ITSMAP F13 Lesson 7

Androids Communication

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Today

- Use UML diagrams
  - for overview and understanding of AFW.
- Communication (Managing connections in a later lesson)
- Work with Hand In 2-3(-4) Get your approvals
- Help setting up Systematic Columna EPJ Client

Commination Resources

- Modern mobile devices offer a number of alternatives for accessing the Internet.
- Android provides two connection techniques for Internet connectivity. **Each is offered transparently to the application layer.**
  - Mobile Internet — GPRS, EDGE, 3G, 4G, and LTE Internet access is available through carriers that offer mobile data.
  - Wi-Fi — Wi-Fi receivers and mobile hotspots are becoming increasingly common.

Communication

- HTTP Communication
  - RESTFul protocol (Representational state transfer)
- Web services
- XML and JSON
- Proprietary protocols (TCP/UDP)

“Think you a little about”
Usin communication on a Smartphone

- **Bandwidth** — Static resources such as images, layouts, and sounds can be expensive on devices with bandwidth restraints. By creating a native application, you can limit the band-width requirements to changed data only.
- **Caching** — With a browser-based solution, a patchy Internet connection can result in intermittent application availability. A native application can cache data and user actions to provide as much functionality as possible without a live connection and synchronize with the cloud when a connection is reestablished.
- **Reducing battery drain** — Each time your application opens a connection to a server, the wireless radio will be turned on (or kept on). A native application can bundle its connections, minimizing the number of connections initiated. The longer the period between network requests, the longer the wireless radio can be left off.
- **Native features** — Android devices are more than simple platforms for running a browser. They include location-based services, Notifications, widgets, camera hardware, background Services, and hardware sensors. By creating a native application, you can combine the data available online with the hardware features available on the device to provide a richer user experience.

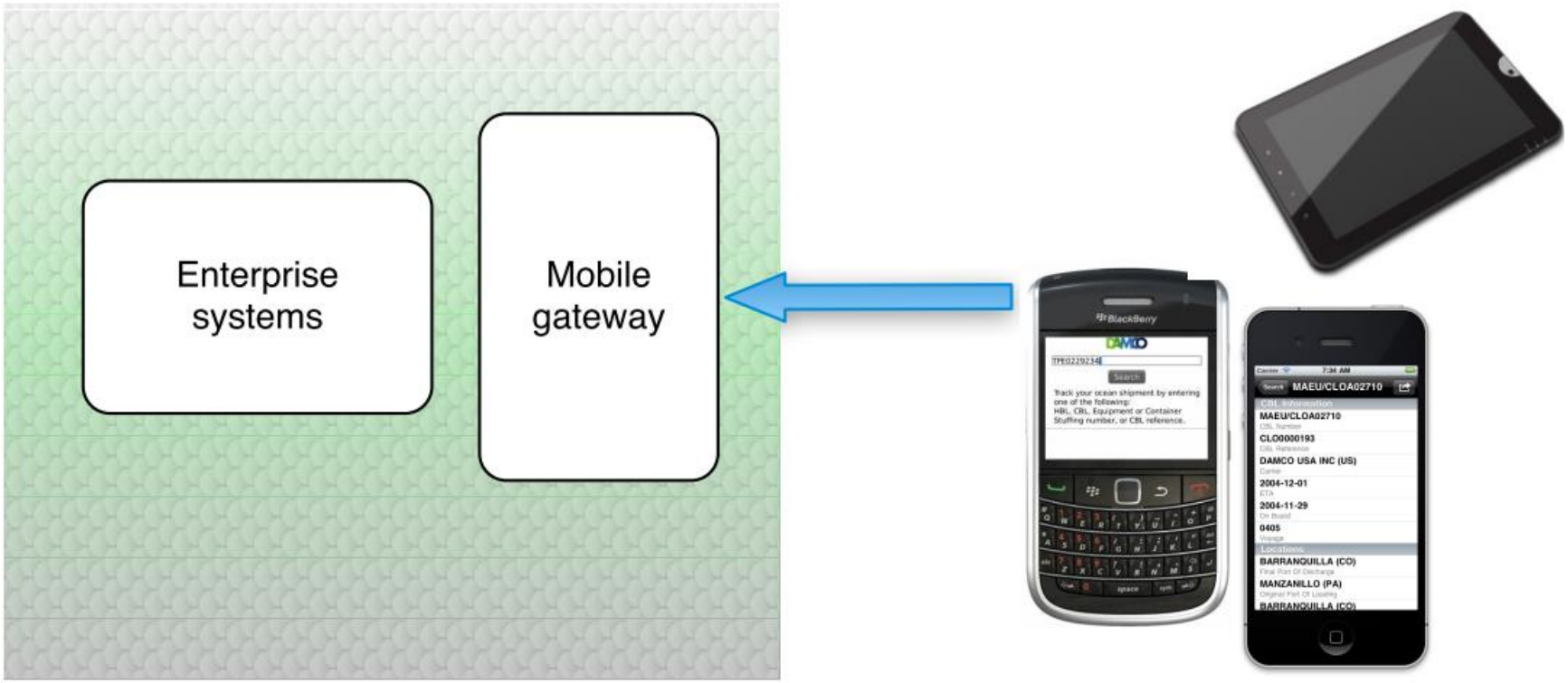
Offline? Online

Is a wireless connection available?

- You can not rely on a stable wireless connection. Simply there may be no signal or use has switch of radio
- Android has a DownloadManager allowing you to up and download resource on the Internet connection when this is available.
- For use: follow example in [MEIER] (Source code available from ITSMAP companion web site

http://developer.android.com/reference/android/app/DownloadManager.html

Principle

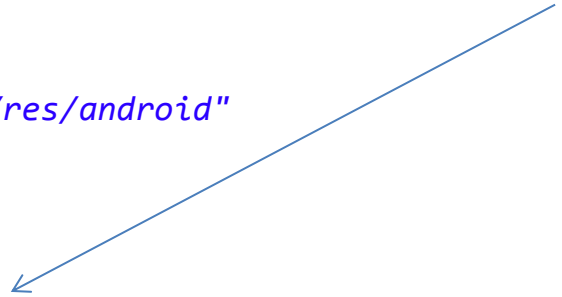

Enterprise systems
Mobile gateway
BlackBerry
DAMCO
Search
Track your ocean shipment by entering one of the following:
HBL, CBL, Equipment or Container Stuffing number, or CBL reference.
7:34 AM
Search
MAEU/CLOA02710
CBL Information
MAEU/CLOA02710
CBL Number
CLO0000193
CBL Reference
DAMCO USA INC (US)
Carrier
2004-12-01
ETA
2004-11-29
On Board
0405
Voyage
Locations
BARRANQUILLA (CO)
Final Port Of Discharge
MANZANILLO (PA)
Original Port Of Loading
BARRANQUILLA (CO)

Using the Internet Resource

Some code for communication

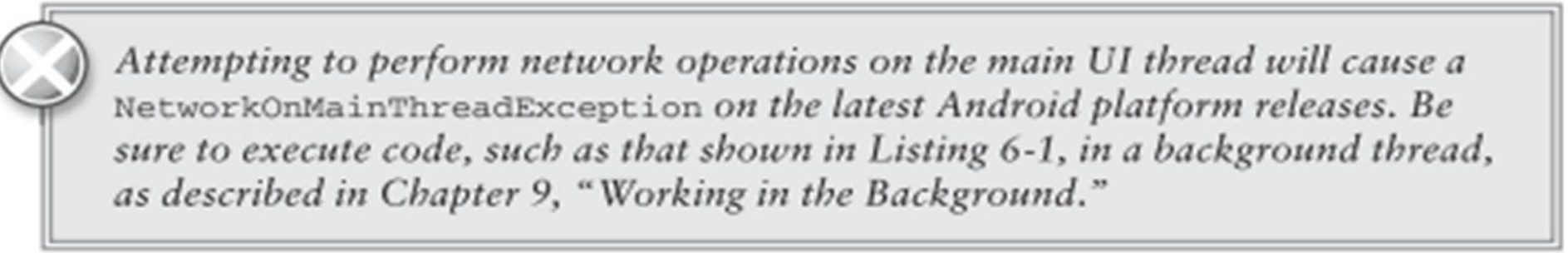
```
public class MyActivity extends Activity {

  private static final String TAG = "Chapter6_Internet";

  private void listing601() {
    /**
     * Listing 6-1: Opening an Internet data stream
     */
    String myFeed = getString(R.string.my_feed);
    try {
      URL url = new URL(myFeed);

      // Create a new HTTP URL connection
      URLConnection connection = url.openConnection();
      HttpURLConnection httpConnection = (HttpURLConnection)connection;

      int responseCode = httpConnection.getResponseCode();
      if (responseCode == HttpURLConnection.HTTP_OK) {
        InputStream in = httpConnection.getInputStream();
        processStream(in);
      }
    }
    catch (MalformedURLException e) {
      Log.d(TAG, "Malformed URL Exception.", e);
    }
    catch (IOException e) {
      Log.d(TAG, "IO Exception.", e);
    }
  }
```

Permissions



```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
  package="com.paad.internet"
  android:versionCode="1"
  android:versionName="1.0" >

  <uses-permission android:name="android.permission.INTERNET"/>

  <application
    android:icon="@drawable/ic_launcher"
    android:label="@string/app_name" >
    <activity
      android:name=".MyActivity"
      android:label="@string/app_name" >
      <intent-filter>
        <action android:name="android.intent.action.MAIN" />
        <category android:name="android.intent.category.LAUNCHER" />
      </intent-filter>
    </activity>
  </application>

</manifest>
```

Foreground – Background
<-API L10 <|>API L11->



- For a very time limited communication use a background AsyncTask or a plain Thread (if View resources is not accessed) in an Activity
- Otherwise put background task into a Service

http://www.vogella.com/blog/2012/02/22/android-strictmode-networkonmainthreadexception/
http://developer.android.com/reference/android/os/NetworkOnMainThreadException.html

We Love Wind (Beta)

FORECASTS SPOTS FOR MOBILE DEVICES ABOUT

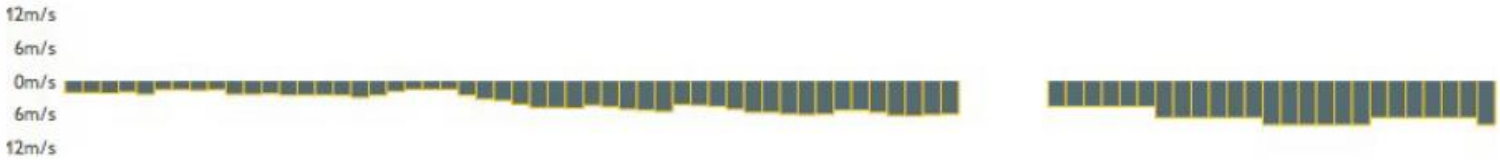
Spots and Forecasts Map

Show weather symbols ☐ Show observations ☑

lon, 6:00 | Mon, 12:00 | Mon, 18:00 | Tue, 00:00 | Tue, 06:00 | Tue, 12:00 | Tue, 18:00 | Wed, 00:00 | Wed, 06:00 | Wed, 12:00

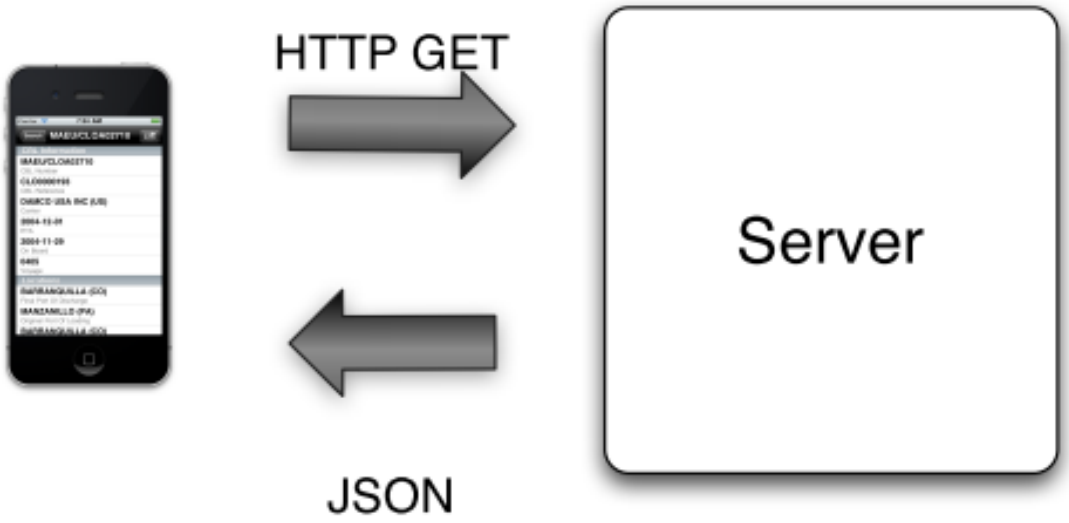
Alrø

Forecast Calculated: Sun, 08:02, Estimated Update: Sun, 21:00

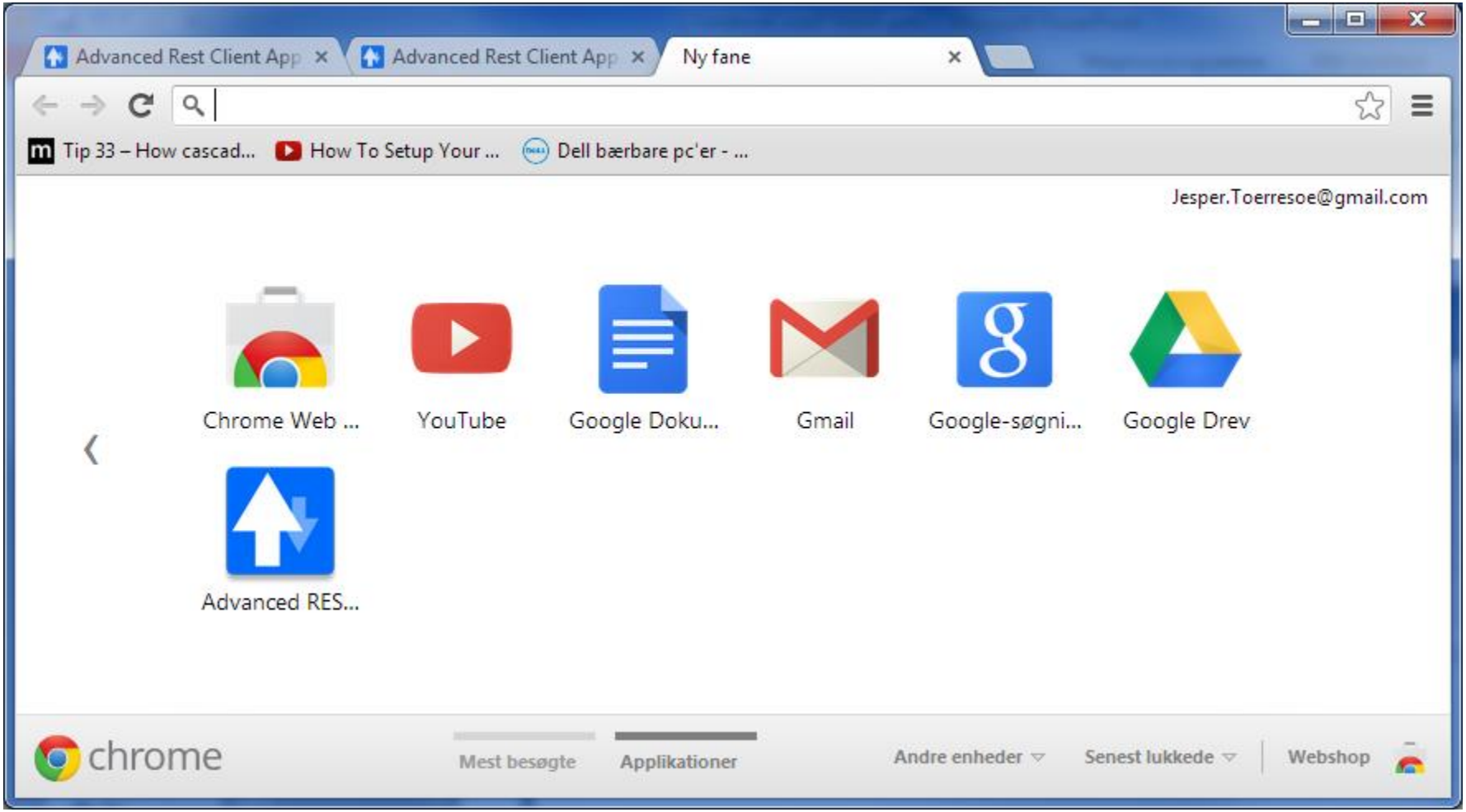


API

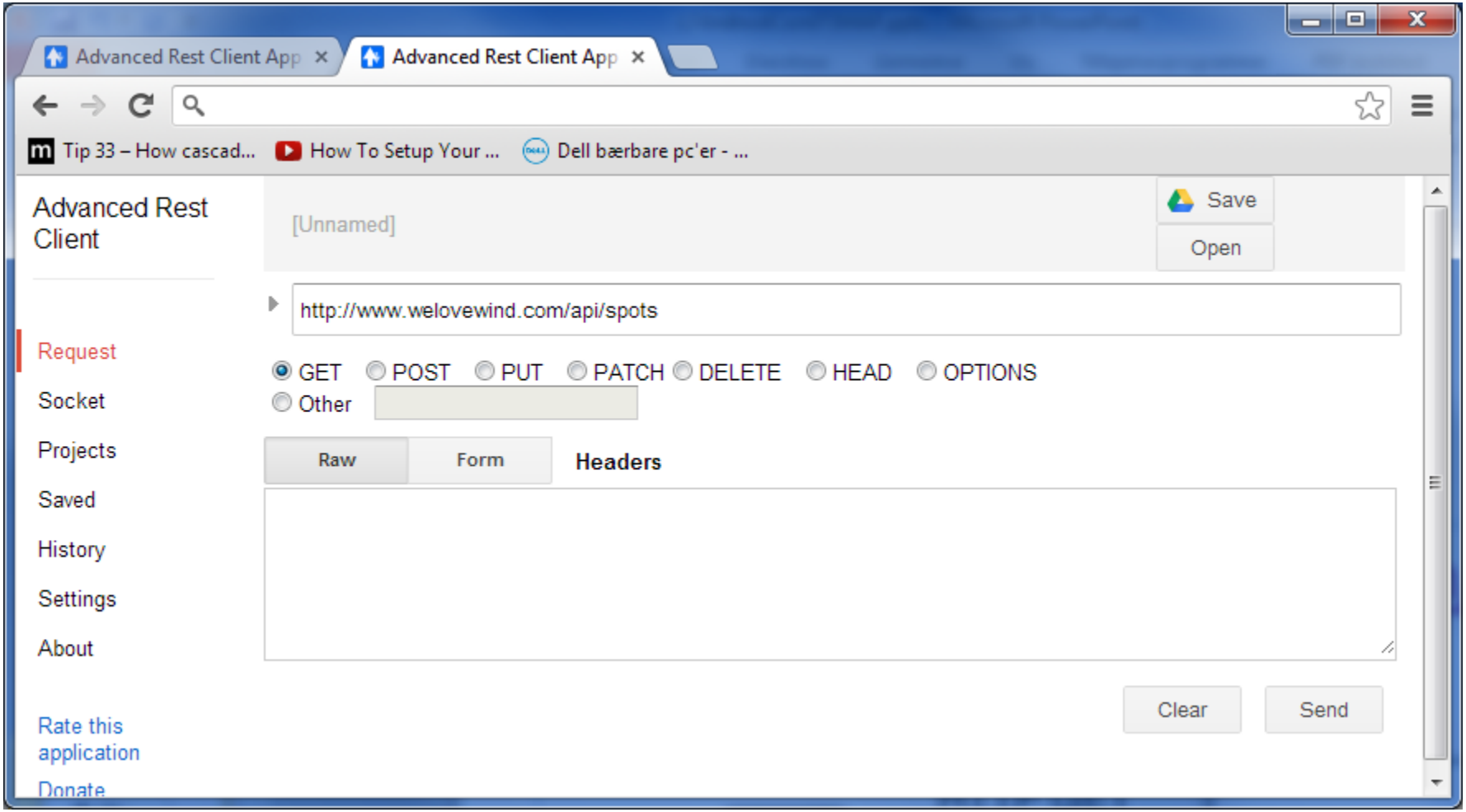
- http://www.welovewind.com/api/spots



Google Chrome Advanced REST Client



Google Chrome Advanced REST Client



Google Chrome Advanced REST Client

```
{
   "items":[
      {
         "name":"Tempo Wind Clube",
         "weather_stations":[
            "/api/weather_stations/br/SBSP/"
         ],
         "lon":-46.731119155883789,
         "uri":"/api/spots/br/tempo_wind_clube/",
         "forecast_point":"/api/forecast_points/-23.7022,-46.7311/",
         "country_code":"br",
         "lat":-23.702214589312561,
         "wind_diagram":{
            "E":"YES",
            "NE":"YES",
            "N":"YES",
            "S":"YES",
            "SE":"YES",
            "NW":"YES"
         }
      },
      {
         "name":"Praia do Pepe",
         "weather_stations":[
            "/api/weather_stations/br/SBJR/",
            "/api/weather_stations/br/SBAF/"
         ],
         "lon":-43.306303024291992,
         "uri":"/api/spots/br/praia_do_pepe/",
         "forecast_point":"/api/forecast_points/-23.0161,-43.3063/",
         "country_code":"br",
         "lat":-23.016066390570344,
         "wind_diagram":{
            "SW":"YES",
            "S":"YES",
            "E":"YES",
            "SE":"YES"
```

```
{
   "calculation_time":"2011-11-20T07:02:22",
   "next_run_time":"2011-11-20T20:00:00",
   "lat":-23.702200000000001,
   "lon":-46.731099999999998,
   "uri":"/api/forecast_points/-23.7022,-46.7311/",
   "forecasts":[
      {
         "direction":"54.4",
         "span":3,
         "temp":"17.7",
         "symbol":"3_night",
         "time":"2011-11-21T06:00:00",
         "speed":"1.7"
      },
      {
         "direction":"21.4",
         "span":3,
         "temp":"18.8",
         "symbol":"1_night",
         "time":"2011-11-21T09:00:00",
         "speed":"2.3"
      },
      {
         "direction":"6.5",
         "span":3,
         "temp":"26.2",
         "symbol":"3",
         "time":"2011-11-21T12:00:00",
         "speed":"3.4"
      }
```

JSON vs. XML

```
<sometitle>ITSMAP</sometitle>
<coursenumber>1212</coursenumber>
```

```
{
sometitle: ITSMAP
coursenumber: 1212
}
```

http://stog.itog.dk/itog/action/list/format/json

DSB S-tog for iPhone and Android

Hand In 4 View

- Here is the Users View for Hand In 4 App
  - ListView,
  - the filter text field
  - and the getdata button