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#### TRAINING GUIDE

ArcGIS Server and Geodatabase Administration for 10.1 Revision: 2013

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# ArcGIS for Server v10.1 and Geodatabase Administration

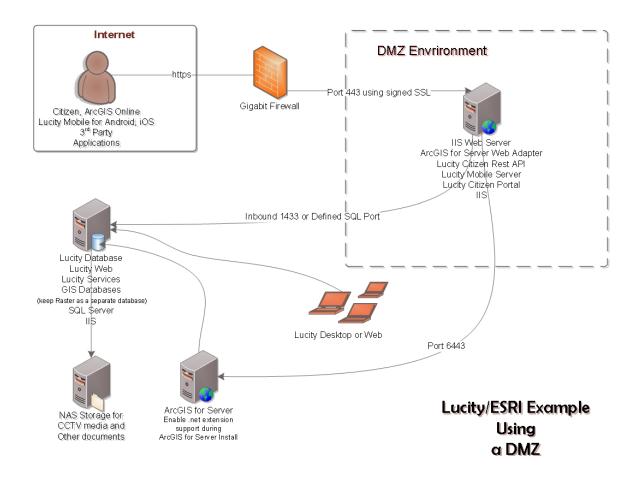
Here at Lucity, we understand that our software is requiring more skills in ESRI technology and these Esri systems can be difficult to manage without training. In this workshop, we will explore the nature of ArcGIS for Server v10.1, touch on key principles and techniques, as well as explore best practices for integration into Lucity. We will cover some key administration best practices for: design, setup, maintenance, and optional editing workflow. Even though we won't be covering the full gamut of ESRI technologies, we will be focused on the administration of ArcGIS for Server, how this relates to the IT and GIS administrators and what are some basic principles for enabling ArcGIS for Server to be compatible with Lucity.

# Setup

### ArcGIS for Server Design

- 64 Bit Operating Systems from Windows XP (depreciated in 2014), Windows Vista (ArcGIS Runtime will not support after 10.2) and 7, Windows 2003 (not supported after ArcGIS 10.2) or higher. Recommend Windows Server 2008 R2 or 2012
- Server should have 2-4 cores minimum and 4GB of RAM per core. For a 4 core system, you should have 16GB of RAM.
- If you have virtual servers, make sure you dedicate resources and have the latest VMware or Hyper-V software available. Based on ESRI's testing, Virtual software is the key to many performance issues. Make sure in VMware environments that you subtract overhead of two cores for the Virtual Environment so ArcGIS for Server map services doesn't pool across the Virtual overhead cores. If you don't, you will see a significant performance decrease in ArcGIS for Server.
- Try to limit map services to utilize 4 pools per core maximum. Anything more than that, you could allow ArcGIS for Server crashes when many people are simultaneously hitting your server.
- If you have a dedicated system for ArcGIS for Server, try creating a RAID 1 SSD configuration for your hard drives. Also, use the latest version of SSD standards as this will increase performance and reliability. For all new SSD cards, it will take at least 40 years before they reach their read/write maximum. This benchmark test was performed on a 24/7 continuous read/write routine. If SAS drives, use RAID 10 with a good RAID controller.

- Space depends on caching. If you plan to cache imagery, please account for large image files. Remember, each scale in the cache will have separate tiles for each scale. If you have 9 scales within a cache, you will have nine separate tiles of cache. Smaller scale images will be smaller in size and the larger scale images will be larger in size.
- Suggest HTTP and HTTPS Secure Design when setting up ArcGIS for Server security Configuration
- If intranet only, use HTTP only unless otherwise specified by your IT administration



#### ArcGIS for Server Setup

1. First, run the upgrade utility on existing system. If this is a new system, bypass the utility. Remember, ArcGIS for Server needs to be 64bit but the web adapter (optional) can be on either 32bit or 64bit.

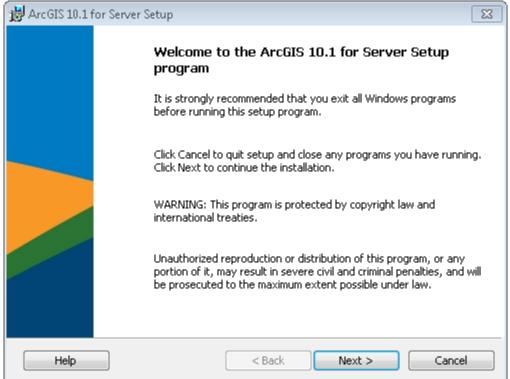
**Note:** When installing ArcGIS for Server on a separate server than your SQL Server 2012 instance with ArcSDE v10.1, you need the SQL Server Native Client 64 bit. Also, these versions need to match. For example, SQL Server 2012 original install media is a different version than the latest updated SQL Server 2012 from Microsoft updates. If the native client doesn't match the patched version of SQL Server 2012, it won't work. Esri recommends either the SQL Server 2012 matching version or the sql server 2008 R2 native client. Latest SQL Server 2012 Native 64 bit Client download link: <a href="http://go.microsoft.com/fwlink/?LinkID=239648&clcid=0x409">http://go.microsoft.com/fwlink/?LinkID=239648&clcid=0x409</a>

ArcG	IS for Serve	er Workgroup	_ ×
		10.1	
Quick Start Guide		Readme	
Uninstall Existing ArcGIS Software - REQUIRED IF			
ArcGIS for Server	Run Utility	Readme	
ArcGIS for Server	Setup	Install Guide	
ArcGIS Web Adapter (IIS)	Setup	Install Guide	
ArcGIS Web Adapter (Java Platform)	Setup	Install Guide	
ArcSDE for Microsoft SQL Server 2008 R2 Express (Workgroup)	Setup	Install Guide	
ArcGIS Data Interoperability for Server	Setup		
ArcGIS Data Reviewer for Server	Setup	Install Guide	
ArcGIS Workflow Manager for Server	Setup	Install Guide	
ArcGIS Server Cloud Builder on Amazon Web Services	Setup	Quick Start Guide	
ArcGIS Web ADF (Microsoft .NET Framework)	Setup	Install Guide	
ArcGIS Web ADF (Java Platform)	Setup	Install Guide	
ArcGIS Web ADF Runtime (Microsoft .NET Framework)	Setup	Install Guide	
ArcObjects SDKs			
ArcObjects SDK for Microsoft .NET Framework	Setup		
ArcObjects SDK for Java	Setup		
		Br	rowse

- 2. Click on ArcGIS for Server Setup
- If you receive a warning for one or more versions of v10, please uninstall v10 products.



#### 4. Once installation starts click next.



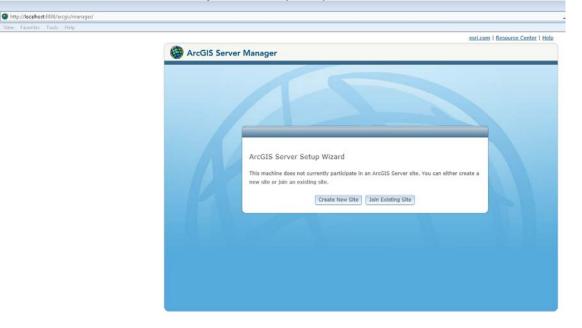
- 5. In the next dialog, click on 'I Accept' and click next.
- 6. In the 'Select Feature' dialog, click next and accept defaults.
- 7. For python, this is needed for geoprocessing and click next.
- In the 'Specify ArcGIS for Server Account, create a username and passwords for arcgis. Recommend to add arcgis as a user within Active Directory and add this to ArcGIS for Server Account information <domain>\<user>.

🙀 ArcGIS 10.1 for Server Setup	X
Specify ArcGIS Server Account	
Specify the account that the ArcGIS Server p	processes will run as.
Specify the account name and passwer	ord:
ArcGIS Server Account:	test\arcgis
Password:	•••••
Confirm password:	•••••
<ul> <li>I have a configuration file with the ac previous run of this setup.</li> <li>Filename:</li> </ul>	count information generated by a
Help	< Back Next > Cancel

In the next screen, you will be given the option to export your configuration; this is recommended and will be helpful during upgrades. Click next and install.

📸 ArcGIS 10.1 for Server Setup		23
Export server configuration file		
Export server configuration file		
	ith installing multiple systems that use the ser account, and grant it the necessary pri e.	
O not export configuration file.		
Export configuration file. This file s	should be placed in a properly secured dire	ectory.
Filename: C:\arcgis_conf	fig.xml	
Help	< Back Next >	Cancel

- 10. When finished, you will need to activate. Refer to Enabling ArcSDE for Workgroup Databases section for more detail about the activation process.
- 11. When finished activation, you will be prompted to create a new site.



12. Click on create a new site and supply the username and password for the site administrator account. Click next.

2	
Primary Site Ad	Iministrator Account
	hat will be the primary administrator for this ArcGIS Server site. This is s stored with the site and is not an operating system account. You will
	en logging in to Manager.
Username:	AGS
Password:	••••••
Confirm Password:	
	Back

13. Specify the root server directory and configuration storage. In AGS v10.1, your server configuration is stored in the config-store directory and your working directories are stored in directories (arcgiscache, arcgisjobs, arcgisoutput, arcgissystem). In this example we will take the defaults.

ArcGIS Server	Manager
R	Specify Root Server Directory and Configuration Store         When you create an ArcGIS Server site, several directories are installed to store output images, geoprocessing job results, cached images, and more. You can choose this location, but it must be accessible from each machine in your site.         Root Server Directory:       C:\arcgisserver\directories         The config store holds information about the GIS server's machines, services, and directories. You can choose the location of the config store, but it must be accessible from each machine in your site.         Configuration Store:       C:\arcgisserver\config-store
	Back Next

#### 14. Click next and finish when done.

ArcGIS for Server does not need a web client to run. ESRI chose to use Tomcat as the servlet engine for ArcGIS for Server and can be a stand-alone system if used internally. However, if you want to serve webpages out through IIS, consider installing a Web Adapter. ArcGIS for Server web-handler will act as a proxy server that will pass requests to and from ArcGIS for Server. Web Adapter will also be able to create an alias URL location for your ArcGIS for Server. ArcGIS for Server by itself needs to have port 6080 as the rest service endpoint for the URL. For

example: http://<internalservername>:6080/arcgis/rest/services is the URL without the Web Adapter. When using the Web Adapter, requests can be masked through an alias URL designation http://<URLname>/<virtualdirectory>/rest/services. The Web Adapter takes care of the requests to and from ArcGIS for Server using port 6080 and translating this to the user. The Web Adapter for ArcGIS for Server can be located on ArcGIS for Server machine running IIS or on a different server within the LAN or a DMZ. For internet and intranet based ArcGIS for Server services, it's recommended to use a DMZ with the firewall open from DMZ web server to the internal ArcGIS for Server on port 6443. The Web Adapter will be installed on the DMZ web server and using ArcGIS for Server installation media. Also, it is highly recommended that the Web Adapter uses HTTPS as the protocol within a secure design as well as running ArcGIS for Server as HTTPS. In ArcGIS for Server design section, we have added a diagram of what this actually looks like.

#### Connect to ArcGIS for Server from ArcCatalog

1. Open ArcCatalog and go to the TOC. Expand GIS Servers.

#### Catalog Tree

- 🗉 🔂 Folder Connections
- 🗉 📷 Toolboxes
- 🗉 🗊 Database Servers
- 🗉 词 Database Connections
- 🖃 🛐 GIS Servers
  - 🍓 Add ArcGIS Server
- 2. Click on Add ArcGIS for Server and choose Administer GIS Server. As a note, you can add users to be able to publish gis services without having administrative rights.

Add ArcGIS Server		X
	This wizard guides you through the process of making a connection to an ArcGIS Server. You can create a connection to use, publish, or administer GIS services.	
<ul> <li>→ <ul> <li></li> </ul></li></ul>	What would you like to do? Use GIS services Publish GIS services Administer GIS server	
		incel

3. In the general dialog, you need to add the URL and the username and password for administrating the server. Make you use the exact case for your username and password as ArcGIS for Server is now case sensitive. If Web Adapter is installed, you can use the Web Adapter URL to connect to ArcGIS for Server if it is setup to accept management.

Server URL: http://lukesavage:6080/arcgis/services   ArcGIS Server: http://myserver:6080/arcgis   Spatial Data Server: http://myserver:8080/arcgis   Server Type: ArcGIS Server   Staging Folder: C:\Users\lsavage\AppData\Local\Temp\arc1CCS\St;   Wuse ArcGIS Desktop's staging folder     Authentication   User Name: AGS   Password: ••••••••   Save Username/Password     About ArcGIS Server connections	eneral		_
ArcGIS Server: http://myserver:6080/arcgis   Spatial Data Server: http://myserver:8080/arcgis   Server Type:   ArcGIS Server   Staging Folder:   C:\Users\lsavage\AppData\Local\Temp\arc1CC5\St;   W Use ArcGIS Desktop's staging folder   Authentication   User Name:   AGS   Password:   Save Username/Password			
Server Type: ArcGIS Server   Staging Folder: C:\Users\lsavage\AppData\Local\Temp\arc1CC5\St;   Vuse ArcGIS Desktop's staging folder     Authentication   User Name: AGS   Password: ••••••••   VarcGIS Server     About ArcGIS Server connections	Server URL:	http://lukesavage:6080/arcgis/services	
Staging Folder:       C:\Users\Isavage\AppData\Local\Temp\arc1CCS\St;         Image: Use ArcGIS Desktop's staging folder         Authentication         User Name:       AGS         Password:       ••••••••         Image: Save Username/Password         About ArcGIS Server connections			
Image:	Server Type:	ArcGIS Server 👻	
Authentication User Name: AGS Password: Save Username/Password  About ArcGIS Server connections	Staging Folder:	C:\Users\lsavage\AppData\Local\Temp\arc1CC5\Sta	
User Name: AGS Password: ••••••• Save Username/Password About ArcGIS Server connections		Vuse ArcGIS Desktop's staging folder	
Password:	Authentication		
Save Username/Password      About ArcGIS Server connections	User Name:	AGS	
About ArcGIS Server connections	Password:	•••••	
		☑ Save Username/Password	
	About ArcGIS Server c	onnections	
< Back Finish Cancel		< Back Finish C	Iancel

# Installing and Configuring ArcGIS for Server Web Adapter

1. In the installation media of ArcGIS for Server, click on ArcGIS Web Adapter IIS. Click next and accept terms.

ArcG	<b>IS</b> for Serve	er Workgroup
		10.1
Quick Start Guide		Readme
Uninstall Existing ArcGIS Software - REQUIRED IF (	JPGRADING AN EXISTI Run Utility	NG INSTALLATION Readme
ArcGIS for Server ArcGIS for Server	Setup	Install Guide
ArcGIS Web Adapter (IIS) ArcGIS Web Adapter (Java Platform)	Setup Setup	Install Guide Install Guide
ArcSDE for Microsoft SQL Server 2008 R2 Express (Workgroup) ArcGIS Data Interoperability for Server	Setup Setup	Install Guide
ArcGIS Data Reviewer for Server ArcGIS Workflow Manager for Server	Setup	Install Guide Install Guide
ArcGIS Server Cloud Builder on Amazon Web Services ArcGIS Web ADF (Microsoft .NET Framework)	Setup	Quick Start Guide Install Guide
ArcGIS Web ADF (Java Platform) ArcGIS Web ADF Runtime (Microsoft .NET Framework)	Setup	Install Guide Install Guide
ArcObjects SDKs ArcObjects SDK for Microsoft .NET Framework	Setup	
ArcObjects SDK for Java	Setup	
		Browse

2. Enable the cross-domain Policy Files so that it will handle Silverlight and Flex clients. Click next.

😸 ArcGIS 10.1 Web Adaptor (IIS) Setup	×
Select Features	
Select the program features you want installed.	
Click on an icon in the list below to change how a feature is inst	
Web Adaptor	Feature Description Installs cross-domain policy files in the web server root location to enable access for Silverlight and Flex clients. This feature requires 8KB on your hard drive.
Help Space < Back	Next > Cancel
<ol> <li>In the new Virtual Directory section, creat will be used to alias ArcGIS for Server UF URL change will be <u>http://<urlname>/Re</urlname></u></li> </ol>	RL location. In this example, the
澍 ArcGIS 10.1 Web Adaptor (IIS) Setup	×
New Virtual Directory Specify the name of the ArcGIS Web Adaptor	
Name for the ArcGIS Web Adaptor	
RockStar	
Help < Back	Next > Cancel

4. Click Install.

5. After finished, you will be rerouted to a site that will allow you to configure your ArcGIS Web Adapter. There are many options but the great thing about the Web Adapter is you can be security conscience. Make sure you figure out if you want management internal only or allow management from both the Web Adapter and ArcGIS for Server. Enabling administrative access to your site through the web adaptor is fine but discuss this option with your network engineer before enabling it to make sure the vulnerability is acceptable. Shared Key is optional and if you want to use it and need a token using a 128 bit encryption, please reference the below

link. <u>http://www.csgnetwork.com/wepgeneratorcalc.html</u> (use the ASCII key as the token can only be 16 characters long). Click Configure.

Note: If you don't see the Rest/services URL and it's giving you a code 500, delete your configuration store under the arcgisserver folder and go to the http://<internalservername>:6080/arcgis/manager and create a new site. This will reset your configuration of your site and will automatically add your web adapter in. Registration of sites sometimes gets corrupted when the web adapter doesn't complete correctly so this step is sometimes required after fixing the web adapter.

Attp://lukesavage/rockstar/wel	badaptor#	
File Edit View Favorites Tools Help		
X Find: shared key	Previous Next 📝 Optio	ns 🔻
ArcGIS We	eb Adaptor	
	co Adaptor	
		-
		010
To configure the Web Adaptor, specify	the URL and an administrator account for	or your GIS server.
GIS Server URL:	http://lukesavage:6080	2
A desirie function I la sum sur su	(Example: http://machine:6080)	
Administrator Username:	AGS	2
Administrator Password:	•••••	2
Shared Key (optional):	&/hZV.rX3{4Dt"*I	2
Enable administrative access to y	our site through the Web Adaptor	
	Configure	
Status: No. CIS a supers are registered	with your Mah Adaptan	
Status: No GIS servers are registered	with your web Adaptor.	

- If your web adaptor install didn't configure the IIS web pool properly, follow the link below to fix the problem. <u>http://support.esri.com/en/knowledgebase/techarticles/detail/404</u> 06
- 7. Once configured, you should see a change in the green section of the web adaptor page.

Status: The following GIS servers are registered to your Web Adaptor

lukesavage

Last updated on 8/16/2012 10:47:42 AM

You can now use the URL (<u>http://lukesavage/rockstar/rest/services</u>) for accessing services in the Services Directory.

## SQL Server Specifications

- Server should have 2-4 cores minimum and 4GB of RAM so that SQL Server can use at least 2GB dedicated for the instance (sql server express can only use up to 1GB RAM per instance). For a Lucity and an Enterprise Geodatabase SQL Instance configuration, I would suggest 4 cores minimum with at least 8GB of RAM for any new database server. Training, Development or Test servers can have less; 2 cores with at least 3GB of RAM which 1GB is dedicated to the SQL Server instance.
- RAID 10 configurations has become a standard RAID best practice. Please don't use onboard RAID controllers as they are not performance based.
- Don't load ArcGIS for Server on a database server. ArcGIS for Server is a
  memory hog and will fight for computer resources. If you are tight on budget, it
  would be better to build two mediocre systems than one big system that has both
  database and ArcGIS for Server on it (SAN and/or Virtual iSCSI configuration is
  an exception to the rule).
- Plan for data scalability 5 years out. If you have imagery that consumes 20GB and you know you will acquire a new image at least once within the 5 years, scale out four times the consumption rate. Space is cheap and there is no need to be caught in a low memory situation. Remember, digital imagery space is higher as they have a smaller focal length per image. If you acquired analog images in the past, digital images can be 2-3 times the memory size.
- If in a virtual environment, make sure you have enough RAM and storage space for your servers. In the new v10.1 server architecture, you could have as much as three to four servers minimum depending on your system design.

# SQL Instance Setup

#### Install SQL Server for ArcSDE for Workgroup

- 1. You can install from ArcGIS for Server disk or you can download installation from Microsoft for SQL Server 2012 Express 64bit with Advanced Services.
- 2. Click on the SQL Server executable.

📸 SQL Server Installation Center	
Planning	New SQL Server stand-alone installation or add features to an existing installation
Installation Maintenance	Launch a wizard to install SQL Server 2012 in a non-clustered environment or to add features to an existing SQL Server 2012 instance.
Tools	SQL SEIVER 2012 INStance.
Resources	Upgrade from SQL Server 2005, SQL Server 2008 or SQL Server 2008 R2
Options	Launch a wizard to upgrade SQL Server 2005, SQL Server 2008 or SQL Server 2008 R2 to SQL Server 2012.
SQL Server 2012	

- 3. Click on new sql server stand-alone installation or add features to an existing installation. In this example, we will be using a fresh installation.
- 4. You can assign different locations for your shared feature directory, most of the time you'll take the defaults and click next. If you don't want reporting services, uncheck the 'Reporting Services –Native' checkbox. If you don't know and may in the future, you can continue with it checked.

SQL Server 2012 Setup Feature Selection Select the Express features to in	nstall.	
Setup Support Rules Feature Selection Installation Rules Instance Configuration Disk Space Requirements Server Configuration Database Engine Configuration Reporting Services Configuration Error Reporting Installation Configuration Rules Installation Progress Complete	Features: Instance Features SQL Server Replication Full-Text and Semantic Extractions for Search Shared Features Supering Services - Native Shared Features SQL Server Data Tools Documentation Components SQL Client Connectivity SDK LocalDB Redistributable Features Select All Unselect All	Feature description:         Includes the Database Engine, the core service for storing, processing and securing data. The Database Engine provides controlled access and rapid transaction processing.         Prerequisites for selected features:         Already installed:         Windows PowerShell 2.0         Microsoft .NET Framework 3.5         To be installed from media:         Microsoft .NET Framework 4.0 (may requined the media)         Microsoft Visual Studio 2010 Shell
	Shared feature directory: C:\Program Files\Micro Shared feature directory (x86): C:\Program Files (x86)\	
	< Back	Next > Cancel Help

5. You can assign different instance names, install as a default instance, and create reporting services directory but in this particular example, we will use the defaults.

📸 SQL Server 2012 Setup					
Instance Configuration	ı				
Specify the name and instance	ID for the instance of SQL Serve	er. Instance l	D becomes part of t	he installation path.	
Setup Support Rules Feature Selection Installation Rules	<ul> <li>Default instance</li> <li>Named instance:</li> </ul>	SQLExpres	5		
Instance Configuration Disk Space Requirements Server Configuration Database Engine Configuration	Instance ID: Instance root directory:	SQLEXPRE C:\Program	SS n Files\Microsoft SQ	!L Server\	
Reporting Services Configuration Error Reporting Installation Configuration Rules Installation Progress Complete	SQL Server directory: Reporting Services directory: Installed instances:	-		L Server\MSSQL11.SQ L Server\MSRS11.SQL	
	Instance Name Instan	nce ID	Features	Edition	Version
			< Back	Next > Can	ncel Help

6. In this next dialog, turn on the sql browser to automatic startup

5 SQL Server 2012 Setup				
Server Configuration				
Specify the service accounts and	collation configuration.			
Setup Support Rules Feature Selection	Service Accounts Collation			
Installation Rules	Microsoft recommends that you use	a separate account for each SQL Server servic	e.	
Instance Configuration	Service	Account Name	Startup Type	
Disk Space Requirements	SQL Server Database Engine	NT Service\MSSQL\$SQLEXPRESS	Automatic	-
Server Configuration	SQL Server Reporting Services	NT Service\ReportServer\$SQLEXPRESS	Automatic	-
Database Engine Configuration	SQL Full-text Filter Daemon Launc	NT Service\MSSQLFDLauncher\$SQLEXPR	Manual	
Reporting Services Configuration	SQL Server Browser	NT AUTHORITY\LOCAL SERVICE	Automatic	-
Error Reporting				
Installation Configuration Rules			Л	
Installation Progress				
Complete				
	1			
		< Back Next > Cance	el He	lp

7. For Server Configuration, it is good to enabled mixed mode. This is the case where you have an administrator and you would like to have SA as an admin user that is constant. Windows authentication only is bad if the person that administrates ever leaves and you disable their active directory account by accident. It's not the end of the world, but this is an IT assurance issue. For me, it's better to be safe than sorry. Store your SA password in a safe location that can be accessed in case of administrative role changes. Again, vulnerability and stability assurance measures are the key to a healthy working server environment. Reduce the number of server admins so you have a single point of entry into the database as an administrator. For those using AD domain or LDAP, please change the account name to include a domain user so you can browse the local server when added in a domain. SQL Server Browser, SQL Server Agent and the database engine is necessary to change to be network aware if using backup maintenance plans (database maintenance plans are enabled for SQL Server Standard, Developer or Enterprise only).

🚡 SQL Server 2012 Setup		- • • ×
Database Engine Conf	guration	
Specify Database Engine authe	ntication security mode, administrators and data directories.	
Setup Support Rules Feature Selection Installation Rules Instance Configuration Disk Space Requirements Server Configuration <b>Database Engine Configuration</b> Reporting Services Configuration Error Reporting Installation Configuration Rules Installation Progress Complete	Server Configuration       Data Directories       User Instances       FILESTREAM         Specify the authentication mode and administrators for the Database English       Authentication Mode <ul> <li>Windows authentication mode</li> <li>Mixed Mode (SQL Server authentication and Windows authentication)</li> <li>Specify the password for the SQL Server system administrator (sa) accourted</li> <li>Confirm password:</li> <li>Specify SQL Server administrators</li> </ul>	it.
	GBAMS\Isavage (Luke Savage) Add Current User Add Remove Sack Next >	SQL Server administrators have unrestricted access to the Database Engine.

8. On the data directories tab, it is good to change the location for easy backup queries and administration. However, system tables will use the Microsoft default location within the root directory of the databases. I would not recommend enabling user instances on the user instance tab as well as filestreaming unless you plan on loading large documents outside of the Geodatabase as blobs. Click next when complete.

Server Configuration Data Dire	ectories User Instances FILESTREAM
Data root directory:	C:\data
System database directory:	C:\data\MSSQL11.SQLEXPRESS\MSSQL\Data
User database directory:	C:\data\
User database log directory:	C:\data\log
Temp DB directory:	C:\data\temp
Temp DB log directory:	C:\data\temp\log
Backup directory:	C:\backup

9. Optional: In the reporting services configuration, if you are using the reporting services, install and configure. If not, I would install and not configure. I chose to install but not configure right away. If you chose not to install at all during the setup process, you will not see this dialog. Click next.

📸 SQL Server 2012 Setup	
Reporting Services Co Specify the Reporting Services	
Setup Support Rules Feature Selection Installation Rules Instance Configuration Disk Space Requirements Server Configuration Database Engine Configuration <b>Reporting Services Configura</b> Error Reporting Installation Configuration Rules Installation Progress Complete	<ul> <li>Reporting Services Native Mode</li> <li>Install and configure. Installs and configures the report server in native mode. The report server is operational after setup completes. <li>Install only. Installs the report server files. After installation, use Reporting Services Configuration Manager to configure the report server for native mode. </li> <li>Reporting Services SharePoint Integrated Mode Install only. Installs the report server files. After installation use SharePoint Central Administration to complete the configuration. Verify the SQL Server Reporting Services service is started and create at least one SQL Server Reporting Services service application. For more information, click Help. </li> </li></ul>
	< Back Next > Cancel Help

 Your choice of sending Microsoft the error reports and usage automatically. I generally do this for a development or test environment. For a production environment, leave unchecked. Click Next.

🃸 SQL Server 2012 Setup		
Complete		
Your SQL Server 2012 installation	on completed successfully with product updates.	
Setup Support Rules	Information about the Setup operation or possible i	next steps:
Feature Selection	Feature	Status
Installation Rules	Solution And Antional Antiona	Succeeded
Instance Configuration	SOL Server Data Tools	Succeeded
Disk Space Requirements	Solution Data Posts	Succeeded
Server Configuration	Sull-Text and Semantic Extractions for Search	Succeeded
Database Engine Configuration	SQL Server Replication	Succeeded
Reporting Services Configuration	Renorting Services - Native	Succeeded
Error Reporting		
. 2	Details:	
Installation Configuration Rules		
Installation Progress	Viewing Product Documentation for SQL S	erver 🔶
Complete	Only the components that you use to view and been installed. By default, the Help Viewer com SQL Server, you can use the Help Library Man your local computer. For more information, see < <u>http://go.microsoft.com/fwlink/?LinkID=224683</u> 224683) Summary log file has been saved to the following lo <u>C:\Program Files\Microsoft SQL Server\110\Setup</u> \Summary LUKESAVAGE 20120814 132258.bt	ager component to download documentation to Use Microsoft Books Online for SQL Server 3> (http://go.microsoft.com/fwlink/?LinkID=
		Close Help

- 11. If complete, you have successfully created a sql instance. If not, go through the troubleshooting information listed in the error log.
- 12. Go to start/all programs/Microsoft sql server 2012/sql server management studio. If you had sql server 2008 before, you can import profile settings.

🚽 Connect to Server		×
SQL Ser	<b>"ver</b> "2012	
Server type:	Database Engine	-
Server name:	LUKESAVAGE\SQLEXPRESS	-
Authentication:	Windows Authentication	-
User name:	GBAMS\lsavage	-
Password:		
	Remember password	
Connec	Cancel Help Option	\$ >>

- 13. Click connect
- 14. Right click the instance you connected to and choose properties

🗏 Microsoft SQL Server Management St	udio
File Edit View Debug Tools Win	dow Hel;
🗄 🛅 🕶 📨 🧉 😹 🛃 🔔 New Que	ry 🗅 📸
Object Explorer 🔹	<del>Ψ</del> ×
Connect - 🛃 🛃 🔳 🍸 🧔 😹	
😑 🐻 LUKESAVAGE\SQLEXPRESS (SQL	
🕢 🧰 Databases	Connect
🕀 🧰 Security	Disconnect
😠 🧰 Server Objects 😠 🧰 Replication	Register
🗄 🧫 Représeion 🗉 🛅 Management	New Query
	Activity Monitor
	Start
	Stop
	Pause
	Resume
	Restart
	Policies +
	Facets
	Start PowerShell
	Reports >
	Refresh
	Properties 😥

15. Go to the memory tab and click on maximum server memory. You will want this to be a realistic number as the default puts an ungodly amount of maximum ram that will far exceed your server limit. Because we are treating this as a production server, you will want to dedicate resources to SQL Server. For the operating system, at least give the operating system 3 GB of RAM and for SQL Server adjust appropriately. In this case, I'm giving SQL Server 2 GB of RAM but in can be more depending on your instance load and available memory. All other defaults are fine.

🚦 Server Properties - LUKESAVA	AGE\SQLEXPRESS
Select a page	🔄 Script 🔻 🛐 Help
Memory Processors Security Connections	Server memory options
Patabase Settings	
	Minimum server memory (in MB):
	0 🔄 Maximum server memory (in MB):
	Other memory options
	Index creation memory (in KB, 0 = dynamic memory):
Connection	
Server: LUKESAVAGE\SQLEXPRESS	Minimum memory per query (in KB):
Connection: GBAMS\Isavage	
View connection properties	
Progress	
O Ready	Configured values
	OK Cancel

16. Tab down to Processors in the TOC, I would highly recommend enabling 'Boost SQL Server Priority' on the server. Especially if you are loading ArcGIS for Server on the same server, which I wouldn't recommend. However, if you are forced to use one server, ArcGIS for Server will try to push SQL Server out of the way so boosting SQL Server priority will help keep the re. This item will dedicate resources to SQL Server and keep the resources available for SQL Server. DO NOT ENABLE WINDOWS FIBERS (lightweight pooling)! This is for older technologies and ArcSDE from v10 and higher uses XML calls to the SQL Server database so keep windows fibers disabled.

🚦 Server Properties - LUKESAVA	AGE\SQLEXPRESS	
Select a page Page General	🖾 Script 🔻 📑 Help	
Memory Processors Security Connections Database Settings Advanced Permissions	Enable processors          Image: Automatically set processor affinity mask for all processors         Image: Automatically set I/O affinity mask for all processors         Image: Processor Processor Affinity         Image: Automatically set I/O affinity mask for all processors	I/O Affinity
Connection	Threads	
Server: LUKESAVAGE\SQLEXPRESS Connection: GBAMS\Isavage I View connection properties	Maximum worker threads:	
Progress		
Ready	Configured values Running values	
		OK Cancel

17. Double the network packet size for the Geodatabase connections in the advanced menu item (from 4096 to 8192). For network traffic and performance, the Geodatabase network packets need the additional size increase.

Select a page	Sc Sc	rript 🔻 🛐 Help		
🚰 General				
I≦™ Memory I≦™ Processors I≤™ Security	•	] ⊉↓		
Proceeding	۵	Containment		
Matabase Settings		Enable Contained Databases	False	
Advanced	۵	FILESTREAM		
Permissions		FILESTREAM Access Level	Disabled	
		FILESTREAM Share Name	SQLEXPRESS	
	۵	Miscellaneous		
		Allow Triggers to Fire Others	True	
		Blocked Process Threshold	0	
		Cursor Threshold	-1	
		Default Full-Text Language	1033	
		Default Language	English	=
		Full-Text Upgrade Option	Import	
		Max Text Replication Size	65536	
		Optimize for Ad hoc Workloads	False	
		Scan for Startup Procs	False	
		Two Digit Year Cutoff	2049	
Connection	۵	Network		
Connoctan		Network Packet Size	8192	
Server:		Remote Login Timeout	10	
LUKESAVAGE\SQLEXPRESS	۵	Parallelism		
Connection:		Cost Threshold for Parallelism	5	
GBAMS\lsavage		Locks	0	· ·
View connection properties		e <b>twork Packet Size</b> et the packet size (in bytes) used across	the entire network.	
Progress				
Ready	۲	Configured values 🦳	Running values	
			ОК	Cancel

#### SQL Server Enterprise Setup

Very similar to the workgroup setup above only that I recommend using default instance and locating all databases for Lucity and ArcGIS in one instance for ease of administration and resource dedication.

### Enabling ArcSDE for Workgroup Databases

1. Click on the setup for ArcSDE for Microsoft SQL Server 2008 R2.

T. CIICK OF THE			2000 112.	
	ArcGIS	for Serve	er Workgroup	_ ×
			10.1	
	Quick Start Guide		Readme	
	Uninstall Existing ArcGIS Software - REQUIRED IF UPGE	RADING AN EXISTI	NG INSTALLATION	
		Run Utility	Readme	
	ArcGIS for Server			
	ArcGIS for Server	Setup	Install Guide	
	ArcGIS Web Adapter (IIS)	Setup	Install Guide	
	ArcGIS Web Adapter (Java Platform)	Setup	Install Guide	
	ArcSDE for Microsoft SQL Server 2008 R2 Express (Workgroup)	Setup	Install Guide	
	ArcGIS Data Interoperability for Server	Setup		
	ArcGIS Data Reviewer for Server	Setup	Install Guide	
	ArcGIS Workflow Manager for Server	Setup	Install Guide	
	ArcGIS Server Cloud Builder on Amazon Web Services	Setup	Quick Start Guide	
	ArcGIS Web ADF (Microsoft .NET Framework)	Setup	Install Guide	
	ArcGIS Web ADF (Java Platform)	Setup	Install Guide	
	ArcGIS Web ADF Runtime (Microsoft .NET Framework)	Setup	Install Guide	
	ArcObjects SDKs			
	ArcObjects SDK for Microsoft .NET Framework	Setup		
	ArcObjects SDK for Java	Setup		

Browse

.

#### 2. Click Next

Welcome to the database server setup wizard	
This setup installs Microsoft SQL Server Express and enables geodatabase storage.	
It is strongly recommended that you exit all Windows programs before running this setup. If other Windows programs are running, click Cancel to quit the setup program, close any programs you have running, then restart this wizard.	
WARNING: This program is protected by copyright law and international treaties.	
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.	
< Back Next > Cancel Help	

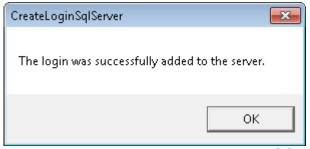
3. Uncheck the checkbox next to Microsoft SQL Server Express Edition

ArcSDE for Microsoft SQL Server Express	×
Installation Options	
Microsoft SQL Server Express Edition	
C Install Microsoft SQL Server Express	
C Upgrade Microsoft SQL Server Express	
Enable geodatabase storage on SQL Server Express	
< Back Next > Cancel	Help

- Click next
   Supply your instance name and windows login

ArcSDE for Microsoft SQL Server Express	;	×
Choose a SQL Server Instance ar Specify an instance and the login of	—	
SQL Server instance name	LUKESAVAGE\SQLEXPRESS	
Windows Login	gbams\lsavage E.g. DOMAIN\login_name	
	n to SQL Server as an Administrative user you sary if the person who is to be using this al Windows Administrators group.	
< Back	Next > Cancel Help	>

6. If successful, click ok and move to step 24. If not, fix the connection issues.



7. The next section will authorize the SQL Server Express instance. For SQL Server enterprise, this is different as the subsequent topics will show you how to authorize Enterprise Geodatabases for SQL Server. Click next

ArcSDE for Microsoft SQL Server Express	×
Enable geodatabase storage on SQL Server Express ArcSDE for Microsoft SQL Server Express	
An authorization file from ESRI is requred to create and use SQL Server Express geodatabases.	
Click Next to start the ArcSDE authorization wizard.	Help

8. The authorize option allows you to point to an authorize file supplied from ESRI or to authorize the software installation. In this example, we will be choosing the later. Click next

Software Authorization Wizard	8
Authorization Options You must authorize the software prior to use. Select from the options below.	
Authorization Options <ul> <li>I have installed my software and need to authorize it.</li> </ul>	
I have received an authorization file from Esri and am now ready to finish the authorization process. Browse	
< Back Next > Can	cel

9. Again, you have the choice of email, website or through the internet. We will be performing the later. Click next.

Software Authorization Wizard	83
Authorization Method Select the method you want to use to authorize the software.	
Authorize with Esri now using the Internet.	
(This automatic method is the easiest way to authorize. It requires an Internet connection	n. J
O Authorize at Esri's website or by email to receive your authorization file.	
K Back Next > Cancel	el

- 10. The authorization information will need filled out. Click next. Click next.
- 11. In software authorization number dialog, you will need to supply the authorization number that ESRI has supplied to you for ArcGIS for Server Workgroup. Click next.

Software Authorization Wizard	8
Software Authorization Number Enter the authorization number for your software product	
The authorization number consists of three letters and a series of numbers; similar to ABC123456789. To authorize the ArcSDE component of ArcGIS Server, provide your ArcGIS Server authorization number.	
ArcGIS Server	
< Back Next > Canc	el

12. If you do not receive a congratulations message as it may be an internet interruption. If you are not successful, contact your ESRI representative for an authorization file. Click Finish.

Software Authorization Wizar	d	×
Authorizing Software		
~	Connecting to ESRI	
~	Sending authorization information	
~	Receiving authorization file	
✓ <i>✓</i>	Authorizing software	
Congratulations, ye	our software has been authorized and is now ready for use.	
	< Back Finish Can	cel

### Install SQL Server Native Client

You will need to install the exact version of SQL Server Native Client on each workstation that will connect using ArcMap or ArcCatalog to the Geodatabase.

13. When using SQL Server 2012 with ArcSDE v10.1, each client (ArcGIS for Desktop, Server) needs the SQL Server Native Client 64 bit. Also, these versions need to match. For example, SQL Server 2012 original install media is a different version than the latest updated SQL Server 2012 from Microsoft updates. If the native client doesn't match the patched version of SQL Server, it won't work. ESRI is requiring anyone connecting to ArcSDE using an installed sql native 64 bit client with identical 2012 versions or SQL Server 2008 R2 native client. Latest SQL Server 2012 Native 64 bit Client download

link: <u>http://go.microsoft.com/fwlink/?LinkID=239648&clcid=0x409</u>

### **Connect and Create Geodatabase in Workgroup**

14. Open ArcCatalog or ArcMap -> Embedded ArcCatalog and expand the database server's item in the TOC. Click on Add Database Server.

Location: 1 Add Database Server	Add Database Server  Add Database Server  Add Database Server    Add Database Server
Image: The second s	Add Database Server  Add Database Server  Add Database Server   Add Database Server   Add Database Server
E □ Folder Connections     E □ Toolboxes     Contextual Servers     W □ Add Database Servers     W □ Database Connections	B       ☐ Folder Connections         B       ☐ Folder Connections         B       ☐ Database Servers         Image: Add Database Server       Image: Add Database Servers         Add Database Server       Image: Add Database Servers         Image: Add Database Server       Image: Add Database Server         Image: Add Database Server       Image: Add Database Server         Image: Add Database Server       Image: Add Database Server         Image: Add Database Server
Add adatabase Servers Add a database server by typing the name of the SQL Server Express instance to which you want to connect. Database Server: Example: myserver(splexpress OK Cancel	Add a database server by typing the name of the SQL Server Express instance to which you want to connect. Database Server: Example: myserver(sqlexpress

15. After the connection has been established, you have the choice of creating a Geodatabase by right clicking on the instance and choosing new Geodatabase.

Catalog	<b>Ψ</b> ×		
🗢 🔹 🚖 🕯	🗟   🏥 🔻   😂   👻 🗄		
Location: 🕕 LUKESA	VAGE_SQLEXPRESS.GDS		
🗉 ன Home - Docu	iments\ArcGIS		
🖪 🗄 🔂 Folder Conne	ctions		
🗄 🚳 Toolboxes			
📄 🗐 Database Serv	/ers		
🚽 Add Datal	pase Server		
	Connect		
	Disconnect		
🗄 🛄 F 🗙 Delete			
🕀 🗊 F 🥭 Refresh			
🗄 🚮 GIS Serv	New Geodatabase		
🖽 🛜 My Host	Attach		
	Restore		
	Permissions		
<b>*</b>	Properties		

16. Create new Geodatabase and change the location if needed of the database file. Also, you have the option of changing the initial size but the autogrow method will be established. Click OK.

New Geodatabase				23
Geodatabase Name:	Vector			
Geodatabase storage				
Location for the Geodataba	se files (on the serve	er):		
C:\data\				
Initial Size: 100		Units:	MB	•
		ОК		Cancel

17. Once complete you will see a new database in your instance. Afterwards, you can add users to the instance by right clicking on the instance in the TOC and choosing permissions.

*	Catalog	Ψ×
	🗢 🕈 🚖 🏠 🗔 🗮 🕯	- 🔛 😫
	Location: 🕕 LUKESAVAGE_SQLE	XPRESS.GDS 🔹
	📧 🙀 Home - Documents\Are	GIS
	🗄 🛅 Folder Connections	
	🗈 🚳 Toolboxes	
	🖃 🗐 Database Servers	
	📲 Add Database Server	r
	□ □ LUKESAVAGE_ □ Demo (VER	Connect
	E Demo (VER	Disconnect
	⊞ 🚺 Raster (VER 🗙	Delete
	🗄 🛄 Repl (VERS) 🥃	Refresh
	🖃 🛱 Database Connect	New Geodatabase
	🚂 Add Database	Attach
Ξ	🚽 demo.default.d	Restore
	vector.default.	Permissions
	w.demo.edit.o	
	w.repl.default.	Properties
	₩ 💭 w.repl.default.osa 🗄 🗊 GIS Servers	
	🗉 🚮 My Hosted Services	•

18. This is where you can add users and groups within your organization from Active Directory.

Select User or Group	8 23
Select this object type:	
User, Group, or Built-in security principal	Object Types
From this location:	
gbams.local	Locations
Enter the object name to select ( <u>examples)</u> :	
GBAMSSales	Check Names
Advanced OK	Cancel

19. Once you click ok, you then need to make a decision if they are going to be server administrators or not. In this example, they are not server administrators. Click ok or apply.

Permissions: lukesavage\sqlexpress
Database Server Users:
GBAMS\GBAMSSales
GBAMS\lsavage NT Service\MSSQL\$SQLEXPRESS
Add User Remove User
Server administrator
OK Apply Cancel

20. Next, you need to assign the group or user per Geodatabase if you have more than one. Because I separate Raster and Vector Geodatabases, the permissions change for users and groups depending on the intent for use. Right click on the new Geodatabase and select administration permissions in the drop down menu.

Ē	Paste		
×	Delete		
З	Refresh		
	New	۲	
	Import	۲	
	Export	۲	
	Administration	۲	Administer Geodatabase
	Distributed Geodatabase	Þ	Backup
	Change Version		Detach
	Save Connection		Permissions
Q	Share as Geodata Service		Permissions
8	Properties		Grant and revoke privileges on the Geodatabase.

21. In the permissions: <database> dialog, select the group or user you would like to add permissions to and select the appropriate permission. In this example, I will be giving the GBAMSSales group read/write permissions. Click ok or apply. Notice the other options available for Workgroup for example, backup, Administer Geodatabase, detach, save connection, compress, Geodatabase maintenance, and change versions. We will explore these tasks in subsequent sections.

Permissions: Vector	8
Database Server Users:	
GBAMS\GBAMSSales	
GBAMS\lsavage NT Service\MSSQL\$SQLEXPRESS	
🔘 No Geodatabase Permissions 🛛 🔘 Read Only	
Geodatabase Administrator Read/Write	
OK Apply Canc	el

22. For your users who edit and publish maps, you will want them to create a connection to the database. You can add database connections using the database connection utility as well. This is a primary connection for anyone running full versions of SQL Server. Go to the TOC of ArcCatalog again and expand Database Connections.



23. Click on 'Add Database Connection'. Add instance and the database to the connection strings. You have the choice of authenticating using the operating system or SQL Server user accounts. In this example, we are going to use the OSA method. Click ok.

Database Connection	<b>•••</b>
Database Platform:	SQL Server
Instance:	lukesavage\sqlexpress
Authentication Type:	Operating system authentication  User name: Password:
Database:	Vector 👻
About Database Connections	OK Cancel

24. The connection string for the name of the connection is always arbitrary. Recommend using the following naming convention.

- <instance if more than one instance; if not skip>.<database>.<version>.<OSA
  or SQL user>
- For this example, we will be renaming the connection to vector.default.osa.
- Right click on the new connection and select rename. Type in the new name.

🔟 vector.default.osa

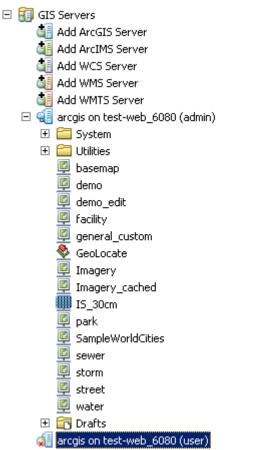
### Registering the Geodatabase in ArcGIS for Server

- 25. In order for ArcGIS for Server to connect to your database, you need to add ArcGIS for Server user as read or read/write depending on your uses.
- 26. You can either grant permissions to ArcGIS for Server service user through the Geodatabase Administration toolset in ArcCatalog or you can add the user in SQL Server and then grant permissions of the data to the user. In this exercise, we'll go through and add ArcGIS for Server user to SQL Server. This exercise is beneficial for GIS workflow scenarios. We will be assigning ArcGIS for Server service user that has read/write access to the database with no DBO or other special privileges.
- 27. Go to SQL Server Management Studio and add the new user to your Geodatabase or Geodatabases. Open Security within the SSMS TOC and right click on logins. Select new login. Add ArcGIS for Server Service user to the Geodatabase. Recommend assign a default database to general groups or users to be other than master.

28. Go to User Mapping and select on the appropriate databases you want ArcGIS for Server service user to connect to. Make sure it has db\_datareader or db\_datawriter enabled depending on the functionality you want.

Login Properties - TEST\a	rcgis				
Select a page	🔄 <u>S</u> Script -	🕶 [ 🚹 Help			
😭 General 🚰 Server Roles		apped to this login:			
🚰 User Mapping 🕾 Securables	Map	Database	User	Default Schema	
Matus		GBAWater001	000		
		GBAWork			
		GBAWork001			
		LucityGIS	TEST\arcgis	dbo	
		master	i zor kaogio		
		model			
		msdb			
	- -	Raster	TEST\arcgis	dbo	
		Replica	TEST\arcgis	dbo	
		ReportServer	1201 lalogio	000	
Connection		e role membership for: R ccessadmin	eplica		
Server: TEST-DB Connection: TEST\Isavage View connection properties Progress Ready	db_b ♥ db_d 0 db_d 0 db_d 0 db_d 0 db_d 0 db_d 0 db_d 0 db_o	ackupoperator atareader dladmin enydatareader enydatawriter wner ecurityadmin			
				ОК	Cancel

29. Click ok and go to your workstation and open ArcCatalog. Go to the GIS Servers section within the TOC of ArcCatalog. Connect to the administration connection by double clicking the connection or right click and choose connect.



30. Once connected, right click on the connection (in this case arcgis on testweb\_6080 (admin)) and choose server properties.

	_ `	,,
ð	Сору	Ctrl+C
×	Delete	
·	Rename	F2
2	Refresh	F5
	Connect	
_	Disconnect	
C	Server Properties	$\supset$
	New Folder	
1	Root Folder Properti	es
	ArcGIS Server Mana	ger
-		

31. Go to the data store tab and click the plus button.

ArcGIS Server Properties
Directories Configuration Store Clusters Machines Data Store Logs Types
Registered Databases    LucityGIS   Raster
Registered Folders
About registering databases and folders Validate All
OK Cancel Apply

32. Notice I already have LucityGIS and Raster inside of my data store and now I want to connect to the Replica. Add the replica name and click add for publisher database connection.

Register Database with the ArcGIS Server			
Name Replica			
,			
Publisher database connection	1		
		Add	
		Import	
Server database connection			
Server database connection			
		Add	
		Add	

33. Add the appropriate information in instance and database. Click ok and ok.

Database Connection		×
Database Platform:	SQL Server	•
Instance:	test-db	
Authentication Type:	Operating system au User name: Password:	thentication
Database:	Replica	<u> </u>
About Database Connections		OK Cancel

34. Your database should have a green check next to it to signify completed successfully.

ArcGIS Server Properties	×
Directories Configuration Store Clusters Machines Data Store Logs Types	1
Registered Databases	
LucityGIS     Raster     ✓ Replica	
Registered Folders	.
About registering databases and folders Validate All	
OK Cancel	Apply

35. Now you are ready to publish map services from connections to the SQL Server Enterprise Geodatabase.

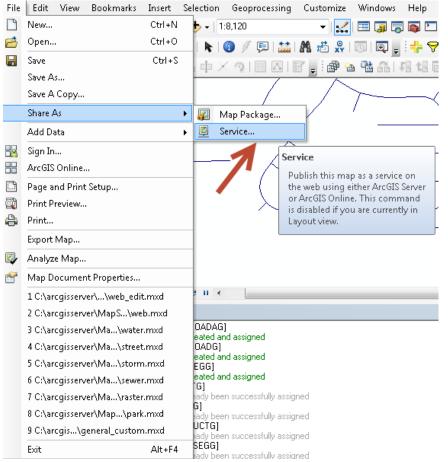
# Create Enterprise Geodatabase (formerly ArcSDE)

- 1. Choose the database platform you will be connecting to. Since Lucity is SQL Server friendly, this will demonstrate the sql server platform type.
- 2. Within SQL Server, an instance is the container or the repository of the databases.
- 3. Database would be a name given to the database. In SQL Server's case, you will be specifying a name of the database. In this example, we will be creating a database called "vector".
- 4. Since I have mixed mode turned on for sql authentication, I chose to use the sa account. As the sysadmin, I could have created a database using my OSA account; however, for organizations that have changes, I would recommend creating the database using the SA as this will tag the database to be owned by sa. For most cases, a mixed mode sql instance is the best practice. This gives your organization the flexibility of using both the sa account and OSA when managing databases. If a DBA is let go and they have created databases using their credentials and the SQL Server instance is set to only use OSA credentials, you will not like the outcome.
- 5. Uncheck sde owned schema as this was the old way ESRI used to use for the ArcSDE setup and configuration. DBO schemas are much preferred as they have the most flexibility of use within a windows environment.
- 6. Authorization file is the file created after authenticating ArcGIS for Server (i.e. c:\program files\ESRI\ License10.1\sysgen\keycodes)

🔨 Create Enterprise Geodatabase	
Database Platform SQL_Server	Database Platform
	Chaolify the type of
Instance test-db	Specify the type of database management
	system to which you will
Database (optional) vector	connect to create a
Jvector	geodatabase.
Operating System Authentication (optional)	Ũ
Database Administrator (optional)	<ul> <li>Oracle—Indicates</li> </ul>
sa	you are connecting
Database Administrator Password (optional)	to an Oracle
	instance
	<ul> <li>PostgreSQL—</li> </ul>
🗖 Sde Owned Schema (optional)	Indicates you are
Geodatabase Administrator (optional)	connecting to a PostgreSQL
	database cluster
Geodatabase Administrator Password (optional)	SQL Server—
	Indicates you are
Tablespace Name (optional)	connecting to a SQL
	Server instance
Authorization File	
Z:\Program Files\ESRI\License10.1\sysgen\keycodes	
	<b>T</b>
OK Cancel Environments << Hide Help	Tool Help

## Publishing and Configuring Map Services

- 1. Open ArcMap and locate your .mxd to publish to ArcGIS Server
  - Recommend: If you have an image, recommend separating the image from the vector map services for performance reasons.
  - Recommend: Cached Image Service
  - Recommend: Converting dynamic labels to Annotation and scale.
  - Recommend: Make your map services scale dependent so not everything shows up in a small scale extent.
  - Recommend: Use ArcGIS Server Web Adapter if using a DMZ. Please consult your IT Administrator for setting up a DMZ.
- 2. When cartographic and scaling operations are complete, go to the file menu and click on 'Share As/Service'.



3. Share as Service dialog prompts. There are three choices. Choose Publish a service and click next.

Share as Service	8
	<ul> <li>Publish a service</li> <li>Save a service definition file</li> <li>Overwrite an existing service</li> </ul>
	About sharing a service
	Next > Cancel

4. Publish a Service dialog appears and give it a name. Click Next.

	g connection or create a new one
Server type:	No Connection Set
vice name	
sewer	

5. Service Editor dialog will appear and this is where you add your settings for your map service.

vice Editor onnection: arcgis on Iul	kesavage_6080 (admin) Sen	vice Name: sewer	🖳 Import	🗸 Analyze	🔁 Preview	🚛 Publish	
Seneral	General		-				
arameters	General						
Tapabilities	Service Name:	sewer					
Mapping	Connection:	http://lukesavage:6080/arcgis	(admin				
ooling							
rocesses	Type of Server:	ArcGIS Server					
aching	Type of Service:	Map Service					
tem Description		Start service immediately					

6. Click on Analyze at the top of the dialog. After the analyze tool has completed, it will list errors, warnings and messages letting you know if there are any issues with the performance of the data being rendered to ArcGIS Server.

) (	Errors	🛕 61 Warnings 🕕 1 Messag	es	Search:			
	Severity	Status	Code	Description	Name	Туре	Data Frame
Δ	Medium	Resolved In Map Service Definition	10009	Enabling the option to convert layer transparency to colo	Street Light	Layer	Layers
Δ	Medium	Resolved In Map Service Definition	10009	Enabling the option to convert layer transparency to colo	Facility Building	Layer	Layers
Δ	Medium	Resolved In Map Service Definition	10009	Enabling the option to convert layer transparency to colo	Park Path	Layer	Layers
<u>î</u>	Medium	Resolved In Map Service Definition	10009	Enabling the option to convert layer transparency to colo	Park Landscape	Layer	Layers
<u>î</u>	Medium	Resolved In Map Service Definition	10009	Enabling the option to convert layer transparency to colo	Parks	Layer	Layers
Δ	Medium	Resolved In Map Service Definition	10009	Enabling the option to convert layer transparency to colo	Street Median	Layer	Layers
<u>î</u>	Medium	Resolved In Map Service Definition	10009	Enabling the option to convert layer transparency to colo	Parcels	Layer	Layers
<u>î</u>	Medium	Unresolved	10016	Layer uses symbol level drawing with a transparent color	Park Path	Layer	Layers
Δ	Medium	Unresolved	10016	Layer uses symbol level drawing with a transparent color	Park Landscape	Layer	Layers
Δ	Medium	Unresolved	10017	Layer uses symbol level drawing with a picture marker sy	Street Sign	Layer	Layers
Δ	Medium	Unresolved	10017	Layer uses symbol level drawing with a picture marker sy	Street Sign	Layer	Layers
Δ	Medium	Unresolved	10017	Layer uses symbol level drawing with a picture marker sy	Street Sign	Layer	Layers
Δ	Medium	Unresolved	10017	Layer uses symbol level drawing with a picture marker sy	Street Sign	Layer	Layers
Λ	Marali	( Income li cont	10017	بنج مماسحه مسطعته واطلاب معتسماه المنبط المطعبية ممعت محبب ا	Charack Class	1	1

- If errors, you need to resolve before proceeding.
- If warnings, you may or may not address these issues but ESRI highly recommends fixing these issues.
- Messages are helpful hints on low priority performance issues. Most of the time, these do not need to be addressed as issues as they are intended.
- 7. Go to parameters in the TOC for the Service Editor dialog and change the anti-aliasing to Normal. Not all map services will show artifacts but if so normal is a good place to start.

**Note:** Anti-Aliasing: A graphics technique that blends foreground and background pixels near edges of objects to trick your eye into seeing smoother borders. You can use this option if unwanted artifacts appear in your map displays, for example, jagged lines, wavy lines or bands, and moiré patterns.

Use the following options to get the graphics effect and performance that will meet your map service needs:

- None: No antialiasing is performed.
- Fastest: Minimal antialiasing is performed, optimized for speed.
- Fast: Some antialiasing is performed, optimized for speed with better quality than can be achieved with Fastest.
- Normal: A good balance of speed and quality.
- Best: The best quality antialiasing. This option takes the longest to render.
- Force text anti-aliasing should be enabled by default.
- 8. Change the maximum number of records returned by the server. This will increase the records returned by one query. 3000 is a good number to return unless your users need more.

onnection: arcgis on lul	kesavage_6080 (admin) Service	Name: sewer	🖳 Import	🗸 Analyze	🥶 Preview	🚚 Publish	0
General Parameters Capabilities Mapping Pooling Processes Caching	Parameters Document Location Original Document: Published Document: Anti-Aliasing Anti-Aliasing: Text Anti-Aliasing:	C:\arcgisserver\MapService: C:\arcgisserver\MapService:		Normal			] ] ]
ltem Description	Properties Maximum number of re- Cluster Choose the cluster hos Output Directory	cords returned by the server:		3000 default	Advanced		
	Directory:	C:\arcgis	server\direct	ories\arcgisoul	tput	•	

#### Unlock Schema

- 7. Fixed in ArcGIS 10.1 SP1 from bug number NIM082716, setting SchemaLockingEnabled to false in Service Properties of ArcGIS for Server 10.1 SP1 disables schema locking. For those who wish to serve their production data as a map service, this is extremely helpful if you need to make any kind of schema changes in your database.
- 8. Within the service editor dialog when publishing a map service, go to Parameters within the menu tabs on the left and click on advanced.

Se	rvice Editor								×
[	Connection: arcgis on lukesava	ge_6080 (admin) Service I	Name: demo		🚉 Import	🗸 Analyze	🥶 Preview	🚛 Publish	
	General Parameters	Parameters							
	Capabilities	Document Location Original Document:	C:\arcgisserver\MapSe	ervices	\web.mxd				
	Mapping Pooling	Published Document:	C:\Demo\demo.mxd						
	Processes	Anti-Aliasing:				Normal		•	)
	Caching	Text Anti-Aliasing:				Force		•	)
	Item Description	Properties							
		Maximum number of rec	ords returned by the se	rver:		1000			
					$\rightarrow$		Advanced		
		Cluster Choose the cluster host	ing the service:			default		-	)
		Output Directory Directory:	(C;)	\arcgiss	erver\direct	ories\arcgisout	put	•	

9. Click on the 'Advanced' button and change the values for schemaLockingEnabled to false if you don't want the map service to lock your database. Click ok when finished.

		_
Property Name	Value	
disableIdentifyRelates	false	
maxDomainCodeCount	25000	
ma×ImageHeight	2048	
maxImageWidth	2048	
schemaLockingEnabled	false	
Use Default	ок	Cancel

10. Go to the Capabilities tab and make sure the Mapping service is the only box checked.

Service Editor						X
Connection: arcgis on lukesave	age_6080 (admin) Service Name: test3	🖳 🕅 Import	🗸 Analyze	🥶 Preview	🚛 Publish	$\diamond$
General Parameters Capabilities	Capabilities Choose the capabilities you would like enabled for this se	ervice:				
Mapping Pooling Processes Caching Item Description Sharing	<ul> <li>Mapping (always enabled)</li> <li>WCS</li> <li>WMS</li> <li>Feature Access</li> <li>Schematics</li> <li>Mobile Data Access</li> <li>Network Analysis</li> <li>KML</li> <li>WFS</li> <li>Lucity Data Update SOE</li> </ul>					

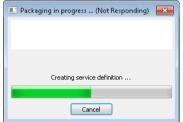
11. In pooling, usually 2 minimum and 5 maximum will suffice for most organizations. For large organizations, increase based on user load.

Service Editor			23
Connection: arcgis on lukesava	ge_6080 (admin) Service Name: sewer 🕮 In	nport 🖌 Analyze	🐺 Preview  된 Publish 🕥
Connection: arcgis on lukesava General Parameters Capabilities Mapping Pooling Processes Caching Item Description	ge_6080 (admin) Service Name: sewer   Pooling  Specify the number of instances  Minimum number of instances per machine:  Maximum number of instances per machine:  Timeouts  The maximum time a client can use a service:	600	eeconds
	The maximum time a client will wait to get a service: The maximum time an idle instance can be kept running:	60 1800	seconds seconds

- 12. In Processes, go to recycle this configuration every: <number> and change to a desirable value. Usually, 12 hours is a good recycled time frame.
- 13. Change the starting at value to 6:00 am or whenever you would like it to start

Service Editor						8
Connection: arcgis on lukesava	age_6080 (admin) Service Name: sewer	🖳 Import	🗸 Analyze	🥶 Preview		٢
General Parameters Capabilities Mapping Pooling Processes Caching Item Description	Processes Services run in processes on the host machin Run instances of this configuration: In a separate process for each instance (hi Instances per process (low isolation only): Recycling shuts down the process and resta performance and stability. Recycle this configuration every: Starting at: I Periodically check and repair data connec Check and repair instance(s) every:	gh isolation) rts it at regula 12 6:00 AM	ho	help maintain our(s), nute(s),	•	

- 14. If you want to cache, click on caching and change the values to a suitable number. For basemaps and imagery, recommend caching. For interactive map services, leave caching turned off which is by default.
- 15. If you want to see the speed of your map service, click on the preview icon in the menu toolbar. Otherwise, click on publish.



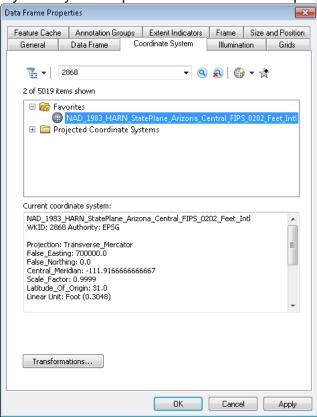
16. Below are Lucity map service deployment scenarios.

- You may have multiple map services for each group if needed. It really depends on your setup with replication, versioning and how complex this may be. Each organization may be different on how they want to handle distributing maps to the users.
- Create Basemaps and Imagery services (tiled) for distribution to your users. Consider your users and what content they would like to see in Basemaps.
- Make sure you're basemap services are using the same coordinate systems (prefer wkid) in the publishing map document. This is important when going to and from basemap services so that it can honor the zoomed extent. For ArcGIS Online services and mashing up with local services, consider Mercator.
- Make sure operational layers are using wkid for the coordinate system in your map document.

# Lucity Data Update SOE Configuration

This server object extension to ArcGIS for Server pushes edits from the Lucity Web and Desktop to the Geodatabase when users edit attributes that are linked.

- 1. Open ArcMap
- 2. Right click on Layers in the table of contents and make sure the coordinate system is using the same spatial reference as the operational layers in your map services. In this example, we are using WKID 2868.



3. Add feature class that is mapped to Lucity. If multiple GIS connections that are synchronizing to Lucity, create a separate map service for each connection with only one feature class per database. The connection to the database must use a user with editing rights.

🔇 Lucity_Edit.mxd - ArcMap				
File Edit View Bookmarks Insert Selection Ge	oprocessing Custom	ize Windows Help		
: 🗋 📸 🔚 🕼   % 🗿 🛍 🗙   🔊 (~   🔶 +   1:7.97	5 🔹	🟒 🖽 🧊 🖓 🚳 🗅	] 🎥 🖕	
i 🔍 🔍 🕎 🎱   XK 23   🗲 🔶   🕅 - 🖾   🔈	/ 🗊 🔛 🛤 🕫 :	🤗   💽   편 🖕 🗄 Editor	r ( k k ( z z 4	1-米I尼尼中×
🗄 🕂 💎 ঝ   📈 🔭 🤮 🥸 📷   Lucity Views - 🏊 📺	) 🔨 🛧 🖁 Asset Ty	ipe:	<ul> <li>✓</li> </ul>	Type an ID to search>
🔝 🌒 🏭 🖉 S 🐰 🖳 + 💁 - 🕅 - I 🏦 🛙	Disable Lucity Editor	Settings Alias Import	🛛 🚽 🗄 World Geoco	de Service (/ 👻   👫 <type< th=""></type<>
Table Of Contents 🛛 🕈 🗙				
📚 🔍 🤝 🗄				
<ul> <li>Gever Pump Station</li> <li>✓</li> </ul>				
				•

- 4. Go to the File/Share As/Service menu.
- 5. Publish a service

Share as Service	<b>—</b>
	<ul> <li>Publish a service</li> <li>Save a service definition file</li> <li>Overwrite an existing service</li> </ul>
	About sharing a service
	Next > Cancel

- 6. Click Next
- 7. Create a service name. Remember, the name used is case sensitive in the rest service URL

Publish a Service	<b>—X</b> —
Choose a connection	
arcgis on lukesavage_6080 (admin)	-
Server type: ArcGIS Server	
Service name	
Lucity_Edit	
< Back Next >	Cancel

- 8. Click Next
- 9. Publish a Service in the root folder or a designated folder.

Pu	iblish a Service		23
	Publish service to folder	[root]	
-		Sack Continue Cance	el

- 10. Click Continue
- 11. In the Service Editor tabbed menu/Table of Contents, click on parameters.
- 12. Under properties, click on the advanced button

ionnection: arcgis on lu	ukesavage_6080 (admin) Service	Name: Lucity_Edit	🖳 Import	🗸 Analyze	🤯 Preview	鰔 Publish	1 (
General Parameters	Parameters Document Location						
Capabilities	Original Document:	C:\Demo\Lucity_Ed					
Mapping KML	Published Document:	The service has not	yet been published				
Pooling	Anti-Aliasing Anti-Aliasing:			None		•	•]
Processes Caching	Text Anti-Aliasing: Properties			Force		•	
Item Description	Maximum number of re	cords returned by the	server:	1000			]
Sharing	Cluster		->		Advanced		
	Choose the cluster hos	ting the service:		default		•	]
	Output Directory Directory:		C:\arcgisserver\directi	ories\arcgisout	:put	•	]

13. Change the values for schemaLockingEnabled to 'false' if you don't want the map service to lock your database. Click ok when finished.

Advanced Properties	X
Property Name	Value
disableIdentifyRelates	false
maxDomainCodeCount	25000
maxImageHeight	2048
maxImageWidth	2048
schemaLockingEnabled	false
Use Default	OK Cancel

14. Go to the Capabilities tab and make sure Mapping and the Lucity Data Update SOE capability is checked.

Service Editor						×
Connection: arcgis on lukesav	age_6080 (admin) Service Name: Lucity_Edit	🖳 🕅 Import	🖌 Analyze	🥶 Preview	된 Publish	٢
	age_5000 (admin) Service Name: Lucity_Edit  Capabilities Choose the capabilities you would like enabled for this set Wapping (always enabled)  VGS VMS Feature Access Feature Access Hotwork Analysis Mobile Data Access Network Analysis VHE VHE5 Lucity Data Update SOE		🖌 Analyze	Preview		

15. In pooling, usually 1 minimum and 3 maximum will suffice for most organizations. For large organizations, increase based on user load but be careful of the number of pools per CPU core.

Si	ervice Editor				8
	Connection: arcgis on lukesav	age_6080 (admin) Service Name: Lucity_Edit 🖳 Impor	🖌 🖌 Analyze	🥶 Preview 🛛 🔬 Publish	
	General	Pooling			
	Parameters				
	Capabilities	Specify the number of instances			
	Mapping	Minimum number of instances per machine:			
	Lucity Data Update SOE	Maximum number of instances per machine: 3			
	Pooling				
	Processes	Timeouts			
	Caching				
	Item Description	The maximum time a client can use a service:	600	seconds	
	Sharing	The maximum time a client will wait to get a service:	60	seconds	
		The maximum time an idle instance can be kept running:	1800	seconds	

16. In Processes, go to recycle this configuration every: <number> and change to a desirable value. Usually, 12 hours is a good recycled time frame.

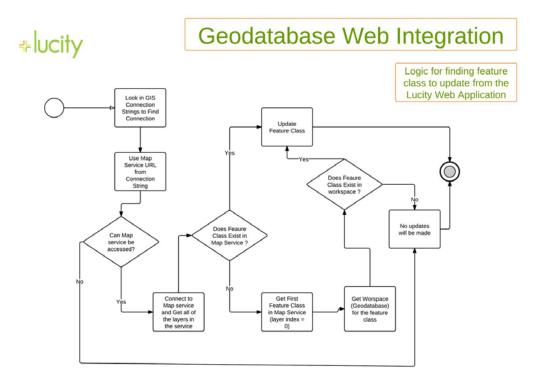
17. Change the starting at value to 6:00 am or whenever you would like it to start

Service Editor					83
Connection: arcgis on lukesav	rage_6080 (admin) Service Name: sewer	🚉 Import 🗹 An	alyze 🥳 Preview	된 Publish	٢
General	Processes				
Parameters	Services run in processes on the host maching	nes.			
Capabilities Mapping	Run instances of this configuration:				
Pooling	In a separate process for each instance (hi	gh isolation)		-	
Processes	Testano en antesta de la constante de la consta				
Caching	Instances per process (low isolation only):				
Item Description	Recycling shuts down the process and resta performance and stability.	rts it at regular interva	als to help maintain		
	Recycle this configuration every:	12	hour(s).		
	Starting at:	6:00 AM	1		
	V Periodically check and repair data connect	tions for idle instances			
	Check and repair instance(s) every:	30	minute(s).		
Click on publ	ish.				
Packaging in progress					
	(Not responding)				

💷 Packaging in progress (Not Responding)	×
Creating service definition	
Cancel	

- 19. Below are definitions for the server object extension for Lucity and deployment scenarios.
  - Lucity Data Update SOE. This server object extension is used to push edits from the Lucity Web and Desktop applications to the Geodatabase when users edit relevant attributes in the web and desktop. You will only need one map service using the Lucity to Geodatabase update SOE capability per Geodatabase.
  - For production environments, we suggest creating a dedicated service for the Lucity to Geodatabase Update SOE so it is not shared with services used for map display. Only use one feature (if multiple databases, use one map service with one feature per Geodatabase; there will be two map services created, one for each geodatabase; each map service will have one feature class for performance reasons.

### Lucity Data Update SOE Logic



### How to Create a Feature Service

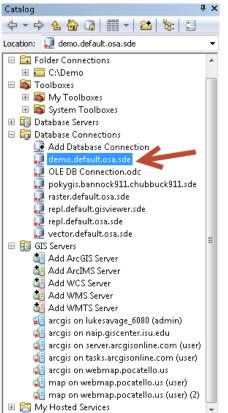
#### **Preparing Map for a Feature Service**

New in Lucity 7.60, we have created a new redlining tool in Lucity WebMap. To configure the Geodatabase and ArcGIS for Server to enable this new capability, we must create a feature class or feature classes depending on the type of redlining capability you desire. We support points, lines and polygons. Below we will demonstrate the creation of a feature dataset, three feature classes and published them to a feature service.

- 1. Open ArcMap
- 2. Click on the Catalog button if it is not already open.



3. In the Catalog Tree, go to database connections and open your production GIS database.



- Right click on the connection and choose new and a submenu will appear.
   Click on Feature Dataset

	in on r calure Dataset		
		den	no default osa sde
	Œ	1	Сору
	E		Paste
	E E	×	Delete
	 •		Rename
	Œ	~	Refresh
			Make Default Geodatabase
Ъ	Feature Dataset		New 🕨
	Feature Class		Import •
	Table		Export •
	View		Administration
뮵	Relationship Class		Distributed Geodatabase
<b>1</b>	Raster Catalog		Connect
	Raster Dataset		Disconnect
<b>***</b>	Mosaic Dataset		Connection Properties
200 C	Schematic Dataset		Geodatabase Connection Properties
8	Toolbox	Q	Share as Geodata Service
&	Address Locator	B	Item Description
&	Composite Address Locator	~	Properties

6. Give the Feature Dataset a name. In this example we will call it Redlining

New Feature D	Jataset 📃	×
Name:	Redlining	
	< Back Next > Cancel	

- 7. Click Next
- 8. Set your coordinate system for the feature dataset

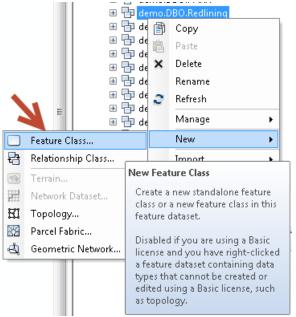
New Feature Dataset	×
Choose the coordinate system that will be used for XY coordinates in this data Geographic coordinate systems use latitude and longitude coordinates on a sp of the earth's surface. Projected coordinate systems use a mathematical conv transform latitude and longitude coordinates to a two-dimensional linear syste	pherical model version to
🚡 ▾│ 2868 🔹 🔍 🛞 蒙 ▾ 🎽	ŧ
2 of 5018 items shown	
<ul> <li>Favorites</li> <li>NAD_1983_HARN_StatePlane_Arizona_Central_FIPS_0202</li> <li>Projected Coordinate Systems</li> <li>State Plane</li> <li>NAD 1983 HARN (Intl Feet)</li> <li>NAD 1983 HARN StatePlane Arizona Central FIPS</li> </ul>	
٠	4
Current coordinate system:	
NAD_1983_HARN_StatePlane_Arizona_Central_FIPS_0202_Feet_Intl WKID: 2868 Authority: EPSG Projection: Transverse_Mercator False_Easting: 700000.0 False_Northing: 0.0 Central_Meridian: -111.91666666666667 Scale_Factor: 0.9999 Latitude_Of_Origin: 31.0 Linear Unit: Foot (0.3048)	
< Back Next >	Cancel

#### 9. Click Next

10. Click Next unless you need vertical coordinate systems applied to the data 11. Set your Z, M and XY tolerance. In this example, we will take the defaults.

New Feature Dataset	×
- XY Tolerance	
The XY tolerance is the minimum distance between coordinates before they are considered equal. The XY tolerance is used when evaluating relationships between features.	
0.003280839895013 Foot	
Z Tolerance	
0.001	
M Tolerance	
0.001 Unknown Units	ance is the minimum distance between coordinates before they are qual. The XY tolerance is used when evaluating relationships between S9895013 Foot Unknown Units efault About spatial reference properties ult resolution and domain extent (recommended)
Reset To Default <u>About spatial reference properties</u>	
Accept default resolution and domain extent (recommended)	
< Back Finish Canc	el

- 12. Click Finish
- 13. In the Database Connection, right click on the newly created Feature Dataset and choose new and submenu Feature Class



14. In this example we will create a point Feature Class and call in RPoint

New Feature Class		×
Name:	RPoint	
Alias:	Redlining Point	-
Туре		
	es stored in this feature class:	
Point Feature	s 🔻	
Geometry Prop		
	s include M values. Used to store route data. s include Z values. Used to store 3D data.	
Coordinates	s include 2 values. Osed to store 3D data.	
	< Back Next > Can	icel

- 15. Click Next
- 16. Except defaults unless you are using configuration keywords 17. Click Next

18. Add desired fields to your redlining point feature class. If you plan on using editing user, date and last editing fields, make sure you turn on editor tracking after creating the feature class.

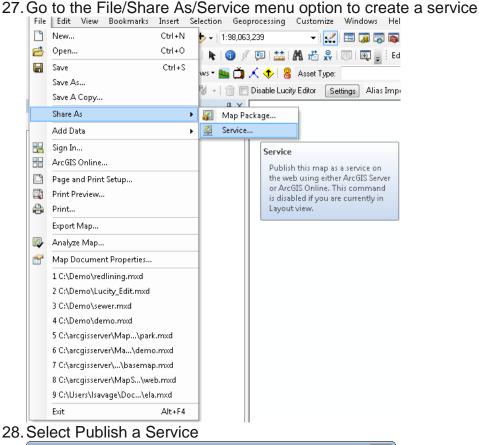
	Field Name	Data Type	
OBJECTID		Object ID	
SHAPE		Geometry	
NAME		Text	
DESCRIPTION		Text	
NOTES		Text	
NOTES2		Text	
GlobalID		Global ID	
created_user		Text	
created_date		Date	
last_edited_user		Text	
last_edited_date		Date	
	properties.		*
ck any field to see its p Field Properties Alias	oroperties.		
ield Properties Alias	·		Import

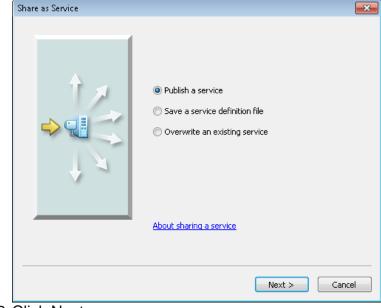
- 19. Click Finish
- 20. Repeat steps 13 through 18 to create polygon and line Feature Classes if desired.
- 21. Make sure to assign credentials for access to the newly create feature dataset and optional versioning before publishing.
- 22. Optional: Right click on each feature class that you would like to enable edit tracking and choose properties.
- 23. Go to the tab Editor Tracking and click on Enable Editor Tracking
- 24. Map the fields to the appropriate Feature Class fields
- 25. Recommend using UTC

Fields	ndexes Subty	pes Feature Extent	Relationships	Representation
General	Editor Tracking	XY Coordinate System	Domain, Resol	ution and Toleran
		a feature is created		•
Create	Date Field:	created_date		-
Editor I		last_edited_user		<b>•</b>
Edit Da	te Field:	last_edited_date	9	<b>_</b>
Record D	ates in:	UTC	🔘 Database Time	
specified		e date and edit date fields recommended if there are		

26. Click Apply or ok.

### **Publishing a Feature Service**







30. Choose server connection and create service name

Publish a Service			23			
Choose a connec	tion					
arcgis on lukesavage_6080 (admin)						
Server type:	ArcGIS Server					
Service name						
redlining						
		< Back Next >	Cancel			

- 31. Click Next
- 32. Use in folder or in the root of ArcGIS service directory
- 33. Click Continue
- 34. Go to Parameters and click on Advanced

Publish 🥢	
•	
•	
•	
-	

#### 35. Set SchemaLockingEnabled value to 'false'

Advanced Properties	
Property Name	Value
disableIdentifyRelates	false
maxDomainCodeCount	25000
maxImageHeight	2048
maxImageWidth	2048
schemaLockingEnabled	false
Use Default	OK Cancel

- 36. Click Ok
- 37. Go to the Capabilities tab and make sure Mapping and Feature Access is selected.

Service Editor						×
Connection: arcgis on lukesava	ge_6080 (admin) Service Name: redlining	🚉 Import	🗸 Analyze	🥶 Preview	된 Publish	$\diamond$
Connection: arcgis on lukesava. General Parameters Capabilities Mapping Feature Access Pooling Processes Caching Item Description Sharing	ge_6080 (admin) Service Name: redlining Capabilities Choose the capabilities you would like enabled for this s WdS WdS Feature Access Schematics Mobile Data Access Network Analysis KML WF5 Lucity Data Update SOE	]	Analyze	Q2 Preview	Self Publish	

38. Click on the submenu tab 'Feature Access' and add the selection 'Enable ownership-based access control on features'. This option will only allow the created user features to be updated by the owner of the features but only allow the other users to query the created data.

Service Editor	×
Connection: arcgis on lukesav	age_6080 (admin) Service Name: redlining 📃 Import 🗸 Analyze 🤯 Preview 🚚 Publish 🚫
General Parameters	Feature Access           REST URL:         http://lukesavage:6080/arcgis/rest/services/redining/FeatureServer
Capabilities	SOAP URL: http://lukesavage:6080/arcgis/services/redlining/MapServer/FeatureServer
Mapping Feature Access	Operations allowed:
Pooling Processes	Properties
Caching Item Description	Allow geometry updates
Sharing	Apply default z-value     When inserting or updating features with no z-values, set z-value to:
-	Enable ownership-based access control on features     Operations allowed on features created by other users :
	Advanced Options

- 39. Analyze to make sure no errors are present.
- 40. Click Publish
- 41. Optional: If you wish to secure the feature service, go to the below section of 'Security a Map Service' and add each user account to have access to the newly created map/feature service.

## Enabling the Geometry Service

We need to enable the geometry service for Lucity GIS Web Map application to allow for buffering, projecting, calculating lengths and areas.

1. Log into ArcGIS Server Manager.

Please provide your ArcGIS Server username and password Username: AGS Password: ••••••• Login	
	)

2. Once logged in, go to the site root tab on the left side of the browser and click on the folder called 'Utilities'

				es	ri.com   <u>Resource Cent</u>	er   Sign Out   Help
ArcGIS Ser	ver Manager	s	ervíces	Site	Security	Logs
Manage Services		KML Network Links				
Folders	Serv	rices			Pu	blish Service 🗱
Site (root) <ul> <li>System</li> <li>Utilities</li> </ul>	<b>a /</b>	basemap ∕ (Ma Status: Instances Runnii Instances in Use Maximum Instan	Started ng: 1 :: 0			ng ⊨ = <i>C</i> ×
K		demo / (Map Si Status: Instances Runnii Instances in Use Maximum Instan	Started ng: 1 :: 0			ng ⊨ = C ×
		demoext ∕ (Ma Status: Instances Runnii Instances in Use Maximum Instan	Started ng: 1 :: 0			eî ► ■ 13 ×

- 3. Go to the Geometry Service and click on the play icon ► to start if the service is stopped
- 4. Once complete, the service is now available.



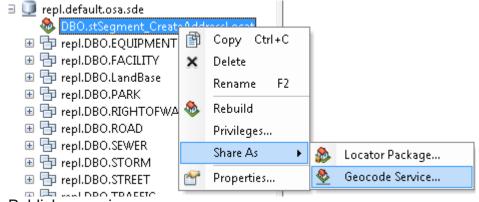
## Creating a Geocoding Service

Geocoding services allow Lucity GIS Web Map to find and display addresses on a map and see how they relate to surrounding features. We do support composite geocoding services.

- 1. Open ArcCatalog
- 2. Create a geolocator in your publishing database
- 3. For dual ranges, make sure to set the 'Match with no zones' value to Yes

Ado	dress Locator Properties	_	x
	Connguration Reyword		
	Support intersections	True	î.
Ð	Reference data tables		
Ð	Place name alias table		
Ŧ	Input address fields		
Ŧ	Outputs		
	Geocoding options		
	Minimum match score	85	
	Minimum candidate score	75	
	Match if best candidates tie	Yes	
	Spelling sensitivity	80	
	Side offset	20	
	Side offset units	Feet 🚽	
	End offset	3	
	End offset units	Percent	E
	Intersection connectors	&@   and at	
	Match without house number	No 🥒 🚽	
	Match with no zones	Yes	
	Left side value	L	
	Right side value	R	
Ŧ	Performance		
G	eocoding options eocoding options that control how the locat places the locations of matched addresses.	<moi. or finds and filters the list of candidates and h</moi. 	· · ·
A	bout locator properties	OK Cancel	

4. Right click on the geolocator in the Catalog Tree and click on Share As/Geocode service



- 5. Publish a service
- 6. Click Next

7. Make the service name simple so it's easier to remember.

Publish a Servic	e	×
Choose a conn	ection	
arcgis on l	ukesavage_6080 (admin)	-
Server type	e: ArcGIS Server	
Service name		
GeoLocate	3	
		< Back Next > Cancel

- 8. Click Next
- 9. Choose a folder or keep default location as root
- 10. Click Continue
- 11. Select Parameters and change the interactive Find if you want more than 500 records returned by the server.

ervice Editor					×
Connection: arcgis on lu	ukesavage_6080 (admin) Service Name: GeoLocate	🗸 A	nalyze	된 Publish	
General	Parameters				
Parameters					
Capabilities	Cluster				
Pooling	Choose the cluster hosting the service: default		•		
Processes	Interactive Find				
Item Description	Maximum number of candidates returned by the server: 10	000			
	Batch Geocoding				
		000			
	Recommended number of records to pass in each batch job: 10	000			
		000			
				-	

12. Analyze and fix any errors. If no errors, publish

#### Securing a Map Service

Starting at Lucity 7.60, we are supporting ArcGIS for Server secure map services. In this section, we will describe the deployment of secure map services as a built-in user store.

ArcGIS Server Manager	
	Please provide your ArcGIS Server username and password Username: AGS Password: •••••••• Login

1. Log into ArcGIS Server Manager.

- 2. Go to the Security menu to configure the security features.
- 3. Click on configuration settings pencil to configure the type of data store.

4. Again, we will be configuring a built-in store at the ArcGIS for Server level not the web store or the windows domain/LDAP configuration in this example.

Security Configuration Wizard	×
User and Role Management	<u>Help</u>
Choose the source of users and roles you will use for ArcGIS Server security.	
Choose one of the following options:	
Osers and roles from ArcGIS Server's built-in store	
<ul> <li>Users and roles from an existing enterprise system (LDAP or Windows Domain)</li> </ul>	
<ul> <li>Users from an existing enterprise system (LDAP or Windows Domain) and roles from ArcGIS Server's built-in store</li> </ul>	
Next	ncel

- 5. Click Next
- 6. Finish after reviewing configuration
- 7. Optional (if using tokens), configure your Long-Lived tokens to the appropriate IT policy. In this example, the lifespan for Long-lived tokens will be 1 day.

Edit Token Settings		x	
Edit the token settings and click	< Save	<u>Help</u>	
Lifespan of Short-lived Tokens:	60 🚔 minutes		
Lifespan of Long-lived Tokens:	1 🚔 days 🗲		
Shared key:	b53f7567-30c3-415d-939f-	7	
	The shared key, used to encryp and decrypt tokens, is critical to ensuring the identity and authorization of clients. The ke should be set using 16 random characters.	y y	
	Save	9	
<ol> <li>8. Click Save</li> <li>9. Go to the roles subr</li> </ol>	nenu of security		
ArcGIS Server Manager	Services Site	Security	Logs
Settings Users <mark>Roles</mark>			
Roles in the Identity Store			Hel
A role is a set of users related by function, title, or some on to add a role. To locate a specific role, enter the first few l		d to manage roles, cli	ck the New Role button
	Find Role	:	Q 🔏 New Role
Role name: Description	Role type: User		/ ×

10. Click new role

**▲** 1 ►

11. Add a role called 'viewer'. In this example, we will create a role used for the end user. You can similarly create roles for administrators and publishers in the same way. If you already had a user create, you can add them to the role by clicking the person with the plus sign icon 🕹

<u>Help</u>

<u>Help</u>
ancel

- 12. Once finished, click on create.
- 13. In this example, we will create a user. Go to the submenu item called 'users'.
- 14. Click on new user.

ArcGI	S Server Manag	er	Services	Site	Security	Logs
Settings	Users Roles					
Users in the I	dentity Store					<u>Help</u>
			GIS Server resource. When th first few letters of the userna			ers, click the New
Username		Full name:	Email:			
chuck		Eric Daniel	edaniel@lucit	ty.com		/ ×
◀ 1 ►						

- 15. Once the 'new user' dialog appears, add the user information. In this example, we will be adding the newly create role to the user during the creation of the user account.
- 16. Add the information in the 'new user' dialog
- 17. Click on the person with the plus sign icon 🚣

Username:	Jasper	Available roles	Role type:		Member of	<u>Help</u>
Password:	•••••	viewers	User	26	viewers	×
Repeat Password:	•••••		۹			
Email:	jasper@frankenberry.com	1 ►		T		
Full name:	Jasper Frankenberry					
Description:						
		)				
					Create	Cancel

#### 19. We now have the new user added to the users list.

ArcGIS Server	Manager	Services	Site	Security	Logs
Settings Users	Roles				
Users in the Identity Sto	re				<u>Help</u>
	vare agent that will access an ArcGIS Serve o locate a specific user, enter the first few le				ers, click the New
			Find User:		Q 🎝 New User
Username	Full name:	Email:			
chuck	Eric Daniel	edaniel@lucity.(	com		/×
Jasper	Jasper Frankenberry	jasper@franker	berry.com		/ ×

20. Assuming you published a map service for the intention to secure, go to the main menu and click on 'services'

demo secure 🖊 (M	ap Service)
Status:	Started
Instances Running:	1
Instances in Use:	0
Maximum Instances	2

of ► = 3 ×

- 21. Click on the lock icon of
- 22. Click on the radio button 'Private, available only to selected users' to enable security. You have the choice to allow access to all users who are logged in which gives access to all users in the 'built-in' users security store but in this example we only want to use the 'viewers' role.
- 23. A message will appear 'no roles have been selected'. This is a friendly reminder that there have been no roles selected.

Edit Pe	rmissions		X
1		<u>Help</u>	
	No roles have been selected. Only Administrators or Publishers will have access to this resource.	×	
	ecurity settings for this resource		
	Private, available only to selected users		
1	Allow access to all users who are logged in		
/	Available roles Allowed roles		
	Role name:		
	viewers ≇5		
	Save	ancel	

24. Click on the person with the plus sign icon 🕹 under roles. This will add the 'viewers' role into the 'Allowed roles' dialog.

Allowed roles		
viewers	×	
	Save	Cancel

- 25. Click Save
- 26. For the map service, you should now see the lock icon a in the locked position.





27. Test the map service security. You can do this by going to the rest endpoint of the map service.

Example:

http://<servername>/<alias>/rest/services/<nameofmapservice>/MapServ er

28. Supply the newly created user credentials and click on login

🗲 ) 🕙 lukesavage/map/rest/login?redirect=http%3A//lukesavage/map/rest/services/demo\_secure/MapServer 👘

#### ArcGIS REST Services Directory

<u>Home</u>

#### ArcGIS Server REST API Login

User Name:	jasper	
Password:	•••••	
Login		

29. If you see the rest service directory open, you have successfully secured your map service.

Secure/MapServer Vices/demo_secure/MapServer				
ArcGIS REST Services Directory				
Home > <u>services</u> > <u>demo_secure (MapServer)</u>				
AND A REAL				
demo_secure (MapServer)				
View In: ArcGIS JavaScript ArcGIS.com Map ArcMap A	ArcGIS Explorer			

View Footprint In: ArcGIS.com Map

# Maintenance

#### Geodatabase Administration Tools

Starting in ArcGIS v10.1, the interface has changed so an admin user can administrate the Enterprise Geodatabase.

1. Go to ArcCatalog and connect to a Geodatabase as an administrator with Dbo privileges. Once connected, right click on the connection and choose administration.

P	Сору	Ctrl+C		
ê	Paste	Ctrl+V		
×	Delete			
	Rename	F2		
З	Refresh	F5		
	New	•		
	Import	•		
	Export	•		
	Administration	•		Administer Geodatabase
	Distributed Geodatabase	•	đ	Compress Database
	Connect			Add User
	Disconnect			Create and Manage Roles
	Connection Properties			
	Geodatabase Connection Prope	rties		
Q	Share as Geodata Service			

- 🚰 Properties...
- 2. In the administration menu, you will see four choices. Compress is now integrated within the administration menu. Also, you can add users and create/manage roles in your enterprise Geodatabase without touching SQL Server. Roles will allow you to give permissions to the role without having to give permissions to each and every user. Think of a role as a group.
- 3. Click on Add User. You have two choices, operating system authentication or sql server authentication which gives an arbitrary login and password not related to windows but related to sql server only. You have the choice of adding the user to a role.

🖉 Create Database User	- • •
Input Database Connection	Database User
Database Connections\demo.default.osa.sde	
Create Operating System Authenticated User (optional)	Type a name for the new database user.
Database User	
gbams\ccrupi	If you chose to create a database user for an
Database User Password (optional)	operating system login, the
	user name must match the
Role (optional)	login name.
Genius	5
Tablespace Name (optional)	
τ.	
OK Cancel Environments << Hide Help	Tool Help

4. Go to Administer Geodatabase on the administration menu, the Geodatabase Administration dialog will appear. You can create versions, check connections and locks.

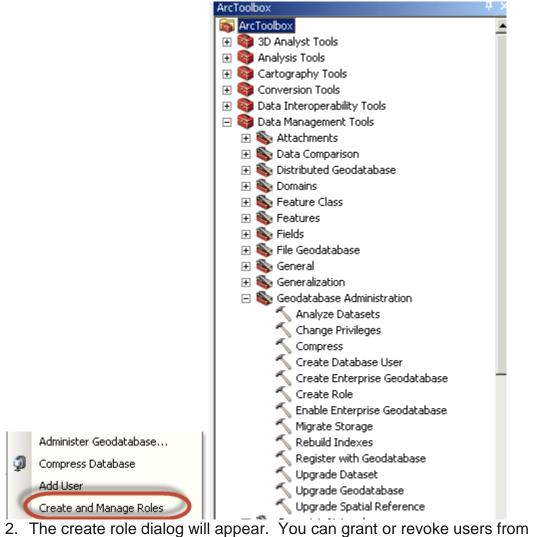
📕 Geodatabase A	dministration (DBO@TEST-DB/LucityGIS)	
Versions Conr	nections Locks	
Tiltaria a		Properties
- Filtering		Name: DEFAULT
Name:	Owner:	Owner: dbo
Name Owner	r Modified	Parent:
DEFAULT dbo edit DBO	8/1/2012 3:33:22 PM 6/28/2012 7:14:32 AM	Description:
	0/20/2012 7:14:32 API	Instance default version.
		Access: Public 💌
		Created: 6/28/2012 7:14:32 AM
		Modified: 8/1/2012 3:33:22 PM
		Is Blocking: False
		Is Replica: True
Refresh 2 of 2 V	/ersions at 8/17/2012 12:31:29 PM >	Is Locked: False
Transactional	Tree View Reconcile Order Historical	]

### Create Role

There are two different ways you can create roles. One way is to create an SDE role and assign users to the roles. The other way is to create Active Directory groups, add active directory groups to SQL Server allowing for Active Directory groups to act like roles. The great thing is that Active Directory is then managed by your IT user administration system without needing to manage all the users through SQL Server. We will show both ways below.

#### Create Role within ArcCatalog

 Right click on the database connection and go to Create and Manage Roles. You can access this from ArcToolbox Data Management Tools as well.



roles from this interface.

🔨 Create Role	
Input Database Connection Database Connections\LucityGIS.default.osa.sde	User Name(s) (optional)
Role Edit Grant To or Revoke From User(s) (optional) GRANT User Name(s) (optional) test\ccrupi,test\nschmidt,test\jscovil	Type the name of the user for which you want to change role membership. To specify multiple users, type the user names separated by commas (no spaces).
OK Cancel Environments << Hide Help	Tool Help

- Create Active Directory Groups for the Enterprise Geodatabase
   Open the Active Directory Users and Computers dialog from your domain controller and add a group by right clicking on users and select new group. Add a name such as GISView. The default settings are fine. Click ok.

, and the second se	×
sers	
Group type	
<ul> <li>Security</li> </ul>	
OK Cano	:el
	Group type © Security

5. Double click on the new group and add members within the members tab.

GISView Properties	Select Users, Contacts, Computers, Service Accounts, or Groups
General       Members       Member Of       Managed By         Members:	Select this object type:         Users, Service Accounts, Groups, or Other objects         From this location:         Itest.local         Enter the object names to select (examples):         Bick Wilson (rwilson@test.local)         Check Names         Advanced
Add Remove	
OK Cancel Apply	

- 6. Add the member and click ok.
- Open SQL Server Management Studio and add new group to SQL Server by going to the TOC of the instance connection and expand security. Right click on the Login folder and select new login.

Microsoft SQL Server I	Management Studio	0	
File Edit View Debu	_	Community Help	
😫 New Query   📑   🖷	- 5 📆 🌇   🗅   🗃		
Object Explorer			₊ ₽ ×
Connect 🕶 📑 📑 🔳	7 🛃 📓		
A F A F A F A F A F A F A F A F	New Login Filter   Start PowerShell  Reports  Refresh  CCCSQLWriter /ICE\SQLWriter /ICE\Winmgmt  cgis omain Admins omain Users (SEdit ovil avage s  hic Providers	jin## ##	

8. Click on Search and make sure you are connecting to your domain as the location and add groups as a selectable item from Object Types. Click ok when you've found the group. In this example, we're using test\GISView. Make sure the default database is selected to something other than master. Since these users are going to a view only group, we're assigning the group to the replica as the default database.

🚪 Login - New			
Select a page	<u> S</u> cript 👻 🚺 Help		
General Server Roles Carrow Mapping	Login name:	TEST\GISView	Search
🚰 Securables	Windows authentication		
🚰 Status	C SQL Server authentication		
	Password:		
	Confirm password:		
	Specify old password		
	Old password:		
	Enforce password polic	y .	
	🗵 Enforce password expir	ation	
	🔽 User must change pass	word at next login	
	O Mapped to certificate		[
	C Mapped to asymmetric key	·	
	Map to Credential		Add
Connection	Mapped Credentials	Credential Provider	
Server: test-db			
Connection: TEST\Isavage			
View connection properties			
Progress			Remove
Ready	Default database:	Replica	
To and the second secon	Default language:	<default></default>	
		OK	Cancel

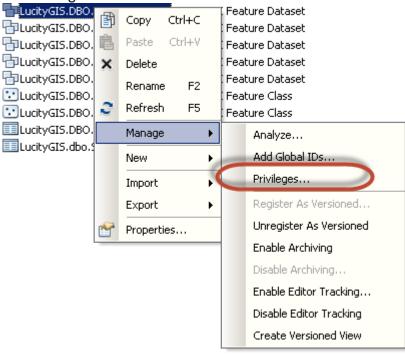
9. In the TOC of the Login – New dialog, click on user mapping. Check the boxes next to the databases you want the group to be assigned to. Just keep database role membership for <database> set to public. We'll let the Enterprise Geodatabase control privileges. Click ok.

Select a page	🔄 <u>S</u> Script 🕞	• 📑 Help			
General     General     Server Roles     Ser Mapping	Users ma	pped to this login:			
Securables	Мар	Database	User	Default Schema	<b>▲</b>
🚰 Status		GBAWork001			
		LucityGIS			
		master			
		model			
		msdb			
		Raster	TEST\GISView	dbo	
		Replica	TEST\GISView	dbo	
		ReportServer			
		ReportServerTempDB			
		tempdb			-
	🗖 Guest	account enabled for: Replic	за		
		account enabled for: Replic			
Connection	Database				
	Database	role membership for: Replic ccessadmin ackupoperator			
Connection Server: test-db	Database	role membership for: Replic ccessadmin ackupoperator atareader			
Server:	Database	role membership for: Replic ccessadmin ackupoperator atareader atawriter			
Server: test-db	Database	role membership for: Replic ccessadmin ackupoperator atareader atawriter dladmin enydatareader			
Server: test-db Connection:	Database	role membership for: Replic ccessadmin ackupoperator atareader atawriter dladmin enydatareader enydatawriter			
Server: test-db Connection: TEST\lsavage	Database	role membership for: Replic ccessadmin ackupoperator atareader atawriter dladmin enydatareader enydatawriter wner			
Server: test-db Connection: TEST\Isavage	Database db_ac db_ba db_da db_da db_da db_da db_da db_da db_oc db_se	role membership for: Replic ccessadmin ackupoperator atareader atawriter Iladmin enydatareader enydatawriter wner ecurityadmin			
Server: test-db Connection: TEST\lsavage View connection properties	Database	role membership for: Replic ccessadmin ackupoperator atareader atawriter Iladmin enydatareader enydatawriter wner ecurityadmin			
Server: test-db Connection: TEST\Isavage View connection properties Progress	Database db_ac db_ba db_da db_da db_da db_da db_da db_da db_oc db_se	role membership for: Replic ccessadmin ackupoperator atareader atawriter Iladmin enydatareader enydatawriter wner ecurityadmin			
Server: test-db Connection: TEST\Isavage View connection properties Progress	Database db_ac db_ba db_da db_da db_da db_da db_da db_da db_oc db_se	role membership for: Replic ccessadmin ackupoperator atareader atawriter Iladmin enydatareader enydatawriter wner ecurityadmin			

## Change/Add Privileges

In the previous exercise, we created two types of role scenarios. One is using the enterprise Geodatabase tools to create a role with multiple users which can be revoked per user. The other is allowing Active Directory Groups to be assigned like roles. Now, we are going to assign privileges to these two types of roles.

 Go to ArcCatalog database connection as administrator and right click on the data you want to add privileges to. Remember, you can multiply select one object at a time (Feature Datasets, Feature Classes, and Tables). In this example, we'll be adding the active group we created. Select Privileges.



2. Click on the user/role you would like to add. Click ok.

🚰 Privileges 📃 🔍	🍶 User/Role	
Replica.DBO.LucityTRAFFIC	Name	Туре
User/Role     Select     Insert     Update     Delete       Add     OK     Cancel     Apply	dbo guest public TEST\arcgis TEST\GISEdit ▼TEST\GISUiew test\jscovil User/Role	User Public User Group User OK Cancel

3. Since the GIS View group is read-only, only keep the select box checked. Click ok.

🚚 Privileges				_ 🗆 🗵
Replica.DBO.LucityTRAFFIC				
User/Role	Select	Insert	Update	Delete
TEST\GISView				
Add	OK		Cancel	Apply

#### Analyze and Index

Analyze and index is something that you want to do on a regular basis if you creating and adding features to your database. This will allow for better faster access to your database. Make sure ArcGIS for Server services are stopped before rebuilding indexes.

1. Go to your database connection and select on the objects you want to analyze and rebuilt index. Right click on the select items and go to manage/analyze. There is no feel good complete dialog given so let the wheel turn until complete.

Contents Preview		ription	•			
Name			Туре			
DBO.STNETG_Ad DBO.STNETG_Cr demo.DBO.Lucit demo.DBO.Lucit demo.DBO.Lucit demo.DBO.Lucit demo.DBO.Lucit demo.DBO.Lucit	eate Base yEQ yFA yPA yRIG yRO ySE\ yST(	AddressLo UIP CILITY RK HTOFWAY AD VER DRM	Locat Locat SDE F SDE F SDE F SDE F SDE F SDE F SDE F SDE F	tor eature Dataset eature Dataset eature Dataset eature Dataset eature Dataset eature Dataset eature Dataset eature Dataset		
demo.DBO.Lucit demo.DBO.Lucit demo.DBO.Lucit demo.DBO.Lucit demo.DBO.Lucit demo.DBO.Lucit demo.DBO.CM demo.DBO.CM demo.DBO.CM	ywz ywz ywz ywz o	AFFIC ATER ATERDIST ATERRAW Copy Ctrl- Paste Ctrl- Delete Rename	SDE F SDE F SDE F SDE F	eature Dataset eature Dataset eature Dataset eature Dataset eature Dataset eature Dataset eature Class eature Class		
		Manage	×	Analyze		
	ŕ	New Import Export Properties	•	Add Global IDs., Privileges Register As Vers Unregister As Ve Enable Archivin	DBMS statist Requires a St	
				Disable Archivir	with a Basic I	

## Compression

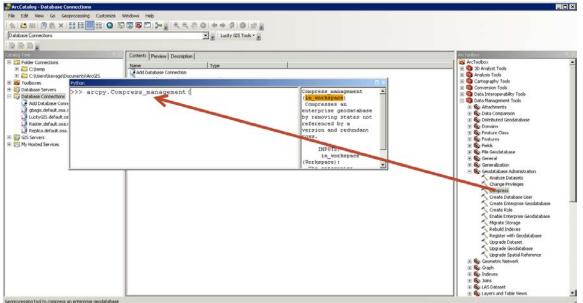
#### What is Compression?

Is a process of moving rows of data from the delta (add and delete) tables to the base tables of the feature classes. This is a versioning performance process.

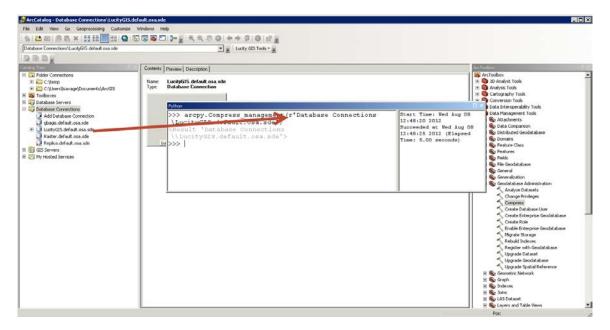
- If your data is in default and you have the data versioned, you should compress.
- Performance and Data Integrity Tip: Analyze statistics and rebuilt indexes before and after compression
- Data Integrity Tip: Compress at least once a week
- Data Integrity Tip: Compress after large loads of data or major changes in data

There are several ways to compress your database. Below are the different ways to compress your database.

- 1. Using Python
  - a. Open ArcToolbox and go to data management tools/Geodatabase Administration/Compress
  - b. Open the Python dialog by going to the Geoprocessing Menu and left click on Python
  - c. A dialog window will open for Python. Left click on the Compress tool in ArcToolbox and drag the tool within the Python window
  - d. Notice that the Python dialog has been updated with the new function



e. Now open the database connection you would like to compress. Make sure the connection has rights to perform a compress. Drag and drop the connection into the Python dialog f. Hit the Enter button on the keyboard as this will execute the command. On the right, the dialog will show the start time and how long it took to complete the operation.



- 2. Using the ArcCatalog Tool
  - a. Right Click on a database connection in the ArcCatalog TOCb. Choose Administration/Compress Database

=								
🗉 🛄 demo.defau	1 1=1	Сору	Ctrl+C	Lucit	yEQUIP	SDE Featu	ire Da	taset
💭 repl.default		Paste	Ctrl+V	Lucit	yfacility	SDE Featu	ire Da	taset
🧊 vector.defa		Delete		Lucit	ypark	SDE Featu	ire Da	taset
GIS Servers		Rename	F2		yRIGHTOFWAY	SDE Featu		
👸 My Hosted Sen	3	Refresh	F5		yroad	SDE Featu		
	~			1	ysewer	SDE Featu		
		New	•		ystorm	SDE Featu		
		Import	•		ystreet	SDE Featu		
		Export	•		ytraffic	SDE Featu		
		Administration		Lucit	WATER	SDE Featu		
			•		Administer Geo	)database		aset
		Distributed Geodatabase	•	ų.	Compress Data	base		aset
		Connect			Add User			aset
		Disconnect			Create and Mar	nage Roles	Com	press Database
		Connection Properties		01910		SPETCOLO	l co	mpress a versioned
		Geodatabase Connection Prop	arties	SDE_c	:ompress_log	Table		odatabase. This removes
	_	•	Jerdes					referenced states from the tes tree, improving query
	Q	Share as Geodata Service						formance.
	1	Properties						
								ly the geodatabase ninistrator can compress the
								ninistrator can compress the odatabase.
							3-	
								quires a Standard or an
								vanced license and is read-only h a Basic license.
							0010	n a basic licerise.

- 3. Command Line Compress; make sure whatever system connected has the command line installation of ArcSDE installed.
  - a. Syntax: sdeversion -o compress -u <sa or admin> -p <password> i sde:sqlserver:<instancename> -s <server> -D <database> -N

```
ArcSDE 10.1 for SQL Server Build 679 Thu Apr 5 11:43:21 2012
Version Administration Utility
Successfully compressed state tree.
```

Note: Compress process will only compress data that is in read-only mode. If a feature class is being edited, the compress process will bypass the feature class table and only compress non-edited data. If you are having problems with compression, please reconcile, post all versions. Afterwards, delete the versions and make sure all state locks are terminated as well as all users are disconnected. After all users are disconnected, perform the compression routine. This is better known as "Zero State Compression". Afterwards, recreate your versions and you'll have clean delta tables.

## Spatial and Attribute Indexes

In ArcGIS v10.1, spatial indexes are managed for you in a sql table. You can delete and recreate the spatial index from the feature class properties. Spatial indexes allow your spatial data to be queried faster within a grid concept. Each grid has a size based on the density of your spatial data. In the past, this was a calculation that needed to be performed by the GIS DBA or GIS Analyst but is now automated for you. Kudos ESRI!

#### **Spatial Indexes**

- 1. If you are recalculating your feature extent and feel that you want to recreate your spatial index, right click on a feature class and choose properties.
- 2. When the feature class properties dialog appears, go to the indexes tab.
- 3. Click Delete and Create under Spatial Index at the bottom of the dialog. Click Apply.

Feature Clas	s Properties				23
General	Editor Tra	cking XY	Coordinate System	Domain, Resolu	ution and Tolerance
Fields	Indexes	Subtypes	Feature Extent	Relationships	Representations
Attribut R507_1 UUID_1	Yes ng: Yes D			Add Delete	
Spatial : This Fea	ature Class ha	as a spatial ind		Create Delete	
				Cance	el Apply

4. This process will recreate the feature class spatial index table for the feature class.

#### Attribute Indexes

Attribute indexes are used to speed the performance of data queries used on a consistent basis. As an example, we are going to setup an attribute index for Lucity GIS data. Both the common ID and the Lucity AutoID will speed up your query performance capability for each feature class that is linked to Lucity when assigning an attribute index.

5. In the same dialog as the previous exercise (Feature Class Properties), please go to the indexes tab.

83

6. Click on the Add button next to Attribute Indexes.

General	Editor Tra	cking	XY	Coordinate System	Domain, Resol	ution and Tolerance
Fields	Indexes	Subty	pes	Feature Extent	Relationships	Representations
R507_ UUID UUID UUID	OID_507 Yes ing: Yes	UK			Add Delete	
OBJEC						

7. Create LucityIDX for the Name and add the NTG\_ID which is linked to the Lucity AutoID.

Add Attribute	Index				X
Name:	LucityIDX				
🔲 Unique	ng				
Fields Fields availa	able:		Fields selected:		
NTG_SHAF NTG_CLN_ NTG_INDX NTG_OWN NTG_ID	_CD _CD		NTG_ID		t
NTG_DB LastModBy LastModDa LastSynDa GlobalID	ate	•			<b>↓</b>
			ОК	Cancel	

- Click ok and Apply.
   Complete the same operation again by adding LucityCMN index and associate it with the field NTG\_NUMBER which is linked to the Lucity AltID.

Add Attribute	Index				23
Name:	LucityCMN				
🔲 Unique	ng				
Fields Fields availa	able:		Fields selected:		
NTG_OWN NTG_ID NTG_ID LastModBy LastModDa LastSynDa GlobaIID NTG_NUMI SHAPE.len	, ate te BER ■	•	NTG_NUMBER		↑ ↓
			ОК	Cancel	

10. Click Ok and Apply.

## Tune SQL Server space for Geodatabases

In terms of SQL Server space for Geodatabases, the functionality of the Geodatabases is key to how much space you will need. Recommend splitting up the vector and the raster data into two separate Geodatabases. Raster should be in its own database. This will allow for easy to manage backups and system configuration.

1. When loading Raster data calculate the decompressed size of the image and set this as the file size for the initial load. The logfile can be somewhat small as ESRI has changed the transaction of the loads from one long transaction to iterative raster load transactions. A good rule of thumb, create logfiles for Raster 1/3 of the size of the Raster database. For the data file size, find out the decompression size of the complete mosaic raster data or single image size as a collection. You can choose to use the new mosaic option for raster as this will create a virtual mosaic dataset like the terrain datasets but that's totally up to you as the administrator.

🥫 Database Properties - Rast	er				_ O ×
Select a page	🛒 Script 👻 📑 H	elp			
🚰 General		·			
Files Filegroups	Database name:		Raster		
Price Coptions	Owner:		TEST\lsavage		
🚰 Change Tracking					
	Use full-text indexing				
🚰 Extended Properties	Database files:				
		File Type	<b>File evenue</b>	Initial Size (MB)	Autogrowth / Maxsize
	Logical Name	Rows	Filegroup PRIMARY	1900	(
	Raster_dat Raster_log	Hows	Not Applicable	575	By 10 percent, Unlimited By 10 percent, Limited to 209
	nastei_iug	LUY	NUC Applicable	575	By to percent, Limited to 205
Connection					
Server: test-db					
Connection: TEST\lsavage					
View connection properties					
Progress					
Ready	•				Þ
Ready					
				Add	Remove
					OK Cancel

2. For logfiles, don't let the log files use unlimited file growth as a looped transaction could bring your server down.

	📱 Change Autogrowth for Ra	ster_log
	Enable Autogrowth	
	File Growth	
	In Percent	ho <del>.</del>
	C In Megabytes	10 芸
	Maximum File Size	
	Limited to (MB)	5,000 🛨
	O Unlimited	
		OK Cancel
3.	Do the come for the date	<u> </u>
5.	Do the same for the data	
З.	Change Autogrowth for Ras	
З.		
3.	Change Autogrowth for Ra	
3.	Change Autogrowth for Ras	
5.	Change Autogrowth for Ras File Growth	ster_dat
3.	Change Autogrowth for Ras Enable Autogrowth File Growth In Percent	ster_dat
3.	Change Autogrowth for Ras Enable Autogrowth File Growth In Percent In Megabytes	ster_dat
3.	Change Autogrowth for Ras Enable Autogrowth File Growth In Percent In Megabytes Maximum File Size	ster_dat

- 4. Most county Raster datasets are 30 GB to 40 GB once loaded in the Enterprise Geodatabase. You may want to compensate for the increase. It's faster to pre-allocate space for Raster before you load.
- 5. After loading, analyze through ArcCatalog and assign permissions. Make sure you backup, truncate logfile and shrink the database before making it available to the public.
- 6. If large loads for vector data or a Geodatabase that is used as an editing Geodatabase, perform similar operations.
- 7. Set your growth to a manageable amount within your data storage. For Vector, you can use percentage. For Raster, you will be adding Raster data per load and sometime every year to three years at a time.

#### Backups

If you want to create backups using the SQL Server maintenance wizard, this is an easy step by step process. However, in our example below, we will be touching on creating backups from SQL Script, using SQL Commands and windows task manager. Command line seems a bit quicker when running through each operation. Below is the information about each batch script. In order to run the complete procedure below, you will need to have each database backup recovery model setting turned to 'Full'. Simple model is good for a development environment but only is as good as the last backup. For cleanup, please use a file copy and delete batch routine to reset the backups as backups will not overwrite in sql script. You can use a simple copy and delete command in command line.

Select a page						
🚰 General	🖳 Script 🔻 🚺 Help					
🚰 Files						
Filegroups	Collation: SQL_Latin1_General_CP1_CI_AS					
Poptions						
Tracking Change Tracking	Recovery model: 🥏		Full Full Bulk-logged Simple			
Permissions	Compatibility level:					
Extended Properties	Container out top of					
	Containment type:	ompio				
	Other options:					
	<b>₹</b> ↓ 🖻					
	Auto Shrink		False			
	Auto Update Statistics		True			
	Auto Update Statistics Async	chronously	False			
	Containment					
	Default Fulltext Language L0	CID	1033	=		
	Default Language		English			
	Nested Triggers Enabled		True			
	Transform Noise Words		False			
	Two Digit Year Cutoff		2049			
Connection	⊿ Cursor					
Server:	Close Cursor on Commit Ena	ibled	False			
LUKESAVAGE\SQLEXPRESS	Default Cursor GLOBAL					
Connection:	✓ FILESTREAM					
GBAMS\Isavage	FILESTREAM Directory Nan					
	FILESTREAM Non-Transacted Access Off					
View connection properties	Miscellaneous					
	Allow Snapshot Isolation ANSENTITE Default		False False			
Progress			False			
Ready	Allow Snapshot Isolation					
			ОК	Cancel		

Full Backup: This will backup the entire database.

Intermediate Backups: Captures changes to the database since the last full backup (also known as differential backups.

Truncate Logs: Truncates logs to free up space

Shrink: Shrinks data and log files.

Analyze and Index: Analyze/update statistics, and updates indexes

1. Create a full backup script. For every database, create a separate action. BACKUP DATABASE [DEMO] TO DISK =

N'C:\backup\SQLEXPRESS\DEMO.bak' WITH NOFORMAT, NOINIT, RETAINDAYS = 13, NAME = N'DEMO-Full Database Backup', SKIP, NOREWIND, NOUNLOAD, STATS = 10

GO

Create an intermediate or differential script. BACKUP DATABASE [DEMO] TO DISK = N'C:\backup\SQLEXPRESS\DEMO.bak' WITH DIFFERENTIAL, NOFORMAT, NOINIT, RETAINDAYS = 13, NAME = N'DEMO-Full Database Backup', SKIP, NOREWIND, NOUNLOAD, STATS = 10GO

Create a backup Log script.

BACKUP LOG [DEMO] TO DISK = N'C:\backup\SQLEXPRESS\DEMO.bak' WITH NOFORMAT, NOINIT, RETAINDAYS = 13, NAME = N'DEMO-Transaction Log Backup', SKIP, NOREWIND, NOUNLOAD, STATS = 10 GO

Create a shrink script.

USE [DEMO]

GO

```
DBCC SHRINKFILE (N'DEMO_Log', 0, TRUNCATEONLY)
GO
```

5. Create an update stats and index script.

EXEC sp\_updatestats

go

EXEC sp\_MSforeachtable @command1='print "?", @command2='set QUOTED\_IDENTIFIER ON;ALTER INDEX ALL ON ? REBUILD WITH (FILLFACTOR=90.ONLINE=OFF)'

We will be calculating an index of 90% capacity for fillfactor (which gives 10%) growth for data indexes). Also, we will retain the backups for 13 days and starting over on the 14<sup>th</sup> day. For each script we will create a batch file to call the .sql files.

- 6. Create batch routines under root of c:\.
  - Full Backup batch file (example: full\_backup.bat)

cd\

sqlcmd -S lukesavage\sqlexpress -i c:\backup\SQLEXPRESS\full backup.sql -o c:\backup\SQLEXPRESS\full\_backup\_log.txt

exit

Intermediate or differential backup (example: intermediate\_backup.bat)

cd\

sqlcmd -S lukesavage\sqlexpress -i c:\backup\SQLEXPRESS\intermediate\_backup.sql -o c:\backup\SQLEXPRESS\inter\_backup\_log.txt exit

• Backup Logs and Truncate (example: backup\_logs.bat)

cd\

sqlcmd -S lukesavage\sqlexpress -i c:\backup\SQLEXPRESS\truncate\_logs.sql -o c:\backup\SQLEXPRESS\truncate\_log.txt exit

exil

• Shrink Data and Log files (example: shrink.bat)

cd\

sqlcmd -S lukesavage\sqlexpress -i c:\backup\SQLEXPRESS\shrink.sql -o c:\backup\SQLEXPRESS\shrink\_log.txt exit

cd

Update Stats and Index batch file (example: update\_stats\_index.bat)

cd\

sqlcmd -S lukesavage\sqlexpress -d Demo -i c:\backup\SQLEXPRESS\update\_stats\_index.sql -o c:\backup\SQLEXPRESS\VECTOR\_update\_stats\_index\_log.txt exit

- 7. Create Windows Scheduled tasks for each backup file.
  - Full Backup: running once a week on a Saturday Early Morning
  - Differential or Intermediate backup: Running once a day except Saturday at the same time as the Full Backup
  - Backup Logs: Run once a day or twice a day depending on your workload and editing. Make sure you try to backup logs during lower workload hours.
  - Shrink Data and Logs: Run right after the backup log routines
  - Analyze, update statistics and indexes: Run once a day and/or before and after backups. Most will run this once a day after backups occur.
  - Create backup copy and cleanup procedures using command line scripts or delete utilities that can be scheduled

### Automated Maintenance Scripts

With the release of ArcGIS v10.1, you have the capability to create python scripts to analyze, update statistics, and update index files. However, in this example we will show how to use ArcSDE and SQL Server command line.

#### SQL Server and ArcSDE Scripts

- 1. Install ArcSDE with Command line tools (ArcGIS 10.2 is the last version to include command line tools. Post 10.2, plan to write automation scripts in python)
- 2. Go to SQL Server Studio Management and open designer.
- 3. Create query. In this query, it will analyze and update statistics and rebuild indexes with a fill factor of 90%, which means you have 10% growth for indexes.

EXEC sp\_updatestats

go EXEC sp\_MSforeachtable @command1='print "?"', @command2='set QUOTED\_IDENTIFIER ON;ALTER INDEX ALL ON ? REBUILD WITH (FILLFACTOR=90,ONLINE=OFF)'

- 4. Save query as update\_stats\_index.sql in the root of c:\
- 5. Create a Batch file that contains the following script. Notice the output log file created so you can keep track of your operations and if they fail troubleshoot the issue effectively. Items in Red signify zero state compression where all data is pushed to base tables. If zero state compression is not needed, delete the lines in Red below.

6. Save as <name>\_state\_compression.bat in the root of c:\. Note: In a versioned environment, recommend zero state compression at least once every 6 months for lightweight editing. Heavy data editing environment zero state compression should be accomplished every quarter. Normal compression should be taking place once a week. This is to ensure data integrity long term.

sdemon -o kill -t all -p <sa password> -i sde:sqlserver:<instance> -s <server name> -D <geodatabase1> -N

sdemon -o kill -t all -p <sa password> -i sde:sqlserver:<instance> -s <server name> -D <geodatabase2> -N

sqlcmd -S localhost -U sa -P <sa password> -D <geodatabase1> -i c:\update\_stats\_index.sql -o c:\update\_stats\_preindex\_log.txt

sqlcmd -S localhost -U sa -P <sa password> -D <geodatabase2> -i c:\update\_stats\_index.sql -o c:\update\_stats\_preindex\_log.txt

sdeversion -o delete -i sde:sqlserver:<instance> -V dbo.edit -u sa -p <sa password> -s <server name> -D <geodatabase1> -N

sdeversion -o compress -u sa -p <sa password> -i sde:sqlserver:<instance> -s <server name> -D <geodatabase1> -N

sdeversion -o compress -u sa -p <sa password> -i sde:sqlserver:<instance> -s <server name> -D <geodatabase2> -N

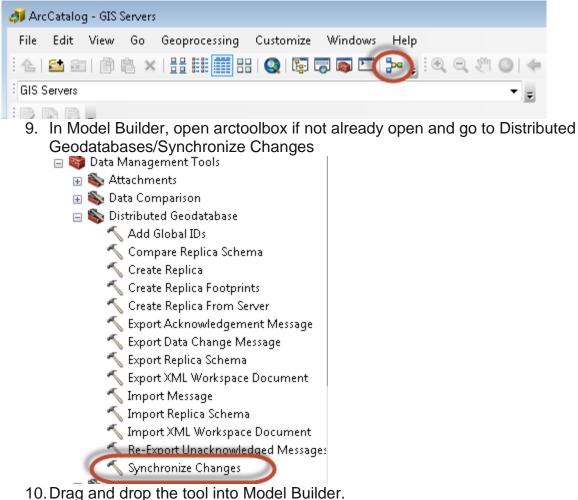
sqlcmd -S localhost -U sa -P <sa password> -D <geodatabase1> -i c:\update\_stats\_index.sql
-o c:\update\_stats\_index\_postlog.txt

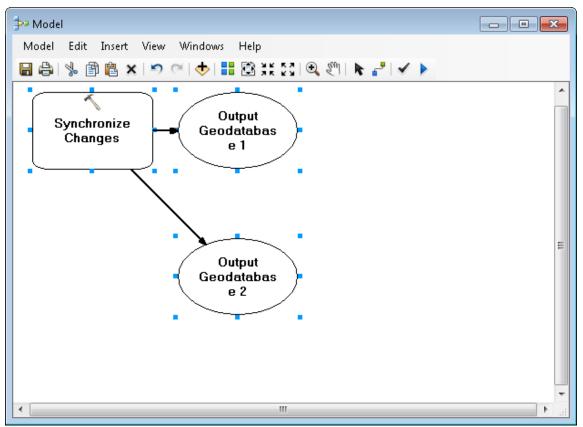
sqlcmd -S localhost -U sa -P <sa password> -D <geodatabase2> -i c:\update\_stats\_index.sql -o c:\update\_stats\_index\_postlog.txt sdeversion -o create -i sde:sqlserver:<instance> -V edit -P dbo.default -A public -u sa -p <sa password> -s <server name> -D <geodatabase1> sqlcmd -S localhost -U sa -P <sa password> -D <geodatabase1> -i c:\update\_stats\_index.sql -o c:\update\_stats\_index\_log.txt

7. Add a windows task in windows task scheduler on the server where ArcSDE binaries and command line tools reside.

#### Automate Replica Synchronization using Python

8. Go to ArcCatalog and open model builder. This is the Garfield way of creating python scripts for the non-savvy coder.

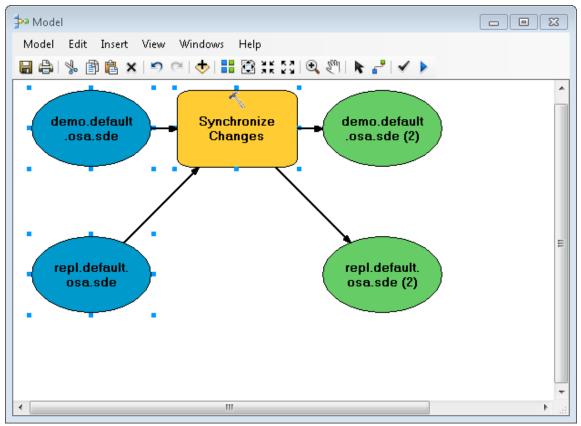




- 11. Once tool is in Model Builder, double click on Synchronize Changes box to open the dialog.
- 12. Fill in the information appropriately. For reference, please visit the Replica section.

🔨 Synchronize Changes	X
Geodatabase 1 Database Connections\demo.default.osa.sde Replica DBO.Lucity_Demo	Synchronize Changes Synchronizes updates
Geodatabase 2 Database Connections\repl.default.osa.sde	between two replica geodatabases in a direction specified by the user.
FROM_GEODATABASE1_TO_2  Conflict Resolution Policy IN_FAVOR_OF_GDB1  Conflict Definition	
BY_OBJECT   Reconcile with the Parent Version (Single Generation only)	
OK Cancel Apply <<< Hide Help	Tool Help

13. Click ok. Notice colors change in the dialog. Run the model to test by clicking on the run button.



14. After successfully testing the model, go to the model menu and click on export/To Python Script.

<b>}</b> • М	lodel	
Mo	del Edit Insert View Wir	ndows Help
	Run	🛧   🔡 🗱 💱 🕄 🔍 🔊
Π	Run Entire Model	
1	Validate Entire Model	
	Save	Synchronize
	Save As	Changes
	Delete Intermediate Data	
	Print Setup	
	Print Preview	
e	Print	
	Report	
1	Model Properties	
	Diagram Properties	
	Export •	To Graphic
	Import •	To Python Script
	Close	

- 15. Save in location that has Python and ArcCatalog installed. For example, auto\_synch.py under the root of c:\.
- 16. Edit the Python script so that it references arcinfo rather than arceditor. This can produce errors in your script. Also, add the RED content below to enable logging when running this script.

# Set the necessary product code
import arcinfo
# Import arcpy module
import arcpy
# Record Logs
arcpy.SetLogHistory(True)
# Local variables:
demo_default_osa_sde = "Database Connections\\demo.default.osa.sde"
repl_default_osa_sde = "Database Connections\\repl.default.osa.sde"
# Process: Synchronize Changes
arcpy.SynchronizeChanges_management(demo_default_osa_sde, "DBO.Lucity_Demo",
repl_default_osa_sde, "FROM_GEODATABASE1_TO_2", "IN_FAVOR_OF_GDB1",
"BY_OBJECT", "DO_NOT_RECONCILE")

17. Go to Windows Task Scheduler and create a basic task.

Create Basic Task Wizard		×
Create a Basic Tas	k	
Create a Basic Task	Use this wizar	d to quickly schedule a common task. For more advanced options or settings
Trigger		ole task actions or triggers, use the Create Task command in the Actions pane.
Action	Name:	AutoSynchReplica
Finish	Description:	This task will automatically synch the Geodatabase replica.
		< Back Next > Cancel

18. Click next and schedule the synchronization of the replica to whenever you want the synchronization to take place. Usually each day or once a week will fit most organizations. In this example we are going to setup a weekly schedule. Click next.

Create Basic Task Wizard	8
🔟 Task Trigger	
Create a Basic Task Trigger Weekly Action Finish	<ul> <li>When do you want the task to start?</li> <li>Daily</li> <li>Weekly</li> <li>Monthly</li> <li>One time</li> <li>When the computer starts</li> <li>When I log on</li> <li>When a specific event is logged</li> </ul>
	S of this schedule. I want this to fire off before the backups

19. In the timeliness of this schedule, I want this to fire off before the backups have occurred so that my databases stay in tune. In my backup routines, I may have a performance maintenance script that analyzes, updates statistics and indexes as well as backups the transaction logs and shrinks the database. Therefore, in this example we'll set the synchronization to occur after I leave for the day on Friday. Click next.

Create Basic Task Wizard	8
Weekly	
Create a Basic Task Trigger Weekly Action Finish	Start: 8/27/2012     Recur every: 1   Weeks on:   Sunday Monday   Tuesday   Wednesday   Thursday   Friday   Saturday      A Back   Next >   Cancel
20. Choose start a pro	
Create Basic Task Wizard	
Create a Basic Task Trigger Weekly Action Finish	<ul> <li>What action do you want the task to perform?</li> <li>Start a program</li> <li>Send an e-mail</li> <li>Display a message</li> </ul>
	< Back Next > Cancel

21. In Windows Vista and above, we need to add the python program as the script so that it knows what executable to use. In Add arguments

(optional):, you need to add the location of your saved python script. Also, in 'Start in (optional), you need to add the location folder of the python executable. Once complete, click next.

Create Basic Task Wizard		2
5tart a Program		
Create a Basic Task		
Trigger	Program/script:	
Weekly	C:\Python27\ArcGIS10.1\python.exe	Browse
Action Start a Program	Add arguments (optional):	c:\auto_synch.py
Finish	Start in (optional):	c:\python27:\arcgis10.1\
	< Back	Next > Cancel

22. Click the 'Open the Properties dialog for this task when I click Finish' checkbox to verify administrative user to run this task and its credentials. Click Finish.

Create Basic Task Wizard		
5 Summary		
Create a Basic Task		
Trigger	Name:	AutoSynchReplica
Weekly Action Start a Program Finish	Description:	This task will automatically synch the Geodatabase replica.
	Trigger:	Weekly; At 10:00 PM every Friday of every week, starting 8/27/2012
	Action:	Start a program; C:\Python27\ArcGIS10.1\python.exe c:\auto_synch.py
	🔽 Open the	Properties dialog for this task when I click Finish
	When you cli	ck Finish, the new task will be created and added to your Windows schedule.
		< Back Finish Cancel

23. Check the 'Run whether user is logged on or not' radio button and check the checkbox next to 'Run with highest privileges'.

	eplica Properties (Local Computer)
Name:	gers Actions Conditions Settings History AutoSynchReplica
Location:	
Author:	GBAMS\Isavage
Description:	This task will automatically synch the Geodatabase replica.
- Security opt When runn	ions ing the task, use the following user account:
GBAMS\Isa	vage Change User or Group
🔘 Run only	/ when user is logged on
💿 Run whe	ther user is logged on or not
🗖 Don	ot store password. The task will only have access to local computer resources.
🔽 Run with	n highest privileges
🔲 Hidden	Configure for: Windows® 7, Windows Server™ 2008 R2 ▼
	OK Cancel

24. Test the task by right clicking on the new task and select run.25. Check the ArcToolBox results history location by going to the following location.

C:\Users\<username>\AppDate\Roaming\ESRI\Desktop10.1\ArcToolbox\Hist ory

# Options

# Versioning

Is an alternative state of the database where you can make edits and changes that will not affect the base tables. When complete and edits are ready, the parent table will be reconciled and posted with the child version. Within the Geodatabase, there are two tables that store changes to the base data. These are called delta tables which are known as Add and Delete tables.

### What are A and D tables?

- A tables are add tables. Anytime you add a record or change a record, the changes are added to the A table.
- D tables are delete tables. Anytime you delete a record, the delete rows are added to the D table.
- A and D tables are numbered based on the registration\_id in the SDE\_Table\_Registry table.

Example of finding an Add Table.

If you have made an edit to a feature class, you need to get the registration\_id for that feature class and go to the appropriate A table. This is stored in the sde\_table\_registry in SQL Server. For child versions, they are subsequent IDs such as default version would be the actual registration\_id (A144) and the child version would be (A145). Same applies to the D tables.

sų	Query35.sql	l - lukesavage	e (136))* 🛛 SC	)LQuery34.sql - Iu	kesavage (13	35)) 🛛 SQLQuer	y33.sql - lukes	avage (13	34)) 🛛 SQ	LQuery32.sql - Iul	kesavage (133)) 🖌 SQLQuery31.sql - lukes	avage (132))
1	***** 2	cript for	SelectTop	NRows comma	nd from SS	SMS *****	/					
1.3	SELECT *	FROM [Den	no].[dbo].	[a445]								
_												
	esults 📑 t	Verrager					m					
F		Messages	EVG DESC	EVG TYPE CD	EVG 1917E	EVG TREPTU		EVG ID	CUADE	CDE CTATE ID		
	OBJECTID	EXG_UNITID	_	EXG_TYPE_CD	_	_	EXG_FA_ID	_		SDE_STATE_ID		
		-	EXG_DESC test	EXG_TYPE_CD 2	EXG_TSIZE	EXG_TDEPTH NULL		E×G_ID 4214	SHAPE 19	SDE_STATE_ID 11471	GlobalD 6FDC0359-64D7-4428-8349-6C725A73AF8B	

### When Does Versioning Make Sense?

The option to moving edits to base tables is a scary thing for GIS people. Why?

- You can edit simple data only—points, lines, polygons, annotation, and relationships. You cannot edit a feature class in a topology, geometric network, or terrain.
- You cannot archive changes for the dataset.
- You cannot replicate the dataset.
- When you edit the DEFAULT version or post a version to the DEFAULT, you do not have the ability to resolve conflicts, so it is possible to overwrite another user's edits.

### How to Create a Version

1. Right click on a Database Connection link in ArcCatalog TOC or right click in the white space in the contents tab in ArcCatalog

👹 ArcCatalog - Database Connections\LucityGIS.de	ault.osa.sde			
File Edit View Go Geoprocessing Customize				
<u>▲</u>   🖆 📾   🗊 🕆   🏭 🏭 🎛   Q   🖫				
Database Connections\LucityGIS.default.osa.sde	💌 🥃 🗄 Lucity GIS Too	is 🔻 📻		
Catalog Tree				AveTaalbay
E Solder Connections	Contents Preview Description	1		ArcToolbox
🕀 🔚 C:\temp	Name Type DBO.STNETG_CreateAddressLoca Locator			🗊 👰 3D Analyst Tool:
C:\Users\lsavage\Documents\ArcGIS     S    Toolboxes	LucityGIS.DBO.LandBase SDE Feature Datase			🐨 🧐 Analysis Tools 🕀 🎯 Cartography To
🗄 🧃 Database Servers	LucityGIS.DBO.LucityEQUIP SDE Feature Datase			🕢 😨 Conversion Tool 🕢 😨
Ginections     Ginection	LucityGIS.DBO.LucityPARK SDE Feature Datase	et .		E S Data Manageme
💭 gbagis.default.osa.sde	LucityGIS.DBO.LucityRIGHTOFWAY SDE Feature Datase LucityGIS.DBO.LucityROAD SDE Feature Datase			🖭 🥎 Attachment E 🦓 Data Compa
LucityGIS.default.osa.sde     Raster.default.osa.sde	LucityGIS.DBO.LucitySEWER SDE Feature Datase	et .		🖃 🚳 Distributed
💭 Replica.default.osa.sde	LucityGIS.DBO.LucitySTORM SDE Feature Datase     DucityGIS.DBO.LucitySTREET SDE Feature Datase		Copy Ctrl+C	Add Glo
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Add WCS Server	LucityGIS.DBO.LucityWATERRAW SDE Feature Datase	* <b>~</b>	Rename F2 Refresh F5	Export /
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_	Employeds.doc.suc_compress_log Table		Administration	Administer Geodatabase
				Compress Database
			Connect	Add User a
			Disconnect	Create and Manage Roles
			Connection Properties	🗄 🗞 File Geodata
			Geodatabase Connection Properties	
		Q	Share as Geodata Service	🕀 🗞 Geodatabas
		<b>6</b>	Properties	⊞ 🇞 Geometric N ⊞ 🇞 Graph
				🕀 🗞 Indexes
An ArcGIS geoprocessing tool that synchronizes updates bet	veen two replica geodatabases in a direction specified by the use			
2. Click on Adr	ninistration/Administ		base.	
3. Right click o		rator Geodata		
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3. Right click o Geodatabase Admini Versions Connection Filtering Name: Name OEFAULT dbo 8/	ninistration/Administ n the Default versior stration (DBO@TEST-DB/L is Locks Owner: Odified 1/2012 3:33:22 PM 28/2012 7:14:32 A	rator Geodata		
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3. Right click o         Geodatabase Admini         Versions       Connection         Filtering         Name:         Name:         Name         Owner         DEFAULT         dbo         6/1         DBO         6/1         Refresh       2 of 2 Version	ninistration/Administ n the Default versior stration (DBO@TEST-DB/L s Locks Owner: Odified 1/2012 3:33:22 PM 28/2012 7:14:32 A Select Wew X Delet	rator Geodata and select ne .ucityGIS)		

4. Create a Name for the new version and select public. Click Ok.

🚚 New Version		
Name		
Test		
Description		
This is a test version		
Access O Private O Public O Protected		
	OK	Cancel

- 5. What's the difference between Access types
  - Private: Created user eyes only; no one has access unless owner of the version
  - Public: Everyone can see the version and create versions from. If you have edit privileges, you can edit the version.
  - Protected: Everyone can see the version but cannot edit the version unless owner. Everyone can create versions from.
- 6. This is now the child of Default and is listed in the Geodatabase Administration dialog.

👹 Geodatabase Administration (DBO@TEST-DB/LucityGIS)		
Versions Connections Locks		
	Properties -	
- Filtering	Name:	Test
Name: Owner:	Owner:	DBO
Name Owner Modified	Parent:	dbo.DEFAULT
DEFAULT dbo         8/1/2012 3:33:22 PM           edit         DBO         6/28/2012 7:14:32 AM	Description:	
Test DBO 8/1/2012 3:33:22 PM	This is a te	st version
	Access:	Public
	Created:	8/27/2012 11:14:04 AM
	Modified:	8/1/2012 3:33:22 PM
	Is Blocking:	False
	Is Replica:	False
Refresh 3 of 3 Versions at 8/27/2012 11:14:05 AM >	Is Locked:	False
Transactional Tree View Reconcile Order Historical		

## Replica

A replica is a copy of a database using GUID attributes that synchronize from the parent to the child databases or vice versa. There are several ways to create a replica but we will be creating the most likely replica used which is a one-way replica. One way replicas are easy to setup and are handy for the administrators to offload view only users off of the production database while performing synchronizations from time to time. Keeping the database in synch when production changes have been approved is a nice way to distribute your data to users while retaining data integrity, security and flexibility.

1. Prepare your data for a replica. Go to your database and right click on Feature Datasets, and go to manage/add global ids. Global Ids are necessary for the Geodatabase to keep track of changes in each database that is a part of a replica.

DBO.STNETG_AddressLocator	Locator
🗞 DBO.STNETG_CreateAddressLo	Locator
🖶 demo.DBO.LandBase	SDE Feature Dataset
🖶 demo.DBO.LucityEQUIP	SDE Feature Dataset
🖶 demo.DBO.LucityFACILITY	SDE Feature Dataset
🖶 demo.DBO.LucityPARK	SDE Feature Dataset
demo.DBO.LucityRIGHTOFWAY	SDE Feature Dataset
🖶 demo.DBO.LucityROAD	SDE Feature Dataset
🖶 demo.DBO.LucitySEWER	SDE Feature Dataset
🖶 demo.DBO.LucitySTORM	SDE Feature Dataset
🖶 demo.DBO.LucitySTREET	SDE Feature Dataset
🖶 demo.DBO.LucityTRAFFIC	SDE Feature Dataset
🖶 demo.DBO.LucityWATER	SDE Feature Dataset
🖶 demo.DBO.LucityWATERDIST	SDE Feature Dataset
🖶 demo.DBO.LucityWATERRAW	SDE Feature Dataset
demo.DRO.Lucit/WATERREC	SDE Feature Dataset
😳 demo.DI 🗊 Copy Ctrl+C	SDE Feature Class
😳 demo.DI 💼 🛛 Paste 🛛 Ctrl+V	SDE Feature Class
💷 demo.dt 🗙 🛛 Delete	Table
Rename F2	
🥭 Refresh F5	
×	
Manage 🕨	Analyze
New 🕨	Add Global IDs
Import 🕨	Privileges

#### Note: Data must be registered as versioned

- 2. Do this for stand-alone Feature Classes as well.
- 3. To create a replica, go to ArcToolbox/Data Management Tools/Distributed Geodatabase and expand.
- 4. Click on Create Replica

ArcToolbox	<b>д</b> ;
🗄 😂 Conversion Tools	
표 📦 Data Interoperability Tools	
😑 🌍 Data Management Tools	
🗉 🗞 Attachments	
🖽 🇞 Data Comparison	
🖃 🇞 Distributed Geodatabase	
🔨 Add Global IDs	
🔨 Compare Replica Schema	
Create Replica 🦳	
🔨 Create Replica Footprints	=
🐔 Croata Banlica Erom Sanjar	

 Browse or drag and drop data you want to replicate from into the Create Replica dialog window. Change the Replica Type to one-way replica. Add the replicated database connection to replicate the data to. Give the Replica a name.

	Datasets		<b>(</b>
Da	tabase Connections\demo.default.osa.sde\demo.DBO.LandBase		• •
Dal	tabase Connections\demo.default.osa.sde\demo.DBO.LucityEQUIP		
Dal	tabase Connections\demo.default.osa.sde\demo.DBO.LucityFACILITY	=	×
Dal	tabase Connections\demo.default.osa.sde\demo.DBO.LucityPARK		
Dal	tabase Connections\demo.default.osa.sde\demo.DBO.LucityRIGHTOFWAY		
Da	tabase Connections\demo.default.osa.sde\demo.DBO.LucityROAD		
Dal	tabase Connections\demo.default.osa.sde\demo.DBO.LucitySEWER		•
	tabase Connections\demo.default.osa.sde\demo.DBO.LucitySTORM		
4			
·			
≀eplica`			
ONE_V	VAY_REPLICA		•
Geodata	abase to replicate data to		_
Databa	ase Connections\repl.default.osa.sde		<b>1</b>
Replica I	Name		
LucityR			_
cacicyr	(opica		

- 6. The advanced settings allow you to change the behavior of your replica. Usually, you would except the defaults and click ok.
- 7. Once replica is in place, you can assign privileges.