Intro to ArcSDE for SQL Server

Tony Wakim & Jim Gough
Our Goal

Two people sharing files

Small team of editors

Enterprise GIS

Two people sharing files
Manager’s Objectives

- 15 Editors
- 25 Viewers
- Serve data through ArcGIS Server
- Vector Data 75 Gigabytes, 10%/year Growth
- Raster Data 100 Gigabytes
Existing Machine

4 Cores

32 Gigabytes Memory

Windows 2008 R2 Standard 64-bit

SQL Server Standard 64-bit
System Design Strategies

From wiki.GIS.com
System Design Strategies 29th Edition

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 schedule
Esri Training Matters training spotlight: Enterprise GIS & Interview with Dave Petrunshak
ArcGIS Resource Centers &

Key 2011 Events
Jul 9 Planning and Managing a GIS Preconference Seminar & at the Esri International User Conference &

An Esri © Technical Reference Document · Spring 2011
Table of Contents

Preface

1. System Design Process
2. GIS Software Technology
3. Software Performance
4. GIS Data Administration
5. Network Communications
6. GIS Product Architecture
7. Platform Performance
8. Information Security
9. Performance Fundamentals
10. Capacity Planning Tool
11. City of Rome
12. System Implementation

Acronyms and Glossary

Previous Wiki Editions
System Design Strategies 28th Edition (Fall 2010)

Page Footer
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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...
The memory requirements will increase to accommodate additional concurrent 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**

*Potential bottlenecks:*
- Disk I/O contention
- DBMS scalability
ArcGIS Resource Center

- resources.arcgis.com
- Gateway to current:
  - Support
  - Web help and tutorials
  - Templates, samples, and data
- ideas.arcgis.com
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]
<table>
<thead>
<tr>
<th>Microsoft SQL Server 2008 Final - R2 (64-bit)</th>
<th>Windows 2003 Server Standard, Enterprise &amp; Datacenter (64-bit (EM64T))</th>
<th>SP2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft SQL Server 2005 Express SP2 &amp; SP3 (32-bit)</td>
<td>Windows 2008 Server Standard, Enterprise &amp; Datacenter (64-bit (EM64T))</td>
<td>Final</td>
</tr>
<tr>
<td>Windows 2003 Server Standard, Enterprise &amp; Datacenter (64-bit (EM64T))</td>
<td>Windows 2008 Server Standard, Enterprise &amp; Datacenter (64-bit (EM64T))</td>
<td>SP2</td>
</tr>
</tbody>
</table>
Physical Memory Limits: Windows Server 2008 R2

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

<table>
<thead>
<tr>
<th>Version</th>
<th>Limit on X64</th>
<th>Limit on IA64</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Server 2008 R2 Datacenter</td>
<td>2 TB</td>
<td></td>
</tr>
<tr>
<td>Windows Server 2008 R2 Enterprise</td>
<td>2 TB</td>
<td></td>
</tr>
<tr>
<td>Windows Server 2008 R2 for Itanium-Based Systems</td>
<td>2 TB</td>
<td></td>
</tr>
<tr>
<td>Windows Server 2008 R2 Foundation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Windows Server 2008 R2 Standard</td>
<td>32 GB</td>
<td></td>
</tr>
<tr>
<td>Windows HPC Server 2008 R2</td>
<td>128 GB</td>
<td></td>
</tr>
<tr>
<td>Windows Web Server 2008 R2</td>
<td>32 GB</td>
<td></td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of CPUs</td>
<td>OS Maximum</td>
<td>4</td>
</tr>
<tr>
<td>Scalability &amp; Performance</td>
<td></td>
<td></td>
</tr>
<tr>
<td>High Availability (Always On)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

KEY: ☑ = Full, ☐ = Partial/Limited, ☐ = Not Available
## Check Requirements

<table>
<thead>
<tr>
<th>Component</th>
<th>Version/Release</th>
<th>Supported</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operating System</td>
<td>Windows 2008 R2 Standard</td>
<td>Yes</td>
</tr>
<tr>
<td>SQL Server</td>
<td>SQL Server 2008 R2 Standard</td>
<td>Yes</td>
</tr>
<tr>
<td>ArcSDE</td>
<td>ArcSDE 10</td>
<td>Yes</td>
</tr>
</tbody>
</table>
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
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
Server authentication

- SQL Server and Windows Authentication mode

Login auditing

- Failed logins only

Server proxy account

- Enable server proxy account

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
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.
Define Database and SDE DBA User

Creates a Spatial database and SDE DBA user.

Repository Setup

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

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 already exist.
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.
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
Log file: C:\Program Files\Microsoft SQL Server\MSSQL10.MS

< Back  Next >  Cancel  Help
ArcSDE configuration files
Select configuration file options

Define giomgr.defs file
- Use default file
- User custom file

Define dbinit.sde file
- Use default file
- Use custom file

Define dbtune.sde file
- Use default file
- Use custom file (if upgrading - do not use - see Install Guide)
Repository Setup

SQL Server instance name: DATADOG

Database name: Vector

Connect using:
- [ ] Windows Authentication
- [x] SQL Server Authentication

SDE user name: sde

SDE User Password: ***
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.
Authorization Options

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

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

```
\r\n\r\n\r\n\r\n```

Browse...
You have authorized the following features:

- bingmapsvr
- arcgisserver
- srvadvanced
- arcsdeserver
- svreenterprise
- 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.
Using Direct Connect

- Connection syntax for Service:
  
  sde:sqlserver:<server_name>

  sde:sqlserver:
    <server_name>\<instance_name>

- Specify name of 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
### General Information

**User name:**
- [ ] Login name: water
- [ ] Certificate name: 
- [ ] Key name: 
- [ ] Without login

**Default schema:**
- water

**Schemas owned by this user:**
- [ ] db_accessadmin
- [ ] db_backupoperator
- [ ] db_datareader
- [ ] db_datawriter
- [ ] db_ddladmin
- [ ] db_denydatareader
A schema contains database objects, such as tables, views, and functions. A schema name is 'water'. The schema owner is also 'water'.
USE [Vector]
GO

/***** Object: DatabaseRole [sde_data_owner] Schema: SDE_DATA_OWNER

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
Database Role Properties - sde_data_owner

Role name: sde_data_owner
Owner: dbo

Schemas owned by this role:
- db_accessadmin
- dbo
- gisadmin
- db_securityadmin
- water
- rth_owner

Members of this role:

Select Database User or Role

Select these object types:
- Users, Database roles

Enter the object names to select (examples):
- [water]
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
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

System Design Strategies
Other Resources

- Physical Memory Limits: Windows Server 2008 R2

- SQL Server 2008: Compare Editions–Enterprise and Standard
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 Geodatabases
  – 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”