

Federal GIS Conference

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Geocoding Techniques and Options for US and International Locations

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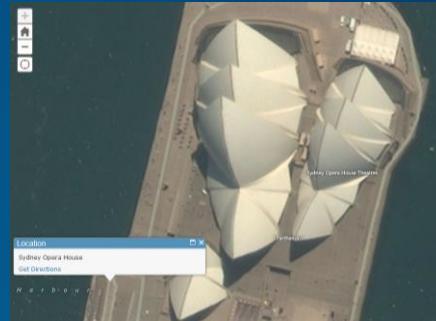
Chris Sheldrick – what3words

Types of Geocoding

- GeoSearch



Sydney Opera House



- Batch Geocoding



A	B	C	D	E
1. Office	Address	Telephone	Type	
2. Redlands	8615 Westwood Center Drive, CA 92379	809-791-2525	Corporate	
3. D.C.	8615 Westwood Center Drive, Vienna, VA 22182	703-306-9515	Federal Sales	
4. Boston	55 Fenmore Road, Danvers, MA 01923	978-777-4541	Regional Office	
5. Charlotte	3325 Springbank Lane, Charlotte, NC 28232	704-541-9810	Regional Office	
6. Denver	One International Court, Broomfield, CO 80021	303-449-7779	Regional Office	
7. Minneapolis	6800 Blue Gentian Road, St. Paul, MN 55121	651-454-0609	Regional Office	
8. Olympia	600 Columbia Street, NW, Olympia, WA 98504	360-754-4727	Regional Office	
9. Philadelphia	1000 Arch Street, Philadelphia, PA 19103	215-597-4000	Regional Office	
10. San Antonio	227 North Long 1804 East San Antonio, TX 78232-1260	210-499-1044	Regional Office	
11. St. Louis	3000 Little Hills Expressway, St. Charles, MO 63301	636-949-6620	Regional Office	
12. Albany	50 Beaver Street, Albany, NY 12207	518-399-8612	Satellite Office	
13. Anchorage	Anchorage, AK	907-644-8470	Satellite Office	
14. Atlanta	3600 Brookside Parkway, Alpharetta, GA 30022	770-777-1490	Satellite Office	
15. Chicago	223 North LaSalle Street, Chicago, IL 60601	312-983-2000	Satellite Office	
16. Cleveland	7700 Mayfield Parkway, North, OH 44125	813-931-8898	Satellite Office	
17. Honolulu, HI	13557 Kapiolani Boulevard, Honolulu, HI 96814	808-947-0993	Satellite Office	
18. Houston	11200 Westheimer Rd, Houston, TX 77042	713-401-0650	Satellite Office	
19. Kansas City	8700 State Line Road, Leawood, KS 66206	913-383-8235	Satellite Office	
20. Nashville	321 Billingsley Court, Franklin, TN 37067	615-599-4120	Satellite Office	
21. New York	75 Broad Street, New York City, NY 10004	212-349-3700	Satellite Office	
22. Sacramento, CA	1600 K Street, Sacramento, CA 95814	916-446-2412	Satellite Office	
23. Seattle	100 South King Street, Seattle, WA 98104	206-749-0533	Satellite Office	



- Reverse Geocoding



Address: 8615 Westwood Center Dr
City: Tysons Corner
Region: Virginia
Postal: 22182
Country: USA

Loc_name: USA.PointAddress

On premises vs Online

- **On premises**
 - Need to geocode behind a firewall for security/privacy reasons
 - need to maintain your own reference data
- **Online**
 - When you want to consume a ready-to-use geocoding service



Geocoding On-Premises

- Users that need to geocode behind a firewall for security/privacy reasons
- Users that maintain their own reference data

What you need:

- Hardware/Device to host data and locators
- ArcGIS Software (Desktop, Server if you want to create a service)
- Locator Files and Reference Data or a Private Geocoding Service

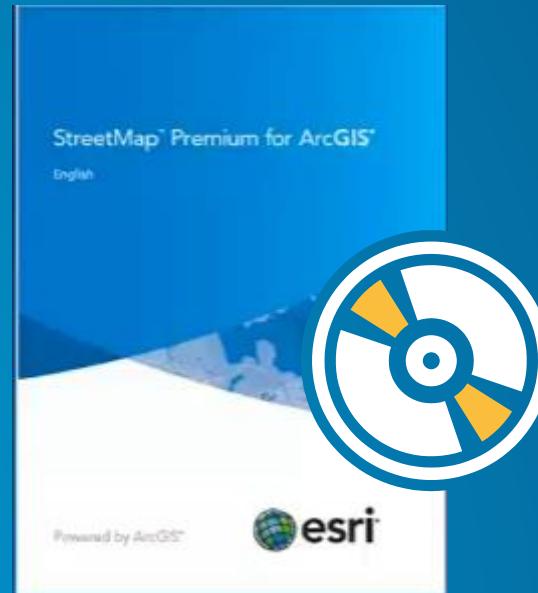


Options

- Obtain or create reference data, build your own locator
- Use locators in Esri's ready to use street data product, **StreetMap Premium**
 - North America
 - Latin America
 - Europe
 - Middle East and Africa
 - Australia/New Zealand
 - Japan

License by:

Continent
Country
State/Province
(US/Canada)



<http://www.esri.com/data/streetmap/comparison>

	HERE North America	TomTom North America	HERE Latin America	HERE Europe	TomTom Europe	HERE Middle East and Africa	HERE Australia/ New Zealand	iPC
Coverage	North America	North America	Latin America	Europe	Europe	Middle East and Africa	Australia/New Zealand	Japan
Vintage	2013	2013	2013	2013	2013	2013	2013 Q1	2012
Current Release	2014 Release 3	2014 Release 2	2013 Release 1	2014 Release 1	2014 Release 1	2014 Release 1	2014 Release 1	2013 Release 1
Update Schedule	3 Updates/year	3 Updates/year	1 Update/year	2 Updates/year	2 Updates/year	1 Update/year	1 Update/year	1 Update/year
Delivery	DVD	DVD	DVD	DVD	DVD	DVD	DVD	DVD
Format	FGDB	FGDB	FGDB	FGDB	FGDB	FGDB	FGDB	FGDB
Geocoding	Down to Address Point Level for US, Canada, Mexico	Down to Address Point Level for US, Canada, Mexico	Coverage Varies; Down to Address Point for many LatAm countries	Coverage Varies; Down to Address Point for many European Countries	Coverage Varies; Down to Street Address Level for many European Countries	Coverage Varies; Down to Address Point for Egypt, Israel, Saudi Arabia, and South Africa	Down to Address Point Level	Down to Address Point Level
Routing	Historic Traffic Data; Trucking Restrictions; Driving Directions	Historic Traffic Data; Trucking Restrictions; Driving Directions	Historic Traffic Data; Trucking Restrictions; Driving Directions	Historic Traffic Data; Trucking Restrictions; Driving Directions	Basic Routing, Driving Directions			

Geocoding On-Line – the ArcGIS Online World Geocoding Service

- Ready-to-use world geocoding service
- Covers:
 - the planet at Admin/Populated places level
 - Over 100 countries supported at address precision
 - Over 50 countries down to address point



Numbers to remember for batch geocoding:

40 credits for every **1,000** geocodes

2.4 credits per
10 MB of stored feature services/month

Which option is for me?

I am a user based in the US that needs to geocode **tens of millions of US addresses per year, which option is right for me?**

On premises option may be best **IF**

Volume of geocodes expected



Cost of credits consumed using the ArcGIS Online World Geocoding Service

Which option is for me?

I am a global, enterprise organization that needs to geocode addresses worldwide, what should I use?



World Geocoding Service IF

your geocoding region extends beyond

StreetMap Premium availability



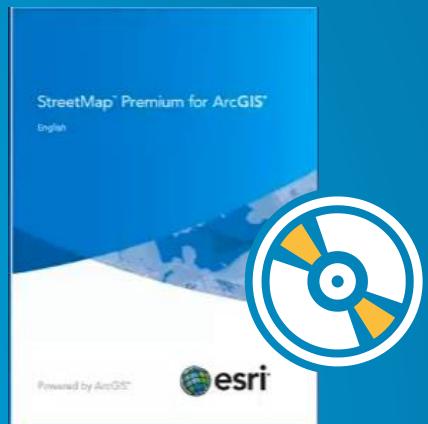
Which option is for me?

I need to geocode millions of North American addresses per month, yet I have a hundred records for other countries I need geocoded as well, what should I use?



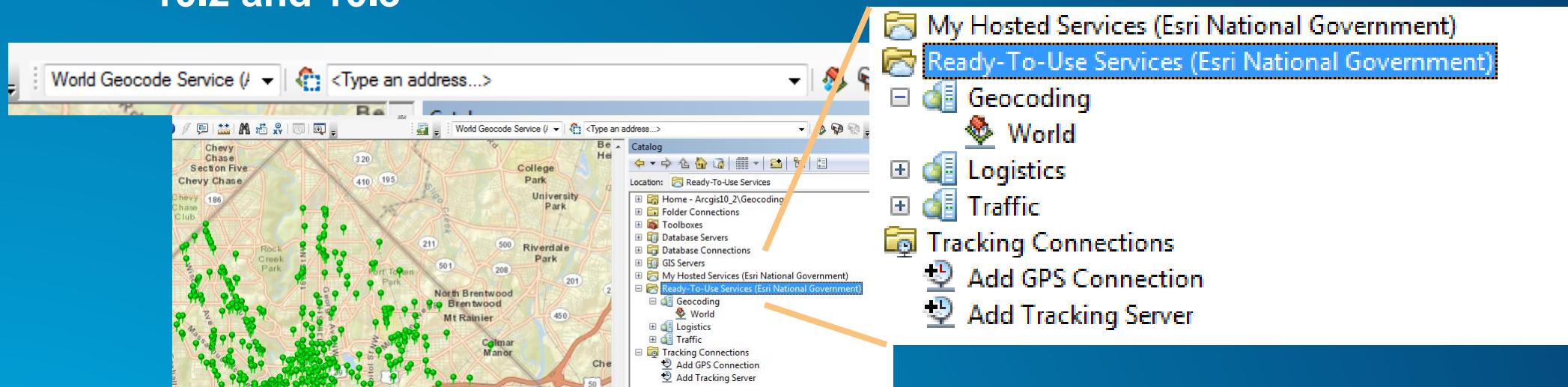
Hybrid!

StreetMap Premium + World Geocoding Service



Accessing the World Geocoding Service - Desktop

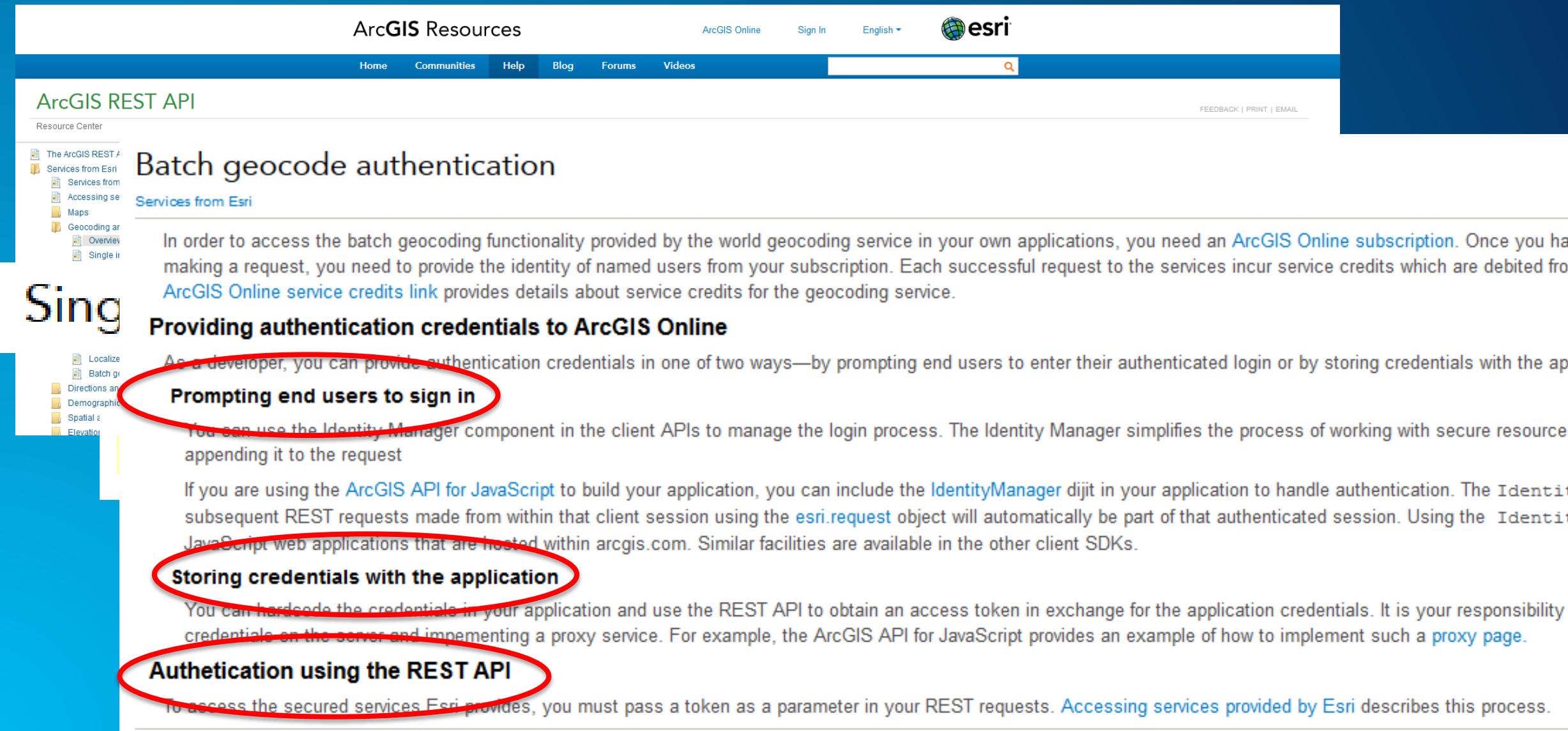
- 10.2 and 10.3



- 10.1



Accessing the World Geocoding Service – Web Apps



ArcGIS Resources ArcGIS Online Sign In English ▾

esri

Home Communities Help Blog Forums Videos

ArcGIS REST API

Resource Center

The ArcGIS REST API Services from Esri Services from Accessing services from Maps Geocoding services Overview Single sign on

Batch geocode authentication

Services from Esri

In order to access the batch geocoding functionality provided by the world geocoding service in your own applications, you need an [ArcGIS Online subscription](#). Once you have made a request, you need to provide the identity of named users from your subscription. Each successful request to the services incur service credits which are debited from [ArcGIS Online service credits link](#) provides details about service credits for the geocoding service.

Providing authentication credentials to ArcGIS Online

As a developer, you can provide authentication credentials in one of two ways—by prompting end users to enter their authenticated login or by storing credentials with the application.

Prompting end users to sign in

You can use the Identity Manager component in the client APIs to manage the login process. The Identity Manager simplifies the process of working with secure resources by appending it to the request.

If you are using the [ArcGIS API for JavaScript](#) to build your application, you can include the [IdentityManager](#) dijit in your application to handle authentication. The Identity Manager will automatically handle subsequent REST requests made from within that client session using the [esri.request](#) object. Using the Identity Manager in web applications that are hosted within [arcgis.com](#). Similar facilities are available in the other client SDKs.

Storing credentials with the application

You can hardcode the credentials in your application and use the REST API to obtain an access token in exchange for the application credentials. It is your responsibility to store the credentials on the server and implementing a proxy service. For example, the ArcGIS API for JavaScript provides an example of how to implement such a proxy page.

Authetication using the REST API

To access the secured services Esri provides, you must pass a token as a parameter in your REST requests. [Accessing services provided by Esri](#) describes this process.

Batch Geocoding in ArcGIS Online

My Content

1	Office
2	Redlands
3	D.C.
4	Boston
5	Charlotte
6	Denver
7	Minneapolis
8	Olympia
9	Philadelphia
10	San Antonio
11	St. Louis
12	Albany
13	Anchorage
14	Atlanta
15	Chicago
16	Columbus
17	Honolulu, HI
18	Houston
19	Kansas City
20	Nashville
21	New York
22	Sacramento, CA
23	Seattle

Folders

NEW **DELETE**

Address	Phone	Category
100 South King Street Seattle, WA 98104	206-749-0533	Satellite Off
1600 K Street Sacramento, CA 95814	916-448-2412	Satellite Off
75 Broad Street New York City, NY 10004	212-349-3700	Satellite Off
321 Billingsly Court Franklin, TN 37067	615-599-4120	Satellite Off
8700 State Line Road Leawood, KS 66206	913-383-8235	Satellite Off
11200 Westheimer Rd Houston, TX 77042	713-401-0658	Satellite Off
1357 Kapiolani Boulevard Honolulu, HI 96814	808-947-0993	Satellite Off
7775 Walton Parkway New Albany, OH 43054	614-933-8698	Satellite Off
221 North LaSalle Street Chicago, IL 60601	312-609-0966	Satellite Off
3650 Brookside Parkway Alpharetta, GA 30022	770-777-1490	Satellite Off
Anchorage, AK	907-644-8470	Satellite Off
100 Beaver Street Albany, NY 12207	310-333-0022	Satellite Off

Add Item

Add an item from your computer or reference an item on the Web.

The item is:

File:

[Supported Items](#)

Title:

Tags:

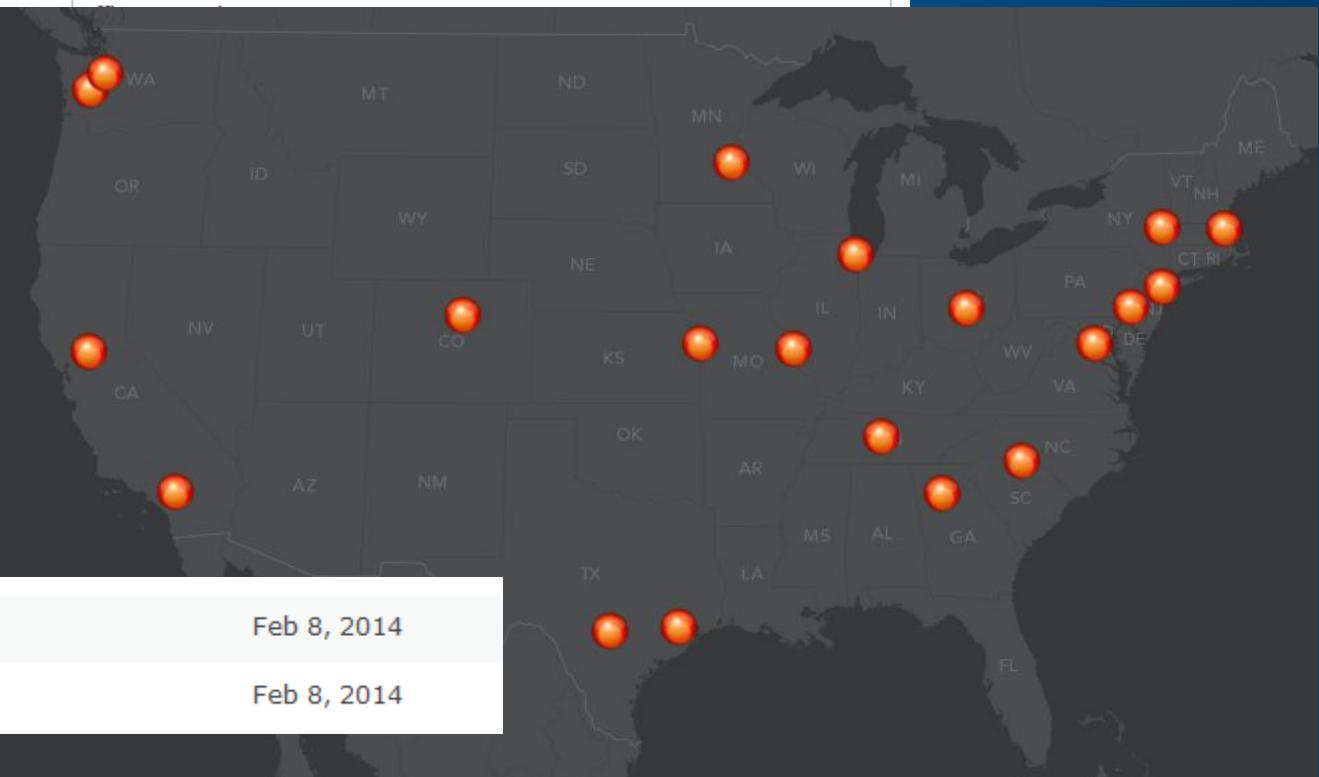
Public [\(Add\)](#)

[Locate](#) [Country](#) [Review](#)

Field Name

Office

Address

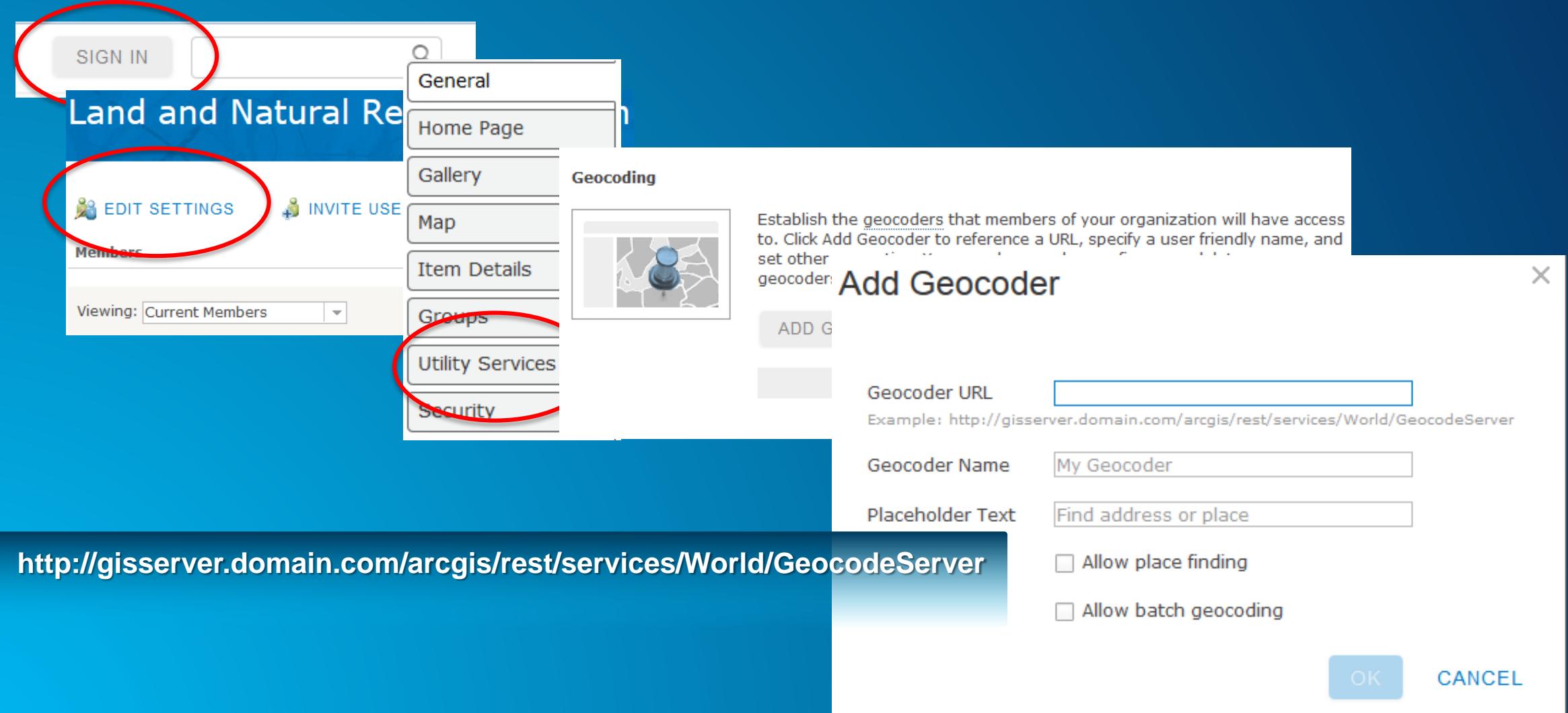


Features Feb 8, 2014

CSV Feb 8, 2014

ADD ITEM **CANCEL**

Registering your own Geocoding Service in ArcGIS Online



The screenshot shows the ArcGIS Online interface for a group named "Land and Natural Re". A red circle highlights the "SIGN IN" button in the top left. Another red circle highlights the "EDIT SETTINGS" button on the left sidebar. A third red circle highlights the "Utility Services" button in the sidebar. A fourth red circle highlights the "Geocoding" section in the main content area. A modal dialog box titled "Add Geocoder" is open in the center. The dialog contains fields for "Geocoder URL" (with an example URL provided), "Geocoder Name" (set to "My Geocoder"), "Placeholder Text" (set to "Find address or place"), and checkboxes for "Allow place finding" and "Allow batch geocoding".

SIGN IN

Land and Natural Re

EDIT SETTINGS

INVITE USE

Members

Viewing: Current Members

General

Home Page

Gallery

Map

Item Details

Groups

Utility Services

SECURITY

Geocoding

Establish the geocoders that members of your organization will have access to. Click Add Geocoder to reference a URL, specify a user friendly name, and set other geocoding options.

Add Geocoder

Geocoder URL

Example: <http://gisserver.domain.com/arcgis/rest/services/World/GeocodeServer>

Geocoder Name

My Geocoder

Placeholder Text

Find address or place

Allow place finding

Allow batch geocoding

OK CANCEL

<http://gisserver.domain.com/arcgis/rest/services/World/GeocodeServer>

Does Esri store the addresses I submit to the World Geocoding Service?

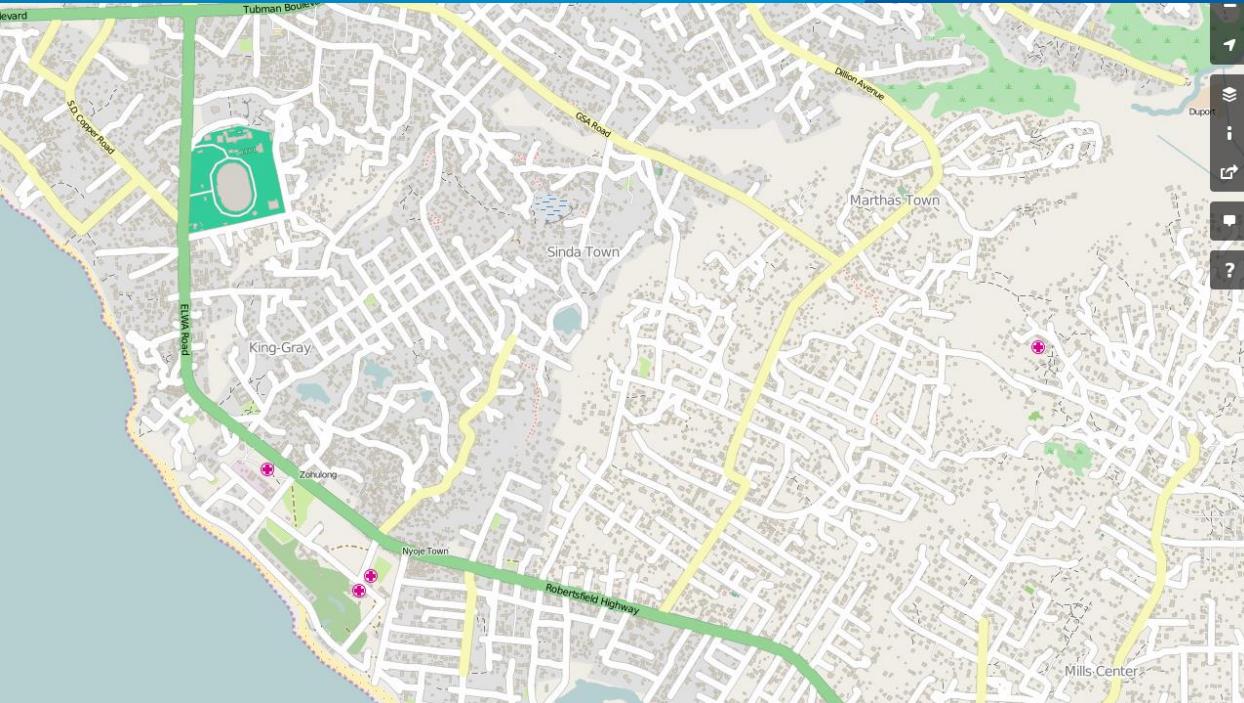
Batch Geocoding

- Esri does NOT save the addresses customers batch geocode - they are NOT persisted on our servers or in our logs
- If an organization implements their *own* geocoding application or process on top of our world geocoding service leveraging our GeocodeAddresses function in the ArcGIS Online API, that is batch geocoding and we WON'T log or persist addresses.

Interactive GeoSearch (one at a time)

- Esri does persist the addresses and uses them for testing and improvement of our system. This pattern is integrated into ArcGIS apps as well.
- If an organization implements custom batch geocoding using our Find or FindAddressCandidates function in the ArcGIS Online API (interactive geosearch) we do log the inputs
- The IP address, orgID, appID, and the Username who made the request is stored and secured, accessible only by DevOps Personnel. Access managed by PKI certificates assigned to each individual who requires access

GeoSearch and Batch Geocoding Demos



Geocoding in West Africa

James Tedrick

The Need: Ebola Cases

- Hospitals & Treatment Centers created patient records
- Country Health offices centralized, forwarded to the international community
- Multiple Locations
 - Residence
 - Infection
 - Hospitalization
 - Death/Burial
- To most effectively target response, need to know where to go!

Big Challenge – 3 countries, 2 ‘official’ languages, little data



Approach

- Separate geocoding process per country
 - English/French
 - Reduce mismatch of close place names in different countries (Lofa/Labé)
- 2 geocoding processes for business purposes
 - Simple Soundex processing in Python on Admin2 with manually curated lookup table to get guaranteed Admin2
 - Geocoding using OSM POI & other historical survey data to attempt to get populated place
- Several different techniques involved (DB lookup, compound geocoding)
- Never underestimate the need for manual reprocessing!



what3words
addressing the world

2015







UNDERLYING TECHNOLOGY



UNDERLYING TECHNOLOGY



UNDERLYING TECHNOLOGY



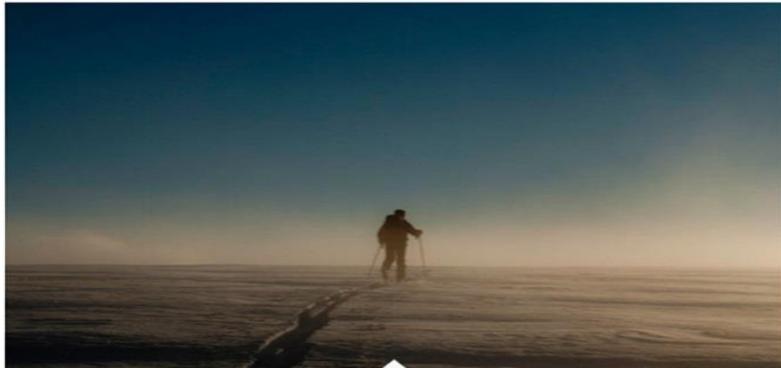
Humanitarian Aid



Navigation



Delivery



Sport & Exploration



Mapping



E-commerce

USE CASES



what3words
addressing the world



what3words is a global grid of 57 trillion 3mx3m squares.

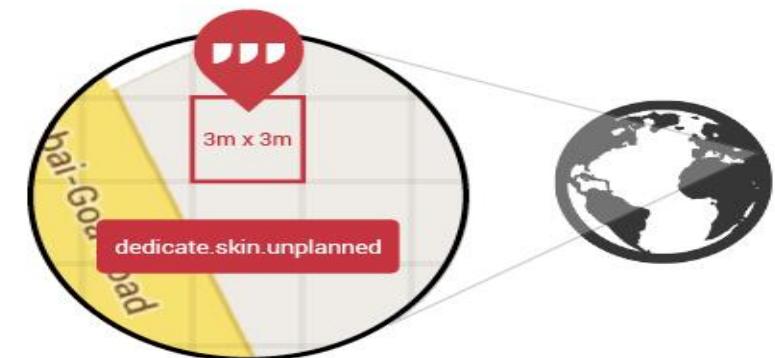
Each square has a 3 word address that can be
communicated quickly, easily and with no ambiguity.

The **geocoder** turns latitude,longitude **coordinates** into 3 word addresses & vice-versa.

Everyone and everywhere now has an **address**.

18.5575014,
73.1289396

=



Questions



Understanding our world.