Working with Locations using ArcGIS Online

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Metadata

- Slides will be available at http://esriurl.com/devsummit13slides
- Code samples at
  - https://github.com/deelesh/batch-geocoding-python
  - https://github.com/BradNiemand/batch-geocoding-csharp
- http://developers.arcgis.com
Topics

- What is the geocoding service?
- What can I do with the service?
- How to access the service?
- How much will the service cost me?
Geocoding Service

• Turn addresses into coordinates

• Search for point-of-interest, business names

• Convert coordinates into addresses

• Convert a table of addresses into points
Geosearch
You can locate an address, or find a place, feature, or point-of-interest. The search result is displayed on the map.

Batch Geocoding
You can convert an address to an x, y coordinate and append the result to an existing record in a database.

Reverse Geocode
You can also reverse geocode an x, y coordinate to get an address.
Geocoding Service Operations

• If your input is single text field – use `find` operation

  https://geocode.arcgis.com/arcgis/rest/services/World/GeocodeServer/find?text=Palm Springs,CA&f=json

• Pass in location and distance to perform local search

Geocoding Service Operations

• If your input is in multiple text fields – use findAddressCandidates operation

https://geocode.arcgis.com/arcgis/rest/services/WorldGeocodeServer/findAddressCandidates?Address=277 N Avenida Caballeros&City=Palm Springs&Region=CA&Postal=92262&f=json

• Same options as the find operation
Geocoding Service Operations

• To convert coordinates into an address – use reverseGeocode operation

Geocoding Operations - Demo

- find, findAddressCandidates, reverseGeocode
Batch Geocoding

• Convert a table of addresses into points

• Synchronous operation that supports SuggestedBatchSize (currently set to 150) records per request
  - Requires chunking of inputs on client side

• Workflows to perform batch geocoding
  - Geocode Addresses geoprocessing tool
  - Use addItem, analyze, generate and publish operations from ArcGIS Online
  - geocodeAddresses operation from the geocoding service
Geocode Addresses geoprocessing tool

- Available with ArcGIS for Desktop, ArcGIS Engine and ArcGIS for Server
- Requires an ArcGIS Server connection file (.ags file)
- Automatically chunks your input table
- Handles timeouts and failure from any intermediate requests
Geocode Addresses geoprocessing tool

- Create ArcGIS Server connection file using ArcGIS for Desktop
Geocode Addresses geoprocessing tool

- Geocode Addresses geoprocessing tool

Specify locator from the .ags file

Map fields from the input table
Scripting Geocode Addresses geoprocessing tool with Python

- Create ArcGIS Server connection file using `arcpy.mapping.CreateGISServerConnectionFile`

- Map the input service fields with fields from your input table

- Call `arcpy.geocoding.GeocodeAddresses` function
Demo – Scripting Geocode Addresses geoprocessing tool with Python

- Get the script from https://github.com/deelesh/batch-geocoding-python
Batch Geocoding using analyze, generate, publish

- Operations available with arcgis.com
- Make use of the geocoding service behind the scenes
- Useful when working with web maps and apps
- Simplifies client-side logic
  - Automatically chunks input table
  - Multi-threaded and sends multiple batches
  - Handles timeouts and failure from any intermediate requests
Batch Geocoding using analyze and generate

- Example use case: Drag and drop a CSV file to perform batch geocoding and save results in a web map

  - Use **analyze** to get publishParameters
    
    https://www.arcgis.com/sharing/rest/content/features/analyze?file=<file name>&type=csv&f=json

  - Use **generate** to geocode the CSV file and create JSON feature collection that can be persisted in a web map
    
    https://www.arcgis.com/sharing/rest/content/features/generate?token=<your token>&file=<file name>&type=csv&publishParameters=<publish parameters>&f=json
Batch Geocoding using addItem, analyze and publish

- Example use case: Upload a CSV file to arcgis.com and publish the file as a feature service

- Use **addItem** to upload the file to arcgis.com and get the item id
  
  https://www.arcgis.com/sharing/rest/content/users/<username>/addItem?token=<your token>&file=<filename>&type=csv&itemInfoParameters=<item info parameters>&f=json

- Use the item id with **analyze** to get publishParameters
  
  https://www.arcgis.com/sharing/rest/content/features/analyze?itemID=<item ID>&type=csv&f=json

- Use **publish** to geocode the uploaded CSV file and save the results as a feature service
  
  https://www.arcgis.com/sharing/rest/content/users/<username>/publish?token=<your token>&itemID=<item ID>&filetype=csv&publishParameters=<publish parameters>&f=json
Batch Geocoding using `geocodeAddresses` operation

- Need to provide the client side logic to
  - Chunk input table into batches of size `SuggestedBatchSize` (currently set to 150)
  - Handle timeouts and failure from any intermediate requests
  - Persist the results from each successful intermediate requests
  - Send multiple batches simultaneously to reduce the overall response time

- Useful if batch geocoding is part of a back end enterprise process
Batch Geocode Access

- Batch geocoding is secured and requires ArcGIS Online Organization Subscription
  - Sign up for a 30 day free trial at www.arcgis.com

- Authentication
  - OAuth2 and non-OAuth2
  - User logins vs App logins

- Enterprise Identity using SAML 2
Demo - Batch Geocoding using `geocodeAddresses` operation

- Get the code sample from [https://github.com/BradNiemand/batch-geocoding-csharp](https://github.com/BradNiemand/batch-geocoding-csharp)
Understanding Your Bill – Service Credits

- Every successful batch geocoding request deducts credits from your organization

- Credit usage reported as number of geocodes

- Credits Explained