Charting the Course

GIS Administration Tools Part 1

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Agenda

Part 1 (3:00-3:50pm)

- Lucity Administration Tool
  - GIS Connection Strings
  - GIS Map Services
- Lucity Desktop
  - Show in Map settings
- ArcMap
  - Lucity settings
  - Symbology Defaults
- ArcCatalog
  - Lucity Show In Map Config tool
  - Default Fields Setup
  - Update Geodatabase Value Tool
  - Update Show in Map flag
- Lucity Geodatabase Config tool

Part 2 (4:00-4:50pm)

An in-depth look (requirements, setup, how it works) for the new Lucity GIS tools that interact with map and feature services:

- Lucity Updates
  - using Lucity SOE
  - using Feature Services
- Lucity Spatial
- Lucity GIS Scheduled Tasks

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Lucity Administration Tool

What you can do…

- Create geodatabase connections
- Specify map and feature service connections
- Configure GIS system settings
- Create map templates
- Clear Lucity cache

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Lucity Geodatabase Configuration Program

What it can do…

- Link GIS feature class and fields to Lucity
- Correlate GIS domains and Lucity picklist values
- Modify feature class schema based upon Lucity properties
- Configure feature class aliases
- Associate feature classes to map/feature services
- Add/modify/delete spatial relationships, number generators and scheduled tasks
- Specify geodatabase versions to interact with Lucity
- Run validations against geodatabases and map/feature services
- Plus more…

Lucity Geodatabase Configuration Changes for 2014

Name	Description
Add Feature Class	➢ Now provides option to map to the following Lucity inspection modules: Storm MACP Insp., Storm Sampling, Sewer MACP Insp., Sewer Overflows, Sewer Structure Insp., Water Hydrant Flow Tests, Water Hydrant Insp., Water Losses, Water System Valve Insp.
Scheduled Tasks	➢ New tool to push inspection data from Lucity into feature class.
Edit Map Service	➢ Now provides ability to specify a feature service at the feature class level. This setting is used for the Spatial Updater service and Scheduled Tasks
Field Configuration	➢ Now supports mapping GIS composite DateTime fields to Lucity.

Lucity Geodatabase Configuration Changes for 2014r2

Name	Description
Edit Map Service	➢ Services configured at the feature class level must now be defined in UI Admin Map Services module.
Update Feature Class Services	➢ New tool to associate map and feature services to multiple feature classes
Connection Properties	➢ The edit map service that is associated to the geodatabase can now be edited from the connection properties tab. ➢ A new Test Connection button is available with the edit map service, which will validate the map service connection.
Validations	➢ The validation results will now include testing of the map and feature service associated to the feature class.
Scheduled Tasks	➢ Added new task type “Sync- GIS to Lucity” in addition to the “Sync- Lucity to GIS” ➢ Enabled the ability to schedule the GIS Task and provides processing log details
Copy GIS Task	➢ New tool that can be used to copy a GIS Task template to other feature classes
Update Street Name Domains	➢ Adds ability to create a text domain for composite street name fields. ➢ In addition, each of the street component domains will now get applied to all feature class fields that are assigned to the corresponding street component field.
Update Work Category Domain	➢ New tool to create a domain for work category component fields. ➢ In addition, the domain will get applied to all feature class fields that are assigned to a work category component field.

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Lucity GIS Admin Tools In ArcCatalog

Lucity Show in Map Configuration Tool

- Set show in map settings for multiple users

Default Fields Setup

- Customize the editable grids that are displayed with the Lucity module tool in ArcMap when creating requests, work orders, PM/Work templates, and inspections.

Update Geodatabase Value

- Quickly update the values in a feature class with the values from the related Lucity table.
- Useful if adding a new field to a feature class that currently has values in Lucity.

Update Show in Map Flag

- Updates the show in map flag in the Lucity database.
- Sets flag for all records in Lucity module to FALSE, then sets to TRUE only if the record exists in the feature class.

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Lucity GIS Admin Tools In ArcMap

Lucity Alias Import

- Updates alias names associated with a feature class based upon .mxd settings.
- Performs some feature validations
- Recommended prior to publishing map/feature services that will be used with Lucity

Lucity Settings

- Bypass Login and password
- Set a default client
- Default search tolerance
- Disable “Lucity will now be updated” prompt
- Disable Lucity Editor extension
- Show in Map options for request/wo/pm
- Symbology defaults
  - Save symbology templates to be used with the Lucity View Tools, View Work Frequency, View Work Locations, and TV Observation tools.

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Other GIS Sessions

- **Lucity GIS Admin Tools Part 2** Mon 4-4:50pm (next)
  - Provides in-depth look at Lucity Spatial, GIS Scheduled Tasks and Lucity to GIS Updates via feature services

- **What is new in Lucity GIS 2014/2014r2** Tues 10-10:50am
  - Provides an overview all new tools and modifications with Lucity GIS since ACT 2013

- **ArcGIS Server Admin Part 1** Tue 2-2:50pm
  - Provides a look at ArcGIS For Server design, setup, configurations.

- **ArcGIS Server Admin Part 2** Tue 3-3:50pm
  - Provides an overview of various Esri tools to setup, configure, and maintain enterprise geodatabases

- **Lucity Webmap Overview** Wed 3-3:50pm
  - Provides an overview of all the tools available with the Lucity Web Map product

Charting the Course

GIS Administration Tools Part 2

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Agenda

Part 1 (3:00-3:50pm)

- Lucity Administration Tool
  - GIS Connection Strings
  - GIS Map Services
- Lucity Desktop
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Part 2 (4:00-4:50pm)

An in-depth look (requirements, setup, how it works) for the new Lucity GIS tools that interact with map and feature services:

- **Lucity Updates**
  - **using Lucity SOE**
  - **using Feature Services**
- **Lucity Spatial**
- **Lucity GIS Scheduled Tasks**

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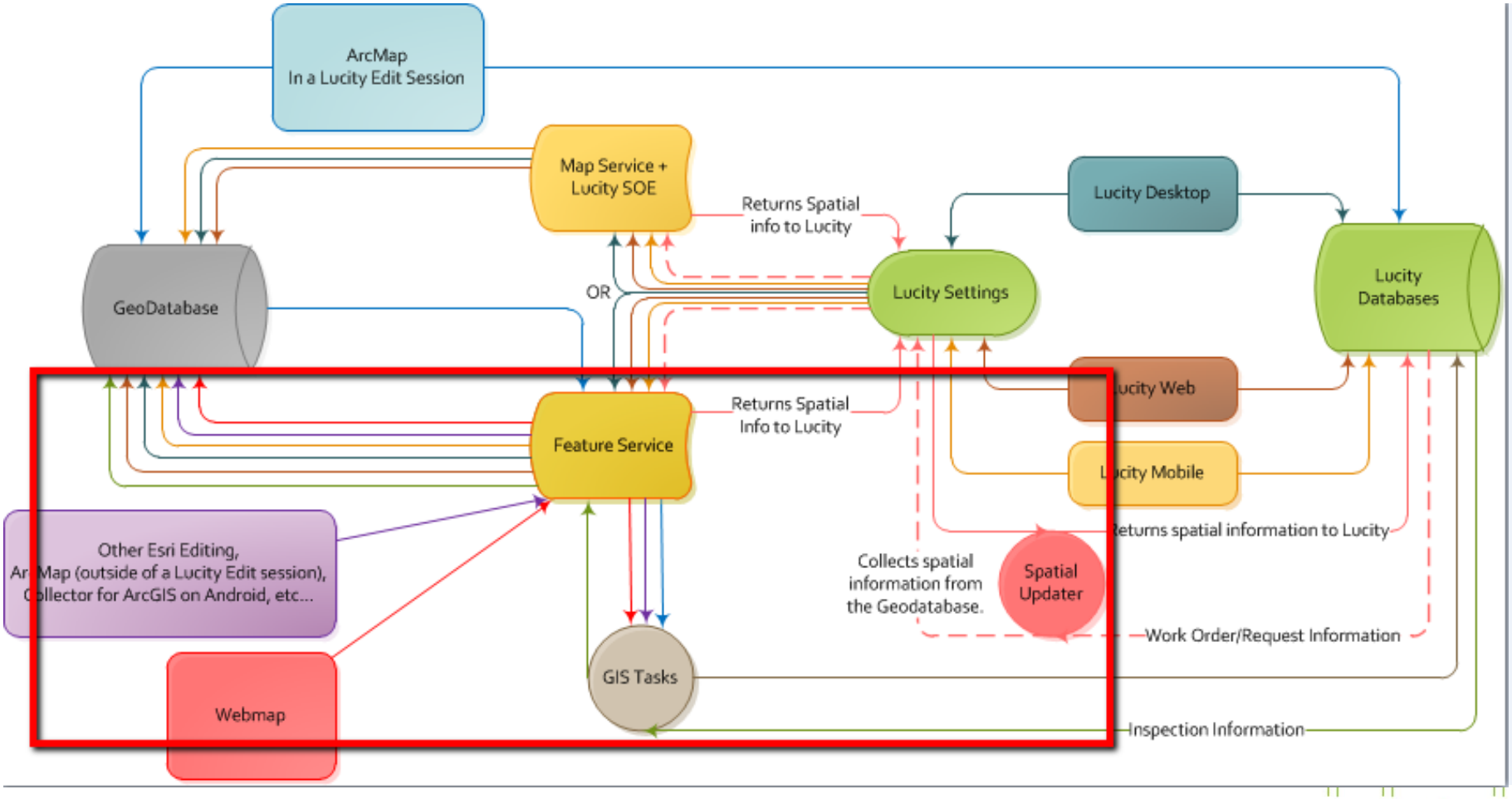
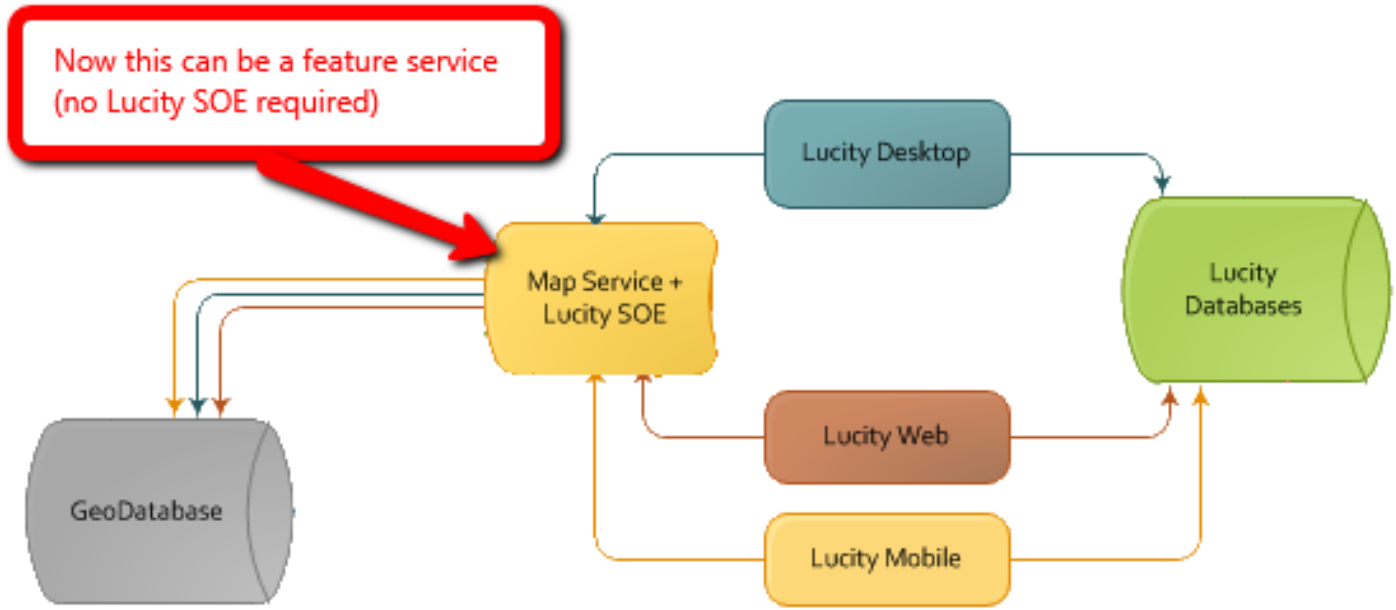
Lucity GIS Integration



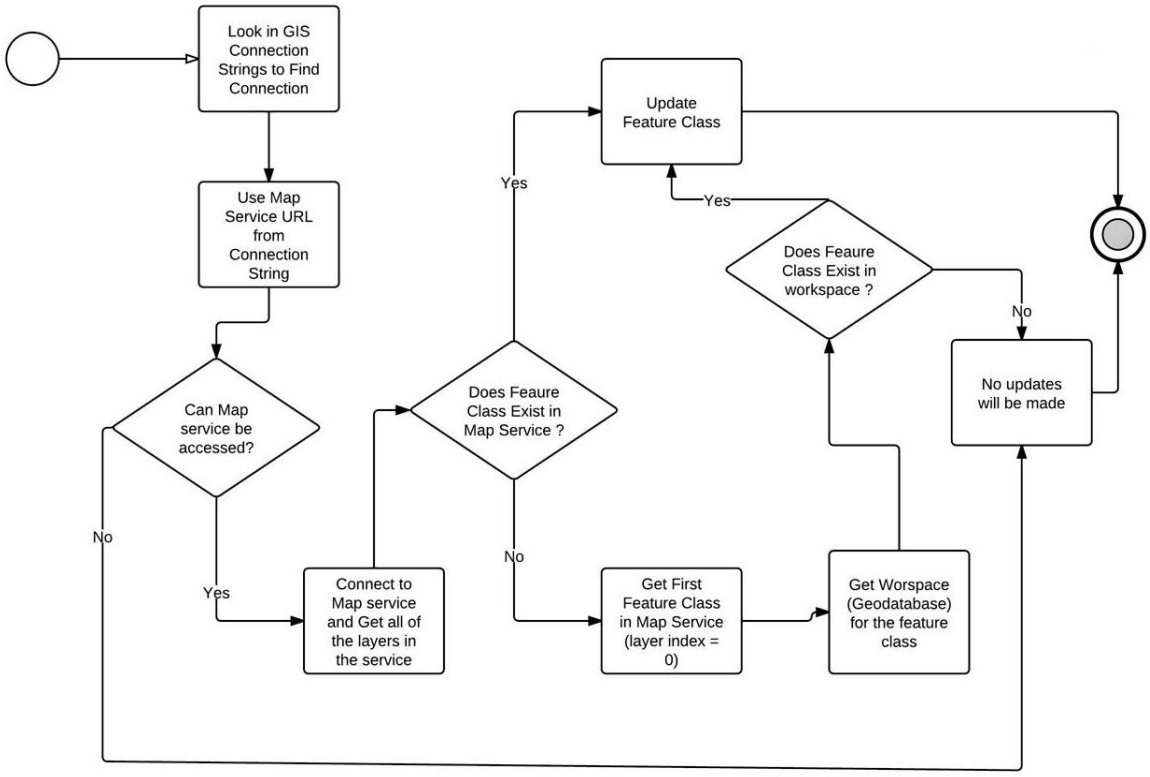
Lucity to GIS Updates

- Lucity has always provided the ability that when an attribute edit is made to a record in the Lucity interface the corresponding feature in the geodatabase is also updated.
  - This applies to edits made in Lucity Desktop, Web, Mobile
- With with 7.6, the Lucity SOE was the only option available for pushing the updates to the geodatabase.
- With 2014r2, a new option is provided for pushing attribute edits to the geodatabase via a Feature Service using the ArcGIS REST API.

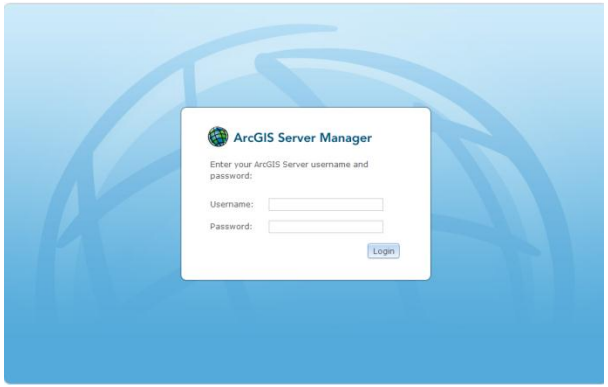


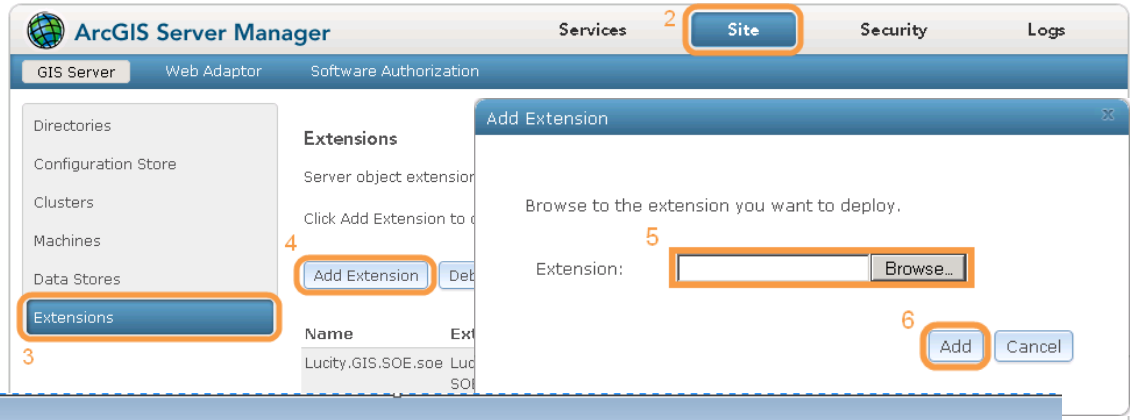
Lucity to GIS Updates using a Lucity SOE

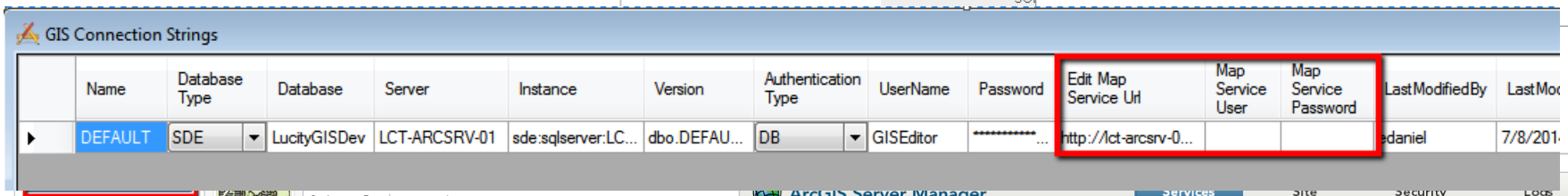
- If the map service does not contain all Lucity linked feature classes then the feature class at layer index = 0 in the service must be connected using a user account that has edit permissions to all Lucity linked feature classes.
- The feature classes in the map service must be connected using a user account that has edit permissions.
- The feature classes in the map service must be pointed to the version that Lucity should update.

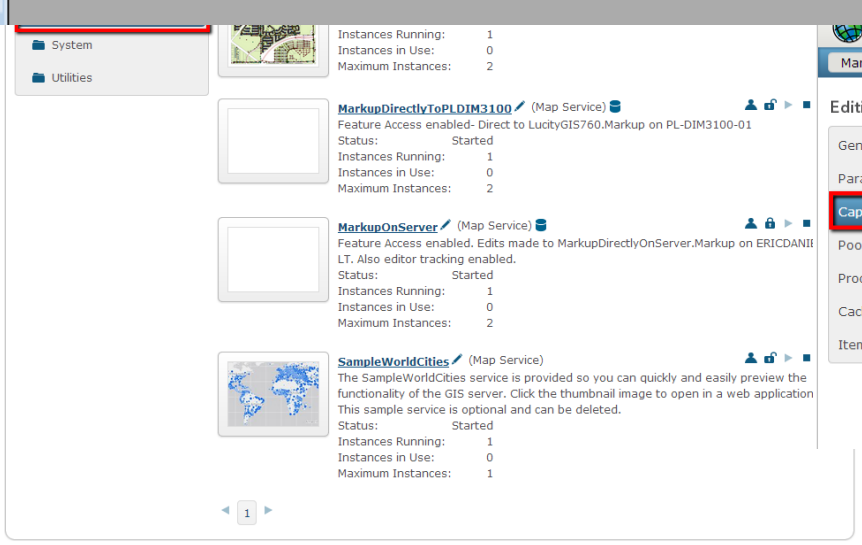


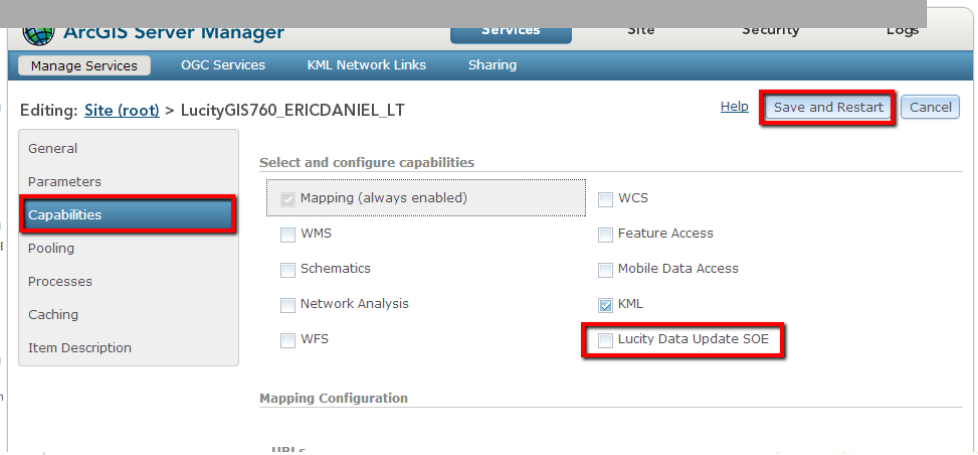
Lucity SOE- Installation











Lucity to GIS Updates using a Feature Service

Requirements:

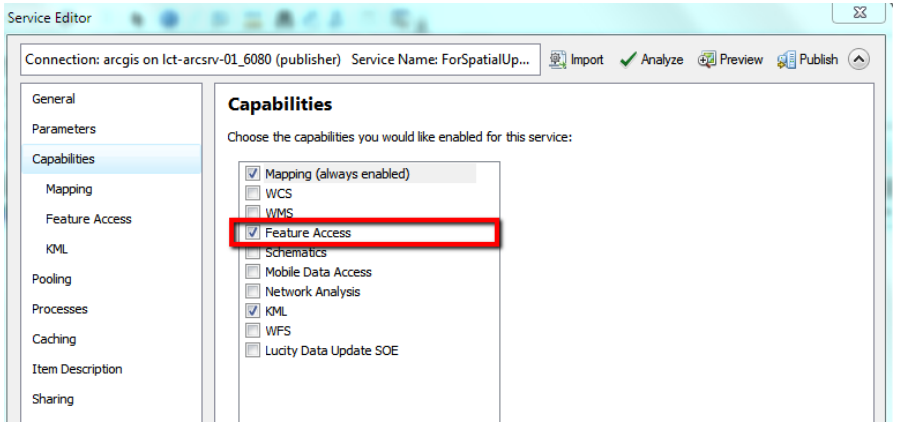
- Each Lucity linked feature class must be assigned to a default map service
  - If a service is defined at the feature class level then that one will be used; otherwise, it will use the service defined at the geodatabase level

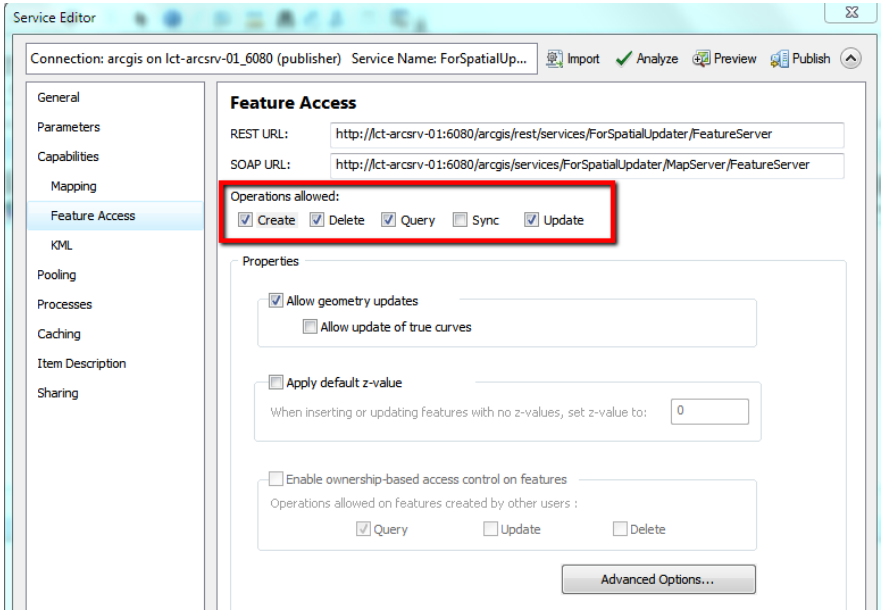
- The default map service for the feature class must:
  - Contain the feature class
  - The feature class alias as listed in the service must be configured with Lucity
  - Enabled Feature Access capabilities with at least the Query and Update operations allowed.

- The “Use Feature Service instead of Lucity SOE” system setting in UI Admin must be set to true.

Lucity to GIS Updates using a Feature Service

Enabling Feature Access:



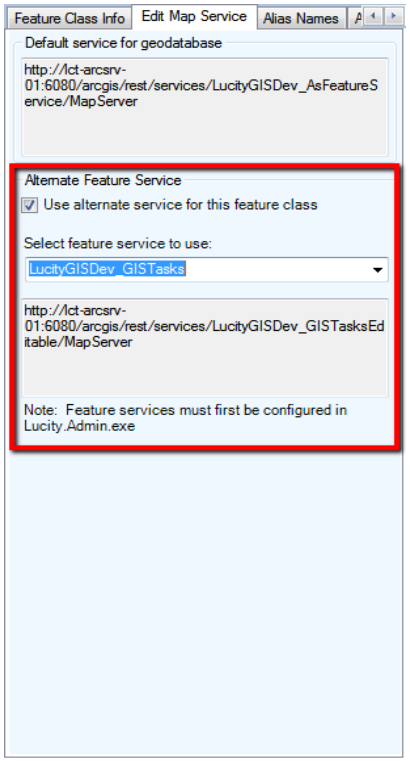


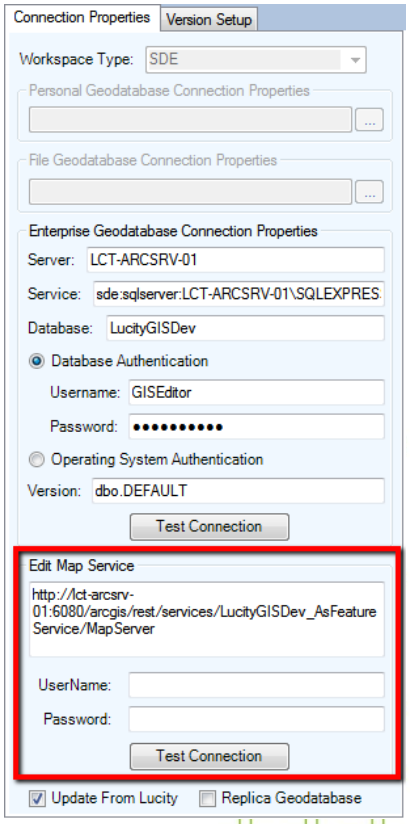
Lucity to GIS Updates using a Feature Service

Assign a default service:

- 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.

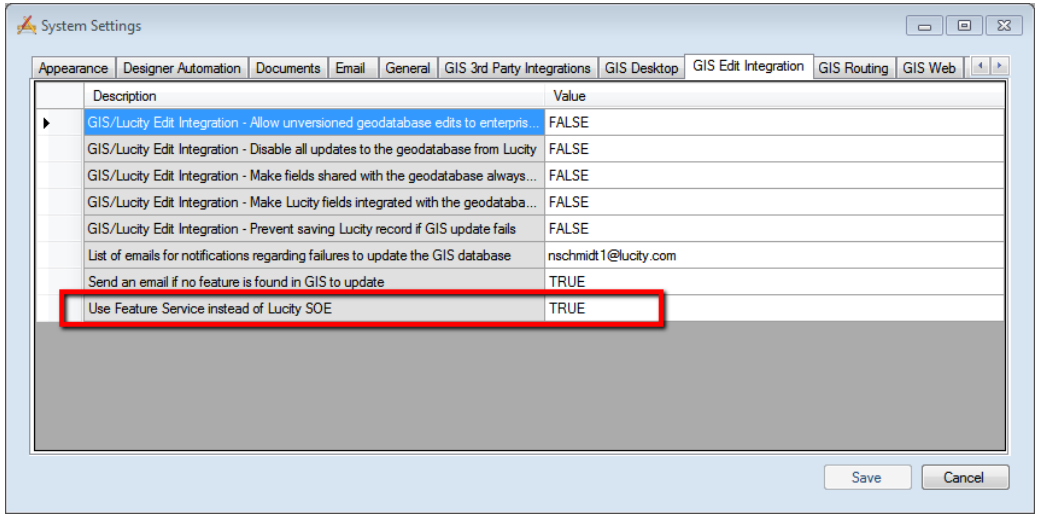
- A service defined at the feature class level will be listed under the Edit Map Service tab when you have the feature class node selected.





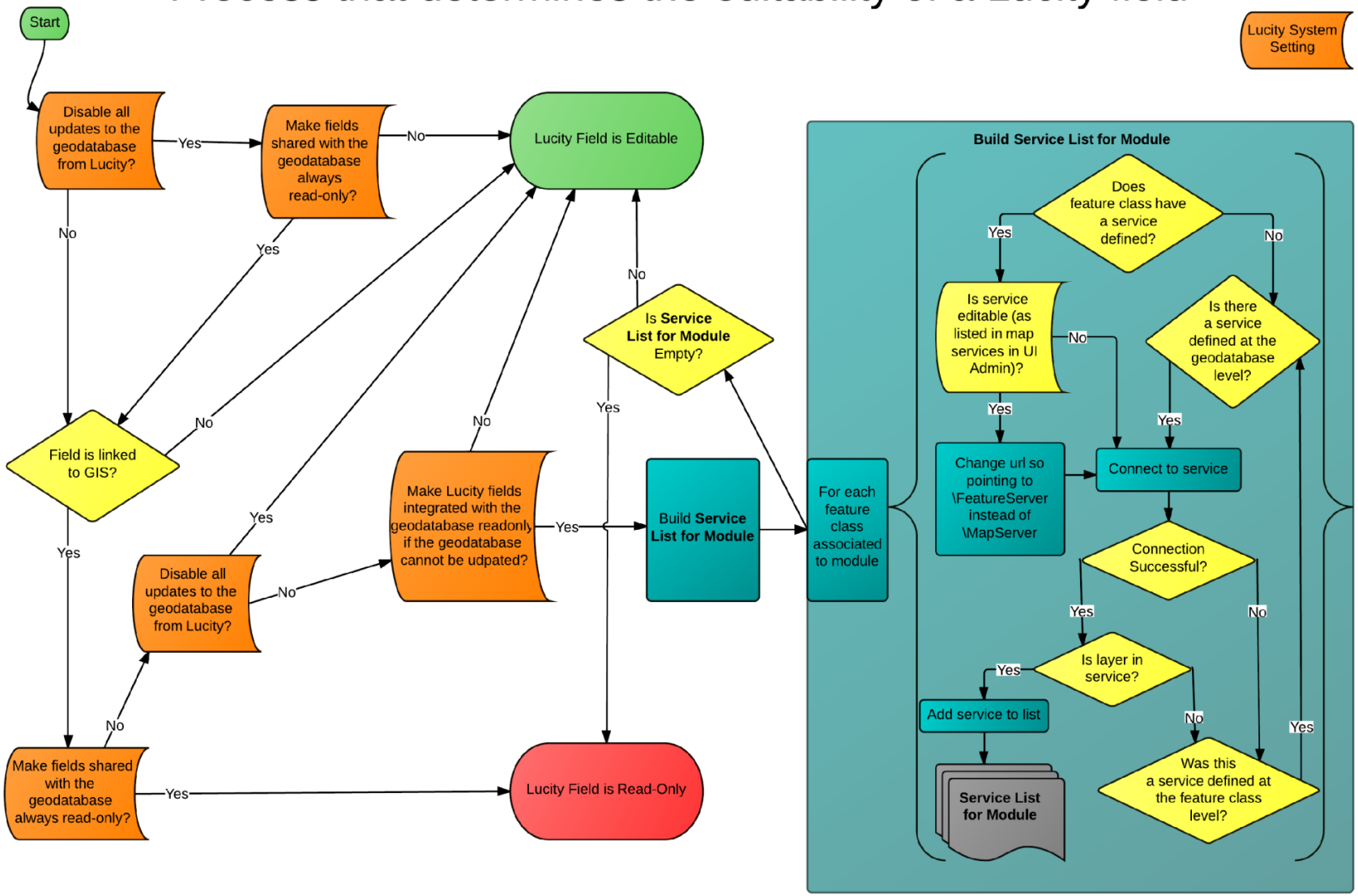
Lucity to GIS Updates using a Feature Service

Assign system settings:



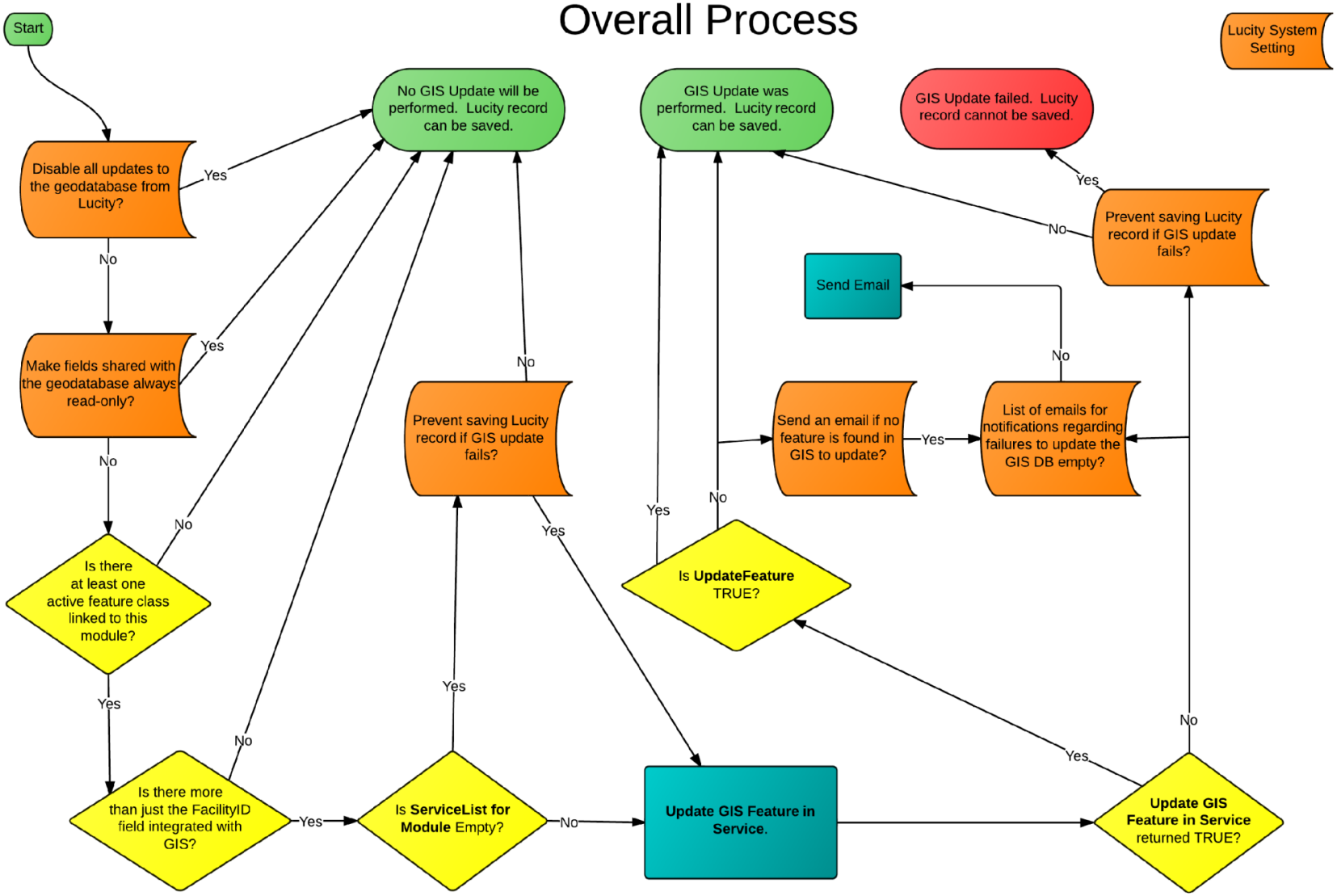
- **Allow unversioned geodatabase edits to enterprise geodatabase**: This allows edits to be made to unversioned geodatabases.
- **Disable all updates to the geodatabase from Lucity**: This prevents the geodatabase from being updated with edits made in Lucity desktop and web.
- **Make fields shared with 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 to update the GIS database** setting.

Lucity GIS Updates-
Process that determines the editability of a Lucity field



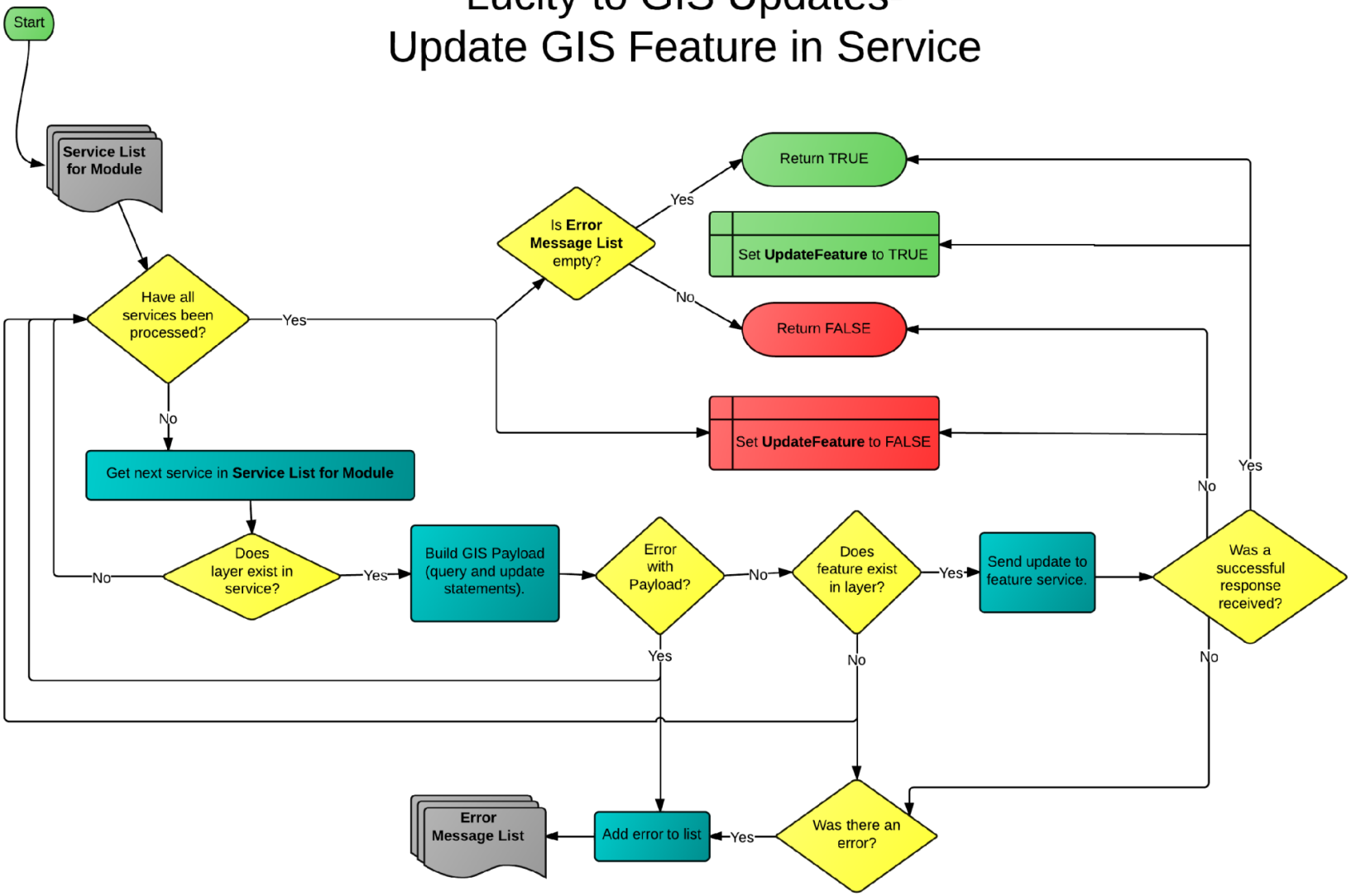
Version 2014r2- 8/7/2014

Lucity to GIS Updates- Overall Process



Version 2014r2- 8/7/2014

Lucity to GIS Updates-
Update GIS Feature in Service



Version 2014r2- 8/7/2014

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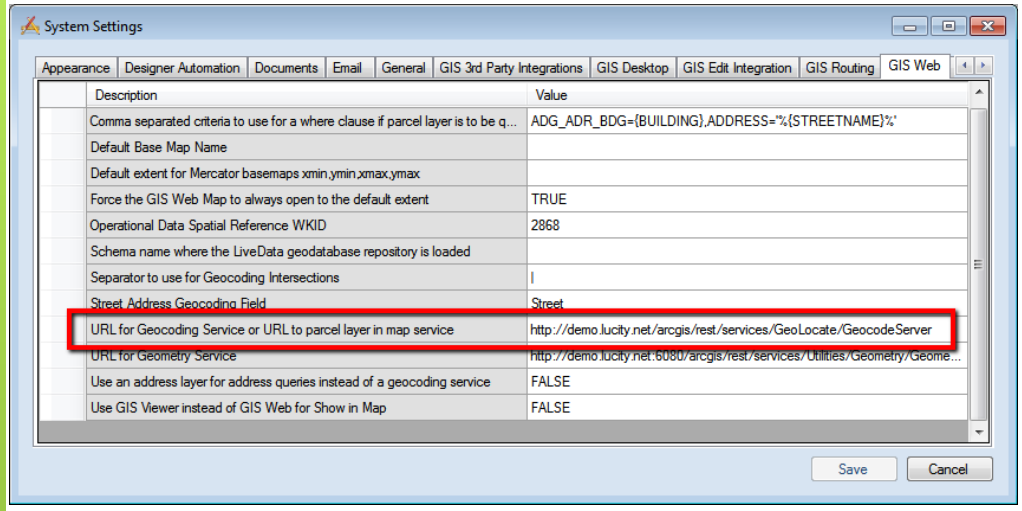
Lucity Spatial

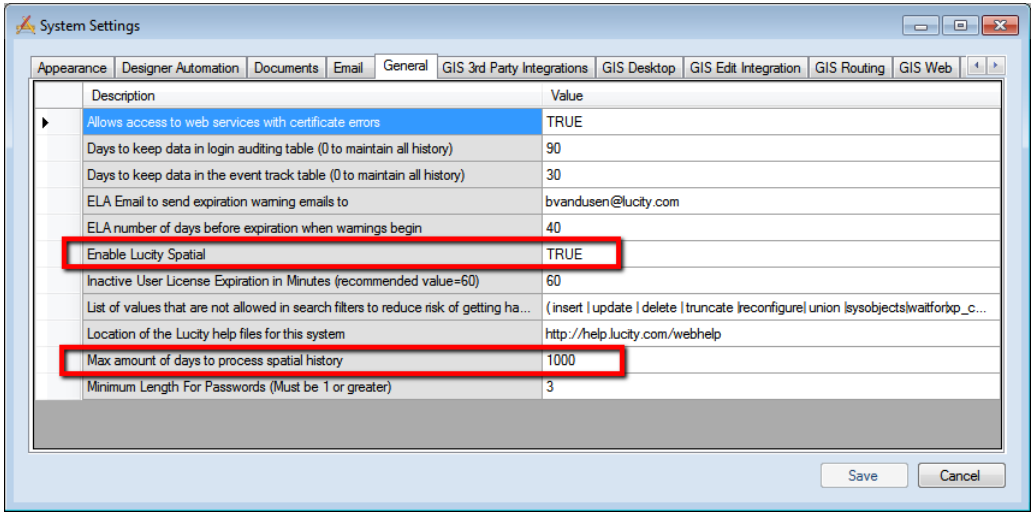
- **Lucity can now be configured to store work request and work order spatial information directly in the Lucity database.**
  - As work orders are created, updated, deleted a new service processes the changes and writes the spatial information directly in the Lucity database.
    - Spatial information includes: addresses, x/y, and asset locations
  - The Lucity Work Viewer tool in ArcMap allows users to create custom views to these spatial tables allowing for display of live work data in the various Lucity GIS solutions

Requirements:

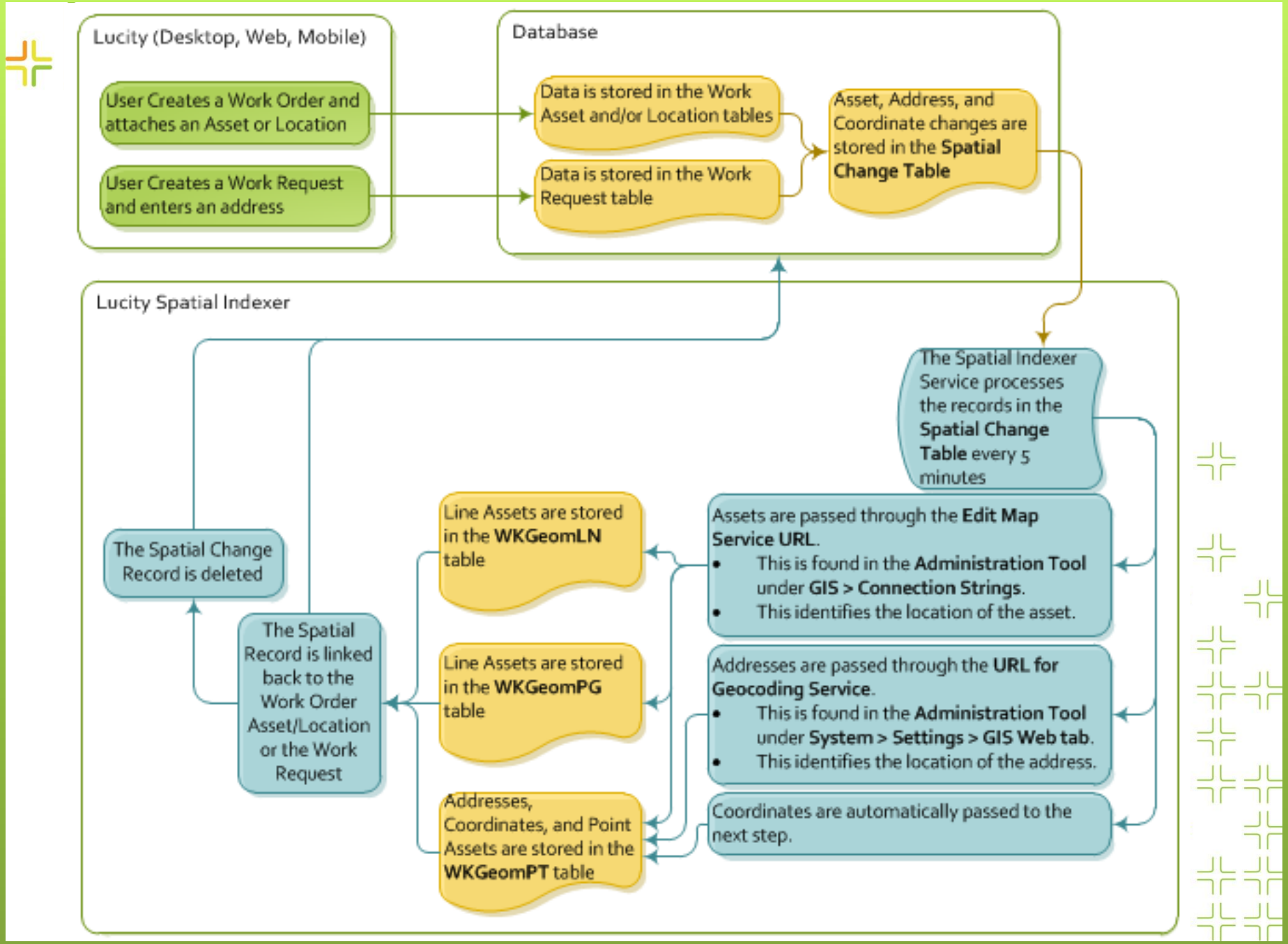
- The Lucity Work database must be one of the following:
  - SQL Server 2008 or higher
  - Oracle with MDSYS.SDO_GEOMETRY data type enabled
- The Lucity Services must be installed
- Each Lucity linked feature class must be assigned to a default map service
- Lucity linked feature classes must be one of the following geometry types:
  - Point
  - Line, polyline
  - Polygon
- System Settings in UI Admin must be configured

Lucity Spatial- System Settings



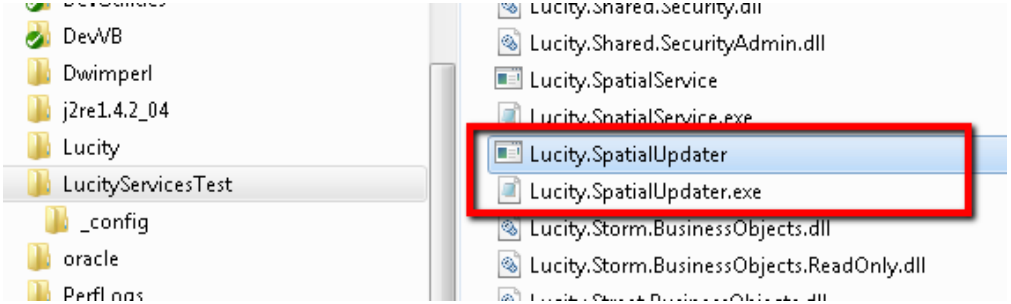


- Requires a url to the geocoding service that can be used to determine the coordinates of work location addresses
- Enable Lucity Spatial must be set to TRUE
- Max amount of days to process spatial history must have a value greater than 0.
  - **Example:** If 180 is entered, the Lucity Spatial Updater will process all work items modified today and within the last 180 days.
- The Lucity Spatial Updater service is reliant on back end configuration that was added to the Lucity database in version 7.4. Therefore, depending on your upgrade history there could be a few years worth of work data that has the potential to be processed.

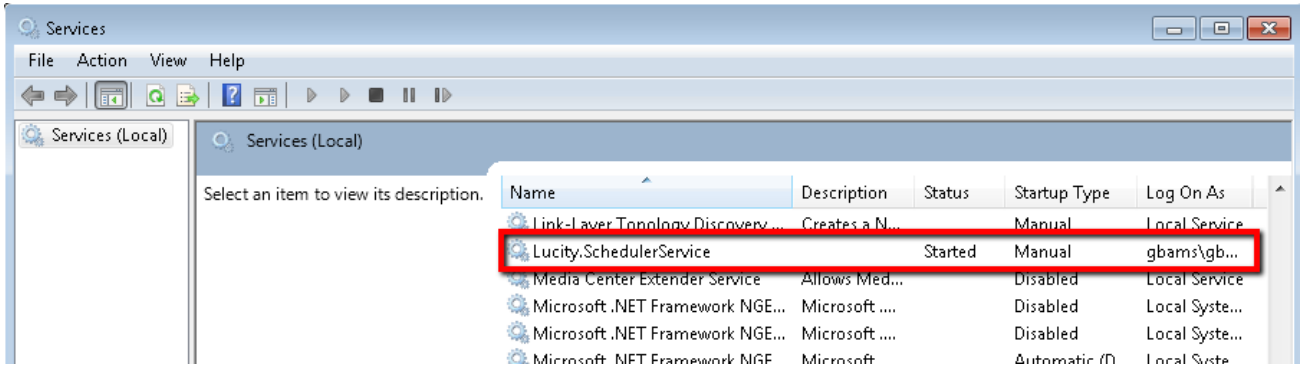

Lucity (Desktop, Web, Mobile)
User Creates a Work Order and attaches an Asset or Location
User Creates a Work Request and enters an address
Database
Data is stored in the Work Asset and/or Location tables
Data is stored in the Work Request table
Asset, Address, and Coordinate changes are stored in the Spatial Change Table
Lucity Spatial Indexer
The Spatial Indexer Service processes the records in the Spatial Change Table every 5 minutes
Assets are passed through the Edit Map Service URL.
This is found in the Administration Tool under GIS > Connection Strings.
This identifies the location of the asset.
Addresses are passed through the URL for Geocoding Service.
This is found in the Administration Tool under System > Settings > GIS Web tab.
This identifies the location of the address.
Coordinates are automatically passed to the next step.
Line Assets are stored in the WKGeomLN table
Line Assets are stored in the WKGeomPG table
Addresses, Coordinates, and Point Assets are stored in the WKGeomPT table
The Spatial Record is linked back to the Work Order Asset/Location or the Work Request
The Spatial Change Record is deleted

Lucity Spatial- How it works

- A Lucity.SpatialUpdater.exe is included with the Lucity Services install.
  - This .exe is responsible for processing any records from WKSPATIALCHANGE that are due for processing



- Lucity.SpatialUpdater.exe runs every 5 mins as part of the new Lucity Scheduler Service that is included with the Lucity Services install.



Lucity Spatial

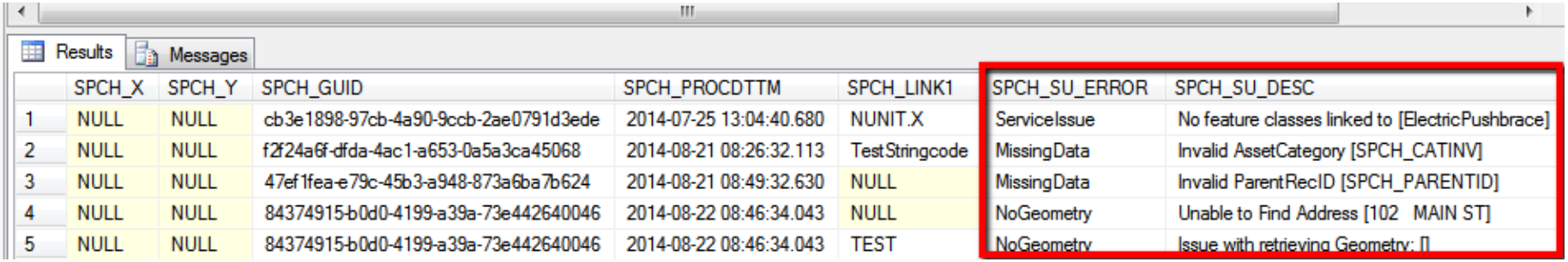
The following GBAWork tables and views are used with Lucity Spatial:

- **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)

Lucity Spatial- Troubleshooting

Records that fail to process will be marked with an error code and remain in the WKSPATIALCHANGE table for 30 days at which point they are deleted.



Results | Messages

	SPCH_X	SPCH_Y	SPCH_GUID	SPCH_PROCDTTM	SPCH_LINK1	SPCH_SU_ERROR	SPCH_SU_DESC
1	NULL	NULL	cb3e1898-97cb-4a90-9ccb-2ae0791d3ede	2014-07-25 13:04:40.680	NUNIT.X	ServiceIssue	No feature classes linked to [ElectricPushbrace]
2	NULL	NULL	f2f24a6f-dfda-4ac1-a653-0a5a3ca45068	2014-08-21 08:26:32.113	TestStringcode	MissingData	Invalid AssetCategory [SPCH_CATINV]
3	NULL	NULL	47ef1fea-e79c-45b3-a948-873a6ba7b624	2014-08-21 08:49:32.630	NULL	MissingData	Invalid ParentRecID [SPCH_PARENTID]
4	NULL	NULL	84374915-b0d0-4199-a39a-73e442640046	2014-08-22 08:46:34.043	NULL	NoGeometry	Unable to Find Address [102 MAIN ST]
5	NULL	NULL	84374915-b0d0-4199-a39a-73e442640046	2014-08-22 08:46:34.043	TEST	NoGeometry	Issue with retrieving Geometry: []

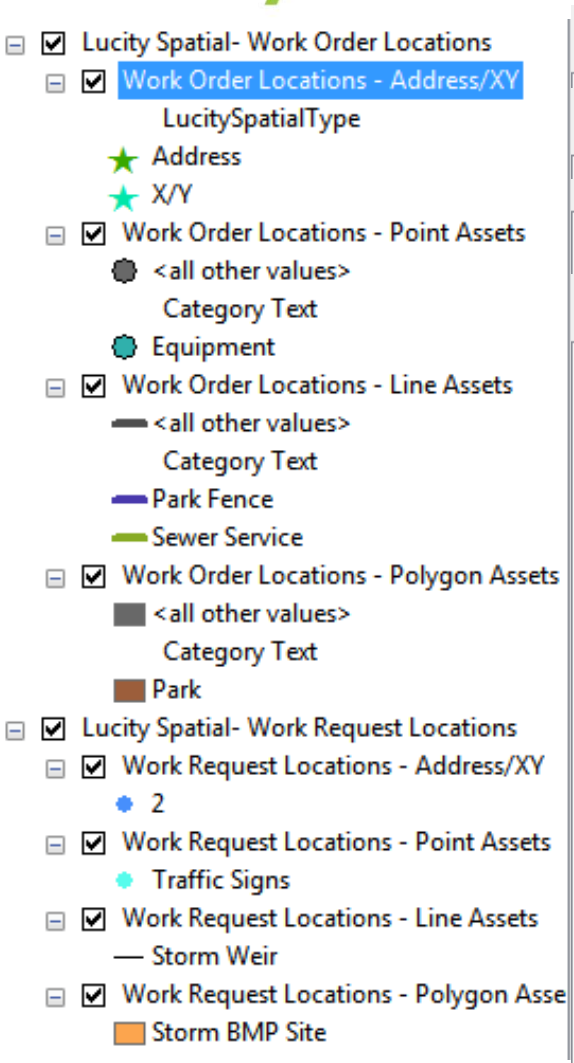
Error codes:

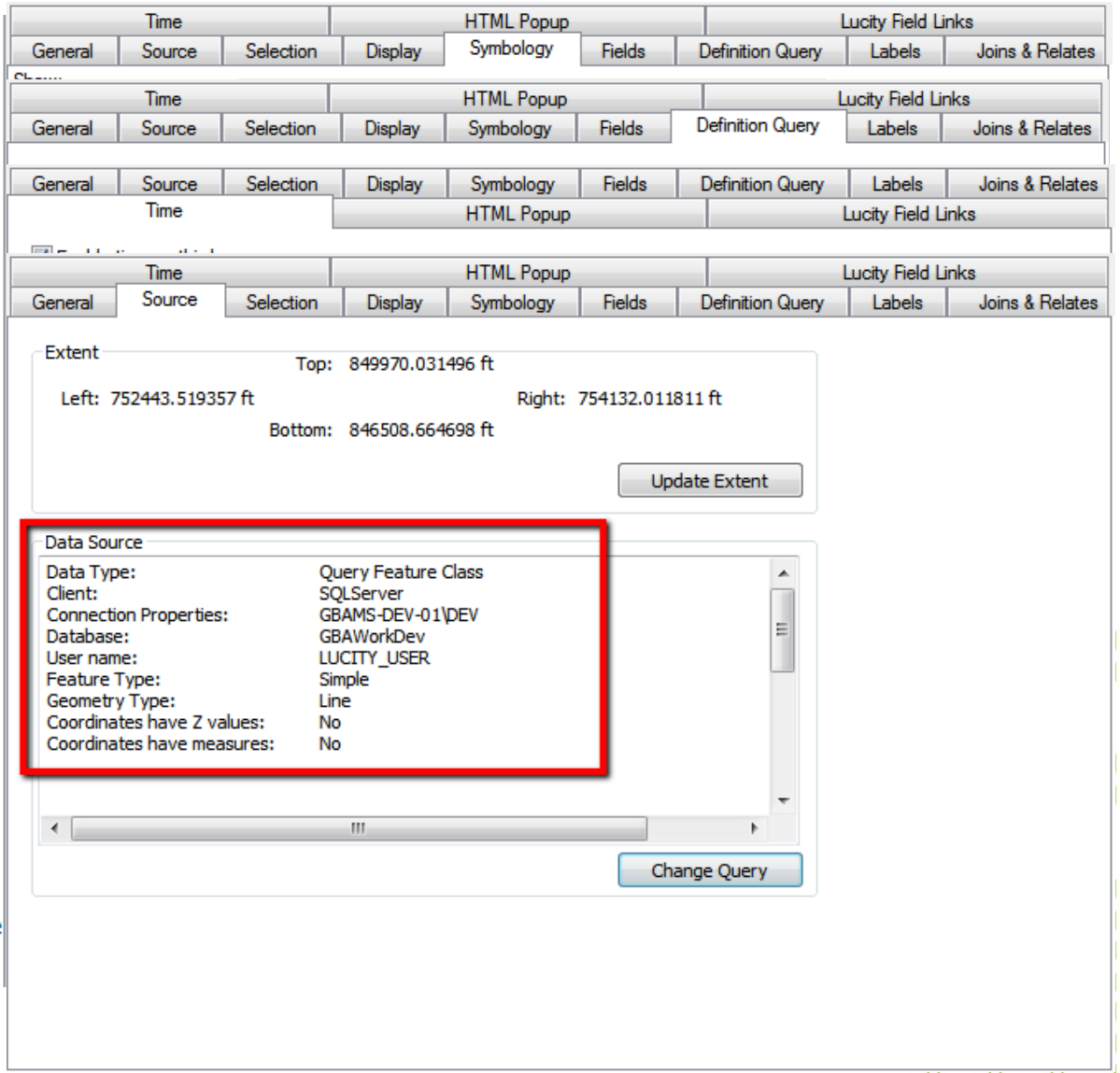
- **MissingData**- Usually means that there was an issue with the data in WKSPATIALCHANGE like the moduleID is invalid, ParentRecID is invalid, invalid x/y data, etc.
- **ServiceIssue**- This occurs if there isn't a map service associated with the feature class or the feature class related to the asset type is not in the service
- **NoGeometry**- Returned if a geometry was found but was emptry, 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:

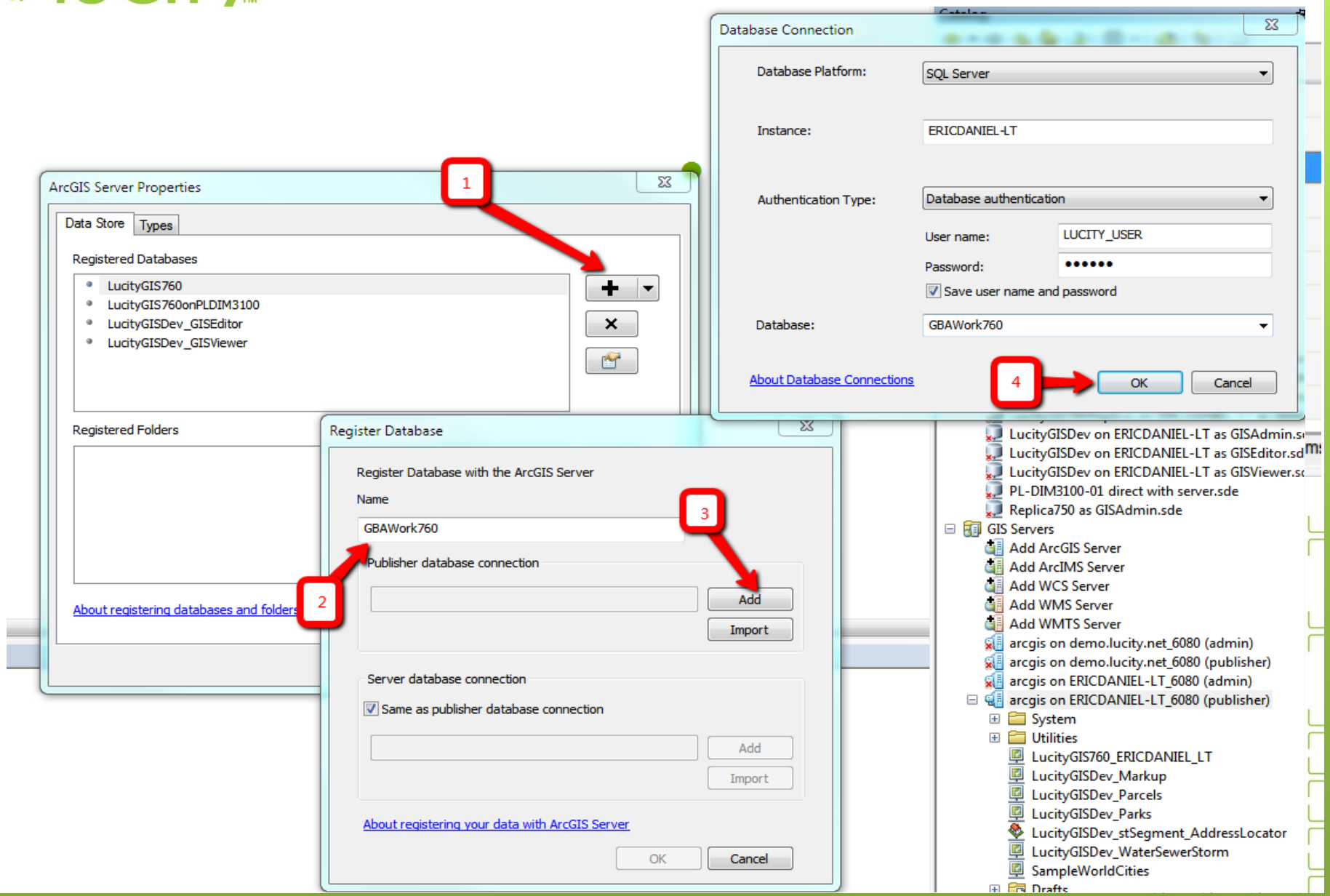
1. In the WKSPATIALCHANGE table find the record that failed
2. Review the error code for the record and resolve the problem
3. Delete the contents of the SPCH_GUID and SPCH_SU_ERROR fields for the record
4. The next time the Lucity Spatial Updater service runs it will attempt to process the record again.

Create Live Work Layer Tool





Publishing Live Work Layers



Charting the Course

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Lucity GIS
Scheduled Tasks

- Scheduled Tasks are designed to push data back and forth between Lucity and the geodatabase. There are two types of synchronizations:
  1. **Lucity to GIS**- Only supported for inspection feature classes
  2. **GIS to Lucity**- Supported for all GIS enabled modules

- Scheduled tasks can be configured to run automatically using a new service, Lucity GIS Task Runner.

- This functionality greatly expands the Lucity and GIS integration capabilities with use of feature services. Edits to the feature service, regardless of who did it and what environment they did it in, can be picked up by Lucity.

Some potential examples:

- Collector for ArcGIS (iOS & Android)- including disconnected editing
- Lucity Web Map
- ArcGIS.com map viewer
- Any other 3rd party app that supports feature service editing
  - http://resources.arcgis.com/en/help/main/10.2/index.html#/Using_feature_services_in_a_client_application/0154000005sq000000/

Lucity GIS
Scheduled Tasks

Requirements:

- 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
  - Lucity To GIS synchronization tasks also requires Enabled Feature Access capabilities (with Create, Delete, Query, and Update)
- The “Use Feature Service instead of Lucity SOE” system setting in UI Admin 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

Lucity GIS
Scheduled Tasks

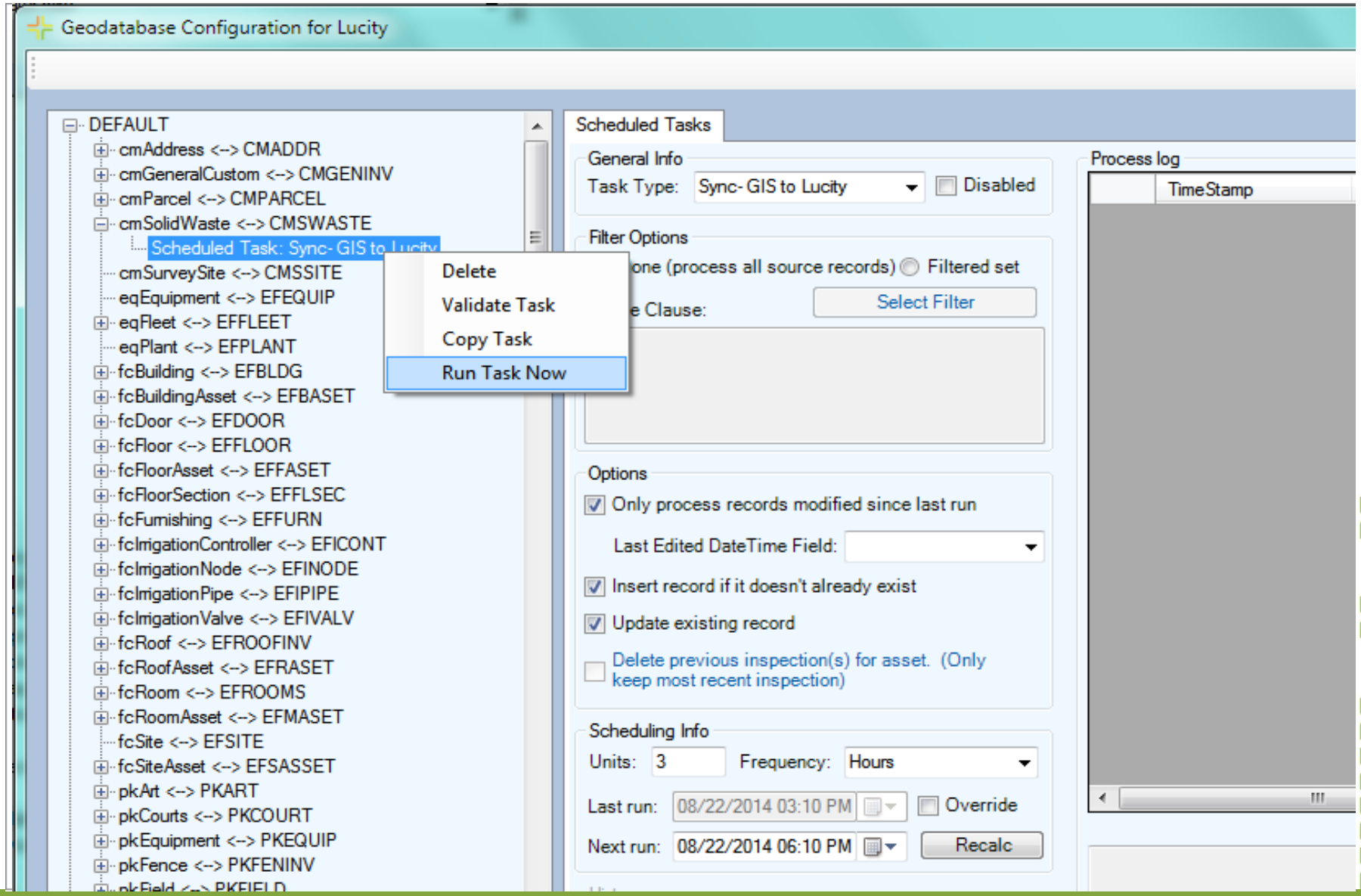
Limitations:

- **Merges, Splits, Renumbers, and Deletes must still be done in an ArcMap editing environment with the Lucity extension enabled in order for the Lucity inspection, construction, and work history to be properly updated.**

- Number generators, spatial relationships, and any other Lucity GIS extension functionality (as found with the ArcMap editing environment) is **not** performed when Scheduled Tasks synchronize features with Lucity.

- Features must meet the Lucity module requirements in order for them to be synchronized. For example, required fields such as the Lucity common ID must be populated with a unique value.

Lucity GIS
Scheduled Tasks

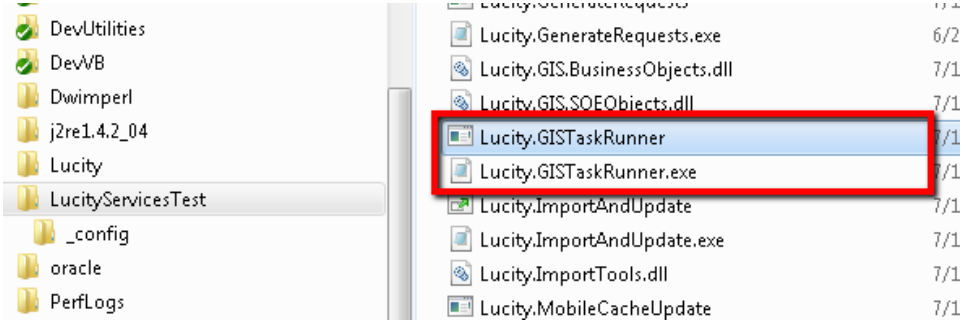


Lucity GIS Scheduled Tasks- Validations

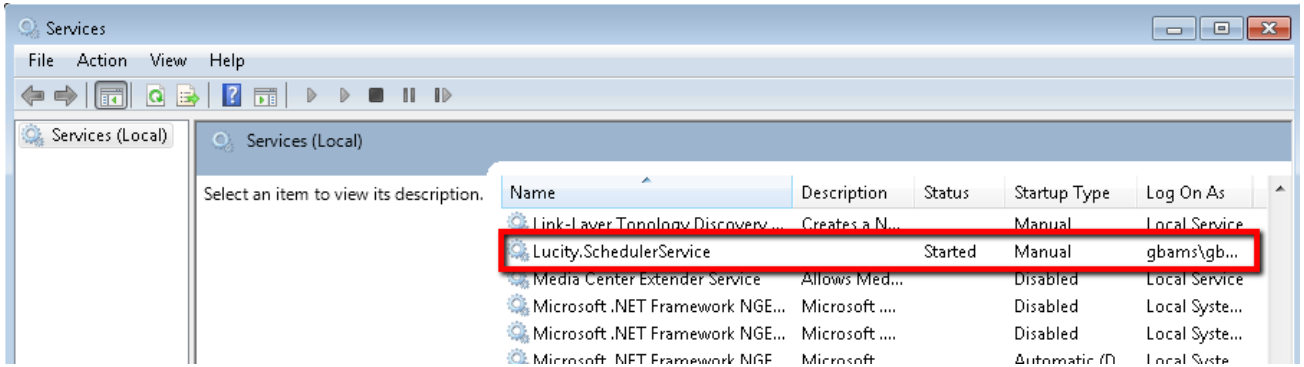
- Verifies at least one option has been set: insert, update, delete.
- Verifies there are feature classes linked to parent module (for inspections only)
- Validates Lucity to GIS field mappings
- Validates list of fields used to determine record uniqueness
- Tests connection to map service for feature 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

Lucity GIS Scheduled Tasks- How it works

- A Lucity.GISTaskRunner.exe is included with the Lucity Services install.
  - This .exe is responsible for checking if any GIS Scheduled Tasks are due for processing and if so kicks off the import/export process



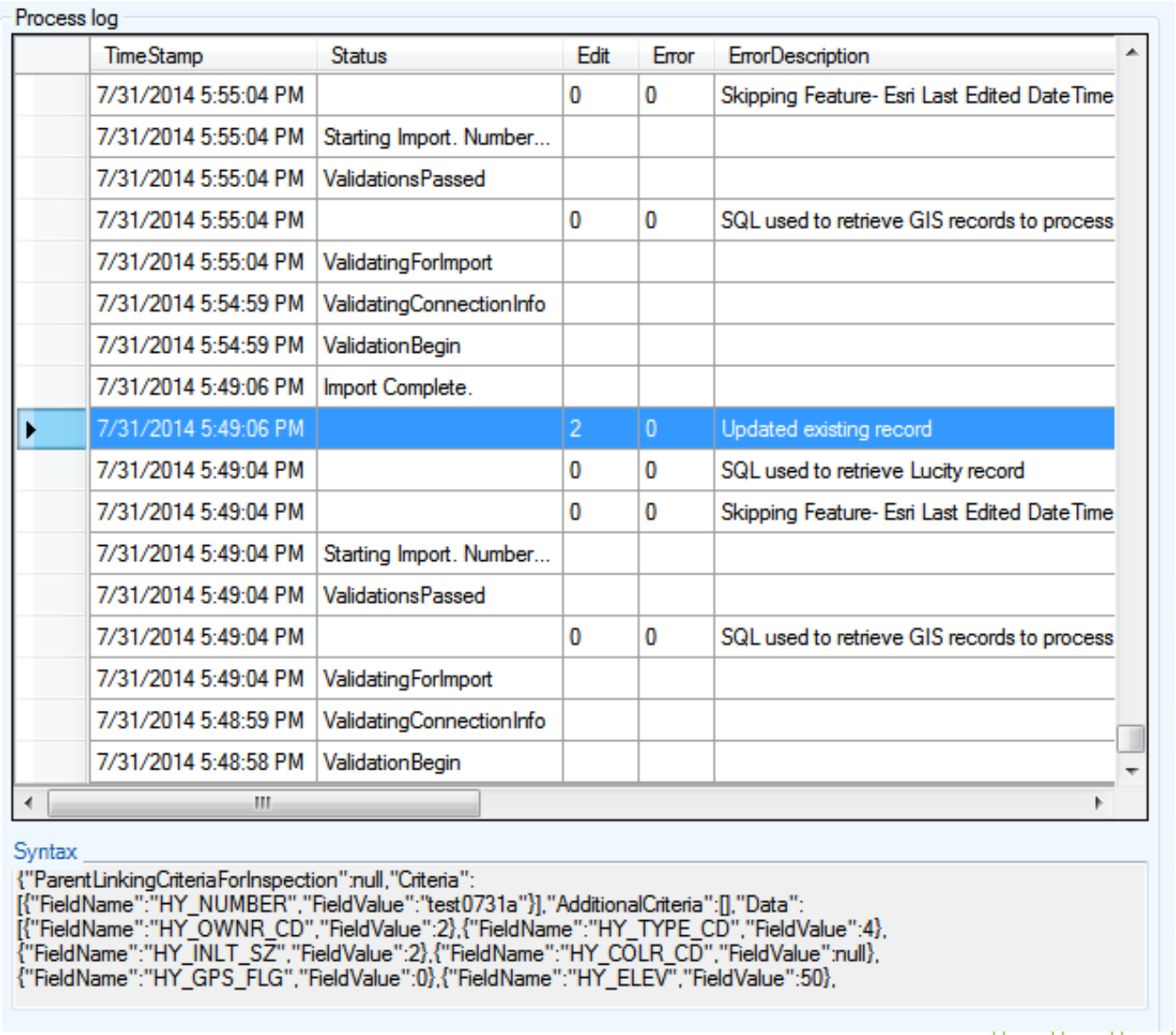
- Lucity.GISTaskRunner.exe runs every 1 min as part of the new Lucity Scheduler Service that is included with the Lucity Services install.



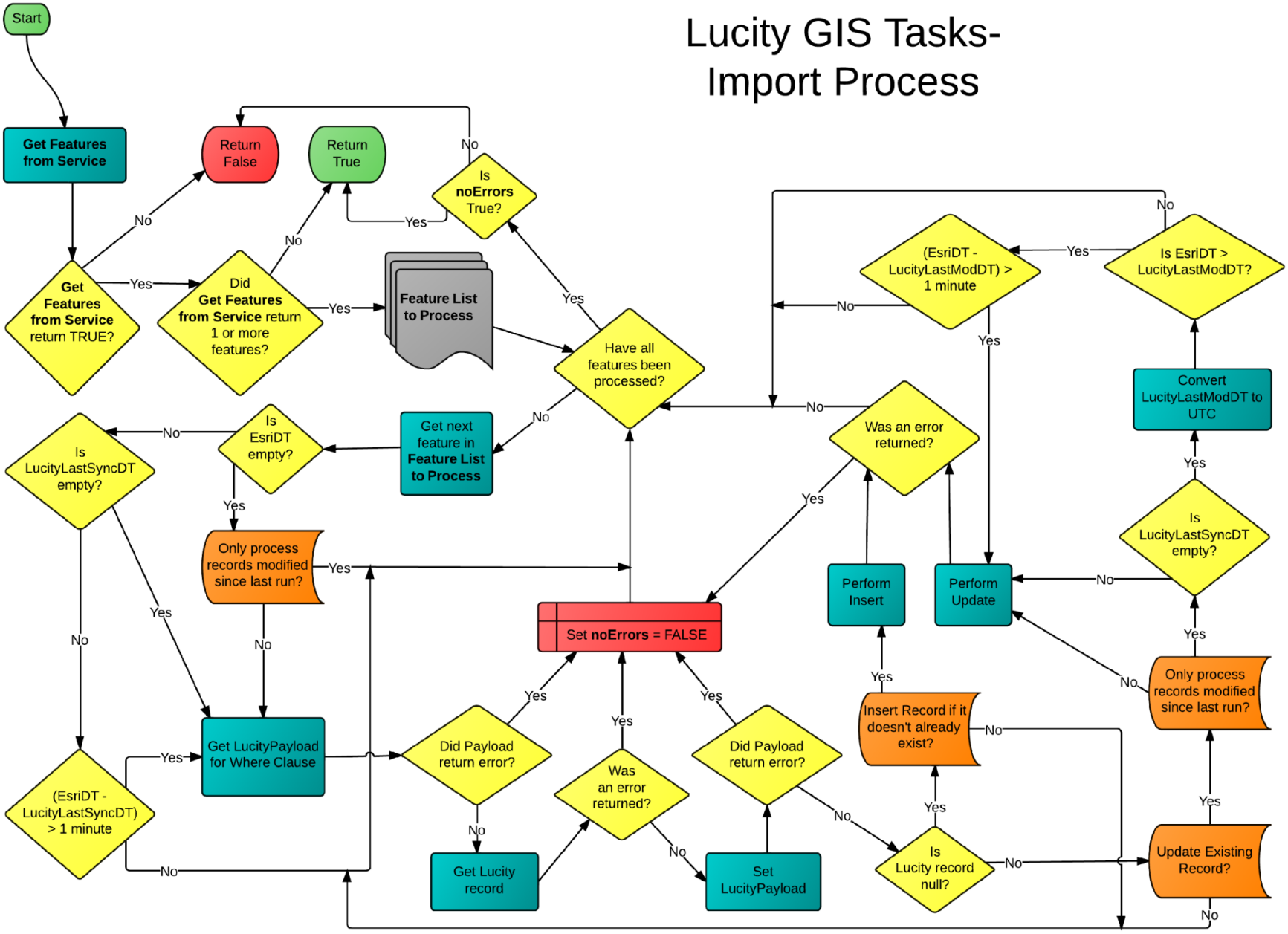
Lucity GIS Scheduled Tasks- Troubleshooting

Records that fail to process will be marked with an error code and remain in the CMGISTASKSLOG table for 30 days at which point they are deleted.

The results of a GIS Task can be found in the Geodatabase Configuration tool under the GIS Task's process log

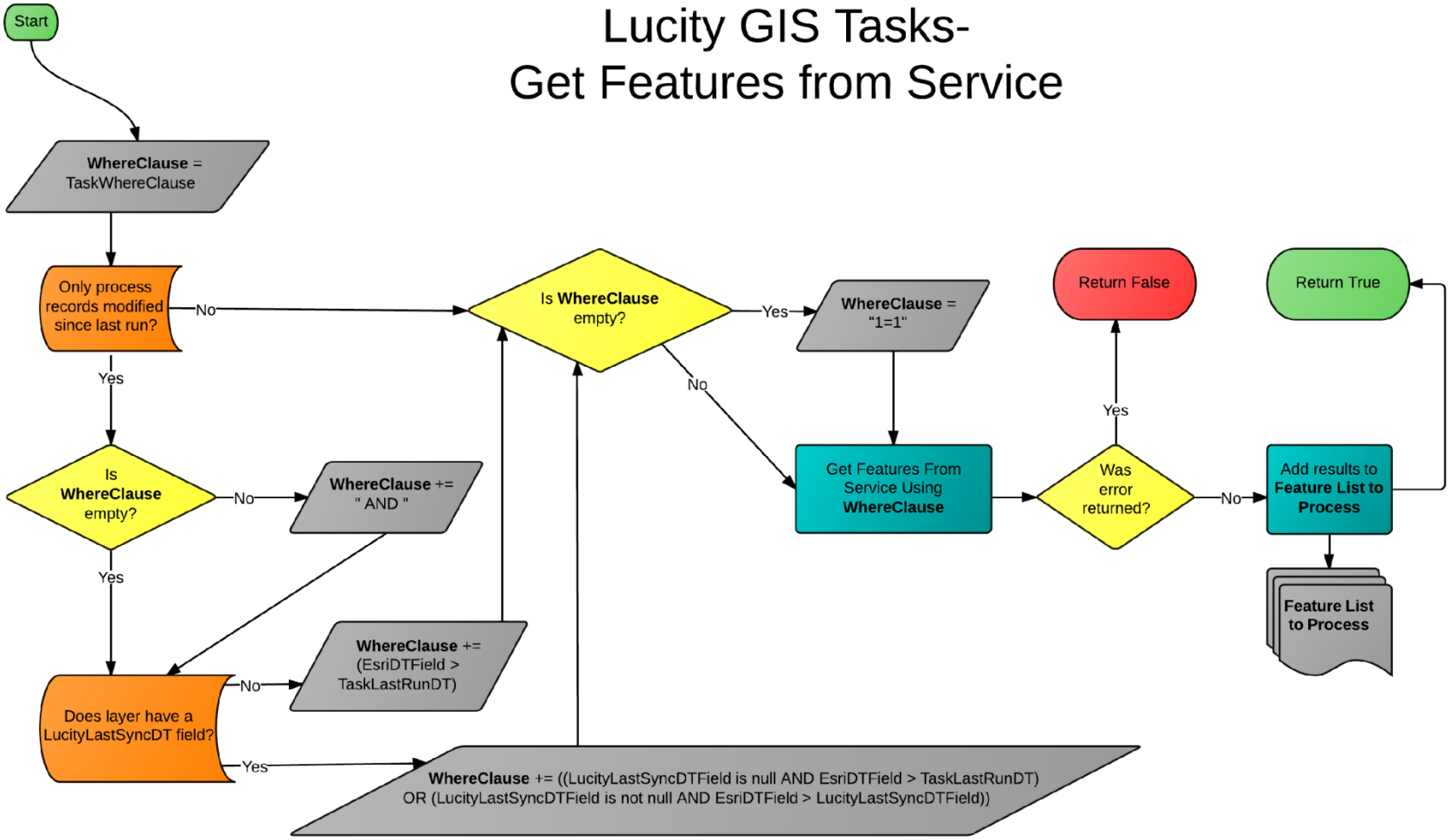


Lucity GIS Tasks- Import Process



Version 2014r2- 8/7/2014

Lucity GIS Tasks-
Get Features from Service



Version 2014r2- 8/7/2014

Charting the Course

Demo

lucity™