

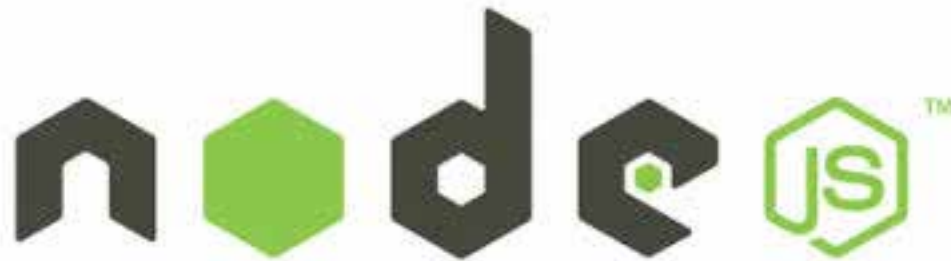
node-geoservices-adapter

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@agup

<https://github.com/Esri/node-geoservices-adaptor>

Open Source
Prototype



Why?

Bring live external data sources into ArcGIS
Using custom data adapters

The logo for City Bikes is rendered in a stylized, bubbly font. The letters are filled with a bright yellow color and feature a fine, grid-like pattern. Each letter is outlined with a thick, black border, giving it a three-dimensional, pop-art appearance. The text reads "City Bikes" in a cursive-like, rounded script.

<http://citybik.es>

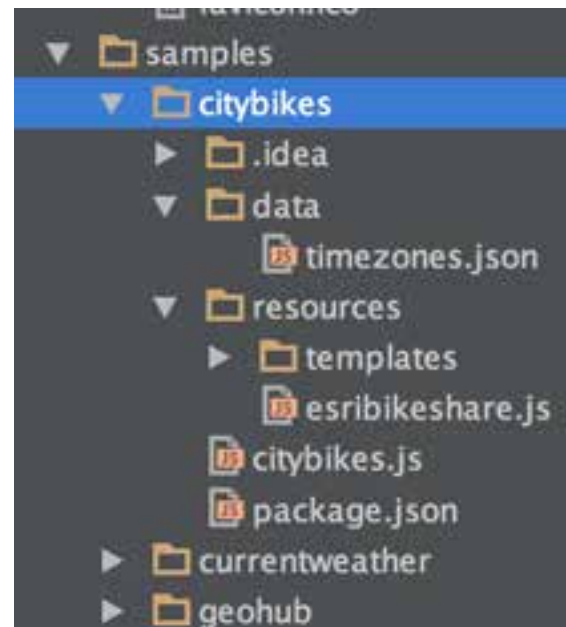
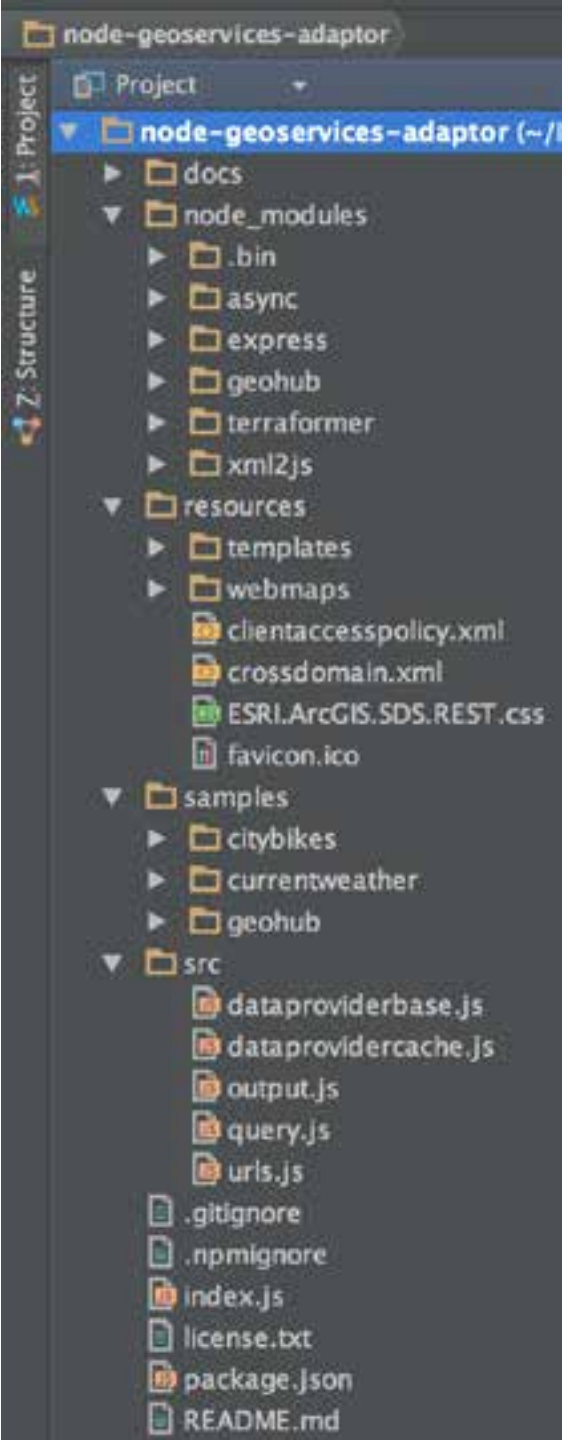
[JSON](#)

Folder: /

Current Version: 10.1

Services:

- [a_rua](#) (FeatureServer)
- [albacete](#) (FeatureServer)
- [alhama_de_murcia](#) (FeatureServer)
- [almunecar](#) (FeatureServer)
- [antequera](#) (FeatureServer)
- [aranda_de_duero](#) (FeatureServer)
- [aranjuez](#) (FeatureServer)
- [badajoz](#) (FeatureServer)
- [baeza](#) (FeatureServer)
- [barclays](#) (FeatureServer)
- [bay-area-bike-share](#) (FeatureServer)
- [bayareabikeshare](#) (FeatureServer)



Live Data

2 Options

Batch

Pre-process

On-Demand

Live Translation

Batch

Batch

Pre-process

- Slowly changing data
- Needs processing
- Map Service

Batch



On-Demand

On-Demand
Live Translation

- Always changing data
- Already geocoded
- Feature Service

<https://github.com/esri/node-geoservices-adaptor>

On-Demand

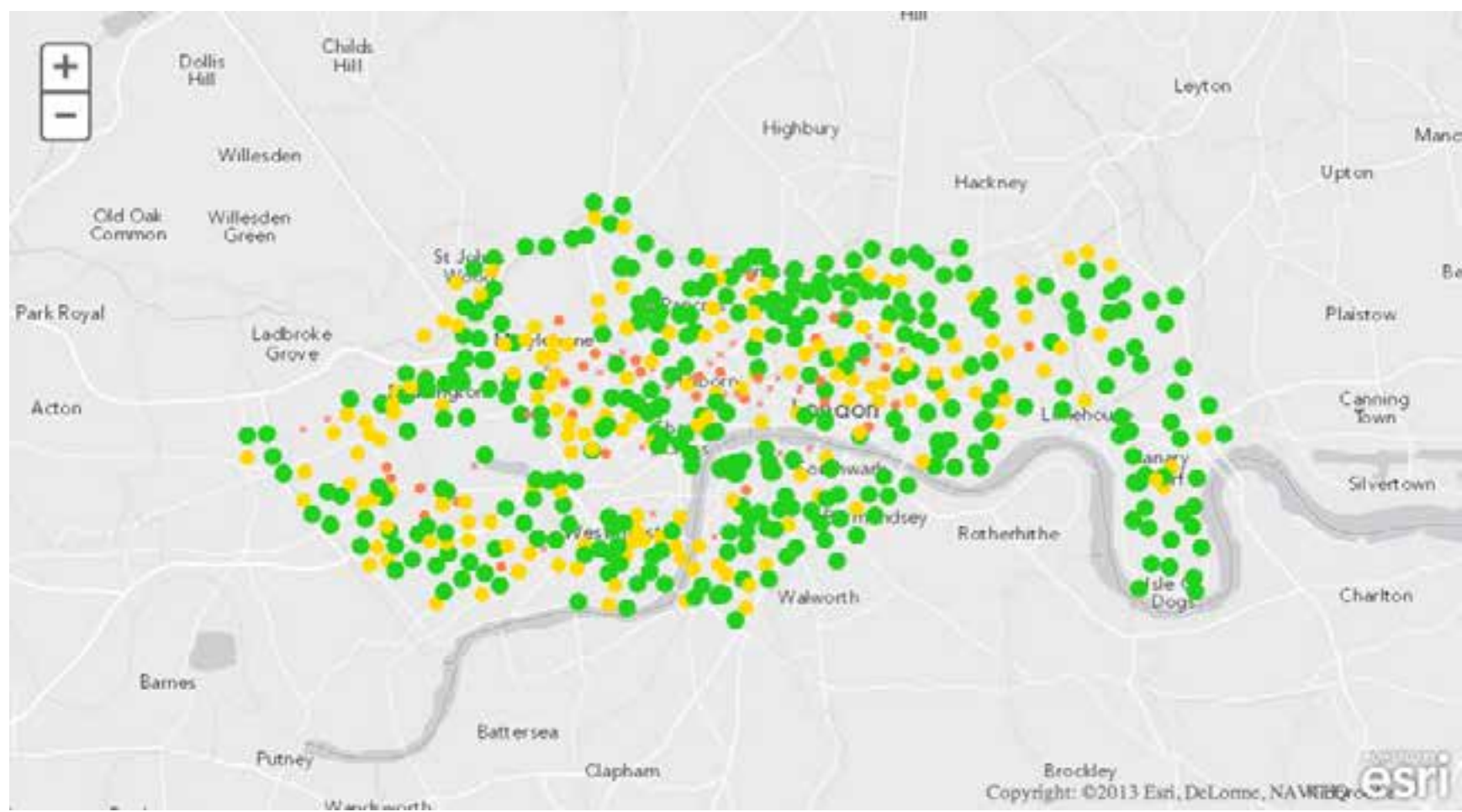




ArcGIS Tools + APIs

EITHER WAY

node-geoservice + ArcGIS JS API



Runtimes

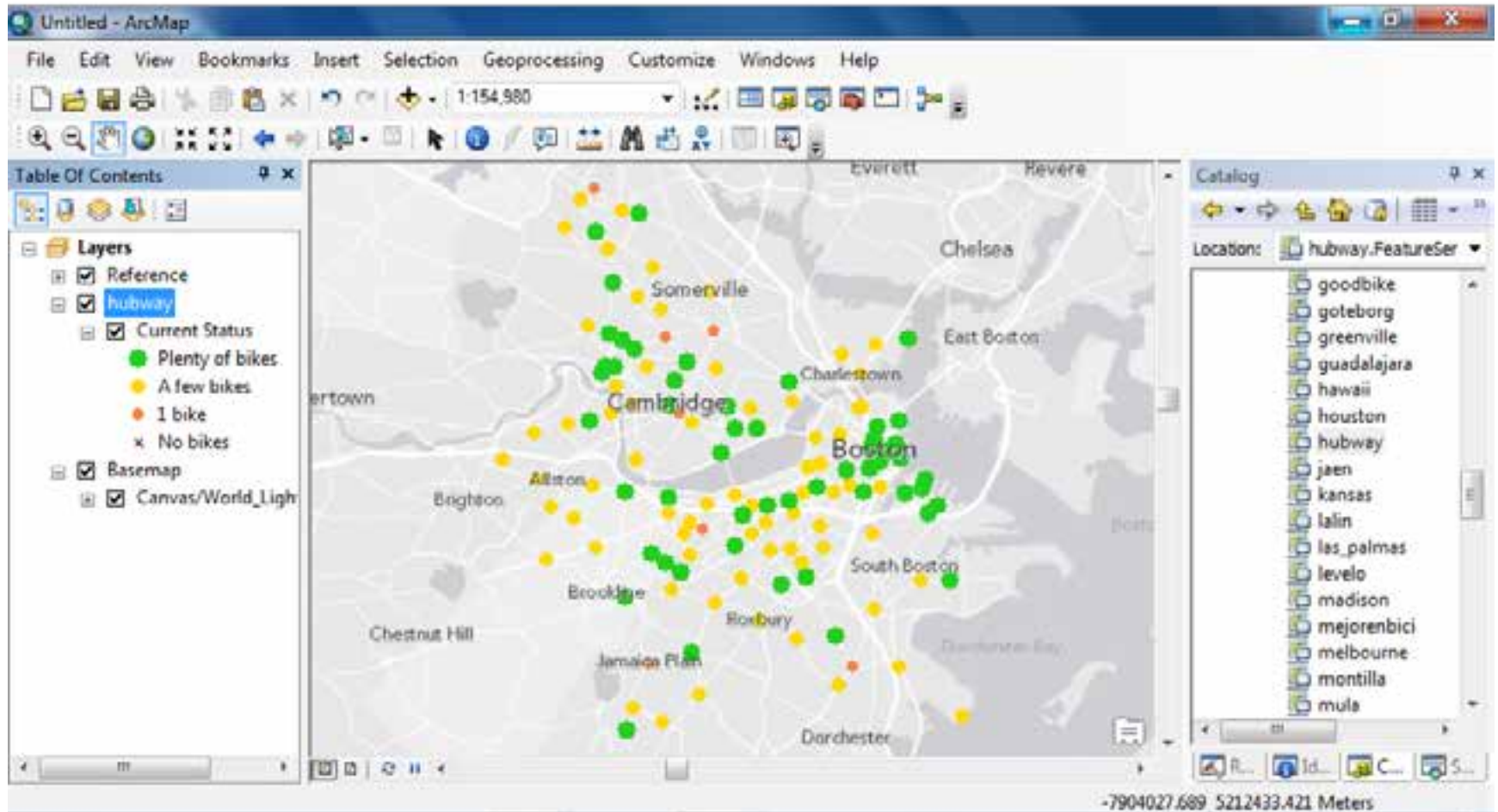


WebMaps & AGOL Apps

Citibike Live Status



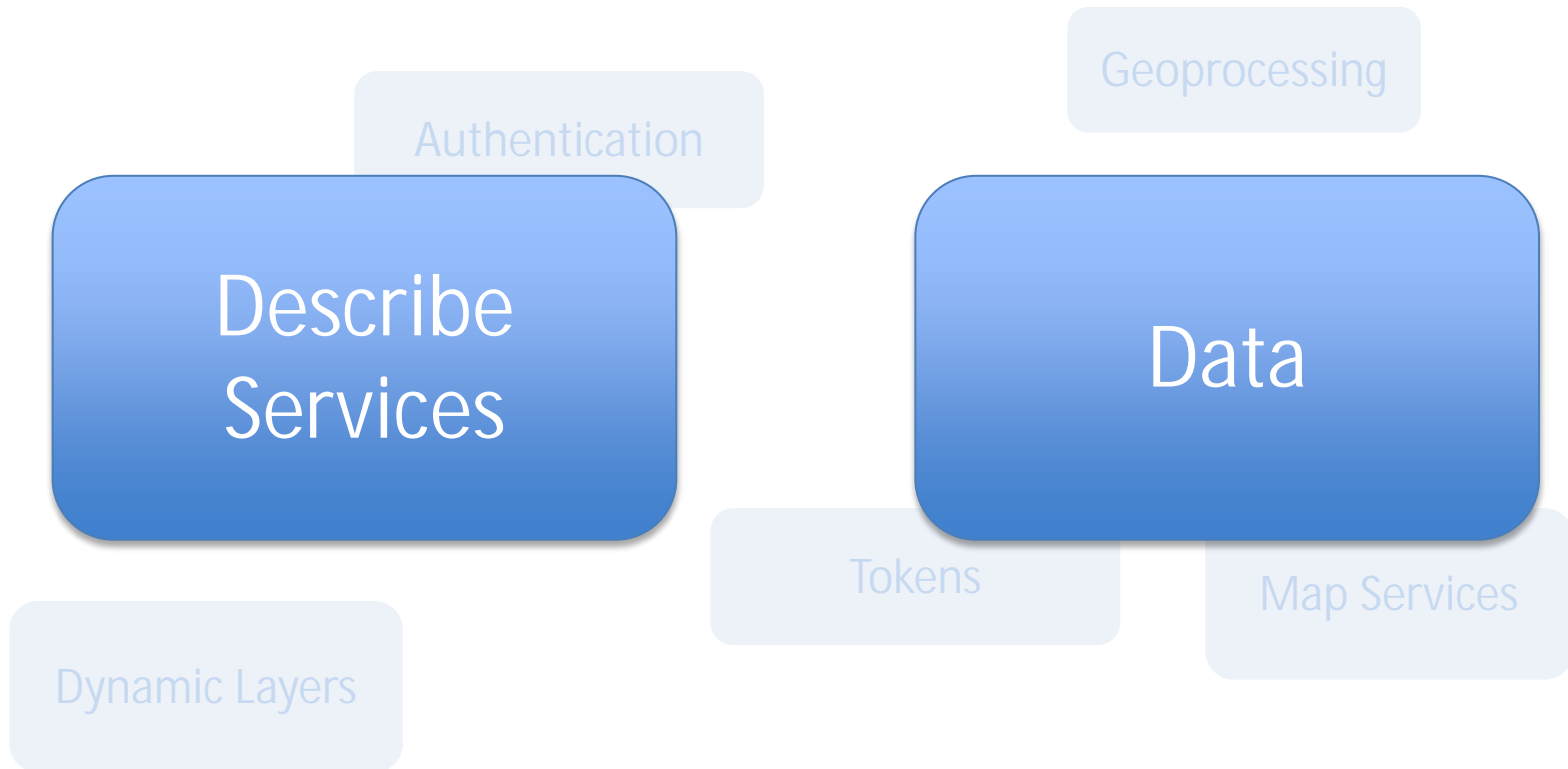
ArcGIS Desktop



DEMO

What does it look like?

Implement



Describe

- APIs and Tools ask...
 - What can the server do?
 - Where do I ask for data?
 - What will the data look like?

```
32 var cityBikesFields = [  
33   {"name": "id", "type": "esriFieldTypeInteger", "alias": "ID", "nullable": "true"},  
34   {"name": "idx", "type": "esriFieldTypeInteger", "alias": "IDX", "nullable": "true"},  
35   {"name": "name", "type": "esriFieldTypeString", "alias": "Name", "length": "255", "n  
36   {"name": "number", "type": "esriFieldTypeInteger", "alias": "Number", "nullable": "t  
37   {"name": "free", "type": "esriFieldTypeInteger", "alias": "Free", "nullable": "true"  
38   {"name": "bikes", "type": "esriFieldTypeInteger", "alias": "Bikes", "nullable": "tru  
39   {"name": "bikesClass", "type": "esriFieldTypeString", "alias": "Bikes Class", "length  
40   {"name": "docksClass", "type": "esriFieldTypeString", "alias": "Docks Class", "length  
41   {"name": "address", "type": "esriFieldTypeString", "alias": "Address", "length": "25  
42   {"name": "citybikesTimeString", "type": "esriFieldTypeString", "alias": "CityBikes Ti  
43   {"name": "utcTime", "type": "esriFieldTypeDate", "alias": "UTC Timestamp", "length":  
44   {"name": "timezone", "type": "esriFieldTypeString", "alias": "Timezone Code", "length  
45   {"name": "timezoneOffset", "type": "esriFieldTypeInteger", "alias": "Timezone Offset"  
46   {"name": "timezoneOffsetString", "type": "esriFieldTypeString", "alias": "Timezone Of  
47   {"name": "localTimeString", "type": "esriFieldTypeString", "alias": "Local Time", "le  
48 ];  
49  
50 var bikeClassificationScheme = {  
51   "0": { "min": 0, "max": 0, "label": "No bikes" },  
52   "1": { "min": 1, "max": 1, "label": "1 bike" },  
53   "few": { "min": 2, "max": 8, "label": "A few bikes" },  
54   "plenty": { "min": 9, "max": 10000, "label": "Plenty of bikes" }  
55 };  
56  
57 var dockClassificationScheme = {  
58   "0": { "min": 0, "max": 0, "label": "No docks" },  
59   "1": { "min": 1, "max": 1, "label": "1 dock" },  
60   "2": { "min": 2, "max": 2, "label": "2 docks" },  
61   "3": { "min": 3, "max": 3, "label": "3 docks" },  
62   "4": { "min": 4, "max": 4, "label": "4 docks" },  
63   "few": { "min": 5, "max": 10, "label": "5-10 docks" },  
64   "plenty": { "min": 11, "max": 10000, "label": "Plenty of docks" }  
65 };
```

Define: Info

- What does the server do?
 - Version (implies capabilities)
 - Authentication?

```
{  
  "currentVersion": 10.1,  
  "fullVersion": "10.1",  
  "authInfo": {  
    "isTokenBasedSecurity": false  
  }  
}
```

Define: Services

- Citybikes:
 - 1 service = 1 city

ArcGIS REST Services Directory

[Home](#) > [services](#)

[JSON](#)

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- [bicikelj](#) (FeatureServer)
- [bicileon](#) (FeatureServer)
- [bicing](#) (FeatureServer)
- [bicio](#) (FeatureServer)
- [bicloo](#) (FeatureServer)
- [bikemi](#) (FeatureServer)
- [bixi](#) (FeatureServer)

Output: Service Description JSON

```
{
  "currentVersion": 10.1,
  "services": [
    {
      "name": "a_rua",
      "type": "FeatureServer",
      "url": "/citybikes/rest/services/a_rua/FeatureServer"
    },
    {
      "name": "albacete",
      "type": "FeatureServer",
      "url": "/citybikes/rest/services/albacete/FeatureServer"
    }
    . . .
  ]
}
```

Define: Feature Service

- What Layers?
 - current status = 1 layer
- Spatial Reference
- Full extent
- Initial Extent
 - Auto zoom

ArcGIS REST Services Directory

[Home](#) > [services](#) > [barclays \(FeatureServer\)](#)

[JSON](#)

barclays (FeatureServer)

View In: (Not Yet Implemented)

Service Description:

Has Versioned Data: false

Max Record Count: 2000

Supported query Formats: JSON

[All Layers and Tables](#)

Layers:

- [Current Status](#) (0)

Description:

Copyright Text:

Spatial Reference: 4326

Initial Extent:

XMin: -0.224223
YMin: 51.467064
XMax: -0.002275
YMax: 51.542138
Spatial Reference: 4326

Full Extent:

XMin: -180
YMin: -90
XMax: 180
YMax: 90
Spatial Reference: 4326

Output: Feature Service JSON

```
{
  "currentVersion": 10.1,
  "serviceDescription": "",
  "hasVersionedData": false,
  "supportsDisconnectedEditing": false,
  "supportedQueryFormats": "JSON",
  "maxRecordCount": 2000,
  "hasStaticData": true,
  "capabilities": "Query",
  "description": "",
  "spatialReference": {
    "wkid": 4326,
    "latestWkid": 4326
  },
  "copyrightText": "",
  "initialExtent": {
    "xmin": -0.224223,
    "ymin": 51.467064,
    "xmax": -0.002275,
    "ymax": 51.542138,
    "spatialReference": {
      "wkid": 4326,
      "latestWkid": 4326
    }
  },
  "fullExtent": {
    "xmin": -180,
    "ymin": -90,
    "xmax": 180,
    "ymax": 90,
    "spatialReference": {
      "wkid": 4326,
      "latestWkid": 4326
    }
  },
  "allowGeometryUpdates": false,
  "units": "esriDecimalDegrees",
  "syncEnabled": false,
  "layers": [
    {
      "id": 0,
      "name": "Current Status",
      "parentLayerId": -1,
      "defaultVisibility": true,
      "subLayerIds": null,
      "minScale": 0,
      "maxScale": 0
    }
  ],
  "tables": []
}
```


Define: Layer

- Fields
 - ObjectID
 - Name
- Symbology
- Layer Extent

Output: FeatureLayer JSON

```
{
  "currentVersion": 10.1,
  "id": "0",
  "name": "Current Status",
  "type": "Feature Layer",
  "displayField": "name",
  "objectIdField": "id",
  "defaultVisibility": true,
  "isDataVersioned": false,
  "supportsRollbackOnFailureParameter":
false,
  "supportsStatistics": false,
  "supportsAdvancedQueries": false,
  "geometryType": "esriGeometryPoint",
  "extent": {
    "xmin": -0.224223,
    "ymin": 51.467064,
    "xmax": -0.002275,
    "ymax": 51.542138,
    "spatialReference": {
      "wkid": 4326,
      "latestWkid": 4326
    }
  },
  "fields": [],
  "supportedQueryFormats": "JSON",
  "hasStaticData": true,
  "capabilities": "Query",
  "drawingInfo": {}
}
```

```
"fields": [
  {
    "name": "id",
    "type": "esriFieldTypeInteger",
    "alias": "ID",
    "nullable": "true"
  },
  {
    "name": "name",
    "type": "esriFieldTypeString",
    "alias": "Name",
    "length": "255",
    "nullable": "true"
  },
  {
    "name": "free",
    "type": "esriFieldTypeInteger",
    "alias": "Free",
    "nullable": "true"
  },
  {
    "name": "bikes",
    "type": "esriFieldTypeInteger",
    "alias": "Bikes",
    "nullable": "true"
  },
  ...
],
```

Define: Query

- Ask for data
 - Clip extent
 - Spatial Reference
 - Fields List

Simple Query only

- Simplest query returns all rows
 - Query by envelope
 - Query by Object IDs

DEMO

Output ArcGIS Query JSON

Future Enhancements

- 304 responses for client-caching
 - JavaScript API “grids” requests so that a server can be smart about client-side caching
- Geometry generalization – simplify.js

ArcGIS Server does a lot more!

- Generalizing
- All projections
- Statistics
- Where clauses, Group By
- Full Geometry queries with SpatialRel
- Map Services, Dynamic Services, Time-aware
- Geometry Service, GP Tasks
- Additional Field Types. Domains. Related Tables.
- Clusters, Scaling load (consider ArcGIS Online or AWS)
- Portal Integration
- ...

Node.js, GitHub, Open Source

- Find the source for this at GitHub
- This is a developer's playpen
- Proof of concept.
- You would not design a robust system like this.
- For a more robust project, see Koop (also on GitHub).

Our solution very simple

- Quickly process simple queries
- That's all

<https://github.com/esri/koop>

Questions

node-geoservices-adaptor

<http://github.com/esri/node-geoservices-adaptor>

<http://github.com/esri/koop>

<http://nodejs.org>

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