



Bringing Open Data into ArcGIS Online

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Summit Europe**

11-13 November 2013
Park Plaza Riverbank London





Open data

searchable in ArcGIS Online



Standards

- **Catalogue Service for the Web (CSW)**
<http://www.opengeospatial.org/standards/cat>
- **Comprehensive Knowledge Archive Network (CKAN)**
<http://ckan.org>

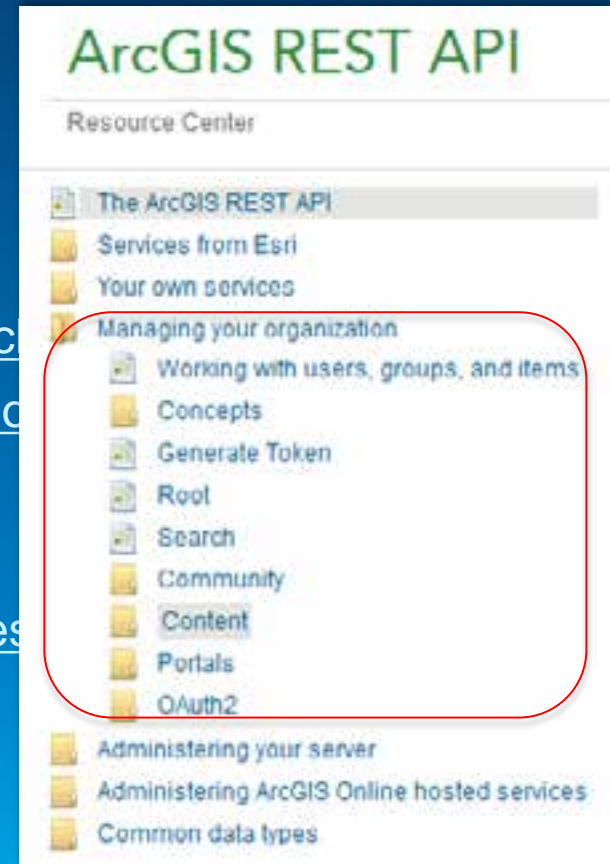


Implementation & Architecture

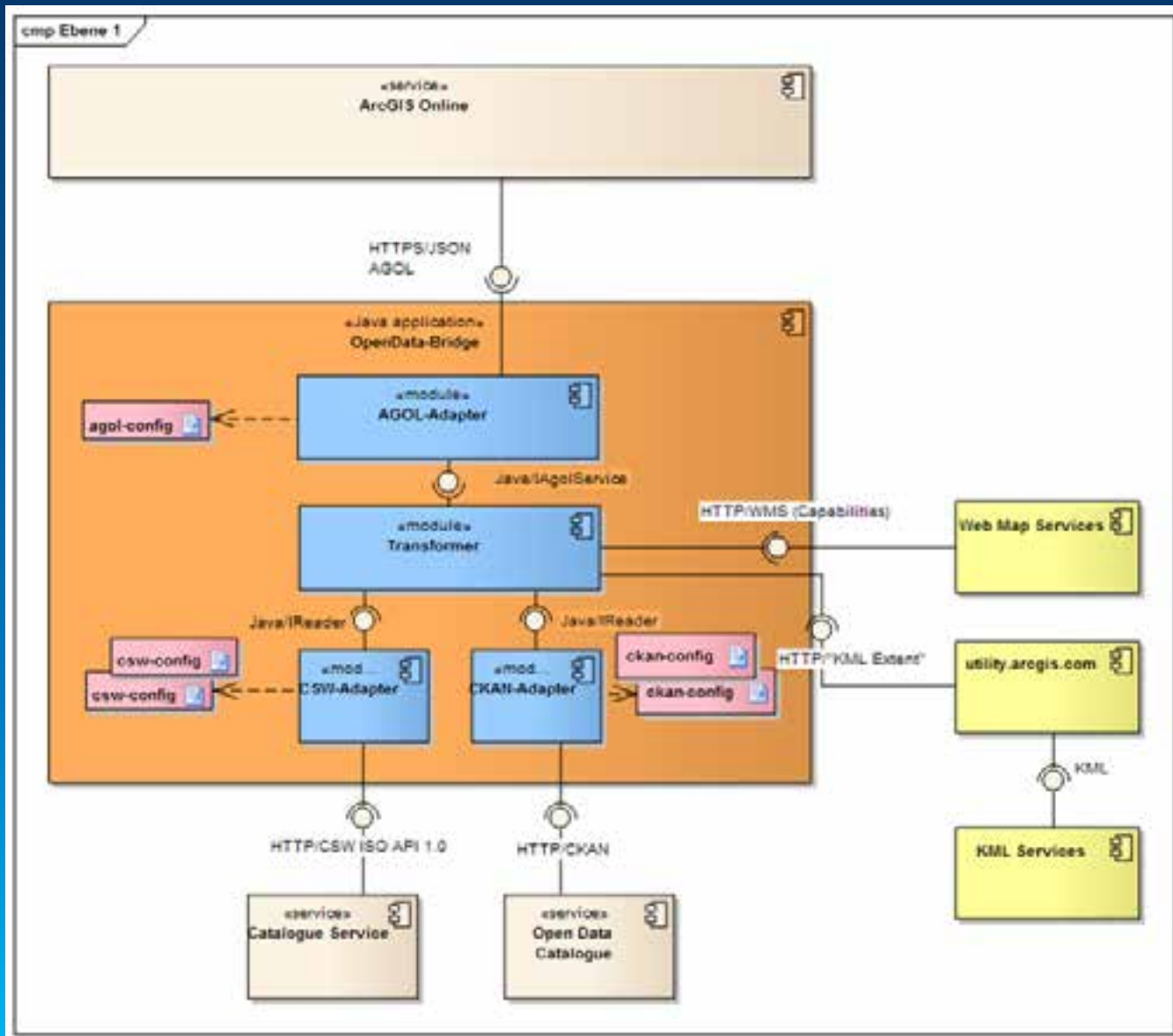


Implementation of the „OpenDataBridge“

- Java
- IntelliJ IDEA, Maven, Spring
- Libraries:
 - CSW, CKAN, KML readers
 - Apache HttpComponents (<http://hc.apache.org/>)
 - Jackson – JSON processor (<http://jackson.codehaus.org/>)
- **ArcGIS REST API**
<http://resources.arcgis.com/en/help/arcgis-rest-api/>

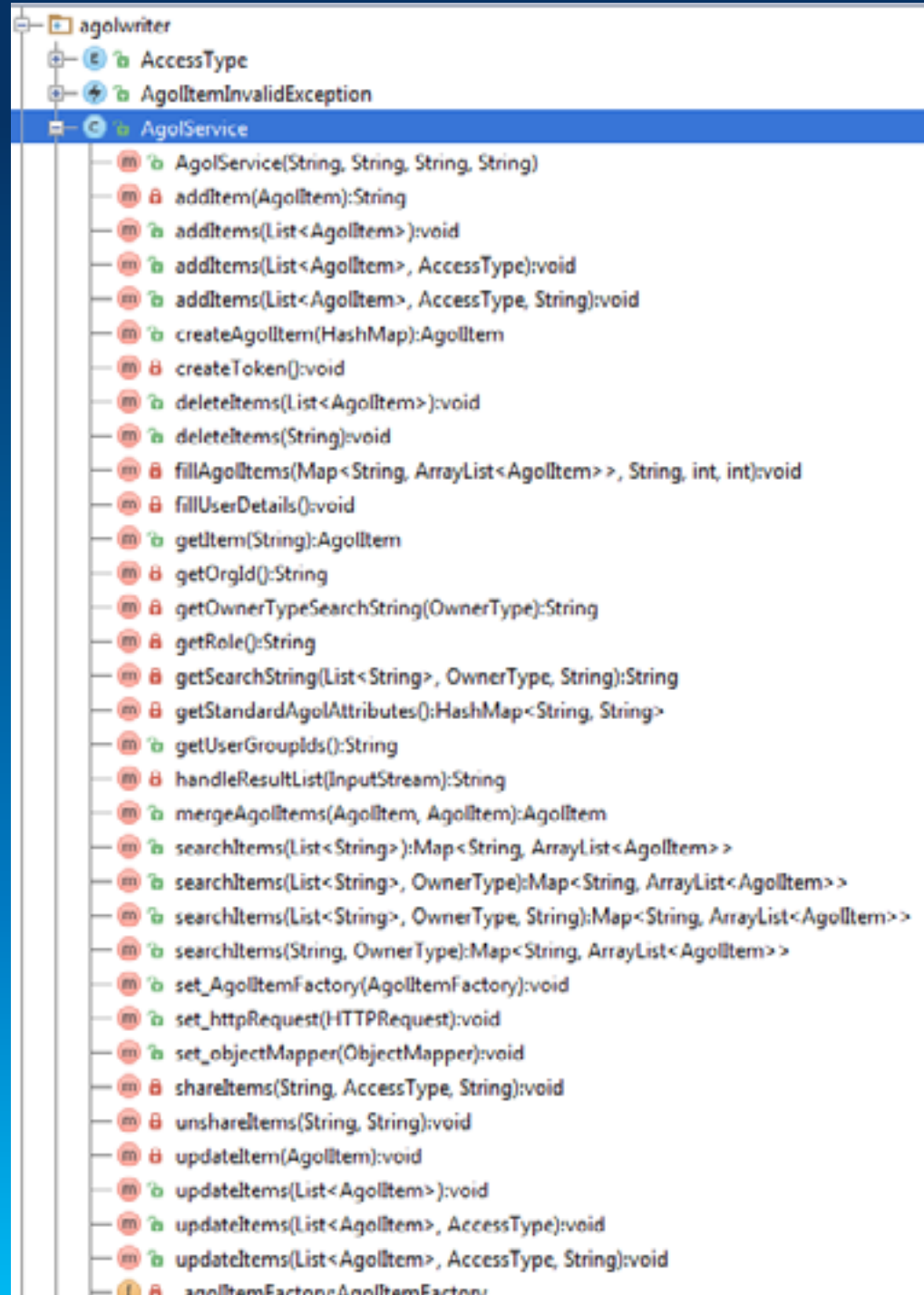


Architecture



AgolService

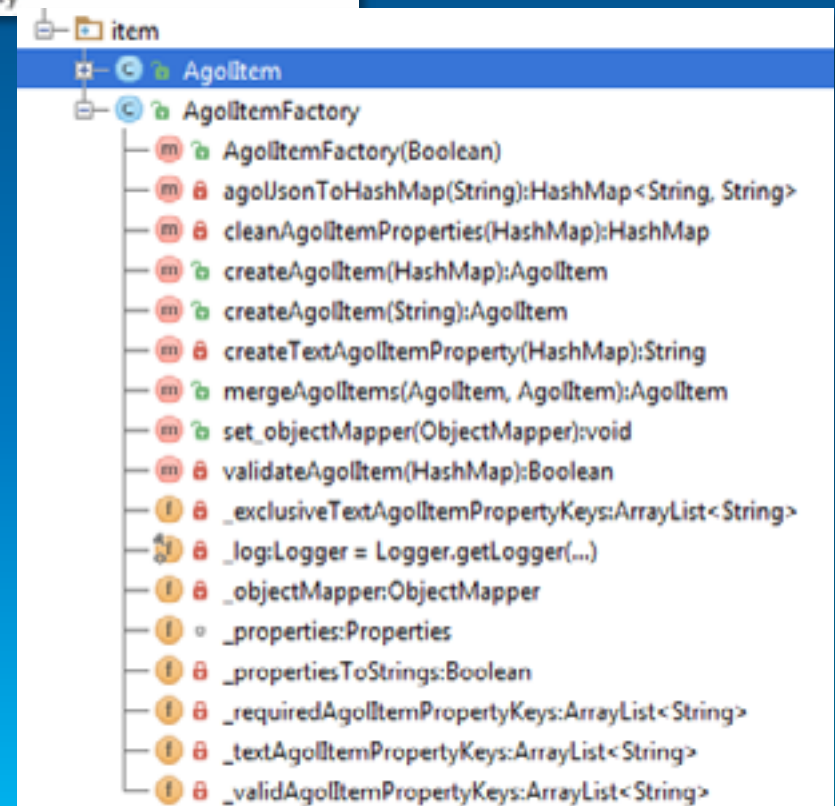
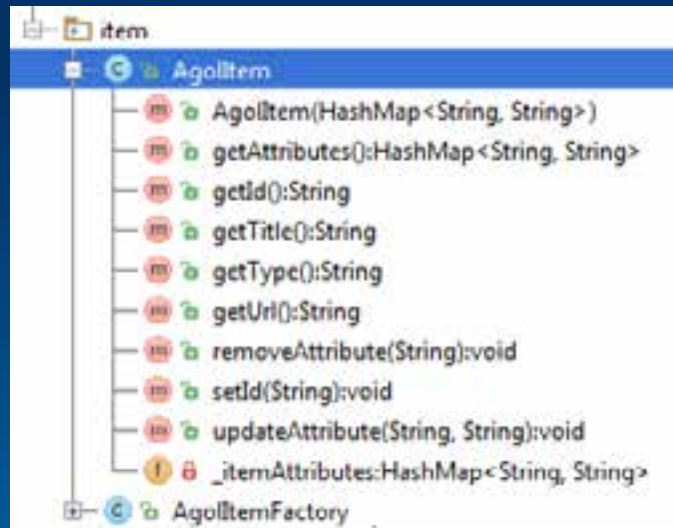
- Token authentication
- Read items
- Upload items
- Share items
- Delete items



```
agolwriter
├── AccessType
├── AgolItemInvalidException
└── AgolService
    ├── AgolService(String, String, String, String)
    ├── addItem(AgolItem):String
    ├── addItem(List<AgolItem>):void
    ├── addItem(List<AgolItem>, AccessType):void
    ├── addItem(List<AgolItem>, AccessType, String):void
    ├── createAgolItem(HashMap):AgolItem
    ├── createToken():void
    ├── deleteItems(List<AgolItem>):void
    ├── deleteItems(String):void
    ├── fillAgolItems(Map<String, ArrayList<AgolItem>>, String, int, int):void
    ├── fillUserDetails():void
    ├── getItem(String):AgolItem
    ├── getOrgId():String
    ├── getOwnerTypeSearchString(OwnerType):String
    ├── getRole():String
    ├── getSearchString(List<String>, OwnerType, String):String
    ├── getStandardAgolAttributes():HashMap<String, String>
    ├── getUserGroupIds():String
    ├── handleResultList(InputStream):String
    ├── mergeAgolItems(AgolItem, AgolItem):AgolItem
    ├── searchItems(List<String>):Map<String, ArrayList<AgolItem>>
    ├── searchItems(List<String>, OwnerType):Map<String, ArrayList<AgolItem>>
    ├── searchItems(List<String>, OwnerType, String):Map<String, ArrayList<AgolItem>>
    ├── searchItems(String, OwnerType):Map<String, ArrayList<AgolItem>>
    ├── set_AgolItemFactory(AgolItemFactory):void
    ├── set_httpRequest(HTTPRequest):void
    ├── set_objectMapper(ObjectMapper):void
    ├── shareItems(String, AccessType, String):void
    ├── unshareItems(String, String):void
    ├── updateItem(AgolItem):void
    ├── updateItems(List<AgolItem>):void
    ├── updateItems(List<AgolItem>, AccessType):void
    ├── updateItems(List<AgolItem>, AccessType, String):void
    └── AgolItemFactory:AgolItemFactory
```

AgollItem

- Data holding



Workflow



ArcGIS Online REST API usage

Basic URLs

URLs

Token

Search

Item Details

Add

Update

Delete

```
/**
 * Constructor
 * @param baseUrl
 * @param userName
 * @param password
 * @param referer
 */
public AgolService(String baseUrl, String userName, String password, String referer) {
    _baseUrl = baseUrl;
    _userName = userName;
    _password = password;
    _referer = referer;

    _rootUrl = _baseUrl + "/sharing/rest";
    _userContentUrl = _rootUrl + "/content/users/" + _userName;
    _selfUrl = _rootUrl + "/community/self";
    _contentUrl = _rootUrl + "/content";
}
```

ArcGIS Online REST API usage

Token Authentication

URLs

Token

Search

Item Details

Add

Update

Delete

```
private void createToken() throws IOException {  
    String generateTokenBaseUrl = "https://www.arcgis.com/sharing/generateToken";  
  
    HashMap<String, String> agolAttributes = new HashMap<>();  
    agolAttributes.put("f", "json");  
    agolAttributes.put("username", _userName);  
    agolAttributes.put("password", _password);  
    agolAttributes.put("referer", _referer);  
  
    InputStream entities = _httpClient.executePostRequest(generateTokenBaseUrl, agolAttributes, null);  
  
    if (entities != null)  
    {  
        JsonNode rootNode = _objectMapper.readTree(entities);  
        JsonNode tokenNode = rootNode.get("token");  
        _token = tokenNode.asText();  
        String tokenExpires = rootNode.get("expires").toString();  
        _tokenExpires = Long.valueOf(tokenExpires);  
    }  
}
```

ArcGIS Online REST API usage

Search items

URLs

Token

Search

Item Details

Add

Update

Delete

```
/**
 * Get items request
 * @param searchString
 * @param startWithItemNumber: Integer value for recursive calls - 100 items are the maximum re
 * @throws IOException
 */
private void fillAgolItems(Map<String, ArrayList<AgolItem>> _agolItems, String searchString, in
    int agolItemsPaginationNextStart:
    int totalItemsCount;
    int retrievedItemsCount;
    int duplicateUrlsCount = 0;
    String searchUrl = _rootUrl + "/search";
    HashMap<String, String> agolAttributes = getStandardAgolAttributes();

    agolAttributes.put("q", searchString);
    agolAttributes.put("num", "100"); // Maximum value: 100
    agolAttributes.put("start", String.valueOf(startWithItemNumber));

    InputStream entities = _httpClient.executePostRequest(searchUrl, agolAttributes, null);

    if (entities != null)
    {
        JsonNode rootNode = _objectMapper.readTree(entities);
    }
}
```

ArcGIS Online REST API usage

Get item details

URLs

Token

Search

Item Details

Add

Update

Delete

```
/**
 * Get a specific item including Sharing information
 * @param itemId
 * @return
 */
public AgolItem getItem(String itemId) throws IOException, AgolTransactionFailedException,
String itemUrl = contentUri + "/items/" + itemId;
HashMap<String, String> agolAttributes = getStandardAgolAttributes();
InputStream entities = _httpClient.executePostRequest(itemUrl, agolAttributes, null);
if (entities != null)
{
    JsonNode rootNode = _objectMapper.readTree(entities);
    JsonNode errorNode = rootNode.get("error");
    if (errorNode != null) {
        throw new AgolTransactionFailedException("Getting item with ID " + itemId + "
    }
    AgolItem agolItem = _agolItemFactory.createAgolItem(rootNode.toString());

    if (errorNode == null) {
```

Transformer

Reconcile items



ArcGIS Online REST API usage

Add items

URLs

Token

Search

Item Details

Add

Update

Delete

```
/**
 * Add item
 * @param agolItem
 */
private void shareItems(String itemIds, AccessType accessType, String groupIds) throws IOException,
String publishItemsUrl = userContentUrl + "/shareitems";
HashMap<String, String> agolAttributes = getStandardAgolAttributes();

agolAttributes.put("items", itemIds);

String everyone = "false";
String org = "false";
if (accessType.equals(AccessType.PUBLIC)) {
    everyone = "true";
}
else if (accessType.equals(AccessType.ORG)) {
    org = "true";
}
agolAttributes.put("everyone", everyone);
agolAttributes.put("org", org);
// PRIVATE items are not shared with anyone. Set AccessType.SHARED to share only with groups.
if (!accessType.equals((AccessType.PRIVATE))) {
    agolAttributes.put("groups", groupIds);
}
InputStream entities = _httpClient.executePostRequest(publishItemsUrl, agolAttributes, null);

String successItems = "";
try {
    successItems = handleResultList(entities);
}
```

ArcGIS Online REST API usage

Update items

URLs

Token

Search

Item Details

Add

Update

Delete

```
private void updateItem(AgolItem agolItem) throws IOException, AgolTransactionFailedException {  
    String userItemUrl = _userContentUrl + "/items/" + agolItem.getId();  
    String updateItemUrl = userItemUrl + "/update";  
  
    HashMap<String, String> agolAttributes = getStandardAgolAttributes();  
    agolAttributes.putAll(agolItem.getAttributes());  
  
    InputStream entities = _httpClient.executePostRequest(updateItemUrl, agolAttributes, null);  
    if (entities != null)  
    {  
        JsonNode rootNode = _objectMapper.readTree(entities);  
  
        JsonNode errorNode = rootNode.get("error");  
        if (errorNode != null)  
        {  
            throw new AgolTransactionFailedException("Updating item \"" + agolItem.getTitle().toString() + "\" failed: " + errorNode.toString());  
        }  
    }  
}
```

```
private void shareItems(String itemIds, AccessType accessType, String userContentUrl)  
{  
    String publishItemUrl = userContentUrl + "/shareItems";  
    HashMap<String, String> agolAttributes = getStandardAgolAttributes();  
}
```


ArcGIS Online REST API usage

Delete items

URLs

Token

Search

Item Details

Add

Update

Delete

```
public void deleteItems(String itemIds) throws IOException, AgolTransactionFailedException {  
    String deleteItemsUrl = userContentUrl + "/deleteitems";  
    HashMap<String, String> agolAttributes = getStandardAgolAttributes();  
    agolAttributes.put("items", itemIds);  
    InputStream entities = _httpClient.executePostRequest(deleteItemsUrl, agolAttributes, null);  
    String successItems = "";  
    try {  
        successItems = handleResultList(entities);  
    }  
    catch (Exception e) {  
        throw new AgolTransactionFailedException("Deleting the following items failed: \n" + e.getMessage());  
    }  
    if (_log.isInfoEnabled()) {  
        _log.info("Items \"" + successItems + "\" have been deleted from your ArcGIS Online account.");  
    }  
}
```

ArcGIS Online REST API usage

All in one

URLs

Token

```
String generateTokenBaseUrl = "https://www.arcgis.com/sharing/generateToken";
```

Search

```
String searchUrl = rootUrl + "/search";
```

Item Details

```
String itemUrl = contentUrl + "/items/" + itemId;
```

Add

```
String addItemUrl = userContentUrl + "/addItem";
```

```
String publishItemUrl = _userContentUrl + "/shareItems";
```

Update

```
String updateItemUrl = userItemUrl + "/update";
```

```
String publishItemUrl = _userContentUrl + "/shareItems";
```

Delete

```
String deleteItemsUrl = userContentUrl + "/deleteItems";
```

Example: shareItems via API and UI

```
.executePostRequest (publishItemUri, agolAttributes, null);
```

agolAttribut

agolAttributes = (java.util.HashMap@2345) size = 6

- [0] = (java.util.HashMap\$Entry@1400) "f" -> "json"
- [1] = (java.util.HashMap\$Entry@1411) "items" -> "5e070626632942b1bf0695dcd82c2703"
- [2] = (java.util.HashMap\$Entry@1414) "token" -> "2f8fwwulku3kf53G6bkZvn8RMFBctbbwRpbG5OKXOLN5Qfo26lPkqu4Kg7p3Tf"
- [3] = (java.util.HashMap\$Entry@141) "org" -> "true"
- [4] = (java.util.HashMap\$Entry@141) "everyone" -> "false"
- [5] = (java.util.HashMap\$Entry@142) "groups" -> "3434b1a3533943639da20d0ae27db5ae,f4fce594945d460cbfa9c22d7f402da7"

Name	Type	Created	Sharing	Size
HH_WMS_DKS.aspx_frei	WMS	29.04.2013	Organisation	1 KB
HH_WMS_DKS.aspx_NF	WMS	29.04.2013	Nicht freigegeben	1 KB
IntegrationTest_DKS-1360719005	WMS	16.05.2013	Organisation	1 KB
Punkttexte des Biotopkataster von Rheinland-Pfalz	WMS	15.05.2013	Nicht freigegeben	1 KB
Yellowstone91	Service Definition	09.04.2013	Nicht freigegeben	247 KB
Yellowstoneadren	Annotation	09.04.2013	Nicht freigegeben	1 KB

Freigeben

Element(e) freigeben für:

- Alle (öffentlich)
- esri-de-1
- Diese Gruppen:

- AgofTestgruppe1
- Test-Kuschelgruppe

Diese Einstellungen ersetzen die aktuellen Einstellungen.

OK Abbrechen

Configuration



Parser configuration

```
remolent_WMS.properties
1 item.count=14
2
3 item[0].md.id=agol.
4 item[0].md.type=ckan
5 item[0].md.value=/r
6 item[0].value.handl
7
8 item[1].md.id=agol.
9 item[1].md.type=ckan
10 item[1].md.value=/r
11 item[1].value.handl
12
13 item[2].md.id=agol.
14 item[2].md.type=ogc
15 item[2].md.value=co
16 item[2].value.handl
17
18 item[3].md.id=agol.
19 item[3].md.type=ckan
20 item[3].md.value=/r
21 item[3].value.handl
22
23 item[4].md.id=agol.
24 item[4].md.type=ogc
25 item[4].md.value=/W
26 item[4].value.handl
27
28 item[5].md.id=agol.
```

Resource Center Anzeigen: Nur Webinhalt Mark Anthony Benachrichtigungen Hilfe Abmelden

ArcGIS GALERIE KARTE GRUPPEN EIGENE INHALTE

WMS Digitale Karte 1: 5000 (MapService) title

thumbnail **type** **snippet**

Hier steht der Snippet-Text **snippet**
WMS von anm.de
Zuletzt geändert: 17. Januar 2013
0 Bewertungen, 0 Aufrufe
Facebook Twitter

Beschreibung description

Dieser WebMapService (WMS) stellt die Digitale Karte 1: 5000 bereit. Die Digitale Karte 1: 5000 (DKS) enthält eine grundrissepgetreue Abbildung des Hamburgischen Staatsgebietes ergänzt um topographische Inhalte und Informationen als detaillierte Grundlage für diverse Anwendungen in Wirtschaft, Verwaltung und Planung. Weitere Daten des Dienstes, die nicht standard-konform (ISO 19119) hinterlegt werden können, zum Teil gemäß INSPIRE-Direktive aber bereit zu stellen sind*: Systemumgebung: ArcGISServer (environmentDescription/gco:CharacterString= ArcGISServer) Erläuterung zum Fachbezug: Zur genaueren Beschreibung der Daten und Datenverantwortung siehe Verweise (supplementalInformation/gco:CharacterString= Zur genaueren Beschreibung der Daten und Datenverantwortung siehe Verweise) --- * Nähere Informationen zur INSPIRE-Direktive: http://inspire.jrc.ec.europa.eu/implementingRulesDocs_md.cfm

Zugriffs- und Nutzungsbeschränkungen accessInformation

REST Connection url

http://gateway.hamburg.de/OGCFassade/HH_WMS_DKS.aspx

Eigenschaften

Freigegeben für **access**
Tags **tags**
Administrative units, Geographie, Geologie und Geobasisdaten, Geoinformation, Raumbezogene Information, Betriebsdaten, Informationssystem, Internet, Geodaten, Karte, Geobasisdaten, Geographisches Informationssystem, DKS, Hamburg, 5000, Grundkarte, Web, Dienst, wms, map, service, ogc, Grundriss, FDS, ESRI, Geoinformationssystem, Digital, opendata, opendata_hh, humanGeographicViewer

Credits **licenseInformation**
Größe 1 KB
Ausdehnung **extent**
Links: 9,42 Rechts: 10,73
Oben: 53,96 Unten: 53,39

Command line parameters

- **Update strategy**

- `-deleteobj`

- **Item subset**

- `-searchstring`

- `-ownertype`

- **Share items**

- `-accesstype`

Demo

Obstacles / Road ahead



Open ends

- **Reconciler algorithms**
- **Improve item validation**
- **Generate thumbnails**
- **Group ArcGIS Online items**
- **Notification management**
- **...**

Result



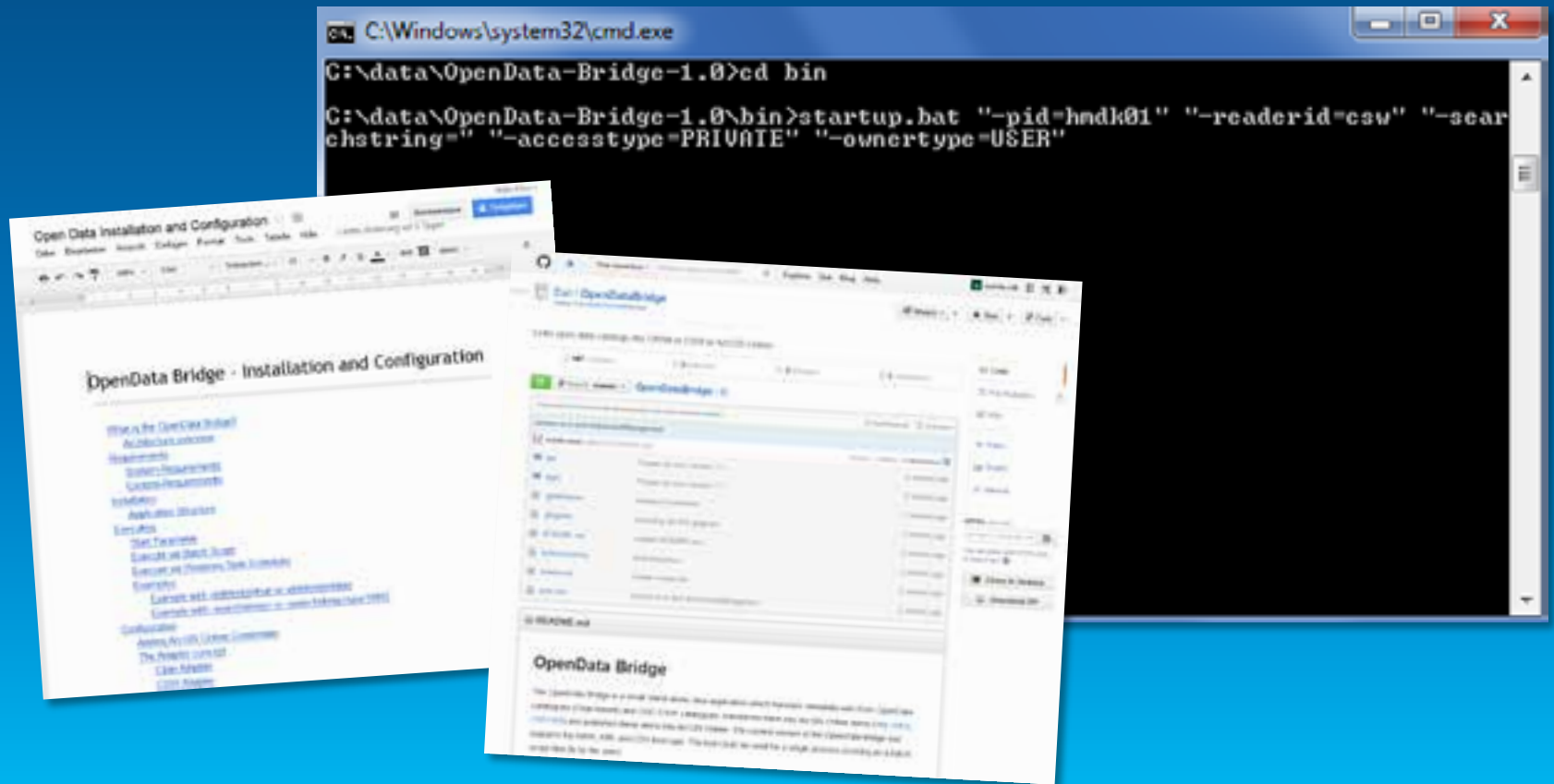
Esri Germany: Open Data services in ArcGIS Online

The screenshot shows the homepage of the GovData Mirror Esri Deutschland website. At the top, there is a navigation bar with links for 'START', 'GALERIE', 'KARTE', and 'GRUPPEN', along with an 'ANMELDEN' button and a search icon. Below the navigation bar is a large banner featuring the GovData logo (a grid of colored dots) and the text 'GOVDATA BETA Das Datenportal für Deutschland' and 'GovData Mirror Esri Deutschland'. The main content area is titled 'Im Fokus' and displays four featured map thumbnails with navigation arrows: 'Sturmflut Ostsee', 'LGB: Geologische Übersichtskarte 1:300.000', 'Straßen', and 'Stadtbuslinien'.

<https://govdata-de.maps.arcgis.com/home>

Result

- <https://github.com/EsriDE/OpenDataBridge>
- <https://github.com/Esri/OpenDataBridge>





Understanding our world.