

Mobile Data: How to avoid the latency trap when using web services

Tom Hughes-Croucher

@sh1mmer

YAHOO! DEVELOPER NETWORK

What is the latency trap?

Mobile

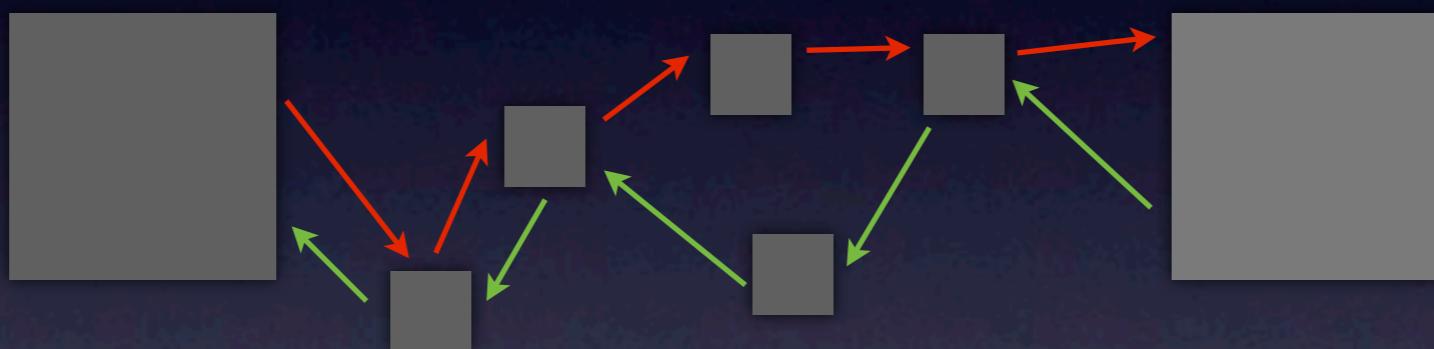
Web Service

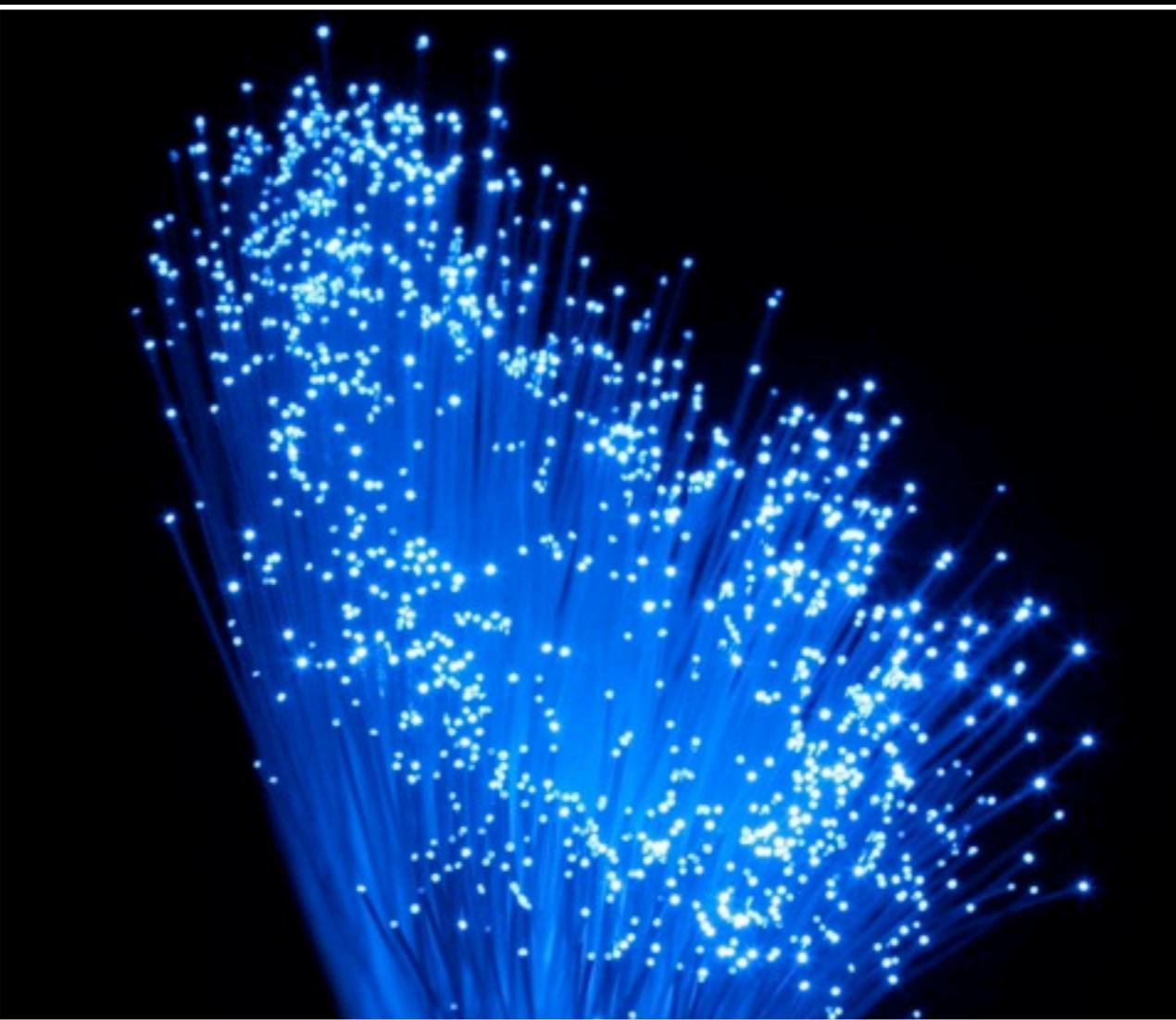
My Server



My Server

Web Service





Optical Fibre

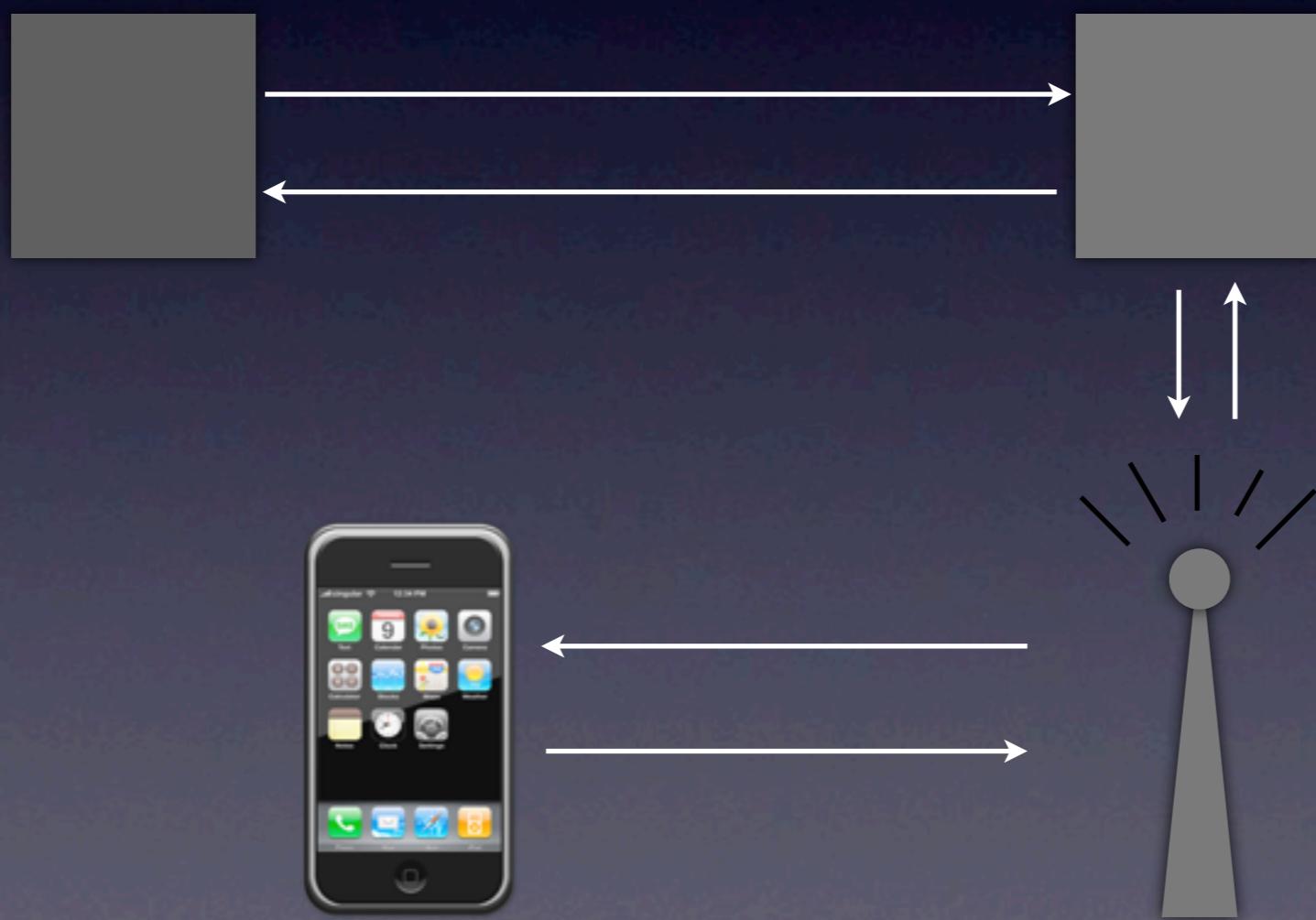
Web Service

AT&T



Web Service

AT&T

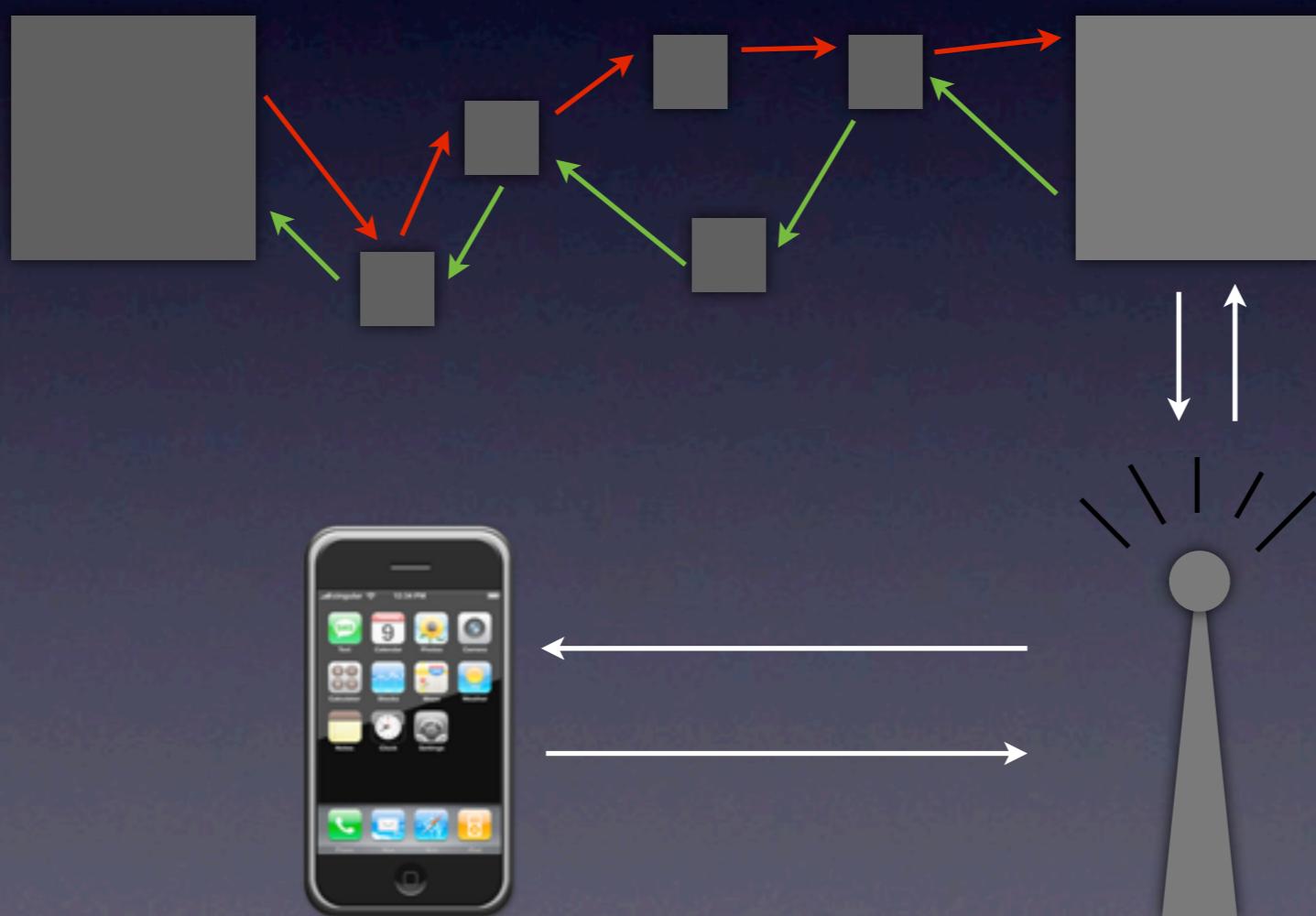




Radio Waves

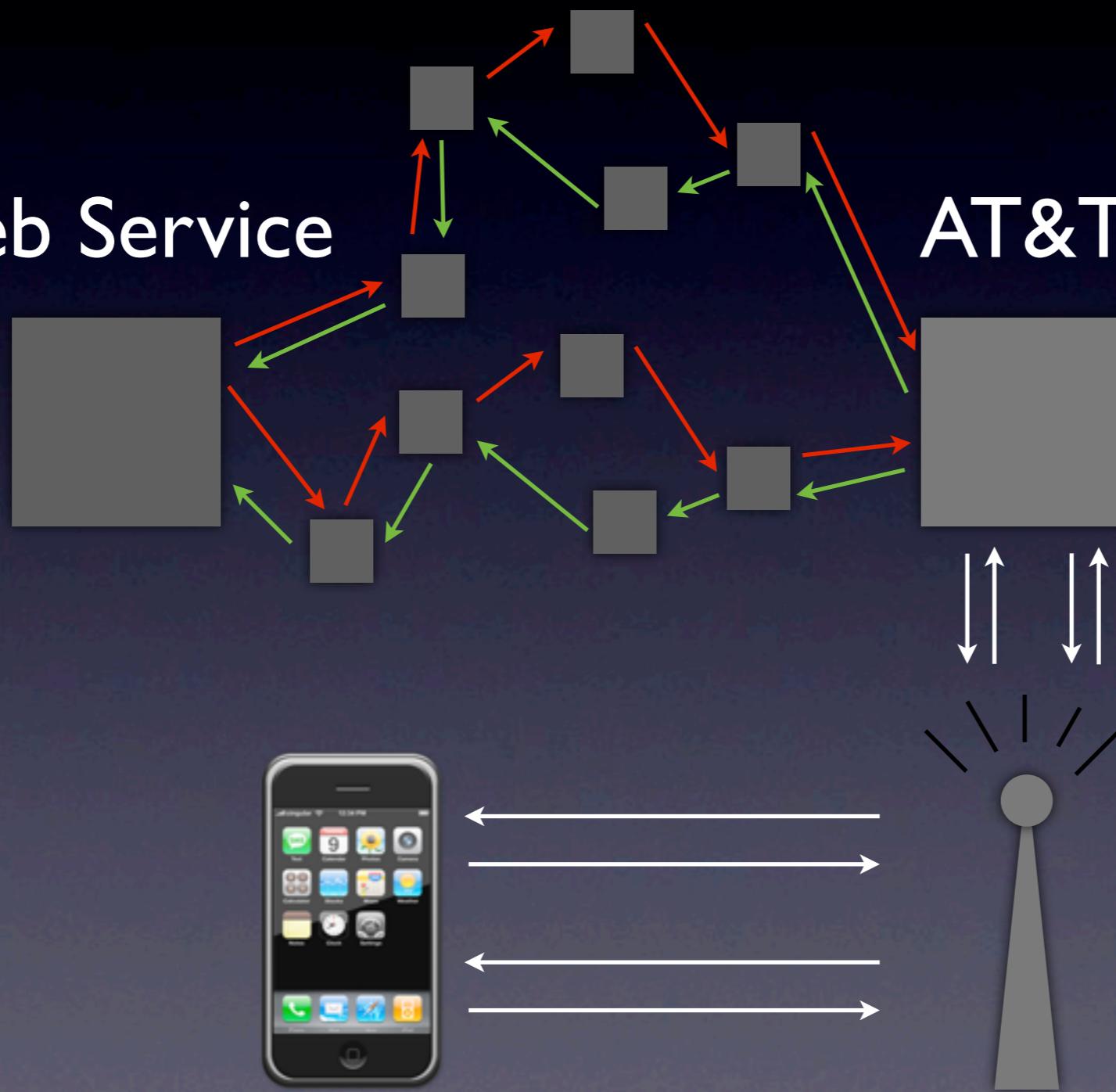
Web Service

AT&T

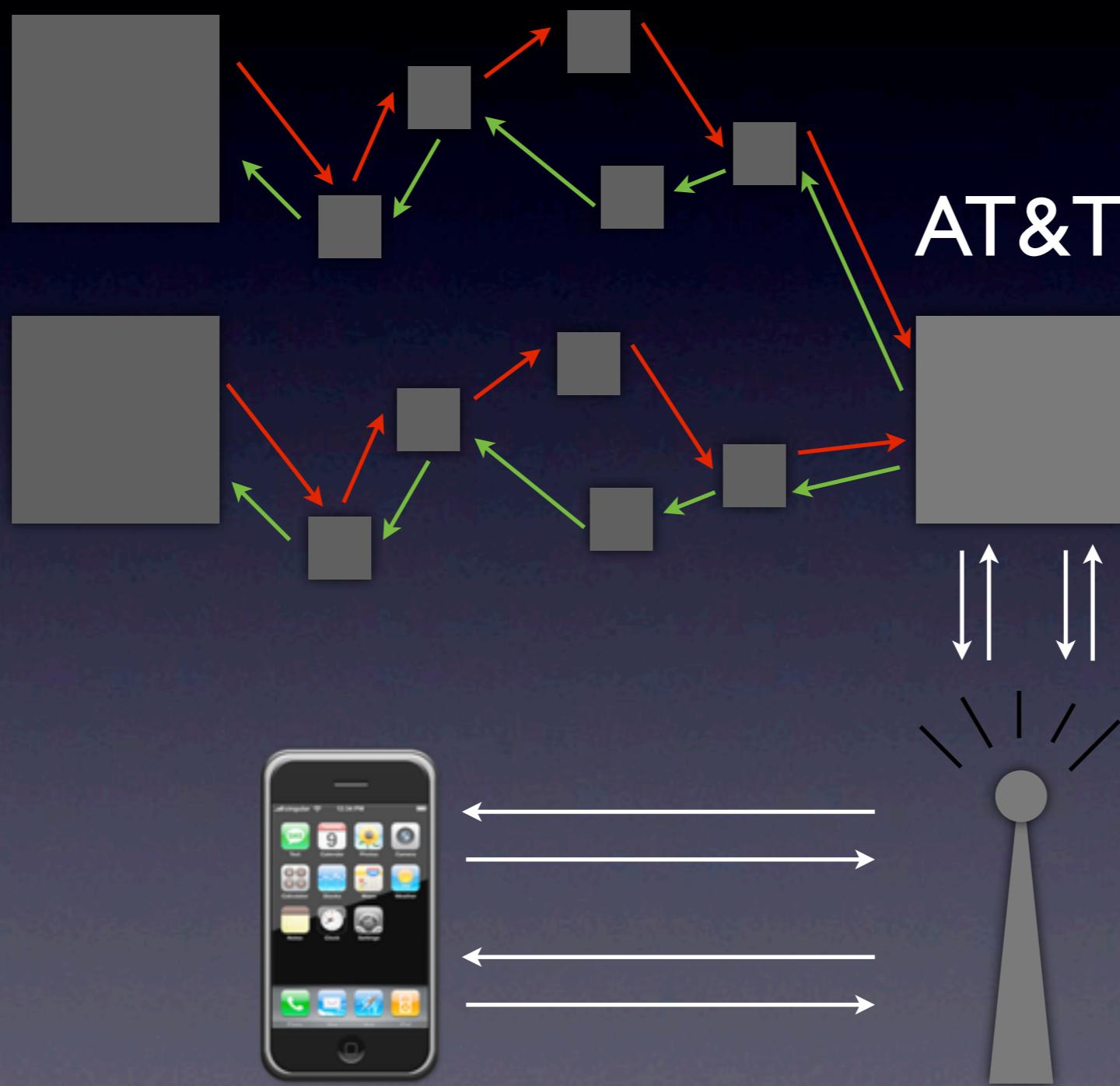


Web Service

AT&T



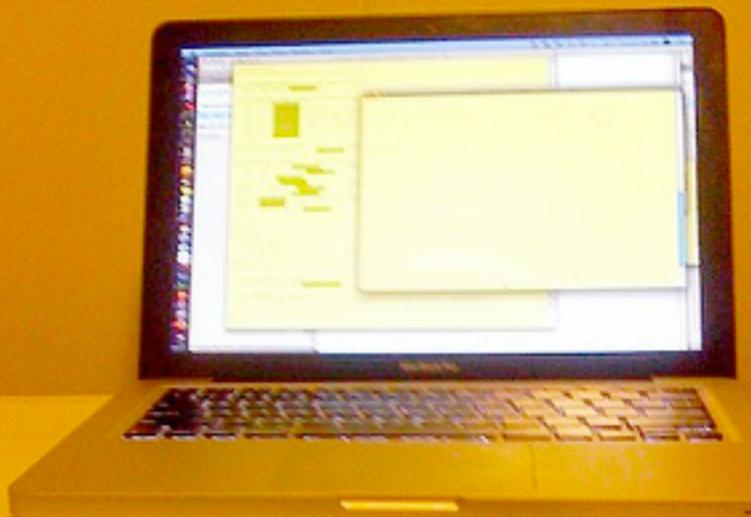
Web Services





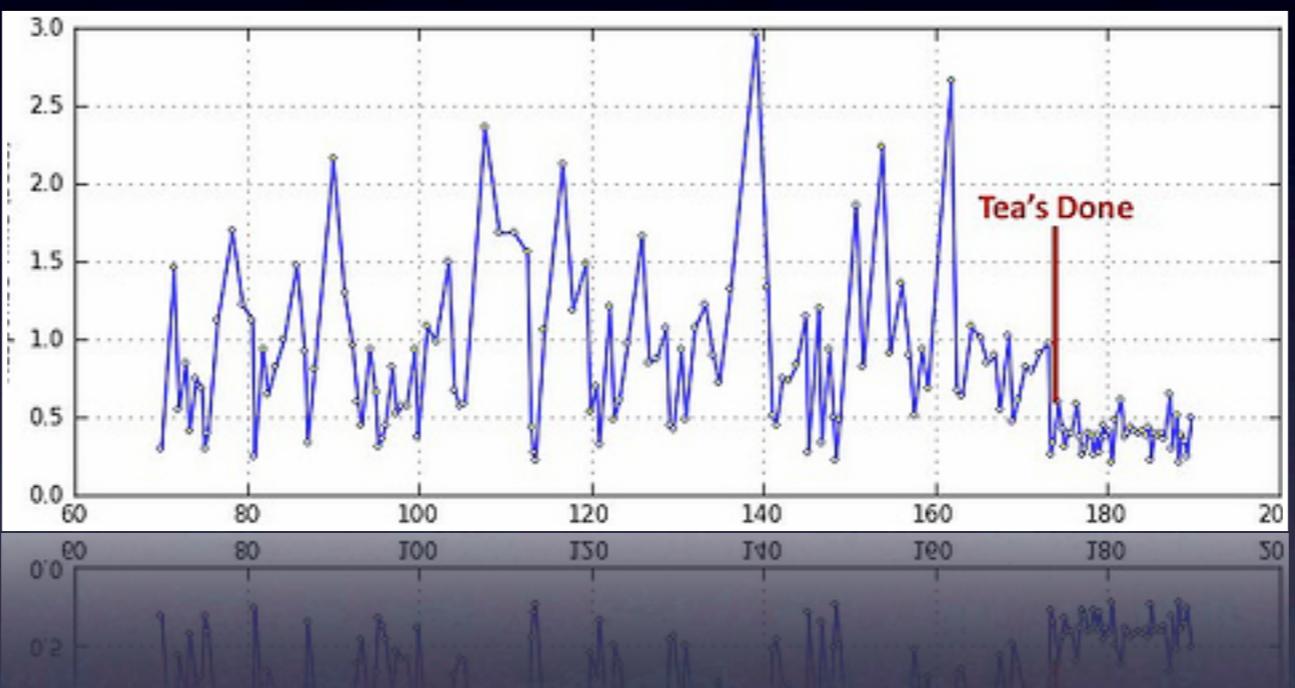
Bigger than mobile?

Packet Loss Measurement Device



Packet Loss Generator

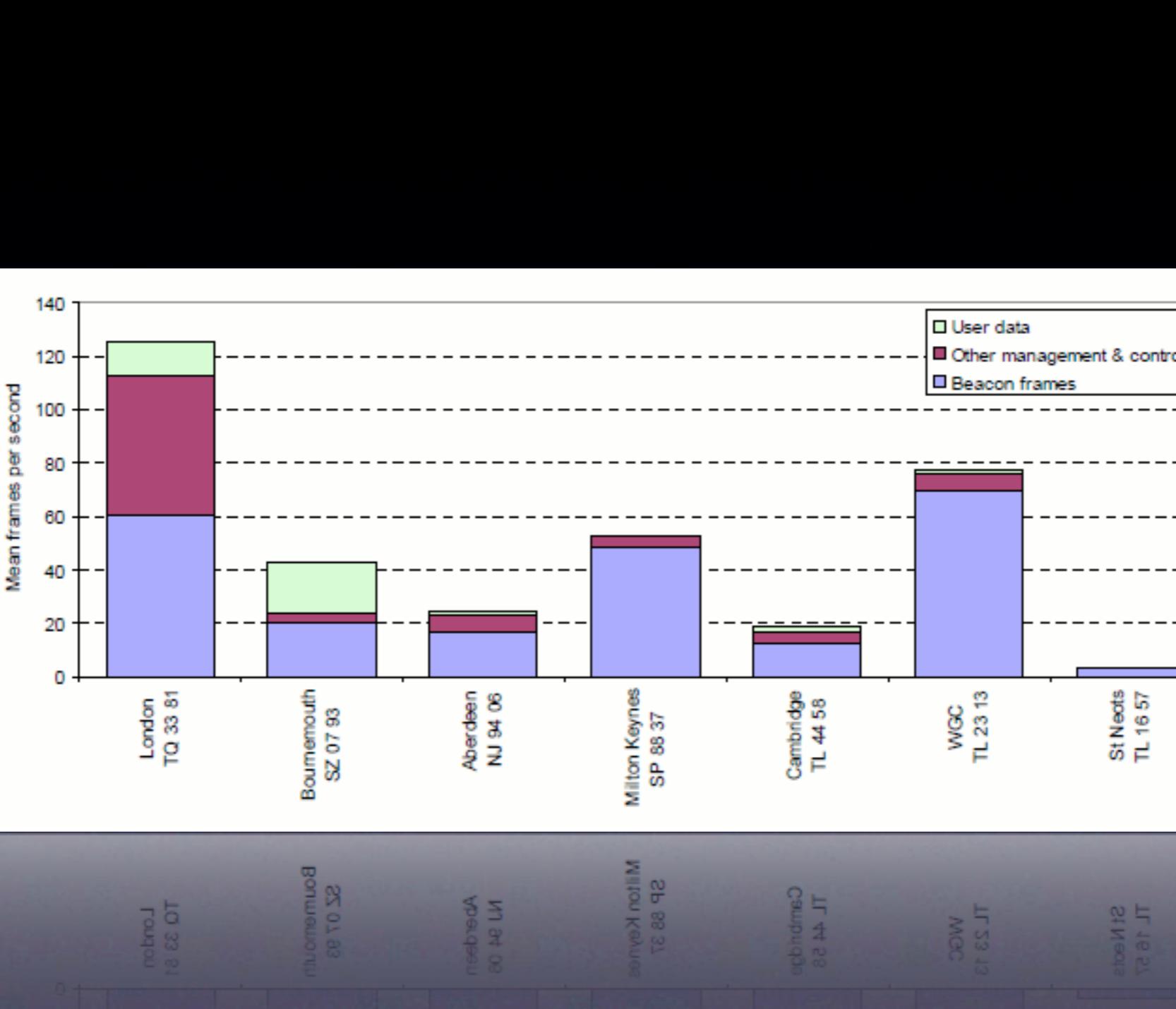




Wifi sucks.

Ofcom study

- UK study into Wifi interfence (PDF)
- Up to 90% of bandwidth used on protocol
- Many other sources of interference
 - Baby monitors
 - Microwaves
 - Cordless Phones

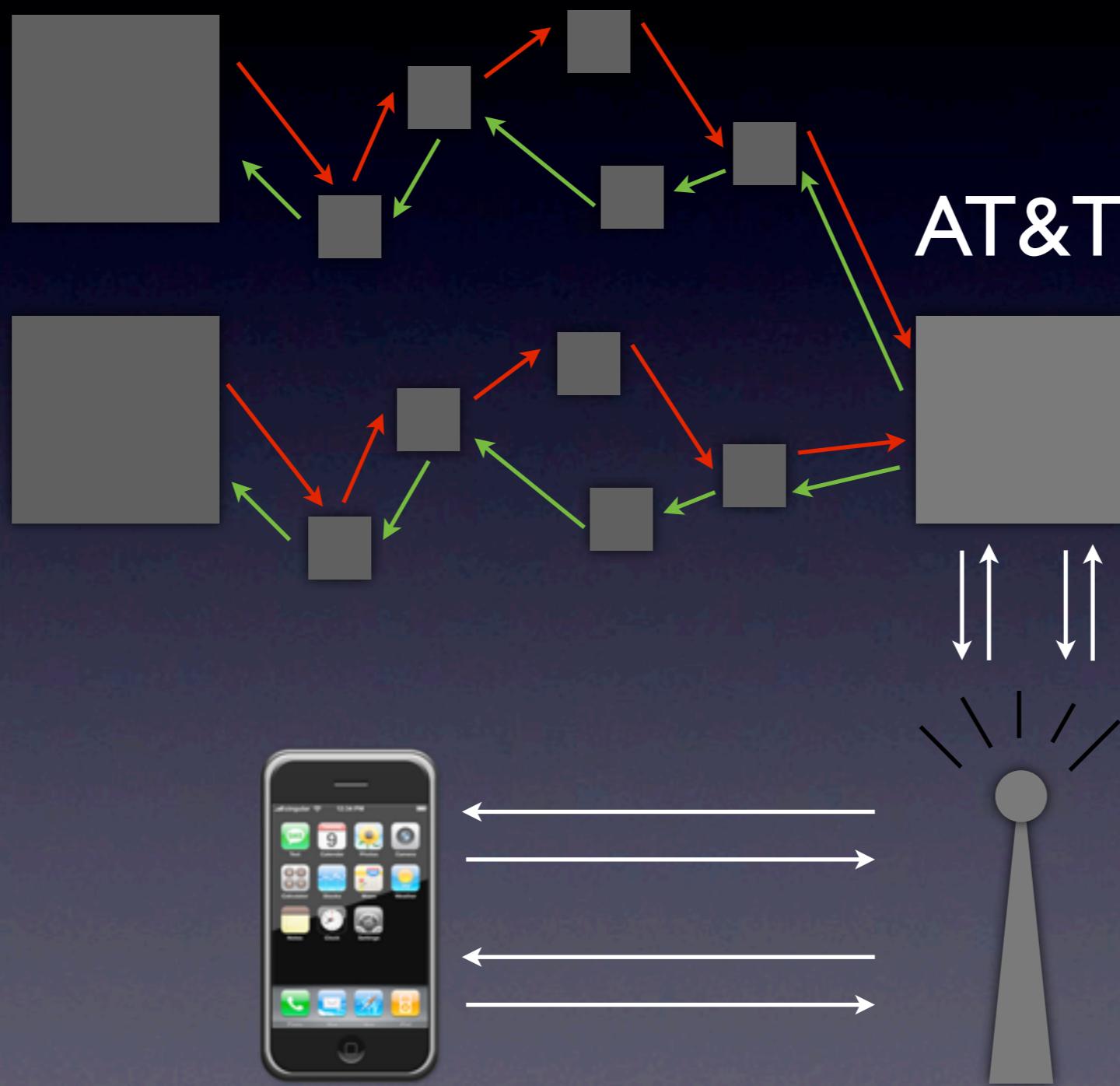


Interference sucks.

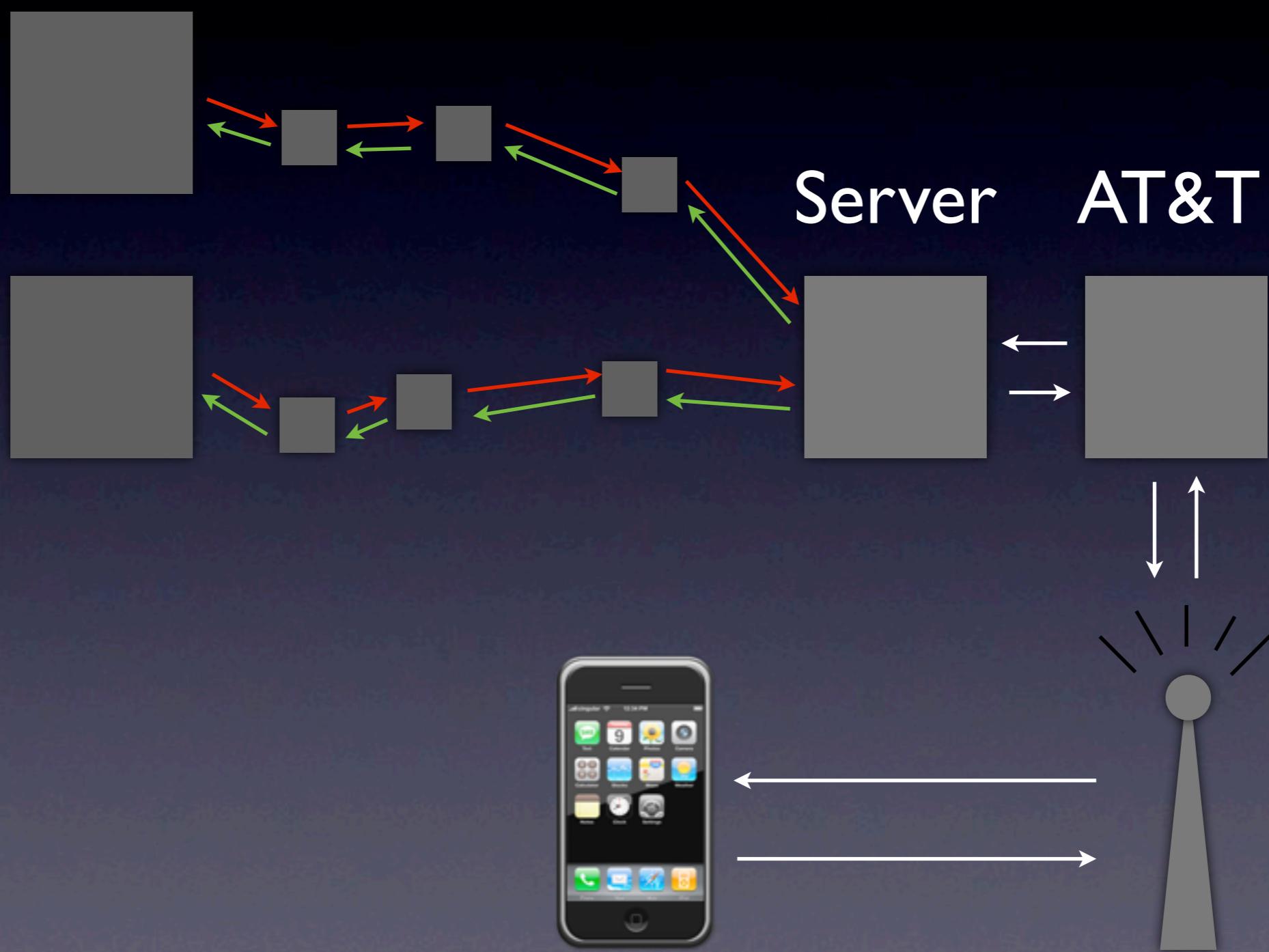
So how do we fix it?

I. Reduce Requests

Web Services



Web Services



Reducing requests

- Yahoo! Performance Guidelines
 - <http://developer.yahoo.com/performance>
- Reduce web service requests
 - Bundle requests from device logically
 - Gzip all web service responses

2. Shape to packets

Indiana Packet and the Byte of Doom

Packet #1 Payload



Packet #2 Payload

.

- | extra byte means
- | extra packet

Reduce number of packets

Packet sizes

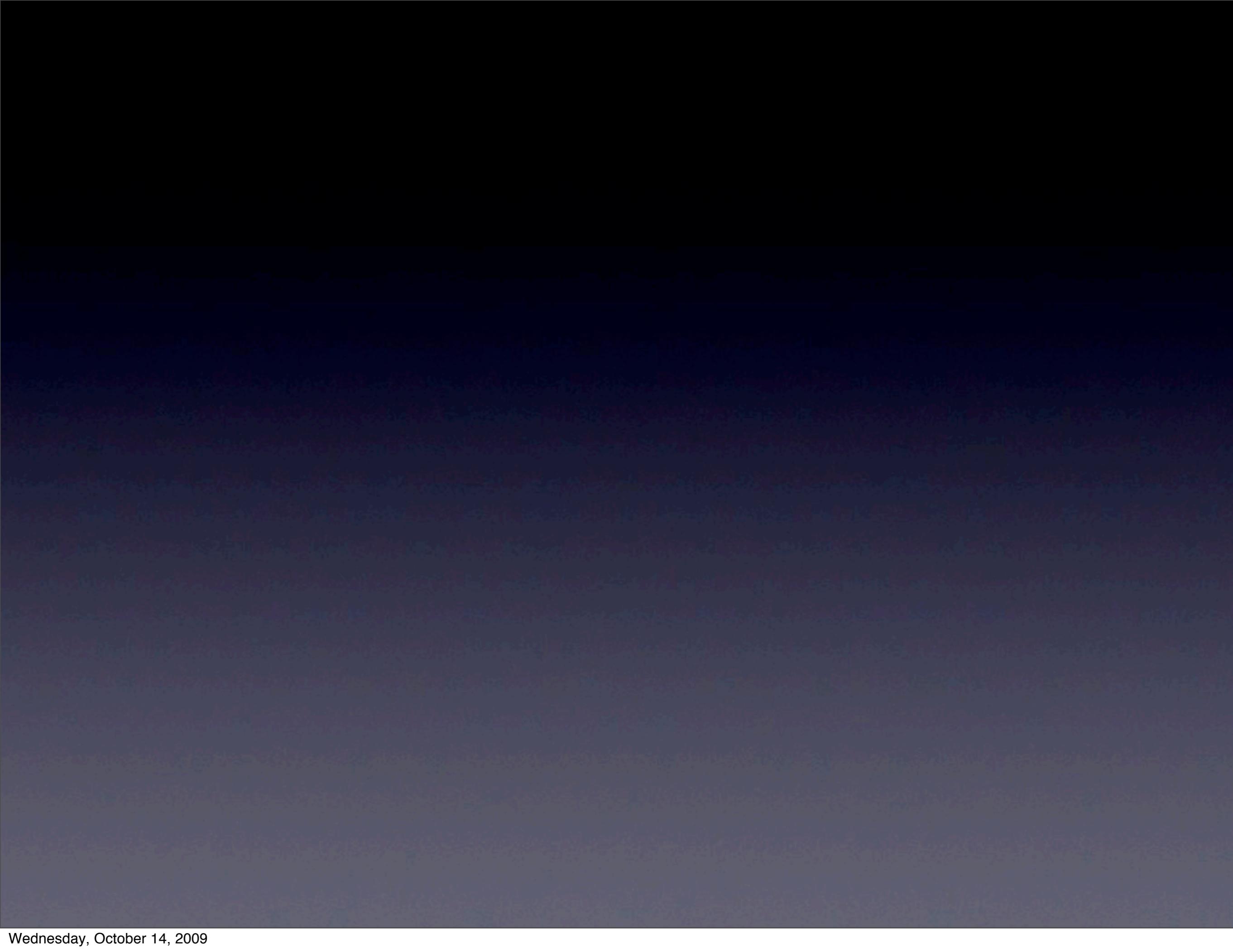
- Make sure static assets (JS, images, etc) fit in discrete packet boundaries
 - Don't forget Gzip
 - Try and figure out ‘high latency’ connections to send inlined assets to
 - E.g. detect ‘iPhone’

Packet Research

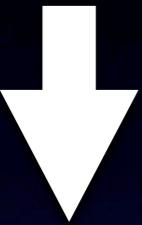
[http://developer.yahoo.net/blog/archives/2009/10/
a_engineers_gui.html](http://developer.yahoo.net/blog/archives/2009/10/a_engineers_gui.html)

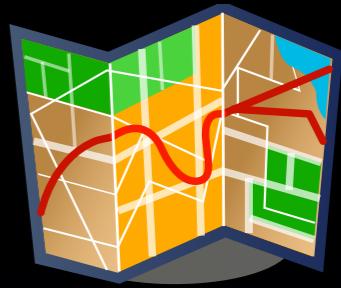
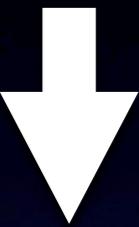
- What is YQL?
- Why is YQL *bad-ass* for mobile development?
- How you can use YQL in mobile development
- Examples

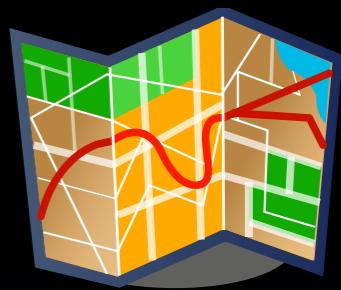
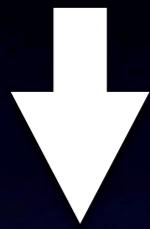
What is YQL?

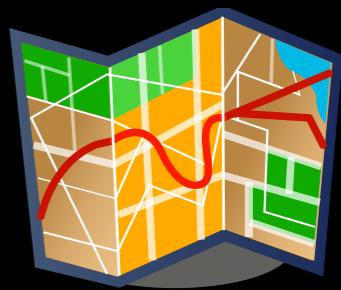
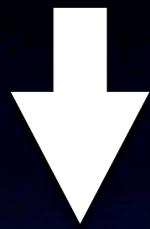


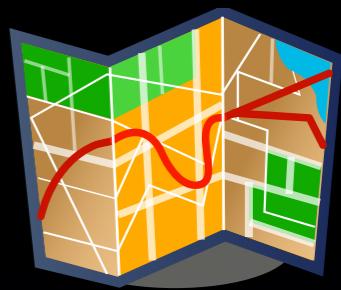
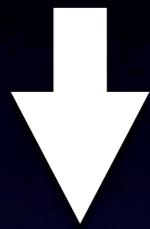


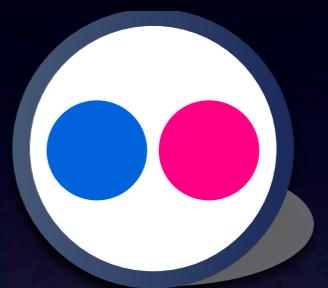
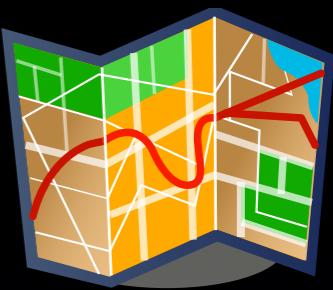


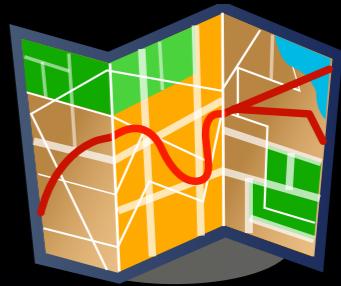


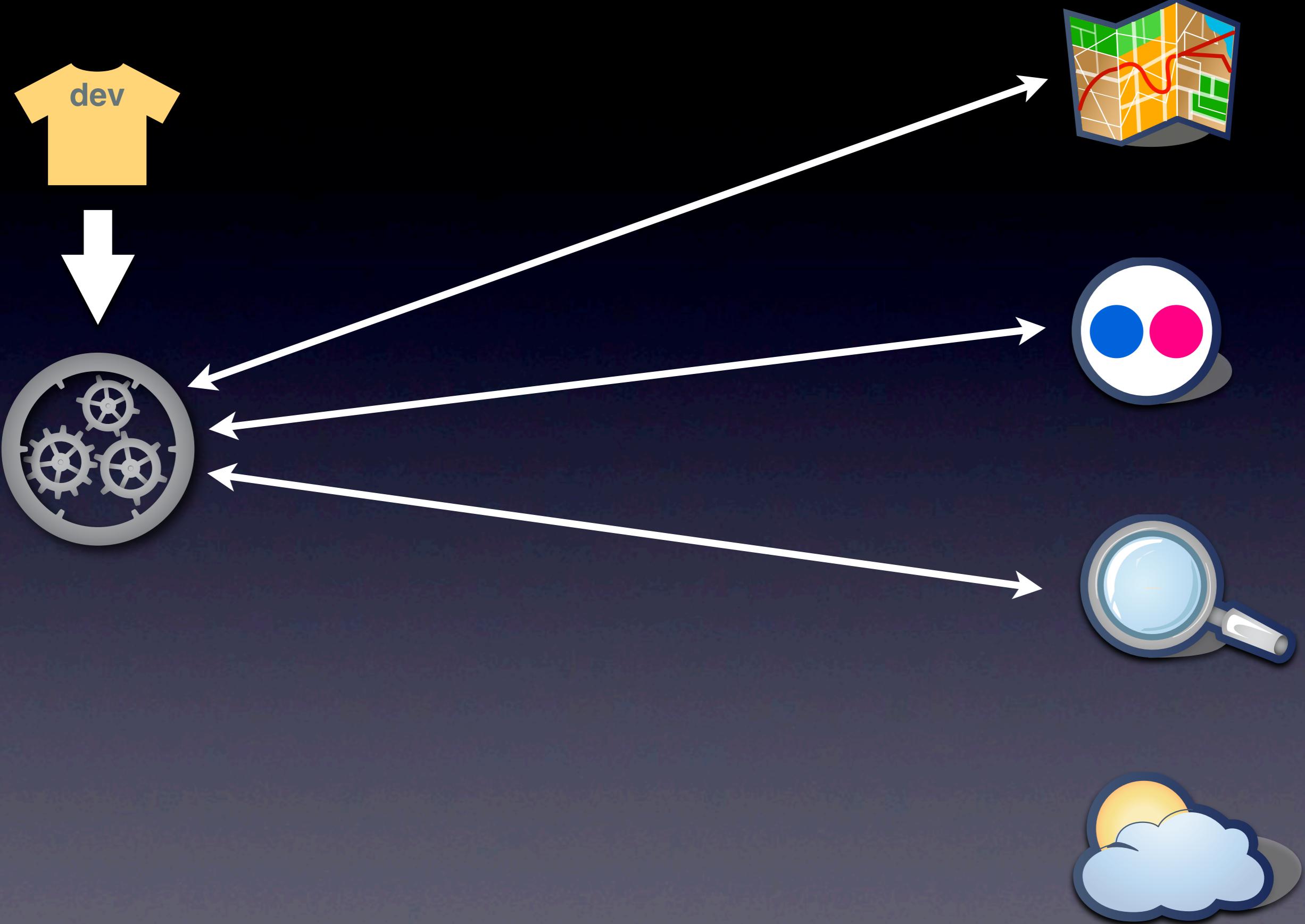


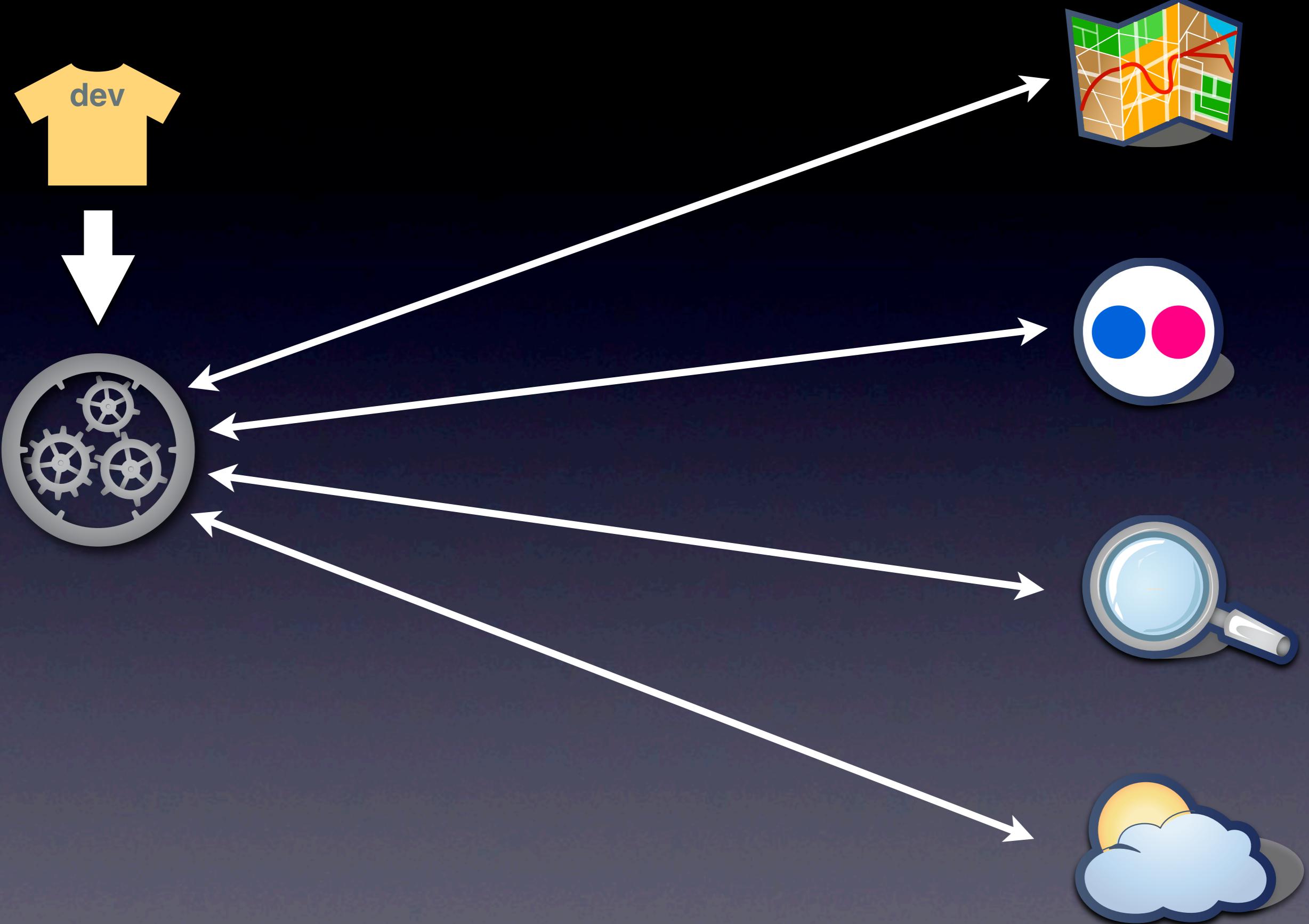


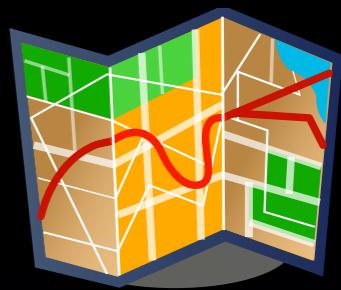
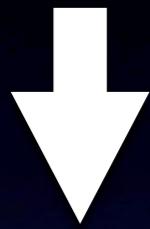




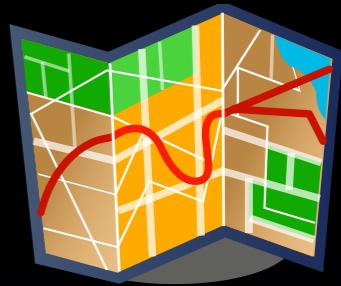


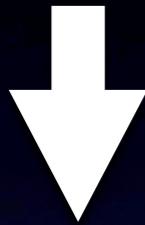




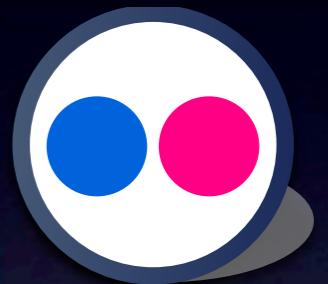
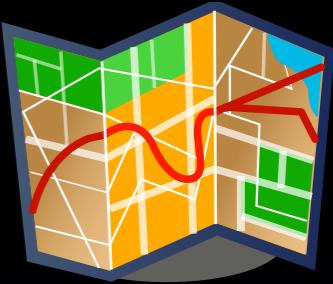


```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```

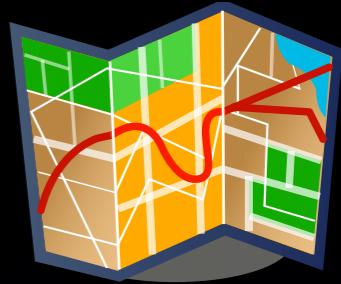


```
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```



```
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```

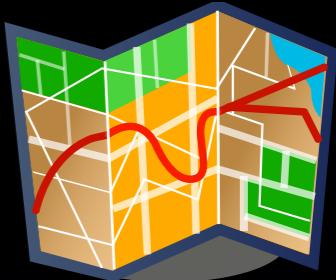


[http://search.yahooapis.com/
ImageSearchService/V1/imageSearch?
appid=YahooDemo&query=Corvette&results=2](http://search.yahooapis.com/ImageSearchService/V1/imageSearch?appid=YahooDemo&query=Corvette&results=2)





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```



```
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```



[http://search.yahooapis.com/
ImageSearchService/V1/imageSearch?
appid=YahooDemo&query=Corvette&results=2](http://search.yahooapis.com/ImageSearchService/V1/imageSearch?appid=YahooDemo&query=Corvette&results=2)

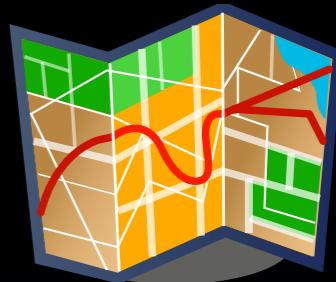


[http://weather.yahooapis.com/
forecastrss?p=FRXX0076&u=c](http://weather.yahooapis.com/forecastrss?p=FRXX0076&u=c)





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...  
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```



[http://search.yahooapis.com/
ImageSearchService/V1/imageSearch?
appid=YahooDemo&query=Corvette&results=2](http://search.yahooapis.com/ImageSearchService/V1/imageSearch?appid=YahooDemo&query=Corvette&results=2)

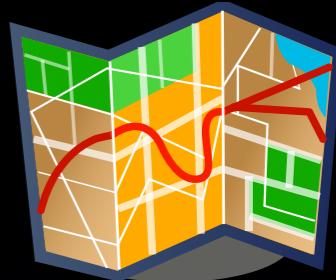


[http://weather.yahooapis.com/
forecastrss?p=FRXX0076&u=c](http://weather.yahooapis.com/forecastrss?p=FRXX0076&u=c)





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...  
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```



[http://search.yahooapis.com/
ImageSearchService/V1/imageSearch?
appid=YahooDemo&query=Corvette&results=2](http://search.yahooapis.com/ImageSearchService/V1/imageSearch?appid=YahooDemo&query=Corvette&results=2)

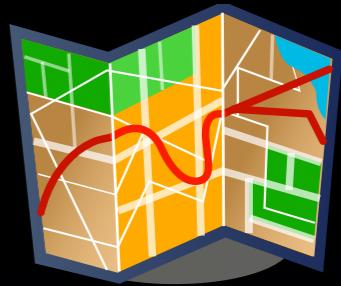


[http://weather.yahooapis.com/
forecastrss?p=FRXX0076&u=c](http://weather.yahooapis.com/forecastrss?p=FRXX0076&u=c)





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```



```
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```



[http://search.yahooapis.com/
ImageSearchService/V1/imageSearch?
appid=YahooDemo&query=Corvette&results=2](http://search.yahooapis.com/ImageSearchService/V1/imageSearch?appid=YahooDemo&query=Corvette&results=2)

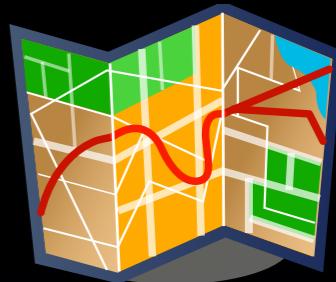


[http://weather.yahooapis.com/
forecastrss?p=FRXX0076&u=c](http://weather.yahooapis.com/forecastrss?p=FRXX0076&u=c)





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```



```
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```



[http://search.yahooapis.com/
ImageSearchService/V1/imageSearch?
appid=YahooDemo&query=Corvette&results=2](http://search.yahooapis.com/ImageSearchService/V1/imageSearch?appid=YahooDemo&query=Corvette&results=2)

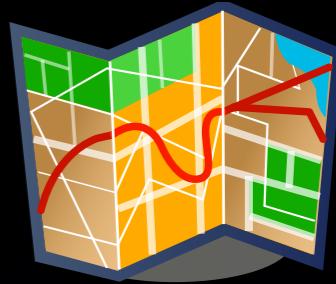


[http://weather.yahooapis.com/
forecastrss?p=FRXX0076&u=c](http://weather.yahooapis.com/forecastrss?p=FRXX0076&u=c)





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```



```
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```



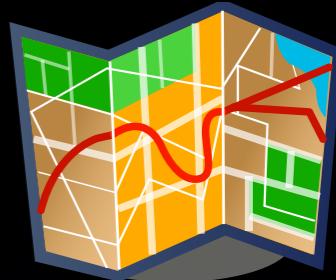
```
http://search.yahooapis.com/  
ImageSearchService/V1/imageSearch?  
appid=YahooDemo&query=Corvette&results=2
```

```
http://weather.yahooapis.com/  
forecastrss?p=FRXX0076&u=c
```





```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```



```
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```



```
http://search.yahooapis.com/  
ImageSearchService/V1/imageSearch?  
appid=YahooDemo&query=Corvette&results=2
```

```
http://weather.yahooapis.com/  
forecastrss?p=FRXX0076&u=c
```



YAHOO! DEVELOPER NETWORK

MY PROJECTS | APIs & WEB SERVICES | RESOURCES | SUPPORT

YDN / Maps Suite / AJAX Maps

Yahoo! Maps Web Started Guide

Learn the fundamentals of the Yahoo!

Introduction and Prerequisites

Examples

- Display a Yahoo! Map
- Add controls to your Yahoo! Map
- Add a logger to a Yahoo! Map
- Place a marker on a Yahoo! Map
- Draw Polylines on a Yahoo! Map
- Place Smart Markers on a Yahoo! Map
- Add multiple custom markers on a Yahoo! Map
- Traffic information overlay
- Yahoo! Pipes RSS output info
- Yahoo! Pipes JSON output info
- Local search results overlay
- Overlay GeorSS XML data
- Overlay custom objects at YGeo
- Overlay custom objects at YGeo
- Overlay polyline on Yahoo! Map
- Export Yahoo! Map in GeoRSS
- GeoRSS overlay with polyline
- Get zoom level given radius from
- Custom position of controls
- Change Marker Images Dynamically
- Use YMapTypeControl to position

Other Features of the Yahoo! Maps API

Rate Limit

Terms of Service

Support & Community

Download all of the cheatsheets and the Maps API Reference Bundle.

For detailed descriptions of the classes check out v3.8 Reference Manual.

Introduction and Prerequisites

The Yahoo! AJAX Maps API lets developers build rich, fully embeddable and scriptable applications. The built-in geocoder means that you can get locations, as you like.

In order to create and test applications in your browser: [Firefox 2](#), [Internet Explorer 7](#) or later are supported. You can code your JavaS

An application ID is required to use the service.

For best results, you should launch your application directly from your hard drive by double-clicking it or by launching it from the Internet Explorer browser or by using the file:// protocol.

Displaying a Yahoo! Map

All the API classes and methods needed to use the Yahoo! Maps API are included in the Yahoo! Maps API library. To use the API, you need to include the Yahoo! Maps API library in your application. You can do this by adding the following line to your HTML page:

```
<html>
<head>
<b><script type="text/javascript">
```



Home The Tour Sign Up Explore

Flickr Services

API Documentation | Feeds | Your API Key

flickr.places.getPlaces

Fetches a list of available places.

Authentication

This method does not require authentication.

Arguments

api_key (Required)Your API application key. [See here](#).

Example Response

```
<place_types>
  <place_type place_type_id="1" name="City" />
  <place_type place_type_id="2" name="Neighborhood" />
  <place_type place_type_id="3" name="Town" />
  <place_type place_type_id="4" name="Village" />
  <place_type place_type_id="5" name="Suburb" />
  <place_type place_type_id="6" name="Hamlet" />
</place_types>
```

Error Codes

100: Invalid API Key

The API key passed was not valid or

105: Service currently unavailable

The requested service is temporarily

111: Format "xxx" not found

The requested response format was

112: Method "xxx" not found

The requested method was not found.

114: Invalid SOAP envelope

The SOAP envelope send in the request

115: Invalid XML-RPC Method

The XML-RPC request document contained

API Explorer

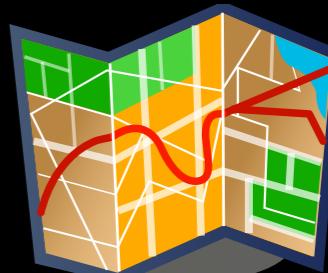
[API Explorer : flickr.places.getPlaces](#)<http://weather.yahooapis.com/forecast.xml?location=40,70&format=json>

For example, to get weather for Yahoo! Headquarters (94089):

<http://weather.yahooapis.com/forecast.xml?location=USCA111&format=json>

Or use the Location ID for Sunnyvale (USCA111).

tById('map'));



Welcome, guest [Sign In](#)

Search

READY TO GET STARTED?

You aren't signed in [Sign In](#) [Help](#)

Search

Welcome, guest [Sign In](#)

Search

Welcome, guest [Sign In](#)

Search

Welcome, guest [Sign In](#)

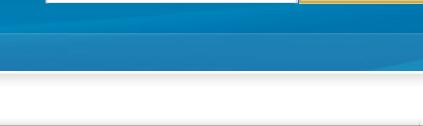
Search

Welcome, guest [Sign In](#)

Search

Welcome, guest [Sign In](#)

Search

Welcome, guest [Sign In](#)

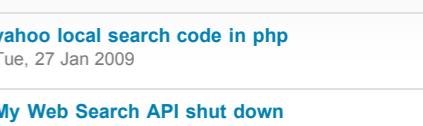
Search

Welcome, guest [Sign In](#)

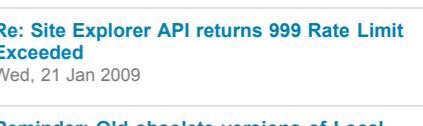
Search

Welcome, guest [Sign In](#)

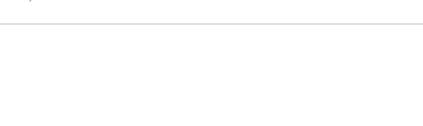
Search

Welcome, guest [Sign In](#)

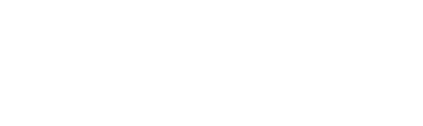
Search

Welcome, guest [Sign In](#)

Search

Welcome, guest [Sign In](#)

Search

Welcome, guest [Sign In](#)

Search

Welcome, guest [Sign In](#)

Search

Welcome, guest [Sign In](#)

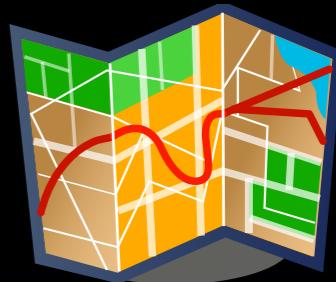
Search

Welcome, guest [Sign In](#)

Search



```
var map = new  
YMap(document.getElementById('map'));  
...  
var currentGeoPoint = new  
YGeoPoint( _c.Lat, _c.Lon );  
map.addMarker(currentGeoPoint);  
...
```



```
...  
if (flickrurl_prepare(fc,  
"flickr.photos.geo.correctLocation",  
parameters, count)) { ... }  
...
```

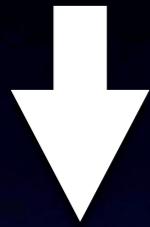


[http://search.yahooapis.com/
ImageSearchService/V1/imageSearch?
appid=YahooDemo&query=Corvette&results=2](http://search.yahooapis.com/ImageSearchService/V1/imageSearch?appid=YahooDemo&query=Corvette&results=2)

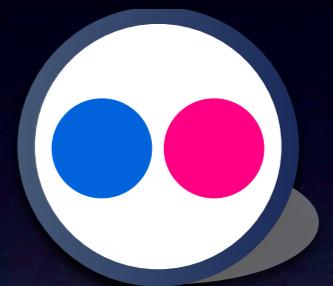
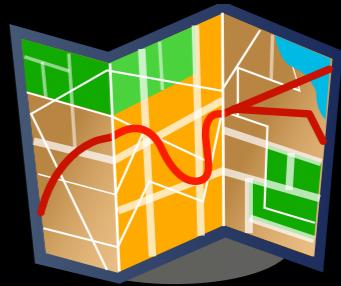


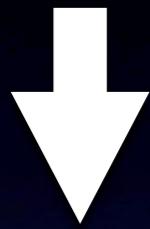
[http://weather.yahooapis.com/
forecastrss?p=FRXX0076&u=c](http://weather.yahooapis.com/forecastrss?p=FRXX0076&u=c)



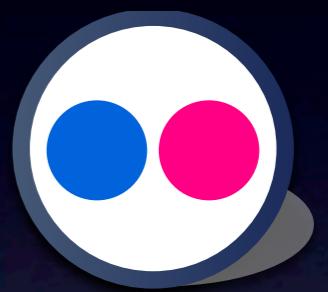
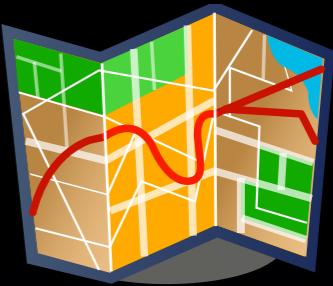


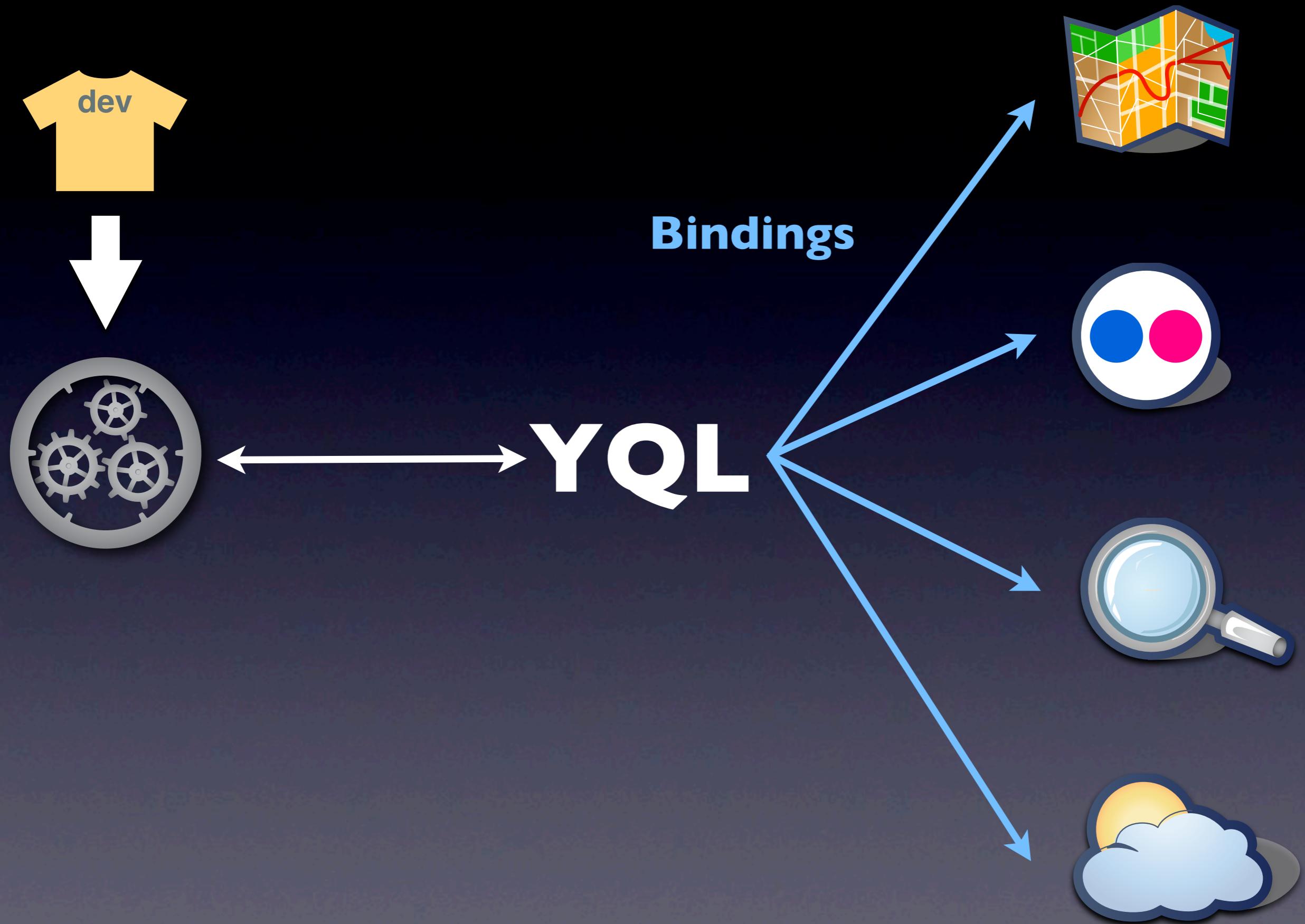
YQL





YQL





YQL

- Unified interface to Web services
- Self-describing to avoid documentation
- Uses a common way to return data

YQL is like SQL

- Uses SQL verbs
- Uses SQL syntax
- Returns rows of data
- Self-describing
 - show tables;
 - desc table;

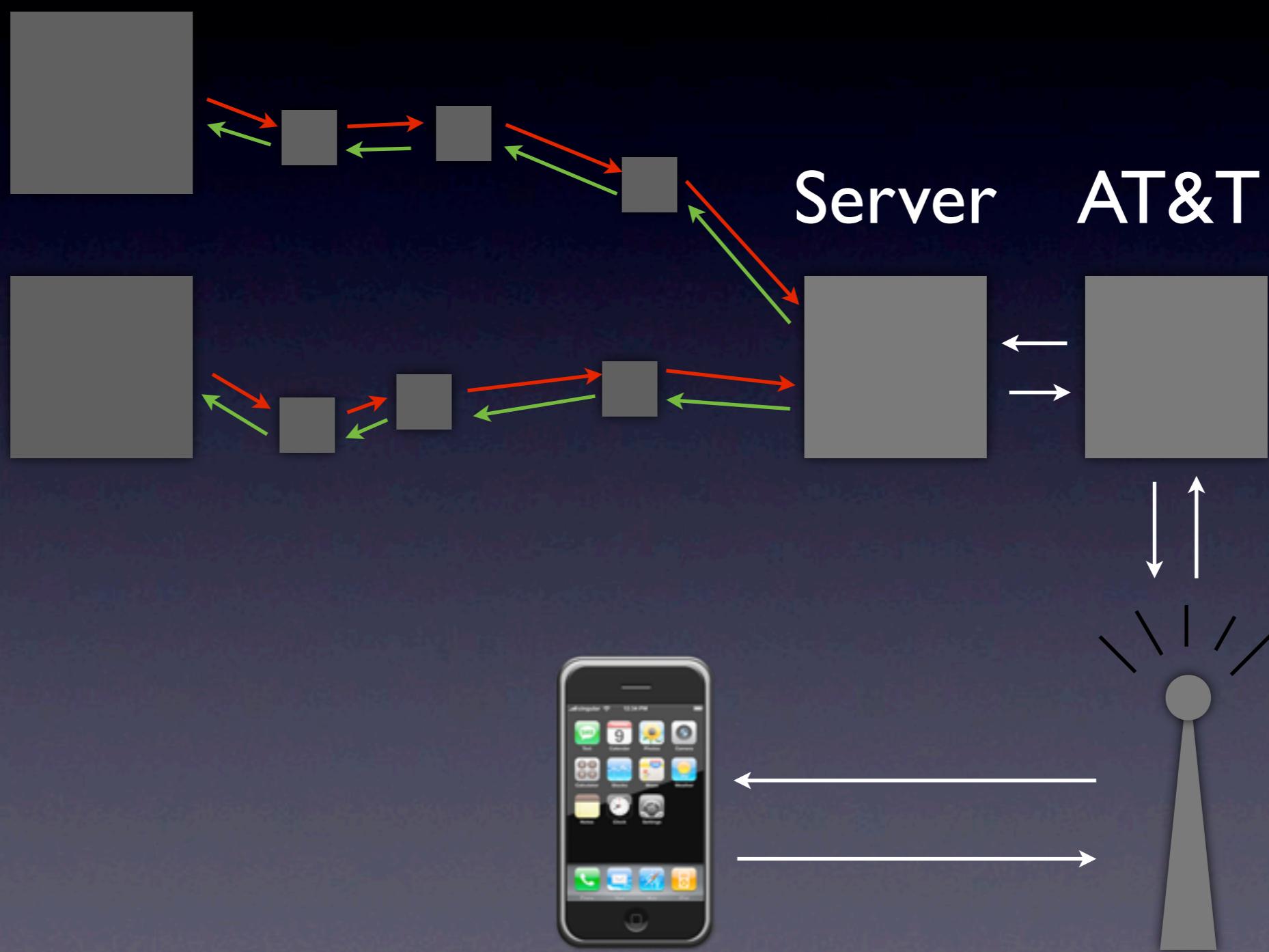
Verbs

- show - *show tables;*
- desc - *desc search.web;*
- select - *select * from flickr.photos.recent;*
- use
- insert
- update
- delete

Demo

<http://developer.yahoo.com/yql/console>

Web Services



YQL Example

```
select * from flickr.photos.info  
where photo_id in (select id from  
flickr.photos.search where query =  
“lolcats”)
```

Conclusion

- Latency hurts anything wireless
- Fight latency by reducing connections
- Fight latency by reducing the number of unnecessary packets
- YQL can help you bundle your requests to mobile device without a backend

follow me on
twitter.com/sh1mmer

Slides? Feedback?
www.speakerrate.com/sh1mmer