



# ArcGIS 10.1 for INSPIRE Server Extension Installation Guide

## Content

1	Introduction.....	1
2	System Requirements .....	1
3	Installation.....	1
4	Software Authorization .....	2
5	Changes to the System .....	2
6	Performance Considerations.....	2
6.1	Spatial Index .....	2
6.2	Number of Instances .....	2
7	Configuration.....	3
7.1	INSPIRE View Service: GetFeatureInfo .....	3
7.2	Example: AdministrativeBoundary .....	4
7.3	GML Transformation Extension.....	4
7.4	Inspire_common:DEFAULT Style .....	5
7.5	Adding Custom Coordinate Reference Systems.....	6
8	Localisation.....	7

## 1 Introduction

This purpose of this document is to provide instructions on installation of the ArcGIS for INSPIRE server extension; describe the changes made to the system once it is installed, performance considerations and possible modifications, and further configurations; and provide details for localisation.

## 2 System Requirements

See the system requirements section of ArcGIS for INSPIRE web help at [resources.arcgis.com/en/help/arcgis-for-inspire/10.1/index.html](http://resources.arcgis.com/en/help/arcgis-for-inspire/10.1/index.html).

**Note:** ArcGIS 10.1 for INSPIRE needs to have the ArcGIS 10.1 environment to work, and earlier versions of ArcGIS for INSPIRE must be properly uninstalled before installing ArcGIS 10.1 for INSPIRE.

## 3 Installation

The ArcGIS for INSPIRE server extension installation contains the server-side functionality to add INSPIRE download and view services to ArcGIS Server. Follow the instructions below to install:

1. Verify that you have already installed ArcGIS Server on the machine where you'll be installing the ArcGIS for INSPIRE server extension. An ArcGIS Server service should already be running.
2. Verify that you have administrative system rights to run the setup.
3. Navigate to the *ServerExt\Setup* folder and double-click setup.exe.
4. Follow instructions on the installation wizard interface.
5. You need to authorise software to use the ArcGIS for INSPIRE server extension. Run the ArcGIS Software Authorization Wizard to authorise the installed server extension.

**Note:** If you already installed ArcGIS for INSPIRE 1.0 , uninstall it before installing the version 10.1 server extension.

6. To create ArcGIS for INSPIRE services, in general, follow the steps below:
  - a. Get the ArcGIS for INSPIRE geodatabase ready (e.g., connect to the database through ArcCatalog, and import geodatabase schema and data).
  - b. Register the geodatabase with ArcGIS Server.
  - c. Create a map document using ArcMap and the INSPIRE Tools add-in.
  - d. Publish the map document as ArcGIS for INSPIRE software-specific services such as View Service or Feature Download Service.

## 4 Software Authorization

After installing the software, you must authorise it for use. Log in to the Esri Customer Care Portal ([customers.esri.com](http://customers.esri.com)) using your Esri global account to obtain the authorisation numbers.

To enable the ArcGIS for INSPIRE server extension, launch the Software Authorization tool from Programs > ArcGIS > Software Authorization and restart the ArcGIS Server Windows service.

## 5 Changes to the System

The ArcGIS for INSPIRE server extension installation will result in the following changes to your system:

- It creates a folder in *ArcGIS for Server* 10.1 config-store location (e.g., `c:\arcgisserver\config-store\arcgisforinspire`); further references will use `<A4I Server>` that contains the following:
  - A bin folder containing DLLs
  - A templates folder for transforming INSPIRE spatial object type GML to an HTML representation (INSPIRE view service GetFeatureInfo operation)
- It creates an ArcGIS for Server registered directory to store web-accessible content (e.g., `c:\arcgisserver\directories\arcgisforinspire`).
- It registers the *ArcGIS for INSPIRE Server* Object Extension with ArcGIS for Server.

## 6 Performance Considerations

This section describes aspects that may impact system performance and possible ways to adjust them. System performance can be affected by many factors such as hardware infrastructure, data management solutions, and map document design. For best practices and performance considerations, refer to the Esri Enterprise GIS Performance and Scalability site at [resources.arcgis.com/en/communities/enterprise-gis/01n200000003000000.htm](http://resources.arcgis.com/en/communities/enterprise-gis/01n200000003000000.htm) for detailed information.

### 6.1 Spatial Index

Make sure that each feature class in the INSPIRE geodatabase contains a spatial index and that the spatial index has been refreshed after the data is loaded. Adding a spatial index to the geodatabase will impact system performance. In addition, all the fields capable of being indexed in the INSPIRE geodatabase will affect system performance.

### 6.2 Number of Instances

When determining the maximum number of instances for a service, consider the following:

- The number of site machines available
- The number of map services to be deployed
- The maximum number of processes required

The start-up process of an INSPIRE network service may take a little bit longer than you are used to. This is because both the INSPIRE view service and the INSPIRE feature download service need to initialise and verify the INSPIRE data model at the geodatabase level. Once the service is started, it should perform similarly to other ArcGIS Server services.

For operating the services, it is recommended that you set the minimum number of instances to the same value as the maximum number of instances. If the minimum number is lower than the maximum number, this can lead to a SOC process start-up when the service is loaded during operation. Because start-up will take time, if a new SOC instance must start on the fly, it will slow down the response to a request.

## 7 Configuration

This section provides information on how to configure the INSPIRE services.

### 7.1 INSPIRE View Service: GetFeatureInfo

Executing a GetFeatureInfo request on a view service instance results in an INSPIRE feature download service request (operation GetFeature) to the internal feature server engine.

Since the GetFeatureInfo operation supports HTML as the return type of the operation, the created Geography Markup Language (GML) of the INSPIRE feature download service has to be transformed from XML to human-readable HTML.

ArcGIS for INSPIRE has several Extensible Style Language (XSL) style sheets that transform XML to HTML. These style sheets can be found in the overall Server Object Extension bundle, `arcgis-for-inspire.soe` file. The file is located under the `extns` folder in the `config-store` directory of ArcGIS for Server. For example, `c:\arcgisserver\config-store\extns\arcgis-for-inspire.soe`.

The SOE definition file `arcgis-for-inspire.soe` is just a ZIP file having a different file extension. The file can be unpacked by following the steps below:

- Copy the SOE file to a temporary location.
- Rename it `arcgis-for-inspire.zip`.
- Unpack the ZIP file and open the Install directory.
- Locate the file `a4i-ags-soe.jar` and copy this file to a temporary location.
- Rename `a4i-ags-soe.jar` to `a4i-ags-soe.zip`.
- Unpack the ZIP file and locate the directory templates.

If any changes are made on the template files, instead of transferring file changes to the SOE definition file, you can simply copy each modified file to `c:\arcgisserver\config-store\arcgisforinspire\templates\`. Files located in that directory will be preferred when read by ArcGIS for INSPIRE. The templates directory does not exist initially, and if it is your first time putting modified template files there, the templates directory needs to be created in that location.

There are two important files under the directory:

- Wfs-getfeature-response-transform.xsl is the "root" template that includes all other templates.
- featureTypes-tableHeader.xsl contains HTML table headings for each feature type supported. All other \*.xsl files deal with a specific INSPIRE layer.

These files are dedicated to encapsulate the specific GML application schema knowledge inside the file.

## 7.2 Example: AdministrativeBoundary

Figure 1 shows an example of transforming XML to HTML in the GetFeatureInfo operation. The file au\_AdministrativeBoundary.xsl is responsible for selecting values from the returned GML string of a GetFeatureInfo request on the INSPIRE layer AU:AdministrativeBoundary. This layer is transformed to a GetFeature request on spatial object type AU:AdministrativeBoundary.

```
<?xml version="1.0" encoding="UTF-8"?>
  <!--
    This Style Sheet is used to transform Inspire GML Data into html for
    the GetFeatureInfo requests of a ViewService. You can reference other
    style sheets relative!
  -->
<xsl:stylesheet version="2.0" xmlns="http://www.w3.org/1999/xhtml"
  xmlns:xsl="http://www.w3.org/1999/XSL/Transform" xmlns:xs="http://www.w3.org/2001/XMLSchema"
  xmlns:gml="http://www.opengis.net/gml/3.2" xmlns:xlink="http://www.w3.org/1999/xlink"
  xmlns:p="http://conterra.de/xslt/params" xmlns:util="xalan://de.conterra.suite.ifc.soe.common.xml.XSLTFunctions"
  xmlns:au="urn:x-inspire:specification:gmlas:AdministrativeUnits:3.0"
  xmlns:gmd="http://www.isotc211.org/2005/gmd"
  exclude-result-prefixes="xlink xsl xs gml p util au gmd">
  <!--
    template writes the gml au:AdministrativeBoundary feature types, please see the
    "featureTypes-TableHeads.xsl for the required columns
  -->
  <xsl:template match="au:AdministrativeBoundary">
    <tr>
      <td>
        <xsl:value-of select="@gml:id" />
      </td>
      <xsl:apply-templates mode="administrativeboundary" />
    </tr>
  </xsl:template>
  <xsl:template match="au:country" mode="administrativeboundary">
    <td>
      <xsl:value-of select="//gmd:Country/text()" />
    </td>
  </xsl:template>
  <xsl:template match="text()|@*" mode="administrativeboundary">
    <!-- disable the default copy templates of attributes and text nodes -->
  </xsl:template>
</xsl:stylesheet>
```

Figure 1: File au\_AdministrativeBoundary.xsl for Transforming GML Response of AU:AdministrativeBoundary

## 7.3 GML Transformation Extension

If the HTML file resulting from a GML transformation needs to be adjusted for a specific INSPIRE layer, two files should be modified:

- The file named according to the INSPIRE layer (For example, if you have an INSPIRE layer with the name au:AdministrativeBoundary, use the file au\_AdministrativeBoundary.xsl.)
- The featureTypes-tableHeader.xsl file

Additional XSL SELECT statements can be added to meet the needs of your organisation. For example, if you want to display the gml:geometry string in your HTML response, you would select this using the proper XSL statement.

The HTML output creates a flat table of attributes and their associated values. If you are going to extend the number of output properties, you also need to add the corresponding table headers. This can be done by modifying the file featureTypes-tableHeader.xml.

The number of selected attributes in the INSPIRE layer-specific XSL file and the number of HTML table header fields should be the same. Any changes made to the XSL files will take effect after restarting the view service instance.

#### 7.4 Inspire\_common:DEFAULT Style

The ArcGIS for Server config store directory for ArcGIS for INSPIRE also contains a folder named slds (i.e., c:\arcgisserver\config-store\arcgisforinspire\slds). This folder contains Style Layer Descriptor rules for all layers referenced in the INSPIRE data specifications of INSPIRE Annex I data themes. See figure 2 below as an example.

```
<?xml version="1.0" encoding="UTF-8" standalone="yes" ?>
- <sld:StyledLayerDescriptor xmlns:ogc="http://www.opengis.net/ogc" xmlns:sld="http://www.opengis.net/sld" version="1.0.0"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://www.opengis.net/sld ../schema/ogc/sld/1.0.0/StyledLayerDescriptor.xsd">
- <sld:NamedLayer>
  <sld:Name>AU.AdministrativeUnit</sld:Name>
- <sld:UserStyle>
  <sld:Name>inspire_common:DEFAULT</sld:Name>
  <sld:IsDefault>1</sld:IsDefault>
- <sld:FeatureTypeStyle>
  <!-- <sld:Description>
  <sld:Title>Administrative Unit Default Style</sld:Title>
  <sld:Abstract>The administrative unit is rendered using a yellow (#FFFF66) fill.</sld:Abstract>
  </sld:Description>
  -->
- <sld:Rule>
- <sld:PolygonSymbolizer>
  - <sld:Fill>
    <sld:CssParameter name="fill">#FFFF66</sld:CssParameter>
  </sld:Fill>
  </sld:PolygonSymbolizer>
  </sld:Rule>
</sld:FeatureTypeStyle>
</sld:UserStyle>
</sld:NamedLayer>
</sld:StyledLayerDescriptor>
```

**Figure 2: SLD Example for AU:AdministrativeBoundary**

By default, the styles available in this folder will be used to visualize the INSPIRE layers.

In addition, ArcGIS for INSPIRE makes the defined ArcMap style available for usage within INSPIRE view services (figure 3).

```

<Style>
  <Name>default</Name>
  <Title>2</Title>
  <LegendURL height="16" width="32">
    <Format>image/png</Format>
    <OnlineResource xmlns:xlink="http://www.w3.org/1999/xlink" xlink:href="http://neale.dev.esri-de.com:8399/arcgis/services/">
  </LegendURL>
</Style>
<Style>
  <Name>inspire_common:DEFAULT</Name>
  <Title>inspire_common:DEFAULT</Title>
  <LegendURL height="16" width="200">
    <Format>image/png</Format>
    <OnlineResource xmlns:xlink="http://www.w3.org/1999/xlink" xlink:href="http://neale.dev.esri-de.com:8399/arcgis/services/">
  </LegendURL>
</Style>
</Layer>
<Layer queryable="1">
  <Name>AU.NUTSRegion</Name>
  <Title>NUTS Region</Title>
  <Abstract>Layer NUTS Region</Abstract>
  <CRS>CRS:84</CRS>
  <CRS>EPSG:4326</CRS>
  <CRS>EPSG:4258</CRS>

```

Figure 3: Styles Available in the View Service Capabilities

The SLD files are configured to run on the geodatabase. If you want to modify these styles, understand that you are responsible for aligning with SLD specifications and the underlying database structure.

## 7.5 Adding Custom Coordinate Reference Systems

ArcGIS for INSPIRE allows you to add additional coordinate reference systems (CRS) to be supported. The approach is a bit different than the one for Web Map Service (WMS) server instances as it requires that you copy and edit a configuration file called `inspire-constants.properties`:

1. Copy the SOE extension file from `c:\arcgisserver\config-store\extns\arcgis-for-inspire.soe` to a temporary location.
2. Rename it `arcgis-for-inspire.zip`.
3. Unpack the ZIP file and locate `a4i-ags-common.jar` under the Install directory.
4. Rename it `a4i-ags-common.zip` and unzip it again.
5. Locate `inspire-constants.properties` under the unzipped directory.
6. Copy the file to the `arcgisforinspire` directory under `config-store` location. This is a template file available for your customizations (e.g., `c:\arcgisserver\config-store\arcgisforinspire\inspire-constants.properties`).
7. Once the file is available in the above location, the copied file will be used instead of the one contained in the SOE extension file.
8. Open the file with an editor and locate the property `supported.crs.codes`.
9. Add a comma-separated list of EPSG codes you want to add. Notice that you also can add EPSG code ranges (e.g., `EPSG:25830-25838`).
10. Changes will take effect upon restart of each ArcGIS map service instance:
  - a. Each CRS will be listed in the view service's `GetCapabilities` response.
  - b. Corresponding to each CRS, a `BoundingBox` element will be added to each `Layer` element.

**Note:** As the feature server back end does not support all EPSG codes, it will reject systems not currently supported.

When setting up an INSPIRE view service, a GetFeatureInfo request won't be forwarded to the feature server. Instead, it will be forwarded to the underlying ArcGIS WMS server.

When setting up an INSPIRE feature download service, the configured system won't be supported by the A4I feature download service.

In both cases, you will find a log message in the ArcGIS Server log files: "CRS <unsupportedCRS> is currently not supported and will not be available when accessing the feature service."

## 8 Localisation

The ArcGIS for INSPIRE desktop extension is localised in French, Spanish, and German languages. If you have an ArcGIS language supplement of these languages installed, ArcGIS for INSPIRE will make use of localised messages.

The ArcGIS for INSPIRE server extension is localisable to other European Member State languages in terms of how the ArcGIS for INSPIRE network services respond to user requests. Follow instructions in the "ArcGIS for INSPIRE Localisation" section of the ArcGIS for INSPIRE web help at [resources.arcgis.com/en/help/arcgis-for-inspire/10.1/index.html](http://resources.arcgis.com/en/help/arcgis-for-inspire/10.1/index.html).