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15.11.2023

Providing Fine Grained Access Control to OGC API Features

Utilizing SOIs to extend Enterprise' newest service type based on user identities

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locate the future

OGC API - Features

" OGC API - Features is a multi-part **standard** that offers the capability to create, modify, and query spatial data on the **Web** and specifies requirements and recommendations for APIs that want to follow a standard way of **sharing feature data**. " (https://ogcapi.ogc.org/features/)

- Previously dubbed as "WFS 3.0"
- No more XML, but JSON
- Endpoints defined by OpenAPI

- **From OGC Web Services to OGC APIs** – Thursday, Noon, Gerhard Trichtl

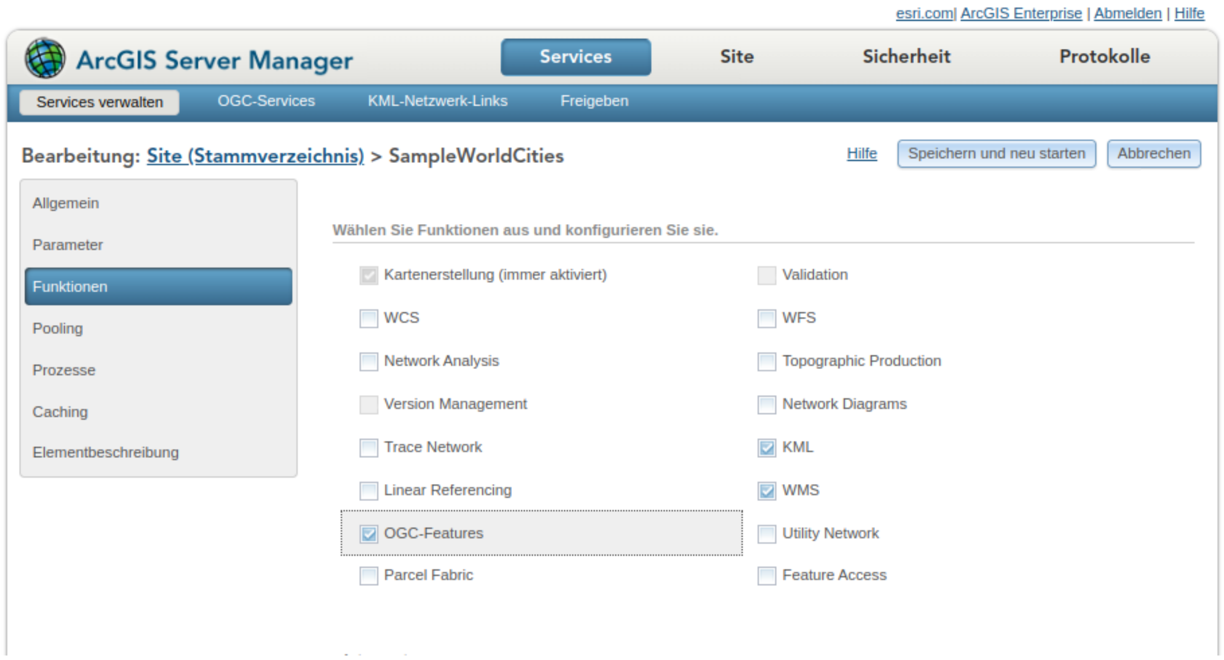
OGC API – Features on ArcGIS Enterprise

- With ArcGIS Enterprise 11: new service capability on MapServer
  - Can just be activated in ArcGIS Server Manager

- Different endpoints are provided

```
/rest/services/SampleWorldCities/OGCFeatureServer
/rest/services/SampleWorldCities/OGCFeatureServer/collections
/rest/services/SampleWorldCities/OGCFeatureServer/collections/0
/rest/services/SampleWorldCities/OGCFeatureServer/collections/0/items
/rest/services/SampleWorldCities/OGCFeatureServer/collections/0/items/1
```

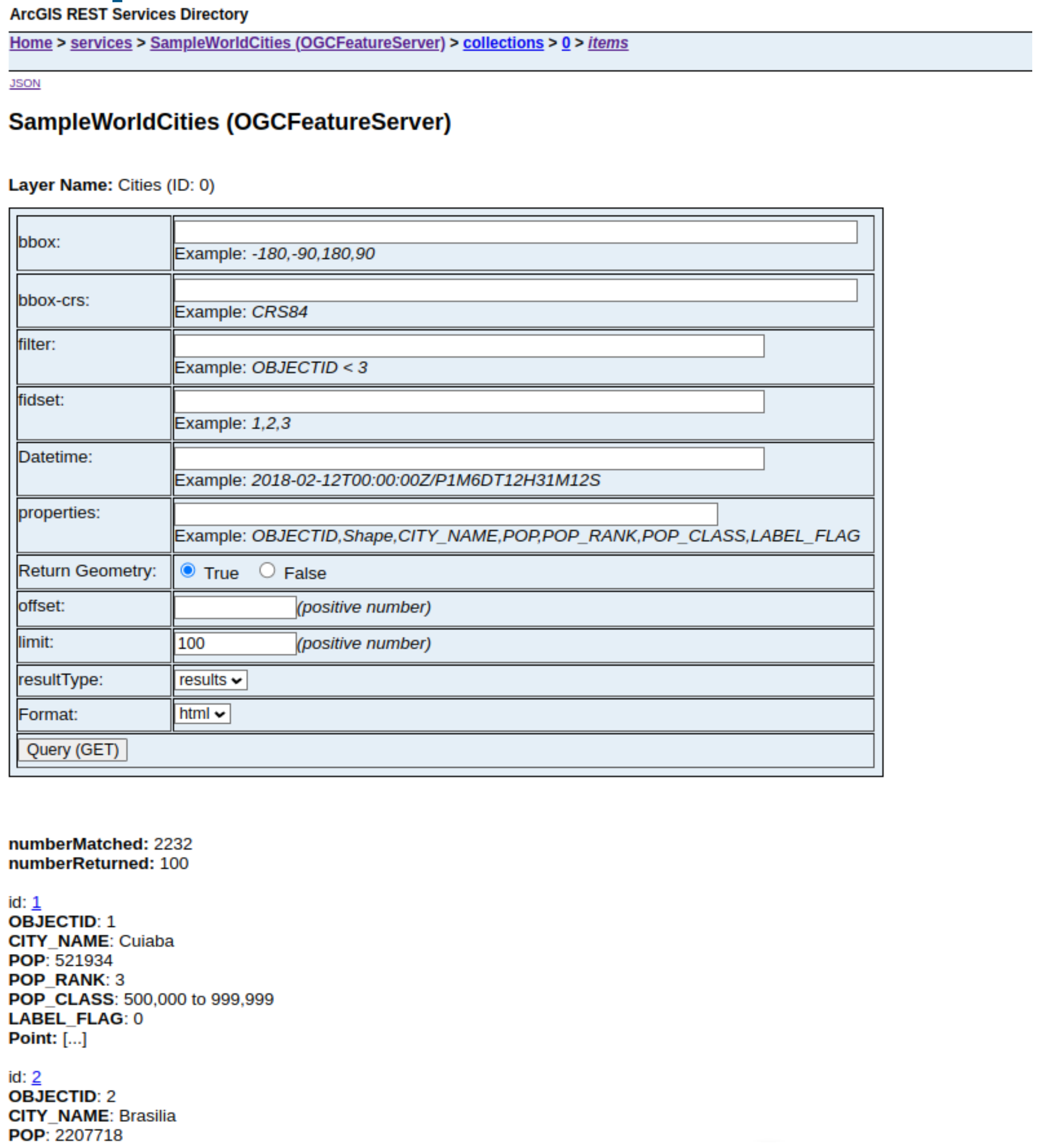
OGC API – Features on ArcGIS Enterprise



Bearbeitung: Site (Stammverzeichnis) > SampleWorldCities

Wählen Sie Funktionen aus und konfigurieren Sie sie.

✓ Kartenerstellung (immer aktiviert)	☐ Validation
☐ WCS	☐ WFS
☐ Network Analysis	☐ Topographic Production
☐ Version Management	☐ Network Diagrams
☐ Trace Network	✓ KML
☐ Linear Referencing	✓ WMS
✓ OGC-Features	☐ Utility Network
☐ Parcel Fabric	☐ Feature Access


ArcGIS REST Services Directory
Home > services > SampleWorldCities (OGCFeatureServer) > collections > 0 > items
JSON
Query (GET)

SampleWorldCities (OGCFeatureServer)

Layer Name: Cities (ID: 0)

bbox:	Example: *-180,-90,180,90*
bbox-crs:	Example: *CRS84*
filter:	Example: *OBJECTID < 3*
fidset:	Example: *1,2,3*
Datetime:	Example: *2018-02-12T00:00:00Z/P1M6DT12H31M12S*
properties:	Example: *OBJECTID,Shape,CITY_NAME,POP,POP_RANK,POP_CLASS,LABEL_FLAG*
Return Geometry:	[✓ True] False
offset:	*(positive number)*
limit:	100 *(positive number)*
resultType:	results
Format:	html

numberMatched: 2232
numberReturned: 100

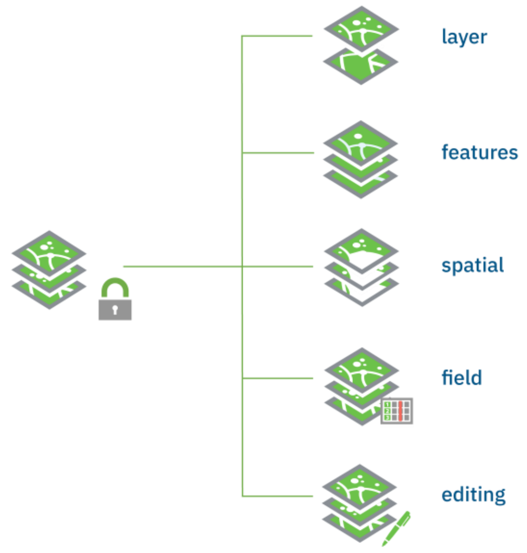
id: 1
OBJECTID: 1
CITY_NAME: Cuiaba
POP: 521934
POP_RANK: 3
POP_CLASS: 500,000 to 999,999
LABEL_FLAG: 0
Point: [...]

id: 2
OBJECTID: 2
CITY_NAME: Brasilia
POP: 2207718

OGC API – Features - Access Control

- No specification on authentication
  - Public services are recommended
  - Not a very common use case …

- Who can access the …
  - Service? ✓
  - Layer?
  - Feature?
  - Features with a specific attribute value?
  - Features with hidden fields?
  - Features within certain area?



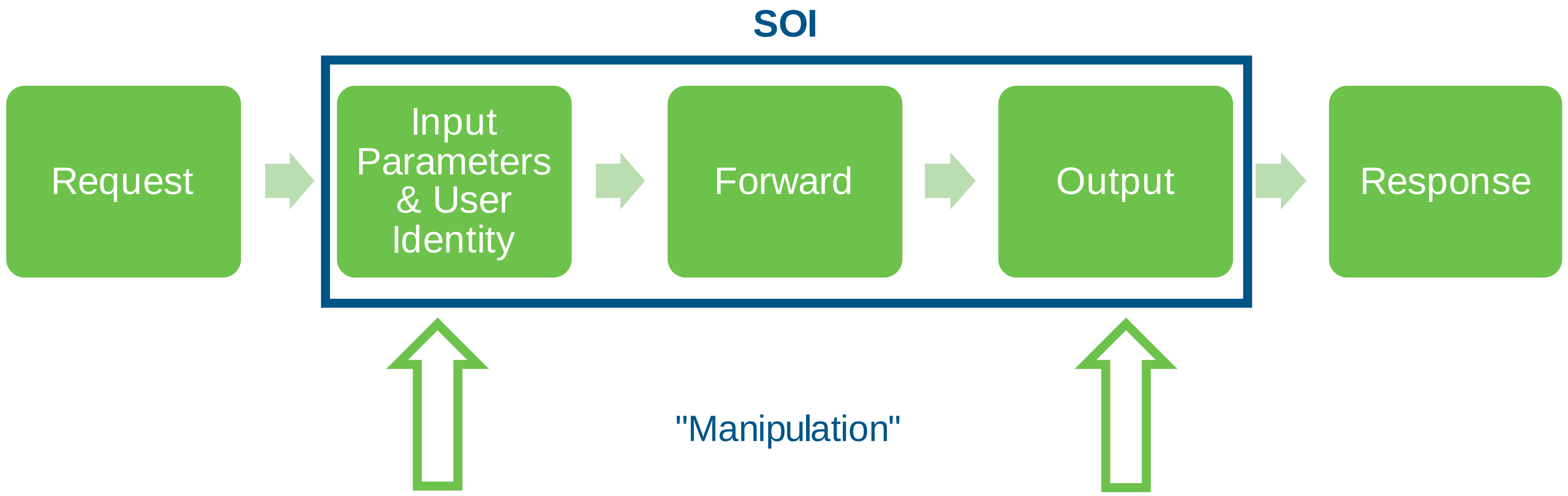
security.manager NEXT capabilites to extend ArcGIS Server security

- Likely to WMS, OGCFeatureServer accepts an **Esri token**!

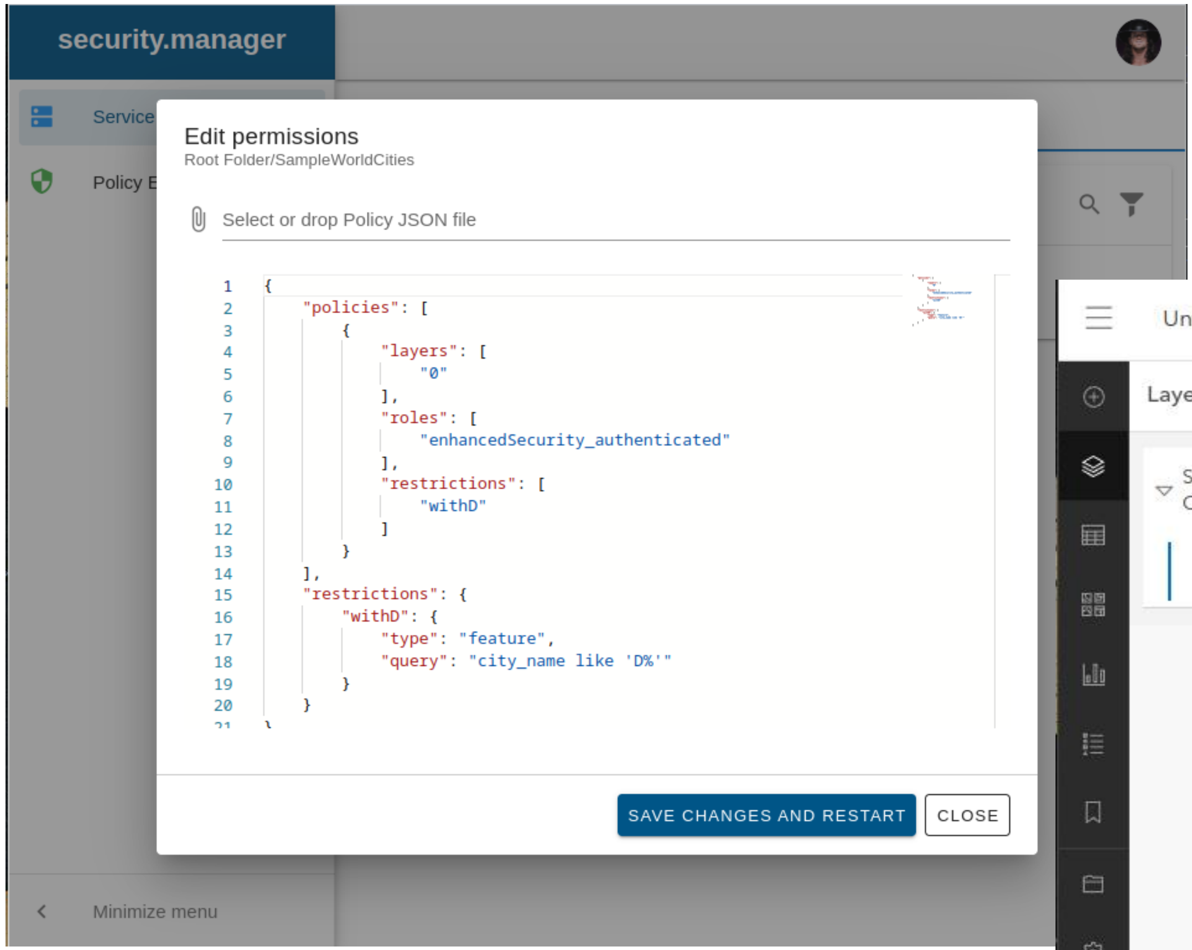
Server Object Interceptors (SOI)

- Tuesday: **Extending ArcGIS Enterprise with the ArcGIS Enterprise SDK -** Cédric Despierre Corporon

- Enterprise SDK based proxy component within the ArcGIS Server runtime
- Intercept every requests to a service



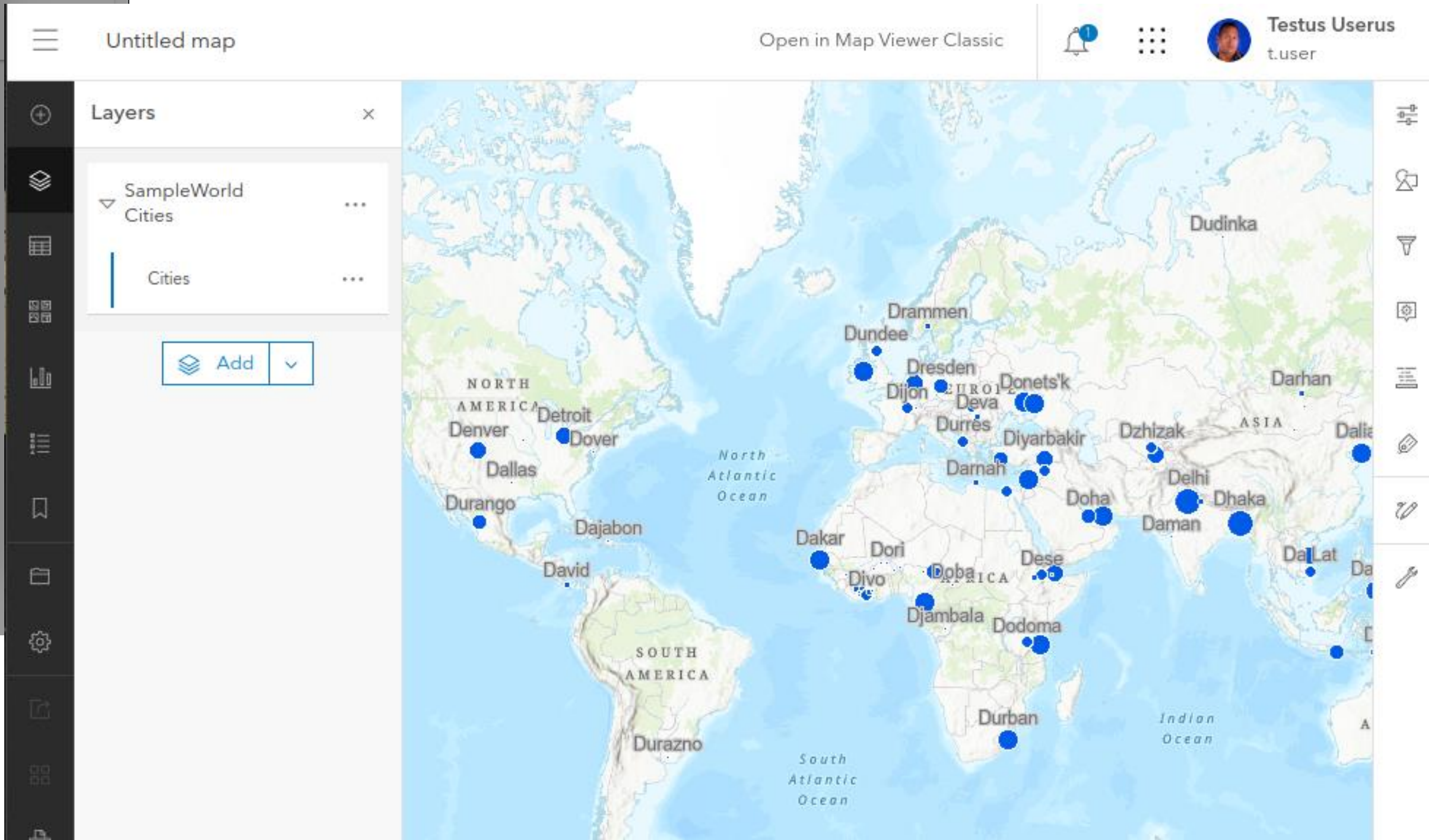
security.manager NEXT – MapServer authorization



Edit permissions
Root Folder/SampleWorldCities

Select or drop Policy JSON file

```
{
    "policies": [
        {
            "layers": [
                "0"
            ],
            "roles": [
                "enhancedSecurity_authenticated"
            ],
            "restrictions": [
                "withD"
            ]
        }
    ],
    "restrictions": {
        "withD": {
            "type": "feature",
            "query": "city_name like 'D%'"
        }
    }
}
```



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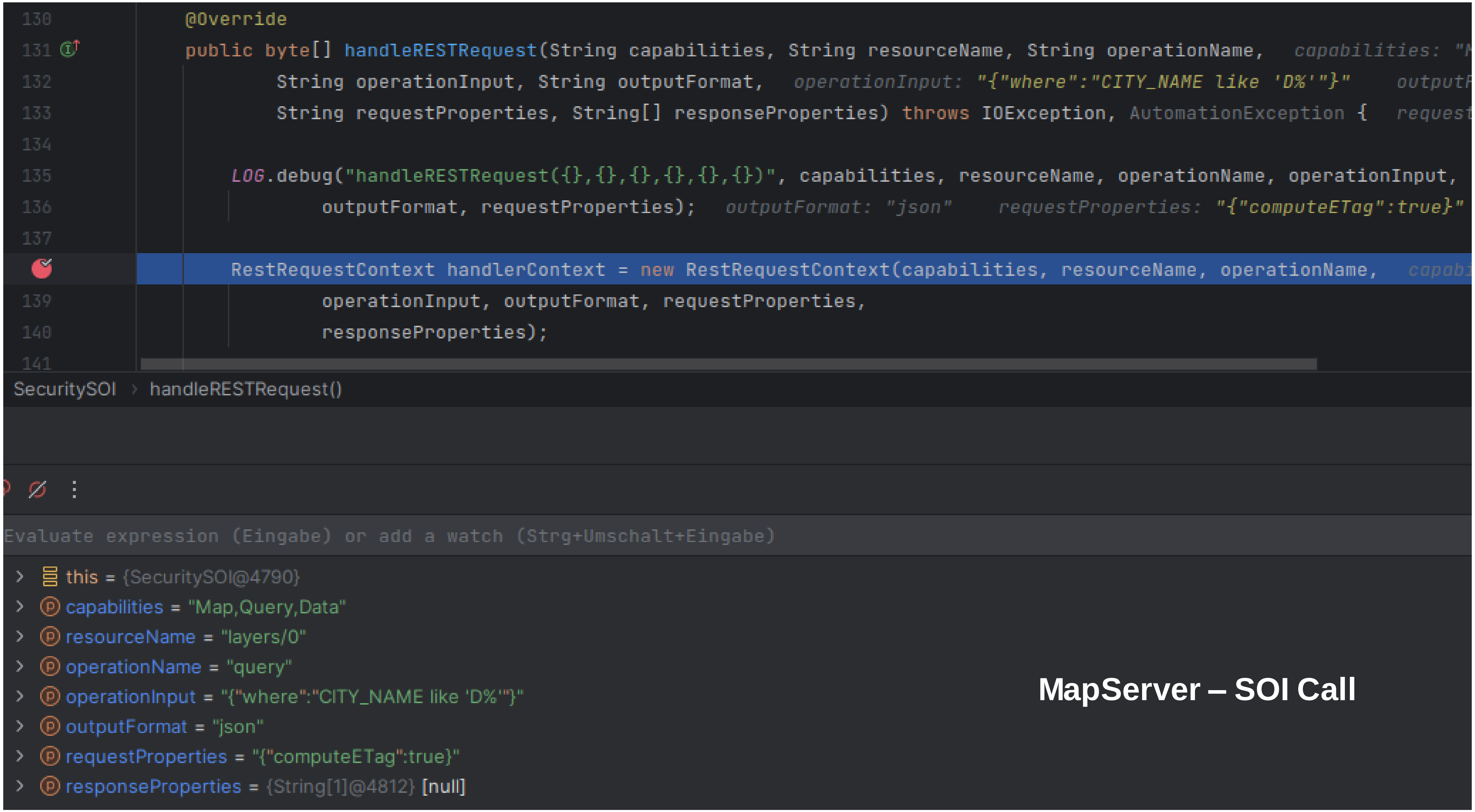
OGCFeatureServer - SOI Support

- MapServer / FeatureServer / OGCFeatureServer -> Rest Requests

```
/**
 * Called to handle REST requests.
 * @return the response as byte array.
 */
@Override
public byte[] handleRESTRequest(
        String capabilities, String resourceName, String operationName,
        String operationInput, String outputFormat,
        String requestProperties, String[] responseProperties
) throws IOException, AutomationException {

  ServerUtilities.getServerUserInfo();
}
```



```
    @Override
    public byte[] handleRESTRequest(String capabilities, String resourceName, String operationName,   capabilities: "M
            String operationInput, String outputFormat,   operationInput: "{"where":"CITY_NAME like 'D%'"}"    outputF
            String requestProperties, String[] responseProperties) throws IOException, AutomationException {   request

        LOG.debug("handleRESTRequest({},{},{},{},{},{})", capabilities, resourceName, operationName, operationInput,
                outputFormat, requestProperties);   outputFormat: "json"    requestProperties: "{"computeETag":true}"

        RestRequestContext handlerContext = new RestRequestContext(capabilities, resourceName, operationName,   capabi
                operationInput, outputFormat, requestProperties,
                responseProperties);
```

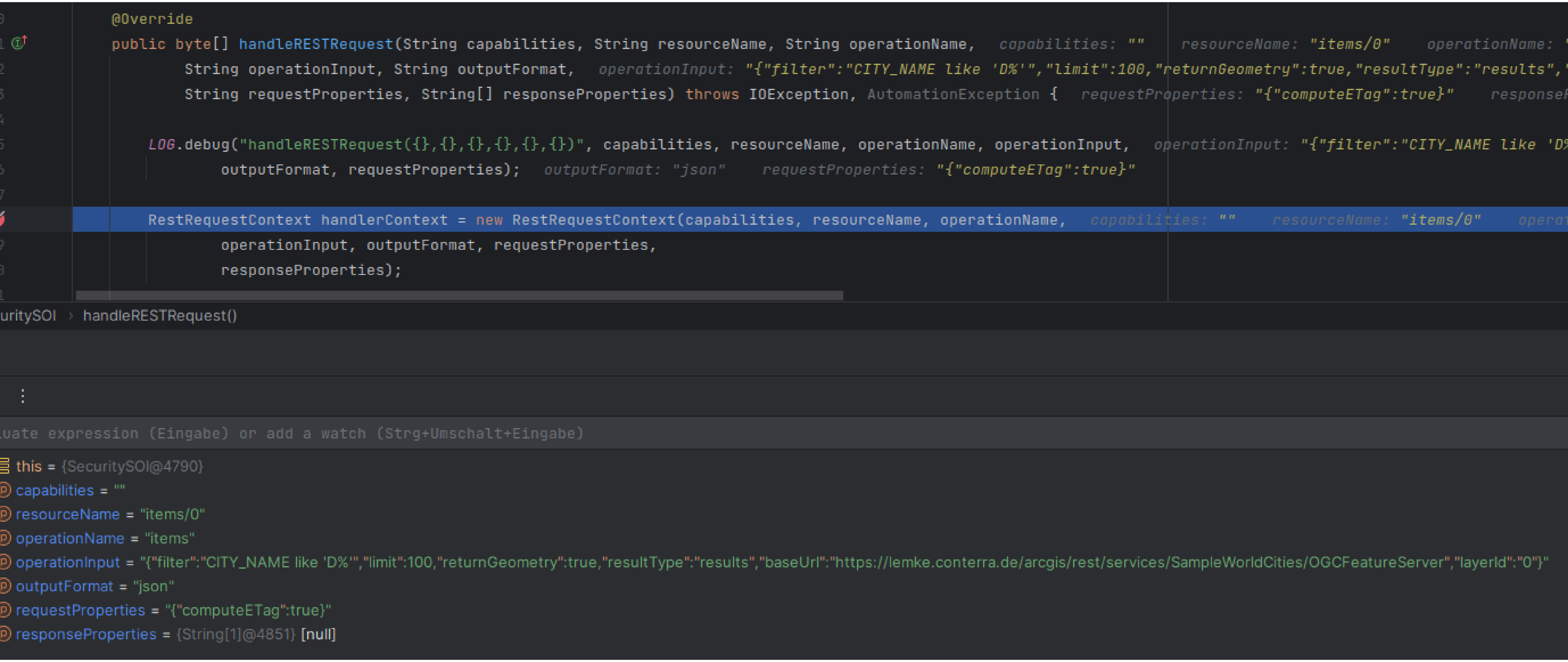
SecuritySOI › handleRESTRequest()

Evaluate expression (Eingabe) or add a watch (Strg+Umschalt+Eingabe)

```
> this = {SecuritySOI@4790}
> capabilities = "Map,Query,Data"
> resourceName = "layers/0"
> operationName = "query"
> operationInput = "{"where":"CITY_NAME like 'D%'"}"
> outputFormat = "json"
> requestProperties = "{"computeETag":true}"
> responseProperties = {String[1]@4812} [null]
```

MapServer – SOI Call

OGCFeatureServer - SOI Call

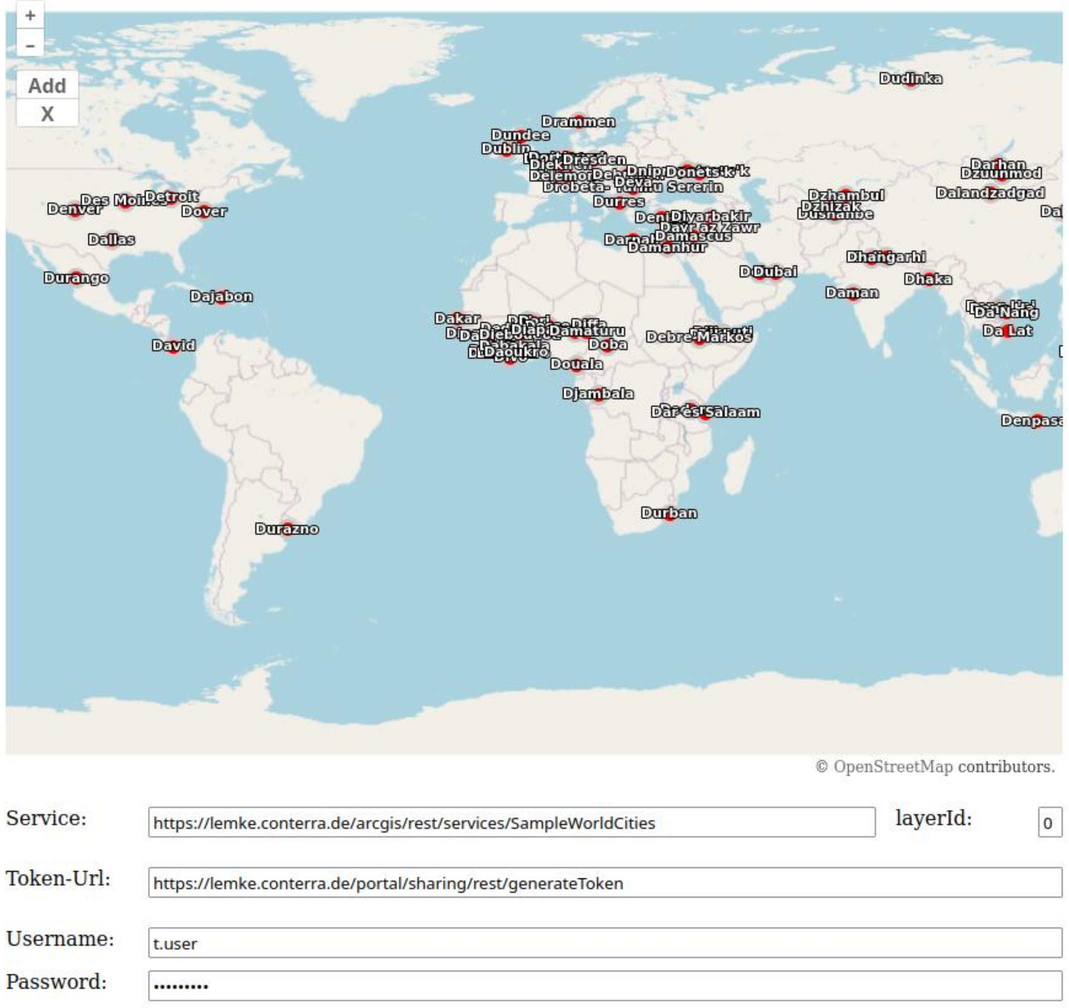


```
    @Override
    public byte[] handleRESTRequest(String capabilities, String resourceName, String operationName,   capabilities: ""    resourceName: "items/0"    operationName: '
            String operationInput, String outputFormat,   operationInput: "{"filter":"CITY_NAME like 'D%'","limit":100,"returnGeometry":true,"resultType":"results",'
            String requestProperties, String[] responseProperties) throws IOException, AutomationException {   requestProperties: "{"computeETag":true}"    responseI

        LOG.debug("handleRESTRequest({},{},{},{},{},{})", capabilities, resourceName, operationName, operationInput,   operationInput: "{"filter":"CITY_NAME like 'D%
                outputFormat, requestProperties);   outputFormat: "json"    requestProperties: "{"computeETag":true}"

        RestRequestContext handlerContext = new RestRequestContext(capabilities, resourceName, operationName,   capabilities: ""    resourceName: "items/0"    operat
                operationInput, outputFormat, requestProperties,
                responseProperties);
```

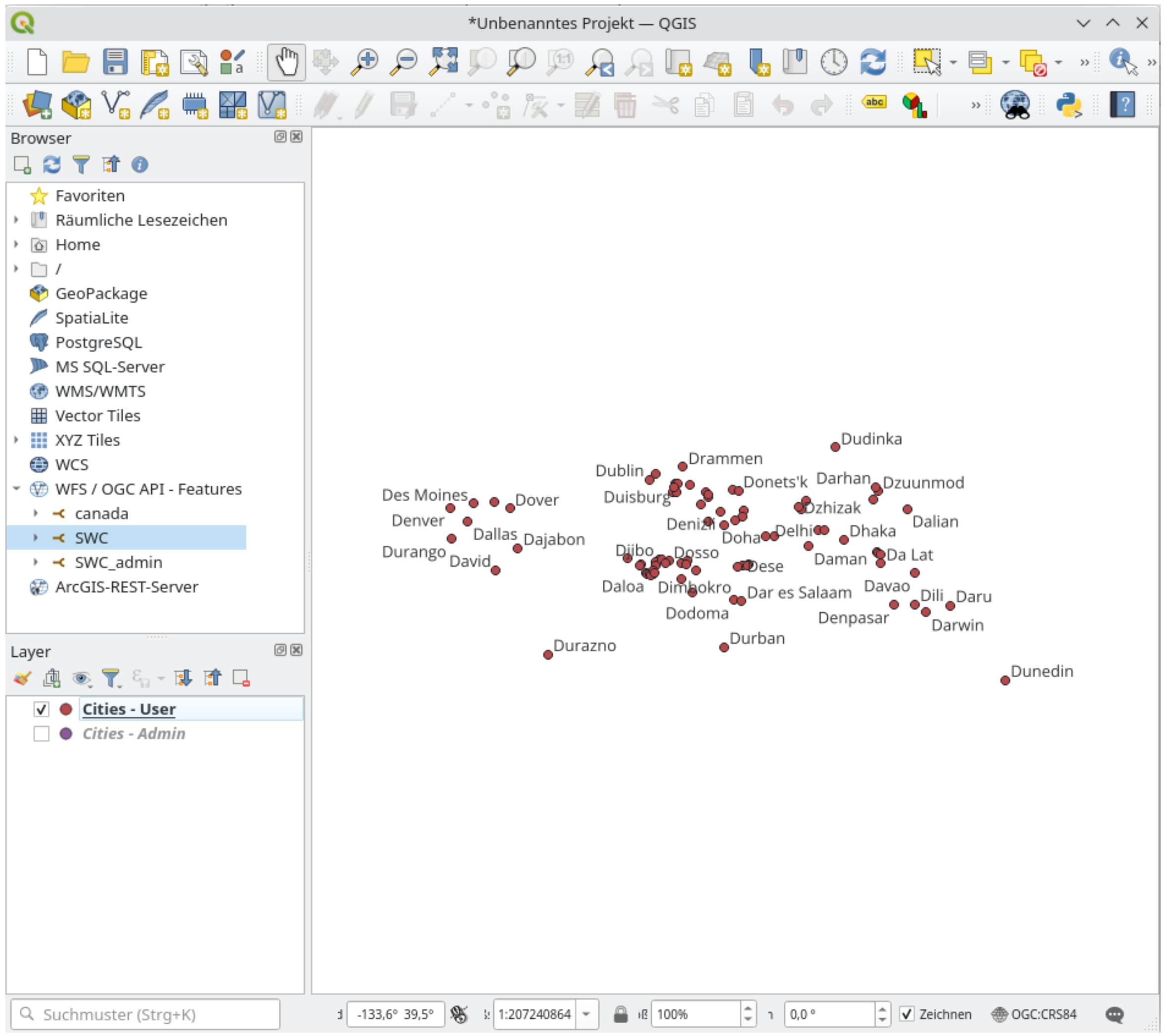
uritySOI › handleRESTRequest()

```
uate expression (Eingabe) or add a watch (Strg+Umschalt+Eingabe)
this = {SecuritySOI@4790}
capabilities = ""
resourceName = "items/0"
operationName = "items"
operationInput = "{"filter":"CITY_NAME like 'D%'","limit":100,"returnGeometry":true,"resultType":"results","baseUrl":"https://lemke.conterra.de/arcgis/rest/services/SampleWorldCities/OGCFeatureServer","layerId":"0"}"
outputFormat = "json"
requestProperties = "{"computeETag":true}"
responseProperties = {String[1]@4851} [null]
```

OGCFeatureServer – OSS Scenarios



Service:	https://lemke.conterra.de/arcgis/rest/services/SampleWorldCities	layerId:	0
Token-Url:	https://lemke.conterra.de/portal/sharing/rest/generateToken		
Username:	t.user		
Password:	••••••••••		



User Identity on OGCFeatureServer - Conclusion

- Easy to set up
  - same data sources as existing MapServer, just activate the service capability
- User Identity is based on an Esri Token
  - Service Access handled by Enterprise
  - OSS Clients must provide a token as well!
- In development, it can be treated likely to MapServer:
  - with SOI's, user specific behaviour can be added
- Caveats:
  - quiet new feature
  - some challenges in the implementation
    - exchange and good cooperation with Esri

Thank You!

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https://github.com/m-scherpi/ogc_security