

Geodatabase Administration: An Introduction

Robert A. LeClair



Getting Started

Geodatabase Administration: An Introduction

- **This is an Intro session using ArcGIS Pro 1.4 but will work in ArcMap too!**
- **Assumes some familiarity with Multiuser Geodatabases**
- **Focuses on Geoprocessing tools for Geodatabases – Demo Heavy**
- **Please hold questions until the end**

Road Map

- **Introduction to the ArcGIS Platform**
- **Evolution of Geodatabase Administration**
- **Administration using ArcGIS Desktop 10.5**
- **Administration Workflows**

ArcGIS is a Platform

Enabling Web GIS Everywhere

Simple
Integrated
Open



Available in the Cloud...
...and on Premise

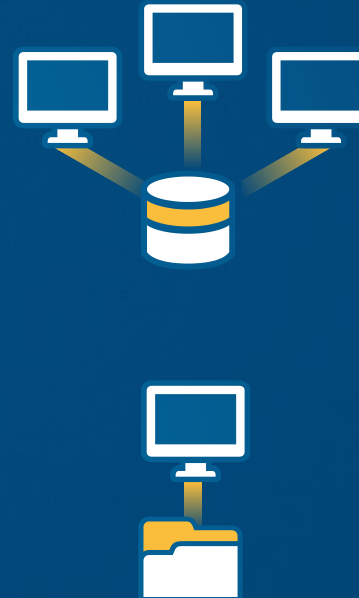
Geodatabases

- **Enterprise Geodatabases**

Supported Databases in ArcGIS Pro	
ALTIBASE	PostgreSQL
Dameng	SAP Hana
DB2	SQL Server
Netezza	Teradata
Oracle	

- **File Geodatabases**

- System files in a file folder



Administration done in ArcGIS Desktop and ArcGIS Enterprise

- **ArcGIS Desktop**

- GUI Tools
- GP Tools



- **ArcGIS Enterprise**

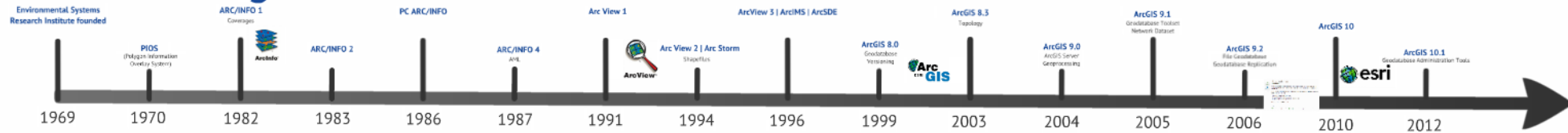
- GP Tools / Python



Evolution of Geodatabase Administration

A timeline of ADMIN advances

History of Geodatabase Administration



- 2013 - ArcGIS 10.2: Support for Netezza 7.0, INZA 2.5, PostgreSQL 9.2, Teradata and SQLite
- 2014 - ArcGIS 10.3: ArcSDE Command line utilities & app server connections deprecated, Data Store
- 2016 - ArcGIS 10.4 & 10.5: GDB Improvements, new storage methods for Multiuser GDB's

Administration Upgrades

Geoprocessing

Change Privileges

Parameters | Environments

Input Dataset

Naperville.GISOWNER.Parcels

User

sam

View (Select)

Grant view privileges

Edit (Update/Insert/Delete)

Grant edit privileges

Run

Geodatabase Administration(DBO@GEODATA/Naperville)

Connections | Locks


Filtering

User Name: Client Machine:

User Name	Session ID	Connection Type	Client Machine	Date
SAM	58	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:54:08 PM
SAM	59	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:54:52 PM
GISOWNER	63	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:55:23 PM

Refresh 3 of 4 Users Connected at 1/26/2017 2:55:49 PM

Administration Upgrades

 Versions: sde@geodata:Naperville ▼ □ ×

4 of 4 versions listed at 1/26/2017 3:16:33 PM.

Name	Owner	Parent	Description	Access	Created	Modified
DEFAULT	sde		Instance default version.	Public	1/26/2017 2:12:04 PM	1/26/2017 2:12:04 PM
QAQC	SDE	DEFAULT		Protected	1/26/2017 3:09:55 PM	1/26/2017 2:12:04 PM
EDIT	GISOWNER	QAQC		Protected	1/26/2017 3:15:30 PM	1/26/2017 2:12:04 PM
SAM	SAM	EDIT		Public	1/26/2017 3:16:19 PM	1/26/2017 2:12:04 PM

Geodatabase Administration(SAM@GEODATA/Naperville) ×

Locks

Filtering

Object Name Lock Type Lock Owner

Object Name	Object Type	Lock Type	Lock Owner	Lock Mode	Date Acquired
Naperville.GISOWNER.P	Feature Class	schema	SAM	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.B	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.R	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:51 PM
Naperville.GISOWNER.V	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.V	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:50 PM

5 of 5 Locks at 1/26/2017 3:19:09 PM

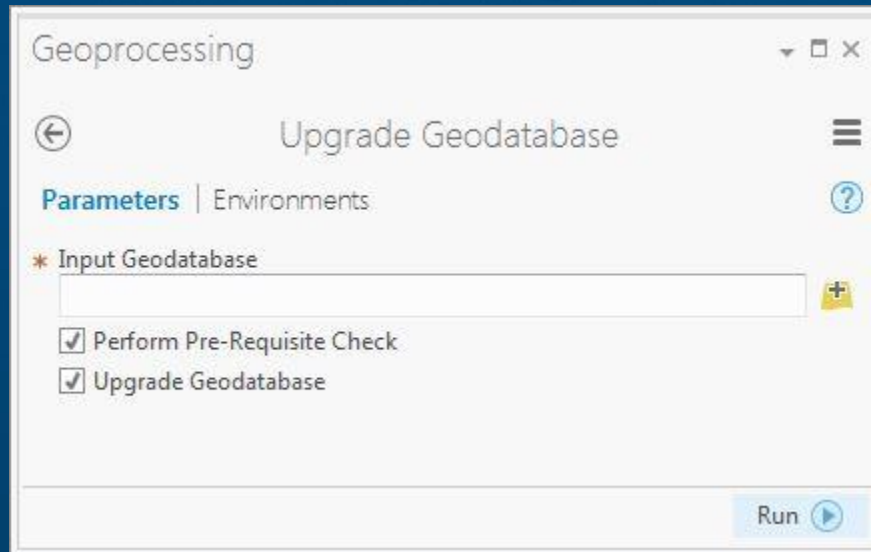
What do Administrators do?

Common ADMIN Tasks

- Create New Multiuser Geodatabases
- Create New Database Connections
- Create Database Users and Roles
- Manage Permissions
- Work with Locks
- Upgrade Geodatabases
- Automation

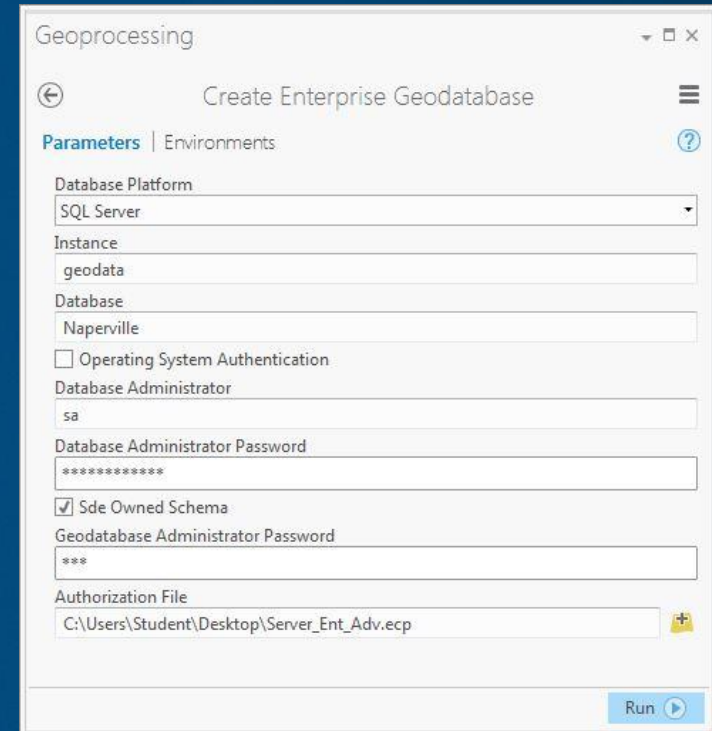
Upgrading Geodatabases

- Upgrade Geodatabase Geoprocessing tool
- Two options:
 - Upgrade directly through Desktop (GP or Context Menu)
 - Script upgrade using Python
 - Cross platform



Creating New Geodatabases

- New enterprise geodatabase created directly through Desktop
- Script the creation of new geodatabases
- Automate and execute across platforms



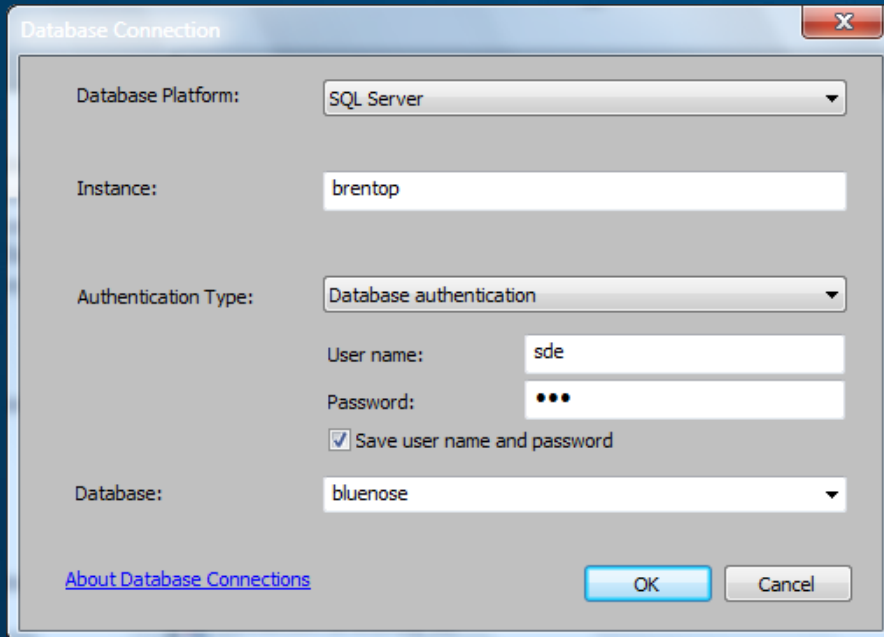
The screenshot shows the 'Create Enterprise Geodatabase' dialog box in the ArcGIS Desktop 'Geoprocessing' environment. The 'Parameters' tab is active. The 'Database Platform' is set to 'SQL Server'. The 'Instance' is 'geodata'. The 'Database' is 'Naperville'. The 'Database Administrator' is 'sa'. The 'Database Administrator Password' is masked with asterisks. The 'Operating System Authentication' checkbox is unchecked. The 'Sde Owned Schema' checkbox is checked. The 'Geodatabase Administrator Password' is masked with asterisks. The 'Authorization File' is 'C:\Users\Student\Desktop\Server_Ent_Adv.ecp'. A 'Run' button is at the bottom right.



The screenshot shows the 'Enable Enterprise Geodatabase' dialog box in the ArcGIS Desktop 'Geoprocessing' environment. The 'Parameters' tab is active. There are two required fields, marked with an asterisk: 'Input Database Connection' and 'Authorization File'. Both fields are empty and have a file selection icon (a yellow square with a plus sign) to their right. A 'Run' button is at the bottom right.

Creating Connections

ArcMap 10.3 & Higher



The screenshot shows the 'Database Connection' dialog box in ArcMap 10.3. It features a grey background and a standard Windows-style window with a title bar and a close button. The fields are as follows: 'Database Platform' is a dropdown menu set to 'SQL Server'; 'Instance' is a text box containing 'brentop'; 'Authentication Type' is a dropdown menu set to 'Database authentication'; 'User name' is a text box containing 'sde'; 'Password' is a text box with three dots; there is a checked checkbox for 'Save user name and password'; and 'Database' is a dropdown menu set to 'bluenose'. At the bottom left is a blue hyperlink 'About Database Connections', and at the bottom right are 'OK' and 'Cancel' buttons.

Database Connection

Database Platform: SQL Server

Instance: brentop

Authentication Type: Database authentication

User name: sde

Password: ...

☒ Save user name and password

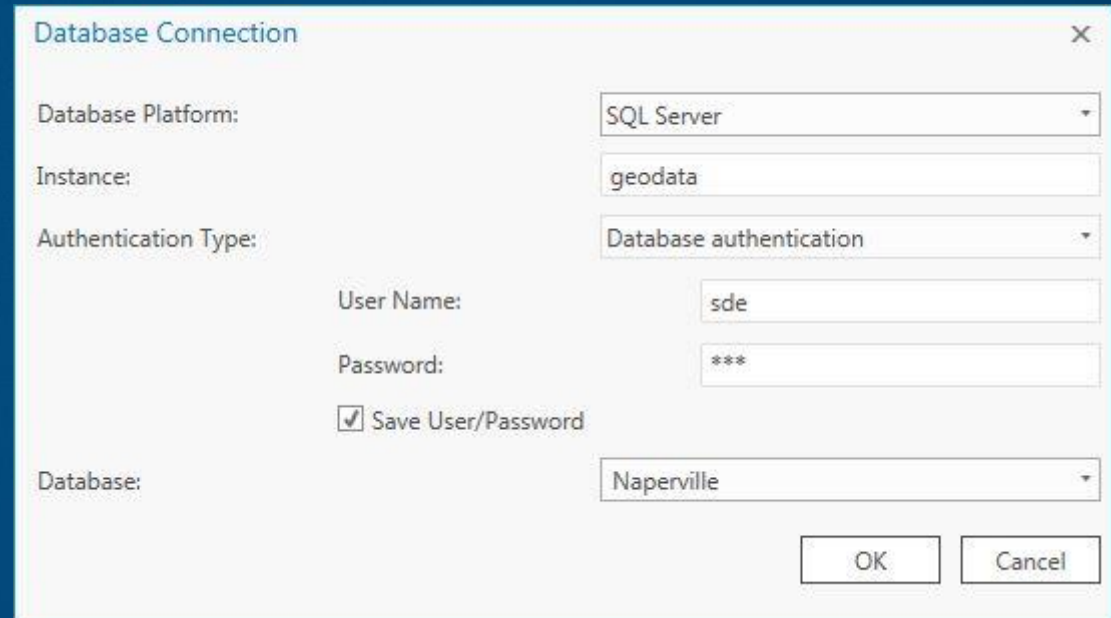
Database: bluenose

[About Database Connections](#)

OK Cancel

Database connection is the default connection type

ArcGIS Pro



The screenshot shows the 'Database Connection' dialog box in ArcGIS Pro. It has a white background and a standard Windows-style window. The fields are: 'Database Platform' is a dropdown menu set to 'SQL Server'; 'Instance' is a text box containing 'geodata'; 'Authentication Type' is a dropdown menu set to 'Database authentication'; 'User Name' is a text box containing 'sde'; 'Password' is a text box containing '***'; there is a checked checkbox for 'Save User/Password'; and 'Database' is a dropdown menu set to 'Naperville'. At the bottom right are 'OK' and 'Cancel' buttons.

Database Connection

Database Platform: SQL Server

Instance: geodata

Authentication Type: Database authentication

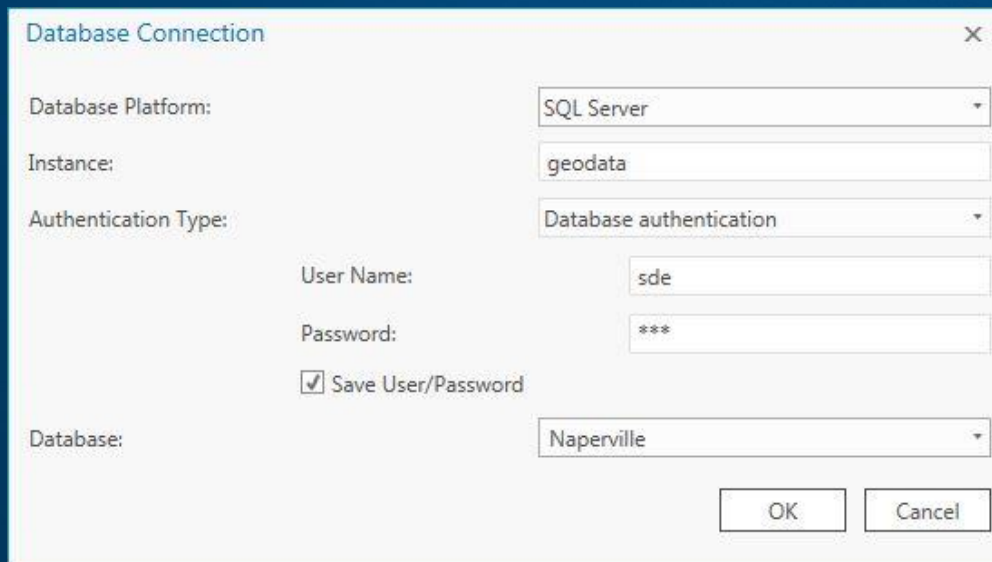
User Name: sde

Password: ***

☒ Save User/Password

Database: Naperville

OK Cancel



A screenshot of a 'Database Connection' dialog box. The dialog has a title bar with a close button (X). It contains several fields: 'Database Platform' is a dropdown menu set to 'SQL Server'; 'Instance' is a text box containing 'geodata'; 'Authentication Type' is a dropdown menu set to 'Database authentication'; 'User Name' is a text box containing 'sde'; 'Password' is a text box containing '***'; there is a checked checkbox labeled 'Save User/Password'; and 'Database' is a dropdown menu set to 'Naperville'. At the bottom right are 'OK' and 'Cancel' buttons.

Database Connection

Database Platform: SQL Server

Instance: geodata

Authentication Type: Database authentication

User Name: sde

Password: ***

☒ Save User/Password

Database: Naperville

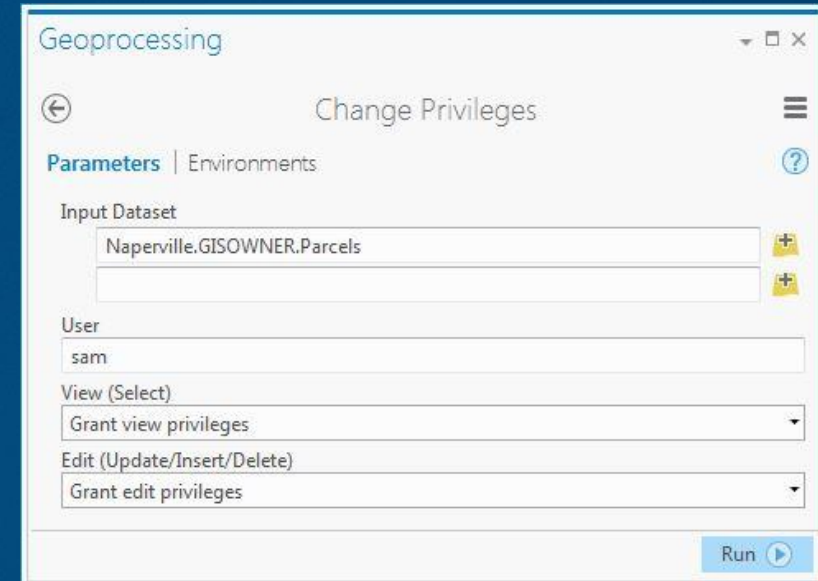
OK Cancel

Demo

Create an Enterprise GDB

Managing Privileges

- Create new users and roles
- Grant and revoke privileges
- All privileges all in one spot
- Automate workflows



Geoprocessing

Change Privileges

Parameters | Environments

Input Dataset

Naperville.GISOWNER.Parcels

User

sam

View (Select)

Grant view privileges

Edit (Update/Insert/Delete)

Grant edit privileges

Run

Demo

Create GISOWNER and
Managing Privileges

Managing Locks

- All lock info is in one spot
- View current connections
- Disconnect users

Geodatabase Administration(SAM@GEODATA/Naperville)

Locks

Filtering

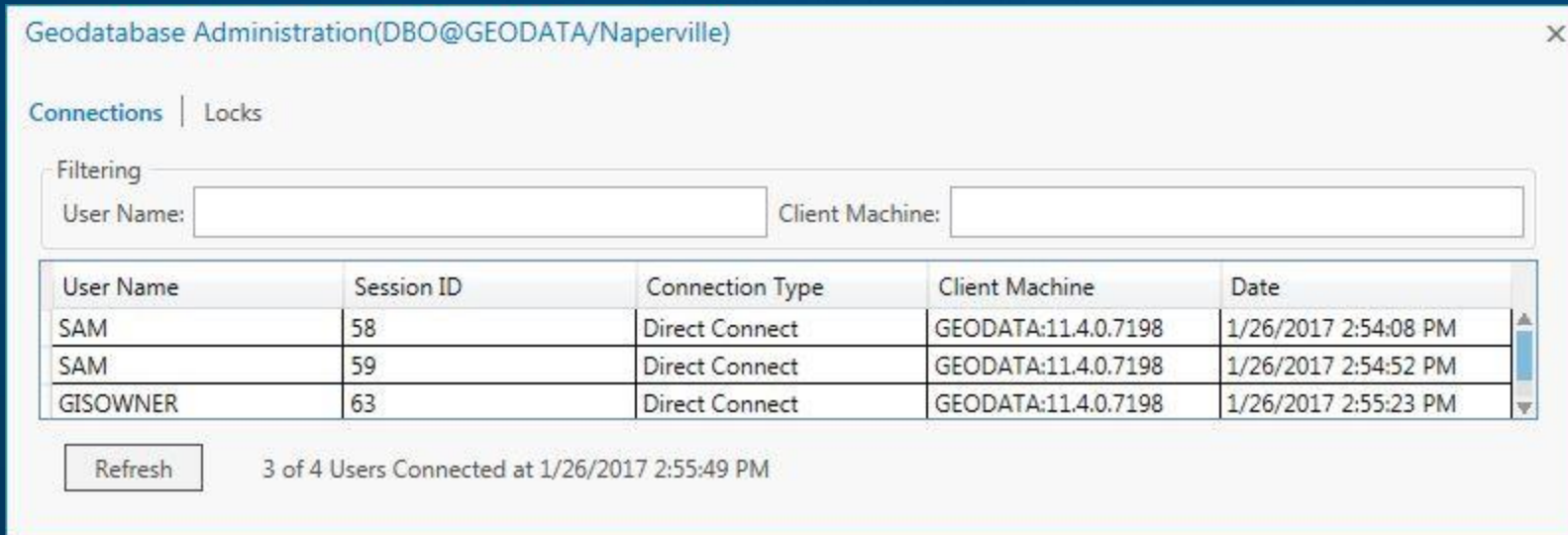
Object Name Lock Type Lock Owner

Object Name	Object Type	Lock Type	Lock Owner	Lock Mode	Date Acquired
Naperville.GISOWNER.P	Feature Class	schema	SAM	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.B	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.R	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:51 PM
Naperville.GISOWNER.M	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.V	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:50 PM

Refresh 5 of 5 Locks at 1/26/2017 3:19:09 PM

Managing Connections

- **View Connected Users**
 - Connection information such as connected machine name and date/time connection was established
- **Disconnect Users**



The screenshot shows the 'Geodatabase Administration(DBO@GEODATA/Naperville)' window. It has two tabs: 'Connections' (selected) and 'Locks'. Below the tabs is a 'Filtering' section with 'User Name' and 'Client Machine' input fields. A table displays the list of connected users with columns for User Name, Session ID, Connection Type, Client Machine, and Date. At the bottom, there is a 'Refresh' button and a status message indicating '3 of 4 Users Connected at 1/26/2017 2:55:49 PM'.

User Name	Session ID	Connection Type	Client Machine	Date
SAM	58	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:54:08 PM
SAM	59	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:54:52 PM
GISOWNER	63	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:55:23 PM

Refresh 3 of 4 Users Connected at 1/26/2017 2:55:49 PM

Geodatabase Administration(DBO@GEODATA/Naperville)

Connections | Locks

Filtering

User Name: Client Machine:

User Name	Session ID	Connection Type	Client Machine	Date
SAM	58	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:54:08 PM
SAM	59	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:54:52 PM
GISOWNER	63	Direct Connect	GEODATA:11.4.0.7198	1/26/2017 2:55:23 PM

Refresh 3 of 4 Users Connected at 1/26/2017 2:55:49 PM

Geodatabase Administration(SAM@GEODATA/Naperville)

Locks

Filtering

Object Name Lock Type Lock Owner

Object Name	Object Type	Lock Type	Lock Owner	Lock Mode	Date Acquired
Naperville.GISOWNER.P	Feature Class	schema	SAM	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.B	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.R	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:51 PM
Naperville.GISOWNER.W	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:52 PM
Naperville.GISOWNER.V	Feature Class	schema	GISOWNER	shared	1/26/2017 3:12:50 PM

Refresh 5 of 5 Locks at 1/26/2017 3:19:09 PM

Demo

Managing Connections and Locks

Managing Versions

- GUI gives an operational overview
- All transactional versions
- Filter, sort and edit properties

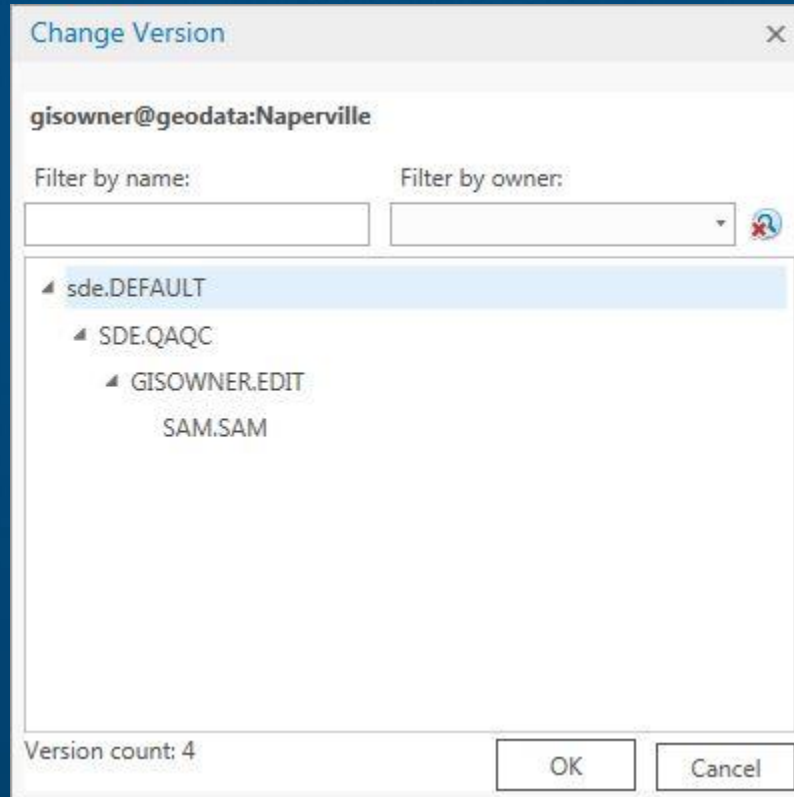
Versions: sde@geodata:Naperville

4 of 4 versions listed at 1/26/2017 3:16:33 PM.

Name	Owner	Parent	Description	Access	Created	Modified
DEFAULT	sde		Instance default version.	Public	1/26/2017 2:12:04 PM	1/26/2017 2:12:04 PM
QAQC	SDE	DEFAULT		Protected	1/26/2017 3:09:55 PM	1/26/2017 2:12:04 PM
EDIT	GISOWNER	QAQC		Protected	1/26/2017 3:15:30 PM	1/26/2017 2:12:04 PM
SAM	SAM	EDIT		Public	1/26/2017 3:16:19 PM	1/26/2017 2:12:04 PM

Managing Versions

- Tree view shows version relationships in the Change Version Pane
 - Default → Parent → Child → Grandchild



Managing Versions

- **Manage Historical versions**
 - View, create and modify

History

Datasource
sde.DEFAULT (gisowner@geodata:Naperville)

☐ Specific Date and Time
1/27/2017 12:52:39 PM

☒ Historical Moment
Type: Historical Marker
Name:
Start:
End:

Name	Date
DEFAULT	1/27/2017 9:02:52 AM

Edit Markers

☐ Return to Current Time
☐ Auto Apply

Apply

Automating Administration

- **Common Admin tasks are now GP tools**
 - Automation makes your life easier
 - Email notifications
 - Schedule using OS tools

Complete code example

The code example below puts all the above pieces together to perform the following operations as the geodatabase administrator user:

- Identify connected users.
- Send an email notification.
- Prevent the geodatabase from accepting new connections.
- Disconnect users.
- Reconcile versions and post changes.
- Compress the geodatabase.
- Allow the geodatabase to begin accepting new connections.
- Rebuild indexes and update statistics on system tables.

```
import arcpy, time, smtplib

# Set the workspace
arcpy.env.workspace = 'C:\\Projects\\MyProject\\admin.sde'

# Set a variable for the workspace
adminConn = arcpy.env.workspace

# Get a list of connected users.
userList = arcpy.ListUsers(adminConn)

# Get a list of user names of users currently connected and make email addresses
emailList = [user.Name + "@yourcompany.com" for user in arcpy.ListUsers(adminConn)]

# Take the email list and use it to send an email to connected users.
SERVER = "mailserver.yourcompany.com"
FROM = "SDE Admin <python@yourcompany.com>"
TO = emailList
SUBJECT = "Maintenance is about to be performed"
MSG = "Auto generated Message.\n\rServer maintenance will be performed in 15 minutes. Please log off."

# Prepare actual message
MESSAGE = """\
From: %s
To: %s
Subject: %s

%s
"" % (FROM, ", ".join(TO), SUBJECT, MSG)
```

Automating Administration

Administrators GP Cheat Sheet

- Create Role
- Create Database User
- Create Enterprise Geodatabase
- Enable Enterprise Geodatabase
- Reconcile Versions
- Rebuild Indexes
- Analyze Datasets
- Upgrade Geodatabase

ArcPy Functions in ArcGIS Pro

- ListVersions
- DisconnectUser
- ListUsers
- AcceptConnections

Geoprocessing

Change Privileges

Parameters | Environments

Input Dataset

Naperville.GISOWNER.Parcels

User

sam

View (Select)

Grant view privileges

Edit (Update/Insert/Delete)

Grant edit privileges

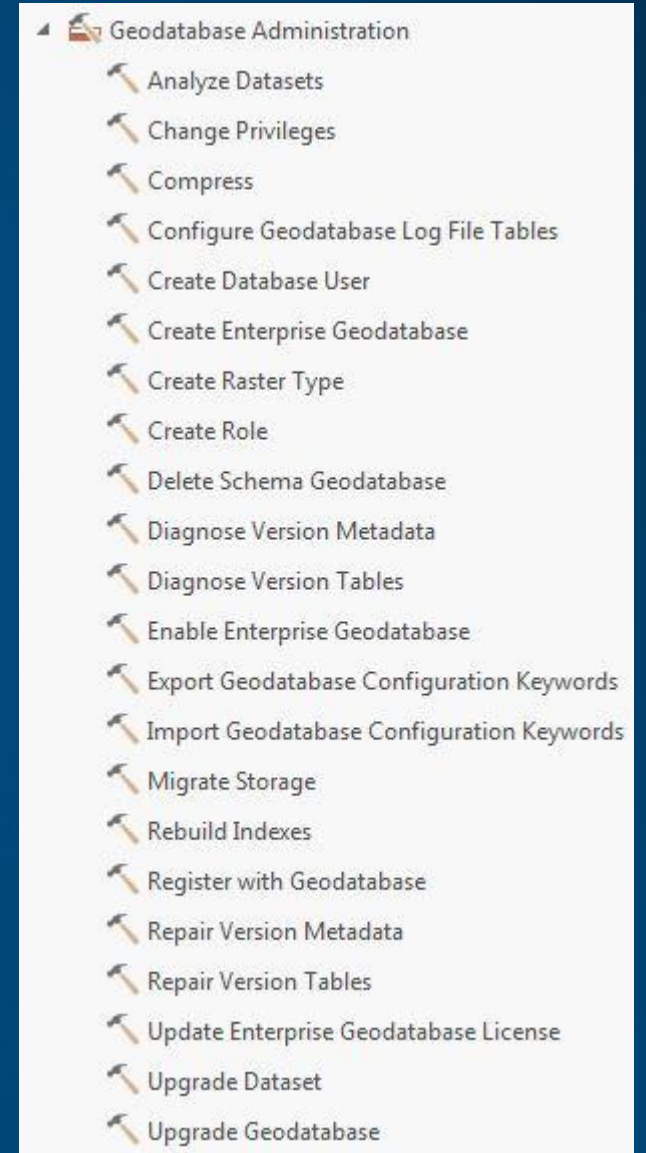
Run

Demo

Administrators Automation

Administration Resources

- Find Admin workflows in the ArcGIS Help
- Managing geodatabase versions
 - [Using Python Scripting to batch reconcile and post versions](#)
- Administering enterprise geodatabases
 - [A quick tour of...](#)
- Geodatabase Resources
 - GeoNet: [Geodatabase](#)
 - [Geodatabase Administration Toolset](#)
 - Simplified management of user privileges



Summary – Geodatabase Administration

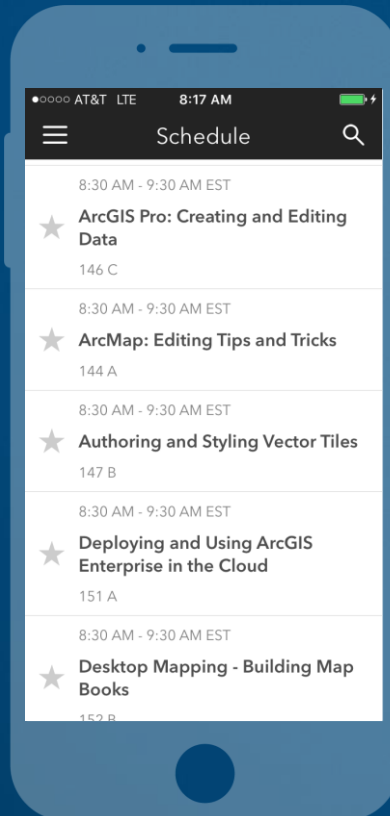
- Administration is done through ArcGIS Desktop and ArcGIS Enterprise technologies in the ArcGIS platform
- Administration is easy and scriptable at 10.5
- Operational view of your enterprise system
- Work where you feel most comfortable
 - Desktop experience or scripting through Python

Please Take Our Survey on the Esri Events App!

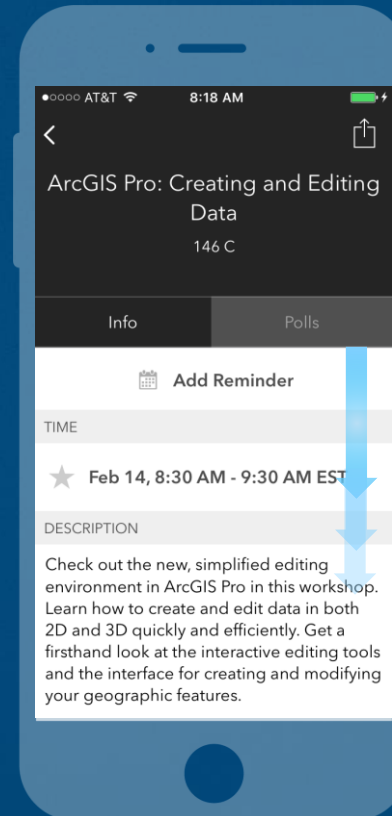
Download the Esri Events app and find your event



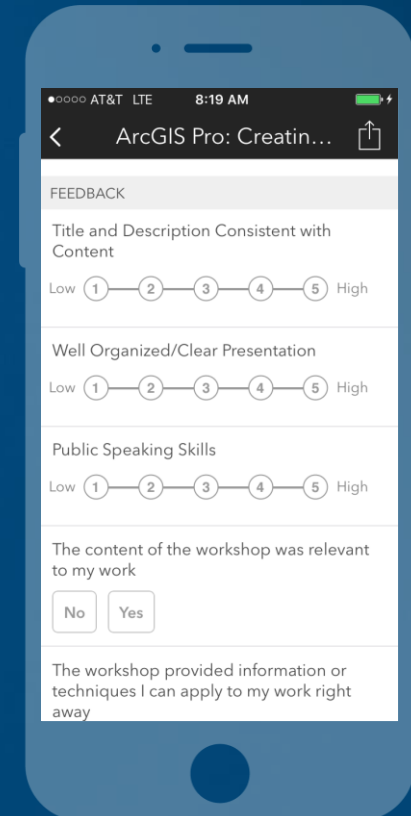
Select the session you attended



Scroll down to find the survey



Complete Answers and Select "Submit"



Print Your Certificate of Attendance

Print stations located in the 140 Concourse

Monday

12:30 PM — 6:30 PM

**GIS Solutions Expo,
Hall B**

5:15 PM — 6:30 PM

**Expo Social,
Hall B**

Tuesday

10:45 AM — 5:15 PM

**GIS Solutions Expo,
Hall B**

6:30 PM — 9:30 PM

**Networking Reception,
Smithsonian National Air
and Space Museum**

Thank-you and Questions





esri

THE
SCIENCE
OF
WHERE