lucity™

TRAINING GUIDE

Lucity GIS Admin Tools

clarity through connections www.lucity.com 10561 Barkley, Suite 500 Overland Park, KS 66212 913.341.3105

Lucity GIS Admin Tools

In this session, we'll cover the tools necessary to properly configure Lucity to work with your GIS environment. We'll give you information about the synchronization setup, synchronization process and database connection.

Table of Contents

Introduction 4

Lucity Administration Tool 5

- GIS Connection Strings 5
- GIS Config 8
- GIS Map Services 12
- System Settings 14
  - GIS Edit Integration Tab 14
  - GIS Desktop Tab 15
  - General Tab 16

Lucity Desktop 17

- Show in Map Configuration (Single User) 17
- Show in Map Function 18

ArcCatalog 19

- Lucity Show in Map Configuration Tool 19
- Lucity Geodatabase Configuration Tool 21
  - Connection Properties 22
  - Validating the Geodatabase Configuration 23
  - Validating Against Geodatabase 23
- Default Fields Setup 25
  - Setting up Default Fields 25
- Update Geodatabase Value 27
- Update Show in Map Flag 28

ArcMap 29

- MXD Specific Settings 29
- User Specific Settings 30
- Symbology Defaults 31

ArcGIS Server 32

- Install the Lucity SOE 32
- Enable the Lucity SOE for a Map Service 33
- Configure SOE settings in Lucity 36

Specify Edit Map Service URL 36
Configure GIS Edit Integration settings 37
GIS Updates via Feature Service 38
Requirements 38
Setup 39
Create Feature Service 39
Assign default map services 40
Configure System Settings 41
How it works 42
What occurs when opening a Lucity record for editing 42
What occurs when saving a Lucity record after editing 43
Lucity Spatial 45
Requirements 45
Setup 46
Assign default map services 46
Configure System Settings 47
How it works 48
Behind-the-scenes 48
Troubleshooting 49
Generating Live Work Layers 50
Publishing Live Work Layers 55
Work Maintenance Zones 57
Setting up Zones 57
In Lucity 57
In GIS 57
Populating Zones from Assets 57
In Lucity 57
In GIS 57
Populating Zones by Location 58
In GIS 58
In Lucity 58
Configure Default Supervisors for Maintenance Zones 59
In Lucity 59
How it Works 59
Requests 59
Work Orders 59
Special Behaviors 60

Lucity GIS- Scheduled Tasks 61
Requirements 61
Setup 62
Assign default map services 62
Creating a new Scheduled Task 63
Copying a Scheduled Task 65
Validate a Scheduled Task 66
Manually Run a Scheduled Task 67
How it works 68
Troubleshooting 70

Introduction

Some system configuration and setup is required prior to using any of the Lucity GIS applications. This configuration occurs in the Lucity Administration tool, Lucity desktop application, ArcCatalog, ArcMap, and ArcGIS Server.

Lucity Administration

1. Create geodatabase connection strings
2. Specify map and/or feature service connection info
3. Configure system settings

Lucity Desktop application

1. Configure show in map settings

ArcCatalog

1. Using the Geodatabase Configuration tool to map feature classes and fields to Lucity
2. Associate map/feature services for feature classes
3. Default fields configuration (optional)
4. GIS Scheduled Tasks (optional)

ArcMap

1. Optional .mxd and user specific settings
2. Alias Name import

ArcGIS Server

1. Install/Enable Lucity Data Update SOE (optional)
2. Create/modify map/feature services
3. Registering the Lucity Work database to the server

The following pages describe the above steps in further detail.

Lucity Administration Tool

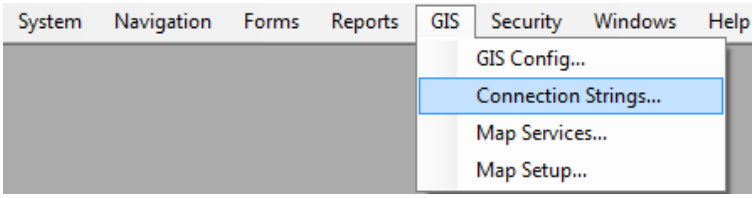
The Lucity Administration tool (Lucity.Admin.exe) is used to configure various GIS settings. This .exe can be found in your local workstation \bin directory or can be accessed by the Start>>All Programs>>Lucity>>Lucity Administration Tools

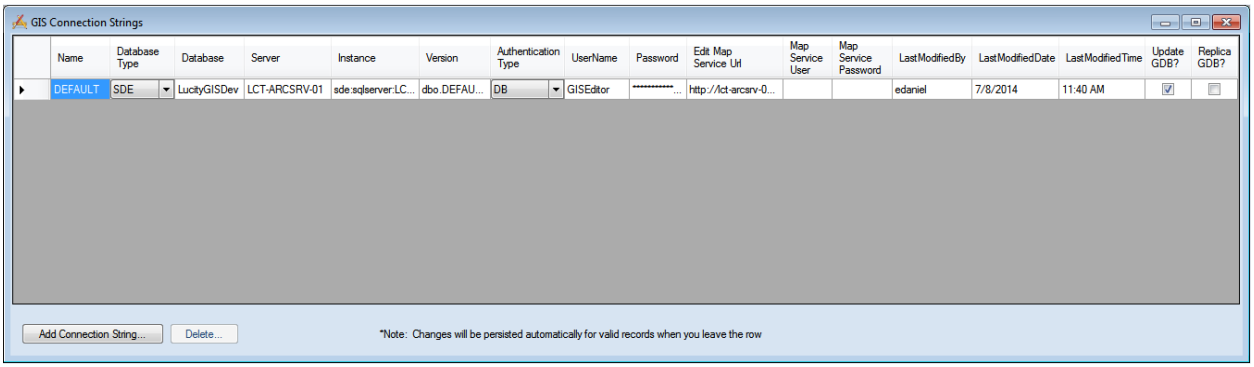
GIS Connection Strings

GIS Connection Strings are created and modified within the Lucity Administration Tool. This information is used in the following situations:

- The Lucity extension for ArcGIS for Desktop (ArcMap/ArcCatalog) compares the layer's connection info in the ArcGIS for Desktop application to the connection info in GIS Connection Strings to determine if the layer is configured with Lucity.
- Some tools (Work Location Viewer, Work Frequency) that are part of the Lucity extension for ArcGIS for Desktop require access to feature classes configured with any of the various Lucity modules. These tools don't require that the feature classes be loaded in the .mxd; therefore, if the Lucity extension can't locate a particular feature class in the .mxd it will create a connection to the geodatabase using the settings in GIS Connection Strings to obtain access to the feature class.
- The Edit Map Service Url property in GIS Connection Strings is used with the following tools:
    - Lucity Spatial Indexer- This service will query this map service URL to obtain the geometry for a particular asset inventory record.
    - Lucity to GIS Updates- When edits are made within the Lucity application, Lucity will attempt to apply the same edit to the corresponding GIS feature. For client's using the Lucity SOE, the Edit Map Service would indicate the map service that has the Lucity SOE enabled. For client's using the Feature Service option, this URL would indicate the feature service that contains the Lucity linked feature classes that can be updated with edits.
    - GIS Scheduled Tasks via GIS Task Runner- A scheduled task interacts with the map and/or feature service specified at the individual feature class level, or if one is not defined, it uses the service configured to the Edit Map Service URL property for the geodatabase. Depending on the GIS Scheduled Task type queries, updates, inserts and/or deletes are being made to the layers configured with the service.

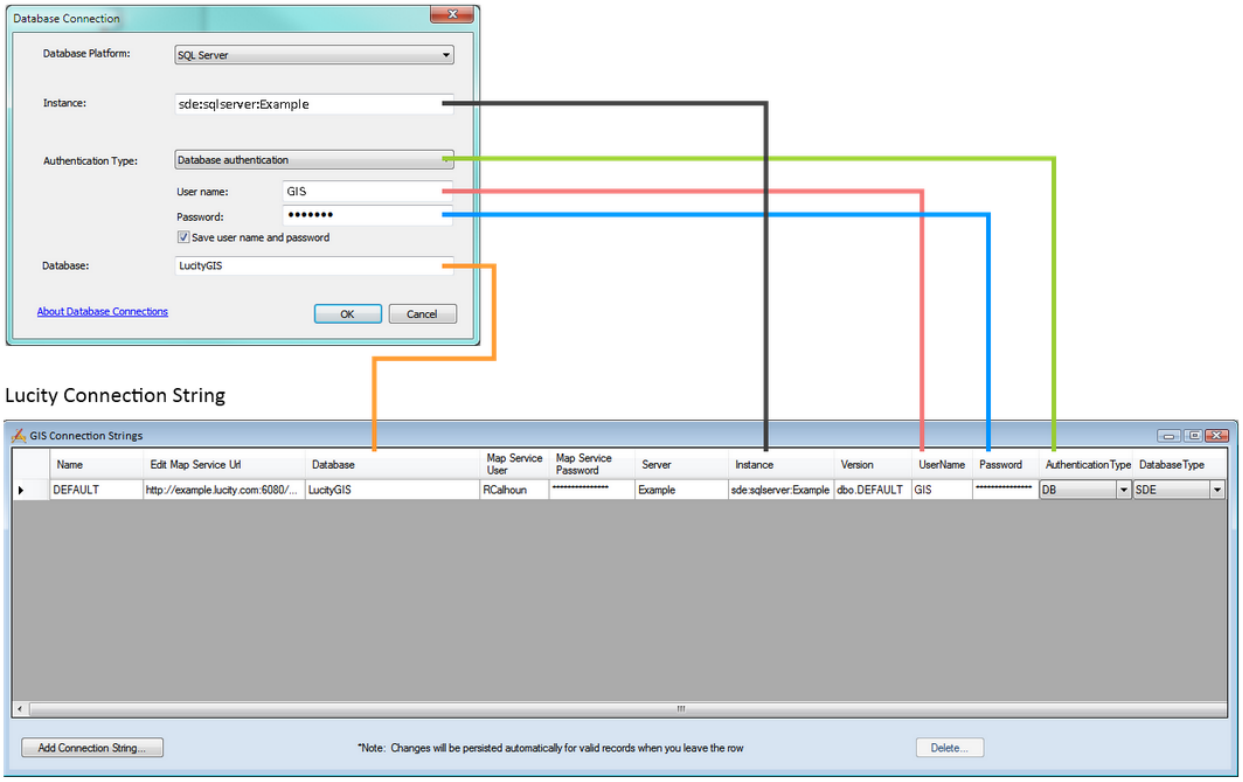
To add a geodatabase connection use the GIS Connection Strings form under the GIS menu.





- **Name:** This is simply a name for the connection. Note: You must have one connection named DEFAULT, so if you only have one geodatabase configured with Lucity, you must name the connection DEFAULT.
- **Database Type:** Specify either SDE, Personal, or File.
- **Database:** This must contain the name of your geodatabase. The database listed in this field is not the SDE repository database. Instead, it is the geodatabase that contains the infrastructure data that you want to integrate with the desktop.
    - For SQL Server geodatabases this must contain the geodatabase name.
    - For Oracle geodatabases this must be blank.
    - For Access or File geodatabase this is the path to the .mdb/.gdb.
- **Server:** (For SDE databases only) The name of the server that holds the SDE database
- **Instance:** (For SDE databases only) The name of the instance for the SDE database. This supports either spatial or direct connections.
    - SQL Server example: sde:sqlserver:LCT-ARCSRV-01\SQLEXPRESS
    - Oracle example: sde:Oracle11g:OracleDBServer
- **Version:** (For SDE databases only) Designates the name of the geodatabase version that Lucity will use to connect to the geodatabase. For Oracle, the Version is case sensitive.
- **Authentication type:** How Lucity will connect to the database. The desktop app will attempt to connect to the geodatabase using either Database Authentication or Operating System Authentication. If you specify DB you must also populate the UserName and Password fields.
- **UserName:** If using DB authentication type you must specify a user. This database login will be used by Lucity to connect to the geodatabase.
- **Password:** If using DB authentication type you must also specify a password for the user.
- **Edit Map Service URL:** This is the URL for a map/feature service that contains this geodatabase's feature classes linked to Lucity.
- **Map Service User:** If the Edit Map Service URL is for a secured map service enter user name that has permissions to access the service.
- **Map Service Password:** Enter the password for the Map Service User.

ArcCatalog/Map Connection String



Notes: _____

_____

_____

_____

_____

_____

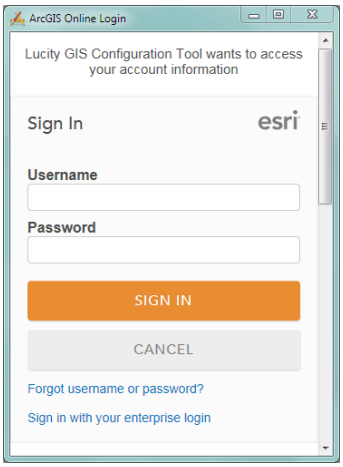
_____

GIS Config

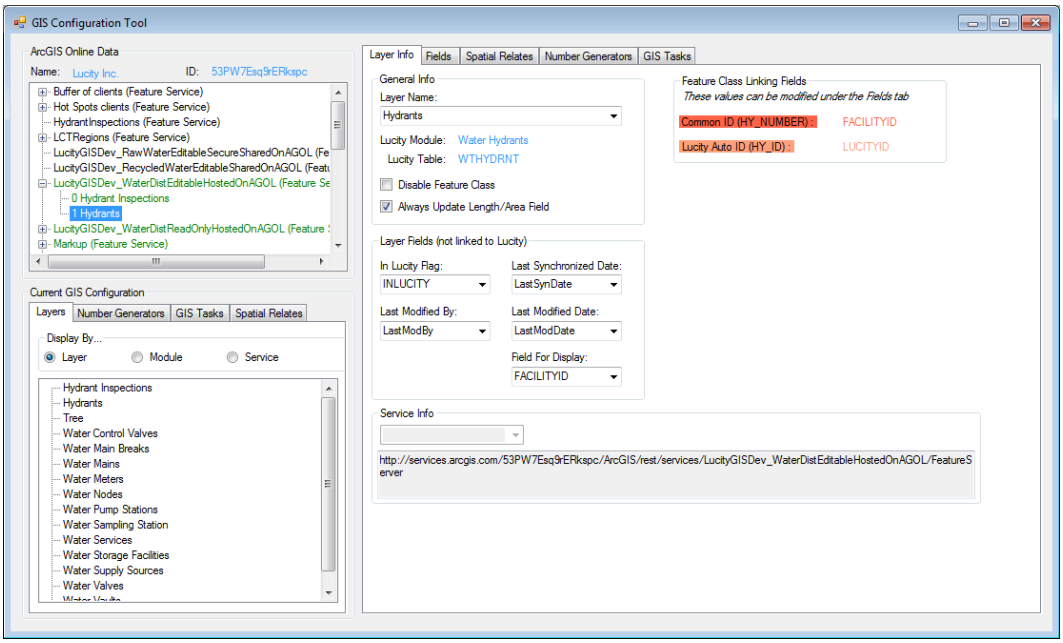
This is a new tool added in version 2015 to configure ArcGIS online hosted services. These are services that the underlying data is hosted by Esri. In other words, the GIS data is off-premise not being published via the client's ArcGIS for Server.

To use the tool:

1. In the Administration tool, select GIS>GIS Config. The ArcGIS Online login window appears.



2. Enter your ArcGIS Online username and password and click Sign In.
    a. Note: Your login must be associated to your agency inside ArcGIS Online. This tool connects to your ArcGIS Online account and provides a list of services available to the connected user; therefore, you must connect as a user that has access to all layers that need to be linked to Lucity.
3. Once logged in the GIS Configuration Tool dialog will appear:

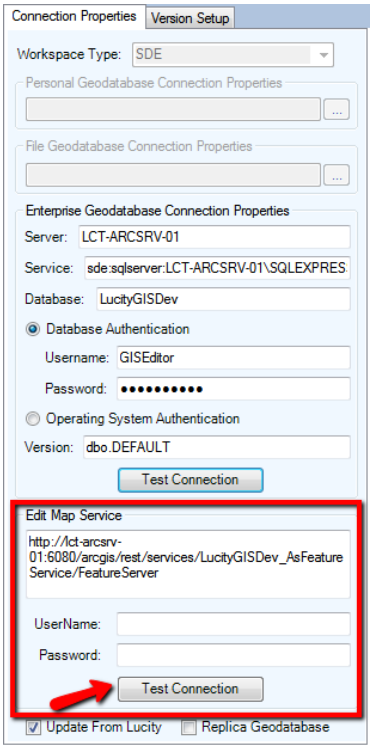


There are three sections to the tool:

- ArcGIS Online Data
    - This section displays information about your ArcGIS Online organization.
- Current GIS Configuration
    - This section provides an overview of the entire configuration linked to Lucity
- Feature Class Configuration
    - This section displays the configuration information about the layer selected in either the *ArcGIS Online Data* or *Current GIS Configuration* sections.

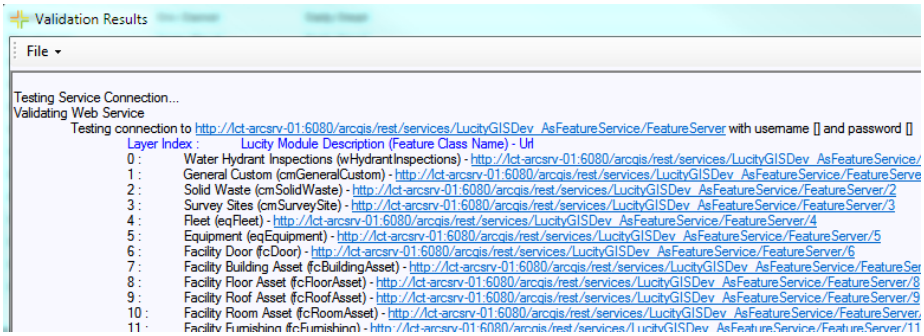
ArcGIS Online Data

- Added in version 2015
- This is used with the new geocoding method to help limit the results especially if using a broad locator service such as Esri's World Geocoding Service.

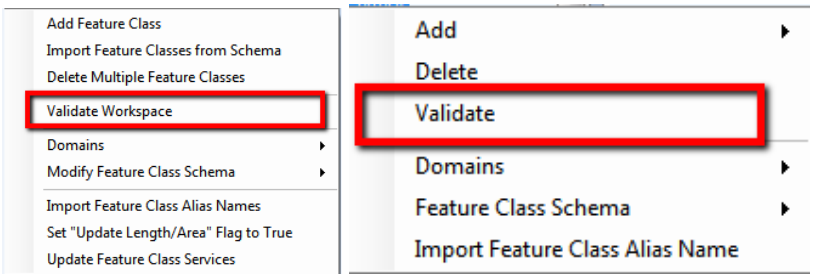


One way to validate a service is to run the Test Connections button found in the Edit Map Service section of the Connection Properties tab for the geodatabase. This test will:

- Validate a connection can be made to the service with the URL and credentials provided
- Analize each layer wihin the service to determine if it has a conneciton to Lucity.
- Results including any errors are reported in the validation results form. An example of the results are shown below.



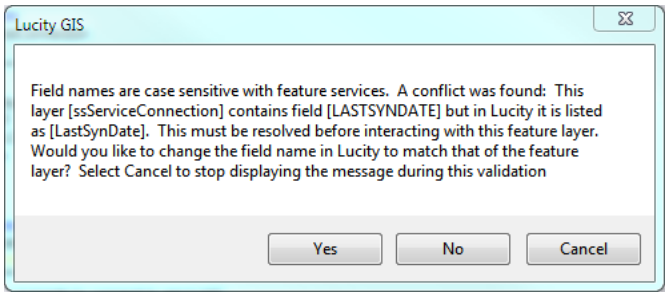
The other map and feature service tests occur as part of the Validation tools that are available in the geodatabase and feature class menus.



There are three parts of this validation:

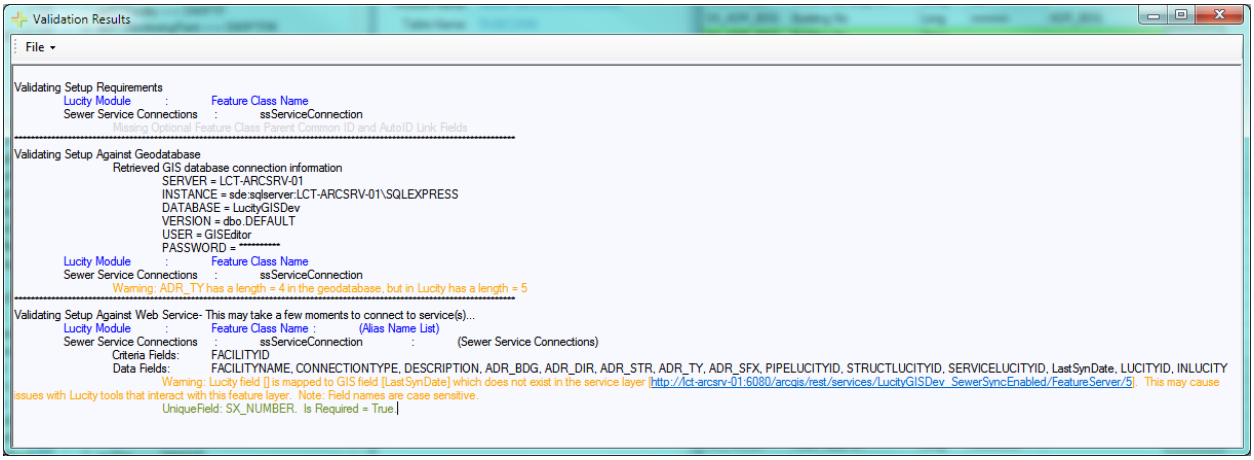
1. Validates setup in Lucity. This part checks to make sure required fields are populated, and Lucity fields are valid.
2. Validates setup in geodatabase. This includes testing the connection to the geodatabase. Validates that the feature class exists, fields exist, data types are compatible, etc.
3. Validates setup in map service. **This test is skipped if both the "Use Feature Service For Updates" and "Enable Lucity Spatial" system settings are FALSE.** This section will validate the following:
    a. A connection can be made to the service.
    b. The feature class exists in the service
    c. The feature class fields exist in the service and validates a sample payload

Part of the service validation is to verify the service layer fields exist. The Lucity tools interact with services using the Esri REST API, which field names are case sensitive. If a conflict in case is found during the validation a prompt similar to the following will appear:



- Yes- will update the case in Lucity.
- No- no changes will be made. Note- this may cause failure when attempting to read or update that field via the map service.
- Cancel- no changes will be made and further case conflicts will be ignored for this validation run.

Once the validation process is complete you will receive a prompt indicating if the validation passed or not. Refer to the validation results window for specifics. The following is an example of the validation results:


Validation Results
File
Validating Setup Requirements
Lucity Module : Feature Class Name
Sewer Service Connections : ssServiceConnection
Missing Optional Feature Class Parent Common ID and AutoID Link Fields
Validating Setup Against Geodatabase
Retrieved GIS database connection information
SERVER = LCT-ARCSRV-01
INSTANCE = sde:sqlserver:LCT-ARCSRV-01\SQLEXPRESS
DATABASE = LucityGISDev
VERSION = dbo.DEFAULT
USER = GISEditor
PASSWORD = **********
Lucity Module : Feature Class Name
Sewer Service Connections : ssServiceConnection
Warning: ADR_TY has a length = 4 in the geodatabase, but in Lucity has a length = 5
Validating Setup Against Web Service- This may take a few moments to connect to service(s)...
Lucity Module : Feature Class Name : (Alias Name List)
Sewer Service Connections : ssServiceConnection : (Sewer Service Connections)
Criteria Fields: FACILITYID
Data Fields: FACILITYNAME, CONNECTIONTYPE, DESCRIPTION, ADR_BDG, ADR_DIR, ADR_STR, ADR_TY, ADR_SFX, PIPELUCITYID, STRUCTLUCITYID, SERVICELUCITYID, LastSynDate, LUCITYID, INLUCITY
Warning: Lucity field [] is mapped to GIS field [LastSynDate] which does not exist in the service layer [http://lct-arcsrv-01:6080/arcgis/rest/services/LucityGISDev_SewerSyncEnabled/FeatureServer/5]. This may cause issues with Lucity tools that interact with this feature layer. Note: Field names are case sensitive.
UniqueField: SX_NUMBER. Is Required = True.

Notes: _____

_____

_____

_____

_____

_____

_____

_____

_____

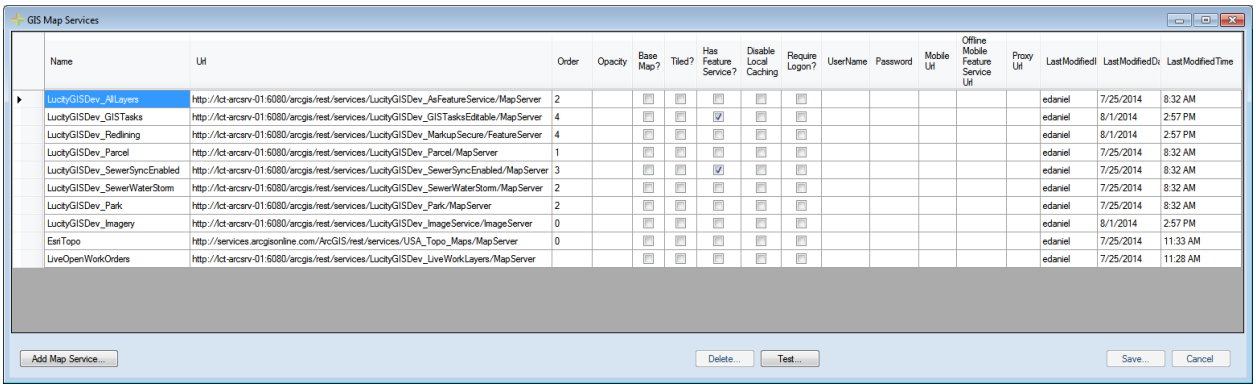
_____

_____

_____

GIS Map Services

Starting with 2014r2, GIS Map Services are no longer just used for Web Maps. Services can now be associated to feature classes. Services defined at the feature class level (instead of the geodatabase level) are used for some new tools available at 2014r2. Before you can associate map/feature services to a feature class the service must first be defined in GIS Map Services.



- **Name:** A unique name for the service. This is used to identify the service during setup.
- **URL:** The URL of the service, or path to a local map package. This must include /rest after ArcGIS.
    - Note: In ArcGIS 10.x the service name is case sensitive
- **Order:** The order in which map services will appear when used together. Lower numbers will appear underneath higher numbers. Base map services will always be on the bottom.
    - Note: The Order can be overwritten for individual maps in Map Setup
- **Opacity:** Controls the opacity of this service
- **Base Map?:** Mark whether a layer should be used as a base map. All layers marked as a Base map will be available to all users in the base map selection tool in the Webmap. This functionality is not available in the Lucity GIS Viewer or Lucity Mobile app.
    - Note: Base maps must be either a Tiled, Image, or Bing Map service
- **Tiled?:** Mark whether the service is tiled. Tiling allows multiple concurrent requests and cached tiles perform faster.
- **Has Feature Service?:** This setting indicates if the map service has a corresponding feature service. This would be the case if the map service had the Feature Access capability enabled on it. This setting is used by Lucity tools to allow editing of the service.
- **Disable Local Caching:** Prevents the mapping tools from using locally cached data. They will always request the latest data from the server.
- **Require Logon?:** If the service is a secured service it should have a username and password assigned. Mark this field to force users to enter their own login credentials as an added layer of security.
- **Username:** If the map service is secured enter a user name that has permission to access it. This is required for secure services that contain Lucity Operational Data.
    - Note: If no username/password is provided users will be required to login
- **Password:** Enter the password for the User Name.

- **Mobile URL:** If this service will be used by Lucity Mobile use this field to enter an alternative URL for the service that is available externally.
    - This functionality only applies to Lucity Mobile
- **Offline Mobile Feature Service Url:**
- **Proxy Url:**

Notes: _____

_____

_____

_____

_____

_____

_____

_____

_____

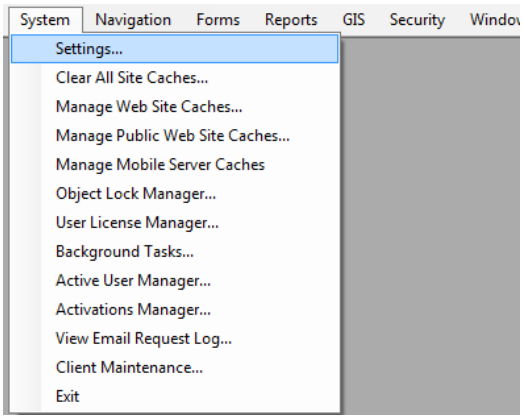
_____

_____

_____

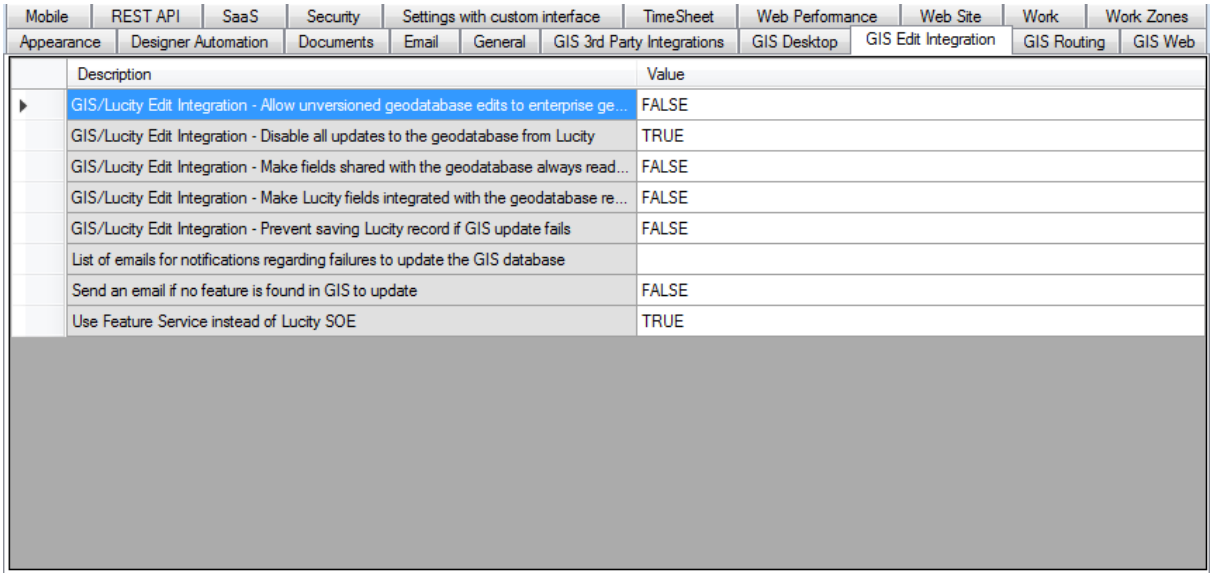
System Settings

There are various settings for Lucity GIS that are maintained under System Settings.



GIS Edit Integration Tab

The GIS Edit Integration tab of system settings contains the options that impact how the Lucity application will update the geodatabase.

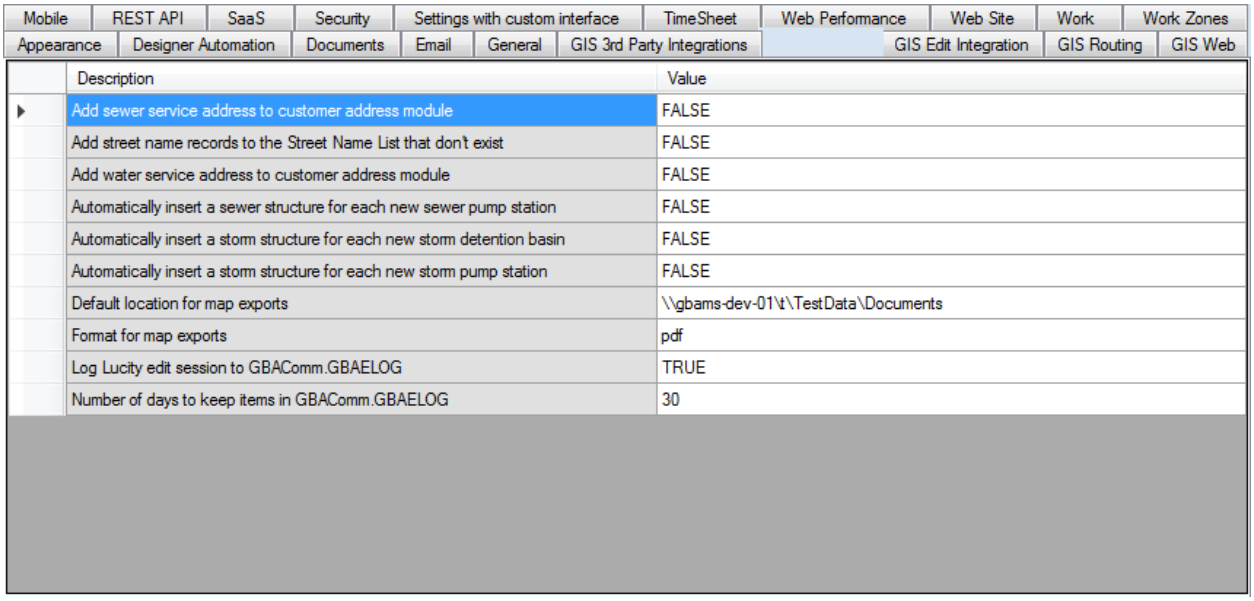


- **GIS/Lucity Edit Integration:** Allow unversioned geodatabase edits to enterprise geodatabase: This allows edits to be made to unversioned geodatabases.
- **GIS/Lucity Edit Integration:** Disable all updates to the geodatabase from Lucity: This prevents the geodatabase from being updated with edits made in Lucity desktop and web.
- **GIS/Lucity Edit Integration:** Make fields shared with the geodatabase always read only. Any field that is shared with the geodatabase will be set as read-only in Lucity desktop and web.
- **GIS/Lucity Edit Integration:** Make Lucity fields integrated with the geodatabase read only if the geodatabase cannot be updated. If a connection to the geodatabase fails when loading a form, all fields integrated with the geodatabase will be read-only.

- **GIS/Lucity Edit Integration:** Prevent saving Lucity record if GIS update fails. This does not apply to the desktop application. If a modification is made to a record in Lucity and the geodatabase fails to get updated this will prevent the record in Lucity from being saved.
- **List of emails for notifications regarding failures to update the GIS database:** Provide a comma delimited list of email addresses that should receive notification if the geodatabase failed to get updated with an edit.
- **Send an email if no feature is found in GIS to update:** Sends an email when cannot find a feature in the geodatabase to update. This is sent to the list specified in the "List of emails for notifications regarding failures…" setting.
- **Use Feature Service instead of Lucity SOE:** This setting indicates if Lucity should attempt to make updates to GIS features directly through a feature service or if it should use the Lucity SOE.

GIS Desktop Tab

The GIS Desktop tab of system settings contains many of the editing options for the Lucity GIS tools

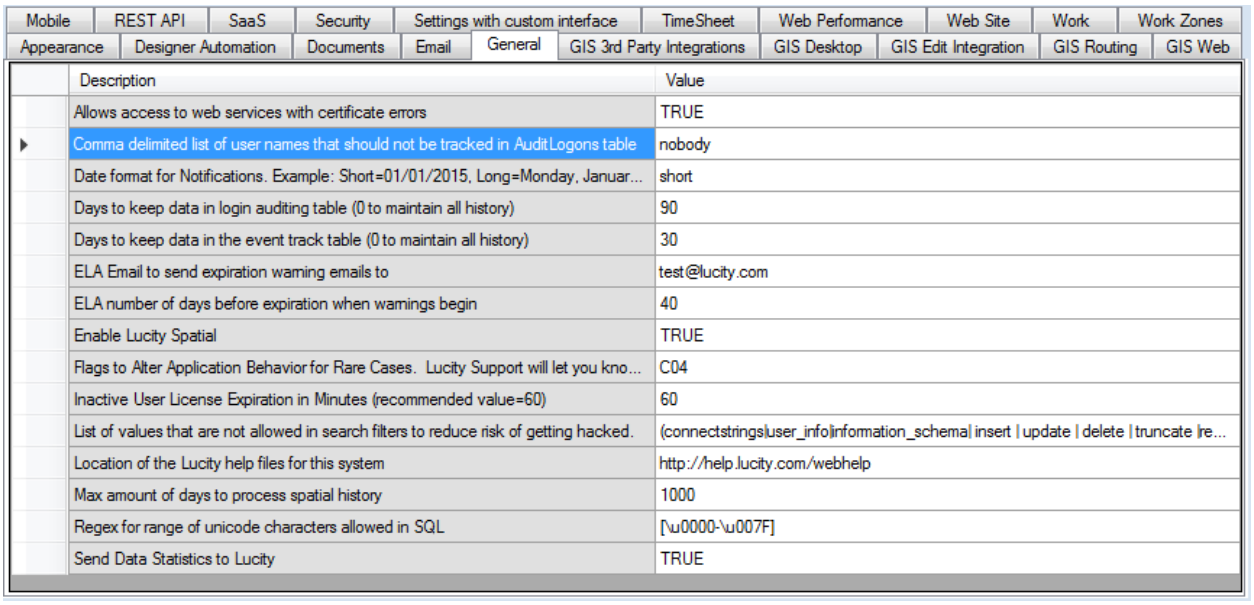


- **Add sewer service address to customer address module:** Set this option to true if you want the sewer service address added to the Customer Address module.
- **Add street name records to the Street Name List that don't exist:** Set this option to true if you want street name records that do not exist added to the Street Name List.
- **Add water service address to customer address module:** Set this option to true if you want the water service address added to the Customer Address module.
- **Automatically insert a sewer structure for each new sewer pump station:** Set this option to true is if you want a sewer structure added for each new sewer pump station.
- **Automatically insert a storm structure for each new storm detention basin:** Set this option to true if you want a storm structure added for each new storm detention basin.
- **Automatically insert storm structure for each new storm pump station:** Set this option to true if you want a new storm structure added for each new storm pump station.

- **Default location for map exports:** This option allows you to choose the location that you would like to store the map images you save when creating a new work order, request, etc.
- **Format for map exports:** This option allows you to choose the file type for the map exports.

General Tab

The general tab of system settings contains some options for GIS services



- **Enable Lucity Spatial:** Set this option to true if you want to turn on the Lucity Spatial Updater service that manages live work spatial views.
- **Max amount of days to process spatial history:** This is the number of days into the past the Lucity Spatial Updater service will process records. For example, if the value is 90, then the Lucity Spatial Updater will not process work history that is more than 90 days old.

Notes: _____

_____

_____

_____

_____

_____

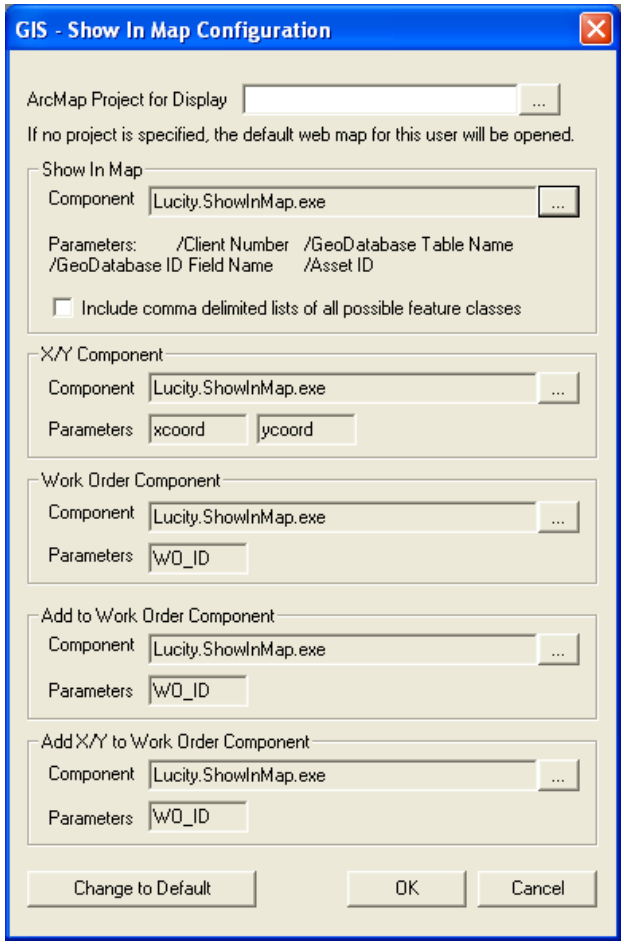
Lucity Desktop

Show in Map Configuration (Single User)

The GIS Show in Map configuration is a user-based setting. This window allows you to choose a custom programmed component for the desktop application to use in place of the default component. You can then select the parameters that the system passes to the component.

> *Note: Since this window determines what GIS project is displayed, it must be defined before initial use of the Show in Map button.*

1. Select *System>>Configuration>>GIS>>Show in Map* to open the configuration window.
2. In the ArcMap Project for Display field, browse to the location of your standard ArcMap project. By default, this map will be displayed whenever you click the Show in Map button in either your desktop version of the desktop application. Note: If you do not have a project set up, the web map will be the default.

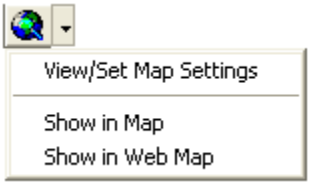


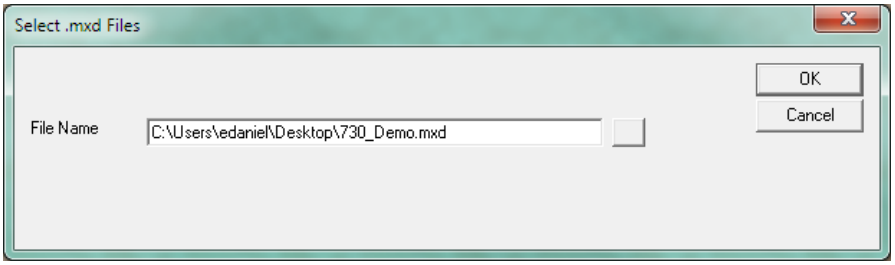
Show in Map Function

The Show in Map function allows you to set the map document to display on a per-module basis. This is useful if you have a separate map document for each asset type. For example, you may have one ArcMap project for sewer features, another for water features, and a third for street features. You can set up the Show in Map function for all *Sewer* modules to open your sewer map, and set up the Show in Map function for all *Water* modules to open your water map. Additionally, you can use the Show in Map function from equipment features that are not in the map if the parent feature is in the map.

To specify a different ArcMap project for each module, complete the following steps:

1. Click the down arrow located to the right of the Show in Map tool in the desired module in the desktop application.
2. A sub-menu will appear; click "View/Set Map Settings"
3. A dialog will appear showing you the currently specified .mxd. If no file is specified then it means that there hasn't been an .mxd associated with this module yet.





4. To associate a new .mxd click the browse button and navigate to the location of the .mxd. Click OK.

> *Note: If no special Show in Map project is setup for a module, the system will use the project specified under System>>Configuration>>GIS>>Show in Map (Show in Map Configuration dialog).*

Notes: _____

_____

_____

_____

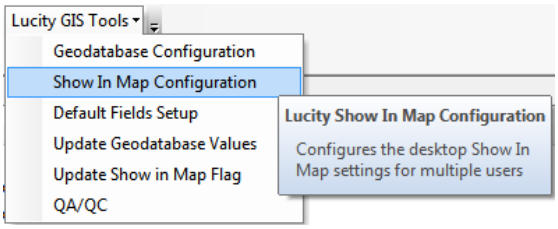
_____

_____

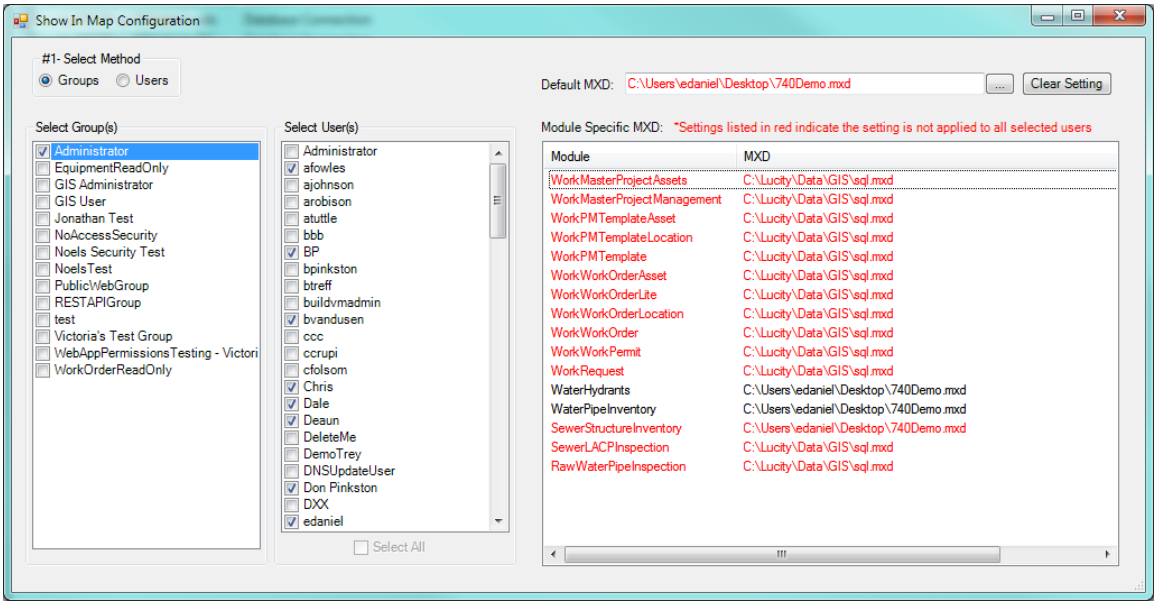
ArcCatalog

Lucity Show in Map Configuration Tool

The Show in Map Configuration tool allows system administrators to set show in map settings for multiple users. This can save a lot of time, especially if they manage which maps their users access, and if a generally used map changes. To access the Show in Map Configuration tool, go into ArcCatalog, click on the **Lucity GIS Tools** button and select **Show in Map Configuration**.



The following dialog will appear:



To select a Group(s) to configure:

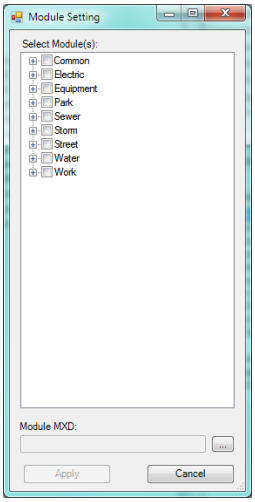
1. Choose the Group Select Method.
    - The Select Group(s) grid will be activated. (these groups are from the Lucity Security program)
2. Select one or more groups in the grid.
    - The users in those groups will be checked in the Select User(s) grid, but the selection will be read-only.
    - The module settings for the selected users are also displayed in the field and grids to the right.

To select a User(s) to configure:

1. Choose the Users select method.
    - The Select Group(s) Grid will be deactivated. The Select User(s) grid will be editable.
2. Select the user(s) to configure.
    - The module settings for the selected users are also displayed in the field and grids to the right.

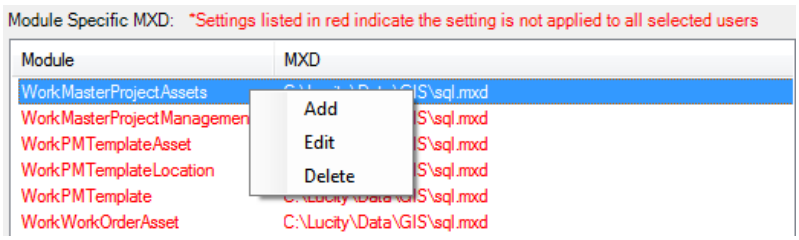
To configure the show in map for selected users:

1. Set the Default MXD for the program. Either enter the path, or click the ... button and navigate to the desire MXD
2. In the Module Specific MXD grid right-click and select Add. The following screen will popup:



3. Select the modules to set a map for. Selecting a program will select all the modules under that (i.e. Selecting Park will select every park module.)
4. Near the bottom of the popup click the ... button to select the .mxd to be used with the show in map for those modules.
5. After selecting the .mxd click Apply.
6. A record will appear in the right hand grid for each module, with the path to the .mxd.

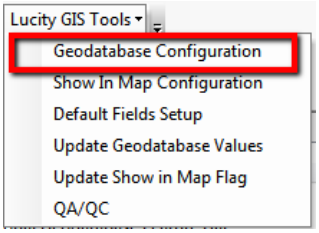
> *Note: Existing show in map settings can be modified by right-clicking on them and selecting either Edit or Delete from the submenu:*



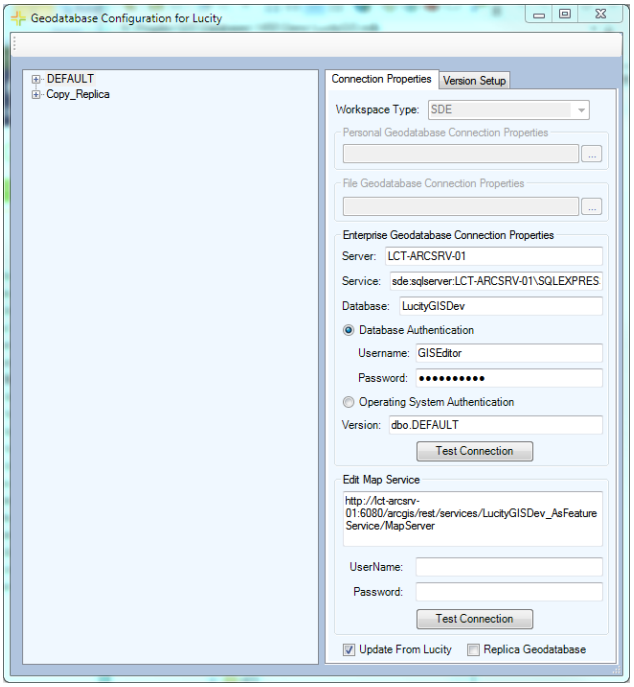
Lucity Geodatabase Configuration Tool

Once you have created the geodatabase connections with the Lucity Administration tool you can use the Lucity Geodatabase Configuration tool in ArcCatalog to perform all other configurations.

In ArcCatalog, Click on Lucity GIS Tools>>Geodatabase Configuration.



The following dialog will appear:

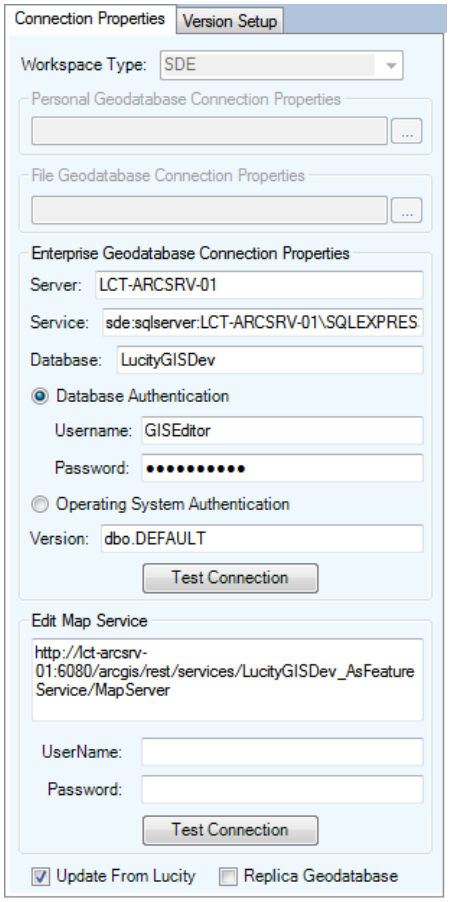


This tool can be used to perform the following activities which are described in detail in the Geodatabase Configuration Overview session:

- Modify and validate connections to geodatabase and map services
- Import Feature Class Schema
- Modify existing feature class schema based upon Lucity properties
- Indicate if geodatabase should be updated from Lucity and if it is a replica
- Specify which versions of the geodatabase should have edits pushed to Lucity
- Add/Modify/Delete feature classes, spatial relationships, number generators, and GIS tasks
- Add/Modify/Delete feature class field mappings
- Create/Sync feature class domains
- View and configure feature class alias names and associated feature services

Connection Properties

The Connection Properties tab shows you the geodatabase connection information.



Server: The name of the server that holds the SDE database

Service: The name of the instance for the SDE database. This supports either spatial or direct connections.

- SQL Server example: sde:sqlserver:LCT-ARCSRV-01\SQLEXPRESS
- Oracle example: sde:Oracle11g:OracleDBServer

Database: This must contain the name of your SQL Server geodatabase. The database listed in this field is not the SDE repository database. Instead, it is the geodatabase that contains the infrastructure data that you want to integrate with the desktop. **For Oracle geodatabases this must be blank**.

Authentication type: Used by Lucity to connect to the geodatabase

- **UserName:** If using DB authentication type you must specify a user. This user must have permission to ALL feature classes linked to Lucity.
- **Password:** If using DB authentication type you must also specify a password for the user.

Version: This information is always required; it designates the name of the ArcSDE version that Lucity will use when connecting to the geodatabase. For Oracle, the Version is case sensitive.

Edit Map Service: This is the URL for a map/feature service that contains this geodatabase's feature classes linked to Lucity.

- **UserName:** If the Edit Map Service URL is for a secured map service enter user name that has permissions to access the service.
- **Password:** Enter the password for the Edit Map Service User.

Update From Lucity: This indicates if the geodatabase should be updated with edits made in the Lucity desktop and web interfaces

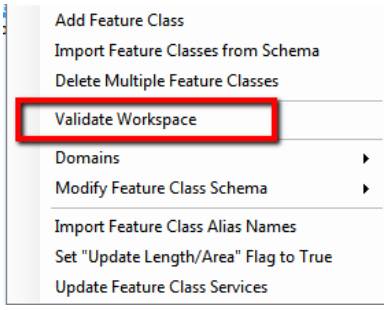
Replica Geodatabase: This indicates if the geodatabase is a replica geodatabase. If this is checked, functionality with the configuration tool will change preventing some actions (such as deleting feature classes) and enable other actions (such as associating feature classes)

Validating the Geodatabase Configuration

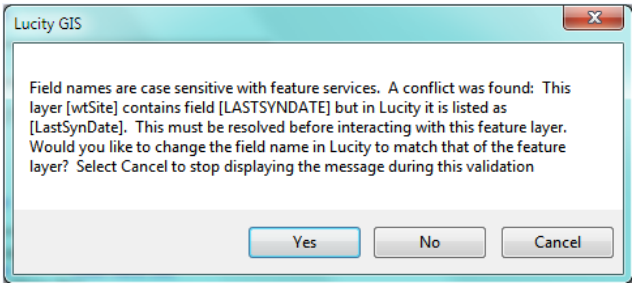
You can validate against the entire geodatabase or individual feature classes. There are three parts to the geodatabase verification: verification of the geodatabase setup based on *Lucity* requirements and business rules, verification of the custom geodatabase setup against your geodatabase to ensure that the setup is valid based on your data structure, and finally verification that the layer and fields exist in the map service. Initially, only the verification of your custom geodatabase setup based on *Lucity* requirements is performed. If no critical errors are encountered during that verification, it will continue the verification and validate against your custom geodatabase to make sure feature class names, field names, and field types are valid based on your setup. If you have enabled Lucity Spatial and/or are using Feature Services for GIS updates instead of the Lucity SOE then the validation of the map service is performed.

Validating Against Geodatabase

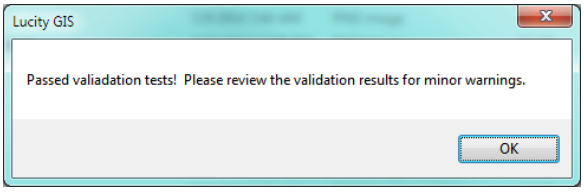
1. Right-Click on the geodatabase node and select Validate Workspace.



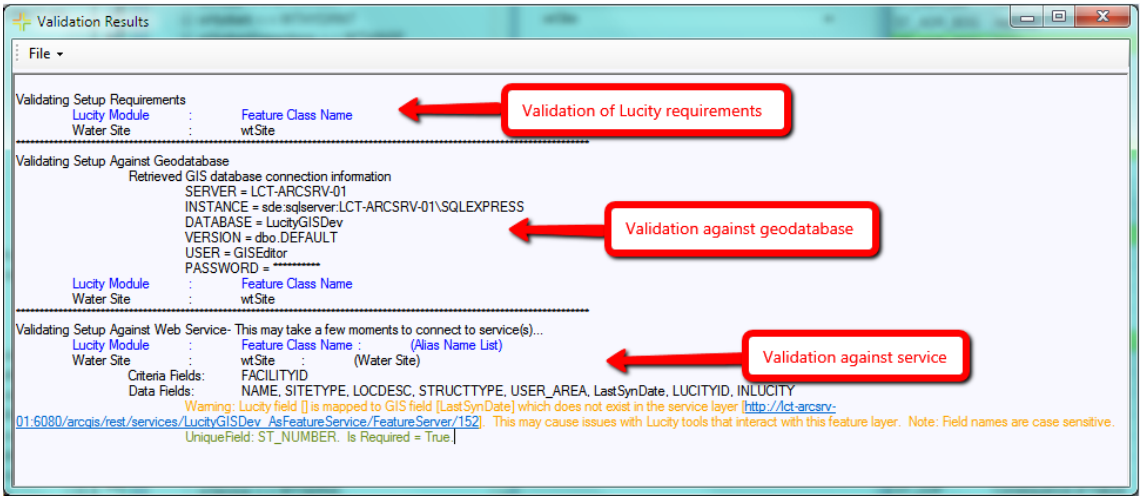
   - Immediately upon clicking this tool, a dialog similar to the one shown below will be displayed with results of the verification. Once it is complete you will be able to scroll down and view any messages resulting from verification.
   - If the validation discovers conflicts between the cases in field names a prompt similar to the following will appear. Click 'Yes' to change the field name in Lucity to match that of the feature class. Click 'No' to not make the change for this particular instance and continue. Click 'Cancel' to not make the change for this instance and any future ones during this validation.



   - Once the initial verification is complete, any errors that are found will prompt the following message and you will be unable to continue the validation until the errors are addressed.



2. When the validation is complete, a message box will appear indicating if the validation result was successful or failed. The validation Results window will remain open. Again, any errors found will be highlighted in red. You can copy the results of this dialog into another file, or you can select File>>Save or File>>Print to print the results.



Notes: _____

_____

_____

_____

_____

_____

_____

_____

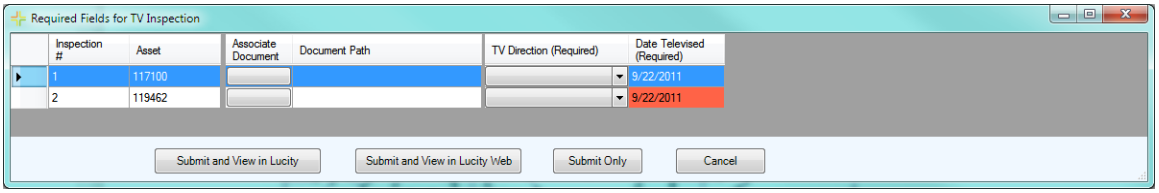
_____

_____

Default Fields Setup

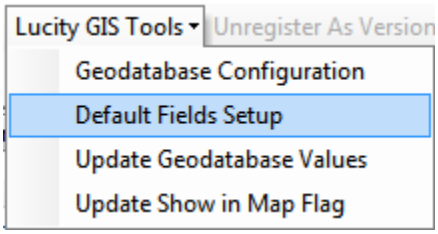
The Default Fields tool allows you to set up additional fields for the editable grids that are displayed with the Lucity Module tool in ArcMap when creating Requests, Work Orders, PM Work/Templates, and Inspections.

These fields will be displayed in the grid in addition to the required fields (both system and user-defined required fields).

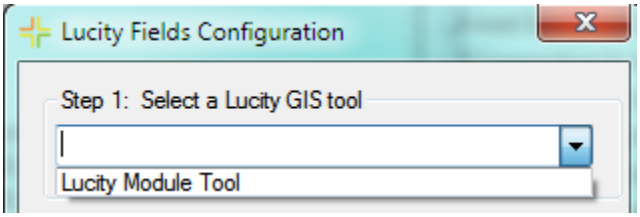


Setting up Default Fields

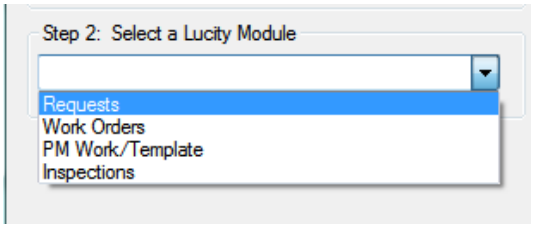
In ArcCatalog, Click on Lucity GIS Tools>>Default Fields Setup.



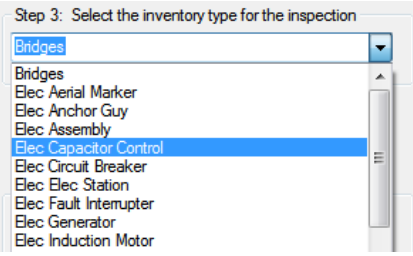
1. After you have logged in to the client, the following dialog will appear. Select the Lucity tool from the drop down menu.



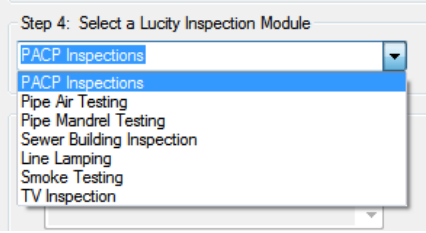
2. After selecting the Lucity tool, the "Select a Lucity Module" option will open up. Select the module for which you are setting up default fields.



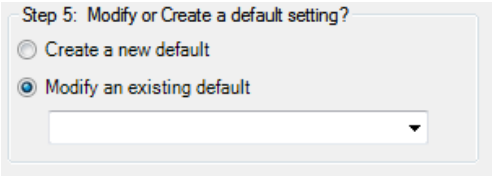
- If you selected Inspections in Step 2 then you will be prompted to select the inventory type for the inspection:



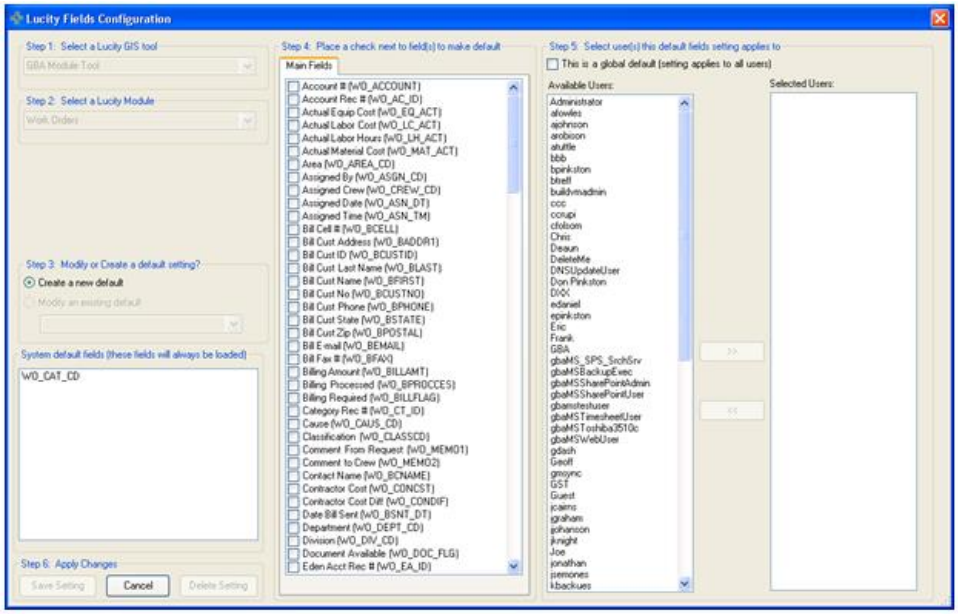
- Next, select the inspection module.



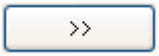
3. After specifying the module you can indicate if you would like to create a new default setting or modify an existing default. Note: If there are no current default settings for the selected module this option will be disabled.

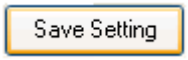


4. After selecting the module and specify the option to create or modify, the following dialog will appear:



Note: The system default fields grid is not editable. This grid shows the fields that are required by the system and will always appear in the grid.

5. Check the fields in the "Main Fields" tab that you would like to make as default.
6. To select the users you would like the default fields to apply to, highlight the user in the "Available Users" grid and click 

to move the user to the "Selected Users" grid. Note: If you wish the default field to appear for all users then select the “This is a global default” checkbox.
7. Click 

to save the default fields to the module.

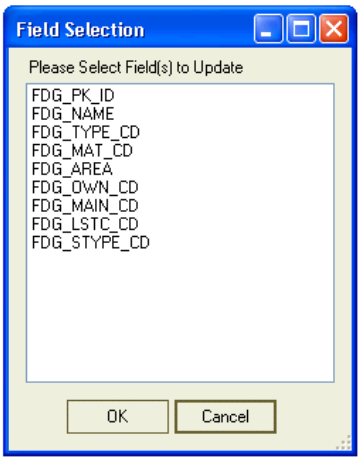
Update Geodatabase Value

This tool is designed to allow users to rapidly update the values in a feature class with the values from a related Lucity table. You'll use this tool if you've recently added a field to the Lucity database and need it to be added to your map.

To use this tool:

1. Select a feature class in ArcCatalog.
2. Then, click 

and select the Update Geodatabase Value tool from the drop down menu. The following window will appear:



3. Select the field you wish to update from the list. Then click *OK*. You'll receive the following warning notifying you that this tool will overwrite the values for the selected field with new values. If you wish to continue, click *OK*.

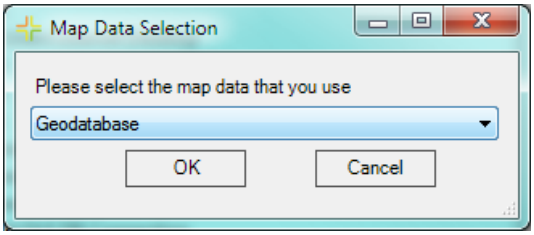
4. You'll be notified when the process is complete.

Update Show in Map Flag

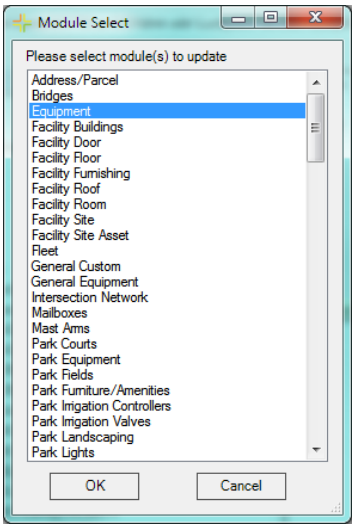
You'll use this tool to run an update query on the show-in-map flag in the *Lucity* inventory modules.

To access the Update Show in Map tool open up ArcCatalog, select Lucity GIS Tools>>Update Show in Map Flag.

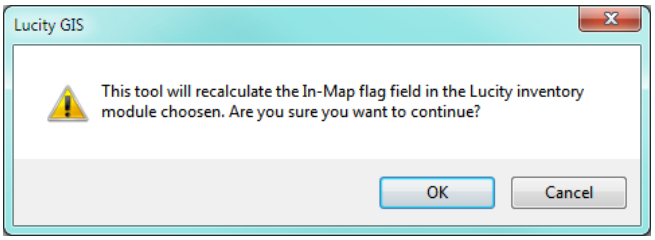
1. Select the type of map data that you use (Geodatabase or Shapefiles).



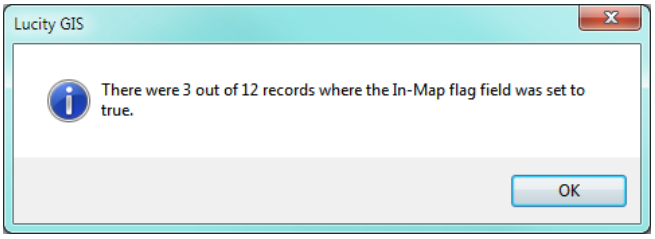
2. After selecting the appropriate map data, the following dialog will appear. Select the module(s) you wish to have updated.



3. The following dialog will appear confirming that you want to continue.



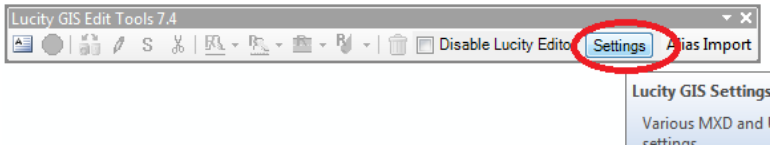
4. Once complete you will receive a dialog indicating the results

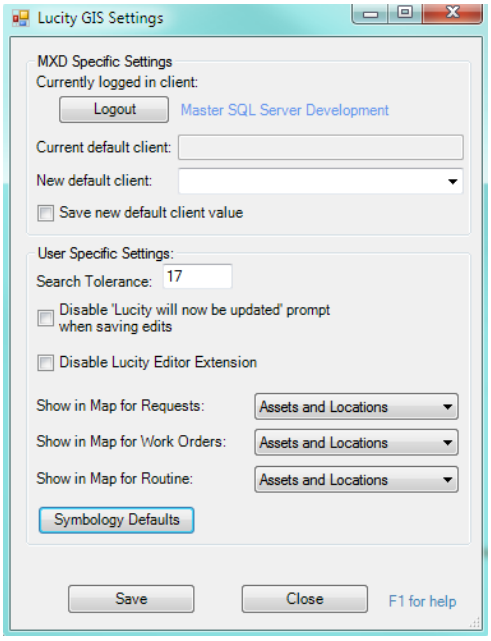


ArcMap

Additional settings can be configured to be used with the Lucity GIS tools in ArcMap. Some of these settings are saved with the map document (.mxd) while others are user specific.

These settings can be accessed by the Settings button on the Lucity GIS Edit Tools toolbar.





MXD Specific Settings

Every time a user opens ArcMap and attempts to use a Lucity tool they are prompted for their Lucity login and password and if there is more than one Lucity client, they will be prompted for which client they are logging into. There are two things that can be setup to speed up this process:

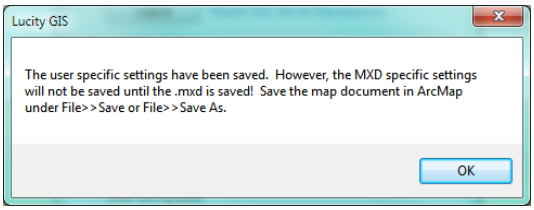
Bypassing Login and password

The Lucity GIS tools support using Lucity Windows Authentication. Upon using a Lucity GIS tool the program checks to see who is logged into the computer and if that user has windows authentication configured. If it finds an associated Lucity account it checks to see if they have permissions to run the Lucity GIS tools. If the correct permissions are present the user is automatically logged in and the Lucity GIS tools are activated. This will stop users from being prompted for their login and password when they try to use the Lucity GIS tools. Lucity Windows Authentication must be setup by an administrator in the Security program.

Setting a Default Client

Part of the login process checks to see what Lucity client the user is logging into. If there is more than one client, the user will be prompted to choose a client every time they start ArcMap and try to use a Lucity GIS tool. To by-pass the client selection dialog, you can specify a default client that should be used for the .mxd.

1. In the settings dialog, select a client from the new default client list
2. Make sure the Save new default client value checkbox is checked
3. Click Save on the Lucity GIS Settings dialog form. A prompt similar to the following will appear:



4. Save the .mxd.

User Specific Settings

There are three user specific settings that can be saved. These settings will be used anytime the user logs into the Lucity GIS extension regardless of the .mxd or machine.

Default Search Tolerance

Users can set a new default search tolerance for Lucity GIS. This is used with all Lucity GIS tools that use a search tolerance. The system default is 7 map units. Alternatively, the search tolerance can be changed on the fly for a specific tool when it is selected by pressing Shift + F7.

Disable "Lucity will now be updated" prompt

Users can disable the editing prompt that lets them know that the Lucity editor extension is going to process the ArcMap edits.

Disable Lucity Editor extension

Users can disable the Lucity editor extension. This is useful if the user never or rarely edits feature classes linked to Lucity. Having this checked will prevent the extension to become active every time they edit the geodatabase linked to Lucity. Alternatively, the editor extension can be disabled directly on the Lucity GIS Editor toolbar; however, that setting only disables the extension for that session of ArcMap.

Show in Map for Requests/Work Orders/Routine

Work Orders, Requests, and PM/Work Templates can be displayed by the Show in Map tool several different ways. They can display the assets and/or the address and XY locations. These settings control how the Show in Map tool should work for the various modules. It will either show Assets, Locations, or both. The default is set to both.

Notes: _____

_____

_____

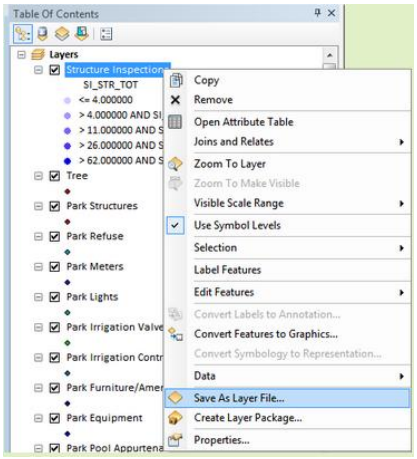
_____

_____

Symbology Defaults

This allows users to specify lyr files as symbology templates for the following set of Lucity GIS tools: Lucity Views, View Work Frequency, View Work Locations and TV Observation tools.

1. In order to set symbology defaults, you first need to run the Lucity GIS tool you wish to have a default symbology template for. (Lucity Views, View Work Frequency, View Work Locations, or TV Observations).
2. Make any desired changes to the properties of the layer the tool generated. These changes can include:
    - Symbology changes (size, shape, color, etc.)
    - Symbol levels
    - Labeling
    - Scale Dependence
    - Fields Displayed
    - Etc…
1. In the table of contents right-click on the layer and select Create Layer File



2. On the Symbology Settings Form, find the related tool and layer.
3. Click the … button and navigate to the location of the .lyr file. This must be repeated for each layer.
4. When complete, click Apply Changes.
5. The next time the Lucity GIS tool is ran, the results will use the settings stored in the .lyr file.

Notes: _____

_____

_____

_____

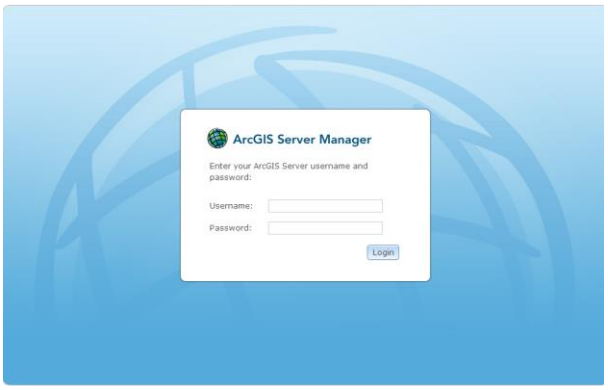
ArcGIS Server

Lucity Desktop and Web use ArcGIS Server and the Lucity SOE to make attribute updates to an SDE geodatabase. This allows users to edit fields in Lucity that are linked to the geodatabase and have the edits persist to the geodatabase.

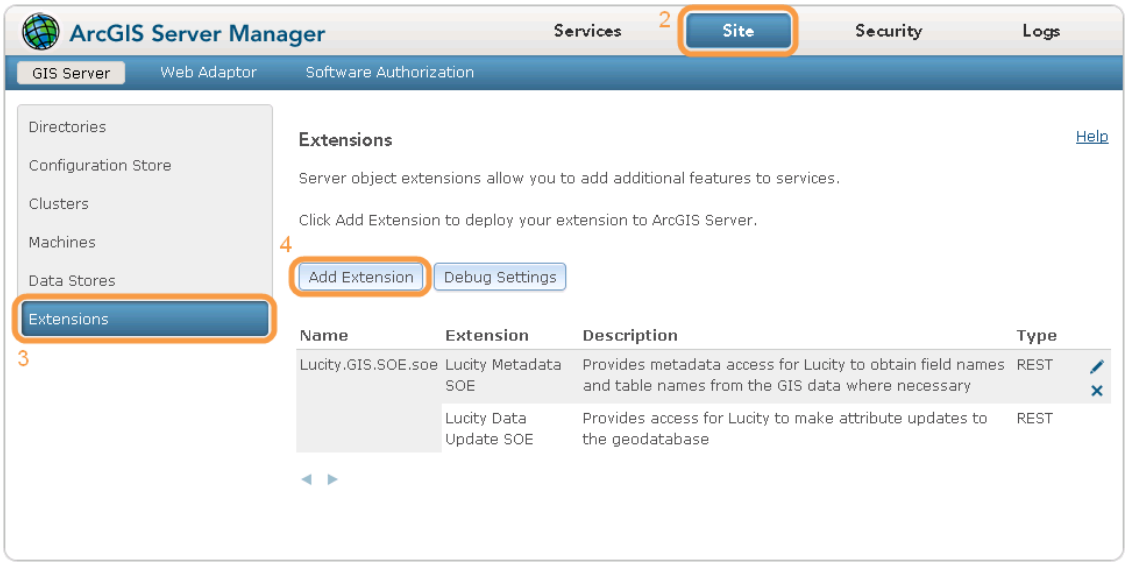
Install the Lucity SOE

The following instructions are for ArcGIS for Server 10.1+. Please refer to the installation instructions provided with your Lucity install media for 10.0 instructions.

1. Log into ArcGIS Server Manager



2. Click on Site at the top of the screen
3. Select Extensions on the left of the screen
4. Select Add Extension. The file selection screen will popup.



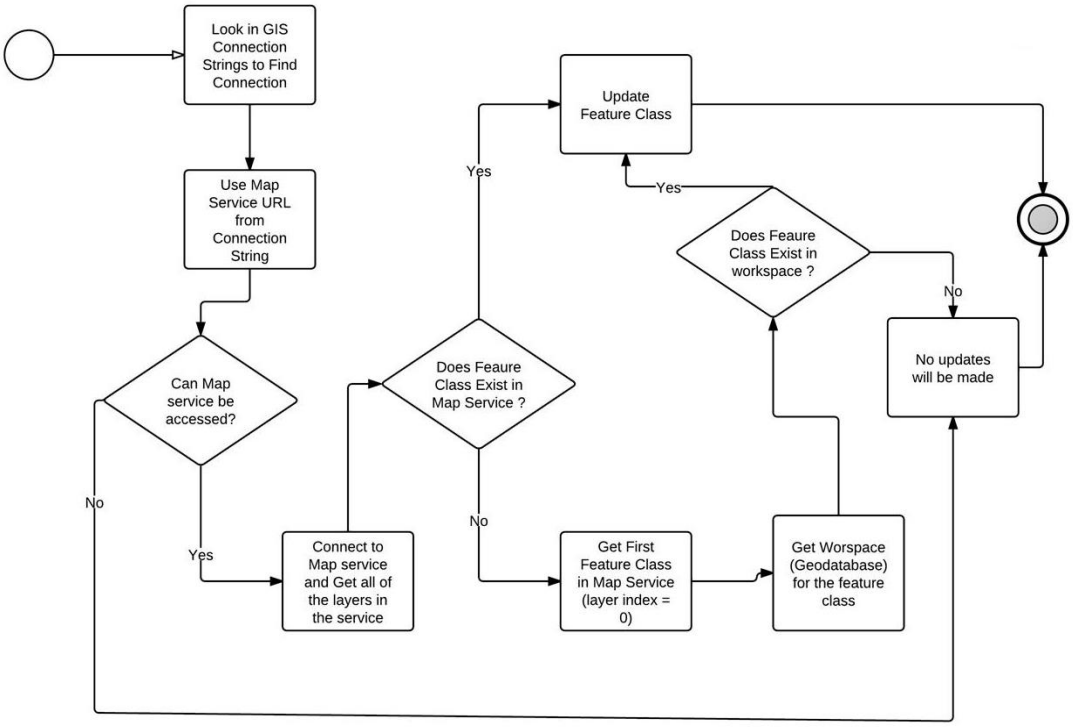
5. Click Browse and navigate to the Lucity SOE file downloaded from the Lucity support site.

6. Click Add.

7. The SOE is now installed. Make sure that the Lucity extensions are enabled on the desired map services.

Enable the Lucity SOE for a Map Service

When Lucity updates the SDE geodatabase using ArcGIS Server it uses a map service made up of Lucity features and the Lucity SOE to correctly update the geodatabase. The following diagram shows the logic the SOE uses to update the feature class.

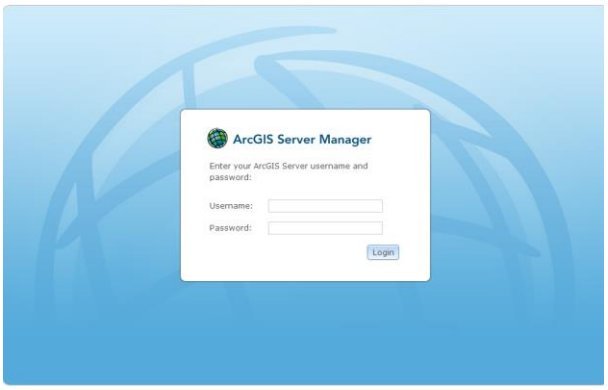


Note:

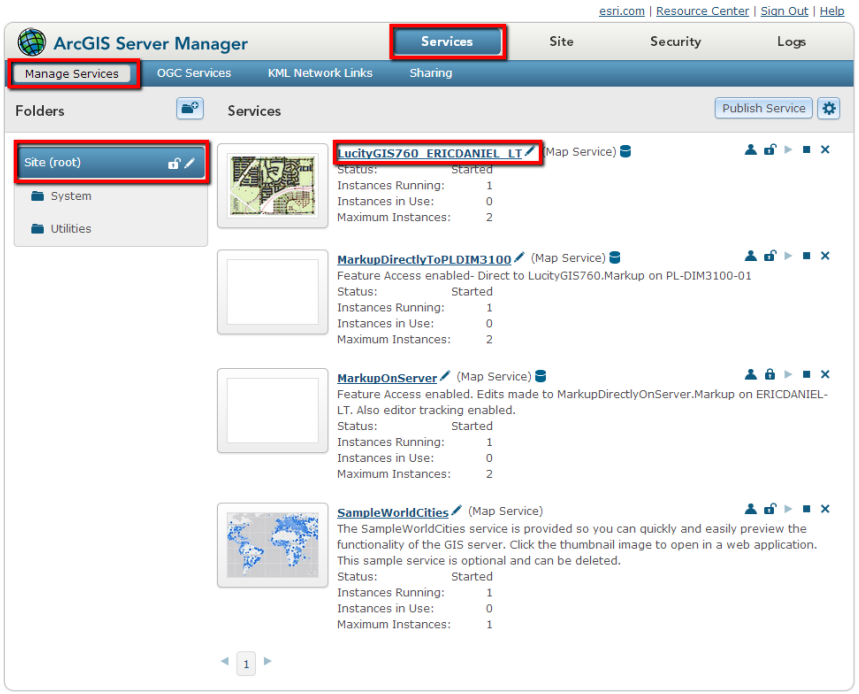
- The map service must contain at least one feature class from the geodatabase that contains the features that Lucity will be updating. It is acceptable for the map service to contain all the feature classes that could be updated but this is not required.
- Map service can be new or existing

- Map service does not need to be included in any web maps
- The feature classes in the map service must be connected using a user account that has edit permissions. Note: If map service isn't going to contain all Lucity linked feature classes then the feature class at layer index = 0 in the map service must be connected using a user account that has edit permissions to ALL Lucity linked feature classes.
- The feature classes in the map service must be pointed to the version that Lucity should update.

1. To enable the Lucity Data Update SOE extension for a map service, Log into ArcGIS Server Manager

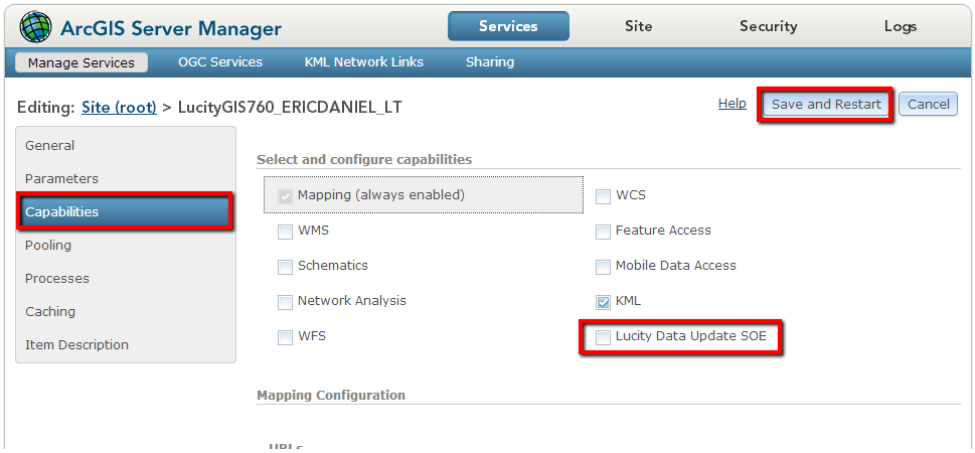


2. Click Services > Manage Services
3. Find the map service to use for the SOE update



4. Click on the map service to see its properties
5. Click on the Capabilities button

6. Check the Lucity Data Update SOE



7. Click Save and Restart
8. If you have more than one geodatabase configured with Lucity, you will need to repeat these steps so that each Lucity linked geodatabase has a map service with the Lucity Data Update SOE enabled.

Notes: _____

_____

_____

_____

_____

_____

_____

_____

_____

Configure SOE settings in Lucity

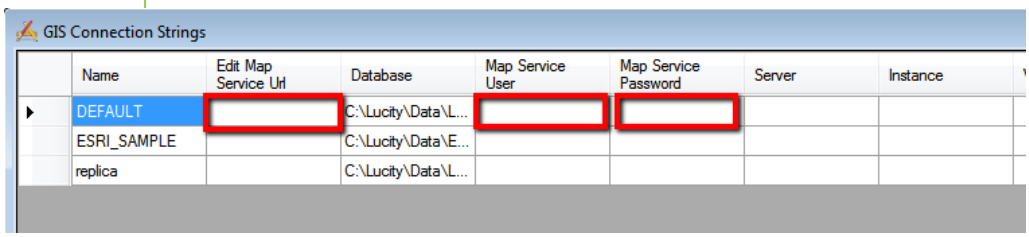
After publishing the map service and enabling the SOE there are several options that must be reviewed inside the Lucity Administration tool

You must know the REST URL of the map service that has the Lucity SOE extension enabled. If you are unsure this information can be obtained in ArcGIS Server Manager on the Capabilities tab of the map service. The REST URL should have a path similar to:
http://<servername>/ArcGIS/rest/services/<servicename>/MapServer

Specify Edit Map Service URL

1. In the Lucity Administration Tool go to GIS > Connection Strings
2. Find the record which contains the connection properties for the data within the map service and update the URL field with the REST URL of the map service.

> *Note: Version 7.6+ supports secured map services, so if using a secure map service you must also populate the Map Service User and Map Service Password fields in order for the Lucity SOE to have the ability to update the gdb.*



3. You will need to repeat this process for each geodatabase connection that contains feature classes linked to Lucity

Notes: _____

_____

_____

_____

_____

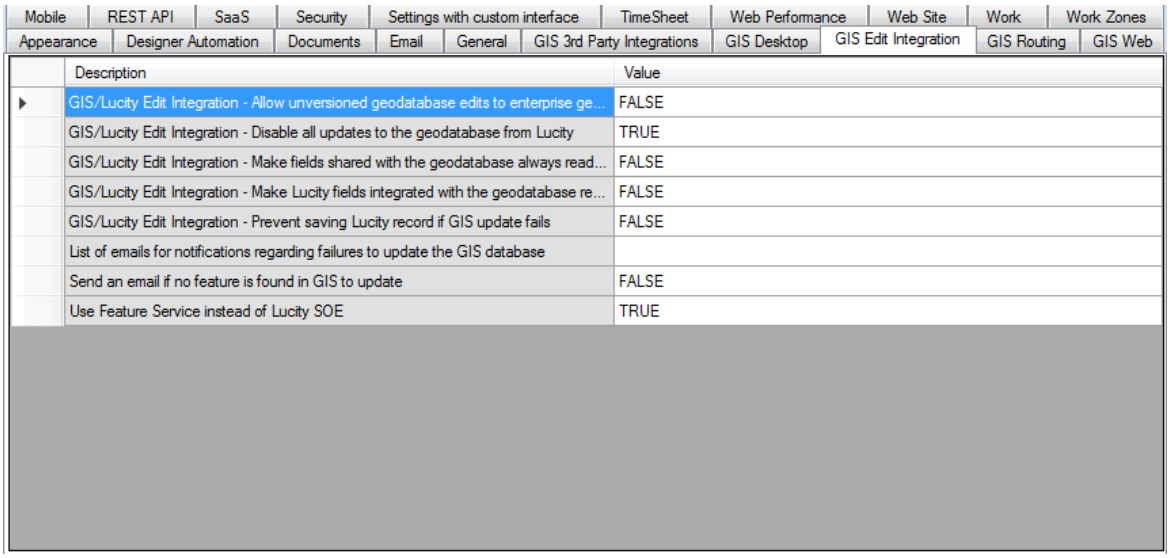
_____

_____

_____

Configure GIS Edit Integration settings

1. In the Lucity Administration Tool go to GIS > Settings
2. The GIS Edit Integration tab contains all the settings used by the SOE.



   - **Allow unversioned geodatabase edits to enterprise geodatabase**: This allows edits to be made to unversioned geodatabases.
   - **Disable all updates to the geodatabase from Lucity**: This prevents the geodatabase from being updated with edits made in Lucity desktop and web.
   - **Make fields shared with the geodatabase always read only:** Any field that is shared with the geodatabase will be set as read-only in Lucity desktop and web.
   - **Make Lucity fields integrated with the geodatabase read only if the geodatabase cannot be updated:** If a connection to the geodatabase fails when loading a form, all fields integrated with the geodatabase will be read-only.
   - **Prevent saving Lucity record if GIS update fails:** (Web Only) If a modification is made to a record in Lucity and the geodatabase fails to get updated this will prevent the record in Lucity from being saved.
   - **List of emails for notifications regarding failures to update the GIS database:** Enter a comma delimited list of email addresses. This list will receive emails when the Lucity Data Update SOE fails to update the geodatabase.
   - **Send an email if no feature is found in GIS to update:** Sends an email when the Lucity Data Update SOE cannot find a feature in the geodatabase to update. This is sent to the list specified in the "list of emails for notifications regarding failures…" setting.
3. After you are finished reviewing the settings, click Save. You have completed the steps necessary to properly configure the Lucity SOE.

GIS Updates via Feature Service

Starting in version 7.6 Lucity updates to the GIS required the use of the Lucity SOE for ArcGIS Server. This Server Object Extension had to be installed on ArcGIS for Server and the extension had to be enabled on the Edit Map Service defined in Lucity Admin UI. With version 2014r2 Lucity offers the ability to push edits from Lucity to GIS directly via a feature service. This new option doesn't require any Lucity installation components on your ArcGIS for Server.

Requirements

A few requirements must be met before implementing the GIS Updates via Feature Service option:

- Each Lucity linked feature class must be assigned to a default map service
- The default map service for the feature class must:
    - Contain the feature class
    - The feature class alias as listed in the service must be configured with Lucity
    - Enabled Feature Access capabilities
        - At a minimum, the Query and Update operations should be allowed
- System Settings in UI Admin must be configured:
    - The "Use Feature Service instead of Lucity SOE" system setting must be set to TRUE

Notes: _____

_____

_____

_____

_____

_____

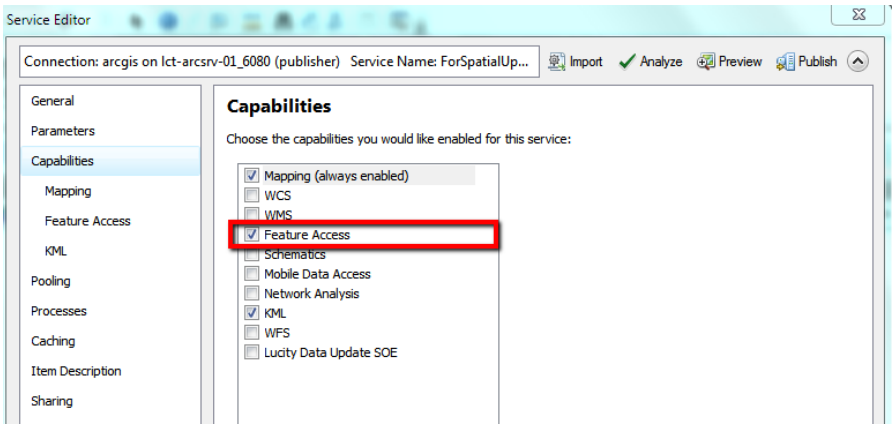
_____

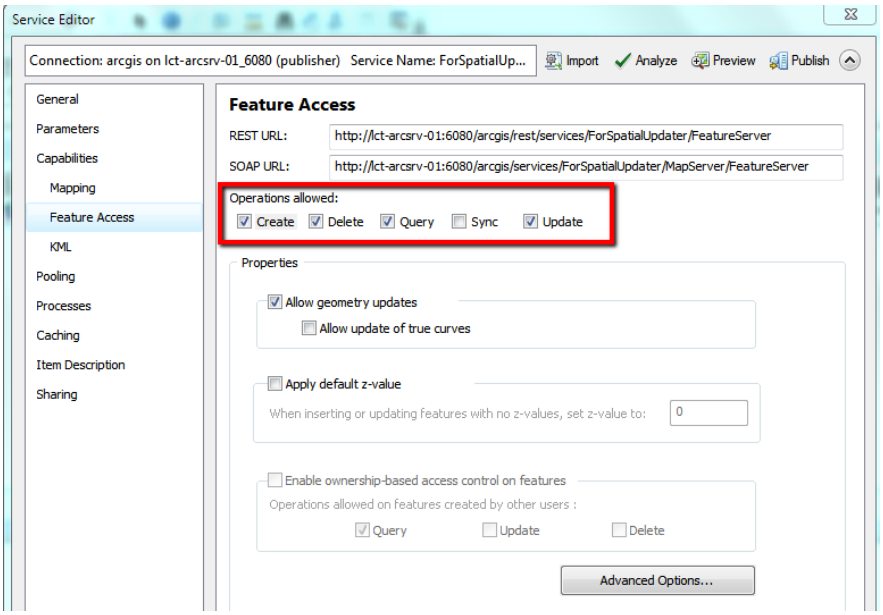
_____

_____

Create Feature Service

If you haven't already created a map service with Feature Access capabilities enabled, then you will need to do that first.



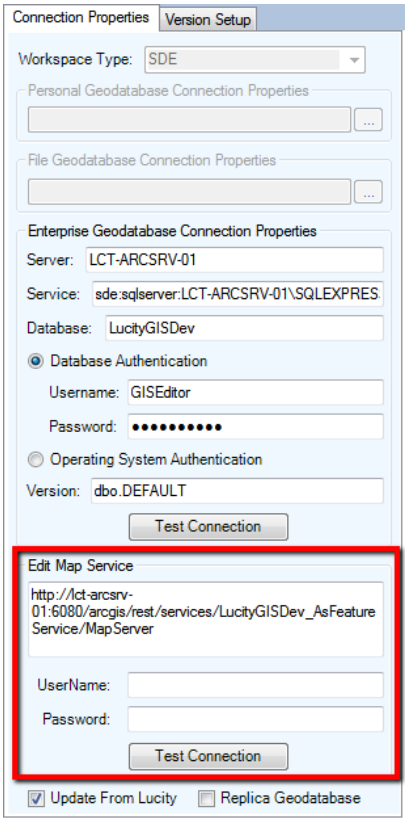


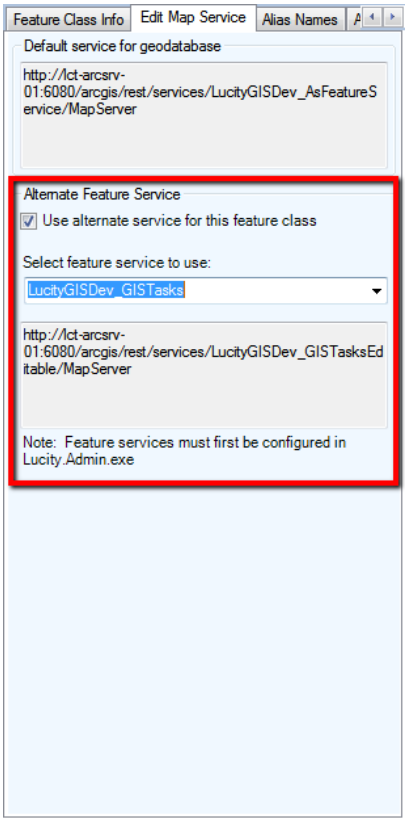
Assign default map services

The GIS Updates via Feature Service interacts with map services in order to push edits made to Lucity to their corresponding feature in GIS. To push edits to the GIS the following process is followed:

1. Determine the list of feature classes linked to the Lucity asset type being edited.
2. Do the following for each feature class until the asset is found:
    a. Determine the map service
        i. If a map service is defined at the feature class level then that one will be used.
        ii. If a map service isn't defined at the feature class level then the one defined at the geodatabase level will be used.
    b. Query the map service for the asset
        i. If it exists, update all asset fields that are linked to Lucity.
        ii. If it doesn't exist, move to the next feature class

- The geodatabase edit map service is defined in the Geodatabase Configuration Tool in ArcCatalog. It is listed under the Connection Properties tab when you have a geodatabase node selected.
- A service defined at the feature class level will be listed under the Edit Map Service tab when you have the feature class node selected.

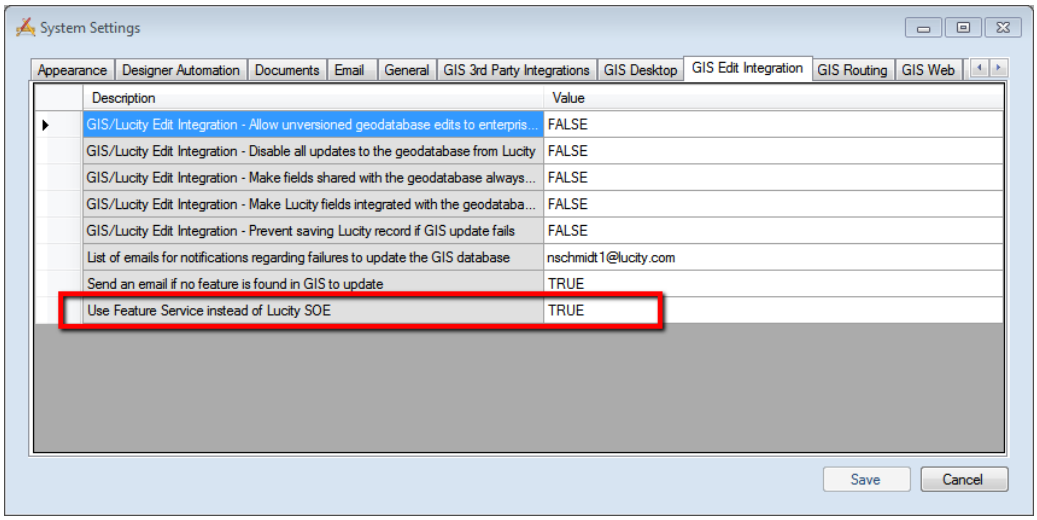




Configure System Settings

In UI Admin, system settings the following must be configured:

1. On the GIS Edit Integration tab, set the “Use Feature Services instead of Lucity SOE” to TRUE

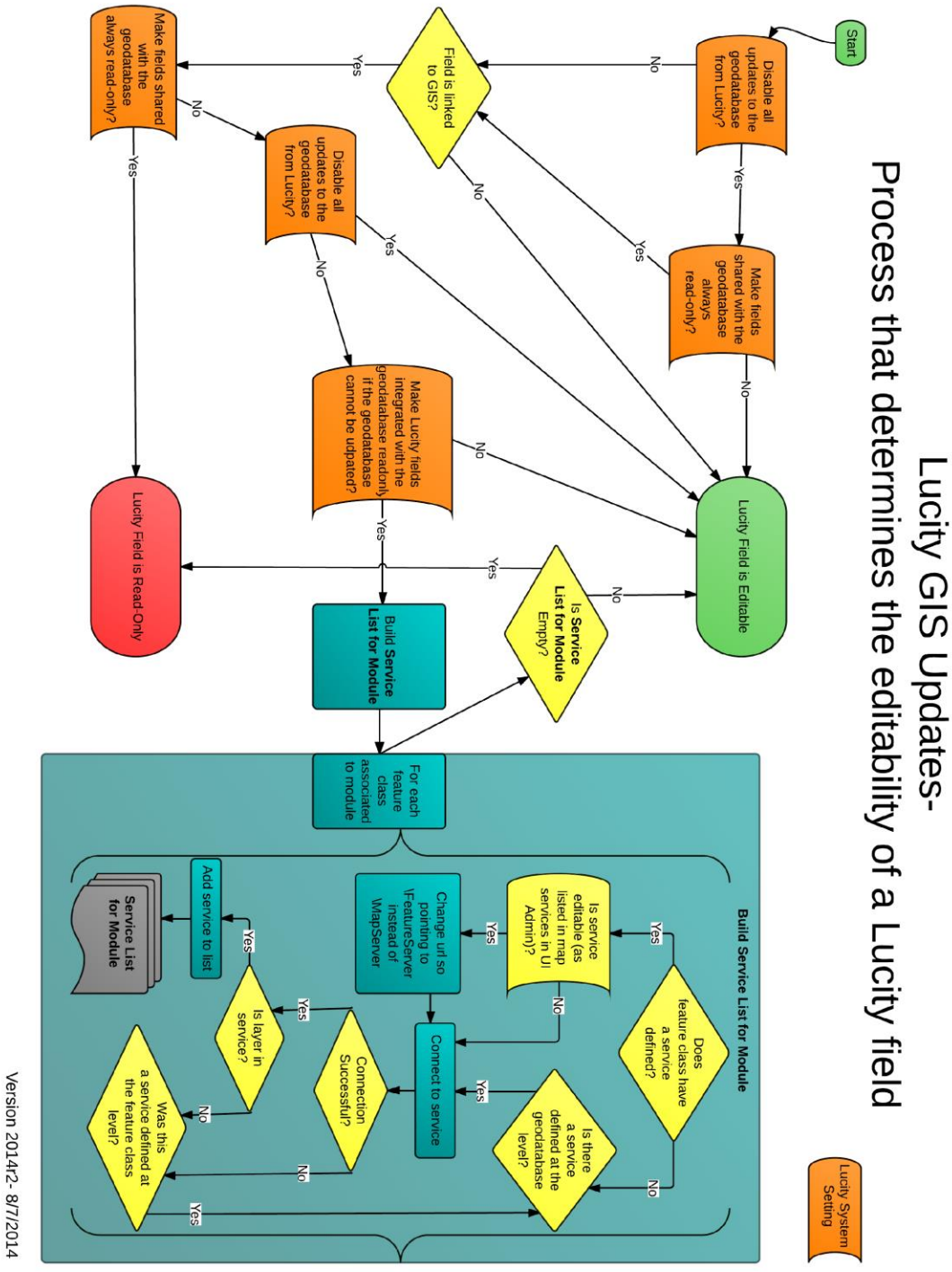


- **Allow unversioned geodatabase edits to enterprise geodatabase**: This allows edits to be made to unversioned geodatabases.
- **Disable all updates to the geodatabase from Lucity**: This prevents the geodatabase from being updated with edits made in Lucity desktop and web.
- **Make fields shared with the geodatabase always read only:** Any field that is shared with the geodatabase will be set as read-only in Lucity desktop and web.
- **Make Lucity fields integrated with the geodatabase read only if the geodatabase cannot be updated:** If a connection to the geodatabase fails when loading a form, all fields integrated with the geodatabase will be read-only.
- **Prevent saving Lucity record if GIS update fails:** (Web Only) If a modification is made to a record in Lucity and the geodatabase fails to get updated this will prevent the record in Lucity from being saved.
- **List of emails for notifications regarding failures to update the GIS database:** Enter a comma delimited list of email addresses. This list will receive emails when the GIS update fails to update the geodatabase.
- **Send an email if no feature is found in GIS to update:** Sends an email when the GIS Update cannot find a feature in the geodatabase to update. This is sent to the list specified in the “list of emails for notifications regarding failures…” setting.

How it works

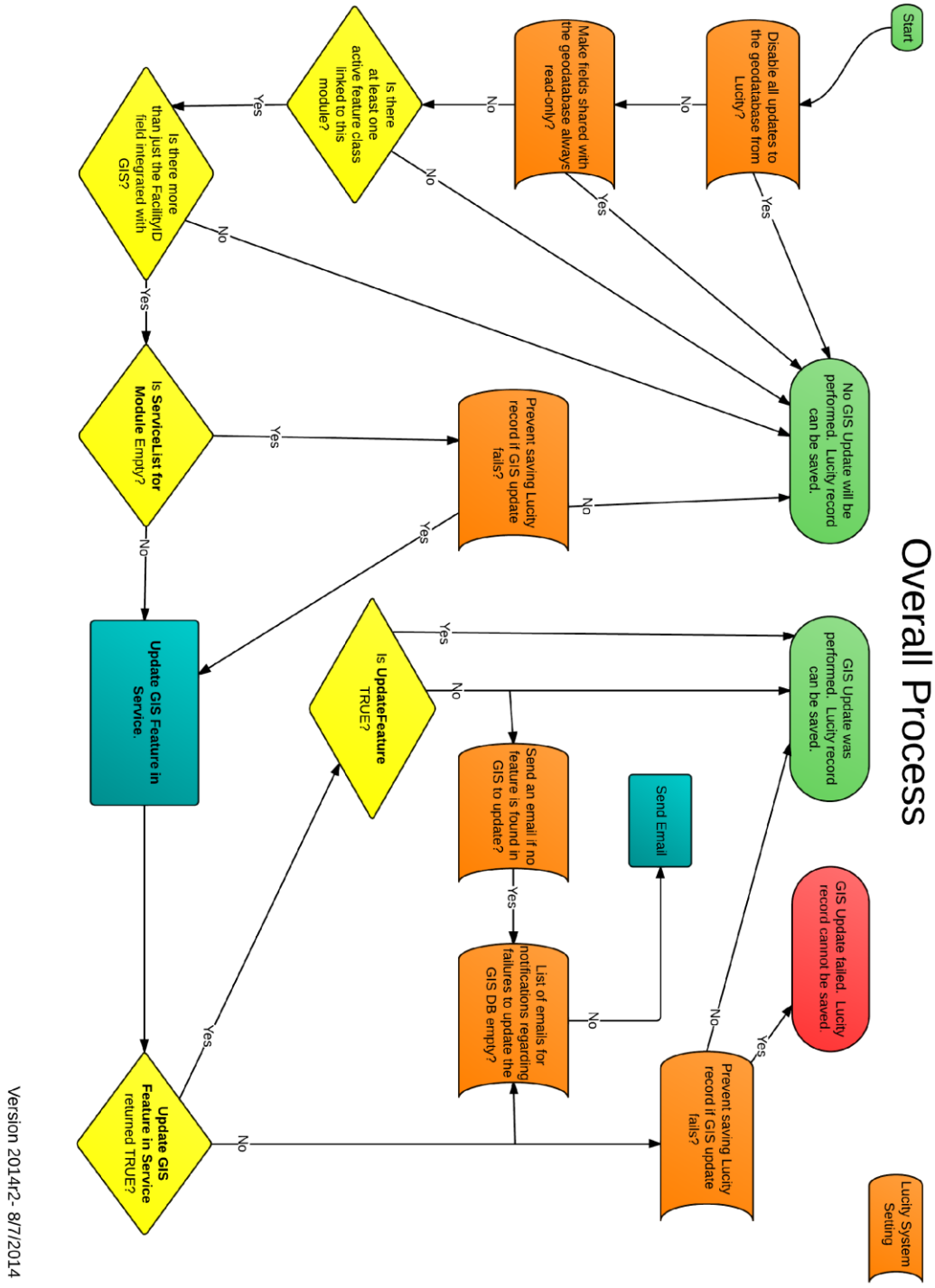
What occurs when opening a Lucity record for editing

The following page shows the process that occurs when opening a Lucity record in the desktop or web for editing. This process determines if the field should be editable or read-only based upon the GIS settings.

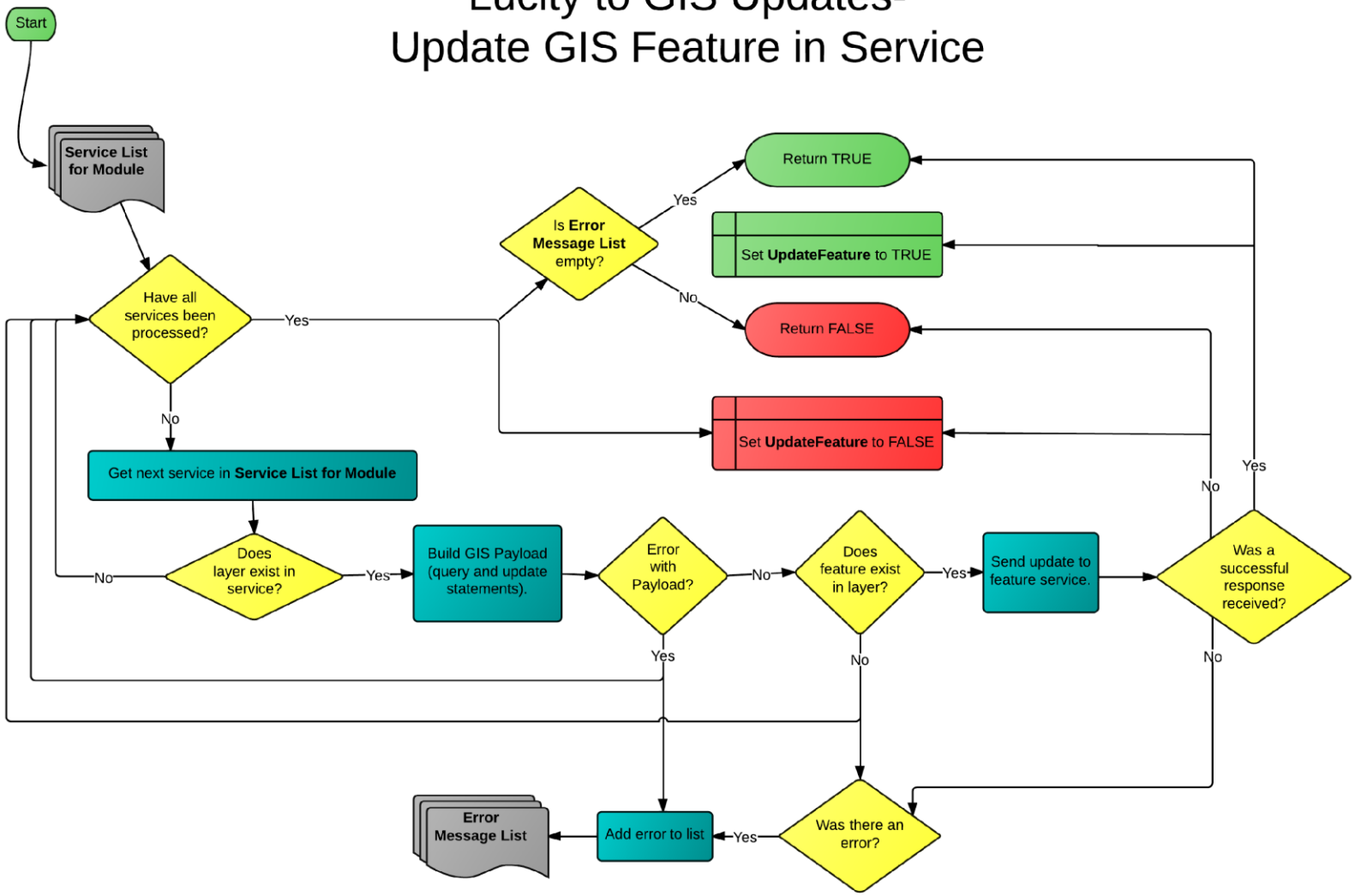


What occurs when saving a Lucity record after editing

The following pages show the process that occurs when saving a Lucity record in the desktop or web. The save could be due to adding a new record or modifying an existing one. This process determines if the GIS record should be edited, and if so, performs the edit.



Lucity to GIS Updates-
Update GIS Feature in Service



Version 2014r2- 8/7/2014

Lucity Spatial

With version 2014 Lucity offers the ability to store work order and work request spatial components directly in the Lucity database. Storing the spatial component (geometry) in the Lucity database allows for faster analysis, better efficiency, and more flexibility when showing these locations in a map.

Requirements

A few requirements must be met before implementing Lucity Spatial:

- The Lucity Work database must be one of the following:
  - SQL Server 2008 or higher
  - Oracle with MDSYS.SDO_GEOMETRY data type enabled
- The Lucity Services must be installed
- Each Lucity linked feature class must be assigned to a default map service
- Lucity linked feature classes must be one of the following geometry types:
  - Point
  - Line, polyline
  - Polygon
- System Settings in UI Admin must be configured:
  - *URL for Geocoding Service* must be defined
    - The Geocoding Service's style version must be at 10.1 or higher (uses Single Line Input)
  - The *Enable Lucity Spatial* system setting must be set to TRUE
  - The *Max amount of days to process spatial history* must be set to a value greater than 0

Notes: _____

_____

_____

_____

_____

_____

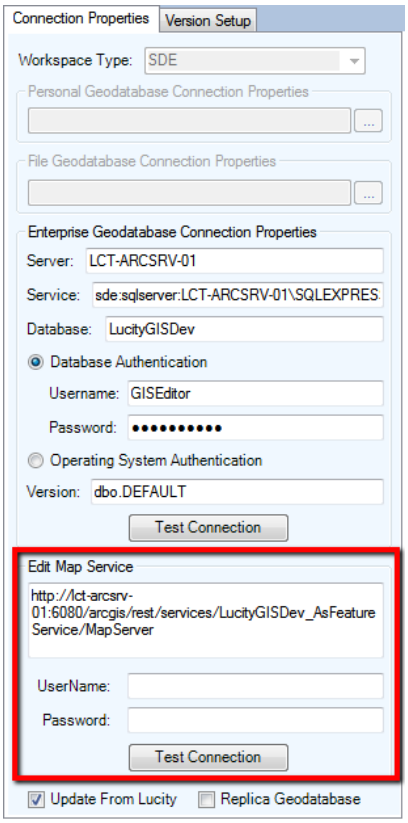
Setup

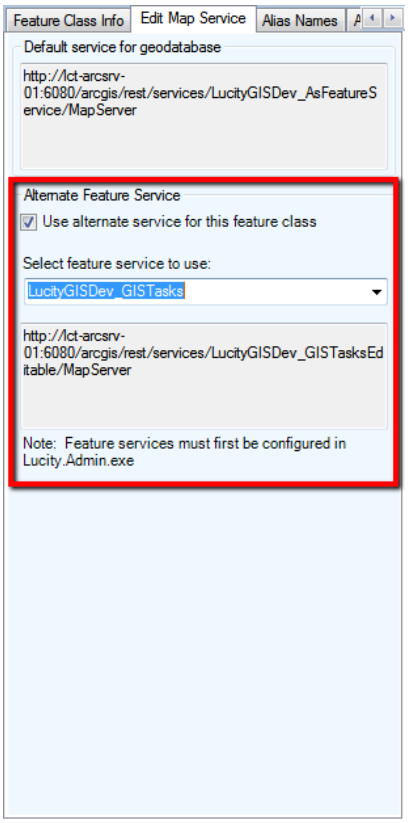
Assign default map services

The Lucity Spatial Updater service interacts with map services in order to obtain an asset's geometry to store in the Lucity database. To obtain the geometry for an asset the following process is followed:

1. Determine the list of feature classes linked to a given asset type
2. Do the following for each feature class until the asset geometry is returned:
    a. Determine the map service
        i. If a map service is defined at the feature class level then that one will be used.
        ii. If a map service isn't defined at the feature class level then the one defined at the geodatabase level will be used.
    b. Query the map service for the asset
        i. If it exists, return the geometry
        ii. If it doesn't exist, move to the next feature class

- The geodatabase map service is defined in the Geodatabase Configuration Tool in ArcCatalog. It is listed under the Connection Properties tab when you have a geodatabase node selected.
- A service defined at the feature class level will be listed under the Edit Map Service tab when you have the feature class node selected.

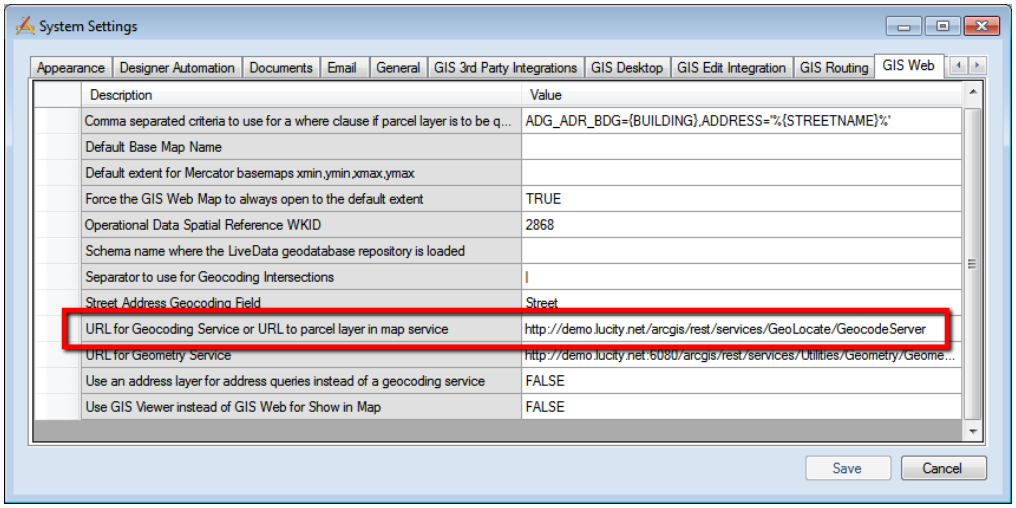




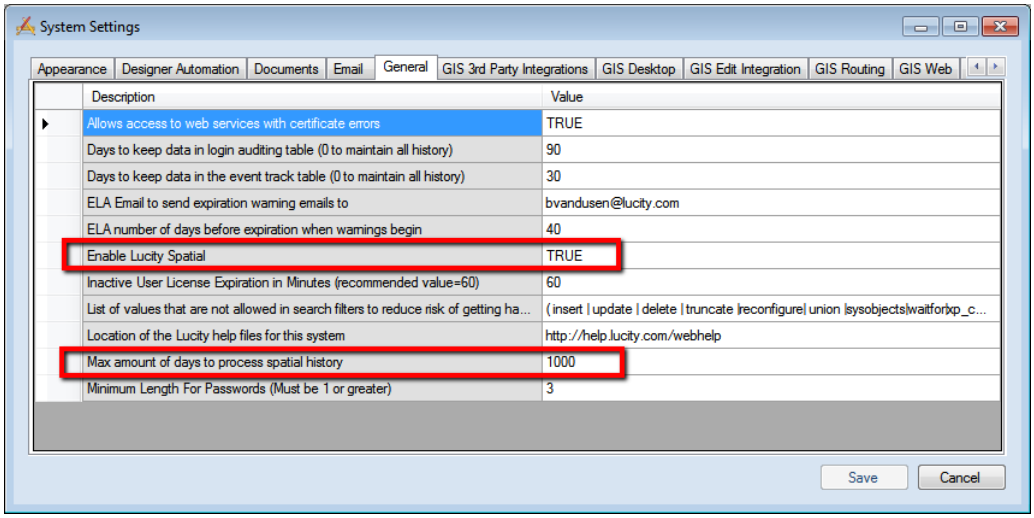
Configure System Settings

In UI Admin, system settings the following must be configured:

1. On the GIS Web tab, specify the URL to the geocoding service that can be used to determine the coordinates of work addresses.



2. On the General tab, set the Enable Lucity Spatial to TRUE

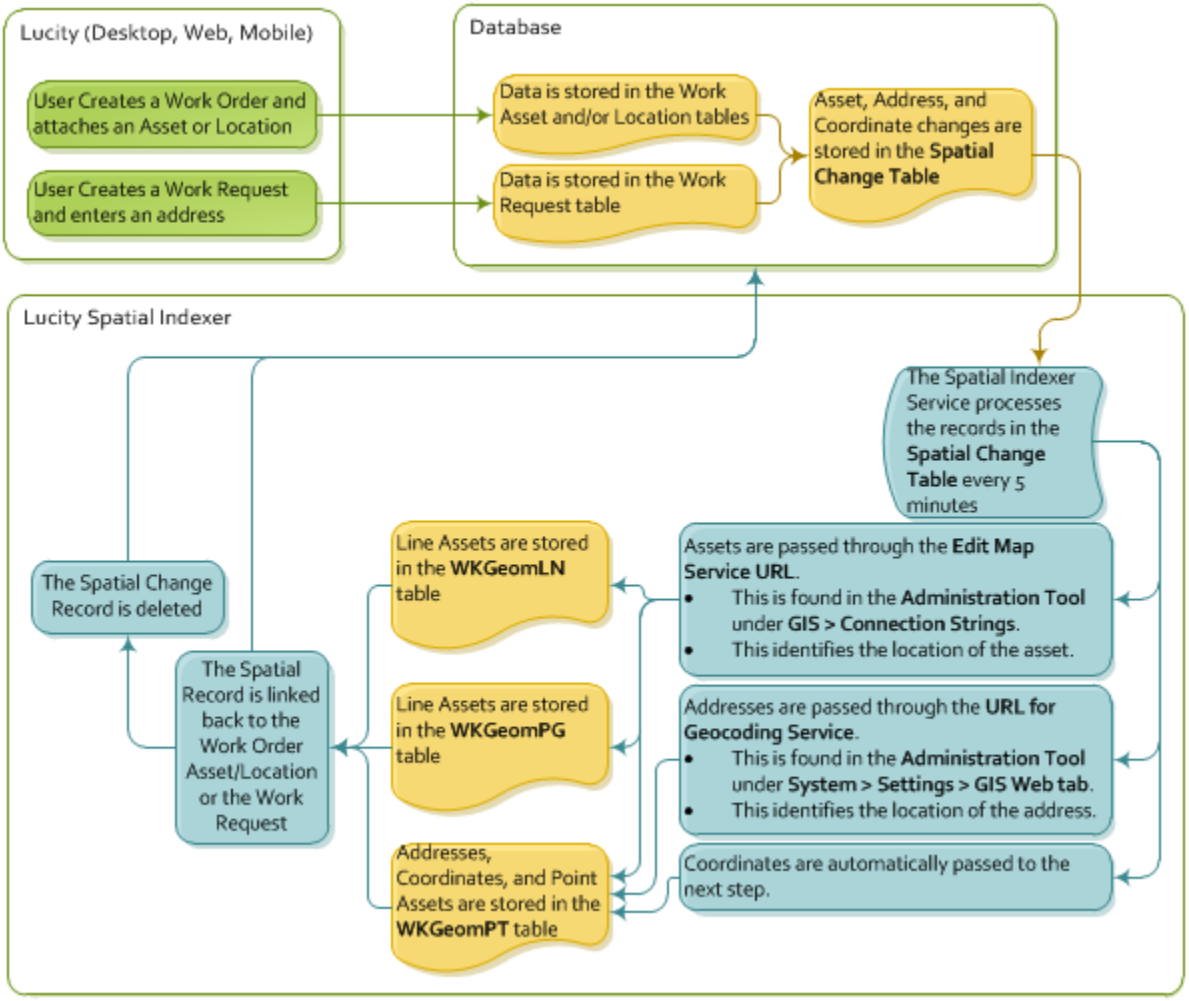


3. On the General tab, adjust the Max amount of days to process spatial history (must be greater than 0).

    a. Example: If you enter 180, the Lucity Spatial Updater will process all work orders/requests modified today and within the last 180 days.

    b. Note: The Lucity Spatial Updater service is reliant on back end configuration that was added to the Lucity database in 7.4. Therefore, depending on your upgrade history there could be a few years' worth of locations that have the potential to be processed.

How it works



Behind-the-scenes

The following GBAWork tables and views are used with Lucity Spatial:

- WKSPATIALCHANGE
    - This table is updated automatically by the Lucity application with any change made to Work Requests and Work Orders that deal with location information.
    - The Lucity Spatial Updater service processes these records by obtaining their corresponding geometries
- WKGEOMPT- This table stores all point geometries populated by the Lucity Spatial Updater service retrieved when processing WKSPATIALCHANGE
- WKGEOMLN- This table stores all linear geometries populated by the Lucity Spatial Updater service retrieved when processing WKSPATIALCHANGE
- WKGEOMPG- This table stores all polygon geometries populated by the Lucity Spatial Updater service retrieved when processing WKSPATIALCHANGE

- GIS_WKGEOMLNRQ- View showing all linear Request locations
- GIS_WKGEOMPGRQ- View showing all polygon Request locations
- GIS_WKGEOMPTRQ- View showing point Request locations (asset only)
- GIS_WKGEOMPTRQLOC- View showing point Request locations (address and x/y)
- GIS_WKGEOMLNWO- View showing all linear Work Order locations
- GIS_WKGEOMPGWO- View showing all polygon Work Order locations
- GIS_WKGEOMPTWO- View showing point Work Order locations (asset only)
- GIS_WKGEOMPTWOLOC- View showing point Work Order locations (address and x/y)

Troubleshooting

Sometimes there may be records that fail to process. When a spatial change record cannot be processed it is kept in the Spatial Change table (GBAWork.WKSPATIALCHANGE) and marked with an error code. These records are kept in the Spatial Change table for 30 days after they were initially processed. After 30 days they are deleted.

The error codes are found in the SPCH_SU_ERROR column:

- MissingData
    - Usually means that there was an issue with the data in WKSPATIALCHANGE like the moduleID is invalid, ParentRecID is invalid, invalid x/y data, etc.
- ServiceIssue
    - This occurs if there isn't a map service associated with the feature class or the feature class related to the asset type is not in the service
- NoGeometry
    - Returned if a record's geometry was found but was empty, if the indexer was unable to geocode an address, or if there was an issue with the REST call to retrieve the geometry.
- NoLucityRecord
    - Returned if the associated record no longer exists in Lucity

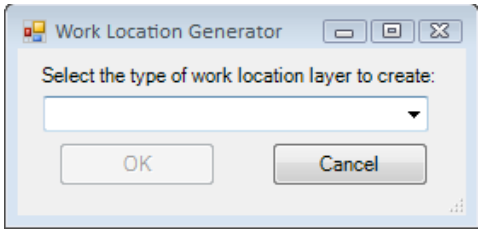
How to Process Records that have failed:

1. In the WKSPATIALCHANGE table find the record that failed
2. Review the error code for the record and resolve the problem
3. Delete the contents of the SPCH_GUID and SPCH_SU_ERROR fields for the record
4. The next time the Lucity Spatial Updater service runs it will attempt to process the record again.

Generating Live Work Layers

After you setup the Lucity Spatial Updater and the service has begun processing work locations you are ready to display and interact with the results. The Lucity GIS extension in ArcMap provides some out-of-the-box tools to facilitate the generation of layers that can be used to show the work locations.

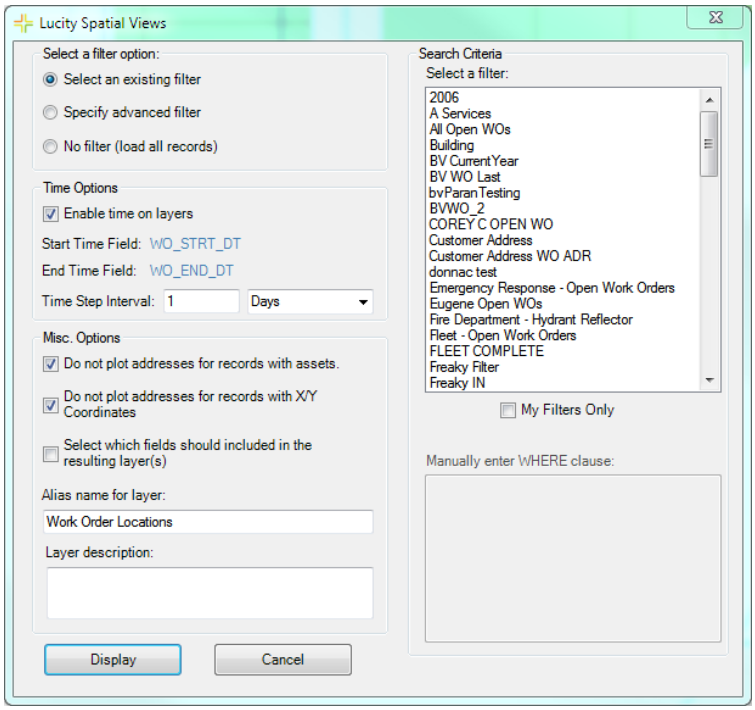
1. In ArcMap on the Lucity toolbar, click on the  button. The following pop-up will appear:



2. Select the type of work location you would like to create from the drop down list and Click OK.

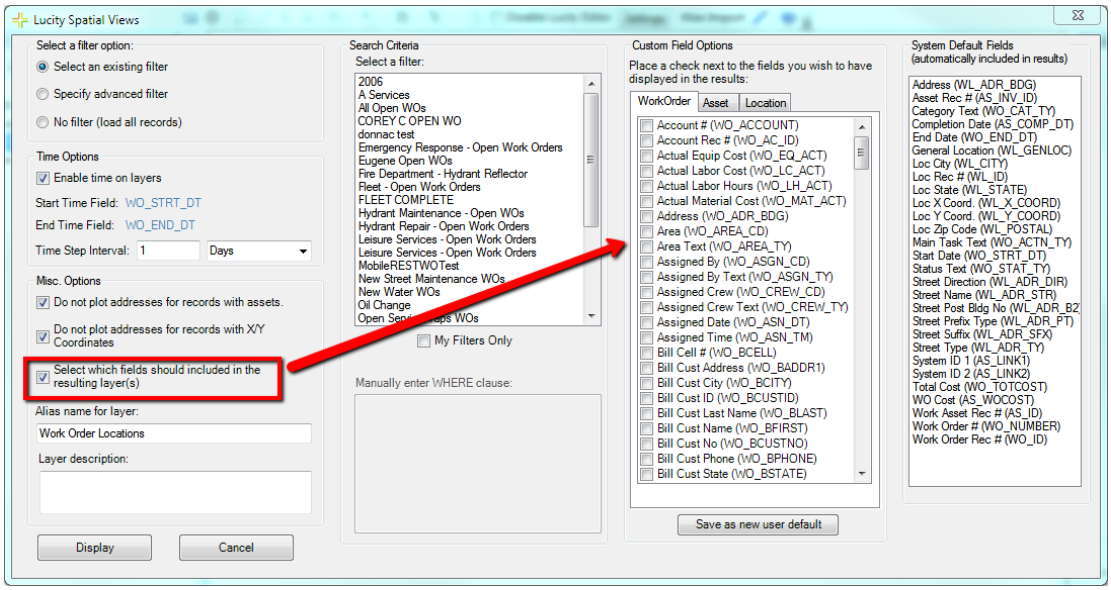
Available Views	
Requests	This creates temporary static layers of work request locations based on Dates, Categories, Filters, and Spatial Filters.
Requests (Live)	This creates dynamic (live) views of work request data based on a filter.
Work Orders	This creates temporary static layers of work order locations based on Dates, Categories, Filters, and Spatial Filters.
Work Orders (Live)	This creates dynamic (live) views of work order data based on a filter.
PM/Routine	This creates temporary static layers of Master Projects based on a filter.
Master Projects	This creates temporary static layers of PM/Routine locations based on a Dates, Categories, Filters, and Spatial Filters.

3. The associated tool will appear allowing you to provide further details specific to the type of work.

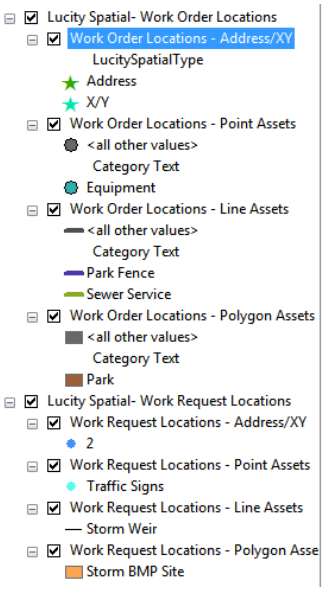


Select a filter option	Provides several ways for users to select a set of work requests to display.	
	Select an existing filter	Allows users to select a filter that was previously created and saved in the Requests module.
	Specify advanced filter	Allows users to manually enter a filter using SQL.
	No filter (load all records)	Displays all requests that have spatial information.
Search Criteria	These fields allow users to select or add a filter depending on their previous selection	
	Select a Filter	Displays all filters that were previously created and saved in the ***Requests module***. Check the ***My Filters Only*** box to show only the filters created by the current user.
	Manually enter WHERE clause	Type in a filter for the request module using SQL. Start with **WHERE....**
Time Options	These allow users to enable time functions within the layer. This allows users to use the ESRI Time functions within ArcMap.	
	Enable Time on Layers	This enables the time function for the request layers.
	Start Time Field ***End Time Field***	These are the pre-configured fields that the time functions will use.
	Time Step Interval	Fill out the number of days/weeks/ months that the time functions should group the requests into. Note: This can be changed in the layer properties after the layer is created.
Misc Options	These allow users to control the results in several other ways.	
	Do not plot addresses for requests with assets...	This option causes the results to not plot the address of the work request if there is an associated asset. If this is turned off the work request will plot both.
	Do not plot addresses for work request locations with X/Y Coordinates	This option causes the results to not plot the address of the request if there is an X/Y coordinate set. If this is turned off the request will plot both.
	Select which fields should be included in the resulting layer(s)	The results produced by this tool will plot the location of different requests and will contain attribute information from the Request module in the Attribute table. Check this option to open another section of the tool to change which fields from the Request module show up in the Attribute table.
	Alias name for layer	The name that will appear in the able of contents.
	Layer description	The description that will appear in the layer's properties.

4. Fill out the form based upon the various settings and options that are available.
    a. Note: All request and work order fields are available for use in the resulting layer. To adjust which fields should be included in the results you will want to check the "Select which fields should be included in the resulting layer(s)".

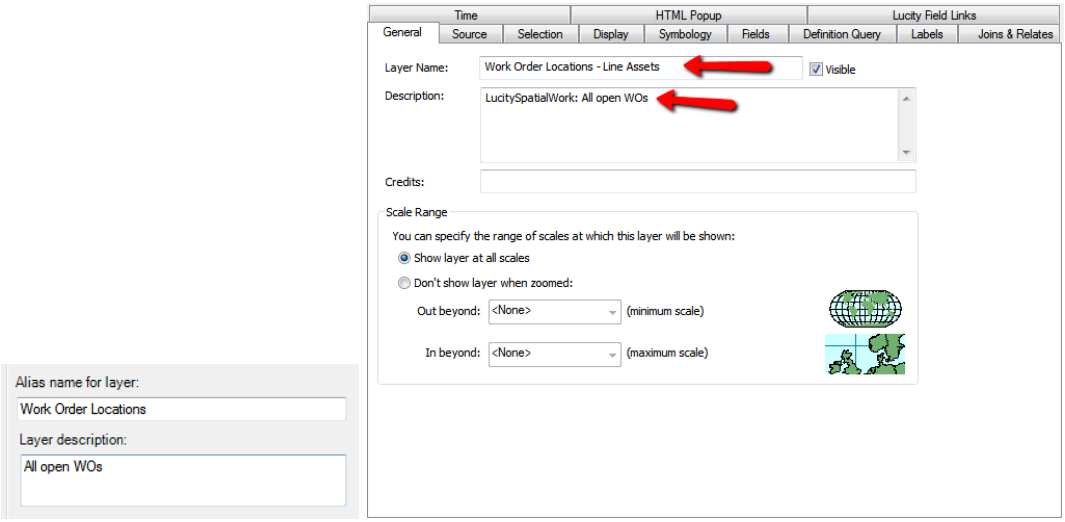


5. Click Display once you are ready to generate the layers. Once the tool has completed processing, the resulting grouped layer will be added to the map.



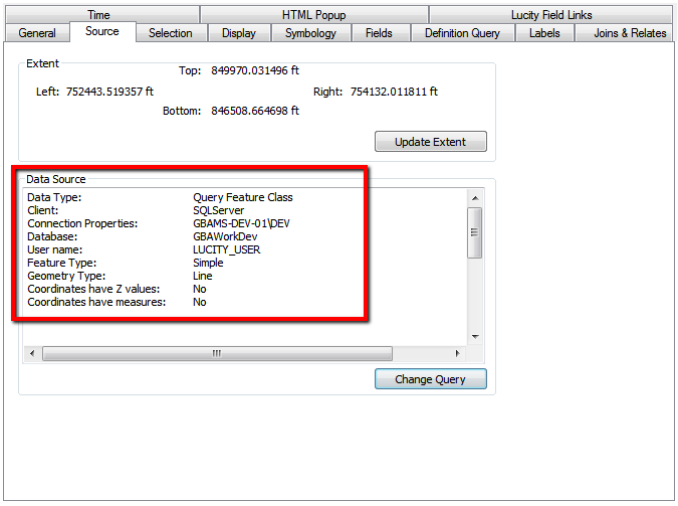
Examining the resulting layers:

- The tool will generate 4 layers:
    - Point layer for address and x/y data
    - Point layer for asset data
    - Polyline layer for asset data
    - Polygon layer for asset data
- General- The resulting layer name and description is determined by the user specified settings that were defined on the Lucity Spatial Views form.

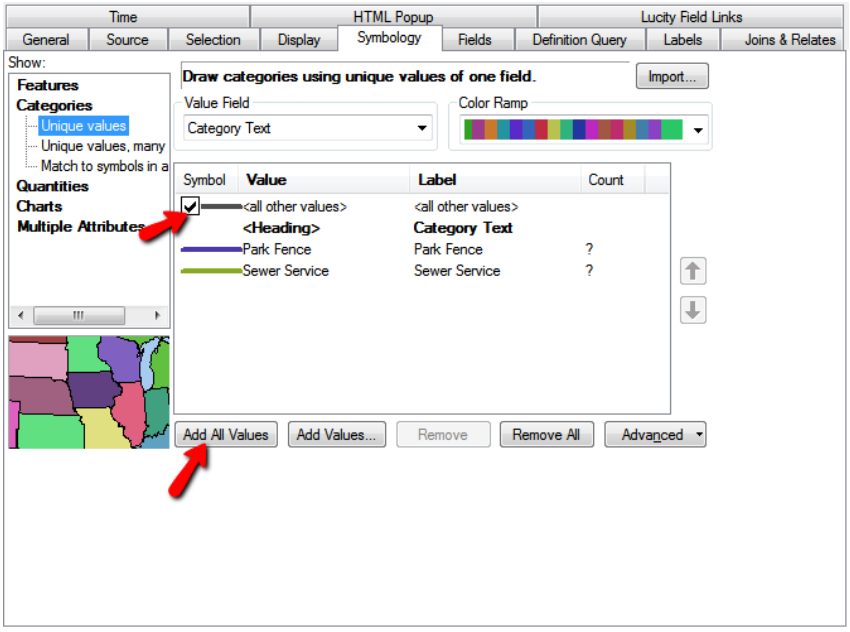


    - **Note**: The Description will start with "LucitySpatialWork:" or "LucitySpatialRequest:". You can modify the description, but the description **must** start with these key words. This is a requirement if these layers are to be used in the Lucity Web Map.

- Source- The source used for the work layers is the GBAWork database. The tool connects to the GBAWork database as Lucity_User. You will need to know this information if you wish to publish the layer as a service later.

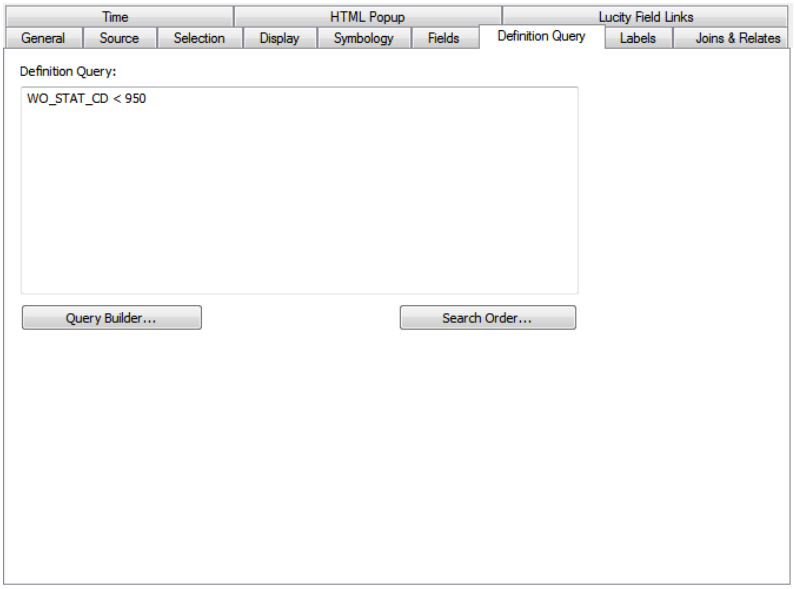


- Symbology- The default for the tool is to symbolize based upon the Work Category Text (RQ_CAT_TY, WO_CAT_TY). The symbology can be altered by going to the layer's symbology tab.

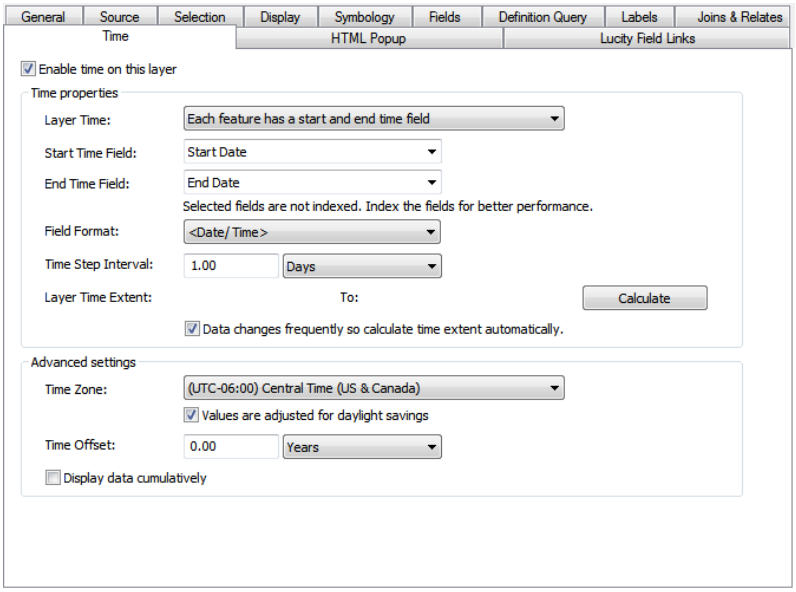


  - Note: The symbology is not dynamic. In other words, if a new work order/request is created that as is assigned to a category that hasn't been used yet- it will not show in the layer. To account for this situation:
    - Adjust the symbology to include the "<All other values>". Even though you visually won't be able to tell what work category the work item has been assigned, at least it will be visible in the layer.
    - Occasionally you will want to update the symbology of the layer by using "Add All Values".

- Definition Query- A definition query was applied to the layer if the option to use an existing filter or an advanced filter was specified on the Lucity Spatial Views Form.



- Time- If the option to enable time on the generated layer was set, then the Time tab on the resulting layer will have some additional settings that can be configured.



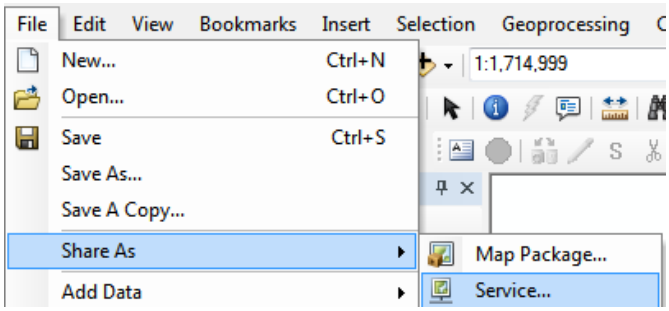
- Customizations to the layer settings (symbology, labelling, etc.) can be saved and used as the default for future runs of the Lucity Spatial View tool. For more information on how to save these settings refer to the Lucity Symbology default tool: http://help.lucity.com/webhelp/v140/gis/index.htm#25859.htm
- The Lucity extension tries to handle all the situations needed with generating query layers; however, there may be some additional requirements needed based upon the underlying database platform. Refer to http://resources.arcgis.com/en/help/main/10.2/index.html#/Preparing_to_use_query_layers/00s500000032000000/ for more information.

Publishing Live Work Layers

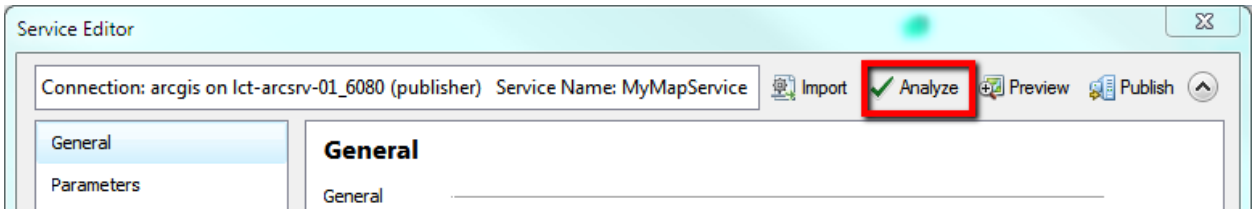
After you have created the live work layers, you can distribute access to those layers for users on the ArcGIS Desktop platform. If you wish to provide access to those layers in the Lucity web map, or any of the Lucity mobile applications then you will need to create a map service that contains these layers.

There is more than one way to publish a map service; the following is an example of how you can create the service from within an ArcMap document (.mxd).

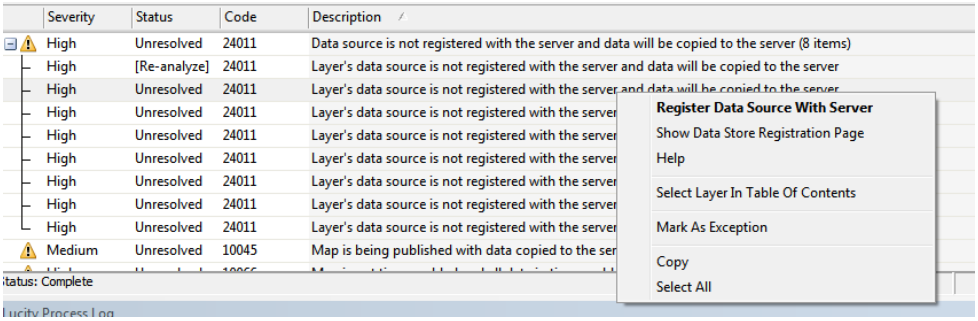
- In ArcMap add the live work layers to the map and customize properties so the map is displaying the data as you like.
- In ArcMap, click File>>Share As>>Service.



- Before you publish the service, you will want to analyse it.



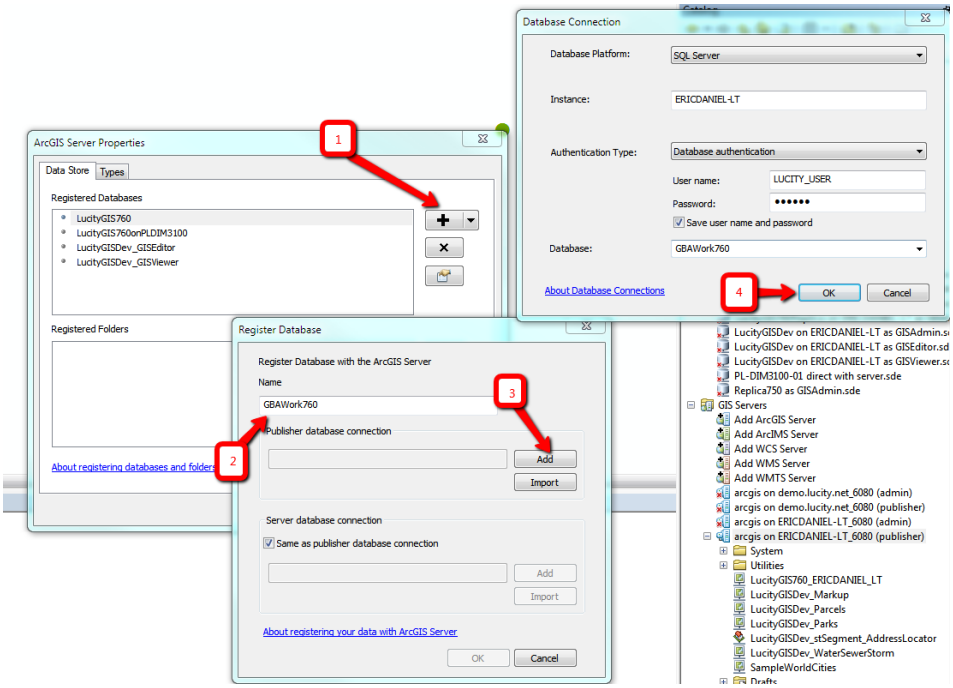
- The following are some common warnings/errors found when publishing the Lucity Live Work Layers and how they can be resolved:
    - Layer's data source is not registered with the server and data will be copied to the server



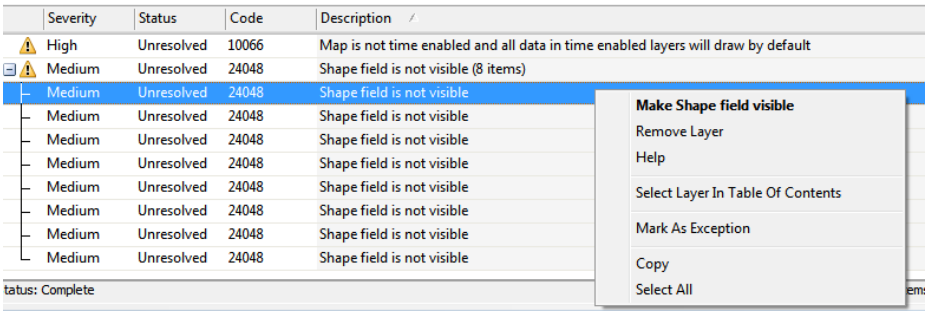
    i. This must be fixed; otherwise, the layer will not be refreshed with updates.

    ii. To resolve, right-click on the error and select the Register Data Source With Server option.

    iii. If needed, you may need to manually create a db connection to GBAWork using Lucity_User.



- Shape field is not visible



i. This must be resolved before publishing

ii. To resolve, right-click and select Make Shape Field Visible

- Once you resolved all the issues, you can publish the service. Once published, you can add this service to the Lucity web map or mobile applications.

The Lucity Live Work layers are essentially query layers. They are pointing to various spatial views in the GBAWork database. These layers are 'live' meaning if a work location is added/updated/deleted this information automatically refreshed in the live work layer.

Work Maintenance Zones

With version 2015 Lucity provides the ability to automate the process of assigning supervisors to requests and work orders based upon the problem and location. It also provides the ability to automatically classify your work based on alternate zones such as for billing, land use, special districts, etc.

For example, say your organization has two supervisors in charge of performing utility locates. One supervisor is in charge of locates on the west side of town the other is in charge of the east. When a request is entered into Lucity with the problem of utility locate, the Lucity application can be configured to automatically determine which supervisor the request should be assigned to given the location of the request.

Setting up Zones

In Lucity

- Zones are stored in the Work > Work Flow Setup > Work Maintenance Zone Setup and Work Alternate Zone Setup module
- Populate these modules with all of the Maintenance and Alternate zones. These can be entered manually or imported using the Lucity Import and Update tool.

In GIS

- You will want to have a polygon feature class(es) that store the maintenance and/or alternate zones.
- These feature class(es) need to have a field that stores the maintenance and/or alternate zone codes. These codes must match the values entered into the Work Maintenance Zone Setup and Work Alternate Zone setup modules.

Populating Zones from Assets

In Lucity

- Each asset inventory module has a maintenance and alternate zone field. These fields are picklist fields that show the values as you defined them in Work Flow Setup. You can manually populate these fields via the user interface, or you can use GIS to help assign the zones as described in the next section.

In GIS

- There are two methods to populate the zones from GIS. You can either setup a Lucity Spatial Relationship, which requires you to have a field in the asset feature class to store the zone code or you can use the Lucity Direct Relates tool.
- Using Lucity Spatial Relationships:
    1. In the asset feature class add a field to store the maintenance and/or alternate zone code.

2. In the Lucity Geodatabase Configuration tool, link the zone field(s) from your asset feature classes to the related zone field in Lucity.
3. In the Lucity Geodatabase Configuration tool, setup a spatial relationship for the asset feature class to update the zone field with the code from the zone feature class based upon the appropriate relationship (intersects, within distance, etc.).
4. In ArcMap, run the Update Spatial Relationship tool on all the asset records you wish to populate the zone field for.

- Using Lucity Direct Relates:
  1. In ArcMap, run the Direct Relates tool against the asset feature class.
  2. For the related feature class, choose one of the zone feature classes.
  3. For the related feature class field, choose the field in the zone feature class that stores the zone code as it is defined in Work Flow Setup.
  4. For the Lucity feature class field, choose the Lucity zone field.
  5. Running the tool will update the zone field in Lucity for all the records linked to GIS for that module.

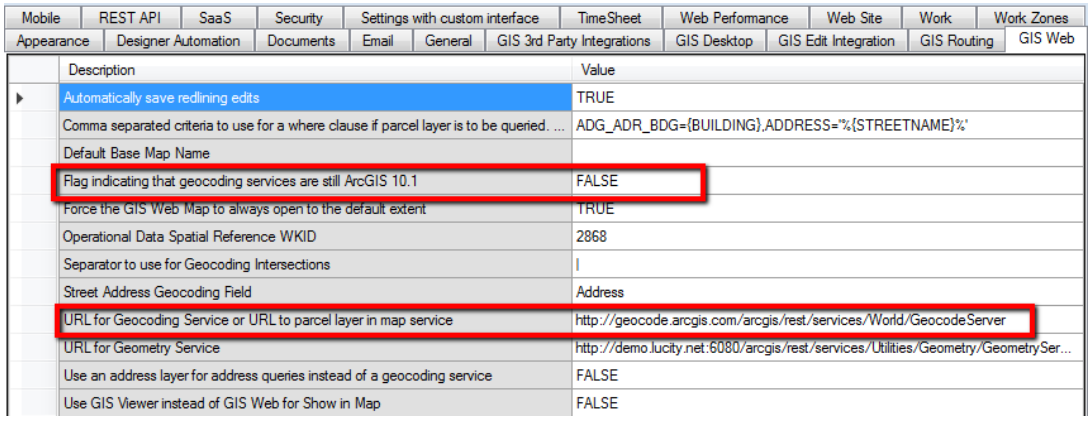
Populating Zones by Location

In GIS

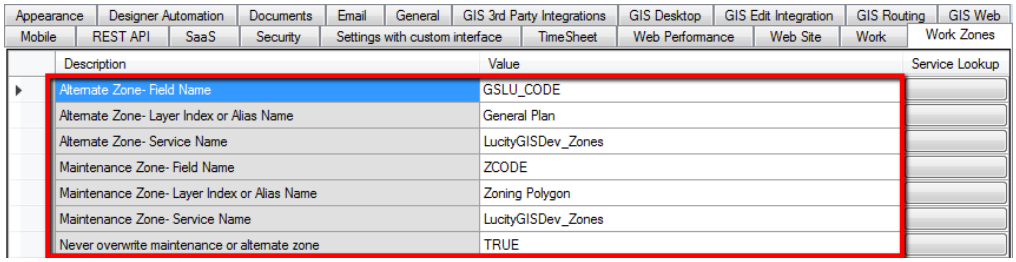
1. Add the maintenance and/or alternate zone feature class to a map.
2. Publish the map to ArcServer as a map service

In Lucity

1. Open the Lucity Administration tool and go to GIS > Map Services.
2. Add the service that contains the zones to the list of map services
3. Make sure the URLs are accessible from the Lucity Web server, Lucity Mobile server, Lucity Citizen Portal server, Lucity REST API server, Lucity Citizen Portal REST API server
4. In Lucity Administration go to System > Settings > GIS Web and make sure the URL for Geocoding Service is filled out. This is required in order to obtain the coordinates for an address.



5. In Lucity Administration go to System > Settings > Work Zones and fill out the appropriate information regarding the maintenance and/or alternate zone layers.



Configure Default Supervisors for Maintenance Zones

In Lucity

1. Open up the Work > Work Flow Setup > Work Problem Setup module
2. Find a problem you would like to add a zone supervisor to
3. Expand the record and select the Zone Supervisors child grid
4. Add a new Zone Supervisor record
5. Select a Maintenance Zone and select a Supervisor
6. Add a new record for each maintenance zone

How it Works

Requests

1. A user creates a request, selects a problem, and assigns an asset.
2. The system checks to see if the asset has zones assigned to them. If it does, it updates the zones on the request.
3. When the request is saved the system checks to see if there are any zones assigned.
4. If there aren't zones assigned it attempts to find a zone based on the asset's XY coordinates, XY coordinates entered on the request, and the address entered on the request.
5. Once the zones are figure out it checks the selected problem to see if it has any matching maintenance zone supervisors.
6. If the problem has a matching maintenance zone supervisor the Request's supervisor field is updated to match.

Work Orders

1. A user creates a work order, selects a problem, and adds an asset and/or location record.
2. The system checks to see if the first asset on the work order has zones assigned to them. If it does, it updates the zone on the work order.
3. When the work order is saved the system checks to see if there are any zones assigned.

4. If there aren't zones assigned it attempts to find a zone based upon the first asset's XY coordinates, the XY coordinates of the first location entered on the work order, and the address of the first location entered on the work order.
5. Once the zones are figured out it checks the selected problem to see if it has any matching maintenance zone supervisors.
6. If the problem has a matching maintenance zone supervisor the Work Order's supervisor field is updated to match.

Special Behaviors

- If the maintenance zone isn't filled out on the asset and the program has to ask the GIS Server for the zone information it will only wait for 10 seconds before timing out.
- If the GIS Server times out 15 times in one day the program will stop asking for zone information and will send a system health and GIS update failure email. This is to prevent the work order and request modules from slowing down while waiting.
- Resetting the web cache will reset the counter.

Notes: _____

Lucity GIS- Scheduled Tasks

Scheduled Tasks provide the ability to automatically sync data between your GIS and Lucity products.

Requirements

A few requirements must be met before implementing GIS Scheduled Tasks:

- Each Lucity linked feature class must be assigned to a default map service
- The map service for the feature class must:
    - Contain the feature class
    - The feature class alias as listed in the service must be configured with Lucity
    - The Lucity To GIS synchronization task also requires:
        - Enabled Feature Access capabilities (with Create, Delete, Query, and Update)
- System Settings in UI Admin must be configured:
    - The "Use Feature Service instead of Lucity SOE" system setting must be set to TRUE
- Enable Esri's Editor Tracking on feature classes
    - At a minimum have a last_edited_date field
    - Record Dates in **UTC** not Database Time!
- Enable Lucity's Last Sync DateTime field on feature classes

Notes: _____

_____

_____

_____

_____

_____

_____

_____

_____

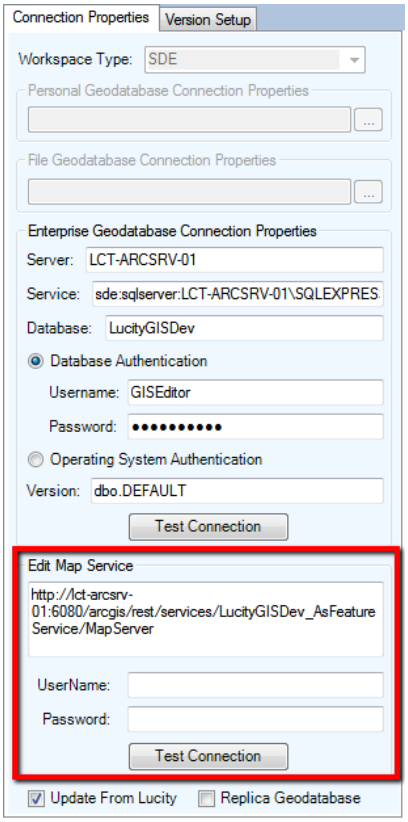
_____

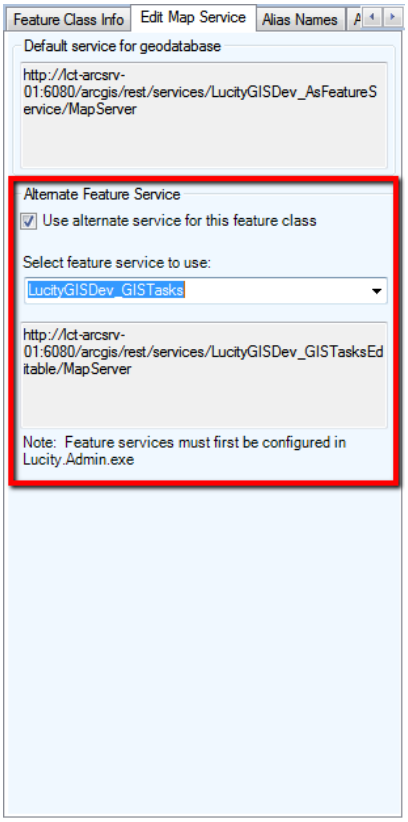
Assign default map services

The Lucity GIS Task Runner interacts with map services in order to synchronize the data between GIS and Lucity. The following process determines the map service used with the GIS Task:

1. If a map service is defined at the feature class level then that one will be used.
2. If a map service isn't defined at the feature class level then the one defined at the geodatabase level will be used.

- The geodatabase edit map service is defined in the Geodatabase Configuration Tool in ArcCatalog. It is listed under the Connection Properties tab when you have a geodatabase node selected.
- A service defined at the feature class level will be listed under the Edit Map Service tab when you have the feature class node selected.

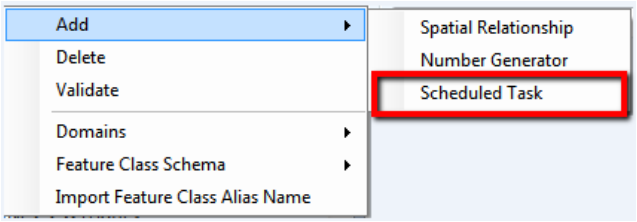




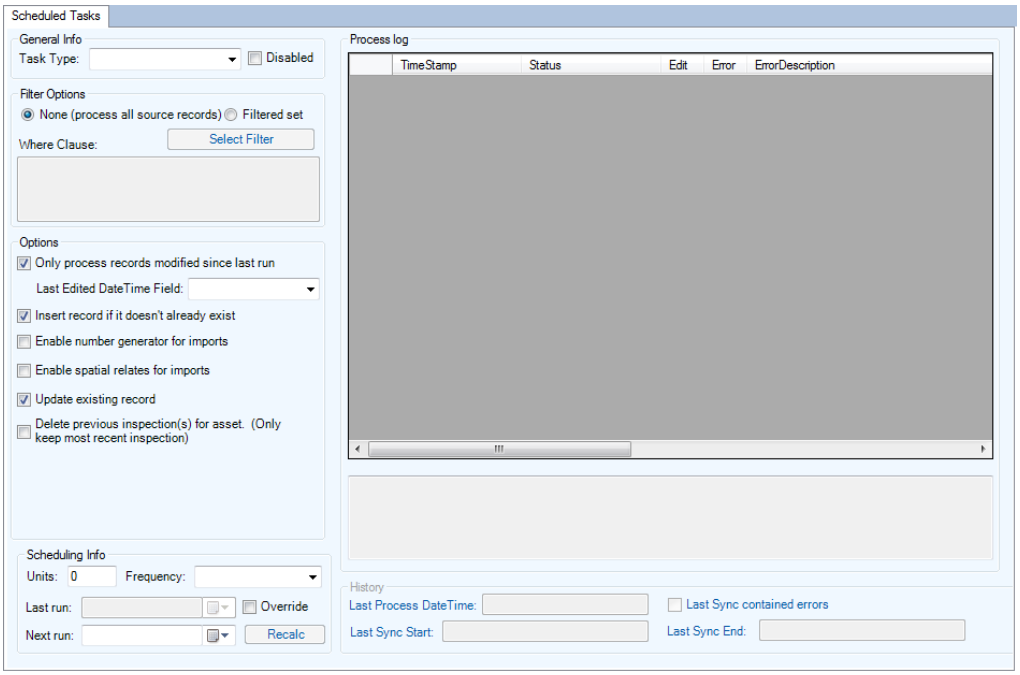
Creating a new Scheduled Task

To setup a new Scheduled Task for a feature class:

1. In the Lucity Geodatabase Configuration tool in ArcCatalog, right-click on the feature class node and click Add>>Scheduled Task.



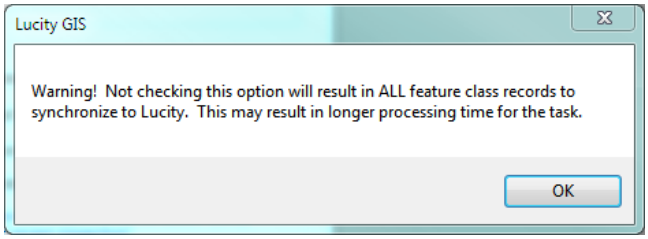
2. The following form will appear:



3. Under General Info- select the desired Task Type from the drop down menu. The options are: “Sync- Lucity to GIS” and “Sync- GIS to Lucity”.
    a. Note: The Disabled checkbox will prevent the Scheduled Task from being processed by the GIS Task Runner service.
4. Filter Options: Select whether the task will process all records (default) or process a filtered set.
    a. If using a Filtered Set- the Select Filter button will only be enabled for task types of “Sync- Lucity to GIS”.
    b. If manually entering the Where Clause, it must pass validation of the underlying data source.
5. Options: Adjust any additional settings as needed:
    a. **Only process records modified since last run**- This option checks through the records that were selected for processing and only processes those records that were edited since the last time the scheduled task processed.

i. Note: If this option is checked and the Task Type is "Sync- GIS to Lucity" then you must also provide the Last Edited DateTime Field. If the Task Type is "Sync-Lucity to GIS", then the Lucity Last Mod Date and Time fields will be used.

ii. Not checking this option will result in the following prompt. Click OK to proceed.



b. **Last Edited Date Time Field**- This option is only enabled if the "Only Process records modified since last run" is checked and the task type is "Sync- GIS to Lucity".

c. **Insert record if it doesn't already exist**- Allows for new records to be inserted into the GIS feature class or Lucity module depending on the task type.

d. **Enable number generators for imports** – Will process the number generators configured for this feature class during the import.

e. **Enable spatial relates for imports** – Will process the spatial relates configured for this feature class during the import. Note: With 2015r2 Reverse Geocode spatial relates are not supported during the GIS Task import process.

f. **Update existing record**- Allows updates to existing records in the GIS feature class or Lucity module depending on the task type.

g. **Delete previous inspection(s) for asset**- This option is only enabled if the task type is "Sync- Lucity to GIS". This option causes the task to delete any inspection in the feature class that isn't the most recent inspection for an asset. The purpose of enabling this option is if you want the feature class to only contain the most recent inspection for each feature.

6. Scheduling Info: This section can be configured so the task is processed by the GIS Task Runner service.

   a. **Units**- Enter a numeric value that indicates how often the process should run. This value is used in conjunction with the Frequency. For example, if Units = 3 and Frequency = Hours then the Scheduled Task would run every 3 hours.

   b. **Frequency**- Select the desired frequency from the drop down. The options are Minute, Hours, Days, or Months.

   c. **Last Run**- This is disabled by default, showing the last time the scheduled task ran. For new scheduled tasks this will be blank.

   d. **Override**-. For new scheduled tasks, or you wish to reset the last run date to trigger the scheduled task to get processed again, then you can check the Override checkbox which will enable the Last Run text box.

   e. **Next Run**- This indicates the next time the scheduled task should be processed. The GIS Task Runner service uses this value to determine which scheduled tasks to process.

   f. **Recalc**- If the Units, Frequency, or Last Run information was updated then the Recalc button will update the next run date field based upon the new settings.

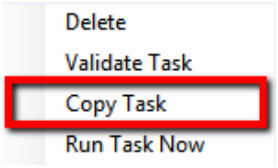
7. History: This section is read-only and shows when the Scheduled Task was last picked up, when the sync process started and when it last finished.

8. Process log: This section is also read-only and shows all logging related to the previous processing of the scheduled tasks. When a scheduled task is processed either manually or via the GIS Task Runner service, logging entries are recorded in GBAComm.CMGISTASKLOG. Entries are removed after 30 days.
    a. **TimeStamp**- The time the entry was inserted
    b. **Status**- Various descriptions to indicate the processing status
    c. **Edit**- 1=Inserts, 2=Edits, 3=Deletes
    d. **Error**-1=TransactionalDetails, 2=ValidationFailed, 3=ProcessFailed, 4=ServiceIssue, 5=BusinessObjectIssue, 6=MissingData
    e. **ErrorDescription**- Further details regarding the edit or error
    f. **ErrorException**- Further details regarding error
    g. **GUID**- The processing batch GUID
    h. **ModID**- The Lucity Module ID
    i. **LucityID**- The Lucity Record ID
    j. **GISID**- The GIS feature's ObjectID
    k. **Syntax**- The syntax used for either retrieving, updating, inserting or deleting

Copying a Scheduled Task

To facilitate the process of setting up scheduled tasks for multiple feature classes, you can use the Copy GIS Task tool to create a new scheduled task for multiple feature classes:

1. In the Lucity Geodatabase Configuration tool, right-click on the existing Scheduled Task and click Copy Task.



Notes: _____

_____

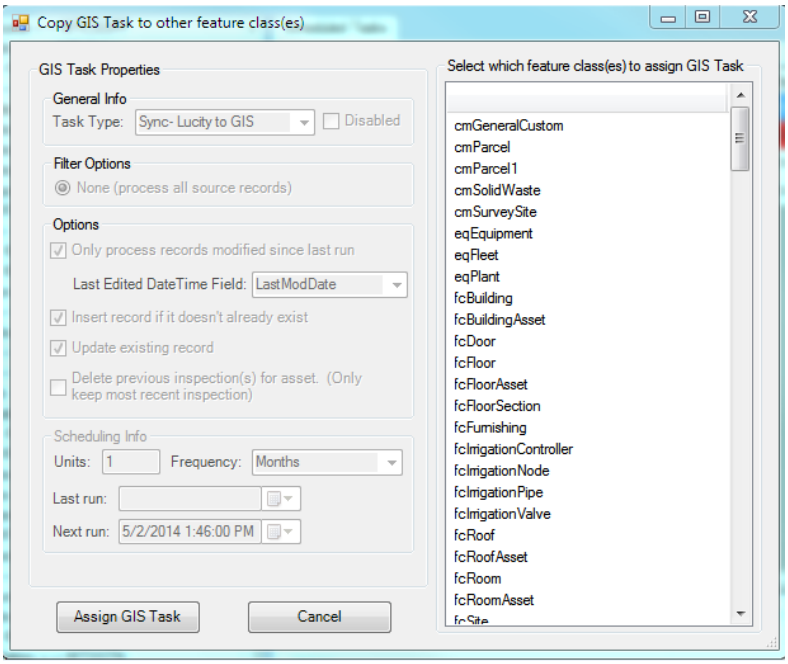
_____

_____

_____

_____

2. The following form will appear:



   a. Note: GIS Task Properties are all read-only. Any item needs to be altered can be done on an individual basis after the Copy GIS Task is complete.

3. On the form select the feature class(es) you wish to create a new Scheduled Task for using the existing scheduled task properties. Once the feature classes have been selected click the Assign GIS Task to complete the process.

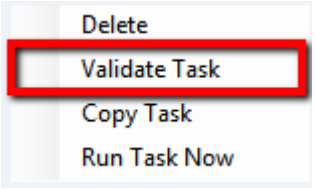
Validate a Scheduled Task

A validation tool is available for scheduled tasks that will run the following checks. Note: these same checks are also performed when running the scheduled tasks:

- Verifies at least one option has been set: insert, update, delete.
- Verifies there are feature classes linked to parent module (for inspections only)
- Validates Lucity to GIS field mappings
- Validates list of fields used to determine record uniqueness
- Tests connection to map service for feature class
- Validates feature class exists in the service
- Export Validations
    - Confirms feature class is an inspection feature class
    - Tests connection to parent feature class service(s)
    - If Use Last Sync Date option is true- verifies the Lucity module contains a Last Mod Dt field
    - If Delete option is true- verifies that the Lucity module has a Most Recent Inspection flag
    - Tests the SQL syntax used to obtain the list of Lucity records

- Import Validations
    - If Use Last Sync Date option is true- confirms that a GIS Date Time Field is defined and exists in the layer in service
    - Confirms that the Scheduled Task's Last Sync Date Time is populated
    - If feature class configuration contains the Lucity Last Sync Date field- confirm it exists in layer in service
    - Confirms that the Lucity module contains a Last Mod Dt field
    - Tests the SQL syntax used to obtain the list of GIS records from service

1. To run the validations, in the Lucity Geodatabase Configuration tool, right-click on the existing Scheduled Task and click Validate Task.

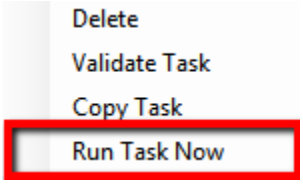


2. The validation will start, once complete you will receive a prompt indicating if the validation passed with our without errors. Any errors or tests that failed validation should be reported in the process log results.

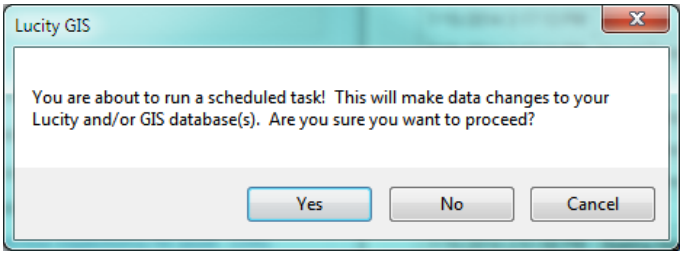
Manually Run a Scheduled Task

With v2014r2 we released a Lucity GIS Task Runner service that, by default, kicks off every min determining if any Scheduled Task is due to run. There may be different situations in which the Scheduled Task needs to be run manually.

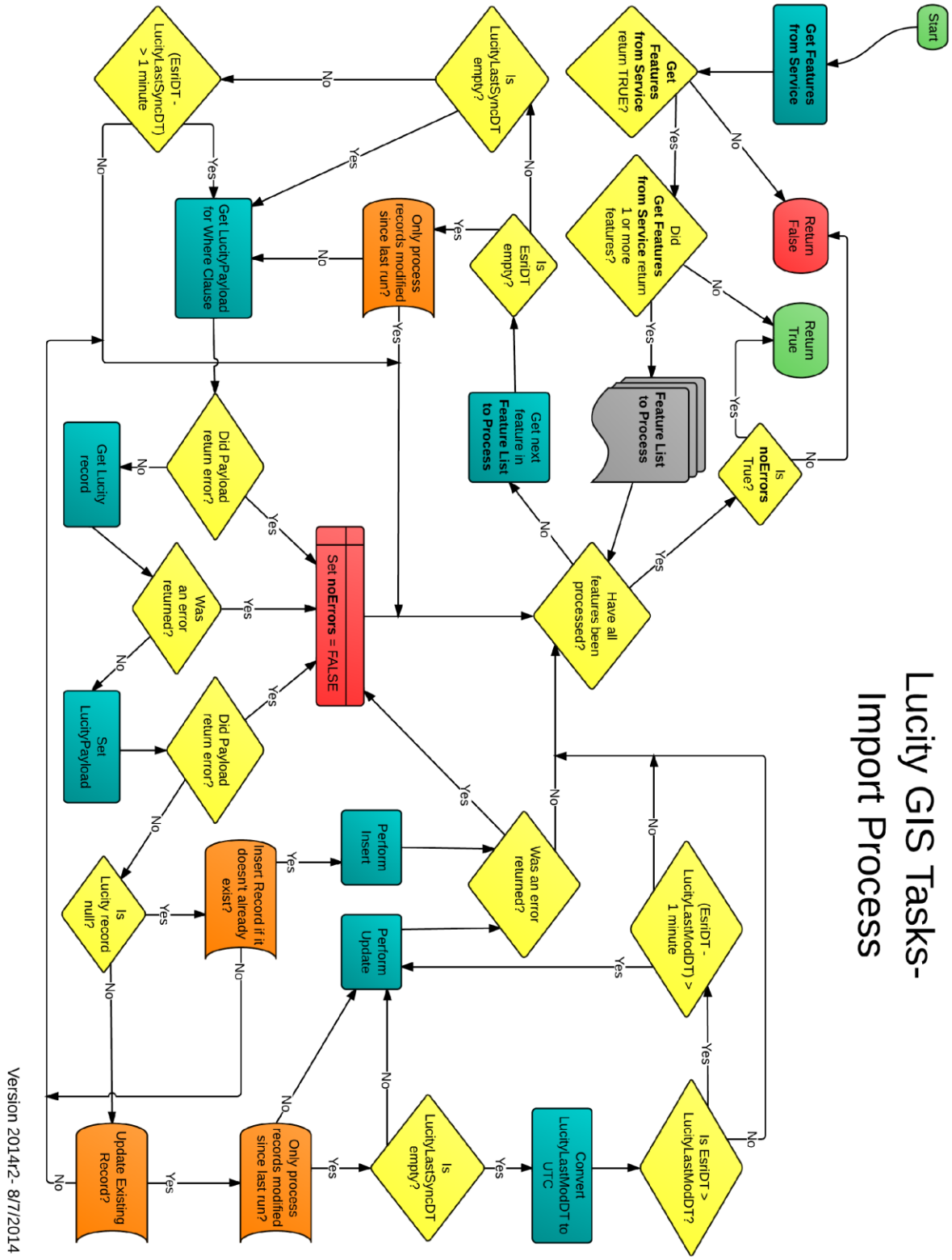
1. In the Lucity Geodatabase Configuration tool, right-click on the existing Scheduled Task and click Run Task Now.



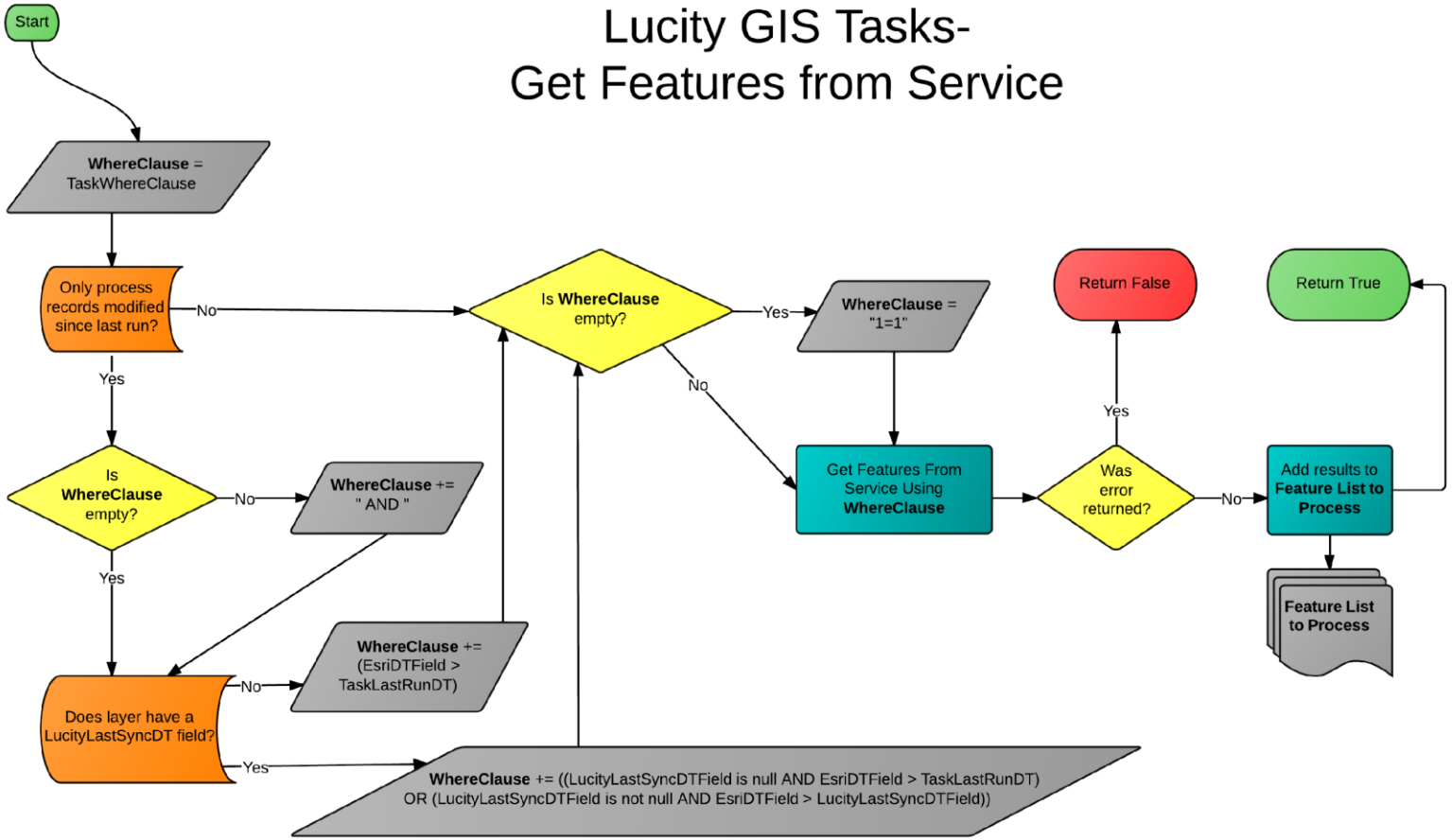
2. The following confirmation prompt will appear. Click Yes if you want to proceed with the process.



3. Once complete you will receive a prompt indicating if the task completed with our without errors. Any errors or other processing details will be reported in the process log results.


Lucity GIS Tasks-
Import Process
Start
Get Features from Service
Get Features from Service return TRUE?
Return False
Return True
Did Get Features from Service return 1 or more features?
Feature List to Process
Is noErrors True?
Get next feature in Feature List to Process
Is EsriDT empty?
Only process records modified since last run?
Is LucityLastSyncDT empty?
(EsriDT - LucityLastSyncDT) > 1 minute
Get LucityPayload for Where Clause
Have all features been processed?
Did Payload return error?
Get Lucity record
Was an error returned?
Set noErrors = FALSE
Set LucityPayload
Is Lucity record null?
Insert Record if it doesn't already exist?
Perform Insert
Perform Update
(EsriDT - LucityLastModDT) > 1 minute
Is EsriDT > LucityLastModDT?
Convert LucityLastModDT to UTC
Is LucityLastSyncDT empty?
Only process records modified since last run?
Update Existing Record?
Yes
No
Version 2014r2- 8/7/2014

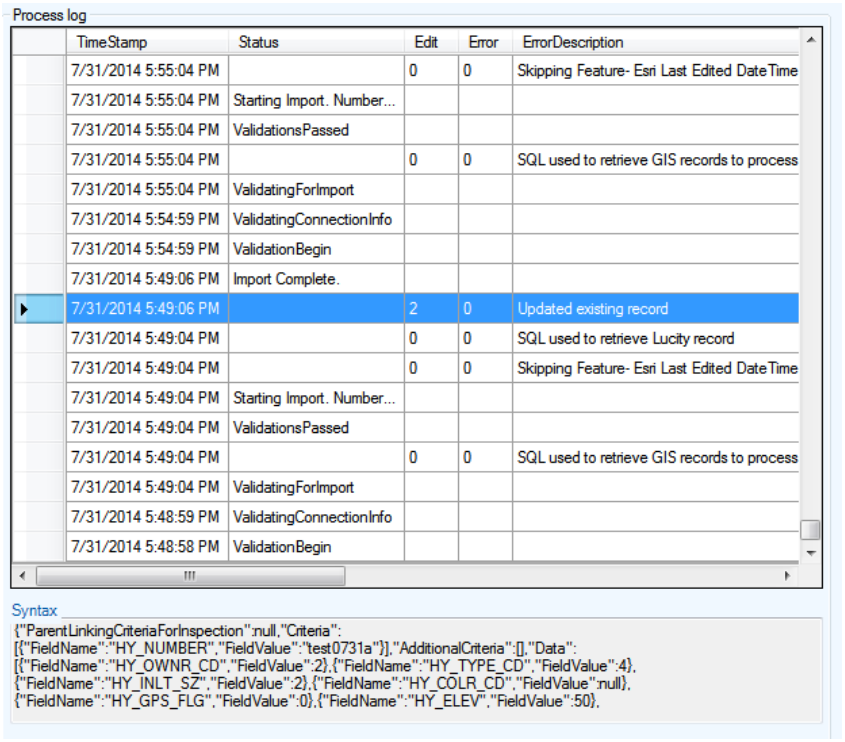
Lucity GIS Tasks-
Get Features from Service



Version 2014r2- 8/7/2014

Troubleshooting

GIS Tasks are stored in the GBAComm database in CMGISTASKS. As a GIS Task is being processed any errors and/or process updates are recorded in CMGISTASKSLOG. Entries in this table are currently set to be deleted after 30 days. The results of a GIS Task can be found in the Geodatabase Configuration tool under the GIS Task's process log. The following give a description of what each item represents:


Process log

TimeStamp	Status	Edit	Error	ErrorDescription
7/31/2014 5:55:04 PM		0	0	Skipping Feature- Esri Last Edited DateTime
7/31/2014 5:55:04 PM	Starting Import. Number...			
7/31/2014 5:55:04 PM	ValidationsPassed			
7/31/2014 5:55:04 PM		0	0	SQL used to retrieve GIS records to process
7/31/2014 5:55:04 PM	ValidatingForImport			
7/31/2014 5:54:59 PM	ValidatingConnectionInfo			
7/31/2014 5:54:59 PM	ValidationBegin			
7/31/2014 5:49:06 PM	Import Complete.			
7/31/2014 5:49:06 PM		2	0	Updated existing record
7/31/2014 5:49:04 PM		0	0	SQL used to retrieve Lucity record
7/31/2014 5:49:04 PM		0	0	Skipping Feature- Esri Last Edited DateTime
7/31/2014 5:49:04 PM	Starting Import. Number...			
7/31/2014 5:49:04 PM	ValidationsPassed			
7/31/2014 5:49:04 PM		0	0	SQL used to retrieve GIS records to process
7/31/2014 5:49:04 PM	ValidatingForImport			
7/31/2014 5:48:59 PM	ValidatingConnectionInfo			
7/31/2014 5:48:58 PM	ValidationBegin			

Syntax

{"ParentLinkingCriteriaForInspection":null,"Criteria":
[{"FieldName":"HY_NUMBER","FieldValue":"test0731a"}],"AdditionalCriteria":[],"Data":
[{"FieldName":"HY_OWNR_CD","FieldValue":2},{"FieldName":"HY_TYPE_CD","FieldValue":4},
{"FieldName":"HY_INLT_SZ","FieldValue":2},{"FieldName":"HY_COLR_CD","FieldValue":null},
{"FieldName":"HY_GPS_FLG","FieldValue":0},{"FieldName":"HY_ELEV","FieldValue":50},

- TimeStamp: This is the time the record was inserted into CMGISTASKSLOG (it will be listed in database time).
- Status: This is a description of what the current process status is. It typically indicates processing events such as starting validations, or results of import/export processes.
- Edit: The type of edit being performed. 0 = N/A, 1 = Insert, 2 = Update, 3 = Delete.
- Error: The type of error encountered or if it is 0 then details regarding the transaction. 0 = Transactional Details, 2= Validation Failed, 3 = Process Failed, 4 = Service Issue, 5 = Business Object Issue, 6 = Missing Data
- Error Description- Further details regarding the edit or error.
- Error Exception- The error exception if one was encountered during the process.
- GUID- The GUID associated to the processing batch
- ModID- The Lucity Module ID. This is the ID associated to the module that the GIS Task is performed against.
- LucityID. The Lucity Record ID. This would be prvoided for Updates and Deletes.
- GISID- This is the ObjectID for the GIS feature.
- Syntax- The syntax used for querying, updating, inserting, or deleting