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# Administering your Enterprise Geodatabase using Python

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Russell Brennan

Jill Penney

# Assumptions

- Basic knowledge of python
  - Basic knowledge enterprise geodatabases and workflows
  - You want code
- 
- Hold all questions till the end
  - Please turn off or silence cell phones



## Roadmap

- Session is divided into three parts
  - Part 1: What is the geodatabase
  - Part 2: Geodatabase Creation
  - Part 3: Version Management
- Demos throughout



# Why Python

- Free
  - Simple and easy to learn
  - Easy to maintain
  - Wide-acceptance
  - Modular
  - Cross platform
  - Scheduling

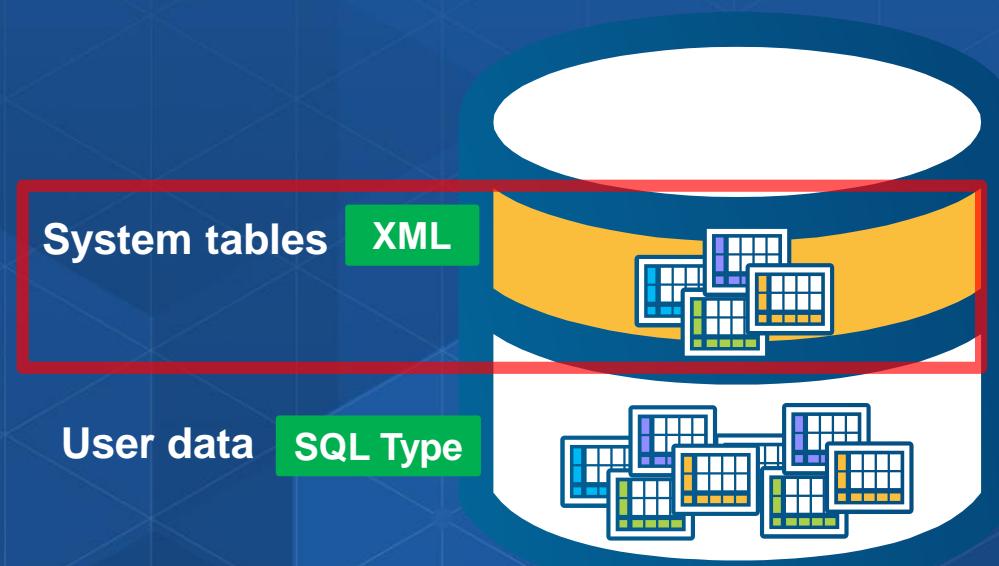
# What is the Geodatabase

- A physical store of geographic data
  - Scalable storage model supported on different platforms
- Core ArcGIS information model
  - A comprehensive model for representing and managing GIS data
  - Implemented as a series of simple tables
- A transactional model for managing GIS workflows
- Set of components for accessing data



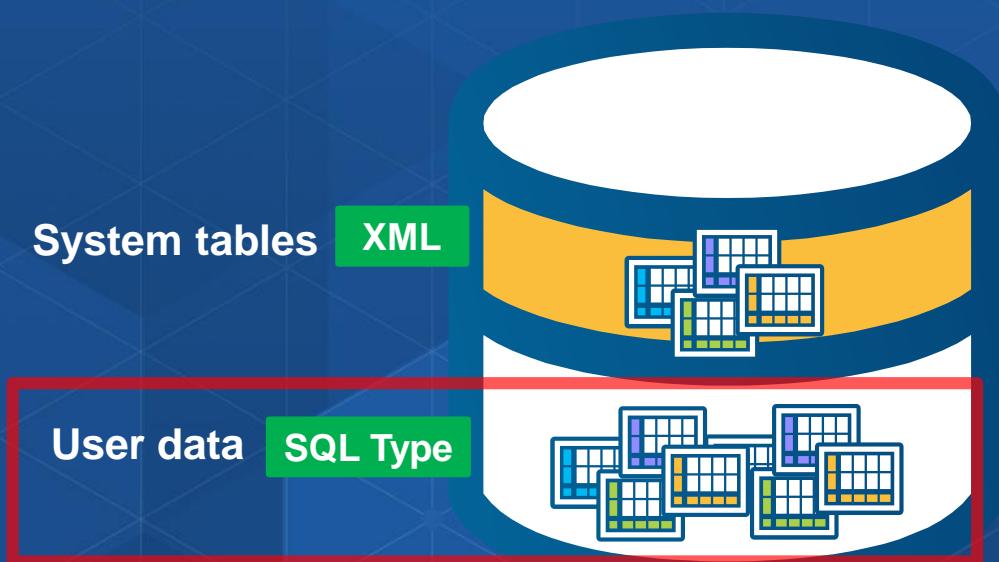
# Geodatabase system tables

- System tables store definitions, rules, and behavior for datasets
- Tracks contents within a geodatabase
- Stores some database level metadata
  - Versions, domains, etc.
- Admin operations:
  - Version management
  - Connection management
  - Geodatabase upgrade



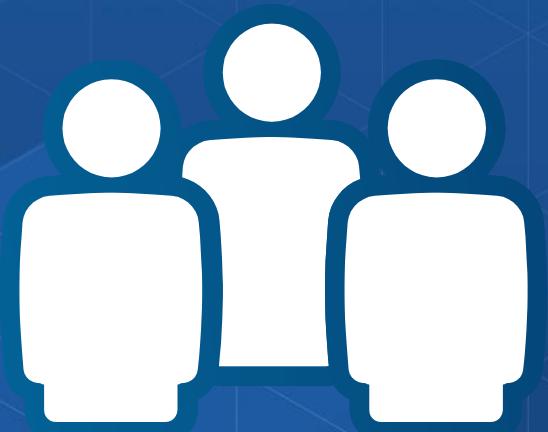
# User-defined tables

- Stores the content of each dataset in the geodatabase
  - Datasets are stored in one or more tables
- Administrative Operations:
  - Granting/revoking privileges
  - Updating statistics/indexes
  - Registering as versioned
  - Adding global id's
  - Enabling editor tracking



# Types of administrators

- Database administrator (DBA)
- Geodatabase administrator
- Data owner (aka dataset administrator)
- May or may not be the same person.



# Types of administrators

## Database

- Database administrator (DBA)
- Instance level admin



# Types of administrators

## Geodatabase

- **Geodatabase administrator**
- **Owns the geodatabase repository**



# Types of administrators

## Data Owner

- **Dataset administrator**
  - **Granting privileges to data**
  - **Modifying schema of data**
  - **Database statistics and index maintenance**



# Connections

- A connection file is needed to access an enterprise geodatabase
- Control how you are connected to the database
- What user is connected
  - Creating data
  - Schema changes
  - Administering the geodatabase
- Instance/database you are connected to
- Version, historical archive or moment in time
- Changing properties requires new connection files.



# How to create a connection

- **Create Database Connection gp tool**
  - Output ‘.sde’ file
  - Can connect to both databases and geodatabases



Demo 1

# Creating Connections



# Geodatabase Creation

with Python

# Enabling geodatabase behavior

- You already have an existing database
- Enable Enterprise Geodatabase
  - From an existing database you can enable geodatabase functionality
- Must connect as appropriate user.



# Creating Enterprise Geodatabases

- Create Enterprise Geodatabase tool
- When you have a need for:
  - Creating testing or development environments
  - Database does not already exist
- Run as DBA



# Creating Users

- Create database user tool
- Creates a user in enterprise geodatabase or database
- Cannot create geodatabase administrative user
- DBA not geodatabase admin.



# Creating Database Roles

- Makes it easier to assign/revoke privileges to a group
- Prior to creating users in the geodatabase
- When creating users you can assign them to a role
- DBA not geodatabase admin.



Demo 2

# How to Create a Geodatabase



# Creating and Loading Data

- Numerous tools for creating any type of data:
  - Create table, Create feature class, Create Raster Dataset, etc.
  - Create Geometric Network, Create Topology, Create Domain, etc.
- Also tools for loading data:
  - Feature class to feature class (single)
  - Feature class to geodatabase (multiple)
  - Import XML workspace
- Write a custom script



# Configuration Keywords

- New tool at 10.3 for managing keywords
- Export and import
  - Export Geodatabase Configuration Keyword tool
  - Import Geodatabase Configuration Keyword tool
- Workflow
  - Export
  - Edit with text editor
  - Import



# Managing privileges

- Allow other users of the geodatabase to view or edit data that you own
- Change privileges tool
- Allows multiple input datasets to be passed in
- Grant view only or view and edit
  - View = select
  - Edit = insert, update, delete
- Must be connected as data owner



# Putting it all together

Geodatabase Creation



# Version administration

## Parts of the version administration workflow

- Reconciling, posting, compressing
- Updating statistics and indexes on system tables
- Updating statistics and indexes on user data tables
- Managing user connections



## Disconnecting user connections

- A user who is connected but has gone home
- Create a cold backup of the database
- Running large queries that are using up resources



# Managing user connections with arcpy functions

- Block/allow connections
  - `arcpy.AcceptConnections`
  - Provide boolean
- Finding connected users
  - `arcpy.ListUsers`
  - Returns a tuple of properties for each connected user
  - ID, name, machine name, connection time, connection type
- Disconnecting users
  - `arcpy.DisconnectUser`
  - Use ids provided from `listusers` function or use 'ALL' keyword



# Disconnecting services

- Services connect as regular users
- Disconnecting all users will disconnect services
- ArcGIS Server logic will try to reconnect
- Workflow:
  - Block connections
  - Stop service
  - Allow connections
  - Start service



Demo 4

# Connection Management



## Reconciling and Posting Versions

- Reconcile = pulling changes from a parent to child version
- Post = pushing reconciled changes to parent version from child
- Reconcile versions tool
- Recommended to run as geodatabase administrator



# Compressing your geodatabase

- Compress gp tool
- Run regularly
  - Trims states
  - Moves edits from delta tables



# Indexes and Statistics

- Update after major ‘data change’ events
  - Reconcile
  - Compress
  - Appending data
  - Typically not necessary after loading new data
- Can be done by both:
  - Geodatabase Admin (system tables)
  - Data owner (data tables)
- We suggest to run regularly.



Demo 5

# Version Maintenance



# Summary



