Administering Your Microsoft SQL Server Geodatabase

Shannon Shields
Chet Dobbins
Agenda

• News since the last UC
• How do I …
  - Configure SQL Server to support geodatabases?
  - Create geodatabases?
  - Control access to my data?
  - Choose a spatial data storage option?
  - Make sure that my data is safe?
  - Maintain good performance?
News

ArcGIS and Microsoft changes since last year
Coming at 10.3

Support for SQL 2014

AlwaysOn connection parameters

New Geodatabase Administration Geoprocessing Tools
10.1 users

- **SQL Server 2012**
  - SQL Server 2012 Support Patch

- **User names containing dot (.) or hyphen (-)**
  - SQL Server User Names With Special Characters Patch

- Both patches require SP1
How do I…?

Common questions when working with SQL Server databases and geodatabases
How do I... configure SQL Server to support geodatabases?
How do I configure SQL Server to support geodatabases?

- Install a supported version of SQL Server
  Microsoft SQL Server database requirements for ArcGIS 10.2
- Must use a Case-Insensitive (CI) collation
- Can use Windows or Mixed-mode authentication
- SQL Server Browser not required
  - Must provide static TCP port on connection
What is the SQL Server Native Client?

- **Microsoft stand-alone DLL**
- **Required for connections to SQL Server**

  - **Install on every single client**
  - **Must be same or newer version than SQL Server**

- **Microsoft ODBC Driver 11 for SQL Server**
  - Support coming at 10.3
SQL Server Native Client

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How do I… create geodatabases?
Databases and Geodatabases

• A database is a SQL Server object
  - There can be many per SQL Server instance

• A geodatabase is an ArcGIS construct hosted in a database
  - One allowed in each database

• Options for creating geodatabases
  - Use a GP tool to create a new geodatabase from scratch
  - Use a GP tool to create a new geodatabase in an existing database
Creating a geodatabase

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Points to remember

• Use GP Tools to create geodatabases
  - Default size of 500MB data file & 125MB logfile

• More control over storage?
  - Use SQL Server tools to create database first

• Enable geodatabase tool
  - Create a geodatabase in an existing database, without sysadmin privileges

• Do not rename a database that contains a geodatabase
How do I... control access to my data?

Access to SQL Server objects are managed with permissions granted to logins, users and roles.
SQL Server Principals

- Logins = Authentication
  - Who is connecting?

- Users = Authorization
  - What can this person do in the database?

- Schemas = Containers
  - What are logical groups of database objects that should be managed as a whole?
SQL Server Instance

Logins → Users

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User-schema relationship

• For users that create data, ArcGIS requires that
  user name = default schema name
  - Not a SQL Server rule

• Users that are DBO all create data in the DBO schema

• Data readers & editors do not need a same-named schema
Who is DBO?

**Sysadmin** fixed-server role members are **DBO** in every database

Database owner is **DBO** in single database

**Db_owner** role members are **NOT** DBO

Have DBO-like permissions
Managing permissions

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Points to remember

• Creating a user does not give access to data in the database
  - It must be granted by the data owner

• ArcGIS tools manage permissions on all parts of a feature class

• Creating a user with the Create User tool will grant permissions sufficient for creating data
How do I...

choose a spatial data storage option?
Three spatial data storage options

Similar characteristics

- **Esri SDEBINARY**
  - Esri type, original type used with SQL Server

- **Microsoft Geometry**
  - Planar spatial type, >= SQL Server 2008

- **Microsoft Geography**
  - Geodetic spatial type, >= SQL Server 2008

Access using T-SQL
Spatial data storage

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Planar measurement
Spherical measurement
Points to remember

• Three storage types are available: SDEBINARY, Geometry and Geography

• In Geography, calculations are done using Great Ellipse line interpolation, while the others use Cartesian

• SQL Server manages spatial indexes on Geometry and Geography

• Microsoft spatial data types provide SQL access to spatial data
How do I...
make sure my data is safe?
BACKUP YOUR DATA NOW
Points to remember

Backups are the **only** way to reliably protect your data

1. Decide how much time you can afford to lose when disaster strikes and data must be restored
2. Create a restore plan that will achieve that goal
3. Create a backup plan that supports your restore plan
4. Implement your plan
5. **Test your recovery plan regularly by using real backup media to restore to a system capable of being used in production**
How do I... maintain good performance?
How do I maintain good performance?

• Standard maintenance
  - Reconcile/Post/Compress
  - Rebuild Indexes
  - Calculate Statistics

• Layer scale dependencies

• Spatial Index
  - Is it being used?
  - Manual-grid vs autogrid
Spatial Indexes

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Thank you…

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**Wednesday July 16: Offering ID 1280**

**Thursday July 17: Offering ID 1376**

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