



Adding “Where” to Mobile and Web Applications

me

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Skyhook Wireless / Loki

<http://loki.com>

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**practical tools to
allow you to add
location capabilities
to your website or app
today**

sarver.org for links
after session

location = context

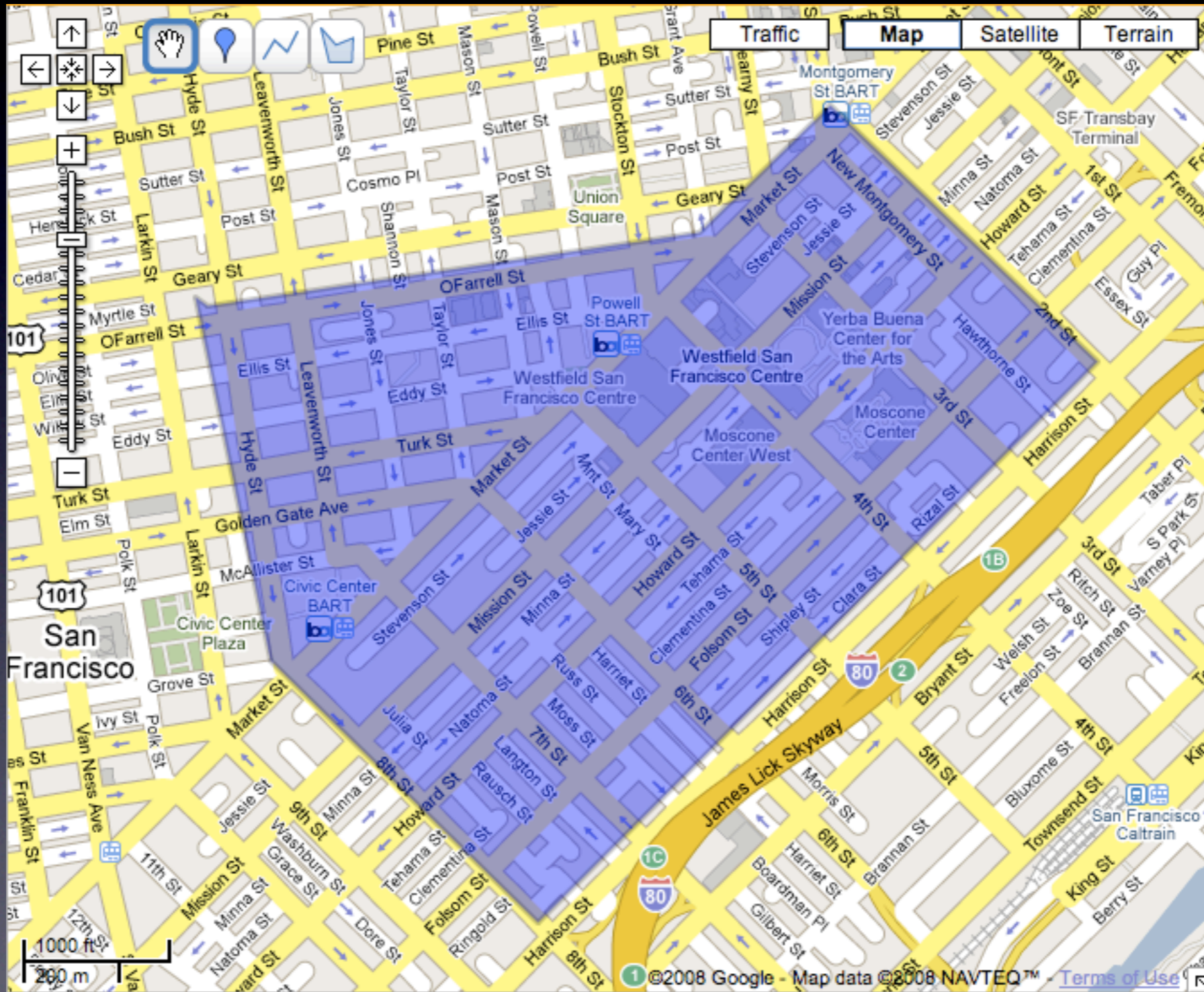
context = higher
relevancy

location = higher
relevancy

location comes in many
flavors

42.2817, -71.18279

Polygons



747 Howard St
San Francisco, CA

Howard St & 3rd St

South of Market

how you display it can
be used as a way of
blurring location

markers in maps can be
difficult when dealing
with exposed location

**Ryan checked into
Soma, San
Francisco, CA**

Sharing Location with Friends

<http://my.loki.com>

 Ryan checked into San Francisco, CA using Loki.

Where am I?



San Francisco, CA



Get your own map badge...



Subscribe to my Location Feed



Subscribe to my Entries Feed



Subscribe to my Entries Feed

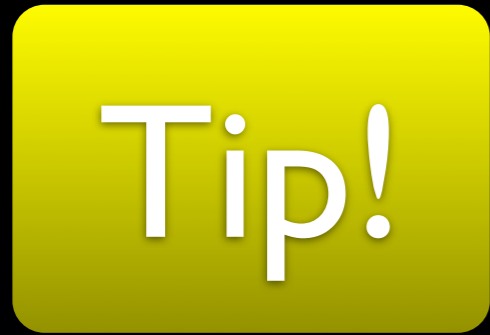


Subscribe to my Location Feed

Geotargeting Rules of Thumb

1. Offer everything you can
2. Degrade gracefully
3. Allow the user to change it

Know your users, know your use cases!



`yoursite.com ?lat=&lng=`

**where does
location happen?**

client & network

Mobile

Web
Apps

Laptop

*many locations in,
one location out*

asynchronous

Mobile

Web
Apps




Laptop



My Location:

[Where Am I?](#) | [My Applications](#) | [My Privacy](#) | [My Alerts](#)

These are the applications you have authorized to *update* or *use* your location information. On this page you can change what these applications are allowed to do on your behalf.

Application:	What can it do?	Recent Activity:
API Explorer	Can read your location at the exact level Can set your location Edit settings 	No Updates
Dopplr	Can read your location at the exact level Can set your location Edit settings 	Update about 9 hours ago
Fire Widgets	Can read your location at the exact level Can set your location Edit settings 	Update 14 days ago

FireEagle Pseudo

```
<?php
$fe = new FireEagle(  $fe_key, $fe_secret,
                     $_SESSION['access_token'],
                     $_SESSION['access_secret']);

$r = $fe->update(array('q' => 'san francisco, ca'));

$loc = $fe->user();
foreach ($loc->user->location_hierarchy as $location) {
    echo $location->latitude.", ".$location->longititude;
}
?>
```

Desktop Web Profile

- **Stationary sessions**
single location lookups
- **Indoors**
GPS and Cell Tower don't work
- **Easier data entry**
- **More complex data can be displayed**

Mobile Profile

- **Transient sessions**
single location and continuous
- **Indoors and Outdoors**
IP doesn't work
- **Difficult data entry**
minimize the amount typed
- **Small screen size, low computing power, be “power-aware”**

Geolocation Methods

1. Triangulate
2. Associate
3. Geo Term Extraction
4. Data Entry / Geocoding

Triangulation

Determine position of an unknown object relative to known objects

- Wi-Fi
- GPS
- Cell Tower

GPS

1 meter

Wi-Fi

20 meter

Cell Tower

2,000 meter

San Francisco Wi-Fi



Wi-Fi

Loki Javascript API

<http://loki.com/developers>

<http://loki.com/developers/documentation>

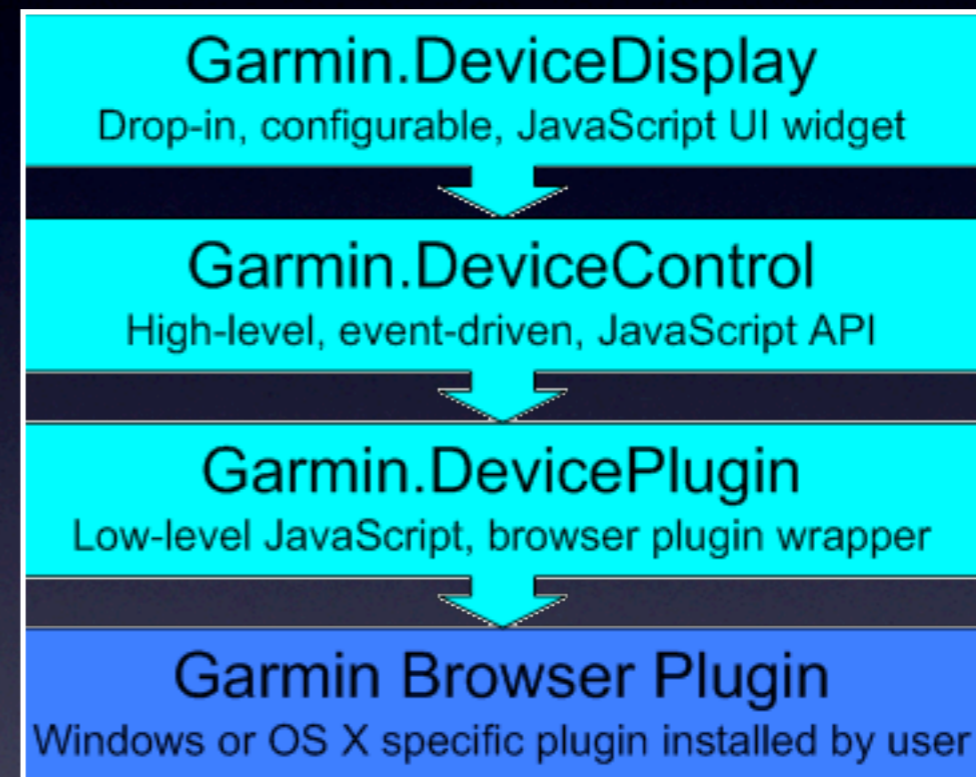
```
function load()
{
    var loki = LokiAPI();
    if (loki) {
        loki.onSuccess = function(location) {alert(location.latitude+',
'+location.longitude)}
        loki.onFailure = function(error) {alert(error)}
        loki.setKey('[your_key_here]');
        loki.requestLocation(true,loki.NO_STREET_ADDRESS_LOOKUP);
    }
}
```

GPS (sideload)

Garmin Communicator Plugin

[http://www.garmin.com/
products/communicator/](http://www.garmin.com/products/communicator/)

[http://developer.garmin.com/
web-device/garmin-
communicator-plugin/](http://developer.garmin.com/web-device/garmin-communicator-plugin/)



Association

Association

- Match an IP Address to a physical location
- Not an exact science
- Best for city-level geotargeting
- False positives and in the correct state only ~85%

IP Geolocation

Quova

<http://www.quova.com>

ip2location

<http://www.ip2location.com>

MaxMind

<http://www.maxmind.com>

Geo Term Extraction

Resolve an arbitrary string into a geographical point or area:

“food in cambridge” = “food” in “Cambridge, Massachusetts, USA”

MetaCarta Query Parser API

<http://ondemand.metacarta.com/?method=QueryParser>

Urban Mapping GeoMods

<http://urbanmapping.com/geomods/index.html>

Geocoding

Resolve a geographically-based string into a geographical point or area

750 Tremont st, boston, Ma all countries

[search](#) [show on map](#) [\[advanced search\]](#)

no records found in geonames database, showing yahoo geocoder first result

1 records found for "750 Tremont st, boston, Ma"

Name	Country	Feature class	Latitude	Longitude
1 750 Tremont St 02118-1105 Boston	United States , Massachusetts		N 42° 20' 23"	W 71° 4' 44"

Geocoding

- **Geonames Webservice**

<http://www.geonames.org/export/>

- **Google Geocoder Class**

<http://code.google.com/apis/maps/documentation/services.html#Geocoding>

- **Yahoo Geocoding API**

<http://developer.yahoo.com/maps/rest/V1/geocode.html>

- **Geocoder.us**

<http://geocoder.us/>

Location in the Browser

navigator.geolocation()

- **LocationAware.org**

Session at Where 2.0

<http://www.locationaware.org>

- **W3C Web API**

<http://www.w3.org/2006/webapi/>

Mobile Location

Mobile Location APIs

- **iPhone Core Location API**
Wi-Fi, Cell Tower
- **Symbian S60 Location API**
GPS, A-GPS
- **J2ME JSR-179**
GPS, device-specific

@implementation MyLocationGetter

- (void)startUpdates

```
{  
    if (nil == locationManager)  
        locationManager = [[CLLocationManager alloc] init];  
  
    locationManager.delegate = self;  
    locationManager.distanceFilter = 1000; // 1 kilometer  
    locationManager.desiredAccuracy =  
kCLLocationAccuracyKilometer;  
    [locationManager startUpdatingLocation];  
}
```

```
- (void)locationManager:(CLLocationManager *)manager
  didUpdateToLocation:(CLLocation *)newLocation
  fromLocation:(CLLocation *)oldLocation
{
  // Disable future updates to save power.
  [manager stopUpdatingLocation];

  printf("latitude %+06.6f, longitude %+06.6f\n",
        newLocation.coordinate.latitude,
        newLocation.coordinate.longitude);
}
```

<http://forums.macrumors.com/showthread.php?t=455767>

Other APIs / Platforms

- **Skyhook SDK**
WinMo, S60, Linux, XP, Vista, OSX
[http://www.skyhookwireless.com/
developers](http://www.skyhookwireless.com/developers)
- **WHERE Widgets**
AT&T, Sprint, Alltel, MetroPCS
<http://developer.where.com/>

Skyhook Example

```
int main(int argc, char *argv[])
{
    WPS_SimpleAuthentication authentication;
    authentication.username = argv[1];
    authentication.realm = argv[2];

    WPS_Location* location;
    int rc = WPS_location(&authentication,
                        WPS_NO_STREET_ADDRESS_LOOKUP,
                        &location);

    if (rc == WPS_OK)
        printf("%f, %f\n", location->latitude, location->longitude);

    WPS_free_location(location);

    return 0;
}
```

Cell Tower

- **Zone Tag (yahoo)**
<http://developer.yahoo.com/yrb/zonetag/>
- **OpenCellID**
<http://www.opencellid.org>
- **CellDB**
<http://celldb.org/>

Upcoming Events

- **Where 2.0**
Burlingame, CA
May 12th - 14th
- **WhereCamp**
Mountain View, CA
May 17th - 18th

Questions?