Introduction to ArcGIS 10.1 for Server

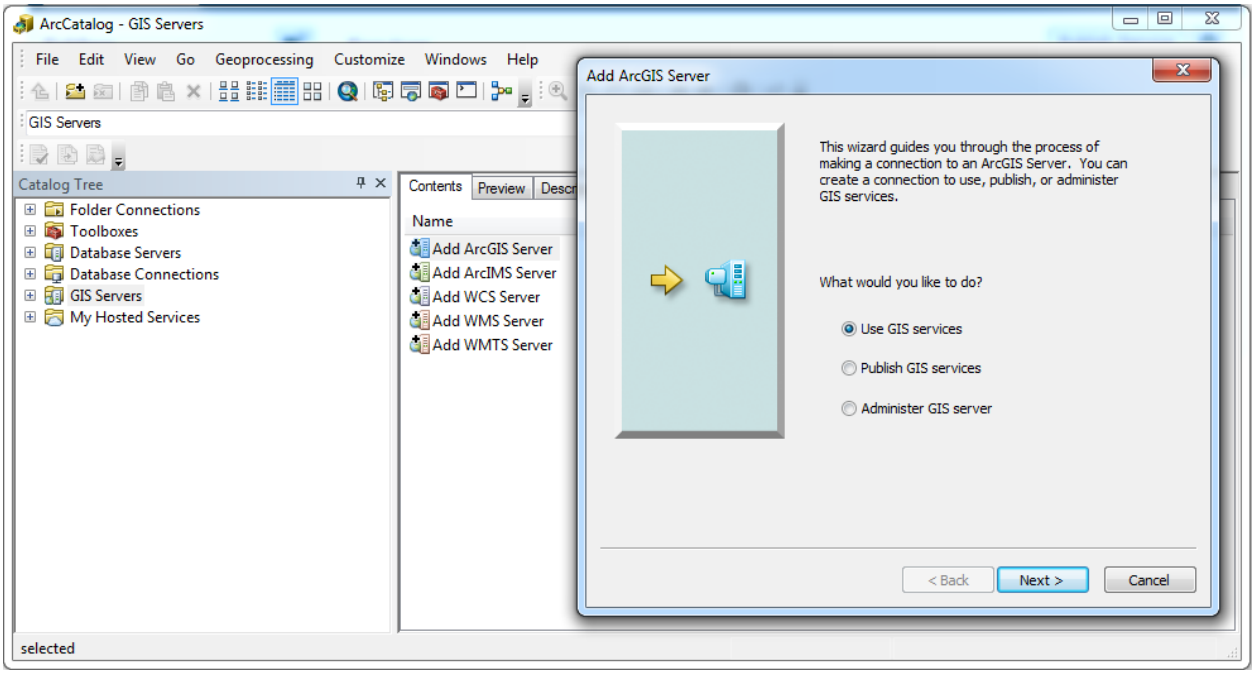
Connecting to an ArcGIS Server

View REST services in browser

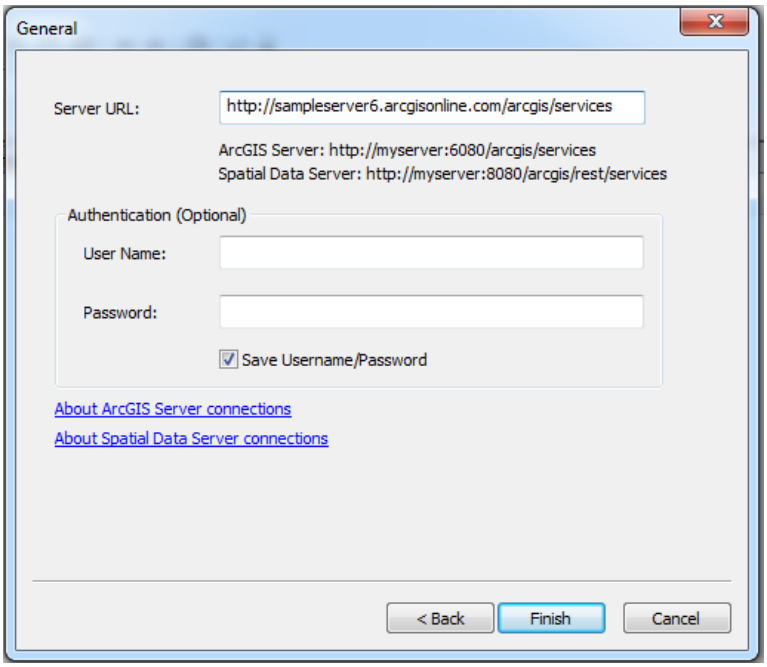
In your browser, go to http://sampleserver6.arcgisonline.com/ArcGIS/rest/services to see an example of the REST services.

View ArcGIS services in ArcCatalog

1. In **ArcCatalog**, go to **GIS Servers** > **Add ArcGIS Server**, and choose to **Use GIS services** and click Next.



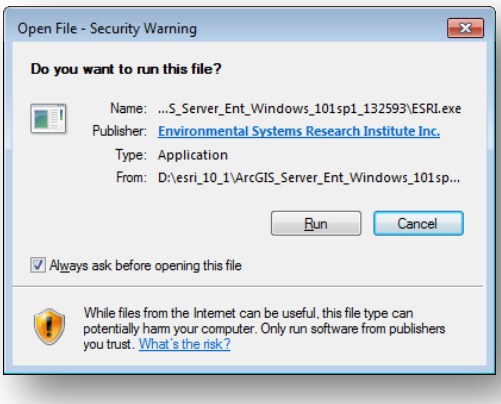
2. Enter http://sampleserver6.arcgisonline.com/arcgis/services into the Server URL and click **Finish**. You should be able to double-click the connection and browse the available services.



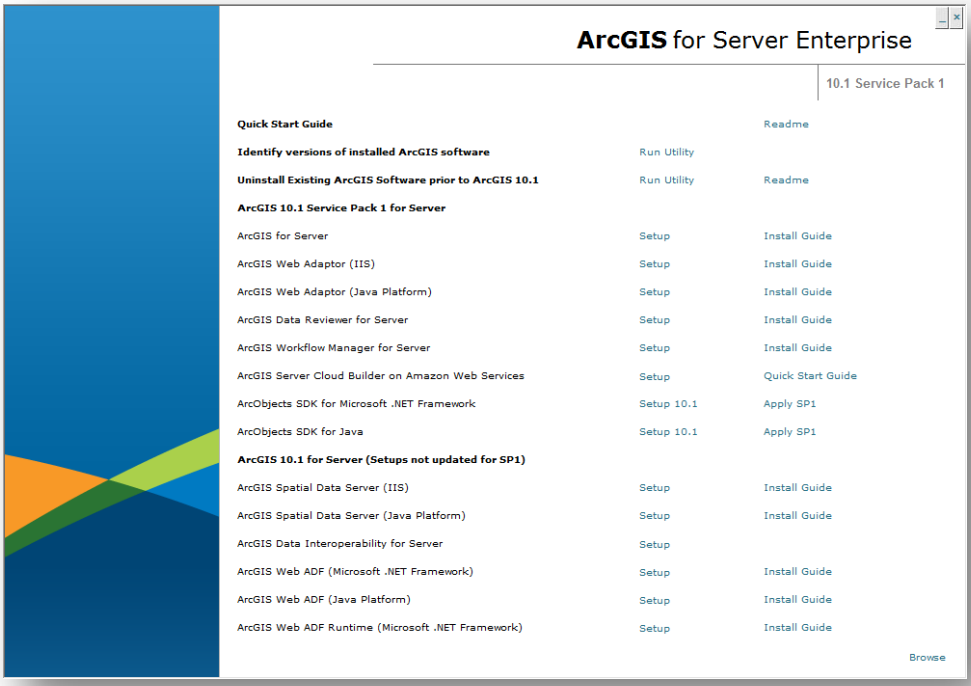
Installing ArcGIS Server 10.1 (SP1) on Windows 7

1. Navigate to the installation folder on your computer (instructors will have this information). Double-click **ESRI.exe** to launch the setup program.

2. Click **Run**, if prompted.

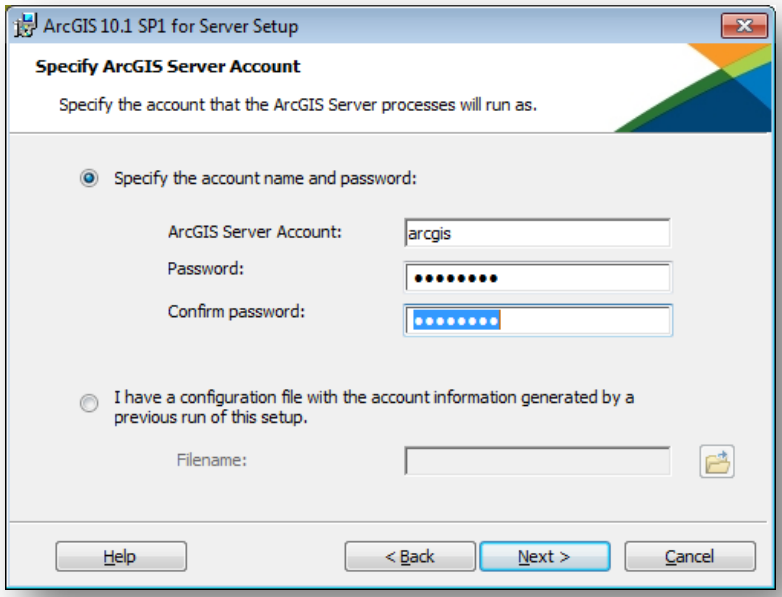


3. Next to the **ArcGIS for Server** item (the first unbolded item in the list), click on the word **Setup**. At this point you may be prompted for administrative credentials, enter them and then proceed.



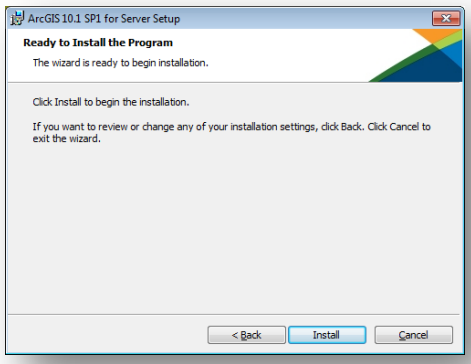
4. Click **Next** to continue
5. **Accept** the license agreement and then click **Next** to continue.
6. Notice that program will be installed in the 64-bit Program Files directory (C:\Program Files\ArcGIS\Server\). Click **Next** to continue.
7. **Accept** the default Python Folder for installation.
8. The **arcgis** account runs the ArcGIS Server Service, it can be a local or domain account and does not need administrative privileges. By default the account is a local account called **arcgis**, and will be created for you. It will be given the necessary permissions to run ArcGIS Server Services. File permissions on data files and folders on the server must be granted manually after

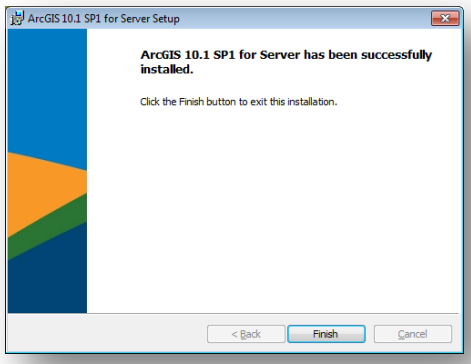
installation.



9. Do not export configuration file.

10. Click **Install**. Installation time takes approximately 5 minutes (for reference, that's on a desktop machine running 64-bit Windows 7 with 8GB of RAM and a 3.00 GHz, quad core).



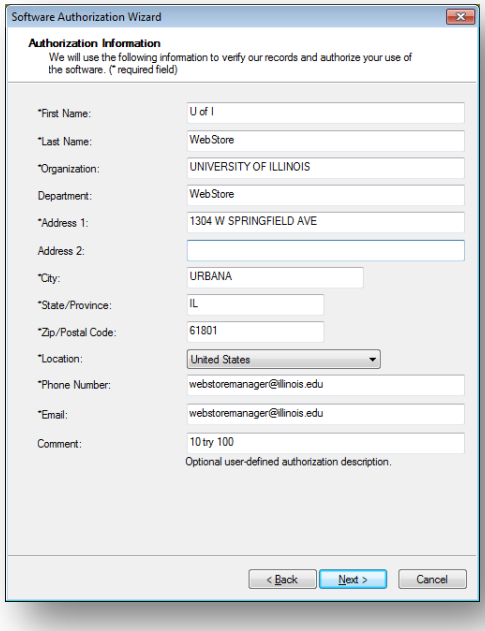


Software Authorization

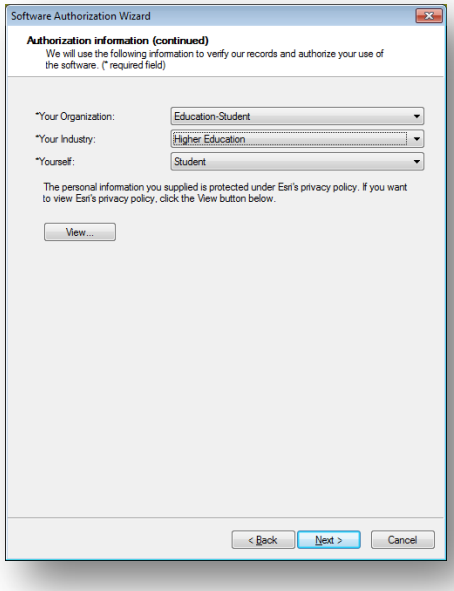
The software authorization wizard should automatically launch. This procedure will authorize the ArcGIS Server software with Esri so that it functions properly.

1. In the **Software Authorization Wizard**, under **Authorization Options**, choose ***"I have installed my software and need to authorize it"***. Click **Next**.

2. Choose ***"I have received an authorization file from Esri and am now ready to finish the authorization process"***. Browse to the course folder and select the file named **ArcGISforServerAdvancedEnterprise_server.prvc**. Click **Next**.
3. Choose ***"Authorize with Esri now using the Internet"***. Click **Next**.
4. Use the default information supplied by the .prvc file. Click **Next**.

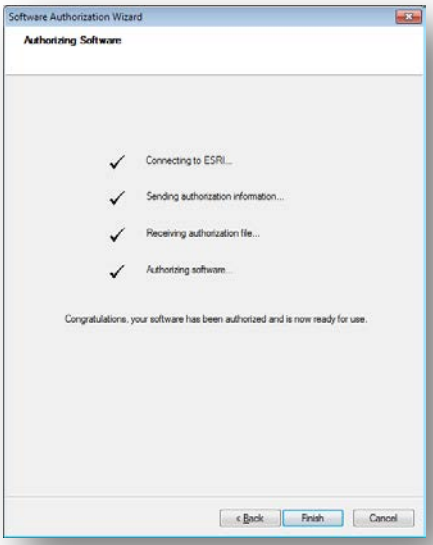


5. Select appropriate values for **Your Organization**, **Your Industry**, and **Yourself**. Click **Next**.



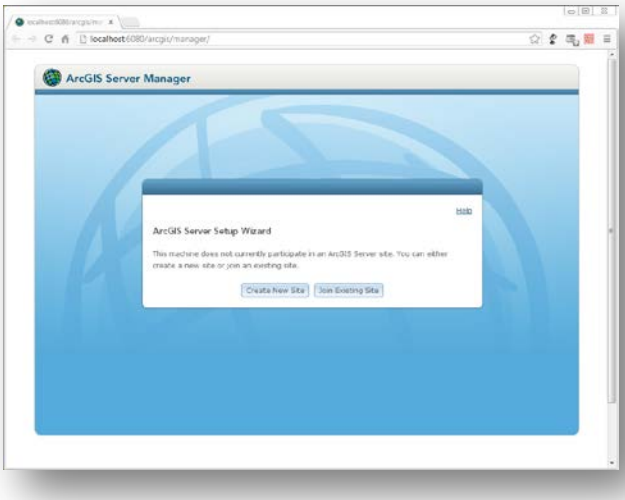
6. The authorization number should be already entered for you as it was included in the authorization file. Click **Next** through the dialogs, and do not Evaluate Software Extensions.

7. Wait while the software is being authorized.



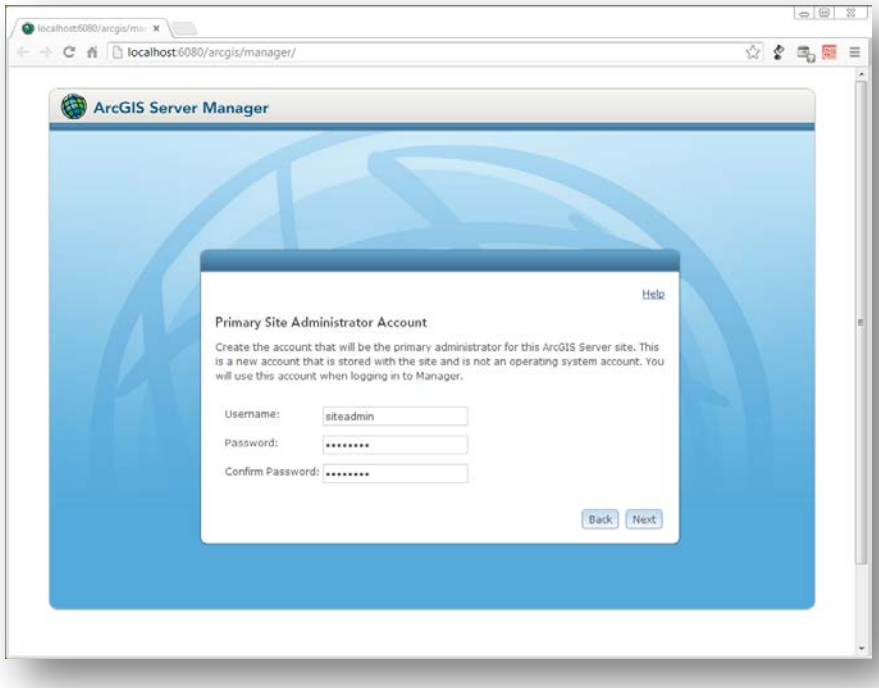
Creating a site

1. Open http://localhost:6080/arcgis/manager. On your first site, you will be asked to Create New Site or Join Existing Site. Click **Create New Site**.

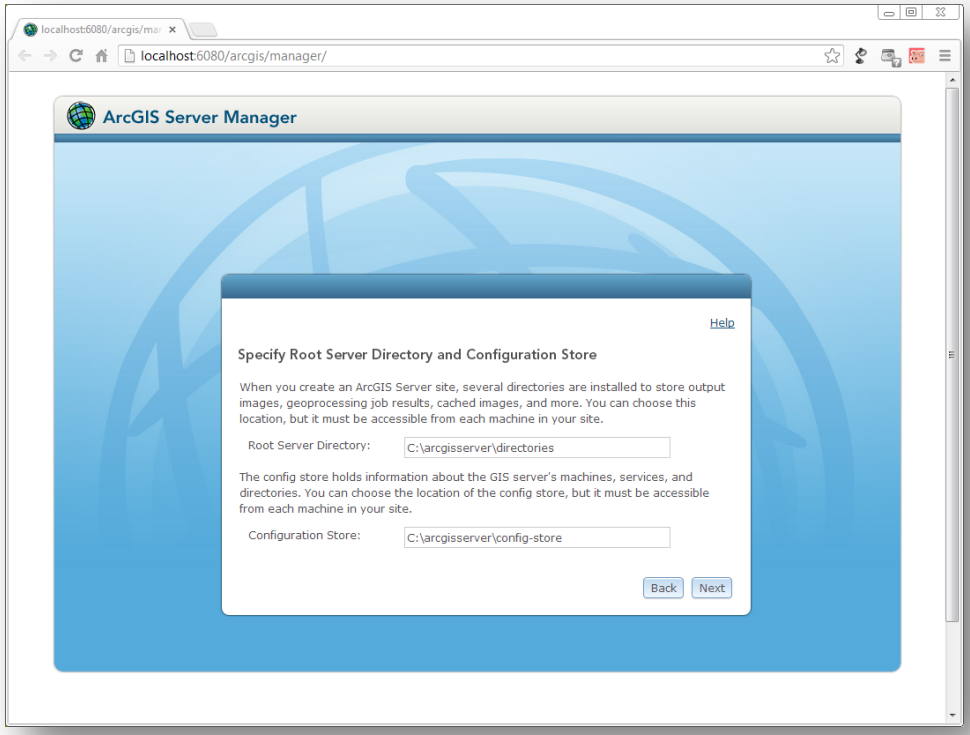


2. Create a **Primary Site Administrator Account**. This account is required by ArcGIS Server to login to Manager, setup the site, and setup security. It is NOT the **arcgis** server account, NOT an OS account; it is stored by ArcGIS Server and controls access to ArcGIS Server ONLY!! *Note: You can change this users password later by logging into ArcGIS Server Manager, and going to*

Security *>* ***Settings*** *and clicking the Edit (pencil) icon next to* ***Primary Site Administrator Account****.*



3. Specify location for **Root Server Directory** and **Configuration Store**. In this lab, we'll stick to the default locations on the C:\ drive.



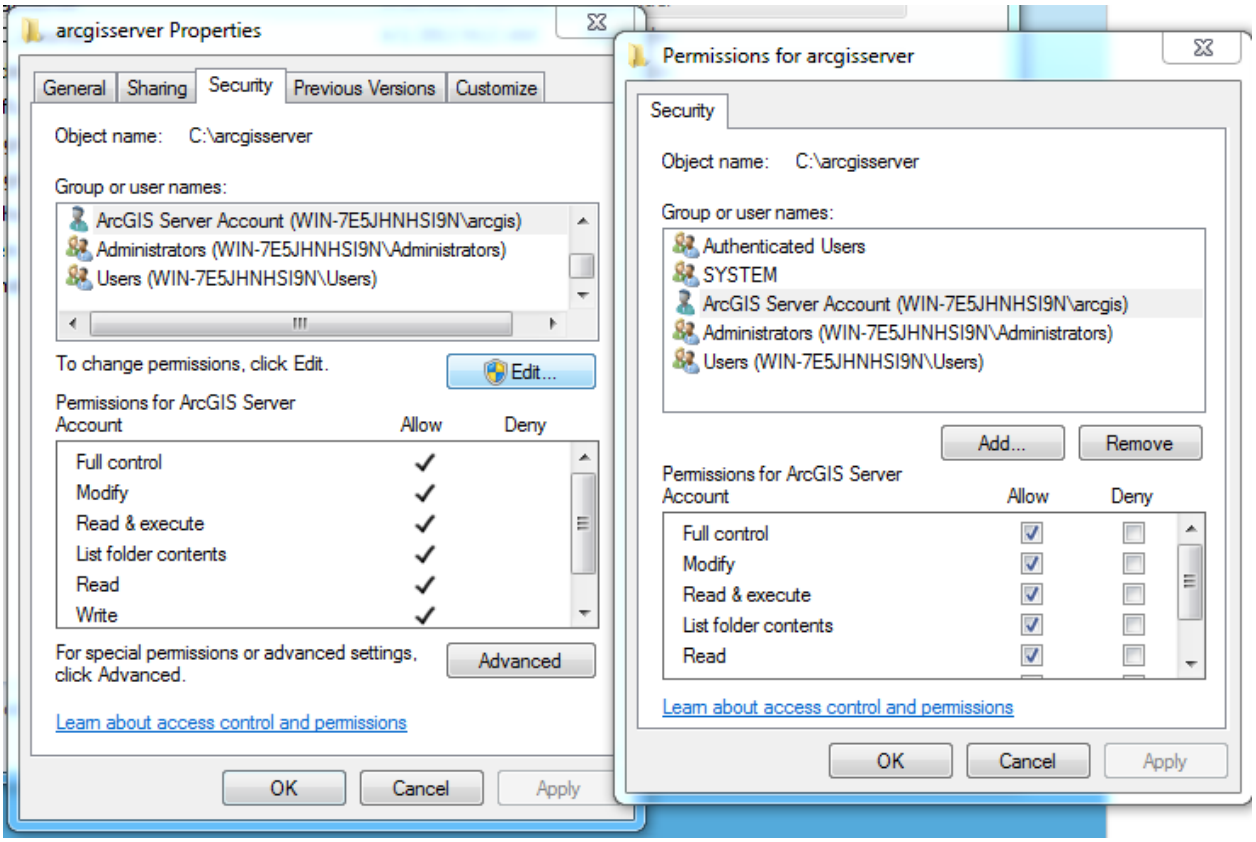
4. Click **Finish** to complete installation. This may take a few minutes.

Post-installation configuration

ArcGIS Server system folders

Now you will give the appropriate permissions to the arcgis server account for the arcgisserver system folders. They were created in the setup process, but the arcgis account on the local system needs to be manually configured.

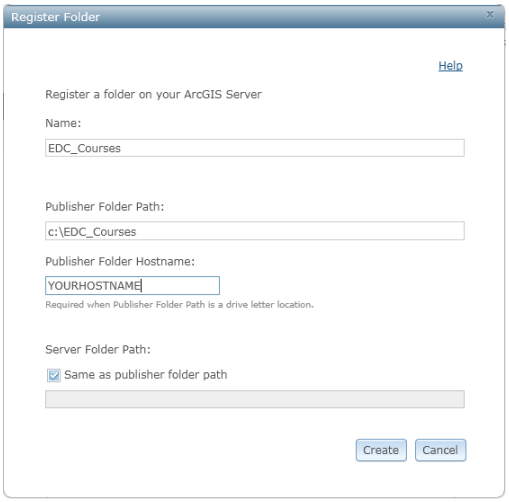
1. Navigate to the arcgisserver folder (C:\arcgisserver). **Right-click** on the folder and choose **Properties**…
2. On the **Security** tab, click **Edit**.
3. In the **Permissions** dialog, click **Add** and search for the arcgis user (or whatever was specified as the ArcGIS System Account in the setup).
4. Give this user Full control over this folder. Click OK to exit dialogs.



Data Store configuration

Follow these steps to copy the course data and set it up so ArcGIS Server can access and display this data.

1. In Windows Explorer, copy EDC_Courses to the C:\ drive.
2. **Right-click** folder, and on **Security** tab set permissions so that ArcGIS System account has read privileges (similar process as the arcgisserver folder previously)
3. Login to ArcGIS Manager (http://localhost:6080/arcgis/manager/)
4. Click on **Site**, then **Data Store**.
5. Click **Register Folder** and enter the following data, then click Create:
    - Name: EDC_Courses (can be any text of your choosing)
    - Publisher Folder Path: C:\EDC_Courses (the directory to publish)
    - Publisher Folder Hostname: your computer hostname (you can find this by pressing WinKEY+Pause/Break)
    - Same as publisher folder path: checked
6. Click the **Validate All** button to check that your folder is accessible to ArcGIS Server.



Firewall

In a production setting, you may need to open up firewall ports. Common ports are 4000 to 4004, 6080, and 6443. You can view ports in use at http://localhost:6080/arcgis/admin/machines (click on machine name and then expand Ports).

Administrative connections to ArcGIS Server

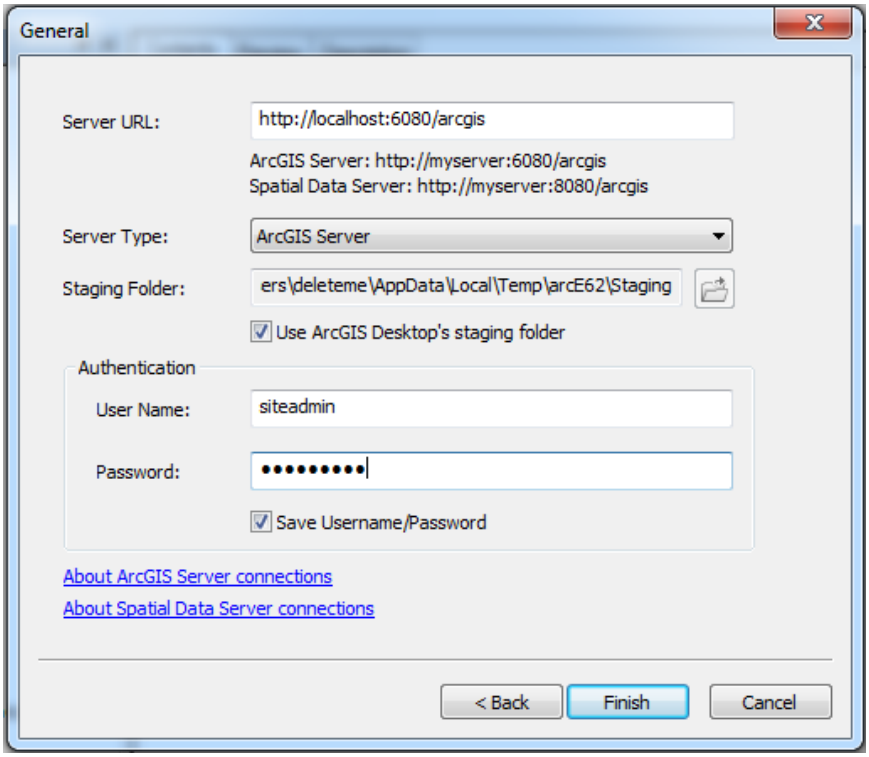
There are three main interfaces for managing ArcGIS Server:

Manager (web): http://localhost:6080/arcgis/manager. This is the web interface you can use to manage your server from any accessible web browser.

Manager (ArcCatalog): A convenient way to administer ArcGIS Server with ArcCatalog. To create an administrative connection:

- In ArcCatalog go to GIS Servers > Add ArcGIS Server
- Choose Administer GIS server

- Enter the following:



REST Admin (web): http://localhost:6080/arcgis/admin/. This is the admin interface through the REST endpoint. It is recommended to use Manager when possible, but some advanced settings and diagnostics can only be accessed through this interface.

Publishing Services with ArcGIS 10.1 for Server

In this exercise, you will:

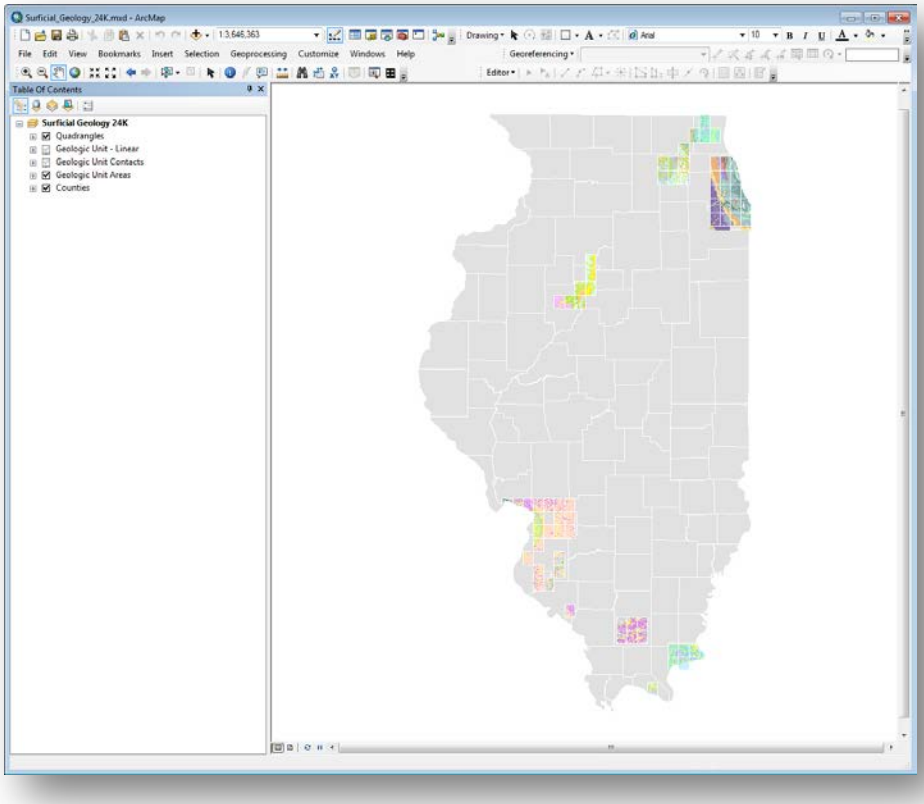
- Prepare a map for publishing.
- Edit your service's Item Description.
- Analyze the map, and correct any errors.
- Publish the service.

You will take the following map document depicting surficial geology in Illinois and make it available as a web service so that it can be consumed on a client computer using desktop GIS software, or a web application. Examples include ArcMap, ArcGIS.com, or a custom application configured or programmed using the ArcGIS API for JavaScript.

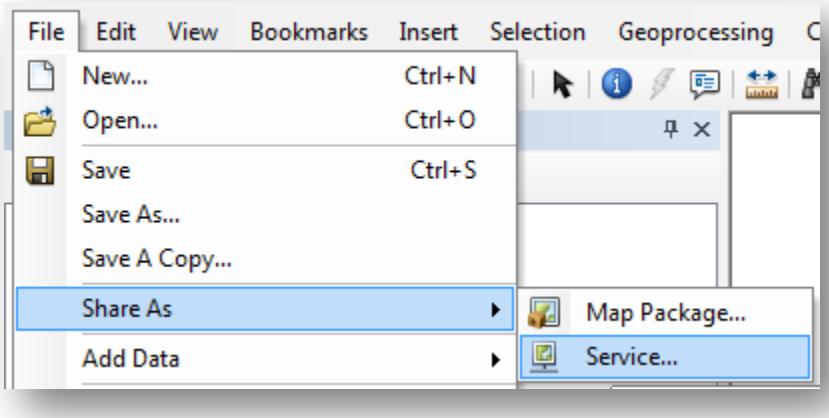
Process Steps

1. In ArcMap, open the **Surficial_Geology_24K.mxd** located in your **C:\EDC_Courses** folder, and take a couple of minutes to look over the content of the map. Take special note of the following:
    a. **File** > **Map Document Properties…**

b. **View** > **Data Frame Properties…**
c. **Layer Properties** for each layer
    i. **General** tab – **Description**, **Credits**, and **Scale Range**
    ii. **Labels** tab – Are there labels?
d. Zoom in and out to see when the layers with **Scale Ranges** set turn on or turn off.

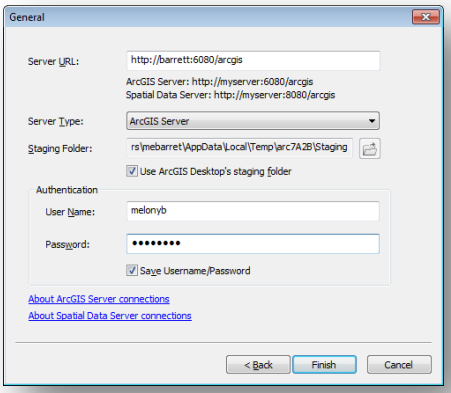


2. Finally, right-click on the Counties layer and choose **Zoom to Layer**.
3. From the **File** menu, chose **Share As** > **Service…**

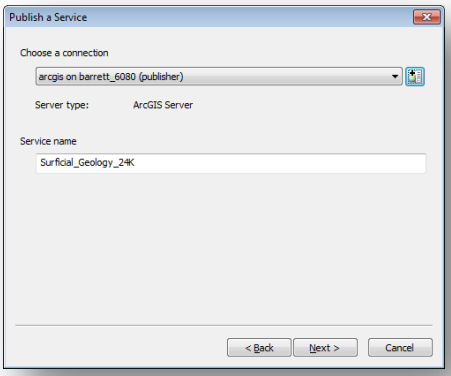


4. In the **Share as Service** dialog, choose **Publish a service**, and click **Next**.

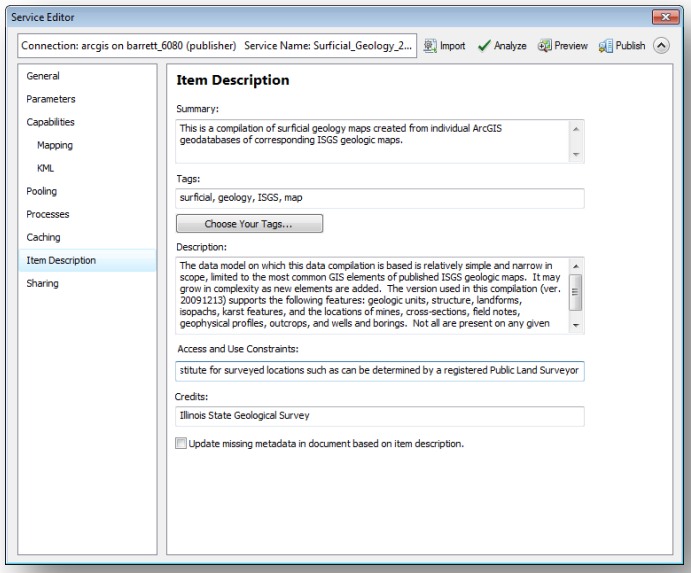
5. In the **Publish a Service** dialog, click on the  and make a connection to your **ArcGIS Server**. Alternatively, you can choose the Administrative connection previously created.
6. In the **General** dialog box, choose **Publish GIS services**. Click **Next**.
7. Enter your **Server URL**, and supply your **User Name** and **Password**. Click **Finish**.



8. You will be returned to the **Publish a Service** wizard, where you can accept the default **Service name**, and click **Next**.



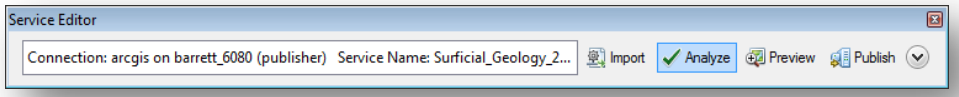
9. Select the **Create new folder** radio button, and name the new folder **Geology**. Click **Continue**.
10. You are now in the **Service Editor**. Set the properties that you want for your map service. Here, you can choose what users can do with your service and take fine-grained control of how the server will expose your service. For details on how to manually set map service properties, see the topic Setting map service properties. For information on how to best configure your service for deployment, see the help topic Tuning and configuring services.
11. Click on the **Item Description** tab. This information should look familiar because the only element that is not extracted from the **Map Document Properties** is the **Access and Use Constraints**.

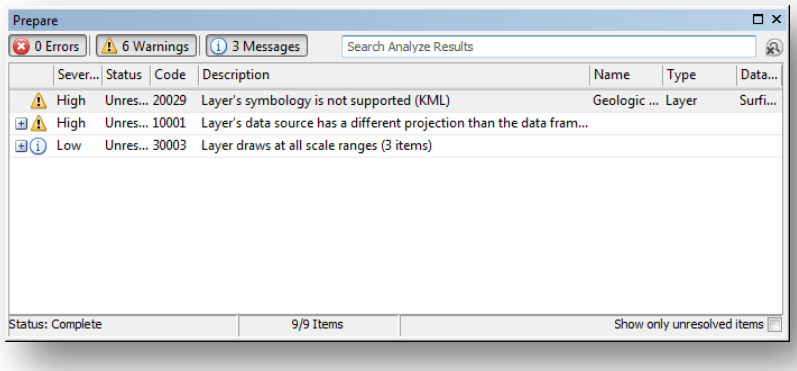


12. Input the following text in the **Access and Use Constraints** box:

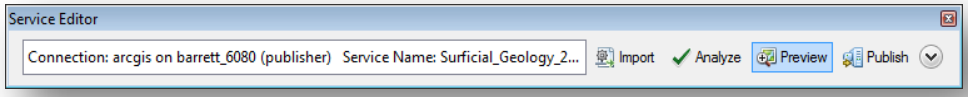
    "This data compilation is intended to provide an overview of the geology of the map area. The data do not replace the need for detailed site-specific studies. The information is not appropriate for, and is not to be used as, a geodetic, legal, or engineering base. The information has no legal basis in the definition of boundaries or property lines and is not intended as a substitute for surveyed locations such as can be determined by a registered Public Land Surveyor."

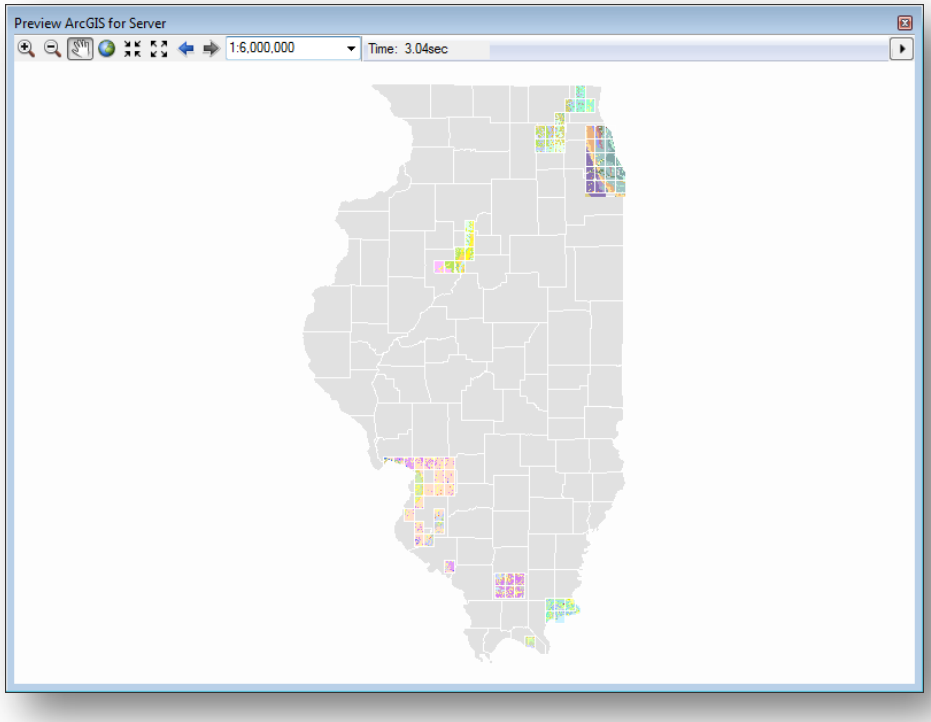
13. Click the Analyze button and review the Errors, Warnings, and Messages. Only Errors absolutely have to be fixed. Warnings and Messages should be reviewed and fixed to improve performance or appearance.



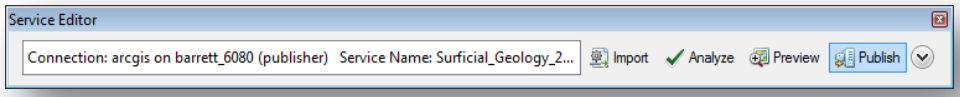


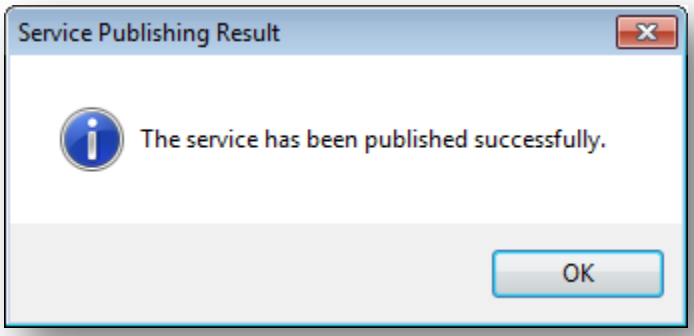
14. Optionally, click Preview to see what your map will look like on the web.





15. Finally, click **Publish**, and wait while the service is published to the server.





Consuming Services Using the ArcGIS.com

Demonstration by instructor.

Consuming Services Using the ArcGIS API for JavaScript

Explore a Sample

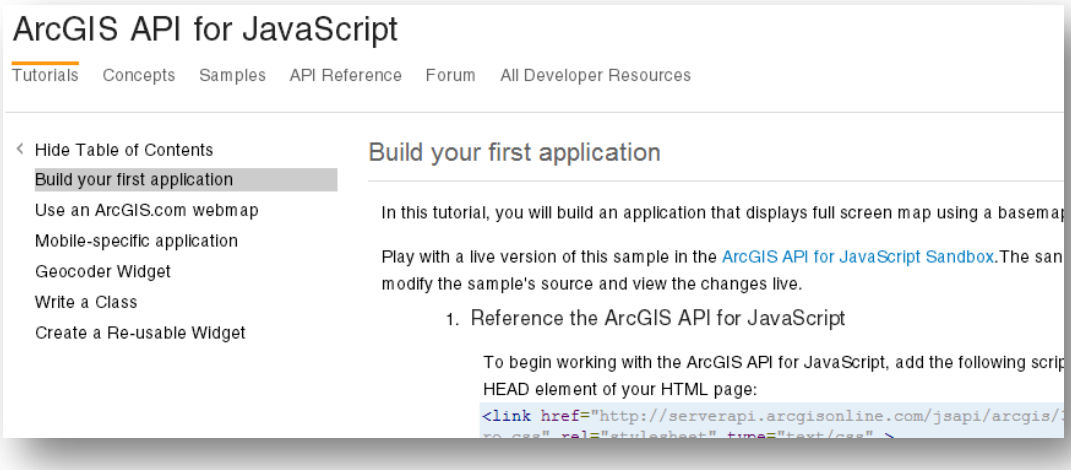
1. Navigate to the **ArcGIS API for JavaScript** developer site: http://developers.arcgis.com/en/javascript/
2. Click on **Samples** in the top navigation bar.
3. Expand the **Query Task** group of samples, and click on **Query and immediately open info window**.
4. Click on the **View live sample** link just under the sample title.
5. By default, users can choose the mouse, keyboard, and sliders for panning and zooming a map, depending on what is enabled in the HTML page. By default, users can do the following:
    - Drag the mouse to pan
    - Mouse Scroll Forward to zoom in
    - Mouse Scroll Backward to zoom out
    - SHIFT + Drag the mouse to zoom in
    - SHIFT + CTRL + Drag the mouse to zoom out
    - SHIFT + Click to recenter
    - Double Click to Center and Zoom in
    - SHIFT + Double Click to Center and Zoom in

- Use arrow keys to pan
- Use + key to zoom in a level
- Use - key to zoom out a level

6. Click on one of the oil fields and an **Info window** will appear with information about the polygon you clicked.

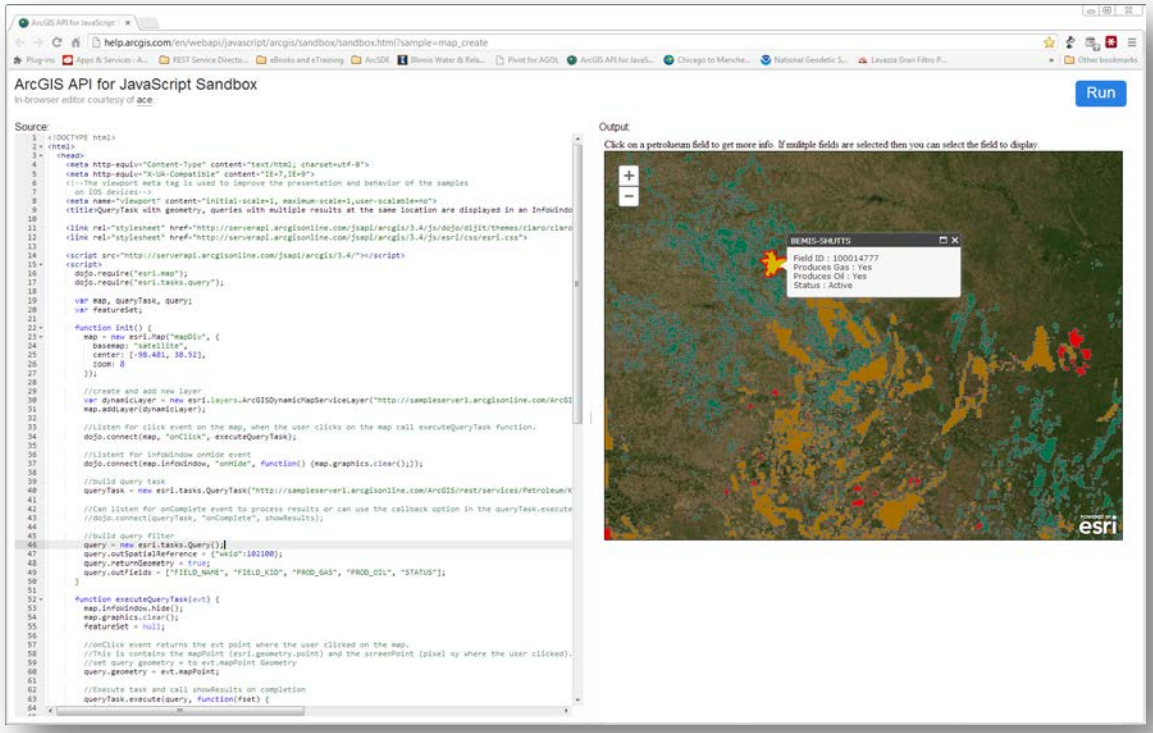
Customize a Sample

1. Now let's customize this sample. Close the live sample, and return to the sample launch page.
2. Copy all of the code text for the sample to the clipboard and launch the **ArcGIS API for JavaScript Sandbox** using the following URL: http://help.arcgis.com/en/webapi/javascript/arcgis/sandbox/sandbox.html?sample=map_create. You can also get to the Sandbox from any location of the JavaScript API site by clicking on **Tutorials** > **Build your first application**, and then clicking on the blue link in the main page.



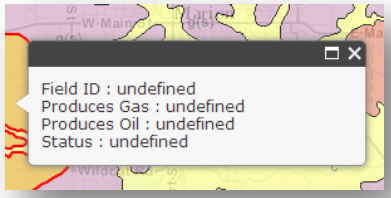
3. Delete all of the code from the left side of the **Sandbox** under **Source:**, and then paste in the sample code.
4. Click **Run**.

5. Now you should have the same Kansas petroleum fields sample running in the sandbox, and it should function just as it did before.



6. Now alter the code so that it references a different basemap, our map service, and then edit the lines of code to query our map and show the information from the query in the **Info window**.
    a. Delete **startExtent**
        i. Go to **line 23** of the code.
        ii. Delete the entire line of code that starts with **var startExtent**… This line is not necessary for our purposes, and is for a location in Kansas.
        iii. Click **Run** again, just to make sure that nothing broke.
    b. Edit the **basemap**
        i. Go to line 24.
        ii. Change the **satellite** to one of the following: **topo**, **gray**, or **street**.
        iii. You can click **Run** here again, too, to view the new **basemap**.
    c. Edit the map **center**
        i. Go to line 25.
        ii. Replace the coordinates with the following **[-88.933, 37.732]**
        iii. If you click Run now, the map will be centered on Marion, Illinois.
    d. Edit the map **zoom**
        i. Go to line 26.
        ii. Change the zoom level from 8 to **13**.
        iii. If you click Run now, the map will be centered on Marion, Illinois.

e. Edit the **ArcGISDynamicServiceLayer**
    i. Go to line 30.
    ii. Delete the service URL that's inside the quotes and parentheses with the service we created in the last exercise.
    http://localhost:6080/arcgis/rest/services/Geology/Surficial_Geology_24K/MapServer
    iii. Click **Run**.
    iv. Now, instead of looking at the Petroleum Fields of Kansas, we're looking at the Surficial Geology of Illinois. Also notice that our while our geology service is visible, we can't see through the polygons to the basemap service below.
f. Edit the map service **opacity**
    i. Go back to line 30.
    ii. Position your cursor after map service URL, just after the end quote, but before the closing parenthesis.
    iii. Type: **, {opacity: "0.75"}**
    iv. Click **Run**.
g. Edit the **QueryTask** URL
    i. Go to line 40.
    ii. Replace the QueryTask URL with the Surficial Geology map service, but this time, add the index number of the Geologic Unit Areas layer to the end of the URL. It is this layer that will be queried. *(Hint: Use your REST services directory to drill down into the layer endpoint.)*
    iii. Click **Run**. Nothing happens. Why?
h. Edit the **Query outFields**
    i. Go to line 49.
    ii. Instead of specifying fields to be returned from the query, get all off the fields by replacing the list of field names with **["*"]**.
    iii. Click **Run**.



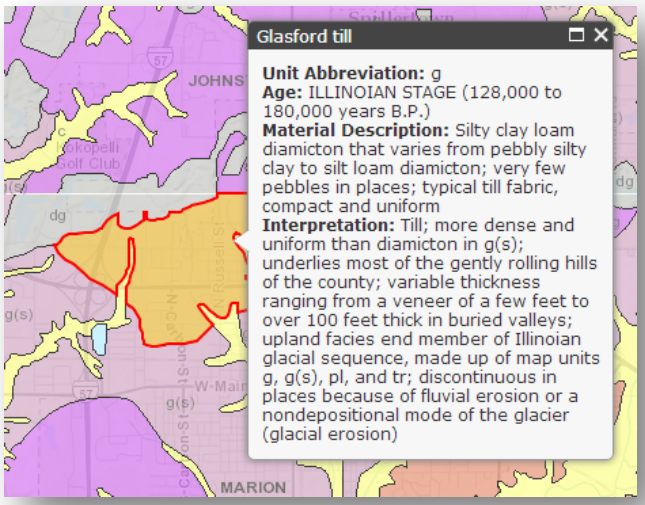
    iv. While the geometry of the Geologic Unit Area is being returned when the user clicks on a polygon, we are not getting the attributes.
i. Edit the **infoWindow** title and content
    i. Go to lines 81-85 and completely replace them with the following code:

```
var title = attr.GUName;
var content = "<b>Unit Abbreviation:  </b>" + attr.GUAbbrev
```

```
+ "<br /><b>Age:  </b>" + attr.GUAge
+ "<br /><b>Material Description:  </b>" + attr.GUMatDesc
+ "<br /><b>Interpretation:  </b>" + attr.GUInterp;
```

j. Click **Run**.

k. Now when the user clicks on a polygon, they should see a fully populated infoWindow with attribute information from the Geologic Unit Polygons.



Securing Services with ArcGIS for Server 10.1

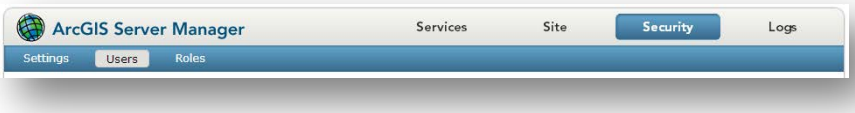
Exercise objectives

In this exercise, you will:

- Create users.
- Create a role.
- Secure the service, allowing access to a role.
- Access the service from various client applications.

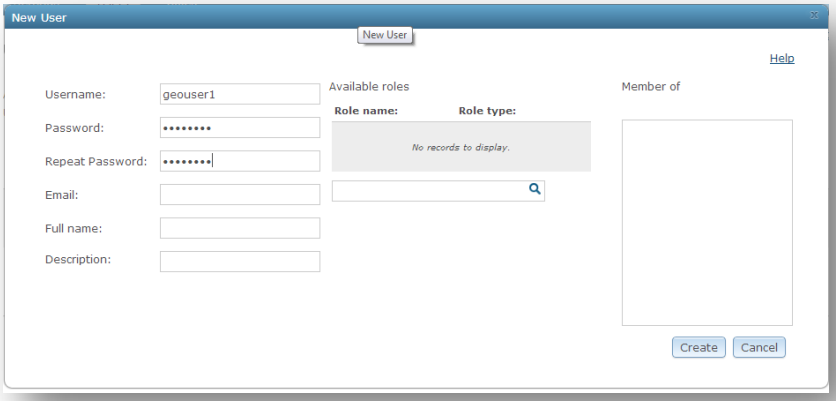
Process Steps

1. Login to **ArcGIS Server Manager** (http://localhost:6080/arcgis/manager/) using your **Primary Site Administrator** (PSA) credentials.
2. Click **Security** (on the gray bar), and then **Users** (on the blue bar).

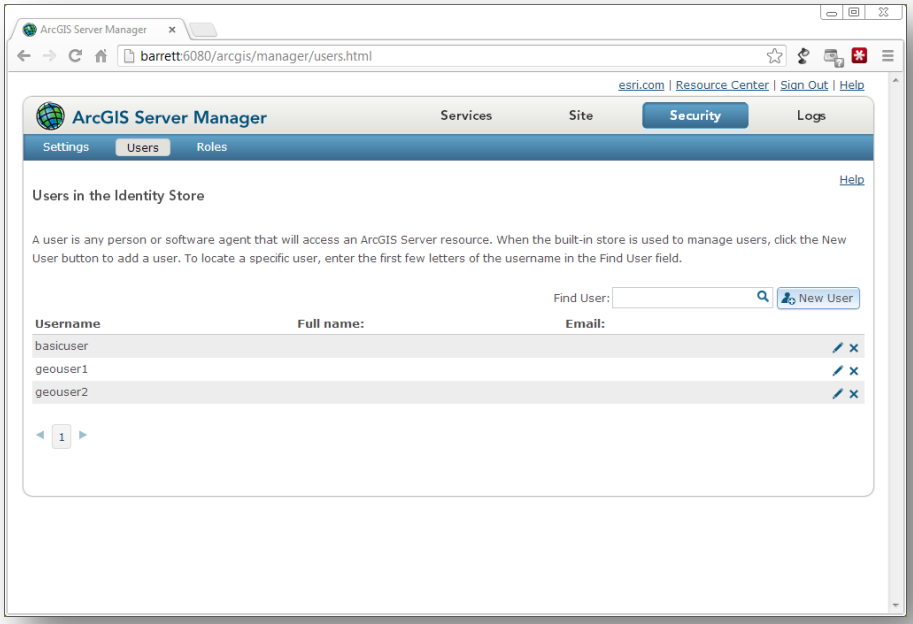


3. Create users

a. Click the **New User** button.
b. In the **New User** dialog, enter **geouser1** as the Username, and then supply a password.

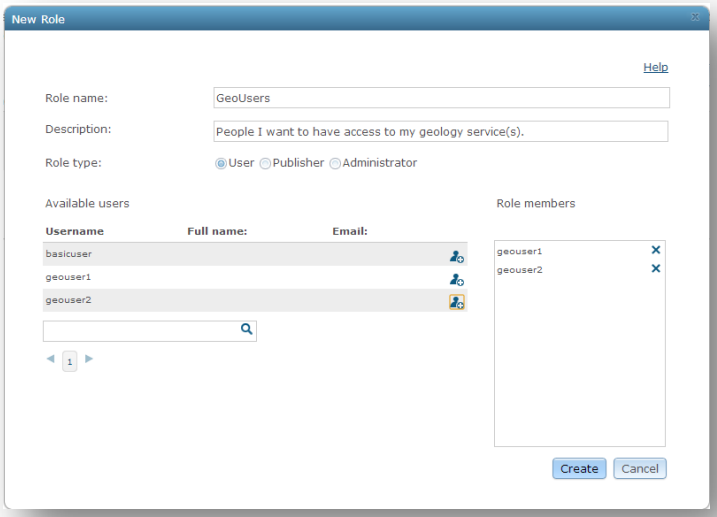


c. Click the **Create** button.
d. Repeat the steps above to create two more users. Call them **geouser2** and **basicuser**.
e. When done, the screen should be as pictured below.



4. Create a role
   a. Click on **Roles**.
   b. Click the **New Role** button.
   c. In the **New Role** dialog, enter **geouser1** as the Username, In the New Role dialog, give the role a name, description, and add users by clicking on the icon next to their

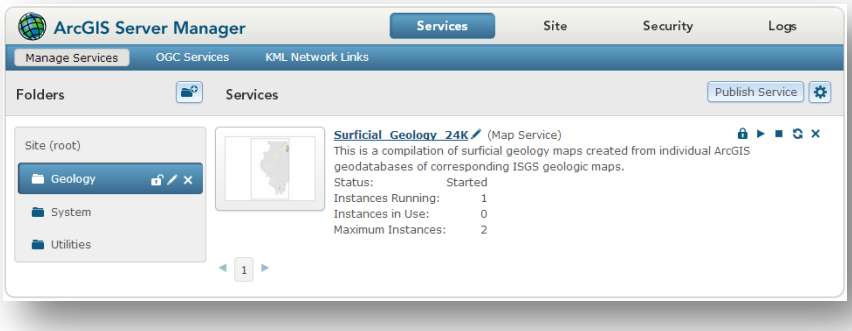
names.



d. Click the **Create** button.

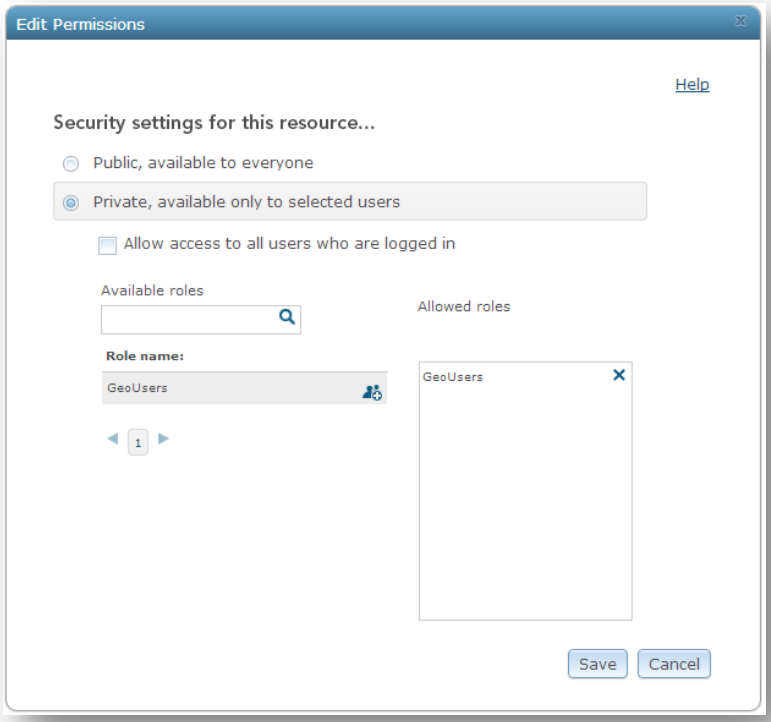
5. Secure a service.

a. Click on **Services** (on top gray bar), then under **Folders**, click on the **Geology** folder. The Surficial_Geology_24K map service is shown in the service gallery.



b. Click on the icon. (All services are by default public.) Click on the **Private, available only to selected users** radio button, and then click the button to add the **GeoUsers**

role to the list of **Allowed roles**.



c. Click **Save**.

d. Note: While **GeoUsers** is the only role that has had permission explicitly given to it, any users in a **Publisher** or **Administrator** role will also be able to access to the service.

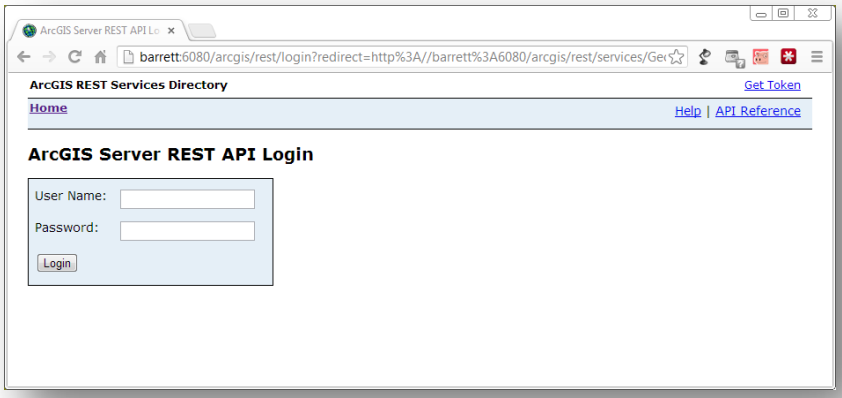
e. Sign out of **ArcGIS Server Manager**, and close your browser.

6. Test User Access Scenarios.

   a. ArcGIS REST Services Directory

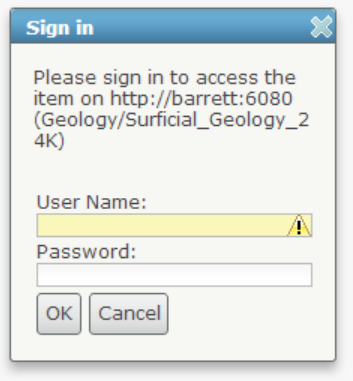
      i. Open a browser, and navigate to your service's REST endpoint. http://localhost:6080/arcgis/rest/services/Geology/Surficial_Geology_24K/MapServer

      ii. When a user tried to access a secured service using the REST endpoint of the service or one of its layers, the following Login page will appear, prompting them to enter their credentials.



b. ArcGIS.com

   i. When a user adds the service to the map by clicking **Add** > **Add Layer from Web**, they will be prompted to sign in.



   ii. After successfully signing in, the map should be added to the map.

c. ArcGIS API for JavaScript – Identity Manager widget.

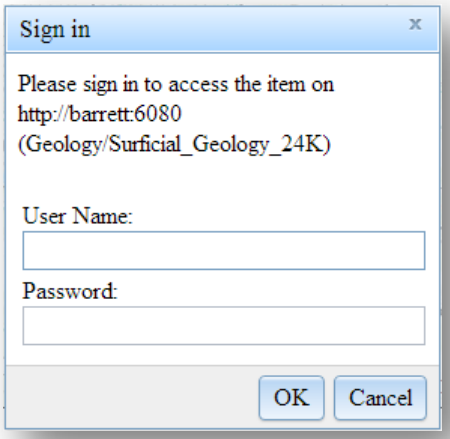
   i. Return to your JavaScript Sandbox code from the last exercise.

   ii. Find the list of dojo.require statements, and add the following statement to the code (hint: it'll be somewhere around line 18):

```
dojo.require("esri.IdentityManager");
```

   iii. Click Run.

   iv. Enter you credentials when the Sign in dialog is shown



v. Click OK
vi. Upon successfully signing in, your layer will be added to the map.

Information

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