Esri International User Conference | San Diego, CA

Technical Workshops | July 12 - 15, 2011

Intro to ArcSDE for SQL Server

Tony Wakim & Jim Gough

Our Goal


Two people
sharing files
Small team
of editors
Enterprise GIS

Manager’s Objectives

15 Editors

25 Viewers

Serve data through ArcGIS Server

Vector Data
75 Gigabytes

10%/year Growth

Raster Data
100 Gigabytes

A D

Existing Machine

4 Cores	32 Gigabytes Memory	Windows 2008 R2 Standard 64-bit	SQL Server Standard 64-bit

System Design Strategies - GIS Wiki | The GIS Encyclopedia - Windows Internet Explorer

http://www.wiki.gis.com/wiki/index.php/System_Design_Strategies

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Page | Discussion | Read | View source | View history

System Design Strategies

From wiki.GIS.com

System Design Strategies 29th Edition

[Search System Design Strategies wiki site] "search text","Category: System Design Strategies"

Key Capacity Planning Reference Sites

Building a GIS Esri Press site

Capacity Planning Tool Updates New February 2011 release

System Architecture Design Strategies training class View the training sched

Esri Training Matters training spotlight: Enterprise GIS Interview with Dave Pet

ArcGIS Resource Centers

Key 2011 Events

Jul 9 Planning and Managing a GIS Preconference Seminar at the Esri International User Conference

Jul 10 System Architecture Design Strategies Preconference Seminar at the International User Conference

An Esri ® Technical Reference Document • Spring 2011

Navigation

- Main page
- Glossary
- All pages
- Categories
- Featured content
- Featured maps
- Random page
- Contact us
- Help

Site Management

- Discussion room
- Create new page
- Requested pages
- Recent changes
- Sandbox
- Contributors

Toolbox

- What links here

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Dave Peters
Manager, Systems Integration
dpeters@esri.com

Table of Contents

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System Design Strategies 28th Edition (Fall 2010)
System Design Strategies 27th Edition (Spring 2010)

Page Footer

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System Design Strategies 26th edition - An Esri ® Technical Reference Document • 2009 (final PDF release)

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Platform Performance - GIS Wiki | The GIS Encyclopedia - Windows Internet Explorer

http://www.wiki.gis.com/wiki/index.php/Platform_Performance

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Platform Performance Baseline

The world we live in today is experiencing the benefits of rapid technology change. Technology advancements are directly impacting

Internet | Protected Mode: On

platform increase, the memory requirements will increase to accommodate the additional concurren user sessions. Heavier workflows can require more memory per session than lighter workflows. Servers must be configured with sufficient physical memory to take advantage of the higher platform processing capacity.

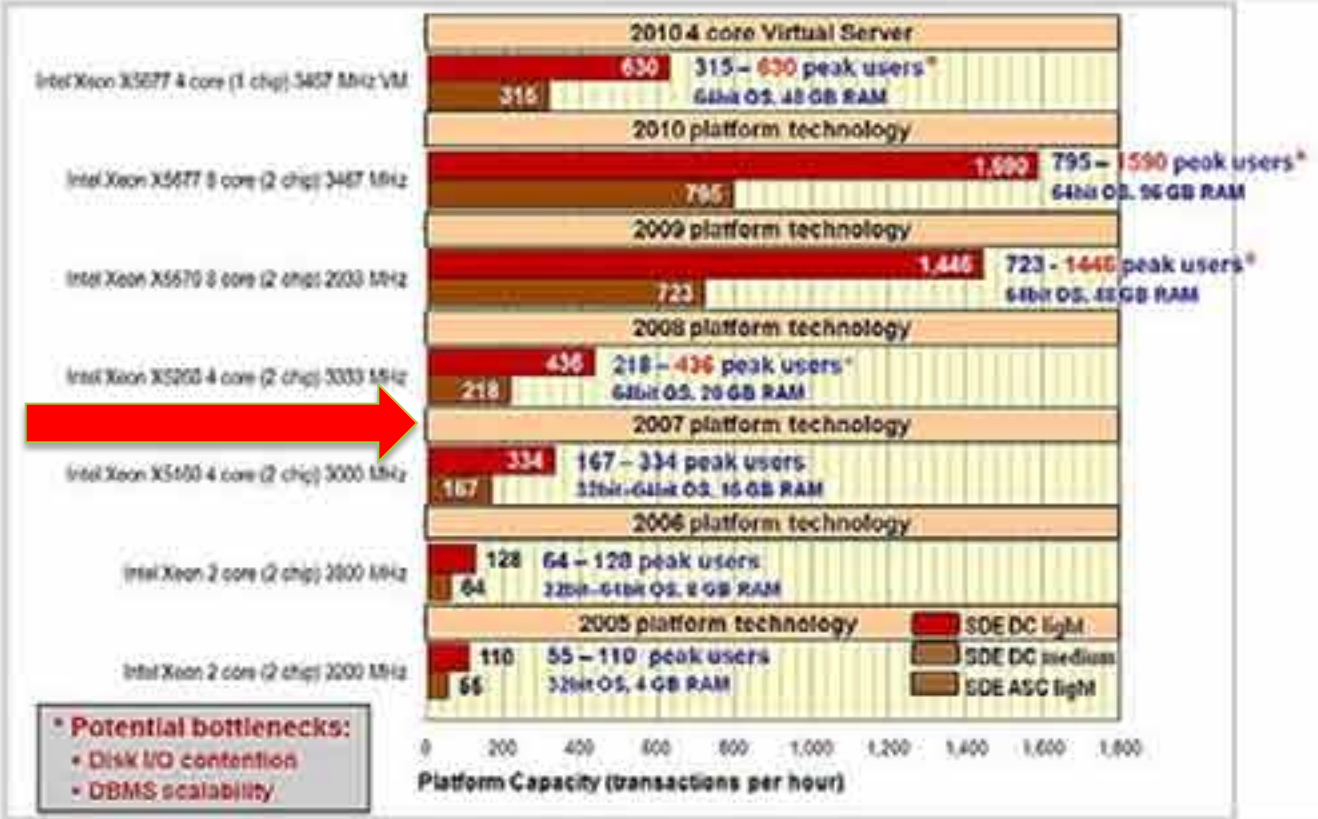

Figure 7-21 Geodatabase Server Platform Capacity is Changing

ArcGIS Resource Center

- resources.arcgis.com
- Gateway to current:
  - Support
  - Web help and tutorials
  - Templates, samples, and data
- ideas.arcgis.com

ArcGIS Resource Center | - Windows Internet Explorer

http://resources.arcgis.com/

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ArcGIS.com Support.esri.com Esri.com

ArcGIS Resource Center

Help Blogs Forums

Integrated Support and Community Resources

Learn more about ArcGIS | Go to the ArcGIS Blog

ArcGIS Products

- Desktop
- Web
- Mobile
- Server
- Engine
- Explorer
- ArcIMS

Functions

- 3D GIS
- ArcGIS Content
- Geoprocessing
- Geodatabase
- Mapping
- CAD Integration
- Data Reviewer

User Communities

- Community Maps
- Defense & Intelligence
- Electric & Gas
- Hydro
- Local Government
  - Infrastructure
  - Land Records

Solution Products

- ArcLogistics
- Aeronautical Solution
- Business Analyst
- Defense Mapping
- Geoportal Extension
- Nautical Solution
- Production Mapping

Internet | Protected Mode: On

Geodatabases

The geodatabase is a collection of geographic datasets of various types used in ArcGIS and managed in either a file folder or a relational database. It is the native data source for ArcGIS and is used for editing and data automation in ArcGIS.

To learn more about the geodatabase, see Essential readings about the geodatabase in the ArcGIS help.

Learn more about what's new for geodatabases in ArcGIS 10. [Download PDF]

ArcSDE 10 SQL Server Database Requirements | ArcGIS Resource Center - Windows Internet Explorer

http://resources.arcgis.com/content/arcsde/10.0/sql-server-system-requirements

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Favorites ArcSDE 10 SQL Server Database Requirements | ArcG... Page Safety Tools

Microsoft SQL Server 2008 Final - R2 (64-bit)	Windows 2003 Serv tandard, Enterprise & Datacenter (64-bit (EM64T))	SP2
	Windows 2008 Server Standard, Enterprise & Datacenter (64-bit (EM64T))	Final
Microsoft SQL Server 2005 Express SP2 & SP3 (32-bit)	Windows 2003 Server Standard, Enterprise & Datacenter (32-bit)	SP2
	Windows 2008 Server Standard, Enterprise & Datacenter (32-bit)	Final
	Windows 7 Ultimate, Professional Edition (32-bit)	
	Windows XP Professional Edition (32-bit)	SP3
	Windows Vista Ultimate, Enterprise, Business (32-bit)	SP1
Microsoft SQL Server 2008 Express Final - R2 (32-bit)	Windows 2003 Server Standard, Enterprise & Datacenter (32-bit)	SP2
	Windows 2008 Server Standard, Enterprise & Datacenter (32-bit)	Final
	Windows 7 Ultimate, Professional Edition (32-bit)	
	Windows XP Professional Edition (32-bit)	SP3
	Windows Vista Ultimate, Enterprise, Business (32-bit)	SP1
Microsoft SQL Server	Windows 2003 Server Standard, Enterprise & Datacenter (64-bit (EM64T))	SP2
	Windows 2008 Server Standard, Enterprise & Datacenter (64-bit (EM64T))	Final

Done Internet | Protected Mode: On

Memory Limits for Windows Releases (Windows) - Windows Internet Explorer

http://msdn.microsoft.com/en-us/library/aa366778(VS.85).aspx#physical_memory_limits_windows_server_

Convert Select

Favorites Memory Limits for Windows Releases (Windows)

Page Safety Tools

Physical Memory Limits: Windows Server 2008 R2

The following table specifies the limits on physical memory for Windows Server 2008 R2. Windows Server 2008 R
available only in 64-bit editions.

Version	Limit on X64	Limit on IA64
Windows Server 2008 R2 Datacenter	2 TB	
Windows Server 2008 R2 Enterprise	2 TB	
Windows Server 2008 R2 for Itanium-Based Systems		2 TB
Windows Server 2008 R2 Foundation		
Windows Server 2008 R2 Standard	32 GB	
Windows HPC Server 2008 R2	128 GB	
Windows Web Server 2008 R2	32 GB	

Internet | Protected Mode: On

Microsoft SQL Server 2008: Compare Enterprise vs. Standard - Windows Internet Explorer

http://www.microsoft.com/sqlserver/2008/en/us/compare-std-ent.aspx

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Microsoft Home | Servers and To

Microsoft® SQL Server® 2008

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Product Details · Technologies · Compare · Editions · News and Reports · White Papers · Case Studies · Benchmarks · Previous Versions

Compare Editions–Enterprise and Standard

Enterprise

SQL Server 2008 Enterprise is a comprehensive data platform that meets the high demands of enterprise online transaction processing and data warehousing applications.

Standard

SQL Server 2008 Standard is a complete data management and business intelligence platform providing best-in-class ease of use and manageability for running departmental applications.

KEY: ✔ = Full ● = Partial/Limited ○ = Not Available

	SQL Server 2008 Enterprise Edition	SQL Server 2008 Standard Edition
Number of CPUs	OS Maximum	4
Scalability & Performance	✔	●
High Availability (Always On)	✔	●

Send Feedback

Also see

- SQL Server 2008 Enterprise
- SQL Server 2008 Standard
- Running SQL Server 2008 on Windows Server 2008 White Paper

Related Links

- Performance and Scalability
- Security
- Data Warehousing

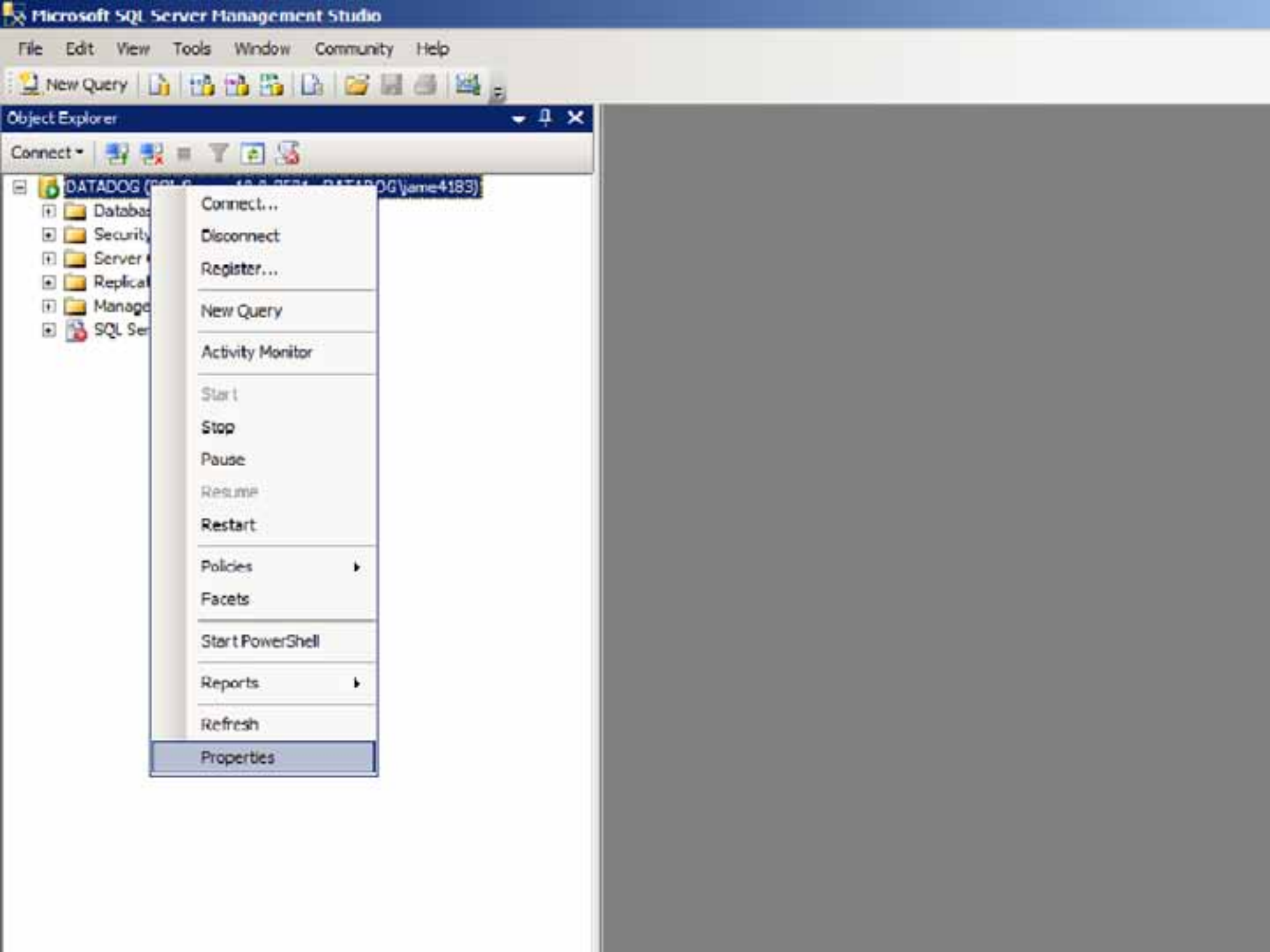
Done | Internet | Protected Mode: On

Check Requirements

Component	Version/Release	Supported
Operating System	Windows 2008 R2 Standard	Yes
SQL Server	SQL Server 2008 R2 Standard	Yes
ArcSDE	ArcSDE 10	Yes

Configure the SQL Server

- Find the SQL Server instance name
  - Used by ArcSDE to attach to the correct database instance
  - Default instance name = Hostname
  - Named instance: Hostname\<Instance Name>
- Configure the SQL Server instance


Microsoft SQL Server Management Studio
File
Edit
View
Tools
Window
Community
Help
New Query
Object Explorer
Connect
DATADOG
Connect...
Disconnect
Register...
New Query
Activity Monitor
Start
Stop
Pause
Resume
Restart
Policies
Facets
Start PowerShell
Reports
Refresh
Properties

Microsoft SQ

File Edit Vie

New Query

Object Explorer

Connect

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SQL S

Server Properties - DATADOG

Select a page

- General
- Memory
- Processors
- Security
- Connections
- Database Settings
- Advanced
- Permissions

Connection

Script Help

Server memory options

Use AWE to allocate memory

Minimum server memory (in MB):

0

Maximum server memory (in MB):

24579

Other memory options

Index creation memory (in KB, 0 = dynamic memory):

0

Minimum memory per query (in KB):

1024

Microsoft SQ

File Edit Vie

New Query

Object Explorer

Connect

DATADOG

Datab

Secur

Serve

Replic

Mana

SQL S

Server Properties - DATADOG

Select a page

- General
- Memory
- Processors
- Security
- Connections
- Database Settings
- Advanced
- Permissions

Connection

Script Help

Server authentication

- Windows Authentication mode
- SQL Server and Windows Authentication mode

Login auditing

- None
- Failed logins only
- Successful logins only
- Both failed and successful logins

Server proxy account

- Enable server proxy account

Proxy account:

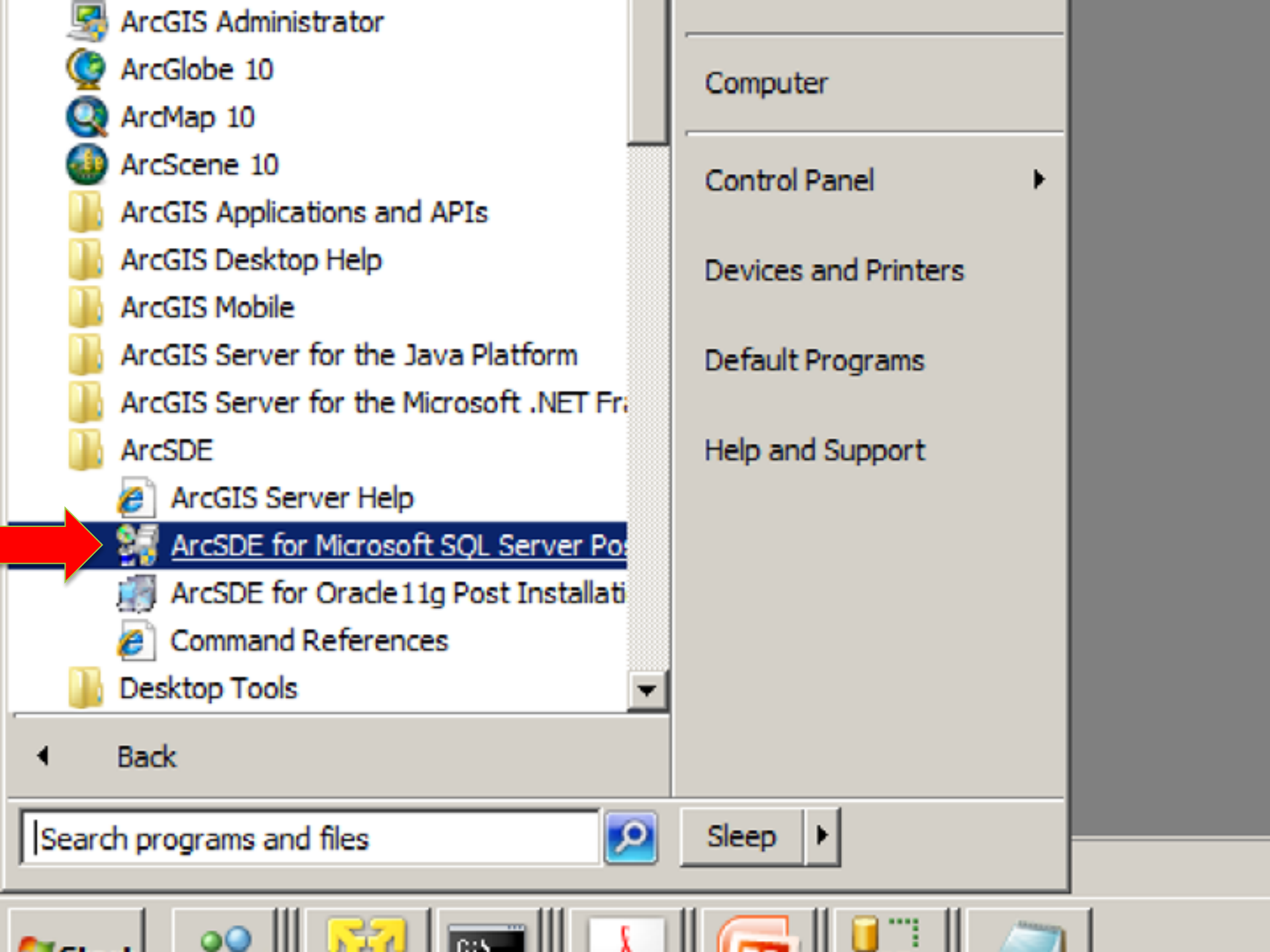
Password:

Options

- Enable C2 audit tracing
- Cross database ownership chaining

ArcSDE Installation

- Install SDE Software
- Defines database and SDE admin
  - Schema (SDE or DBO)
  - Creates a SQL Server database
- Creates geodatabase repository
- Authorizes ArcSDE
  - With software license
- (optional) Creates ArcSDE service


ArcGIS Administrator
ArcGlobe 10
ArcMap 10
ArcScene 10
ArcGIS Applications and APIs
ArcGIS Desktop Help
ArcGIS Mobile
ArcGIS Server for the Java Platform
ArcGIS Server for the Microsoft .NET Fr
ArcSDE
ArcGIS Server Help
ArcSDE for Microsoft SQL Server Po
ArcSDE for Oracle 11g Post Installati
Command References
Desktop Tools
Back
Search programs and files
Computer
Control Panel
Devices and Printers
Default Programs
Help and Support
Sleep

ArcSDE for SqlServer

Welcome to the ArcSDE Post Installation for new geodatabases

ArcSDE for SqlServer

This setup helps you create a spatial database, an ArcSDE DBA user, set up the ArcSDE repository, and create the ArcSDE service.

Complete

This helps you create a spatial database, an ArcSDE DBA user, setup the ArcSDE repository, and create the ArcSDE service.

Custom

Use this option to select from the available Post Installation Setup options. This option is recommended for advanced users, or users upgrading their license keys of their ArcSDE service.

< Back | Next > | Cancel | Help

ArcSDE for SqlServer

Select ArcSDE Setup Wizard Option

Select from the following options

- [x] Define Database and SDE DBA User

  Creates a Spatial database and SDE DBA user.

- [x] Repository Setup

  Sets up the reporistory. The SDE tablespace and user must already exist.

- [x] Authorize ArcSDE

  Select this option to register ArcSDE for use. This must be done for every new geodatabase.

- [ ] Create ArcSDE Service

  Creates the ArcSDE service. The SDE tablespace, user, and SDE repository must alreadv exist.

< Back | Next > | Cancel | Help

ArcSDE for SqlServer

Select schema

Choose the schema for the spatial database

DBO Schema

The repository objects will reside on the dbo schema, or be owned by the dbo user.

SDE Schema

The repository objects will reside on the sde schema, or be owned by the sde user. Use this schema if you wish to create a multiple spatial database instance.

< Back | Next > | Cancel | Help

ArcSDE for SqlServer

User information

Connect as SQL Server user

SQL Server instance name: DATADOG

Connect using:

- (•) Windows Authentication
- ( ) SQL Server Authentication

sysadmin user name: sa

sysadmin user password:

< Back | Next > | Cancel | Help

ArcSDE for SqlServer

Create Spatial database

Enter the required information to create a spatial database.

SDE user password: ****

Database name: Vector

Data file size: 100

Log file size: 30

Create in folder

Data file

C:\Program Files\Microsoft SQL Server\MSSQL10.MS

Browse

Log file

C:\Program Files\Microsoft SQL Server\MSSQL10.MS

Browse

< Back | Next > | Cancel | Help

ArcSDE for SqlServer

ArcSDE configuration files

Select configuration file options

Define giomgr.defs file

- (•) Use default file
- ( ) User custom file

[ ] Browse

Define dbinit.sde file

- (•) Use default file
- ( ) Use custom file

[ ] Browse

Define dbtune.sde file

- (•) Use default file
- ( ) Use custom file (if upgrading - do not use - see Install Guide)

[ ] Browse

< Back | Next > | Cancel | Help

ArcSDE for SqlServer

Repository Setup

Repository Setup

SQL Server instance name: DATADOG

Database name: Vector

Connect using:

- Windows Authentication
- SQL Server Authentication

SDE user name: sde

SDE User Password: ***

< Back | Next > | Cancel | Help

ArcSDE for SqlServer

ArcSDE for SqlServer authorization

ArcSDE for SqlServer

ArcSDE must be authorized before use. The process involves authorizing ArcSDE for use on your computer.

If the repository setup failed in any way, this may not be successful as a result.

Click Next to start the ArcSDE authorization wizard.

< Back | Next > | Cancel | Help

Software Authorization Wizard

Authorization Options

You must authorize the software prior to use. Select from the options below.

Authorization Options

- ○ I have installed my software and need to authorize it.
- ◉ I have received an authorization file from ESRI and am now ready to finish the authorization process.

r_offline_auth_files\Server_Ent_Adv_10.0_ECP_073011.ecp Browse...

< Back Next > Cancel

Software Authorization Wizard

Authorization Complete

You have authorized the following features:

bingmapsevr
arcgisserver
svradvanced
arcsdeserver
svrenterprise
spatialserver

If you want to enter authorization information for any additional features, Click Back.

Congratulations, your software has been authorized and is now ready for use.

< Back | Finish | Cancel

Using Direct Connect

- Connection syntax for Service:

  sde:sqlserver:<server_name>

  sde:sqlserver:
  <server_name>\<instance_name>

- Specify name of database

Spatial Database Connection Properties

Server:

Service: sde:sqlserver:datadog

Database: vector

(If supported by your DBMS)

Account

- (•) Database authentication
  - Username: sde
  - Password: •••
  - [x] Save username and password
- ( ) Operating system authentication

Connection details

The following transactional version will be used:

sde.DEFAULT [Change...]

[x] Save the transactional version name with the connection file.

[Test Connection] [OK] [Cancel]

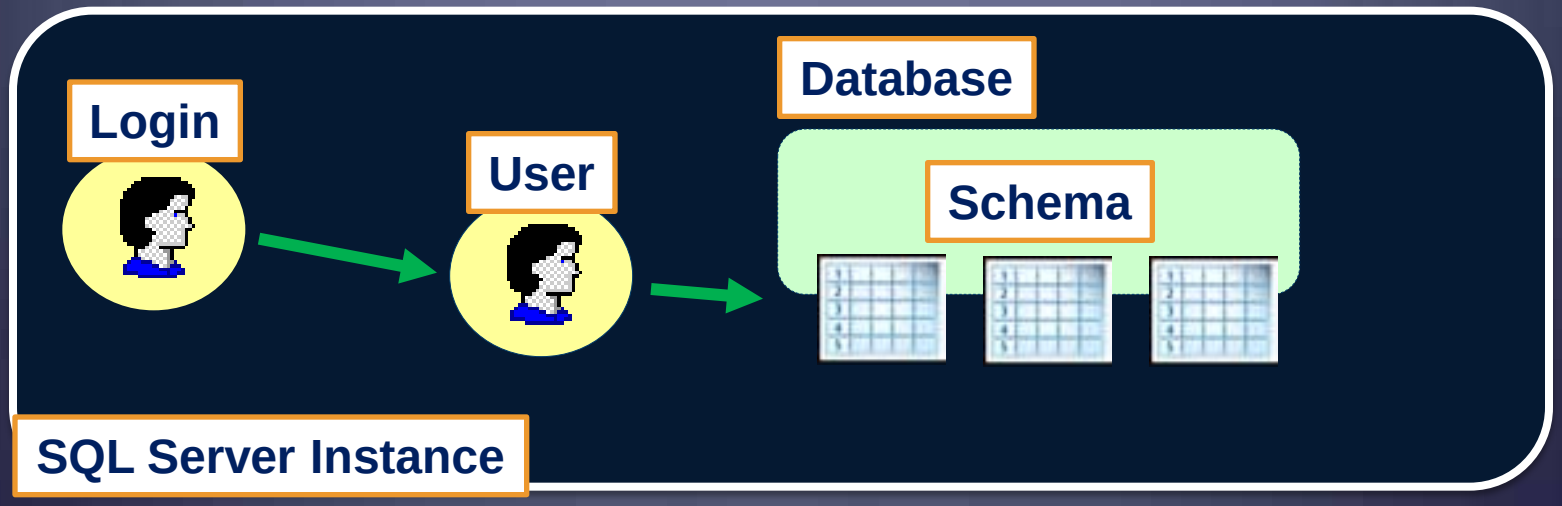
Vector_sde.sde

Project2_Oracle_dir
project2_shorter.sd
Raster_sde.sde
SaveTheBay.sde
sde_oracle.sde
SQL_Server_movet
SQL_Server_movet
SQL_Server_riversi
SQL_Server_riversi
SQL_Server_riversi
SQL_Server_VM_SD
SQL_Server_workfl
test_sqlexpress.sde
Vector_sde.sde
vector_sde_direct.s
Vector_sde_OLE.od
VM_SDE_Oracle_Gis

Vector_sde.sde
Spatial Database

Users and Privileges

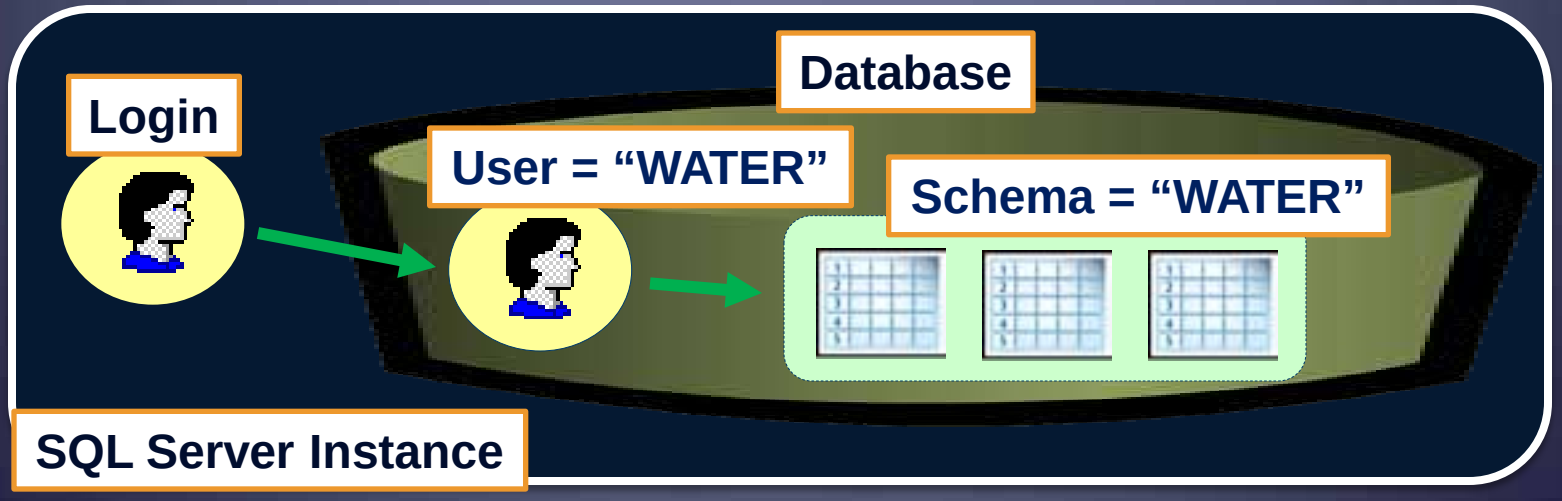
- Login – Instance-level authentication to connect
- User – Database-level authorization to access data
  - A login is associated with a user in each database
- Schema – Database-level logical grouping of data



ArcSDE Data Owners

Creating a data owner in SQL Server

1. Add a login to the instance
2. Create a user in the database
3. Associate the login to the user in database
4. Create a schema with a matching name



Microsoft SQL Server Management Studio

File Edit View Tools Window Community Help

New Query

Object Explorer

Connect

DATADOG (SQL Server 10.0.2531 - DATADOG\jame4183)

Databases

Security

Server

Replic

Manag

SQL S

New

Reports

Refresh

Login...

Credential...

Audit...

Server Audit Specification...

Login Properties - water

Select a page

- General
- Server Roles
- User Mapping
- Securables
- Status

Script Help

Login name: water

Windows authentication

SQL Server authentication

Password: ••••••••••••••••

Confirm password: ••••••••••••••••

Specify old password

Old password:

Enforce password policy

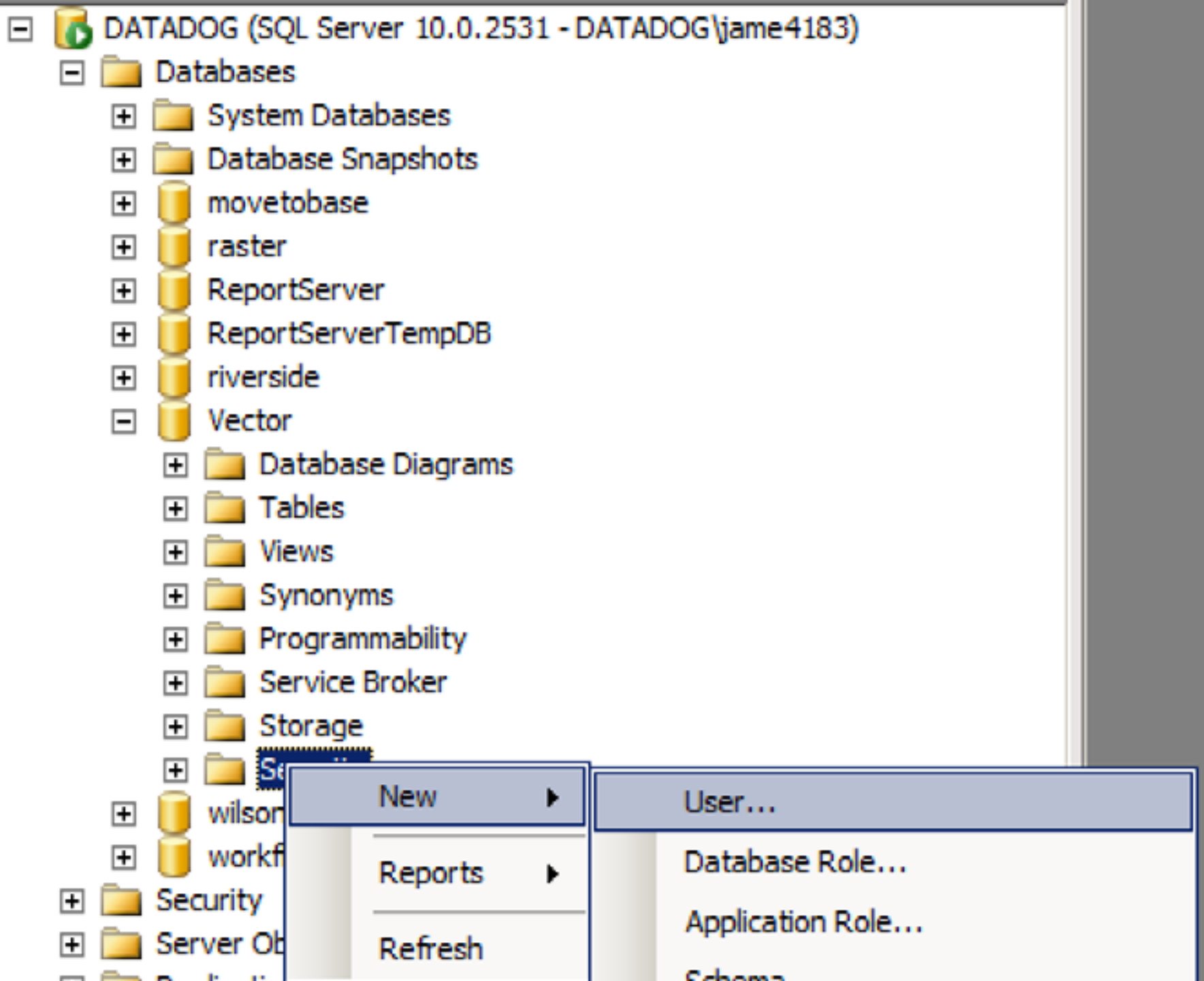
Enforce password expiration

User must change password at next login

Mapped to certificate

Mapped to asymmetric key

Map to Credential


DATADOG (SQL Server 10.0.2531 - DATADOG\jame4183)
Databases
System Databases
Database Snapshots
movetobase
raster
ReportServer
ReportServerTempDB
riverside
Vector
Database Diagrams
Tables
Views
Synonyms
Programmability
Service Broker
Storage
wilson
workf
Security
Server Ob
New
Reports
Refresh
User...
Database Role...
Application Role...

Database User - water

Select a page

- General
- Securables
- Extended Properties

Script Help

User name: water

Login name: water

Certificate name:

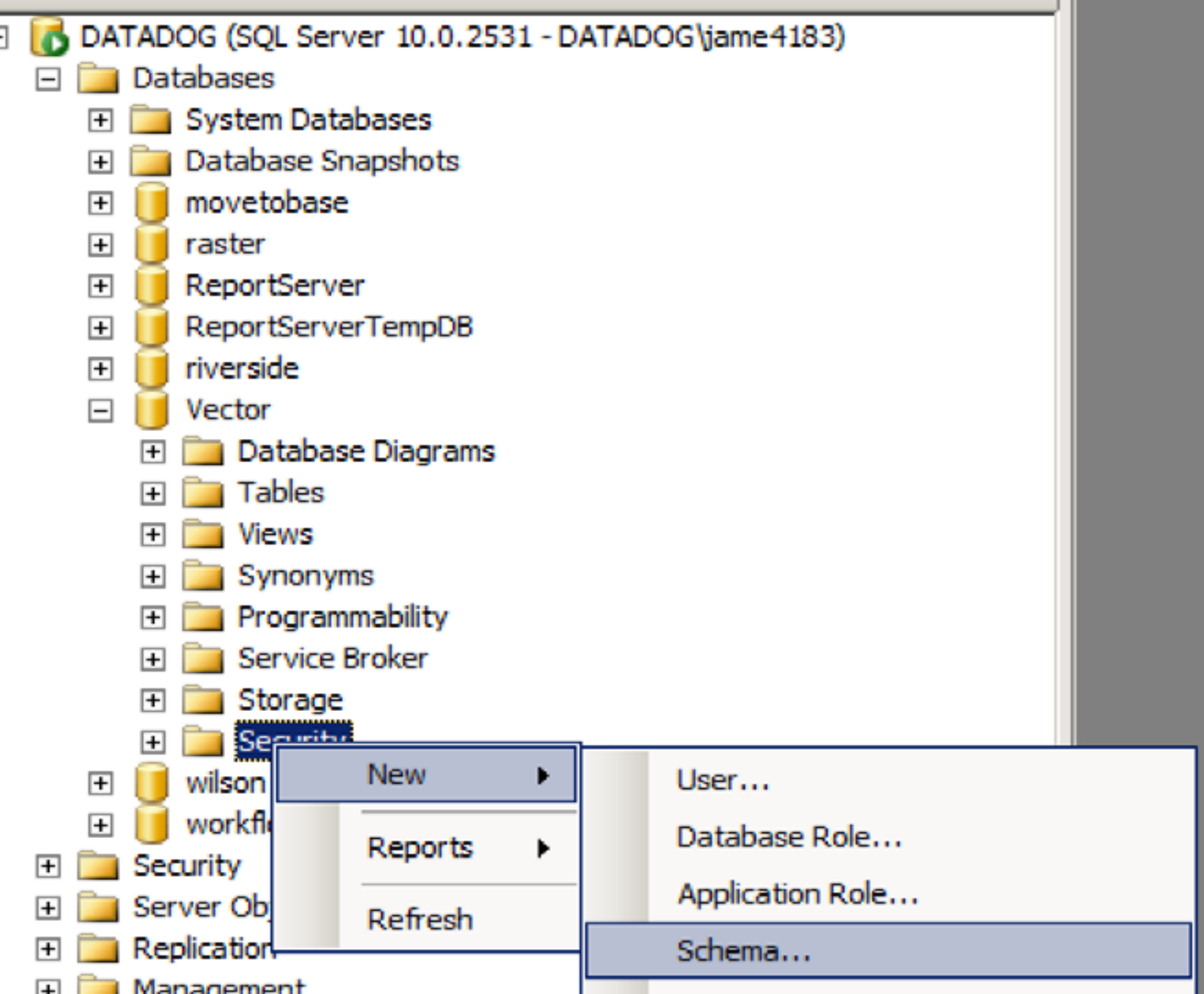
Key name:

Without login

Default schema: water

Schemas owned by this user:

Owned Schemas
db_accessadmin
db_backupoperator
db_datareader
db_datawriter
db_ddladmin
db_denydatareader


DATADOG (SQL Server 10.0.2531 - DATADOG\jame4183)
Databases
System Databases
Database Snapshots
movetobase
raster
ReportServer
ReportServerTempDB
riverside
Vector
Database Diagrams
Tables
Views
Synonyms
Programmability
Service Broker
Storage
wilson
Security
Server Obj
Replication
Management
New
Reports
Refresh
User...
Database Role...
Application Role...
Schema...

Schema Properties - water

Select a page

- General
- Permissions
- Extended Properties

Script Help

A schema contains database objects, such as tables, views, a

Schema name:

water

Schema owner:

water

SQLQuery1.sql...ame4183 (55))*

```
USE [Vector]
GO

/****** Object:  DatabaseRole [sde_data_owner]    Sc
CREATE ROLE SDE_DATA_OWNER
GO
GRANT CREATE TABLE TO SDE_DATA_OWNER
GO
GRANT CREATE VIEW TO SDE_DATA_OWNER
GO
GRANT CREATE PROCEDURE TO SDE_DATA_OWNER
GO
```

Microsoft SQL Server Management Studio

File Edit View Project Debug Tools Window Community Help

New Query

Object Explorer

Connect

- raster
- ReportServer
- ReportServerTe
- riverside
- Vector
  - Database Di
  - Tables
  - Views
  - Synonyms
  - Programmab
  - Service Brok
  - Storage
  - Security
    - Users
    - Roles
      - Data
      - Appl
    - Schemas
      - db_
      - db_

Database Role Properties - sde_data_owner

Select a page

- General
- Securables
- Extended Properties

Script Help

Role name: sde_data_owner

Owner: dbo

Schemas owned by this role:

Owned Schemas
db_accessadmin
dbo
gisadmin
db_securityadmin
water
db_owner

Members of this role:

Role Members

Select Database User or Role

Select these object types:

Users, Database roles

Object Types...

Enter the object names to select (examples):

[water]

Check Names

Browse...

Add... Remove

Database Role - New

Select a page

- General
- Securables
- Extended Properties

Script Help

Role name: water_viewer

Owner: water

Schemas owned by this role:

	Owned Schemas
☐	db_accessadmin
☐	dbo
☐	gisadmin
☐	db_securityadmin
☐	water
☐	db_owner

Members of this role:

	Role Members

Database Role - New

Select a page

- General
- Securables
- Extended Properties

Script Help

Role name: water_editor

Owner: water

Schemas owned by this role:

	Owned Schemas
☐	db_accessadmin
☐	dbo
☐	gisadmin
☐	db_securityadmin
☐	water
☐	db_owner

Members of this role:

	Role Members

Demo

Backups

- Prepare a restore plan that can be accomplished in a timeframe that meets your business needs
- Prepare a backup plan that supports your restore plan
- Backup on a regular basis
- Practice restoring from your backup sets onto another machine before you really need to recover lost data
- Read the SQL Server backup overview: http://msdn.microsoft.com/en-us/library/ms175477.aspx

Resources

- ArcGIS Help in the ArcGIS.com Resource Center
  - Web-based help on many topics
  - http://resources.arcgis.com/content/web-based-help
- ESRI Support Center
  - Contacting support analysts, submitting support requests
  - http://support.esri.com/
- Geodatabase blog
  - What's new in ArcSDE and the geodatabase
  - http://blogs.esri.com/Dev/blogs/geodatabase/default.aspx
- System Design Strategies
  - http:// www.wiki.gis.com/wiki/index.php/System_Design_Strategies

Other Resources

- Physical Memory Limits: Windows Server 2008 R2
  - http://msdn.microsoft.com/en-us/library/aa366778(v=vs.85).aspx#physical_memory_limits_windows_server_2008_r2
- SQL Server 2008: Compare Editions–Enterprise and Standard
  - http://www.microsoft.com/sqlserver/2008/en/us/compare-std-ent.aspx

Other Sessions

Technical Workshops

- Understanding Topology in the Geodatabase
  - Thursday 8:30am Room 4
- Automating Geodatabase Creation Using Model Builder
  - Thursday 8:30am Room 6D

Other Sessions

Technical Workshops

- Managing Distributed Data with Geodatabase Replication
  - Tuesday 3:15pm Room 6D
  - Thursday 10:15am Room 4
- Understanding Geometric Networks
  - Wednesday 1:30pm Room 3

Other Sessions

Technical Workshops

- Editing Strategies for Enterprise Geodatabses
  - Thursday 10:15am Room 5A/B
- The Road Ahead – ArcGIS 10.1 Overview
  - Tuesday 8:30am Room 10
  - Wednesday 1:30pm Room 10
- Road Ahead – ArcGIS Server 10.1
  - Tuesday 1:30pm Room 10
  - Thursday 8:30am Room 10

Other Sessions

Technical Workshops

- Road Ahead – ArcGIS Desktop 10.1
  - Tuesday 10:15am Room 10
  - Wednesday 3:15pm Room 10
- Road Ahead – Introducing ArcGIS Online
  - Tuesday 3:15pm Room 10
  - Thursday 10:15am Room 10

Other Sessions

Demo Theatre Presentations

- Working with SQL Server Express Geodatabases
  - Tuesday 10:00am Geodatabase Management Demo Theatre
- Administration for IBM Databases
  - Tuesday 11:30am Geodatabase Management Demo Theatre
- Using Attachments in ArcGIS
  - Tuesday 1:30pm Geodatabase Management Demo Theatre
  - Wednesday 5:00pm Geodatabase Management Demo Theatre
- Leveraging Relationship Classes in the Geodatabase
  - Tuesday 3:00pm Geodatabase Management Demo Theatre
  - Wednesday 5:30pm Geodatabase Management Demo Theatre

Other Sessions

Demo Theatre Presentations

- Using SQL Profiler to Troubleshoot
  - Tuesday 5:00pm Geodatabase Management Demo Theatre
  - Wednesday 1:00 pm Geodatabase Management Demo Theatre
- File Geodatabase Overview
  - Wednesday 10:00am Geodatabase Management Demo Theatre
  - Thursday 10:00am Geodatabase Management Demo Theatre
- Using Oracle Trace to Troubleshoot
  - Wednesday 11:30am Geodatabase Management Demo Theatre
  - Thursday 11:30am Geodatabase Management Demo Theatre

Other Sessions

Demo Theatre Presentations

- Using SQL with your Geodatabase
  - Thursday 10:30am Geodatabase Management Demo Theatre

Other Sessions

Technical Workshop 20 Minute

- What is a Geodatabase?
  - Tuesday 1:55pm Room 6B
- Migrating Data to the Geodatabase
  - Wednesday 3:40pm Room 6B
- Database Security Tips
  - Thursday 10:15am Room 23B
- Administration for SQL Server – Advanced
  - Tuesday 3:15pm Room 4
  - Thursday 10:15am Room 4

Other Sessions

Technical Workshop 20 Minute

- Troubleshooting Performance Issues with Enterprise Geodatabases
  - Thursday 10:40am Room 24A
- Python – Automating Geodatabase Administration
  - Thursday 11:05am Room 24A
- Upgrading to ArcGIS 10.0 Geodatabases
  - Thursday 1:30pm Room 23B
- Using Spatial Data in ArcGIS with Query Layers
  - Thursday 1:55pm Room 23B

Other Sessions

Technical Workshop 20 Minute

- Leveraging the Cloud for Data Sharing Between Remote Offices
  - Thursday 2:20pm Room 23B
- Implementing Database Roles in the Enterprise Geodatabase
  - Thursday 3:15pm Room 3
- Enterprise Geodatabase Administration – Tips and Tricks
  - Thursday 3:40pm Room 3

Other Sessions

Technical Workshop 20 Minute

- Enterprise Geodatabase Administration – Tips and Tricks
  - Thursday 3:40pm Room 3
- Road Ahead – GDB Admin
  - Thursday 3:40 Room 27B
- Road Ahead – Geodatabase
  - Thursday 9:20am Room 6B

Other Sessions

Special Interest Group Meeting

- EGUG – Ask the Experts
  - Tuesday 4:30pm Room 29A
- Defense METOC SIG
  - Wednesday 12:00pm Room 28D
- Data Preservation SIG
  - Wednesday 12:00pm Room 28C
- Geodatabase Design and Modeling
  - Wednesday 12:00pm Room 29C

Evaluation

- www.esri.com/sessionevals

- Sign in with your “My UC login”