

ArcSDE Spatial Data Management Roles and Responsibilities

The following discussion outlines the major roles and responsibilities involved in deploying your spatial data and geographic information system (GIS) applications to an ArcSDE® server. Because ArcSDE is a unifying technology that brings two traditionally separate technical departments together, some issues may arise regarding the ownership and administration of spatial databases. To help mitigate any unforeseen organizational impasses, IT and GIS management should review this document together and agree on the roles of this endeavor.

This document reviews two broad categories of roles and responsibilities that comprise a healthy ArcSDE spatially managed enterprise.

- Administration
- Development

The following sections discuss the exact roles and responsibilities.

ADMINISTRATION

Server Maintenance

Role: ArcSDE Service Management

Responsibility

Manage the ArcSDE service including

- Starting and stopping the service
- Establishing a recovery process if the service stops
- Establishing a troubleshooting process
- Remedying an ArcSDE service that will not restart
- Fail-over

Requirements

- Administrative or Power User Windows rights on the service host
- Access to the Windows Event Log
- Administrative access to the database management system (DBMS) to diagnose database changes or problems
- Knowledge of IT policies and methodologies

Owner: IT or GIS

Role: Server Load Management

Responsibilities

- Monitor and remedy server load.
- Monitor server load or automate the monitoring of the server load.
- Create framework for alerts.
- Diagnose which processes and operations are overloading the server.
- Remedy unnecessary loads such as a runaway process.

Build plans to overcome overloaded server.
Potentially build fail-over infrastructure of mission critical server.

Requirements

Access to system monitoring tools (e.g., PerfMon, Task Manager)
Administrative or Power User Windows rights on the host
Knowledge of IT policies and methodologies

Owner: IT or GIS

Role: ArcSDE Service Anomaly Management

Responsibility

Manage the ArcSDE service when unforeseen troubles occur.

Requirements

Administrative or Power User access to the service host
Access to the Windows Event Log to diagnose problems
Access to a technical support group to diagnose and remedy problems
Administrative access to the DBMS to diagnose database problems
Knowledge of IT policies and methodologies
Ability to troubleshoot ArcSDE service anomalies
Ability to understand ArcSDE error logs to help resolve problems

Owner: IT or GIS

Note: Timely support is required and is part of the criteria for choosing the staff.

Security

Role: Spatial Database Access

Responsibility

Manage access to the spatial database in ArcSDE including

- Creating new users to a spatial database
- Maintaining administration user
- Creating a procedure to support ArcSDE/SQL Server standard security (ArcSDE does not support integrated security.)
- Preparing and enforcing procedure to manage ArcSDE clients (e.g., individual SQL Server logins)
- Locking down command line administration tools

Requirements

Administrative access to SQL Server to create logins
Administrative access to SQL Server spatial databases
Ability to control the use of the ArcSDE administration tools (e.g., sdemon)

Ability to enforce SQL Server data access
Knowledge of IT policies and methodologies

Owner: IT or GIS

Recovery

Role: Spatial Database Recovery

Responsibilities

Establish recovery policy and procedures including

- Frequency (e.g., incremental, differential)
- Archive location
- Versioning
- Recovery medium (i.e., backup versus replication)

Enforce recovery policy and procedures.
Automate recovery procedure where practical.

Requirements

- Administrative access to SQL Server to create and maintain recovery procedure
- Ability to create and enforce SQL Server recovery procedures
- Knowledge of ArcSDE layer schema to recover correct database objects
- Knowledge of IT policies and methodologies

Owner: IT or GIS

Replication

Role: Replicate Spatial Data

Responsibilities

Configure ArcSDE replication facilities (e.g., f and s tables).
Establish appropriate replication for business needs (e.g., transactional, snapshot, merge).
Implement replication needs.

Requirements

- Administrative access to SQL Server to create and maintain replication configurations
- Ability to create and enforce SQL Server replication
- Knowledge of ArcSDE layer schema to replicate correct database objects
- Knowledge of IT policies and methodologies

Owner: IT or GIS

Performance Tuning

Role: Tune an ArcSDE Layer

Responsibilities

Configure a spatial index for a given layer.

Measure and monitor the performance of the spatial searches critical to the business needs of your company (e.g., data maintenance, custom products, general products).

Maintain performance and quality of service as new spatial applications arrive, data and maintenance grow, and the user base increases.

Requirements

Ability to adjust a spatial index of an ArcSDE layer

Ability to measure the performance of a spatial search in a given application

Knowledge of quality of service requirements

Owner: IT or GIS

Role: Tune ArcSDE Server and Network Infrastructure

Responsibilities

Configure the ArcSDE instance parameters for the ArcSDE server.

Measure and monitor the performance of the ArcSDE server instance and the anticipated needs (e.g., data maintenance, custom products, general products, usage growth.) Maintain performance and quality of service as new users and applications arrive, data and maintenance grow, and the user base increases.

Requirements

Knowledge of quality of service requirements

Owner: IT or GIS

Upgrades

Installing new versions of ArcSDE

Executing data migration tools (e.g., sdeupgrade)

Role: ArcSDE Upgrade Management

Responsibilities

Ensure ArcSDE service version is up-to-date and supports existing and new application functionality.

Ensure ArcSDE compatibility with applications (e.g., MapObjects®, ArcIMS®, ArcGIS®).

Install and configure upgrades to an ArcSDE service and its application clients.

Support and remedy incompatibility issues.

Implement ArcSDE upgrades (service packs, sdeupgrade).

Install and configure upgrades of ArcSDE dependencies (e.g., DBMS, access libraries, operating system).

Requirements

Ability to monitor and maintain the versions of ArcSDE and the applications it supports
Ability to monitor and maintain the versions of ArcSDE dependent technologies (e.g., operating system, DBMS.)
Administrative privileges on ArcSDE server
Administrative privileges on ArcSDE DBMS
Knowledge of IT policies and methodologies
Permission to purchase upgrades

Owner: IT or GIS

Research Projects

Role: Research New Tools and Technologies to Improve the Spatial Data Management

Responsibilities

Continually investigate how to improve spatial data management.
Continually test and scrutinize new spatial data management tools, techniques, and technologies.
Investigate new data management techniques (e.g., DBMS abstract data types).
Investigate new spatial analysis to improve overall effectiveness.

Requirements

Knowledge of common GIS tools, techniques, and modern technologies
Knowledge of common spatial data maintenance issues and requirements
Knowledge of common spatial data access issues and requirements
Knowledge of GIS services and practices
Willingness to try new things

Owner: IT or GIS

DEVELOPMENT

Spatial Data Maintenance Development

Role: Develop Tools and Work Flow to Maintain Changes to Spatial Data

Responsibilities

Translate related changes in business data to changes in spatial data (e.g., city annexed two new parcels).
Use the right GIS tool and approach to maintain the spatial data.
Automate data maintenance where practical.
Support automation (tools or work flow).
Integrate new GIS tools and techniques to maintain the spatial data.

Requirements

Knowledge of the functional abilities and limitations in ESRI client applications (e.g., CAD Client, ArcObjects™)
Knowledge of current software engineering policies and methodologies
Knowledge of GIS policies and methodologies
Knowledge of GIS discipline (e.g., coordinate systems, topology)
Knowledge of AutoCAD technologies
Knowledge of spatial editing issues (e.g., topology, spatial processing)

Owner: IT or GIS

Custom Mapping Service Development

Role: Develop Custom Mapping Related Solutions (i.e., analysis and mapping)

Responsibilities

Understand and translate a specific business need to GIS analysis perspective.
Identify the right tool and spatial data to satisfy a business need.
Develop a spatial solution to satisfy a business need.
Test spatial solution.
Deliver or deploy spatial solution.

Requirements

Ability to translate general business needs to spatial processing requirements
Knowledge of the functional abilities and limitations in ESRI client applications (e.g., ArcObjects)
Knowledge of current software engineering policies and methodologies
Knowledge of GIS policies and methodologies
Knowledge of GIS discipline (e.g., coordinate systems, topology)

Owner: IT or GIS

General Mapping Development

Role: Develop General Mapping Applications

Responsibilities

Develop GIS application for your company's general business needs (e.g., "show me my parcel on a map").
Test GIS application for your company's general business needs.
Deploy GIS application for your company's general business needs.
Maintain GIS application for your company's general business needs.

Requirements

Knowledge of the functional abilities and limitations in ESRI client applications (e.g., ArcObjects)
Knowledge of current software engineering policies and methodologies
Knowledge of GIS policies and methodologies
Knowledge of GIS discipline (e.g., coordinate systems, topology)
Knowledge of IT policies and methodologies

Ability to deploy applications

Owner: IT or GIS

Application Support

Role: Support Deployed GIS Applications

Responsibilities

Support users with technical issues about GIS applications (e.g., "help desk").
Maintain the data sources for GIS applications.
Troubleshoot functional issues of a GIS application.
Support Web-based spatial applications (if Web-based mapping services apply).

Requirements

Ability to install and deinstall applications and their dependencies
Knowledge of IT policies and methodologies

Owner: IT or GIS

Database Development

Role: Spatial Data Design

Responsibility

Determine the appropriate layout of spatial data layers including

- Organizing by entity type (e.g., points, lines, polygons)
- Organizing by functional analysis (e.g., SQL queries)
- Organizing by normalization principles
- Organizing by maintenance (i.e., minimize maintenance effort)
- Organizing by spatial data vendors (e.g., Assessor changes, .dwg structure)

Requirements

Knowledge of spatial data maintenance work flow in detail
Knowledge of how the spatial data will be used (i.e., map functionality and products)
Knowledge of basic principles of normalization and database objects
Knowledge of ArcSDE layer schema

Owner: IT or GIS

IT Manager

Date:

GIS Manager

Date: