



ArcGIS 10.4 for INSPIRE Server Extension Installation Guide

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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 localization.

2 System Requirements

See the System Requirements section of ArcGIS for INSPIRE web help at

- [English](#)
- [French](#)
- [German](#)
- [Spanish](#)

ArcGIS 10.4 for INSPIRE requires ArcGIS 10.4 environment. If you have ArcGIS 10.3 or 10.3.1 for INSPIRE installed, you can run the ArcGIS 10.4 for INSPIRE setup.exe to upgrade to ArcGIS 10.4 for INSPIRE directly. If you have ArcGIS 10.1 for INSPIRE the upgrade process requires upgrading first to 10.2.1 or 10.2.2 then upgrade to 10.3. If you have 10.2.1 or 10.2.2 then you must upgrade to 10.3. Please go to section 4 and follow the Upgrade Installation section. Please read the migration guide (MigrationGuide_ArcGISForINSPIRE_10_4_EN.pdf) for further details.

3 Installation

The ArcGIS for INSPIRE server extension installation contains the server-side functionality to add INSPIRE download and view services to ArcGIS for Server. If you have ArcGIS for INSPIRE in an ArcGIS Site with multiple GIS server machines please read the notes below first.

Follow the instructions below to install ArcGIS for INSPIRE server extension on a single GIS server:

1. Verify that you have already installed ArcGIS for Server on the machine where you'll be installing the ArcGIS for INSPIRE server extension. ArcGIS 10.4 for Server service should already be running.
2. Verify that you have administrative system rights to run the setup.
3. Navigate to the *ServerExt* folder and run setup.exe.
4. Follow instructions on the installation wizard interface.

The installation is now completed.

NOTE: If you are installing ArcGIS for INSPIRE in an ArcGIS Site with multiple GIS server machines then follow the recommendations below.

- 1) Setup an ArcGIS 10.4 for Server Site with multiple GIS server machines

- 2) Install ArcGIS 10.4 for INSPIRE server extension on each machine in the ArcGIS Server site

The installation is now completed. Proceed to section 5 Configuration to configure ArcGIS for INSPIRE.

4 Upgrade Installation

The ArcGIS for INSPIRE server extension upgrade contains the server-side functionality to add INSPIRE download and view services to ArcGIS for Server. If you have ArcGIS for INSPIRE in an ArcGIS Site with multiple GIS server machines please read the notes below first.

Follow the instructions below to upgrade ArcGIS for INSPIRE server extension on a single GIS server:

1. Verify that you have already upgraded ArcGIS for Server to 10.4 on the machine where you'll be installing the ArcGIS for INSPIRE server extension.
2. Verify that you have administrative system rights to run the setup.
3. Navigate to the *ServerExt* folder and run 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.

The installation is now completed. Proceed to section 5 Configuration to configure ArcGIS for INSPIRE.

Follow the instructions below to upgrade ArcGIS for INSPIRE server extension on multiple GIS server site:

1. Verify that you have already installed ArcGIS for Server on the machine where you'll be installing the ArcGIS for INSPIRE server extension. ArcGIS 10.4 for Server service should already be running.
2. Verify that you have administrative system rights to run the setup on each GIS server machine.
3. Navigate to the *ServerExt* folder and run setup.exe on each GIS server machine.
4. Follow instructions on the installation wizard interface on each GIS Server machine.

The installation is now completed. Proceed to section 5 Configuration to configure ArcGIS for INSPIRE.

5 Configuration

After you've successfully installed the ArcGIS for INSPIRE server extension on a single or multi-machine environment, you will need to run the ArcGIS for INSPIRE Configuration Utility to configure and upload the ArcGIS for INSPIRE Server Object Extension, and deploy configuration files.

Follow the instructions below to run the ArcGIS for INSPIRE Configuration Utility:

1. The ArcGIS for INSPIRE Configuration Utility configures the ArcGIS site and should be executed only on the primary site GIS server.
2. Verify that you have administrative system rights to run the ArcGIS for INSPIRE Configuration Utility.
3. Setup a directory for the ArcGIS for INSPIRE configuration files to be deployed to. The ArcGIS Server service user needs at least Modify access to this directory. (If configuring for a multiple

GIS server site, setup a shared directory for all ArcGIS Server site machines to access. And make sure the users for all ArcGIS Server services have Modify access to this directory.)

4. Login to the primary site GIS Server and start the ArcGIS for INSPIRE Configuration Utility by clicking the shortcut in the Start menu under ArcGIS for INSPIRE > Configuration. Answer Yes to the User Account Control window.
5. Enter the ArcGIS Server Site Administrator Username and Password and click Connect.
6. The Utility will connect to ArcGIS Server and display the Configure parameters section.
7. Enter the following configuration parameters:
 - a. Configuration Directory – enter the directory that was setup in Step 3, into the Configuration Directory parameter text box (use UNC path if the ArcGIS site has multiple GIS machines).
 - b. Output Directory – the recommended path for the Output Directory will be generated based on the default ArcGIS Output directory location. If you are doing an upgrade, the existing path for the ArcGIS for INSPIRE Output Directory will be used.
8. Click Configure.
9. The Configuration Utility will display a Summary window with the configuration information. Click Apply to begin the configuration.
10. The Configuration Utility will perform the ArcGIS for INSPIRE configuration.

ArcGIS for INSPIRE is now configured.

6 Software Authorization

After installing and configuring the software, you must authorize it for use. Log in to the Esri Customer Care portal (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 for Server Windows service.

7 Changes to the System

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

- It deploys the ArcGIS for INSPIRE files and folders to the install directory. (e.g., *C:\Program Files\ESRI\ArcGIS for INSPIRE*)
- It registers the XtraSrvCOM.dll with the system.
- It creates an ArcGIS for Server registered directory to store web-accessible content (e.g., *C:\arcgisserver\directories\arcgisforinspire*).
- It copies the ArcGIS for INSPIRE Configuration files to a user defined location.

- It updates and registers the ArcGIS for INSPIRE SOE with ArcGIS Server

8 Performance Considerations

This section describes aspects that may impact system performance and suggests 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 detailed information on 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.

8.1 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.

8.2 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 for 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 server object container (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.

9 Services Configuration

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

9.1 Configure INSPIRE services to use HTTPS protocol

If your ArcGIS Server is configured to use HTTPS only and the certificate is not signed by a certification authority, follows the two steps below:

1. Export your certificate using the ArcGIS admin REST API:
`https://<servername>/arcgis/admin/machines/<hostname>/sslcertificates/<certName>/export`

2. On the server(s) running the ArcGIS for INSPIRE server extension import the certificate exported in step 1 into the keystore of the JRE included in ArcGIS Server:
 - a. Navigate to <ArcGIS Server>\framework\runtime\jre\bin
 - b. Run the following tool : `keytool -importCert -trustcacerts -keystore "<ArcGIS Server>\framework\runtime\jre\lib\security\cacerts" -storepass changeit -file <path to the cert stored in step1> -alias <aliasName>`

9.2 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 ArcGIS for INSPIRE configuration folder chosen when running the Configuration Utility.. See the folder templates for the XSL files.

There are two important files under the template directory:

- The `wfs-getfeature-response-transform.xml` file is the root template that includes all other templates.
- The `featureTypesTableHeader.xml` file contains HTML table headings for each feature type supported. All other `*.xml` files (referenced by `_featureTypeIncludes.xml` and located in the `includes` subfolder) deal with a specific INSPIRE layer.
- These files are dedicated to encapsulate the specific GML application schema knowledge inside the file.

9.2.1 Example: AdministrativeBoundary

Figure 1 shows an example of transforming XML to HTML in the GetFeatureInfo operation. The `includes/au_AdministrativeBoundary.xml` file is responsible for selecting values from the returned GML string of a GetFeatureInfo request on the INSPIRE AU:AdministrativeBoundary layer. 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

9.2.2 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 au_AdministrativeBoundary.xsl file.)
- The featureTypesTableHeader.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 featureTypesTableHeader.xsl file.

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.

9.3 Inspire_common:DEFAULT Style

The ArcGIS for Server configuration folder for ArcGIS for INSPIRE also contains a folder named slds (for example: C:\arcgisforinspireconfig\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 use 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.

9.4 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 file from `C:\arcgissserver\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:\arcgissserver\config-store\arcgisforinspire\inspire-constants.properties`).

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.

7. Open the file with an editor and locate the property `supported.crs.codes`.
8. 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`).
9. 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."

9.5 Turn off streaming for INSPIRE Services

With ArcGIS 10.2.2 SP1 for INSPIRE, streaming is enabled by default for INSPIRE download services, and ArcGIS for INSPIRE allows you to turn off streaming for both type of services if necessary, following are the steps to turn off streaming:

1. Stop the service that need to have streaming turned off.
2. Go to the service configuration folder (e.g., C:\arcgisserver\config-store\services\abup2.MapServer).
3. Open JSON configuration file (e.g., abup2.MapServer.json).
4. Search "streamingEnabled": "true", and change the value to "false".
5. Save the file, then restart the service.

9.6 Turn off caching of INSPIRE Services getCapabilities documents

By default ArcGIS for INSPIRE creates service-level capabilities documents when the service starts. To turn off caching for both types of INSPIRE services:

1. Stop the service that need to have caching of capabilities documents turned off.
2. Go to the service configuration folder (e.g., C:\arcgisserver\config-store\services\abup2.MapServer).
3. Open JSON configuration file (e.g., abup2.MapServer.json).
4. Search "cacheGetCapabilities": "true", and change the value to "false".
5. Save the file, then restart the service.

9.7 Create and use custom INSPIRE Services getCapabilities documents

ArcGIS for INSPIRE allows you to apply changes (for example keywords) to the getCapabilities documents returned by WMS and WMTS-based INSPIRE View services as well as WFS-based INSPIRE Download services.

If "cacheGetCapabilities" is set to false then getCapabilities reponse is generated dynamically and cannot be override by a custom getCapabilities file. This means that all properties authored in ArcCatalog property pages are reflected in the response.

If "cacheGetCapabilities" is set to true then getCapabilities response is generated every time service is restarted and file is cached for each version and supported languages.

View service instructions

If the administrator decides to create and use a custom getCapabilities response then GetCapabilities<version>_<3 letter language code>_custom.xml filename needs to be used at the service cached capabilities folder (for example c:\arcgisserver\directories\arcgisforinspire\GEMR_MapServer\GEMR_MapServer_inspireview).

If a custom getCapabilities file is found in the folder, the file is used to respond to getCapabilities request for that specific version and language level. For example GetCapabilities130_FRE_custom.xml would be used when responding to a getCapabilities request with parameter Language=FRE and version=1.3.0 and

service=WMS request parameters. If there is no custom cached file in the directory for that particular language and version configuration the regular cached getCapabilities files are used to respond. The administrator therefore may choose to use custom cache file for certain version and/or language and use default for others. Custom cached getcapabilities file is not deleted when service is restarted. Only default cached getcapabilities files are deleted and recreated.

For WMTS-based getCapabilities the custom file name pattern is WMTSGetCapabilities100_<3 letter language code>_custom.xml.

Download service instructions

If the administrator decides to use a custom getcapabilities response then GetCapabilities<version>_<3 letter language code>_custom.xml filename needs to be used at the service cached capabilities folder (for example c:\arcgissserver\directories\arcgisforinspire\GEMR_MapServer\GEMR_MapServer_inspiredownload).

If a custom getCapabilities file is found in the folder the file is used to respond to getCapabilities request for that specific version and language level. For example GetCapabilities200_FRE_custom.xml would be used when responding to a getCapabilities request with parameter Language=FRE and version=2.0.0 and service=WFS request parameters. If there is no custom cached file in the directory for that particular language and version configuration the regular cached getCapabilities files are used to respond. The administrator therefore may choose to use custom cache file for certain version and/or language and use default for others. Custom cached getcapabilities file is not deleted when service is restarted. Only default cached getcapabilities files are deleted and recreated.

10 Localization

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