Agenda

HTML5 Geolocation from A to Z
Use cases
Coding patterns
Tips and tricks

Goal: Save you 2 - 4 weeks of ramp up time!

Who am I?

Andy Gup
Tech Lead for Web APIs and Android SDK
Email: agup@esri.com
Blog: http://blog.andygup.net
Twitter: @agup

Who are you?
Agenda

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Images by Microsoft Clipart
Who are you?
What is HTML5 Geolocation?

W3C API
Built into the browser
Opt-in required!
Approximate location

What, why, how, huh??

Why do I care? Use Cases?

Find info around user
Direction assistance
Search analysis
Auto-select country/state/city
Auto-display language
Location targeted sales

Demo
What is HTML5 Geolocation?

W3C API
Built into the browser
Opt-in required!
Approximate location
Why do I care? Use Cases?

Find info around user
Direction assistance
Stats/analysis
Auto-select country/state/city
Auto-display language
Location targeted sales
Demo
Geolocation Object

```
Scope Variables

Local

html5Error: undefined
position: Geoposition
coords: Coordinates
  accuracy: 20
  altitude: null
  altitudeAccuracy: null
  heading: null
  latitude: 39.919464
  longitude: -105.1170243
  speed: null
  __proto__: Coordinates
  timestamp: 1334158861845
  __proto__: Geoposition
  this: DOMWindow
```
Verify HTML5 feature support
Feature Detection

```
function checkLocationSupport() {
  
  ...
  
  if (!('geolocation' in navigator)) {
    alert('Sorry, your browser does not support geolocation!');
  }
}
```

Terms of Service

To share your location you must agree to:

- Google Terms of Service
- Google Privacy Policy

This site wants to know your location.

- [ ] Remember choice

[Share Location] [Deny]
```
function setHTML5Location() {
  if (navigator.geolocation) {
    ...
  } else {
    alert("Sorry, your browser does not support geolocation");
  }
}
```
Feature Detection

```javascript
window.onload = function() {
    if (navigator.geolocation) {
        navigator.geolocation.getCurrentPosition(showPosition);
    } else {
        alert("Your browser does not support geolocation.
    
</script>

Terms of Service

To share your location you must agree to:

Google Terms of Service
Google Privacy Policy

[Agree] [Disagree]

This site wants to know your location.

[ ] Remember choice

[Share Location] [Deny]
Not Supported

- Let user know
- Fallback to IP Geolocation
Get Location
function setHTML5Location() {
    if (navigator.geolocation) {
        navigator.geolocation.getCurrentPosition(function(position, html5Error){
            processGeolocationResult(position);
        });

        watchId = navigator.geolocation.watchPosition(function(position, html5Error){
            processGeolocationResult(position);
        });;
    }
    else {
        alert("Sorry, your browser does not support geolocation");
    }
}
Process results
```javascript
function processGeolocationResult(position) {
  html5Lat = position.coords.latitude; // Get latitude
  html5Lon = position.coords.longitude; // Get longitude
  html5TimeStamp = position.timestamp; // Get timestamp
  html5Accuracy = position.coords.accuracy; // Get accuracy in meters

  console.log("success " + html5Lat + ", " + html5Lon);
  displayGeocodedLocation(html5Lat, html5Lon, html5TimeStamp, html5Accuracy);

  if (html5Lat !== null && html5Lon !== null) {
    ZoomToLocation(html5Lat, html5Lon);
  }
}
```
Use or Display results
HTML5 Geolocation Accuracy

What is a Geolocation Service?
Built into browser
Provided by Google, Microsoft, and Apple
Automatic request made via HTTPS
Sends info to remote service, including:
  - wifi mac id, ssid, signal strength
Returns Geolocation Object

Location, Location, Location

What to do with location data?
One-time snapshot vs Continuous updates
Return value = latitude & longitude (e.g., 37, -104)

Options:
- Place location on map
- Write to database
- Analyze and normalize

You may need a Geocoder
You may need a spatially-enabled database

Analyze and normalize continuous location updates

Define accuracy
- Time
- Distance
- Speed
- Heading

Reject bad results
- Bad vs. good
- Mark as bad or delete

Too many updates
- Define max
- Consider local storage limits
- Performance
- Retain database up to
HTML5 Geolocation Accuracy

Depends on multiple factors...

Type of browser (Geolocation Service)
Type of device
Wi-fi enabled
Internet connectivity
GPS enabled
VPN
What is a Geolocation Service?

Built into browser
Provided by Google, Microsoft and Apple
Automatic request made via HTTPS
Sends info to remote service, including:
  wifi macid, ssid, signal strength
Returns Geolocation Object
GET /maps/api/browserlocation/json?browser=firefox&sensor=true&wifi=mac:01-24-7c-bc-51-46%7Cssid:3x2x%7Css:-37&wifi=mac:09-86-3b-31-97-b2%7Cssid:belkin.7b2%7Cssid:-47 HTTP/1.
What to do with location data?

One-time snapshot vs Continuous updates
Return value = latitude & longitude (e.g. 37, -104)

Options:
- Place location on map
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What to do with location data

One-time snapshot vs Continuous updates
Return value = latitude & longitude (e.g. 37, -104)

Options:
- Place location on map
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Options:

- Place location on map
- Write to database
- Analyze and normalize
• Analyze and normalize

You may need a **Geocoder**
You may need a **spatially-enabled database**
Analyze and normalize continuous location updates

Define accuracy
Time
Distance
Speed
Heading

Reject bad results
Define rules
Mark as bad or delete

Too many updates
Define rules
Consider local storage limits
Performance
Remote database sync
Define accuracy

Time
Distance
Speed
Heading
Reject bad results

Define rules
Mark as bad or delete

Too many updates
Too many updates

Define rules
Consider local storage limits
Performance
Remote database sync
Geocoding

Geocoder accuracy?

44.49, 72.24
Berlin, DE
Score: 80%

Fallback to IP Geocoder?

Converts IP to location
Service-based or COTS

74.125.224.160
Country: United States
State: CA
City: Mountain View
Latitude: 37.4192
Longitude: -122.0574
Geocoder accuracy?

44.49, 72.24
Berlin, DE
Score: 80%
Fallback to IP Geocoder?

Converts IP to location
Service-based or COTS

74.125.224.160
Country: United States
State: CA
City: Mountain View
Latitude: 37.4192
Longitude: -122.0574
Tips for storing location data

Storing location data (Client-side)

Consider mobile & desktop
- HTML5 Web Storage [≈ 5MB]
- Web SQL [not recommended]
- IndexedDB [not recommended]

- location
- timeStap
- accuracy
- UID [optional]
- browserType [optional]

Storing location data (Server-side)

- UID
- location
- timeStap
- accuracy
- altitude
- altitudeAccuracy
- heading
- speed
- browserType
- geometry

*Mobile only - not available on most platforms
Storing location data (Client-side)

Consider mobile & desktop
- HTML5 Web Storage [\(\leq 5\text{MB}\)]
- Web SQL [not recommended]
- IndexedDB [not recommended]

location
timeStamp
accuracy
UID [optional]
browserType [optional]
Storing location data (Server-side)

UID
location
timeStamp
accuracy
altitude*
alitudeAccuracy*
heading*
speed*
browserType
geometry!

*Mobile only - not available on most platforms
Wrap-up!

Browser Support
Use feature detection pattern
Use your .js library
http://yepnopejs.com
http://caniuse.com
http://mobilehtml5.org/

Resources
@agup or agup@esri.com
http://blog.agup.com
http://esriurl.com/javascript
http://caniuse.com
http://mobilehtml5.org/
http://dev.w3.org/geo/api/spec-source.html

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Browser Support

Use feature detection pattern
Use your .js library
http://yepnopejs.com

http://caniuse.com
http://mobilehtml5.org/
Privacy

Get legal advice
Follow W3C geolocation guidelines (Section 4)
Allow for opt-out
Be clear about your privacy policy
Resources

@agup or agup@esri.com
http://blog.andygup.net
http://esriurl.com/javascript
http://caniuse.com
http://mobilehtml5.org/
http://dev.w3.org/geo/api/spec-source.html
http://esriurl.com/survey
ID# 244

Understanding our world.