

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 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.

| 볩 | Сору | Ctrl+C | | |
|---|--------------------------------|---------|---|-------------------------|
| ê | Paste | Ctrl +V | | |
| × | Delete | | | |
| | Rename | F2 | | |
| 2 | Refresh | F5 | | |
| | New | • | | |
| | Import | • | | |
| | Export | • | | |
| | Administration | • | | Administer Geodatabase |
| | Distributed Geodatabase | • | ø | Compress Database |
| | Connect | | | Add User |
| | Disconnect | | | Create and Manage Roles |
| | Connection Properties | | | |
| | Geodatabase Connection Propert | ies | | |
| Q | Share as Geodata Service | | | |
| 8 | 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 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 | | | | 2 |
|--|------------|--|---|---|
| Database Connections\actweb.vector.default.c | osa.sde | | 6 | |
| Create Operating System Authenticated User | (optional) | | | |
| Database Liser | | | | |
| test\mminer | | | | |
| Database User Password (optional) | | | | |
| Role (optional) | | | | |
| UnlimitedGISPower | | | | |
| Tablespace Name (optional) | | | | |
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4. Go to Administer Geodatabase on the administration menu, the Geodatabase Administration dialog will appear. You can create versions, check connections and locks.

| af 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.



J

2. The create role dialog will appear. You can grant or revoke users from 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) User Name(s) (optional) test(ccrups,test(nschmidt;test)(scovil | 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). |
| | |
| | |
| × | |

Create Active Directory Groups for the Enterprise Geodatabase

1. 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/Users | |
| Group name: | |
| GISView | |
| , | |
| Group name (pre-Windows 2000): | |
| GISView | |
| | |
| Group scope Group type | |
| C Domain local C Security | |
| Global O Distribution | |
| C Universal | |
| | |
| | |
| ОК | Cancel |

2. 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 Diject Types From this location: text.local Locations Enter the object names to select (example): Matt Miner (mininer@text.local) Check Names Advanced OK Cancel |
| Add Remove | |
| OK Cancel Apply | |

- 3. Add the member and click ok.
- 4. 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.

| File Edit View Debug Tools Window Community Help New Query Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start Power Shell Image: Start | Kicrosoft SQL Serve | er Managemenl | nt Studio |
|--|--|------------------------------------|-----------------------|
| New Query Image: Connect - Con | File Edit View De | bug Tools W | Window Community Help |
| Object Explorer | 🕴 🔔 New Query 🛛 🔓 | 🔁 🔁 🔁 🗈 |) 💕 🖬 🚳 🜌 🖕 |
| Connect Connect Co | Object Explorer | | + 4 × |
| test-db (SQL Server 11.0.2100 - TEST\\savage) Databases Security New Login Filter Filter Start PowerShell Reports Refresh NT SERVICE\SQLWriter NT SERVICE\SQLWriter NT SERVICE\SQLWriter Sa TEST\arcgis TEST\Comain Admins TEST\Comain Users TEST\GISEdit test\jscovil TEST\Savage Server Roles Credentials Cryptographic Providers Audits Server Audit Specifications Server Objects Replication Management | Connect 🕶 📑 📑 | 🝸 🛃 🍒 | |
| Databases Security Filter Filter Start PowerShell Reports Refresh NT SERVICE\SQLWriter NT SERVICE\SQLWriter NT SERVICE\SQLWriter NT SERVICE\Winmgmt sa TEST\arcgis TEST\Omain Admins TEST\Omain Users TEST\GISEdit test\jscovil TEST\GISEdit test\jscovil TEST\Savage Server Roles Server Roles Server Roles Server Audit Specifications Server Objects Replication Management | 🖃 🚺 test-db (SQL Serv | /er 11.0.2100 - TE | TEST\lsavage) |
| Security New Login pin## Filter Start PowerShell Reports Refresh NT SERVICE\SQLWriter NT SERVICE\SQLWriter NT SERVICE\Winmgmt sa TEST\arcgis TEST\Domain Admins TEST\Domain Users TEST\Carcgis TEST\Carcgis TEST\Carcgis TEST\Savage Server Roles Credentials Cryptographic Providers Audits Server Audit Specifications Server Audit Specifications Server Objects Management | 🕀 🧰 Databases | | |
| New Login pin## Image: Start PowerShell ## Image: Start PowerShell ## Image: Start PowerShell Refresh Image: Start PowerShell Image: Start PowerShell Image: Start PowerShell Image: Start PowerShell Image: Start PowerShell Imaget PowerShell | E Security | | |
| Filter Start PowerShell Reports Refresh NT SERVICE\SQLWriter NT SERVICE\SQLWriter NT SERVICE\Winmgmt sa TEST\Domain Admins TEST\Domain Users TEST\GISEdit test\jscovil TEST\Savage Server Roles Credentials Cryptographic Providers Audits Server Audit Specifications Server Objects Management | | New Login | ain## |
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| Reports Refresh Refresh Refresh NT SERVICE\SQLWriter NT SERVICE\Winngmt Sa TEST\arcgis TEST\Domain Admins TEST\Domain Users TEST\GISEdit test\jscovil TEST\larcgis TEST\support | 2 | Start PowerShe | nell |
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| TEST\Domain Users TEST\GISEdit Lest\jscovil TEST\lsavage TEST\lsavag | 🚺 🛛 🧖 TEST | ,Domain Admins | |
| TEST\GISEdit test\jscovil TEST\Isavage TEST\Isavage Test\lsavage Test\lsavage Credentials Cryptographic Providers Audits Server Audit Specifications Server Objects Replication Management | TEST | Domain Users | |
| test\jscovil TEST\lsavage TesT\lsavage Server Roles Credentials Cryptographic Providers Cryptographic Providers Audits Server Audit Specifications Server Objects Replication Management | 🦉 TEST | GISEdit | |
| TEST Isavage Server Roles Credentials Cryptographic Providers Audits Server Audit Specifications Server Objects Replication Management | 📥 test\j | scovil | |
| | TESTI | (Isavage | |
| Creating Creatin | 🛨 🧾 Server Ro | oles de | |
| Audits Audits Server Audit Specifications Server Objects Pi a Replication Management | ⊞ | anhic Providers | |
| | ⊕ □ Audits ⊕ | | |
| | 🕀 🧰 Server Au | udit Specifications | s |
| | 🔢 🕀 📄 Server Objec | ts | |
| 🛨 🛅 Management | 🛨 🚞 Replication | | |
| | 🕂 📃 Management | | |

5. 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 | _ Script 👻 🛐 Help | | | |
| General Server Roles | Login name: | TEST\GISView | | Search |
| Securables | Windows authentication | | | |
| 🚰 Status | C SQL Server authentication | | | |
| | Password: | | | |
| | Confirm password: | | | _ |
| | Specify old password | , | | |
| | Old password: | | | |
| | Enforce password policy | J | | |
| | Enforce password expire | ation | | |
| | User must change pass | word at next login | | |
| | Mapped to certificate | | | V |
| | C Mapped to asymmetric key | <u></u> | | T |
| | Map to Credential | í – | | 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> | | - |
| | | | ОК | Cancel |

6. 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 | 🔍 Script 👻 | 🚯 Help | | | | | | | | | |
| 🚰 General | | | | | | | | | | | |
| Server Roles | Users mar | ped to this login: | | | | | | | | | |
| Securation | Map | Database | User | Default Schema | | | | | | | |
| Status | | GBAWork001 | | | | | | | | | |
| | | LucitvGIS | | | | | | | | | |
| | | master | | | | | | | | | |
| | | model | | | | | | | | | |
| | | msdb | | | | | | | | | |
| | | Raster | TEST\GISView | dbo | | | | | | | |
| | | Replica | TEST\GISView | dbo | | | | | | | |
| | | ReportServer | | | | | | | | | |
| | | ReportServerTempDB | | | | | | | | | |
| | | tempdb | | | - | | | | | | |
| | Database | role membership for: Replic | a | | | | | | | | |
| Connection Server: test-db Connection: TEST\Isavage View connection properties Progress Beadu | db_ac db_ba db_da db_da db_da db_da db_de db_de db_w db_w public | cessadmin ckupoperator tavanter ladmin nydatareader nydatawniter nydatawniter nydatawniter nydatawniter curityadmin | | | | | | | | | |
| Treaty | | | | OK | 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 | | | | _ 🗆 X | ų | ser/Role | | | |
|---------------------------|--------|--------|--------|--------|-----|--|---|----|--------|
| Replica.DBO.LucityTRAFFIC | | | | | | Name | Туре | | |
| User/Role | Select | Insert | Update | Delete | Use | dbo guest public TEST/GISEdit TEST/GISEdit TEST/GISView test\jscovil | User User Public User Group User | ОК | Cancel |
| Add | O | < | Cancel | Apply | | | | | |

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

| and the second s | | | | |
|--|--------|--------|--------|--------|
| 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 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 Description | | | | | | |
|------------------------------|---------|---------------------|---|--|--|--|
| Name | Туре | | | | | |
| & DBO.STNETG_AddressLocator | Locat | or | | | | |
| 💩 DBO.STNETG_CreateAddressL | o Locat | or | | | | |
| 🖶 demo.DBO.LandBase | SDE F | eature Dataset | | | | |
| 🖶 demo.DBO.LucityEQUIP | SDE F | eature Dataset | | | | |
| demo.DBO.LucityFACILITY | SDE F | eature Dataset | | | | |
| 🖶 demo.DBO.LucityPARK | SDE F | eature Dataset | | | | |
| demo.DBO.LucityRIGHTOFWA | SDE F | SDE Feature Dataset | | | | |
| demo.DBO.LucityROAD | SDE F | eature Dataset | | | | |
| demo.DBO.LucitySEWER | SDE F | eature Dataset | | | | |
| demo.DBO.LucitySTORM | SDE F | eature Dataset | | | | |
| demo.DBO.LucitySTREET | SDE F | eature Dataset - | | | | |
| demo.DBO.LucityTRAFFIC | SDE F | SDE Feature Dataset | | | | |
| demo.DBO.LucityWATER | SDE F | eature Dataset | | | | |
| demo.DBO.LucityWATERDIST | SDEF | eature Dataset | | | | |
| ademo DBO Luck WATERRAW | | eature Dataset | | | | |
| Copy | Ctrl+C | eature Class | | | | |
| emo.DBO.CM B Paste | Ctrl+V | eature Class | | | | |
| demo.dbo.SDE × Delete | | | | | | |
| Rename | F2 | | | | | |
| C Refresh | F5 | | | | | |
| | | | | | | |
| Manage | · · | Analyze | | | | |
| New | | Add Global IDs., | Apaluze | | | |
| Import | • | Privileges | | | | |
| Export | • | Register As Vers | Analyze this dataset to update the DBMS statistics. | | | |
| Properti | es | Unregister As Ve | | | | |
| | | Enable Archivin | Requires a Standard or an Advanced license and is disabled | | | |
| , | | Disable Archivir | with a Basic license. | | | |
| | | | | | | |

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 TOC
- _____ + ß Copy Ctrl+C LucityEQUIP SDE Feature Dataset repl.default LucityFACILITY SDE Feature Dataset Paste Ctrl+V repl.default LucityPARK SDE Feature Dataset Delete 💭 vector.defa 🗙 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 SDE Feature Dataset LucitySTREET 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 mommoreo Compress a versioned Connection Properties... SDE_compress_log Table geodatabase. This removes Geodatabase Connection Properties... unreferenced states from the states tree, improving query Ũ 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.

| General | Editor Tra | cking | XY Coordinate System | Domain, Resolu | ution and Tolerance |
|---|-------------------------|-----------|----------------------|------------------|---------------------|
| Fields | Indexes | Subty | pes Feature Extent | Relationships | Representations |
| Attribut R507_ UUID UUID Unique: Ascend Fields: Globali OBJEC | e Indexes | UK | | Add Delete | |
| Spatial This Fe. a500_i> | Index ature Class ha | as a spat | 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.

| | cking 📔 Xì | Coordinate System | Domain, Resolu | ution and Tolerance |
|---------------------|------------|-------------------|----------------|---------------------|
| ields Indexes | Subtypes | Feature Extent | Relationships | Representations |
| | | | | |
| Attribute Indexes — | | - | | |
| R507_SDE_ROWID_ | UK | | odd | |
| UUID_OID_507 | | | Huu | |
| | | | Delete | |
| | | | | |
| Unique: Yes | | | | |
| Ascending: Yes | | | | |
| Fields: | | | | |
| GlobalID | | | | |
| OBJECTID | | | | |

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

| Add Attribute | Index | | | 8 |
|---|-------------------|------------------|--------|---|
| Name: | LucityIDX | | | |
| 🔲 Unique | ng | | | |
| Fields Fields avail | able: | Fields selected: | | |
| NTG_SHAF NTG_CLN_ NTG_INDX NTG_OWN NTG_ID | 200 00 100 | NTG_ID | | t |
| NTG_DB LastModBy LastSynDa GlobalID | / E ate 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 | | | 23 |
|---|--------------------------------|------------------|--------|----|
| Name: | LucityCMN | | | |
| 🔲 Unique | ng | | | |
| Fields Fields avail | able: | Fields selected: | | |
| NTG_OWN NTG_ID NTG_DB LastModDa LastSynDa GlobalID NTG_NUM SHAPE.len | I_CD / ate ite BER | NTG_NUMBER | | 1 |
| | | ОК | 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 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.

| 길 Database Properties - Rast | er | | | | _ 🗆 × | | | |
|------------------------------|------------------|-----------------------------------|----------------|-------------------|-------------------------------|--|--|--|
| Select a page | 🔄 Script 🝷 [🔓 H | elp | | | | | | |
| General | | | | | | | | |
| Filegroups | Database name: | | Raster | | | | | |
| Poptions | Owner: | | TEST\lsav | age | | | | |
| Change Tracking | | r - * | | | | | | |
| Extended Properties | Use rui-text in | Discrumenting | | | | | | |
| | 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 | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| Connection | | | | | | | | |
| Comer | | | | | | | | |
| test-db | | | | | | | | |
| Connection: | | | | | | | | |
| TEST\lsavage | | | | | | | | |
| View connection properties | | | | | | | | |
| | | | | | | | | |
| Progress | | | | | | | | |
| Ready | | | | | | | | |
| 10 4 K 91 | | | | Add | Remove | | | |
| | | | | | | | | |
| | | | | | 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 🛨 |
| O In Megabytes | 10 🛨 |
| | |
| Maximum File Size | |
| Limited to (MB) | 5,000 🛨 |
| O Unlimited | |
| | OK Cancel |

3. Do the same for the data filegroup.

| 📱 Change Autogrowth for Raster_c | lat 🛛 🔀 |
|-------------------------------------|-----------|
| 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.

Enterprise Geodatabase Backups

| 🥑 Database Properties - Demo | | | | | |
|------------------------------|---------|--------------------------------------|---------|--------------------------|--------|
| Select a page | C Ser | rint 🗶 🔀 Help | | | |
| 🚰 General | | ipt - 🔝 Holp | | | |
| 🚰 Files | | | | | |
| 🚰 Filegroups | Collati | ion: | SQL_I | Latin1_General_CP1_CI_AS | - |
| 🚰 Options | Baco | veru model: | Eul | | |
| 🚰 Change Tracking | neco | ively model. | T call | | |
| | Comp | atibility level: | Bulk-lo | aaed | |
| Extended Properties | Conta | ainment type: | Simple | ; | |
| | |] | | | |
| | Other | options: | | | |
| | | 2↓ 🖻 | | | |
| | 4 | Auto Shrink | | False | * |
| | A | Auto Update Statistics | | True | |
| | 4 | Auto Update Statistics Asynchro | nously | False | |
| | ⊿ (| Containment | | | |
| | | Default Fulltext Language LCID | | 1033 | = |
| | | Default Language | | English | |
| | N | Nested Triggers Enabled | | True | |
| | T | Fransform Noise Words | | False | |
| | Т | Two Digit Year Cutoff | | 2049 | |
| Connection | ⊿ (| Cursor | | | |
| Server: | 0 | Close Cursor on Commit Enabled | | False | |
| LUKESAVAGE\SQLEXPRESS | | Default Cursor | | GLOBAL | |
| Connection: | ⊿ - | FILESTREAM | | | |
| GBAMS\lsavage | F | FILESTREAM Directory Name | | | |
| | F F | FILESTREAM Non-Transacted Access Off | | | |
| View connection properties | | 4 Miscellaneous | | | |
| | μ μ | Allow Shapshot Isolation | | False | |
| Progress | 411 | ANSINIT Default | | raise | |
| C Ready | Allow | w Snapshot Isolation | | | |
| | | | | OK | Cancel |
| | | | | | |

Security Scan Report

Since 10.4.1, Esri has added a security scan python script that will print out possible security issues with your ArcGIS Server configuration. Below, we will show you how to setup the python script to run on ArcGIS 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\ArcGISx6410.6

| Variable | Value | Variable value: | erShell\v1.0\;C:\Python27\ArcGISx6 |
|---|---|-----------------|------------------------------------|
| TEMP | c:)temp | | |
| TMP | c:\temp | | OK Can |
| | | | |
| stem variable | New Edit Delete | | |
| stem variable v. able | New Edit Delete | | |
| stem variable v. able Path | New Edit Delete es Value ^ C:\windows\system32;C:\windows;C:\ ^ | | |
| stem variable v. able Path PATHEXT | New Edit Delete ass Value ^ C:\windows\system32;C:\windows;C:\ ^ .COM, EXE;.BAT;.CMD;.VB5;.VB5;.J5; ^ | | |
| stem variable V. able Path PATHEXT PROCESSOR_ PROCESSOR_ | New Edit Delete es Value ^ C:\windows\system32;C:\windows;C:\ ^ .COM;.EXE;.BAT;.CMD;.VB5;.VBE;.J5; ^ A AMD64 ID Intel64 Family 6 Model 60 Stepping 3, G | | |

- Copy python script from the ArcGIS 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'.

| | Administrator: Command Prompt |
|---|--|
| C:\>serverScan.py Enter ArcGIS for Server fully qualified domain Enter administrator username: arcgis Enter administrator password: Server scan completed - 6 security items noted Scan results written to serverScanReport_test-(| name: test-web.test.local web_2016-08-25.html |

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

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

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

G

test-web.test.local

Potential security items to review

| Id | Severity | 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.

| Unatabase Properties - Demo | | | | | | |
|------------------------------|-------|-----------------------------------|---------------------|-----------------|----------|--|
| Select a page | S 🕄 S | icript 🔻 [🚡 Help | | | | |
| 🚰 General Relea | | | | | | |
| Filegroups | Coll | lation: | • | | | |
| Change Tracking | Red | covery model: | Full | | - | |
| | Cor | nnatibilitu level: | Full Bulk-logged | | | |
| Extended Properties | | | | | | |
| | Cor | ntainment type: | | | | |
| | Oth | Other options: | | | | |
| | • | 2 ↓ □ | | | | |
| | | Auto Shrink | | False | | |
| | | Auto Update Statistics | | True | | |
| | | Auto Update Statistics Asynchrono | usly | False | | |
| | ۵ | Containment | | | | |
| | | Default Fulltext Language LCID | | 1033 | ======= | |
| | | Default Language | | English | | |
| | | Nested I riggers Enabled | | Irue | | |
| | | I ransform Noise Words | | False | | |
| Connection | | I wo Digit Year Lutoff | | 2049 | | |
| Connection | 4 | Class Curser on Commit Enabled | | Falsa | | |
| Server: | | Default Cursor on Commit Enabled | | raise CLODAI | | |
| LUKESAVAGE\SQLEXPRESS | 4 | FILESTREAM | | GLUDAL | | |
| Connection: | 1 | FILESTREAM Directory Name | | | | |
| GBAMS\lsavage | | FILESTREAM Non-Transacted Act | Cess | UN | | |
| I View connection properties | ۵ | Miscellaneous | 0000 | 011 | | |
| | - | Allow Snapshot Isolation | | False | | |
| Program | | ANSENTED Default | | False | . | |
| Flogless | All | ow Snapshot Isolation | | | | |
| C Ready | | | | | | |
| | | | | | | |
| | | | | OK | | |

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.



• Create new database backup

| 🚑 SQL Backup Mas | 9 SQL Backup Master v3.1.193.0 [Free Edition] | | | | | | |
|-------------------------------|---|-----------------------------|------------------------|---------------------|------------------------|---------------------|--|
| SQL Backt Master | Backup a | and restore | Tools and | utilities | Help | 🔯 <u>Settings</u> ? | |
| Create new database backup | Explore database backups | View database backup log | Run all backups now | Stop all backups | Sort backup jobs by | Expand all jobs | |

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

| | Database Backup Editor |
|---|--|
| Source: | Destinations: |
| Current: [Unspecified] Choose SQL Server Back up all non-system databases (?) Show system databases | 🚍 Add 🔀 Remove 🗮 Enable 🚡 Disable |
| | 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: Comparison of the successes of the |
| Backup job settings | Save Cancel Help |

| æ | Connect to SQL Server | X |
|-------------------------------|---|------|
| Server name | 2 | |
| (local) | | - |
| Server logo | n | |
| Connect Choose member | ct using Windows Authentication e this option if your current Windows account is a r of the System Administrator role in SQL Server | |
| ⊖ Connec | ct using the following SQL Server account: | |
| Userna | me: | |
| Passwo | ord: | |
| Test SQL Co | onnection OK Ca | ncel |

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

| <u>.</u> | | Backup Job Settings | | × |
|--|---|--|---|---|
| General Databa | ase Windows Account | Compression / Encryption | SQL Scripts | Notifications |
| 🖌 Run backup | as different Windows us | er | | |
| Account name: | TEST\lsavage | | | |
| Password: | ••••• | | | |
| | Test | | | |
| Important: Wi connect to SQI and move back Please see <u>this</u> | en running a backup jol . Server (when Windows cup files to their destinat <u>help file topic</u> for more i | o as a different Windows user Authentication is specified ir ions (e.g. a network folder, et nformation regarding this op | , the specified the database :c.). tion. | account will be used to connection settings) |
| Save these se | ttings 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.

| ÷ | Backup Job Schedule | _ D X |
|--|---|--|
| Schedule | | |
| Full Backup Differential Transaction Log | Every 24 hrs Every 12 hrs 0 n Every 4 hrs 0 n | nins (after the full backup) nins (after the full backup) |
| Start date/time: End date/time: | 8/6/2015 3:00 PM ■ (a | applies to full backup) |
| Days of week: Load a preset backu Reset to defaults | ✔ Sun ✔ Mon ✔ Tues ✔ Wed ✔ Th p plan | hu 🗹 Fri ✔ Sat |
| 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 | oase Wi | ndows Account | Compression / Encryption | SQL Scripts | Notifications | |
| Send email | notificati | ions | un (or completed with errore) | | | |
| Notify about | ups 🖌 D | ifferential backu | ps 🗹 Transaction log backu | ıps | | |
| - Notification e From address Recipient add | email add :: Iress(es): | resses wonderifthiswo itmustwork@lu | rks@lucity.com city.com | | | |
| Server setting | o GMa | il | | | | |
| SMTP server: | smtp.of | ffice365.com | | | | |
| SMTP port: | 587 | | | | | |
| Username: | wonder | ifthisworks@luci | ity.com | | | |
| Password: | ••••• | ••• | | | | |
| Encryption: | ✓ Use: | SSL | | | Send test mess | age |
| Save these se | ettings 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.

| 📇 Database Ba | ackup Recovery Exp | lorer | | | – 🗆 X |
|------------------|--------------------|-------|-------------------|---------------------|----------------------------|
| Backup Job: | Demo | Ŧ | Start date: Enter | start date | |
| Destination: | C:\Backup | Ŧ | End date: Enter | end date | 🗄 Refresh Help |
| Database Name | e 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 fi | les | Show | files not created b | y the selected destination |



• Add in your credentials and recycle period.

| | | | Drowse |
|----------------------------|--|--|------------------------|
| Optional set | tings | Open folder location | |
| You may ne locations. (| eed to specify authentication credentials when conn Dtherwise, leave these fields blank. Do not specify | ecting to remote (network of the context of the con | vork) aths. |
| Jsername: | testVsavage | | |
| Password: | ****** | | |
| IMPORTAN backup job | T: If you specify a username and password above, to run under a specific Windows user account (see | you must also config Windows Account tal | ure the b of backup |
| job settings | -7. | | |
| job settings Cleanup | | | |

• 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 | | x | | |
|-----------------------|---|-----------------|--------------------------|-------------|------------------|--|--|
| General | Database | Windows Account | Compression / Encryption | SQL Scripts | Notifications | | |
| _ Temp | orary backu | p folder — | | | | | |
| G:\do | wnloads\m | aintenance | | | | | |
| E | Browse | | | | | | |
| Note abov Inste | Note: You can enable remote database server backups by specifying a shared network folder location above. We strongly recommend against the use of mapped network drive letters for this purpose. Instead, use UNC paths in the form of \\server\share. For details, see the <u>related help topic</u> . | | | | | | |
| Auton | Automatic cleanup — Automatically delete old differential backup files (after each full or differential backup) Automatically delete transaction log backup files (after each full or differential backup) | | | | | | |
| diffe | ✓ Automatically delete transaction log backup files (after each full or differential backup) Note: Enabling automatic cleanup options will conserve storage space by removing uncessary differential and/or transaction log backup files at each full and differential backup interval. | | | | | | |
| ✔ Save | these setting | gs 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.

| . | Backup Job Settings | | | x |
|---|---|-----------------------------|----------------------|------|
| General Database Windows Account | Compression / Encryption | SQL Scripts | Notifications | |
| Before backup job: | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| After backup job: | | | | |
| EXEC sp_updatestats | | | | Ê |
| EXEC sp_MSforeachtable @command1= INDEX ALL ON ? REBUILD WITH (FILLFA) | ='print ''?''', @command2='se CTOR=90.ONLINE=OFF)' | et QUOTED_ID | DENTIFIER ON;ALTE | R 🔳 |
| go LISE MASTER | , | | | |
| declare | | | | |
| @isql varchar(2000), @dbname varchar(64). | | | | |
| @logfile varchar(128) | | | | ~ |
| Execute the above scripts during full | backups only | | | |
| Note: Maximum length per SQL script i the SQL Backup Master product log file | s 4,096 characters. Execution , and will not halt backup ope | errors are log erations. | iged as warnings wit | hin |
| Save these settings as default | | | Save Cancel | Help |

Example Script for After Full Backup

--Rebuild Index and Update Statistics --Rebuild Indexes Use Master gо 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 gо --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 go

Backup ArcGIS Server Site

Provided with ArcGIS 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 Server, go to C:\Program Files\ArcGIS\Server\tools\admin and copy the two python script utilities.

| ; PC → Local Disk (C:) → Program Files → ArcGIS → Server → tools → admin | | | | | | | | |
|--|-------------------|-------------|-------|--|--|--|--|--|
| | | | | | | | | |
| Name | Date modified | Туре | Size | | | | | |
| new packup.py | 2/13/2014 3:42 PM | Python File | 7 KB | | | | | |
| Convertcachestorageformat.py | 2/13/2014 3:42 PM | Python File | 1 KB | | | | | |
| neatecacheschema.py | 2/13/2014 3:42 PM | Python File | 1 KB | | | | | |
| Createservice.py | 2/13/2014 3:42 PM | Python File | 1 KB | | | | | |
| 🔁 deletecache.py | 2/13/2014 3:42 PM | Python File | 1 KB | | | | | |
| nanagecachetiles.py | 2/13/2014 3:42 PM | Python File | 1 KB | | | | | |
| nanageservice.py | 2/13/2014 3:42 PM | Python File | 1 KB | | | | | |
| nanagesite.py | 2/13/2014 3:42 PM | Python File | 1 KB | | | | | |
| 🔁 restore.py | 2/13/2014 3:42 PM | Python File | 11 KB | | | | | |
| | | | | | | | | |

- 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.

| ▶ | This P | Cŀ | Local Disk (C:) | ► | AGSUtil |
|---|-------------|------|-----------------|---|---------|
| | | | | | |
| | | | | | |
| | Ν | lam | e | | |
| | | 🥭 b | ackup.py | | |
| | Territoria. | 🥏 re | 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 Server Site

Provided with ArcGIS 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 |
|--|
| 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 and 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 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.

| 🔨 Synchronize Changes | ß |
|---|--|
| Geodatabase 1 Database Connections/demo.default.osa.sde | Synchronize Changes |
| Replica DBO.Lucky_Demo Geodatabase 2 Database Connections/yepl.default.osa.sde Direction FROM_GEODATABASE1_TO_2 Conflict Resolution Policy IN_FAVOR_OF_GOB1 Conflict Definition BY_OBJECT | Synchronizes updates between two replica geodatabases in a direction specified by the user. |
| OK Cancel Apply << Hide Help | Tool Help |

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 Task | ¢ | |
| Create a Basic Task Trigger | Use this wizar such as multi | 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 | |
|--|---|
| 🔟 Task Trigger | |
| Create a Basic Task Trigger Weekly Action Finish | When do you want the task to start? Daily Weekly Monthly One time When the computer starts When I log on When a specific event is logged |
| | < Back Next > Cancel |

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 | | 23 |
|--|---|--------|
| 迿 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 > | Cancel |

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

| Create Basic Task Wizard | | × |
|--|--|-------|
| Dection | | |
| 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 > C; | ancel |

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 | | | 83 |
|--------------------------|-----------------------------------|--------|--------------------------|
| 🔟 Start a Program | | | |
| Create a Basic Task | | | |
| Trigger | Program/script: | | |
| Weekly | C:\Python27\ArcGIS10.1\python.exe | | Browse |
| Action | Add arguments (ontional) | | c'\auto_synch.nv |
| Start a Program | Add arguments (optional): | | criticato_syntempy |
| FILIST | 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 | | |
|--------------------------|--------------|--|
| 迿 Summary | | |
| Create a Basic Task | | |
| Trigger | Name: | AutoSynchReplica |
| Weekly | Description: | This task will automatically synch the Geodatabase replica. |
| Action | | |
| 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 | ick 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: \ | | | | | | | | |
| Author: | GBAMS\Isavage | | | | | | | |
| Description: | Description: This task will automatically synch the Geodatabase replica. | | | | | | | |
| - Security opt When runn | ions ing the task, use the following user account: | | | | | | | |
| GBAMS\Isa | GBAMS\Isavage Change User or Group | | | | | | | |
| 🔘 Run only | 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 | Run with 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\Desktop10.6\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.

| ∕sq | LQuery35.sql / * * * * * * * * | -lukesavage | • (136))* SQ | LQuery34.sql - lu NRONS, COmmai | kesavage (13 ad. from SS | 5)) SQLQuery | /33.sql - lukes; / | avage (13 | 34)) / SC |)LQuery32.sql - Iul | (esavage (133)) 🏹 | SQLQuery31.sql - lukesa | vage (132)) |
|-----|-------------------------------------|-------------|--------------|------------------------------------|-----------------------------|--------------|-----------------------|-----------|-----------|---------------------|-------------------|-------------------------|-------------|
| | SELECT * FROM [Demo]. [dbo]. [a445] | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| | | | | | | | | | | | | | |
| • | | | | | | | | | | | | | |
| | Results 🛅 N | 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 | 6FDC0359-64D7-44 | 28-8349-6C725A73AF8B | |
| 2 | 20 | 55789 | test | 2 | NULL | NULL | NULL | NULL | 19 | 11470 | 6FDC0359-64D7-44 | 28-8349-6C725A73AF8B | |

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



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

| 🗿 Geodatabase | Administration | (DBO@TEST-I | DB/LucityGIS) |
|----------------|------------------|----------------|-------------------|
| Versions Co | onnections L | ocks | |
| | | | |
| - Filtering | | | |
| Name: | | Ow | mer: |
| · · · · · | | | |
| Name Owr | ner Modified | | |
| DEFAULT dbo | 8/1/2012 3 | :33:22 PM | |
| edit DBO | 6/28/2012 | 7:14:32 A | Reconcile Version |
| | | - <u>-</u> | New Version |
| | | × 1 | Delete Version |
| | | - i v | View Locks |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| Refresh 2 of 2 | Versions at 8/27 | /2012 11:08:06 | AM > |
| | | , | |
| Transactional | Tree View | Reconcile Or | der 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 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 t | 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 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 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.

| | · / F - |
|--------------------------------|---------------------|
| 🗞 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 |
| 둼 demo.DBO.LucityROAD | SDE Feature Dataset |
| 🖶 demo.DBO.LucitySEWER | SDE Feature Dataset |
| 둼 demo.DBO.LucitySTORM | SDE Feature Dataset |
| 둼 demo.DBO.LucitySTREET | SDE Feature Dataset |
| 둼 demo.DBO.LucityTRAFFIC | SDE Feature Dataset |
| 둼 demo.DBO.LucityWATER | SDE Feature Dataset |
| 둼 demo.DBO.LucityWATERDIST | SDE Feature Dataset |
| 둼 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.dl 🗙 🛛 Delete | Table |
| Rename F2 | |
| Sefresh F5 | |
| Manage 🕨 | Analvze |
| New | Add Global IDs |
| Transact | Privileges |
| Import | |

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 | | - |
| | 1 | |
| | | |
| 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 | × | |
| Database Connections\demo.default.osa.sde\demo.DBO.LucityPARK | | |
| Database Connections\demo.default.osa.sde\demo.DBO.LucityRIGHTOFWAY | T | |
| Database Connections\demo.default.osa.sde\demo.DBO.LucityROAD | | |
| Database Connections\demo.default.osa.sde\demo.DBO.LucitySEWER | \bullet | Ξ |
| Database Connections\demo.default.osa.sde\demo.DBO.LucitySTORM | | |
| | | |
| | | |
| | _ | |
| ONE_WAY_REPLICA | • | |
| Geodatabase to replicate data to | | |
| Database Connections\repl.default.osa.sde | 2 | |
| Replica Name | | |
| LucityReplica | | |
| | | - |
| X Advanced Cetting | | |
| OK Cancel Environments << Hid | le 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 | Ν | Ν | Y |
| Тороlоду | Ν | Ν | Y |
| Feature dataset | Ν | Ν | Y |
| Relationship class | Ν | 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

| | | _ |
|---------------------------|-----------------------------------|---|
| E Beplica.DBO.EO | Copy Ctrl+C | |
| 🗄 📴 Replica.DBO.FA 💼 | Paste Ctrl+V | |
| 🗉 🖶 Replica.DBO.Lar 🗙 | Delete | |
| E Replica.DBO.MA | Rename F2 | |
| H P Replica.DBO.PA | Refresh F5 | |
| E B Replica.DBO.RI | | - 1 |
| E P Replica.DBO.SE | New | - |
| 🗉 🖶 Replica.DBO.ST | Import • | |
| 🗉 🖶 Replica.DBO.STI | Export + | |
| Replica.DBO.TR | Administration | - |
| Replica DBO WA | Distributed Geodatabase | Synchronize Changes |
| | Connact | |
| 🗉 🖶 Replica DBO.W/ | Connect | Export Data Changes Message |
| Replica.DBO.cm | Disconnect | Export Acknowledgment Message |
| Replica.DBO.cm | Connection Properties | Timport Message |
| Replica.DBO.cm | Geodatabase Connection Properties | 🖳 Re-Export Unacknowledged Messages |
| GIS Servers | Share as Geodata Service | 1 Import Schema Changes |
| 🔄 📶 Add ArcGIS Server | Properties | a Export Replica Schema |
| Add ArcIMS Server | | Compare Replica Schema |
| Add WCS Server | | |
| Add WMS Server | | Manage Replicas |
| ArcGIS on services arcris | sonline.com (user) | Compare the schema of the data in a |
| arcgis on test-web_6443 | (admin) | replica to the relative replicas |
| 🗉 🛜 My Hosted Services | | schema. The result is a replica schema channes file that can be used |
| 🗄 🛜 Ready-To-Use Services | | to apply schema changes to the |
| | | relative replica. |
| 1 | U | |

- 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

| vizard | |
|---|---|
| | -1: |
| ierna changes between a relative replica and your rep | Jiica. |
| ica schema to compare: | |
| | |
| ver:test-db-LucitvGIS | |
| | |
| . file: | |
| | |
| | |
| | |
| DBO.Lucity | _ |
| One way parent to child | |
| | |
| anges XML file : | |
| | |
| | |
| chema | |
| | |
| | |
| F | -inish Cancel |
| | /izard rema changes between a relative replica and your replica schema to compare: .ica schema to compare: .ver:test-db-LucityGIS . file: DBO.Lucity One way parent to child anges XML file : chema |

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

| 1 | Kasidi Judi aukuosa, su | ic II | | _ | | | |
|---|-------------------------|----------------------------|---------|----------------|--------------------------------|--------------|------------------------------|
| | E U Replica.default.c | Сору | Ctrl+C | | | | |
| | F B Replica.DBO | Paste | Ctrl+V | L | | | |
| | 🗄 📴 Replica.DBO 🗙 | Delete | | L | | | |
| | 🗄 🖶 Replica.DBO | Rename | F2 | L | | | |
| | E P Replica.DBO | Refrech | E5 | L | | | |
| | 🗄 🔂 Replica.DBO 🎽 | | 15 | - | | | |
| | H D Replica.DBO | New | • | | | | |
| | H Replica.DBO | Import | • | L | | | |
| | 🗄 📑 Replica.DBO | Export | + | L | | | |
| | 🗄 🖶 Replica.DBO | Administration | | | | | |
| | 🗄 📴 Replica.DBO | Distributed Condetations | , | - | | | |
| | 🗄 📅 Replica.DBO | Distributeu Geouatabase | • | 6 | Synchronize Changes | | |
| | E D Replica.DBO | Connect | | 42 | Export Data Changes Message | | |
| | Replica.DBO | Disconnect | | ٩, | Export Acknowledgment Message | | |
| | Replica.DBO | Connection Properties | | 5 | Import Message | | |
| | Replica.DBO | Geodatabase Connection Pro | perties | a | Bo Evport Uppel/poulodeed Mess | | |
| | 🔲 Replica.dbo. 👝 | Chara as Coodata Somisa | | 197 <u>121</u> | Kercxport on atknowledged mess | ayes | |
| | 🖻 🛐 GIS Servers 🛛 🎽 | Sildre as Geouala Service | | 1 | Import Schema Changes | | |
| | 🌉 Add ArcGIS Serv 😭 | Properties | | 40 | Export Replica Schema | Import Sc | hema Changes |
| | de Add ArcIMS Server | | | 22 | Compare Replica Schema | Transat you | alica cohoma changes from a |
| | Add WCS Server | | | | Manage Replicas | replica sch | nema changes file. This file |
| | Add WMIS Server | | | -0- | Hanage Replicasi II | is generat | ed by comparing the |
| | ArcGIS on services ar | caisonline.com (user) | | | | Schema di | fferences occur when |
| | arcgis on test-web 64 | 143 (admin) | | | | schema ch | anges are applied after the |
| | 🗉 🛜 My Hosted Services | | | | | replica is o | reated. |
| | · · · · · · | | | | | | |

7. Locate the schema change xml file generated and add to the import schema changes wizard

| mport Schema Changes ' | Wizard | × |
|----------------------------|---|---------|
| This wizard imports the so | hema changes from a relative replica to your replica. | |
| Choose the replica sche | ma changes xml file: | |
| C:\temp\compare. | ml | |
| Replica name: | DBO.Lucity | |
| Replica type: | One way parent to child | |
| Import to database: | test-db-sde:sqlserver:test-db-Replica | |
| About importing schema | changes | |
| | < 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'.

| Apply | Change | Details | |
|--------------------------|-------------|--------------|---|
| Repl.DBO.cmGeneralCustom | DeleteField | field = test | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| | | | |
| 4 | | | > |
| • | | | - |
| | | | |
| | | | |

10. Click Finish and Synchronize Changes.