

TRAINING GUIDE

ArcGIS Enterprise Administration

Part 2

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ArcGIS Enterprise Administration - Part 2

This session touches on key elements of maintaining enterprise geodatabases that help drive ArcGIS for Server services as well as backup techniques.

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Maintenance

Geodatabase Administration Tools

You can use the ArcCatalog interface for administrating users in 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.

Ē1	Сору	Ctrl+C			
ė	Paste	Ctrl +V			
×	Delete				
	Rename	F2			
З	Refresh	F5			
	New	•			
	Import	•			
	Export	•			
	Administration	•		Administer Geodatabase	
	Distributed Geodatabase	•	þ	Compress Database	
	Connect			Add User	
	Disconnect			Create and Manage Roles	
	Connection Properties				
	Geodatabase Connection Propert	ies			
Q	Share as Geodata Service				

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 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.

Input Database Connection			
Database Connections\actweb.vector.default.c	osa.sde		
Create Operating System Authenticated User	(optional)		
Database User			
test\mminer			
Database User Password (optional)			
Role (optional)			
UnlimitedGISPower			

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

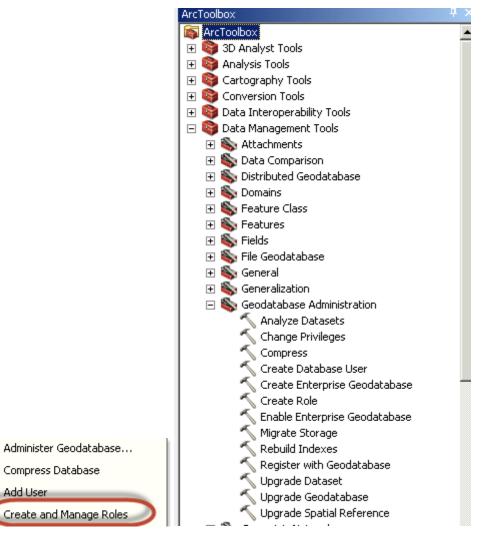
Geodatabase Administration (DBO@TEST-DB/LucityGIS)	
Versions Connections Locks	
Filtering Name: Owner:	Properties Name: DEFAULT Owner: dbo
Name Owner Modified	Parent:
DEFAULT dbo 8/1/2012 3:33:22 PM edit DBO 6/28/2012 7:14:32 AM	Description: Instance default version. Access: Public Created: 6/28/2012 7:14:32 AM Modified: 8/1/2012 3:33:22 PM Is Blocking: False Is Replica: True
Refresh 2 of 2 Versions 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.

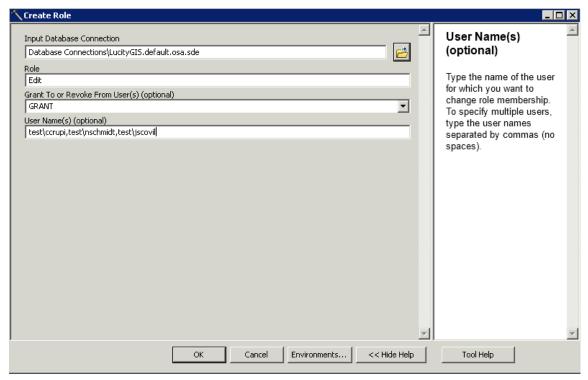
Create Role within ArcCatalog

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



IJ

2. The create role dialog will appear. You can grant or revoke users from roles from this interface.



3. Create Active Directory Groups for the Enterprise Geodatabase

4. 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.

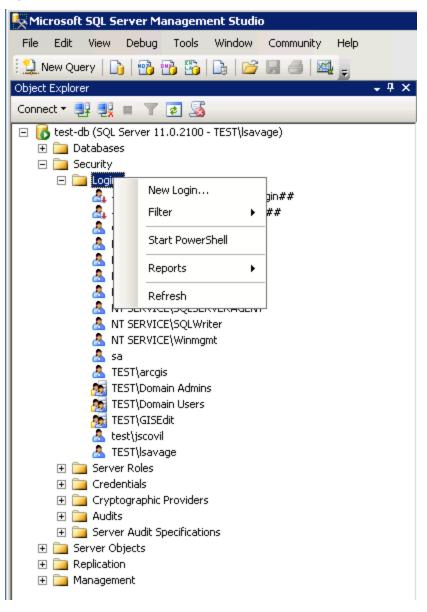
New Object - Group		×
Create in: test.local/l	Users	
Group name:		
GISView		
Group name (pre-Windows 2000):		
GISView		
Group scope	Group type	
C Domain local	• Security	
Global	C Distribution	
C Universal		
	OK Car	ncel

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: Name Active Directory Domain Services Folder	Select this object type: Users, Service Accounts, Groups, or Other objects Object Types From this location: Est-local Locations Enter the object names to select (examples): Matt Miner (mininer@test.local) Check Names Advanced OK Cancel
Add Remove	
OK Cancel Apply	

6. Add the member and click ok.

7. 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.



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	Login name:	TEST\GISView	Search
🚰 Securables	Windows authentication		
🚰 Status	SQL Server authentication		
	Password:		
	Confirm password:		
	🗖 Specify old password		
	Old password:		
	Enforce password polic	Ψ.	
	Enforce password expir	ation	
	🔽 User must change pass	sword at next login	
	Mapped to certificate	Y	
	O Mapped to asymmetric key		
	Map to Credential		Add
Connection	Mapped Credentials	Credential Provider	
Server: test-db			
Connection: TEST\lsavage			
View connection properties			
Progress			Remove
Ready	Default database:	Replica 🔽	
	Default language:	<default></default>	
		OK	Cancel

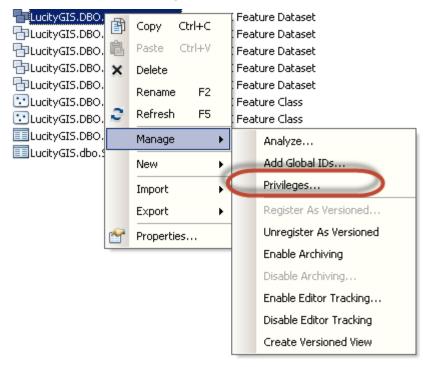
9. In the TOC of the Login - New dialog, click on user mapping. Check the boxes next to the databases you want the group to be assigned to. Just keep database role membership for <database> set to public. We'll let the Enterprise Geodatabase control privileges. Click ok.

🚪 Login - New					_ 🗆 ×			
Select a page	<u> S</u> Script 👻	· [Help						
🚰 General								
Server Roles	Users mapped to this login:							
User Mapping Securables	Map Database User Default Schema							
Status		GBAWork001						
		LucityGIS						
		master						
		model						
		msdb						
		Raster	TEST\GISView	dbo				
		Replica	TEST\GISView	dbol				
		ReportServer	1201 MIDVION					
		ReportServerTempDB						
		tempdb						
		tempab						
		account enabled for: Replic role membership for: Replic						
Connection		cessadmin						
Server: test-db Connection: TEST\Isavage View connection properties Progress Ready	db_ba db_da db_da db_da db_da db_da db_da db_ov	ackupoperator atareader atawriter aladmin enydatareader enydatawriter vorer worityadmin						
				ОК	Cancel			

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 those roles.

1. 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 directory group we created. Select Privileges.



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

🚺 Privileges				_ 🗆 ×	a 🗐 U	lser/Role			_ 🗆 🗵
Replica.DBO.LucityTRAFFIC						Name	Туре		
<u>User/Role</u>	Select	Insert	Update	Delete	Use	dbo guest public TEST\arcgis TEST\GISEdit TEST\GISView test\jscovil er/Role	User User Public User Group User	ОК	Cancel
Add	OF	(Cancel	Apply					

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	Oł	(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.

• 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	Desc	ription					
Name			Туре				
💩 DBO.STNETG_A	ddre	ssLocator	Locat	or:			
💩 DBO.STNETG_C	reate	AddressLo	Locat	or:			
🖶 demo.DBO.Lano	:IBase		SDE F	eature D)ataset		
📴 demo.DBO.Luci			SDE F	eature D)ataset		
🖶 demo.DBO.Luci			SDE F	eature D)ataset		
🖶 demo.DBO.Luci			SDE F	eature D)ataset		
demo.DBO.Luci				eature D			
📴 demo.DBO.Luci				eature D			
demo.DBO.Luci				eature D			
demo.DBO.Luci				eature D			
demo.DBO.Luci				eature D			
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demo.DBO.Luci				eature D eature D			
demo.DBO.Luci		TEPPEO		ieature D			
🖸 demo.DBO.CM	(T	Copy Ctrl	+C	eature C	Class		
⊡ demo.DBO.CM	Ē	Paste Ctrl	+V	eature C	Class		
🔲 demo.dbo.SDE	×	Delete					
		Rename	F2				
	з	Refresh	F5				
		Manage	•	А	nalyze		
		New	•	А	dd Global IDs. ₍		
		Import	•	P	rivileges	Analyze	
		Export	•		egister As Vers	Analyze this DBMS statis	dataset to update the tics.
	ng.	Properties		U	nregister As Ve		
L	_	1		Er	nable Archivin		tandard or an cense and is disabled
				D	isable Archivir	with a Basic	
					l		

Compression

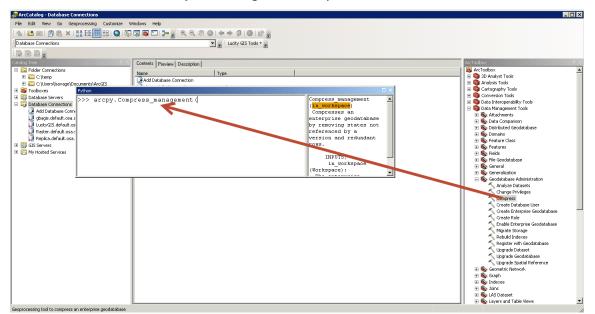
What is Compression?

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.

🚮 ArcCatalog - Database Connections\LucityGIS.defa	ault.osa.sde							
File Edit View Go Geoprocessing Customize Windows Help								
i 🖕 🖴 📾 i 🖗 🖄 🗶 i 🔡 🎆 🔠 📿 i 🚱	□ □ □ □ = = = = = = = = = = = = = = = =							
Database Connections\LucityGIS.default.osa.sde	💌 🤠 Lucky GIS Tools * 🖉							
Catalog Tree	Contents Preview Description	ArcToolbox 🤍 🕹						
Folder Connections C:\temp	Name: LucitvGIS.default.osa.sde	ArcToolbox						
C:\Users\Isavage\Documents\ArcGIS C:\Users\Isavage\Documents\ArcGIS	Type: Database Connection	Analysis Tools						
E 🛐 Tooboxes		🖲 🍯 Cartography Tools						
Database Servers		Conversion Tools						
🖃 🛱 Database Connections	Python	Data Interoperability Tools Data Management Tools						
Add Database Connection	>>> arcpy.Compress_management (r'Database Connections Start Time: Wed Aug Di	Attachments						
gbagis.default.osa.sde	LucityCTC Light.05a.5de 12:48:20 2012 KResult 'Database Connections Succeeded at Wed Aug	18 💰 Data Comparison						
LucityGIS.default.osa.sde Raster.default.osa.sde	<pre>\LucityGIS.default.osa.sde'></pre>	i Sy Distributed Geodatabase						
Replica.default.osa.sde	Time: 5.00 seconds)	I 🇞 Domains						
GIS Servers		Seature Class						
📧 👸 My Hosted Services		S Fields						
		🐝 File Geodatabase						
		Seneral						
		Second Se						
		Analyze Datasets						
	2	Change Privileges						
		Compress						
		🔨 Create Database User						
		Create Enterprise Geodatabase						
		Enable Enterprise Geodatabase						
		Migrate Storage						
		S Rebuild Indexes						
		Register with Geodatabase						
		Upgrade Dataset						
		Vpgrade Spatial Reference						
		🗉 🗞 Geometric Network						
		🗉 🚳 Graph						
		Solution Solution						
		Source S						
		As Dataset Expers and Table Views						
,		Pos:						

- 2. Using the ArcCatalog Tool
 - a. Right Click on a database connection in the ArcCatalog TOC
- _____ ß Copy Ctrl+C LucityEQUIP SDE Feature Dataset repl.default LucityFACILITY SDE Feature Dataset Paste Ctrl+V repl.default LucityPARK SDE Feature Dataset 💭 vector.defa 🗙 Delete LucityRIGHTOFWAY SDE Feature Dataset ਗ GIS Servers F2 Rename LucityROAD SDE Feature Dataset \overline My Hosted Sen 2 Refresh F5 LucitySEWER SDE Feature Dataset SDE Feature Dataset LucitySTORM New ۶ LucitySTREET SDE Feature Dataset Import . LucityTRAFFIC SDE Feature Dataset Export • Lucit/WATER <u>SDE Feature Daț</u>aset Administration . Administer Geodatabase... aset Distributed Geodatabase Compress Database laset • aset Add User **Compress Database** Disconnect Create and Manage Roles MOWAJIEU Compress a versioned Connection Properties... SDE_compress_log Table geodatabase. This removes Geodatabase Connection Properties... unreferenced states from the states tree, improving query Ŵ Share as Geodata Service... performance. Properties... A Only the geodatabase administrator can compress the geodatabase. Requires a Standard or an Advanced license and is read-only with a Basic license.
- b. Choose Administration/Compress Database

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 nonedited 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. Recommend Zero State Compression at least once a year.

Spatial and Attribute Indexes

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.

o 1	E D T				D : D	·
General Fields					ution and Tolerance Representations	
R507_3 UUID_3	e Indexes 5DE_ROWID_1 507 OID_507	UK			Add	
Unique: Ascendi Fields: GlobalI OBJEC	ng: Yes D				Delete	
─ Spatial I This Fea a500_ix	ature Class ha	s a spati	ial index named		Create Delete	

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 will manually 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. Lucity now has a tool to add Attribute Indexes for Lucity linked feature classes in the Geodatabase Configuration Tool. This will be featured in the ACT Class "Geodatabase Configuration Tool Overview"

- 1. In the same dialog as the previous exercise (Feature Class Properties), please go to the indexes tab.
- 2. Click on the Add button next to Attribute Indexes.

eature Class Properties				X
General Editor Tra	cking XY I	Coordinate System	Domain, Resolu	tion and Tolerance
Fields Indexes	Subtypes	Feature Extent	Relationships	Representations
Attribute Indexes R507_SDE_ROWID_ UUID_507 UUID_OID_507 UUID_OID_507 Unique: Yes Ascending: Yes Fields: GlobalID OBJECTID	<u>U</u> K		Add Delete	

3. Create LucityIDX for the Name and add the NTG_ID which is linked to the Lucity AutoID.

Add Attribute	Index					83
Name:	LucityIDX					
💭 Unique	ng					
Fields Fields avail	able:			Fields selecte	ed:	
NTG_SHAF NTG_CLN_ NTG_IND> NTG_OWN NTG_ID	_CD {_CD	*	➡	NTG_ID		
NTG_DB LastModB LastModD LastSynDa GlobalID	ate	•				€
				ОК	Cancel	

- 4. Click ok and Apply.
- 5. 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					X
Name:	LucityCMN					
🗌 Unique	ng					
Fields Fields avail	able:			Fields selected:		
NTG_OWN NTG_ID NTG_DB LastModBy LastModDa LastSynDa GlobaIID NTG_NUMI SHAPE.len	, ate ite BER	4 III +	•	NTG_NUMBER		↑ ↓
				OK	Cancel	

6. Click Ok and Apply.

Tune SQL Server space for Geodatabases

In terms of SQL Server space for Geodatabases, the functionality of the Geodatabase 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. If you don't want Raster data in a Geodatabase, I would suggest using the mosaic tool in ArcGIS which requires an <u>image extension</u> for ArcGIS for Server when publishing.

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 - Raste	2r				
Select a page	🔄 Script 👻 📑 He	elp			
General					
🚰 Files 🚰 Filegroups	Database name:		Raster		
Philophians	Owner:		TEST\lsava	age	
🚰 Change Tracking			,		
Permissions	Use full-text in	dexing			
Properties	Database files:				
	Logical Name	File Type	Filegroup	Initial Size (MB)	Autogrowth / Maxsize
	Raster_dat	Rows	PRIMARY	1900	By 10 percent, Unlimited
	Raster_log	Log	Not Applicable	575	By 10 percent, Limited to 209
		3			-,
Connection					
Server: test-db					
Connection:					
TEST\lsavage					
View connection properties					
Progress					
Ready	•				Þ
Post P				Add	Remove
				A00	nemove
					OK Cancel

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

🚪 Change Autogrowth for Raster_	log 🛛 🗙
Enable Autogrowth	
File Growth	
In Percent	ho 🛨
C In Megabytes	10 +
Maximum File Size E Limited to (MB)	5,000 🛨
C Unlimited	
	OK Cancel

3. Do the same for the data filegroup.

🚪 Change Autogrowth for Raster_	_dat 🛛 🗙
Enable Autogrowth	
File Growth	
In Percent	10 🗧
O In Megabytes	10 😤
Maximum File Size	
 Limited to (MB) 	5000
O Unlimited	
	OK Cancel

- 4. Most Raster datasets are 30 GB to 70 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. Don't allow Raster databases to get too large. As a recommendation, you could split up Raster databases into separate databases maxing out each one into 300GB databases.
- 5. After loading, analyze through ArcCatalog and assign permissions. Make sure to backup, truncate and shrink the log files 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 large amounts of data in one transaction. You should consider size growth rather than percentage.

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 creating backups from SQL Backup Master. This an optional program to use for backing up SQL Express as well as SQL Server Standard and Enterprise. Note: when you want 99% assurance of your enterprise geodatabase backups, simply backup to a known location both offsite and onsite as a file geodatabase.

Select a page Page General		🔄 Script 🔻 🌃 Help					
🚰 Files 🚰 Filegroups	Col	lation:	•				
Poptions Change Tracking	Re	covery model:	Full		+		
Permissions	Compatibility level: Containment type:		Full				
🚰 Extended Properties			Bulk-log Simple	ged			
		ner options:					
	_						
		Auto Shrink		False			
		Auto Update Statistics		True			
		Auto Update Statistics Asynchronously		False			
	Δ	Containment					
		Default Fulltext Language LCID		1033	=		
		Default Language		English			
		Nested Triggers Enabled		True			
		Transform Noise Words		False			
		Two Digit Year Cutoff 2049					
Connection	۵	Cursor					
Server:		Close Cursor on Commit Enabled		False GLOBAL			
LUKESAVAGE\SQLEXPRESS		Default Cursor					
Connection:	۵	FILESTREAM					
GBAMS\lsavage		FILESTREAM Directory Name					
-		FILESTREAM Non-Transacted Acc	cess	Off			
View connection properties	۵	Miscellaneous		F 1	_		
		Allow Snapshot Isolation	False False				
Progress				False			
C Ready	AI	low Snapshot Isolation					
				OK	Cancel		

Enterprise Geodatabase Backups

Security Scan Report

Since 10.4, Esri has added a security scan python script that will print out possible security issues with your ArcGIS for Server configuration. Below, we will show you how to setup the python script to run on ArcGIS for Server and execute. List of severity is listed on <u>Esri's Security best practices</u> page.

1. Add python within the environment variables for Windows. Add at the end of the path→ ;C:\python27\ArcGISx6410.5

	Environment Variables	x		Edit System Variable	x
User variables for Is	Iser variables for Isavage			Path	
Variable	Value		Variable value:	verShell\v1.0\;C:\Python27\ArcGI	Sx6410.4
TEMP	c:\temp			ОК	Cancel
TMP	c:\temp				cancor
	New Edit Delete				
System variables	Value	~			
Path	C:\windows\system32;C:\windows;C:\				
PATHEXT	.COM;.EXE;.BAT;.CMD;.VBS;.VBE;.JS;				
PROCESSOR_A					
PROCESSOR_ID	. Intel64 Family 6 Model 60 Stepping 3, G	~			
	New Edit Delete				
	OK Cance	el			

- Copy python script from the ArcGIS for Server path to a known path (C:\Program Files\ArcGIS\Server\tools\admin.serverScan.py). In this example, I'll run the python script from the root of C:\
- 3. Execute serverScan.py in command line. I highly recommend to 'run as administrator'.



4. Click on the html server scan report to view in any browser.

(i | file:///C:/serverScanReport_test-web_2016-08-25.html

C

ArcGIS for Server Security Scan Report - 2016-08-25

test-web.test.local

Potential security items to review

Id	<u>Severity</u>	Property Tested	<u>Scan Results</u>
SS08	Important	Cross-domain requests	Cross-domain requests are unrestricted. To reduce the possibility of a recommended to restrict the use of your services to applications hoste
SS07	Important	Rest services directory	The Rest services directory is accessible through a web browser. Unle reduce the chance that your services can be browsed, found in a web cross-site scripting (XSS) attacks.
SS12	Recommended	Feature service operations	Feature service: ValveExercisingIMP This feature service has the update and/or delete operations enabled a deleted without authentication.
SS12	Recommended	Feature service operations	Feature service: LucityGIS_Redlining This feature service has the update and/or delete operations enabled a deleted without authentication.
SS11	Recommended	PSA account status	The primary site administrator account is enabled. It is recommended Server other than the group or role that has been specified in your ider
SS10	Recommended	Web adaptor registration	One or more web adaptors are registered over HTTP. To allow Serve HTTPS.

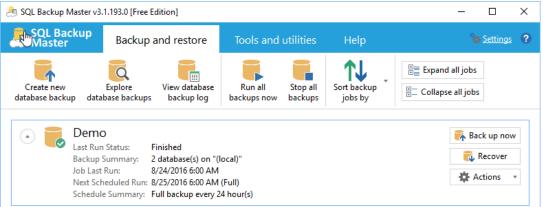
Backups

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 creating backups from SQL Backup Master. This an optional program to use for backing up SQL Express as well as SQL Server Standard and Enterprise. Note: when you want 99% assurance of your enterprise geodatabase backups, simply backup to a known location both offsite and onsite as a file geodatabase.

🧻 Database Properties - Demo		- • •
Select a page	🛒 Script 🔻 🎼 Help	
🚰 General	🖉 scibr 🔺 🚺 Helb	
🚰 Files		
Filegroups	Collation: 🛛 👞 💊 SQL_Latin1_General_CP1_Cl_AS	_
🚰 Options		
📑 🚰 Change Tracking		
Permissions	Compatibility level: Full Bulk-logged	
📑 🚰 Extended Properties	Containment type: Simple	
	Containment type.	i
	Other options:	
	Auto Shrink False	*
	Auto Update Statistics True	
	Auto Update Statistics Asynchronously False	
	Containment	
	Default Fulltext Language LCID 1033	=
	Default Language English	-
	Nested Triggers Enabled True	
	Transform Noise Words False	
	Two Digit Year Cutoff 2049	
Connection	⊿ Cursor	
Server:	Close Cursor on Commit Enabled False	
LUKESAVAGE\SQLEXPRESS	Default Cursor GLOBAL	
Connection:	⊿ FILESTREAM	
GBAMS\lsavage	FILESTREAM Directory Name	
-	FILESTREAM Non-Transacted Access Off	
View connection properties	Miscellaneous	
	Allow Snapshot Isolation False	
Progress	ANSENTED Default Ealse	· · · · · · · · · · · · · · · · · · ·
Ready	Allow Snapshot Isolation	
1. A. A.		
	OK	Cancel

Enterprise Geodatabase Backups

- 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 log files.
- Analyze and Index: Analyze/update statistics, and updates indexes
- 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 14th day.
- Full Backup: Everday at night
- Differential or Intermediate backup: Running every 12 hours
- Backup Logs: Run every 4 hours.
- Shrink Logs: Run after full backup
- Analyze, update statistics and indexes: Run after full backup.
- Create backup copy
- Test Recovery randomly (maybe every quarter)
- For Raster or Large Static Databases (20GB or more), consider separate plan for backup and recovery. Still backup transaction logs and shrink transaction logs on a periodic basis.
- 1. A free or paid tool to use is <u>http://www.sqlbackupmaster.com/</u>. SQL Server Maintenance Backup Job.



• Cre	Create new database backup							
🙇 SQL Backup Mast	ter v3.1.193.0 [Free E	dition]				_		\times
SQL Backu Master	ap Backup a	and restore	Tools and	utilities	Help		Setting:	s ?
Create new database backup	Explore database backups	View database backup log	Run all backups now	Stop all backups	Sort backup jobs by	Expand all jo		

• Connect to SQL Server instance, backup databases and add destinations for backup

<u>.</u>	Database Backup Editor
Source:	Destinations:
Current: [Unspecified] Choose SQL Server Back up all non-system databases (?) Show system databases	🛼 Add 🛼 Remove 💭 Enable 🛜 Disable 🛧 Up 🔸 Down
	Configuration: Schedule: Not scheduled Job runs as (?): NT AUTHORITY\SYSTEM Email notifications: On for successes; On for failures Backup name: New Database Backup Description: Image: Contemport
Backup job settings	Save Cancel Help

<u>.</u>	Connect to SQL Server	x
Server name:		
(local)		-
Server logon		
Choose th	using Windows Authentication his option if your current Windows account is a of the System Administrator role in SQL Server	
O Connect	using the following SQL Server account:	
Usernam	e:	
Password	:	
Test SQL Conr	OK Ca	ncel

• If using Windows Auth, you'll be prompted for running the backup as windows auth.

<u>.</u>	Backup Job Settings
General Datab	ase Windows Account Compression / Encryption SQL Scripts Notifications
🖌 Run backup	as different Windows user
Account name:	TEST\lsavage
Password:	••••••
	Test
connect to SQ and move bac	hen running a backup job as a different Windows user, the specified account will be used to L Server (when Windows Authentication is specified in the database connection settings) thup files to their destinations (e.g. a network folder, etc.). <u>help file topic</u> for more information regarding this option.
Save these se	ettings as default Save Cancel Help

• Click on the schedule hyperlink. You may want to start this overnight when there is little chance people are on Lucity/GIS or other sql databases within the sql server instance.

<u>.</u>	Backup Job Schedule	_ □ ×
Schedule		
 Full Backup Differential Transaction Log 		nins (after the full backup) nins (after the full backup)
Start date/time:	8/6/2015 3:00 PM 🔳 (a	applies to full backup)
End date/time:	Enter date	
Days of week:	🗸 Sun 🗸 Mon 🗸 Tues 🗸 Wed 🗸 Th	nu 🗸 Fri 🗸 Sat
Load a preset backu Reset to defaults	<u>p plan</u>	
Estimated Execut	ion Plan	
Date / Time		Backup Type
Thursday, August	06, 2015 3:00 PM	Full
Thursday, August	06, 2015 7:00 PM	Transaction Log
Thursday, August	06, 2015 11:00 PM	Transaction Log
Help		Save Cancel

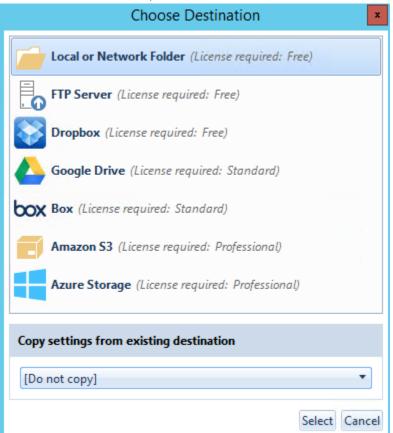
•	Click on	e-mail	notifications	hyperlink
---	----------	--------	---------------	-----------

	Backup Job Settings	x
General Datab	base Windows Account Compression / Encryption SQL Scripts Notifications	
 Send email Notify on Successfu Notify about 	ul backup 🗹 Failed backup (or completed with errors)	
	cups 🗹 Differential backups 🗹 Transaction log backups	
From address	email addresses s: wonderifthisworks@lucity.com dress(es): itmustwork@lucity.com	
Server setting		
SMTP server:	: smtp.office365.com	
SMTP port:	587	
Username:	wonderifthisworks@lucity.com	
Password:	••••••	
Encryption:	✓ Use SSL Send test messa	ige
Save these se	settings as default Save Cancel	Help

• Save and you can see your Backup plan listed. You can create multiple plans for different SQL Server instances as well. As you can see, recovery is simple and time stamped for each different type of backup within the plan.

患 Database Ba	ckup Recovery Expl	orer			– 🗆 ×
Backup Job:	Demo	Ŧ	Start date: Enter	start date	B
Destination:	C:\Backup	Ŧ	End date: Enter	end date	🖄 Refresh Help
Database Name	File Name	Туре	Created	Size	Action
🧧 Lucity	Lucity-20	Full	8/24/2016 6:00 AM	120 MB	Recover Delete
🧧 Demo	Demo-20	Full	8/24/2016 6:00 AM	110 MB	Recover Delete
🧧 Lucity	Lucity-20	Full	8/23/2016 7:27 AM	120 MB	Recover Delete
🭯 Demo	Demo-20	Full	8/23/2016 7:27 AM	110 MB	Recover Delete
🧧 Lucity	Lucity-20	Full	8/23/2016 6:00 AM	120 MB	Recover Delete
🧉 Demo	Demo-20	Full	8/23/2016 6:00 AM	110 MB	Recover Delete
🧧 Lucity	Lucity-20	Full	8/20/2016 6:00 AM	120 MB	Recover Delete
🥛 Demo	Demo-20	Full	8/20/2016 6:00 AM	110 MB	Recover Delete
🧧 Lucity	Lucity-20	Full	8/19/2016 6:00 AM	120 MB	Recover Delete
🧧 Demo	Demo-20	Full	8/19/2016 6:00 AM	110 MB	Recover Delete
Delete all shown	database backup fil	es	Show	files not created b	y the selected destination

• Add a destination, there are several choices. Pick one.



• Add in your credentials and recycle period.

	Fe	older Destinati	ion Settings	;	×
Local or netw	ork folder location:				
E:\backup\m	naintenance				Browse
0.11			<u>Ope</u>	en folder location	
Optional set	-				
	eed to specify authen Otherwise, leave thes			-	*
Username:	test\\savage				
Password:					
	VT: If you specify a u to run under a speci s).				
Cleanup					
Delete vers	ions older than 14	<pre>^ days (0 = n)</pre>	ever)		
Test				ОК	Cancel

• Click on backup job settings and change temporary backup folder. Recommend somewhere local on the server if you can. This will backup and compress the files before it's copied to the final destination

	Backup Job Settings	×
General	Database Windows Account Compression / Encryption SQL Scripts	Notifications
_ Temp	orary backup folder	
G:\d	wnloads\maintenance	
	Browse	
Autor	e: You can enable remote database server backups by specifying a shared n re. We strongly recommend against the use of mapped network drive letter ad, use UNC paths in the form of \\ <i>server\share</i> . For details, see the <u>related</u> natic cleanup utomatically delete old differential backup files (after each full or differentia	rs for this purpose. <u>I help topic</u> . Il backup)
Not	utomatically delete transaction log backup files (after each full or differentia e: Enabling automatic cleanup options will conserve storage space by remo rential and/or transaction log backup files at each full and differential back	oving uncessary
✓ Save	these settings as default	Save Cancel Help

• Go to SQL Scripts tab and you can add your maintenance scripts. For this example, the maintenance script will only run after the full backup is complete and bypasses script on differential and transaction log backups. The script will update statistics, rebuild indexes, and shrink the transaction logs. In our setup in this example, this script only fires off every 24 hours at night.

<u>.</u>			Backup Job Settings			x
General	Database	Windows Account	Compression / Encryption	SQL Scripts	Notifications	
Before ba	ckup job:					
After bac						
EXEC sp go	updatestat	ts				Ê
EXEC sp			:'print ''?''', @command2='se CTOR=90,ONLINE=OFF)'	et QUOTED_ID	ENTIFIER ON;ALTE	R
go USE MA			,			
declare						
	archar(2000 me varchar					
_	varchar(12					\sim
🖌 Execu	te the abov	ve scripts during full	backups only			
			s 4,096 characters. Execution , and will not halt backup op		ged as warnings w	ithin
✔ Save t	hese setting	gs as default			Save Cancel	Help

Example Script for After Full Backup

--Rebuild Index and Update Statistics --Rebuild Indexes Use Master go DECLARE @cmd VARCHAR(8000); SET @cmd = 'exec sp_MSforeachtable @command1="print ""?""", @command2="set QUOTED_IDENTIFIER ON;ALTER INDEX ALL ON ? REBUILD WITH (FILLFACTOR=90,ONLINE=OFF)" EXEC sp_msforeachdb @command1 =@cmd go DECLARE @cmd VARCHAR(8000); SET @cmd = 'EXEC sp_updatestats' EXEC sp_msforeachdb @command1 =@cmd go --Shrink Logfiles for non-system databases USE MASTER declare @isql varchar(2000), @dbname varchar(64), @logfile varchar(128) declare c1 cursor for SELECT d.name, mf.name as logfile--, physical_name AS current_file_location, size FROM sys.master_files mf inner join sys.databases d on mf.database_id = d.database_id where d.name not in ('master', 'model', 'msdb', 'tempdb') and mf.type_desc = 'LOG' open c1 fetch next from c1 into @dbname, @logfile While @@fetch_status <> -1 begin select @isql='USE ' + @dbname + ' checkpoint' print @isql exec(@isql) select @isql='USE ' + @dbname + ' DBCC SHRINKFILE (N"' + @logfile + "', 100)' print @isql exec(@isql) fetch next from c1 into @dbname, @logfile end close c1 deallocate c1 gо

Backup ArcGIS for Server Site

Provided with ArcGIS for Server, you can now backup your site. This backup only accounts for the site configuration not the data. If you have caches, handle the backup of the caches using another copy or backup utility.

1. On your ArcGIS for Server, go to C:\Program Files\ArcGIS\Server\tools\admin and copy the two python script utilities.

Name	Date modified	Туре	Size
🛃 backup.py	2/13/2014 3:42 PM	Python File	7 K
🛃 convertcachestorageformat.py	2/13/2014 3:42 PM	Python File	1 K
🛃 createcacheschema.py	2/13/2014 3:42 PM	Python File	1 K
🔁 createservice.py	2/13/2014 3:42 PM	Python File	1 K
🛃 deletecache.py	2/13/2014 3:42 PM	Python File	1 K
🛃 managecachetiles.py	2/13/2014 3:42 PM	Python File	1 K
🔁 manageservice.py	2/13/2014 3:42 PM	Python File	1 K
🔁 managesite.py	2/13/2014 3:42 PM	Python File	1 K
restore.py	2/13/2014 3:42 PM	Python File	11 KI

- 2. Create a new folder in a known location that is easy to get to in command line. As an example, I created an agsutil folder under the root of c:\.
- 3. Paste them in the new location.

Þ	This P	C ⊧	Local D	isk (C:)	►	AGSUtil
	N	lam	e			
		д b	ackup.p	у		
		<u>е</u> г	estore.py	,		

- 4. Go to the command prompt as an administrator, run the backup.py script. Make sure you are connecting to python's home directory or set python.exe as a path. Below is an example after setting python.exe path in environment variables.
 - a. Python.exe c:\agsutil\backup.py -u <ags admin> -p <password> -s http://<localhost or servername:6080> -f c:\backup\ags
 - b. After running, below is an example of the output.

Aug-28-2014_09-58-13.agssite

Restore ArcGIS for Server Site

Provided with ArcGIS for Server, you can restore a backup of your site.

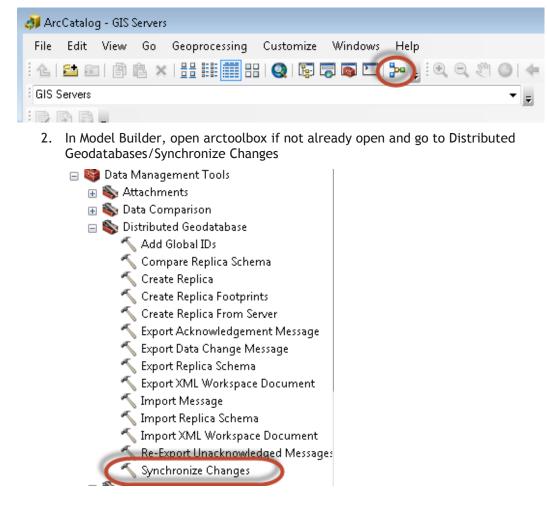
- 5. Go to command prompt and restore your site using the backup and restore.py script. Below is an example.
 - a. Python.exe c:\agsutil\restore.py -u <username> -p <password> -s <localhost or servername>:6080 -f c:\backup\ags\Aug-29-2014_09-58-13.agssite -r c:\backup\ags
 - b. This procedure will take some time and your site will be down until complete.

C:\>python.exe c:\agsutil\restore.py -u AGS -p QWE@zxc1234 -s http://lukesavag 6080 -f c:\backup\ags\Aug-28-2014_09-58-13.agssite -r c:\backup\ags	je :
Beginning to restore the site running on "lukesavage" using the site backup av lable at: c:\backup\ags\Aug-28-2014_09-58-13.agssite This operation can take some time. You will not receive any status messages an will not be able to access the site until the operation is complete	

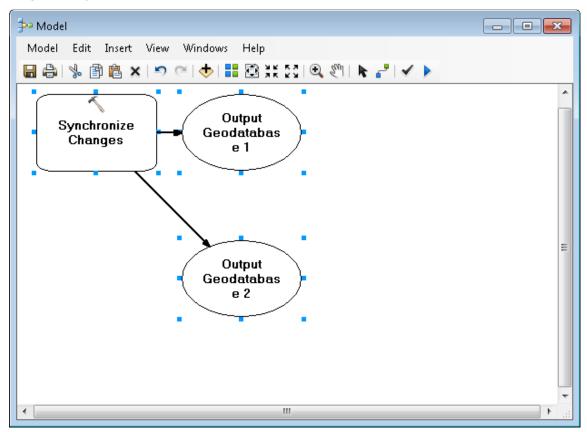
6. It is important that you reregister your web adaptor to ArcGIS for Server after the restore is complete.

Automate Replica Synchronization using Python

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



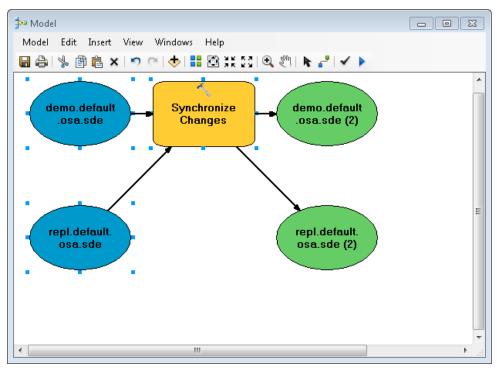
3. Drag and drop the tool into Model Builder.



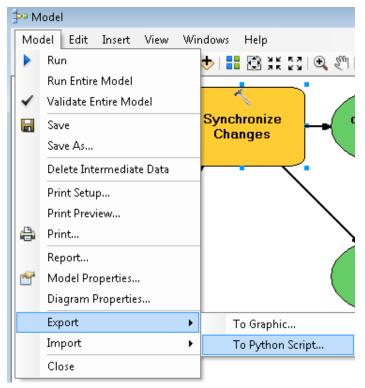
- 4. Once tool is in Model Builder, double click on Synchronize Changes box to open the dialog.
- 5. Fill in the information appropriately. For reference, please visit the Replica section.

Geodatabase 1		Synchronize
Database Connections\demo.default.osa.sde		Changes
Replica		
DBO.Lucity_Demo	-	Synchronizes updates
Geodatabase 2		between two replica geodatabases in a direction
Database Connections\repl.default.osa.sde		specified by the user.
Direction		-F
FROM_GEODATABASE1_TO_2	-	
Conflict Resolution Policy		
IN_FAVOR_OF_GDB1	•	
Conflict Definition		
BY_OBJECT	-	
Reconcile with the Parent Version (Single Generation only)	*	

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



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



- 8. Save in location that has Python and ArcCatalog installed. For example, auto_synch.py under the root of c:\.
- 9. 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") 10. Go to Windows Task Scheduler and create a basic task.

Create Basic Task Wizard		
Create a Basic Tas	¢	
Create a Basic Task Trigger		d to quickly schedule a common task. For more advanced options or settings ple 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

11. 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		23
🔟 Task Trigger		
Create a Basic Task	When do you want the task to start?	
Trigger Weekly	🖉 🔘 Daily	
Action	Weekly	
Finish	Monthly	
	🔘 One time	
	When the computer starts	
	🔘 When I log on	
	When a specific event is logged	
	< Back Next > Car	ncel

12. 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		83
🐌 Weekly		
Create a Basic Task Trigger Weekly Action Finish	Start: 8/27/2012 🛛 10:00:00 PM 🚔 🗖 Synchronize across time zones Recur every: 1 weeks on: Sunday Monday Tuesday Wednesday Thursday V Friday Saturday	
	< Back Next > Ca	ncel

13. Choose 'start a program' and click next.

Create Basic Task Wizard		×
Action		
Create a Basic Task Trigger Weekly	What action do you want the task to perform?	
Action	Start a program	
Finish	💿 Send an e-mail	
	💿 Display a message	
	< Back Next > Ca	ncel

14. 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		X
🖲 Start 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

15. 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	Description:	This task will automatically synch the Geodatabase replica.
Start a Program		
Finish		
	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

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

🕒 AutoSynchRe	eplica Properties (Local Computer)
General Trig	gers Actions Conditions Settings History
Name:	AutoSynchReplica
Location:	λ
Author:	GBAMS\lsavage
Description:	This task will automatically synch the Geodatabase replica.
Security opt When runn	ions
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

17. Test the task by right clicking on the new task and select run.

18. Check the ArcToolBox results history location by going to the following location.

C:\Users\<username>\AppData\Roaming\ESRI\Desktop10.5\ArcToolbox\History

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.

	Query35.sql	- lukesavage	(136))* SQ	LQuery34.sql - Iul	kesavage (13	5)) SQLQuery	/33.sql - lukes:	avage (13	(4)) SC	QLQuery32.sql - luk	(esavage (133)) 🔽 SQLQuery31.sql - luke	savage (132))
1	***** S	cript for	SelectTop	NRows comman	nd from SS	MS ******	/					
s	ELECT *	FROM [Dem	o].[dbo].	[a445]								
	1											
B R	esults 🛅 M	lessages										
	OBJECTID	EXG_UNITID	EXG_DESC	EXG_TYPE_CD	EXG_TSIZE	EXG_TDEPTH	EXG_FA_ID	EXG_ID	SHAPE	SDE_STATE_ID	GlobalID	
1	20	55789	test	2	NULL	NULL	NULL	4214	19	11471	6FDC0359-64D7-4428-8349-6C725A73AF8B	
		55789		2	NULL	NULL	NULL	NULL	19	11470	6EDC0359-64D7-4428-8349-6C725A73AE88	

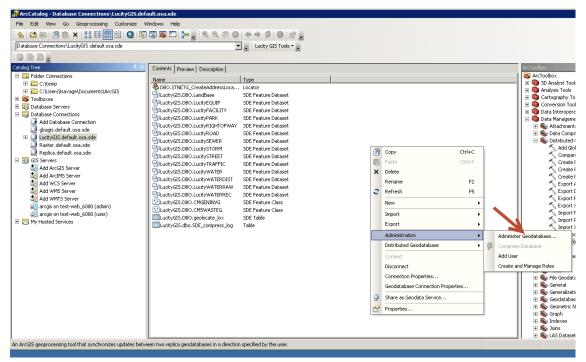
When Does Versioning Make Sense?

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



- 2. Click on Administration/Administrator Geodatabase.
- 3. Right click on the Default version and select new version

🔰 Geodatal	oase Adr	ninistratior	(DBO@1	TEST-DB/LucityGIS)
Versions	Conne	ctions L	ocks	
Filtering				Owner:
Name	Owner	Modified		
DEFAULT edit		8/1/2012 3	: <i>33:22 Pl</i> 7:14:32 A	Reconcile Version
				Delete Version View Locks
Refresh	2 of 2 Ver	sions at 8/27	/2012 11:	:08:06 AM >
Transacti	onal	Tree View	Recon	cile Order Historical

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		
	ОК	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 A	dministration (DBO	@TEST-DB/Lu	icityGIS)		
Versions Conr	nections Locks				
Tilkasia a				Properties -	
- Filtering				Name:	Test
Name:		Owner:	<u> </u>	Owner:	DBO
Name Owner				Parent:	dbo.DEFAULT
edit DBO	8/1/2012 3:33:22 6/28/2012 7:14:3			Description:	
Test DBO	8/1/2012 3:33:22	PM		This is a te	est 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 V	'ersions at 8/27/2012	11:14:05 AM	>	Is Locked:	False
Transactional	Tree View Ree	concile 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 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.

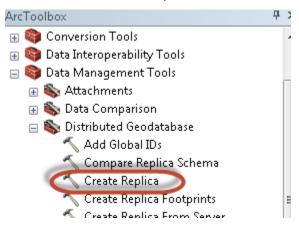
1. Prepare your data for a replica. Go to your database and right click on Feature Datasets, and go to manage/add global ids. Global Ids are necessary for the Geodatabase to keep track of changes in each database that is a part of a replica.

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🇞 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.DBO.Lucit/WATERREC	SDE Feature Dataset
🖸 demo.Dl 🎒 Copy Ctrl+C	SDE Feature Class
🖸 demo.DI 💼 Paste Ctrl+V	SDE Feature Class
🔲 demo.dt 🗙 🛛 Delete	Table
Rename F2	
Sefresh 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



5. 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.

🔨 Create Replica		
Replica Datasets		
	(
Database Connections\demo.default.osa.sde\demo.DBO.LandBase		
Database Connections\demo.default.osa.sde\demo.DBO.LucityEQUIP		
Database Connections\demo.default.osa.sde\demo.DBO.LucityFACILITY	×	
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Database Connections\demo.default.osa.sde\demo.DBO.LucityRIGHTOFWAY	1	
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Database Connections\demo.default.osa.sde\demo.DBO.LucitySEWER	•	Ξ
Database Connections\demo.default.osa.sde\demo.DBO.LucitySTORM		
Replica Type		
ONE WAY REPLICA	-	
	•	
Geodatabase to replicate data to		
Database Connections\repl.default.osa.sde		
Replica Name		
LucityReplica		-
X Advanced Cetting		Ŧ
OK Cancel Environments << Hi	de Help	

- 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.

Apply Schema Changes to Replica

To update the schema in a replica, there are three tools that you can use to update the schema. However, there are certain instances where you will need to unregister the replica, delete the replica feature class/tables/datasets and recreate the replica for the changes to push down from the parent to the child. Below is a matrix from <u>Esri's ArcGIS Resources</u> page for schema changes. It describes what is supported with the update process and what is not supported.

	Add	Change	Drop
Field	Y	Y (domains)	Y
Domain	Y	Y	Y
Table/Feature Class	Y	Y (domains, add/drop fields)	Y
Geometric network	N	Ν	Y
Тороlоду	N	Ν	Y
Feature dataset	N	Ν	Y
Relationship class	N	Y (add/drop fields, domains)	Y

Steps to complete

- Compare Schema in Parent
- Import Schema into Child
- 1. Open ArcCatalog.
- 2. Right Click on the Replica database and choose distributed geodatabase/compare replica schema

		1			
Replica.default.osa. Replica.default.osa.	(F)	Copy Ctrl+C	1		
E P Replica.DBO.EQ		Paste Ctrl+V			
E P Replica.DBO.Lar		Delete			
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E Replica.DBO.PA		Rename F2			
🗄 🖶 Replica.DBO.RI	З	Refresh F5			
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E 🖶 Replica.DBO.SE			-		
🗄 🖶 Replica.DBO.ST		Import +			
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E P Replica.DBO.TR		Administration	1		
⊞		Distributed Geodatabase	55	Synchronize Changes	
⊞	_			Synchronize Changes	
E P Replica.DBO.WA		Connect	92	Export Data Changes Message	
Replica.DBO.cm		Disconnect	٩,	Export Acknowledgment Message	
Replica.DBO.cm		Connection Properties	5	Import Message	
Replica.DBO.cm		Geodatabase Connection Properties	9		
Replica.dbo.SDE	-			Re-Export Unacknowledged Messages	
🖃 🛐 GIS Servers	9	Share as Geodata Service	8	Import Schema Changes	
Add ArcGIS Server	2	Properties	**	Export Replica Schema	
Add ArcIMS Server	_		99.49 99.90	Compare Replica Schema	
Add WCS Server				Manage Replicas	
Add WMTS Server			5	Compa	re Replica Schema
ArcGIS on services.a	arcais	sonline.com (user)		Compa	are the schema of the data in a
arcgis on test-web 6				replica	to the relative replicas
E My Hosted Services		` ´			a. The result is a replica
E Ready-To-Use Services					a changes file that can be used ly schema changes to the
					e replica.

- 3. Browse to the parent geodatabase
- 4. Choose Replica Name if you have multiple replicas
- 5. Choose a location to save the replica schema changes xml file

npare Replica Schema	Wizard	×
	chema changes between a relative replica and your replica. plica schema to compare:	
Geodatabase:		
test-db-sde:sqls	erver:test-db-LucityGIS	
C Replica schema X	۲L file:	
	E E	
Replica name:	DBO.Lucity	
Replica type:	One way parent to child	
Output replica schema c	hanges XML file :	
C:\temp\compare.xml	2	
About comparing replica	<u>schema</u>	
	Finish Car	icel

6. After complete, right click on the Replica database and choose distributed geodatabase/import replica schema

Replica.default.c File Replica.DBO	Copy Ctrl+C				
E Replica.DBO	Paste Ctrl+V				
E P Replica.DBO X	Delete				
🕀 📴 Replica.DBO	Rename F2				
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🕀 🖶 Replica.DBO	Connect	Q.	Export Data Changes Message		
🕀 🖶 Replica.DBO	Disconnect		Export Acknowledgment Message		
🖸 Replica.DBO	Connection Properties				
Replica.DBO		-	Import Message		
Replica.DBO	Geodatabase Connection Properties	90	Re-Export Unacknowledged Mess	ages	
E 🗊 GIS Servers	Share as Geodata Service		Import Schema Changes	N	
Add ArcGIS Serv M	Properties		Export Replica Schema	- K2	
Add ArcIMS Server			Compare Replica Schema		hema Changes
Add WCS Server					olica schema changes from a nema changes file. This file
dd WMS Server		5	Manage Replicas	is generat	ed by comparing the
Add WMTS Server					of replicas in a replica pair. Afferences occur when
ArcGIS on services.a	rcgisonline.com (user)				rrerences occur when anges are applied after the
	tto (dumin)			replica is c	reated.
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7. Locate the schema change xml file generated and add to the import schema changes wizard

mport Schema Changes W	lizard	×
This wizard imports the sch	ema changes from a relative replica to your replica.	
Choose the replica schem	a changes xml file:	
C:\temp\compare.xn	1 🖻	
Replica name:	DB0.Lucity	
Replica type:	One way parent to child	
Import to database:	test-db-sde:sqlserver:test-db-Replica	
About importing schema c	hanges	
	< Back Next >	Cancel

- 8. Review the information and click next
- 9. In the next screen, you should see the changes to the schema to apply. In this scenario, we deleted a field called 'test; short int'.

Imp	ort Schema Chai	nges Wizard	
Apply	Change	Details	
Repl.DBO.cmGeneralCustom	DeleteField	field = test	
<			>
		< Back Finish	Cancel

10. Click Finish and Synchronize Changes.