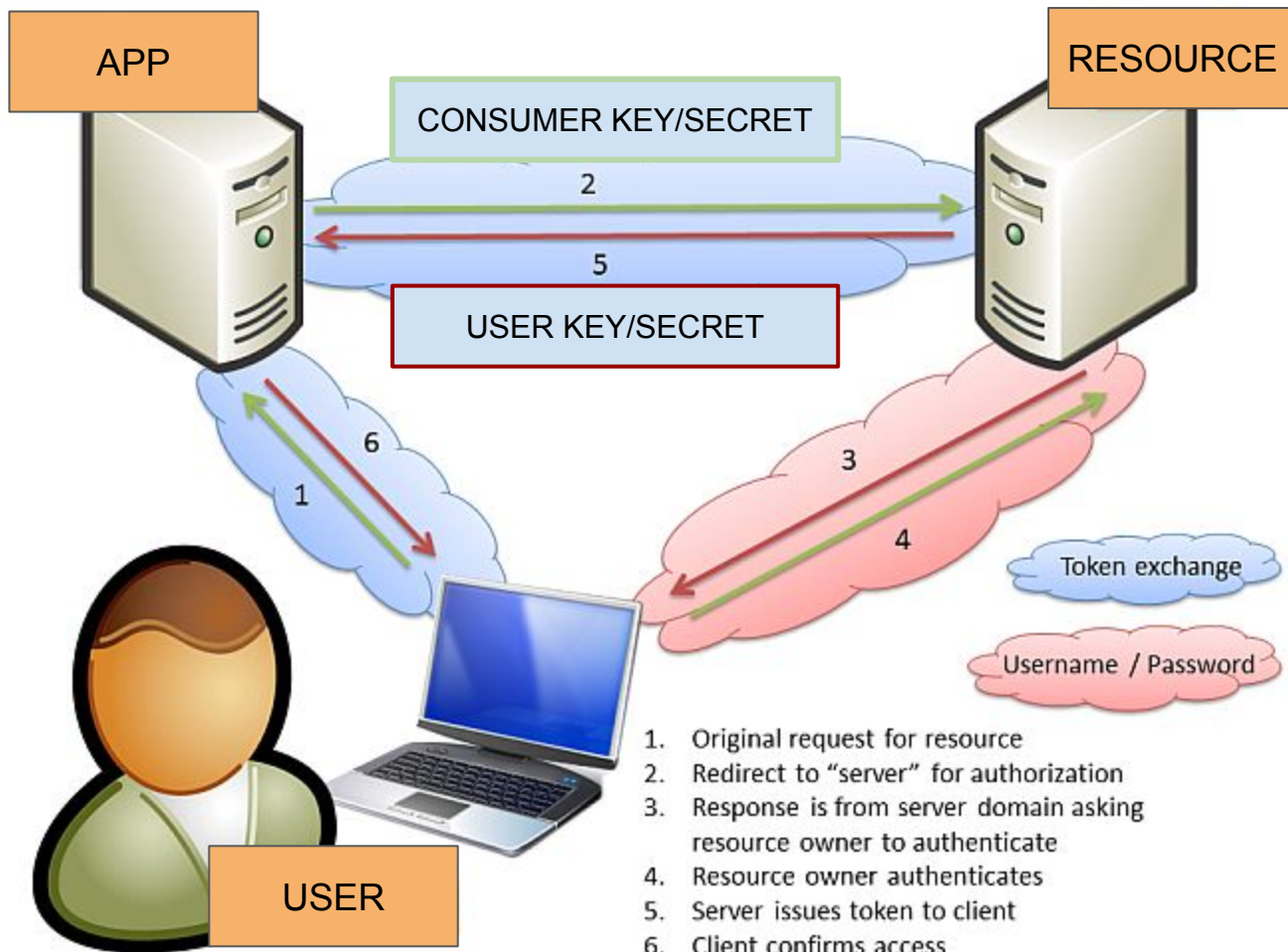

api.tumblr.com + jumblr + POST = LOLZ

```
import com.tumblr.jumblr.JumblrClient;
import com.tumblr.jumblr.types.*;
import processing.video.*;

String BLOG_NAME = "hacknights.tumblr.com";

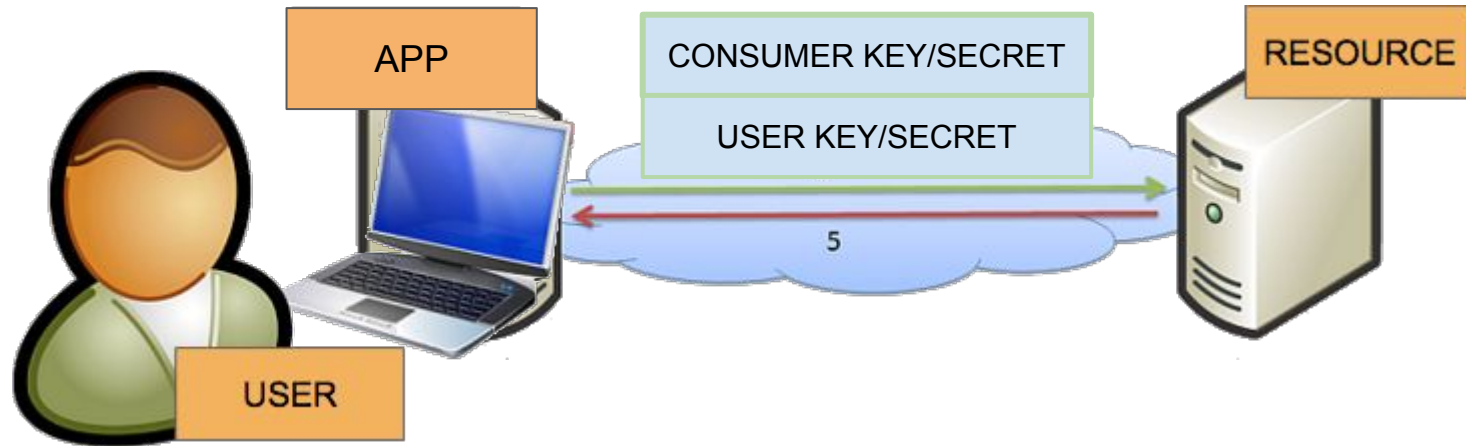
String CONSUMER_KEY = "Hf0sHk4cVf4erHSRyP20JvNJQkq9oqq0SVV4fCnXSYxsrupr81";
String CONSUMER_SECRET = "TcRolbWNwklL8JLmP1xQcoDysU7wb6rUB2aaBn27LhNFG1EdP8";
String OAUTH_TOKEN = "CtEm0vmQbcdm2TaLjXIdidWgKpAhQuFyMZv35RY7driQUv0bXM";
String OAUTH_TOKEN_SECRET = "M6S10oSRKeBQ5WeFH9ZlyRs6MDVVS90pbZmJXRdQdJBB1sUQIG";
```

But first... OAuth



1. Original request for resource
2. Redirect to "server" for authorization
3. Response is from server domain asking resource owner to authenticate
4. Resource owner authenticates
5. Server issues token to client
6. Client confirms access

But first... OAuth



api.tumblr.com + jumblr + POST = LOLZ

