ArcGIS Enterprise: Versioning 101 Geodatabases

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Revision History

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# Introduction

## Purpose

This installation guide provides the information necessary to understanding enterprise gdb versioning.

## Scope

This document covers all required steps for understanding enterprise gdb versioning.

## Document Conventions

Table 1‑1 describes the conventions used in this documentation.

Table 1‑1: Document Conventions

| Convention | Meaning |
| --- | --- |
| **🛈** | Indicates a note that supplements the information in the current section or about the procedure. |
| ! | Indicates an important note related to the current section or procedure. |
|  | Indicates that a section or procedure needs to be repeated. |
| Text > Text > Text | The arrow symbol (>) is used for navigation paths (e.g., **Start** > **Programs** > **Adlib** > **Express** > **Express Server**). All navigation paths in this document assume that Windows is set to display Classic View. |

# About This Guide

The content in this installation guide contains references to the software manufacturer’s online help documentation specific to ArcGIS Enterprise Versioning 101, Essential information about geodatabases. Rather than a comprehensive discussion of versioning, this article presents the key concepts about geodatabase versioning including version creation; version workflows; reconciliation and post; states; and compress operations. These help topics are noted, where applicable, and the links to the specific topics are in alphabetical order in Appendix A.

# What is Versioning?

This section describes ArcGIS Enterprise geodatabase and what constitutes versioning a geodatabase.

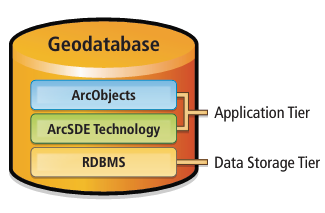
Versioning is the mechanism that enables concurrent multiuser geodatabase editing in geodatabases. It uses an optimistic concurrency data-locking model, which means no locks are applied to affected features and rows during long transactions. It is the default editing environment in enterprise geodatabases and supports complex editing workflows that are required by enterprise GIS systems.

Versioning records and manages states of individual features and rows as they are edited while preserving integrity in the database. It is the basis for multiple users accessing and editing data simultaneously in enterprise geodatabases. Conceptually, a version of the geodatabase represents an alternative, independent, persistent view of the geodatabase. It supports multiple concurrent editors and does not involve creating a copy of the data. A version references a specific state of the geodatabase. It contains all the datasets in the geodatabase and evolves over time. Users access data in an enterprise geodatabase through a version. Behind the scenes, simple queries in the underlying DBMS are used to view and work with the referenced state for a particular point in time or to see an individual user's current edits.

|  |  |
| --- | --- |
| **🛈** | **Note:** Database transactions represent a package of work that makes changes to databases. Most database transactions occur within a very short time period, often within seconds. A state is a unit of change (i.e., an edit) that is performed on data in the geodatabase. It represents a discrete snapshot of the database whenever a change is made. What constitutes an enterprise geodatabase? |

Enterprise geodatabases provide support for many users creating and maintaining large amounts of GIS data in a central location. In many cases, multiple users need to edit the same data at the same time. In other words, they require concurrent multiuser geodatabase editing. The nature of the spatial relationships and connectivity that define geographic data requires that edit sessions for geospatial data typically span long periods of time (e.g., hours, days, or weeks). These long edit sessions can be thought of as long transactions in the DBMS. Additional user requirements include the ability to undo or redo changes, the capability to develop alternative application design proposals without affecting the published geodatabase, and a mechanism to manage how the data and the geodatabase have changed over time.

*Figure 1: At a conceptual level, geodatabases have a multi-tier architecture that implements advanced logic and behavior in an application tier on top of a data storage tier. The application tier consists of ArcObjects and technology, while the data storage tier is comprised of database management system (DBMS) software. geodatabases utilize the simple, formal data model of a DBMS for storing and managing information in tables. They also leverage DBMS support for multiuser transaction processing.*



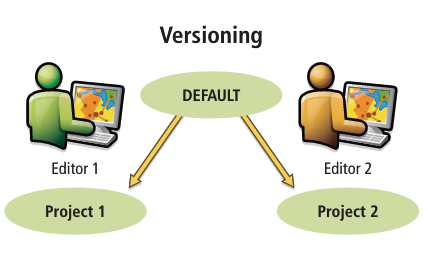
### Default Version

Every enterprise geodatabase has a default version named DEFAULT that is owned by the administrator. The DEFAULT version always exists and cannot be deleted or renamed. It is the root version and, therefore, the ancestor to all other versions in the geodatabase. In many workflow strategies, it is the published version of the geodatabase, representing the current "public" end-user view of the geodatabase. The DEFAULT version is typically maintained and updated over time by incorporating changes to it from other versions. Like any other version, it can also be directly edited.

Enterprise geodatabases can have many versions. A new version (child version) is created from an existing version (parent version). When a new child version is first created, it is identical to its parent. However, over time, parent and child versions may diverge as changes are made to each version. In the figures in this article, Project 1 is a child version of DEFAULT, its parent version (Figure 2).

When editing geodatabase datasets within the versioned editing environment, each version will seem to have its own copy of the data. As a dataset is edited in one version, it will appear differently when viewed in another version. Regardless of how many versions exist within the geodatabase, each dataset is only stored once in the DBMS. Behind the scenes, ArcGIS leaves each dataset in its original state during editing. All changes to a dataset are recorded in associated tables known as delta tables. Delta tables are also commonly called the A (adds) and D (deletes) tables. Each table or feature class will have an associated pair of these delta tables when they are registered as versioned within ArcCatalog.

*Figure 2: Versioning allows multiple users to work on the same geodatabase. DEFAULT is the parent version and Project 1 and Project 2 are child versions.*

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**Every version has an owner, description, parent version, associated database state, and level of user access. There are three levels of access to a version:**

* **Private: Only the owner can view and edit.**
* **Protected: All users can view, but only the owner can edit.**
* **Public: All users can view and edit.**

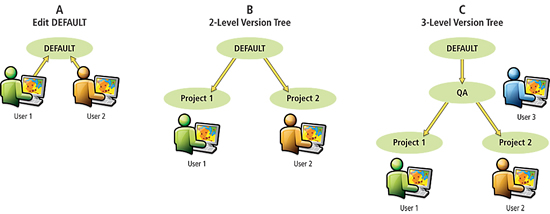
**The access level for the DEFAULT version is public by default. It is recommended that its access level be set to protected to ensure data in an enterprise ArcSDE geodatabase is not accidentally corrupted or lost. This means that only the ArcSDE administrator can edit or post changes to the DEFAULT version.**

**Versions are beneficial for workflow management in enterprise ArcSDE geodatabases, such as modeling different discrete stages in a GIS project (e.g., each stage is represented by a version) and modeling what-if scenarios without affecting the original datasets. They provide a framework for security management and quality assurance in data editing, and they also support historical archiving and geodatabase replication.**

### Versioning Workflows

Versioning supports many complex editing workflows and can be easily adapted and/or customized to meet the business requirements of any organization. Three example business workflows using versions are shown in Figure 3. The simplest workflow is to have concurrent editors directly editing the DEFAULT version (see Figure 3A). Another option is to create a separate version (e.g., multiple projects) for each editor in the geodatabase (see Figure 3B). To ensure that the publication view of the geodatabase is protected from accidental data corruption, many organizations create a quality assurance (QA) version from the DEFAULT version (see Figure 3C). The QA version would be maintained by a data quality manager and would regulate all edits that are applied back to DEFAULT. Note that each versioning workflow strategy has its own advantages and disadvantages. It is important to use a strategy that best meets the requirements of the business workflow.

*Figure 3: Three example version workflow strategies*

[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_3-lg.jpg)

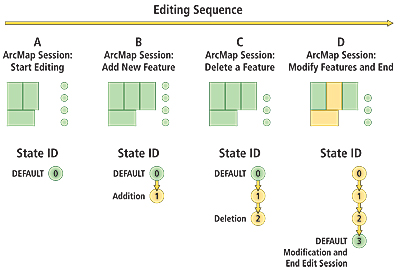
### Database States and Versions

A version references a specific database state—a unit of change that occurs in the database. Every edit operation performed in the geodatabase creates a new database state. An edit operation is any task or set of tasks (e.g., additions, deletions, or modifications) undertaken on features and rows. State ID values apply to any and all changes made in the geodatabase.

Initially, the DEFAULT version points to state 0. As edits are made to datasets in the geodatabase, the state ID will increase incrementally. In general, the state ID increases by a value of one for each edit operation. However, there are some exceptions where state ID may increase by a value greater than one, such as during a reconcile operation.

Figure 4 illustrates the state ID increasing as edits are made to two feature classes in the geodatabase. An edit session is started on a polygon and a point feature class in the DEFAULT version (see Figure 4A). A new polygon feature is added (see Figure 4B). Next, an existing point feature is deleted (see Figure 4C). Lastly, an attribute property for two polygon features is modified in one operation, then the edit session ends and edits are saved (see Figure 4D). For each edit, the state ID incremented by a value of one. The DEFAULT version now points to state 3.

*Figure 4: Example editing workflow and state ID growth in a geodatabase*

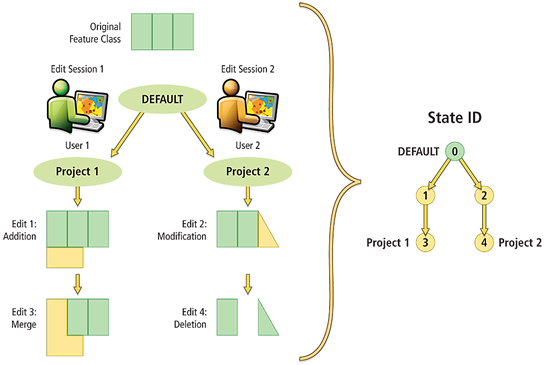
[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_4-lg.jpg)

In the previous example, the geodatabase state ID increased because editing was performed through the DEFAULT version. If the scenario had included another edit session with another version, the state ID would have also grown by the number of edits performed in the second edit session.

Figure 5 illustrates a two-level version tree editing workflow. Two versions (Project 1 and Project 2) were created from DEFAULT. Initially, they were both exactly the same as DEFAULT and pointed to state 0. As User 1 starts an edit session and adds a new feature, the state ID increases by one. When User 2 begins an edit session, a new separate branch is created from DEFAULT to record edits. In this scenario, these editing operations occur as follows:

* User 2 modifies an existing feature.
* User 1 merges two features into a single feature.
* User 2 deletes a feature.

*Figure 5: Editing in different versions and state ID growth in a geodatabase*

[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_5-lg.jpg)

The order of these edit operations is recorded with corresponding state IDs that represent each change made in the geodatabase.

State IDs in the geodatabase can be conceptually thought of as being maintained in a treelike structure. This structure, called a state tree diagram, is a logical map between states in a geodatabase. As the geodatabase is edited over time, a lineage of states is maintained that identifies all the changes that have occurred in a version. To determine the lineage for a specific version, follow the most direct path up the state tree to state 0.

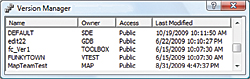
At the end of the example in Figure 5, DEFAULT points to state 0. Project 1 points to state 3 and has a lineage of 3, 1, 0; and Project 2 points to state 4 and has a lineage of 4, 2, 0. Version parent-child relationships can be derived from the state lineages. Both the Project 1 and Project 2 versions reference newer state IDs in contrast to DEFAULT, and their lineages contain the state ID that DEFAULT references: state 0. This indicates that DEFAULT is likely an ancestor version to them. In this case, DEFAULT is the parent version to both Project 1 and Project 2.

### Version Management

The number of versions that exist within an enterprise geodatabase can be seen in the Version Manager dialog box in ArcCatalog and ArcMap (as shown in Figure 6). Version Manager will show all versions in a geodatabase, except those marked as private—those versions will only be visible to their respective owners.

Versions can be created or deleted from the Version Manager dialog box. As stated earlier, it is important to implement a versioning workflow strategy that best fulfills the requirements of the business workflow. The complexity of managing versions in a geodatabase increases as more versions are used.

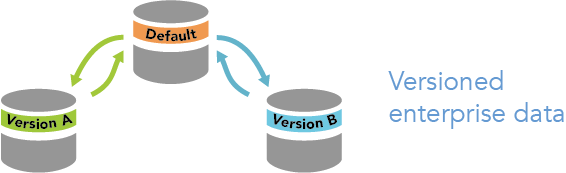
*Figure 6: Version Manager dialog box in ArcGIS*

[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_6-lg.jpg)

Edits that are made within a version are isolated to that version until its owner or the administrator decides to merge the changes into another version. The exception to this statement is schema changes. When the schema in a version is changed—for example, by adding a new field to a table—the change applies to all other versions. The operational task of properly merging edits between versions in an enterprise geodatabase is achieved in ArcGIS through two operations: reconciling and posting. These two operations are typically performed in tandem (i.e., reconciling followed by posting) to combine edits from one version with another version.

Versioning is a mechanism that allows multiple users to work on different versions of the geodatabase simultaneously. Each user can create a version to make edits, and these edits can be reconciled and merged with the main version (also known as the default version) to maintain a consistent and accurate representation of the data.

In an enterprise geodatabase with multiple editors, versions allow you to work with the same data at the same time without applying locks or duplicating data. Versions give each editor their own unique, isolated view of the data. Versioning facilitates long transactions by allowing editors to work isolated within their own version of the geodatabase and across multiple edit sessions. Once an editor finishes a collection of edits, they can merge their changes back to the parent version from which their version was created. The original parent of all versions in a geodatabase is called the default version.



Versions are not separate copies of the geodatabase. Instead, versions and the transactions that take place within them are tracked in system tables. This isolates an editor's work across multiple edit sessions, allowing users to edit without locking features in the production version or immediately impacting others and without having to make copies of the data.

Workflows vary among organizations. They often progress in discrete stages, with each stage requiring the allocation of a different set of resources and business rules. Typically, each stage in the overall process represents a discrete unit of work, such as a work order. To manage each work order, you can create a separate, isolated version and modify it. Once you're satisfied the work is complete, you can integrate the changes into the published version of the database. Working with versions in this way gives you the flexibility to accommodate a wide variety of workflows and data management strategies.

**Enterprise data management strategies**

Workflows using geographic data can vary widely in duration and complexity. Enterprise geodatabases support two data management strategies that balance the workflow needs of users and applications to perform short and long transactions on data: data management with versions and data management without versions. The nonversioned approach manages short transaction editing, and the versioned approach accommodates long transactions.

Each strategy, whether with or without versions, can be applied on a feature-class-by-feature-class or table-by-table basis, so it's possible to use both in the same enterprise geodatabase. Versioned data management is further expanded into three options: branch versioning, traditional versioning, and versioning with the option to move edits to base. The strategy you choose is determined by the capabilities that you want in your GIS, as there are differences in the data that you can edit and the types of workflows you can perform.

The following table provides a summary of the editing workflow options supported with these dataset types in an enterprise geodatabase:

| Dataset types | Branch versioning | Traditional versioning | Traditional versioning (move edits to base) | Nonversioned editing |
| --- | --- | --- | --- | --- |
| Feature class | Yes | Yes | Yes | Yes |
| Table | Yes | Yes | Yes | Yes |
| Annotation | Yes | Yes | Yes | Yes |
| Dimension | Yes | Yes | Yes | Yes |
| Relationship class | Yes | Yes | Yes | Yes |
| 3D Object feature class |  |  |  | Yes |
| Trace network | Yes |  |  |  |
| Utility network | Yes |  |  |  |
| Parcel fabric | Yes |  |  |  |
| Topology | Yes | Yes |  |  |
| Network dataset |  | Yes |  |  |
| Terrain dataset |  | Yes |  |  |

|  |  |
| --- | --- |
| **🛈** | **Note:** In addition to the dataset types listed in the table above, there are other geodatabase capabilities, such as replication, archiving, and attribute rules, that only work with specific geodatabase registration datasets. Consult these individual capability topics for details. |

**Data management without versioning**

This strategy does not involve working with multiple versions of your data; it uses the underlying DBMS transaction model. Nonversioned edits are equivalent to standard database short transactions.

To edit data, click the **Edit** tab on the ribbon and perform the required operations, such as adding, deleting, or moving features and updating attributes. Your first edit in the edit session begins the transaction, and the individual edit operations you perform are each committed to the database as a single transaction. When editing nonversioned data in ArcGIS Pro, each transaction is automatically committed to the database so you do not need to save the edits. The changes you make are available to all other users and applications accessing the data when your transaction is complete.



As you edit, unique indexes, constraints, and triggers that are defined on the data with the DBMS apply. The same locking behaviors apply as if you were performing transactions on the data with the DBMS directly. There is the possibility that users or applications that access or modify the same data may block one another.

|  |  |
| --- | --- |
| **🛈** | **Note:** When using nonversioned editing in a multiuser editing environment, you should understand how isolation levels and locking work in your DBMS and, if necessary, set the correct isolation level in the DBMS before you start working with ArcGIS. |

This strategy is appropriate for simple features (those that don't include multiple representations of the data within versions). Since this strategy doesn't use versions, it's also useful if you require both GIS and non-GIS applications to share access to a common database.

**Benefits**

Benefits of nonversioned data management include the following:

* Integrate geographic data into existing applications by allowing third-party applications (those not created with Esri software) to read and modify the same data that is accessed by ArcGIS applications. For example, business partners of Esri frequently build add-ons and extension applications that require open access to update the data stored in the underlying DBMS.
* Manage projects with simple workflows and edits. If transactions are always simple and of short duration, you can modify the data directly without merging changes and periodically manage additional tables that are required for versions.

**Limitations**

Limitations of nonversioned data management include the following:

* You can only edit simple features: points, lines, polygons, annotation, and relationships. You can't edit feature classes that participate in a topology, utility network, parcel fabric, or other datasets with advanced functionality.
* Since you edit the data source directly, you cannot undo or redo an individual edit .
* There is no conflict detection with nonversioned editing. If one user updates a feature and saves their change, and another user updates the same feature and saves their change, the last update made overwrites the first.
* In multiuser editing scenarios, as one user edits a feature, locks are applied by the DBMS preventing other editors from making simultaneous edits to that same feature.

**Data management with versioning**

The enterprise geodatabase uses versioning to accommodate multiuser editing scenarios and long transactions. The geodatabase extends the standard DBMS transaction model by allowing multiple concurrent states of the databases, known as versions, to exist at the same time. This allows multiple users to edit the same data in the geodatabase at the same time, without applying locks or duplicating data.

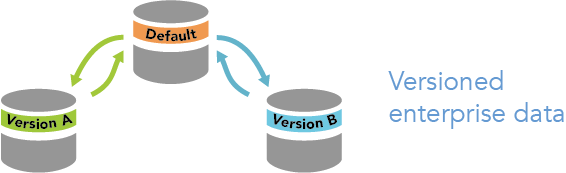
Editors can work in their own personal version of the geodatabase so that other users don't see incomplete work and editors don't block one another from accessing the data.

Each version can represent ongoing work, such as a design or a group of work orders, that can span multiple connections to the database and extend over a period of weeks or months if necessary. Once an editor has completed their work, they can integrate their changes back into the parent version.

The following are example workflows using versions:

* Projects requiring a what-if analysis—Create a design in a separate version. If the design is approved, you can merge it with the rest of the database. If it is not approved, you can discard it.
* Projects with specific quality assurance requirements—Collect changes to data, such as bulk imports, in a version isolated from other database users. Test and approve the changes before merging them with the published version of the database.
* Projects that divide work into functional or geographic units—For example, a project to design and construct a new shopping mall may have distinct construction phases subdivided into east and west sections or by construction activities, such as building, utility installations, or landscaping. Each unit of work is undertaken in a separate version; as each version is completed, it is posted to the published version of the database.
* Projects that evolve through a prescribed or regulated group of stages, whereby each stage requires engineering, administrative, or legal approval before it can be considered complete—Workflows for these projects can manage each stage as a separate version, such as an initial design or proposed version, an approved version, and a version for the construction phase. As a project advances through the various milestones, each stage is reviewed and approved, and then superseded by the next version until the last stage is reached and completed.
* Projects that require maintenance crews in the field to update data with mobile devices—Editors in the field can work in their own versions and merge changes with the updates made by editors in the office.

Every enterprise geodatabase has a version named Default. Unlike other versions, the Default version always exists and cannot be deleted. In most workflow strategies, it is the published version of the database, representing the current state of the system being modeled. You maintain and update the Default version over time by posting changes to it from other versions. You can also edit the Default version directly, as with any other version. The Default version is the root version and the ancestor of all other versions.



Versioning allows flexibility and scalability in data management strategies. There are two types of versioning available, each applicable to particular workflows and deployment options:

* [Branch versioning](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/versioning-types.htm#ESRI_SECTION1_6FA2CFB5F9484FF096740D653C674B5D)
* [Traditional versioning](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/versioning-types.htm#ESRI_SECTION1_DCA6DDB0FAE04F0180C3F3D7BADB88FA)
  + [Traditional versioning with the option to move edits to base](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/versioning-types.htm#ESRI_SECTION1_00B1E70D9E8F4F8584B4D6EDEAF22801)

See [branch version scenarios](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/branch-version-scenarios.htm) and [traditional version scenarios](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/traditional-version-scenarios.htm) for configurations that illustrate how the versioning technology can be applied in an organization.

The following sections provide a general overview of version concepts and workflows.

**Versioning Types**

There are two main versioning types available to use in an enterprise geodatabase. Many similar concepts and workflows apply to both versioning types, but there are also some key differences that set them apart. The type of versioning used depends on your workflows and deployment options. Because an enterprise geodatabase can contain datasets with a mixture of versioning types, it is important to understand the implementation and usage workflows supported for each type.

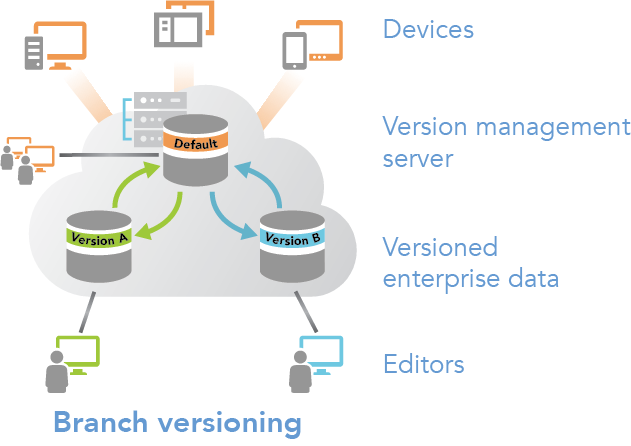
There are two types of versioning available, each catering to particular workflows and deployment options:

* [Branch versioning](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/versioning-types.htm#ESRI_SECTION1_6FA2CFB5F9484FF096740D653C674B5D)—Facilitates the Web GIS model by allowing multiuser editing scenarios and long transactions while working with web feature layers. For more information, see [Branch version scenarios](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/branch-version-scenarios.htm).
* [Traditional versioning](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/versioning-types.htm#ESRI_SECTION1_DCA6DDB0FAE04F0180C3F3D7BADB88FA)—Provides the flexibility to work within versions for long transactions when accessed directly from the enterprise geodatabase and a simplified editing experience when using feature services to accommodate shorter transactions. For more information, see [Traditional version scenarios](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/traditional-version-scenarios.htm).
  + [Traditional versioning with the option to move edits to base](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/versioning-types.htm#ESRI_SECTION1_00B1E70D9E8F4F8584B4D6EDEAF22801)—An optional form of traditional versioning that allows editors and applications to have direct access to the base data while also allowing other editors to work in their own isolated versions.

**Branch versioning**

ArcGIS is a full Web GIS, a platform of systems capable of sharing data across and between individuals, teams, and organizations. This is made possible by collaborating through services online or in an organization's portal. Branch versioning is the mechanism behind long transaction editing for web feature layers (feature services). If you require multiple editors to concurrently access web feature layers with the ability to undo and redo their edits, you must first register your data as branch versioned.

When a dataset that is registered as branch versioned is shared as a web feature layer, you can enable the Version Management capability at the time of publishing. This creates a version management service (also known as a version management server) that facilitates the creation of named versions and version management. Editors can then work with their own named version in the web feature layer, update the data, and reconcile and post their changes with the default version when finished.



**Benefits**

Benefits of branch versioning include the following:

* Editing and version administration tasks use a service-oriented architecture. This allows access to data using web feature layers from an ArcGIS Enterprise portal.
* Version administration workflows are streamlined due to a simplified data model.
* Undo or redo edits as you're editing data in named versions. To learn more, see [Edit web feature layers](https://pro.arcgis.com/en/pro-app/3.2/help/data/services/edit-web-feature-layers.htm).
* Conflict resolution can be managed over multiple sessions.
* Utility network, parcel fabric, and topology datasets support branch versioning for editing workflows when using an enterprise geodatabase.
* Track edits for insert, update, and delete operations on features in a version.

**Limitations**

Limitations of branch versioning include the following:

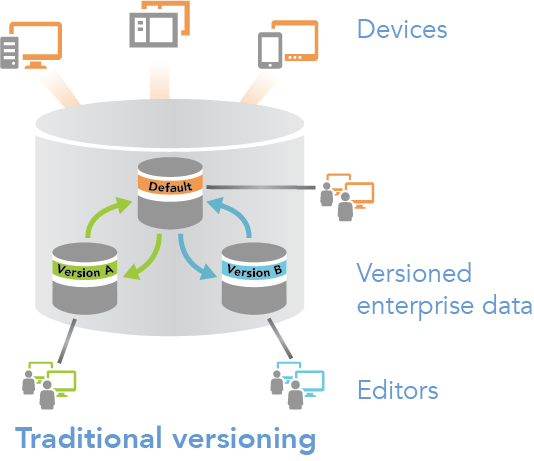
* Branch versioned datasets are not accessible in ArcMap and versions earlier than ArcGIS Pro 2.1.
* Branch versioning is only supported for certain datasets in a geodatabase. For more information regarding supported datasets for branch versioning, see [Enterprise data management strategies](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/data-management-strategies.htm#GUID-7617F9DC-54D4-4DD4-94CE-8394130674DE).
* Branch versioning allows only one editor per named version or multiple readers. Once an editor begins editing in a named version, an exclusive lock is obtained and no other users can connect to that version.
* Branch versioning has a simplified version hierarchy allowing only one level of named versions to be created from the default version.
* When editing data in the default version, undo and redo are not supported.

**Traditional versioning**

If you are not working with web feature layers that require long transactions but want the multiuser editing and workflow benefits provided by versions, you can use traditional versioning as your data management strategy. This allows you the flexibility to accommodate multiple editors and isolated versions to manage your workflows, such as what-if scenarios, predictive analytics, and work site proposals.

Traditional versioning is intended for users who use multiuser editing workflows by accessing the enterprise geodatabase directly through the database connection. If you require multiple users to perform long transaction editing when accessing the data directly from a connection to the enterprise geodatabase, use traditional versioning. Datasets that are registered for traditional versioning can be shared through web feature layers, but the web feature layers will not have the same level of multiuser version management capabilities. For example, the version you publish from is the only version you have access to when you connect to that web feature layer, and you cannot undo or redo edits you make in the web feature layer.

There is no limit to the number of traditional versions an enterprise geodatabase can have. Versions can be arranged in various configurations and support a wide variety of workflows, including multilevel hierarchies with grandchildren versions, great-grandchildren versions, and so on. However, for simplicity and geodatabase management considerations, a recommended best practice is to either maintain a flat version tree or have multiple editors concurrently edit the default version.



**Benefits**

Benefits of traditional versioning include the following:

* The isolated editing environment allows flexible, multiuser deployment scenarios.
* Editing advanced datasets such as network datasets and topologies is supported.
* When editing, you can use undo or redo for individual edits and save or discard for groups of edits.
* You can edit without blocking other editors. Editing conflicts can be detected and reconciled.

**Limitations**

Limitations of traditional versioning include the following:

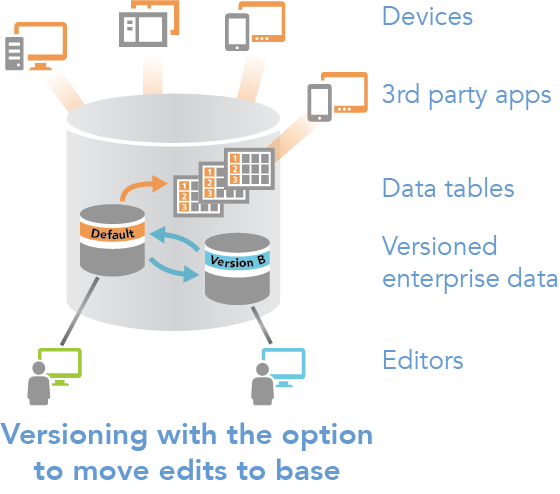
* Depending on the number of versions and volume of edits, there are version administration tasks that must be done regularly to keep your system performing well.
* Third-party (not ArcGIS) applications must be adapted with versioned views before they can read data.
* There are restrictions on the use of active database management system (DBMS) behavior, such as unique constraints and triggers when working with versioned data.
* There are no version management capabilities when working with the data in web feature layers.

**Traditional versioning with the option to move edits to base**

In a heterogeneous computing environment in which you have a number of different departmental applications accessing the same database, you may need to support both ArcGIS and third-party applications. In this case, you can register your data as versioned with the option to move edits to base. This is a hybrid data management strategy in which you can create versions for long transactions and multiuser editing requirements, but edits to the default version are performed as short transactions and are immediately accessible to all applications using the database.

An example is one department that maintains the geographic data in the database with ArcGIS Pro and another department that maintains customer records in the same database with a custom application. The custom application needs to apply DBMS constraints and triggers as transactions are made and may not recognize versioned tables. At the same time, the other department needs to edit the geographic data in its own isolated version, not sharing the departmental edits until they are complete and approved.

With these requirements in mind, versioning with the option to move edits to base allows you to perform versioned editing on a feature class or table while retaining the ability to share edits with other applications. The option to move edits to base allows all applications to work on the same database.



**Benefits**

Benefits of versioning with the option to move edits to base include the following:

* Many of the same benefits of traditional versioning are included with this type.
* You can work with long transactions in a named version and short transactions in the default version.
* Projects requiring concurrent data access by ArcGIS Pro and other applications can be accommodated.

**Limitations**

Limitations of versioning with the option to move edits to base include the following:

* You can edit simple features only: points, lines, polygons, annotation, and relationships. You cannot edit a feature class in a topology, network dataset, or utility network.
* If you publish the data, functionality is limited. For example, you cannot use web layers containing versioned data with the option to move edits to base in distributed collaboration.

**Register data as versioned**

Regardless of the type of versioning, you must register data as versioned to have it participate in versions of the geodatabase other than the default version. Registering data as versioned allows editors to work in isolation by creating and working within their own version. When you register your data as versioned, edits are tracked for insert, update, and delete operations performed on the data.

Once you have registered a dataset as versioned, you can begin working within your own version by creating one from the default version.

For more information on registering datasets as versioned, see [Register a dataset as branch versioned](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/register-a-dataset-as-branch-versioned.htm) or [Register a dataset as traditional versioned](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/a-quick-tour-of-registering-and-unregistering-data-as-versioned.htm).

**Default version**

When you access enterprise geodatabases, a version is always used. The version you connect to when accessing versioned datasets is specified on the **Geodatabase Connection Properties** tab for the database connection. You automatically connect to the default version when you create a database connection.

Every geodatabase contains a default version; it is the ancestor or root version for the geodatabase. After you create other versions, you can change which version you access. Depending on the versioning type and data source, this can be changed directly for the database connection (traditional versioning), changed after adding datasets from the database connection to a map (traditional versioning), or changed after adding web feature layers that are published with version management enabled to a map (branch versioning).

Unlike other versions, the default version always exists and cannot be deleted. In most workflow strategies, it is the published version of the database, representing the current state of the system being modeled. You maintain and update the default version over time by posting changes to it from other versions. Depending on the access permission set, you can also edit the data in the default version, just like any other version. It may be necessary to modify the access permission for the default version to be protected to prevent accidental edits.

For more information, learn how to protect the default version for [branch](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/manage-branch-versions.htm#ESRI_SECTION2_45A8B949A14B45B6970588A6431FFFB1) and [traditional](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/create-modify-and-delete-versions.htm#ESRI_SECTION2_45A8B949A14B45B6970588A6431FFFB1) versioned workspaces.

**Manage versions**

A geodatabase can have many versions. From the **Versions** view, you can create versions, modify version properties, and delete versions in an enterprise geodatabase.

When versions are created, they are considered children or branches of an existing version. In traditional versioning, the versions you create are referred to as child versions. In branch versioning, these are referred to as named versions.

When a version is created, it is identical to the parent (ancestor) version. Over time, the versions diverge as changes are made to the ancestor and child or named versions. As more versions are created, a tree-like architecture begins to develop. This is called a version tree.

For simplicity and geodatabase management considerations, a recommended best practice is to maintain a flat version tree where the default version is the ancestor for all other versions.

|  |  |
| --- | --- |
| **🛈** | **Note:** With branch versioning, all named versions are created with the default version as the ancestor; only one version level is allowed. |

**Connect to a specific version**

When you first make a connection to an enterprise geodatabase, you automatically connect to the default version. For traditional versions, you can change which version the database connection accesses. When you add data to a map from this connection, it will access the version you specified for the connection. However, you can change the version that the layer in the map accesses too. See [Connect to a traditional version](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/connect-to-a-version.htm) for instructions.

Geodatabase connections to branch versioned data always access the default version. To access other versions, add the web feature layer that contains the branch versioned data to a map, and change the version that the layer accesses. See [Connect to a branch version](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/connect-to-a-branch-version.htm) for instructions.

**Reconcile and post changes**

Reconciling and posting integrates data edits into any version that is an ancestor of the version you are working in, such as the parent or default version. When you reconcile, the changes in the child or named version that you are editing are compared with the version into which you want to merge them.

Two editors working on the same data, either in the same version or a different version, can produce conflicts. A conflict occurs when a row differs in the two versions being compared. The reconciliation process shows each conflict and allows you to choose which representation of the row to preserve.

Once you finish reconciling, you can post the changes. This applies the modifications you made into the ancestor version. For branch versioning, this is always the default version. If you no longer need the child or named version you posted from, you can delete it. Alternatively, you can continue editing data and reconcile and post changes again.

For more information, see [Reconcile and post edits to a branch version](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/reconcile-and-post-edits-to-a-branch-version.htm) and [Reconcile and post edits to a traditional version](https://pro.arcgis.com/en/pro-app/3.2/help/data/geodatabases/overview/reconcile-and-post-edits-to-a-version.htm).

|  |  |
| --- | --- |
| **🛈** | **Note:** Alternatively, you can use the Reconcile Versions tool to reconcile and post from multiple versions. |

### Reconcile

Reconciling is the first step in merging edits between two versions. In this process, edits from an ancestor version (called the target version) are brought into the version being edited in an edit session in ArcMap (called the edit version). A target version can be any version in the direct ancestry (i.e., in the lineage) of the version being edited. For example, referring back to the state tree diagram in Figure 5, DEFAULT is an ancestor version to Project 1, because DEFAULT points to state zero (0), which is part of Project 1's lineage: 3, 1, 0. The reconcile process involves merging edits from the target version into the edit version, as shown in Figure 7.

*Figure 7: Diagram of the reconcile process*

[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_7-lg.jpg)

To perform a reconcile operation, there can only be one user editing the edit version. Since a version spans all the versioned objects in the geodatabase, any features or rows that were modified in the target version will be merged into the edit version. As the majority of these features and rows are not likely to be in conflict, they will merge seamlessly into the edit version. For example, if a new polygon feature was added in the target version, after the reconcile process, the polygon feature would appear in the edit version. The editor would then decide whether to save the changes in the edit version.

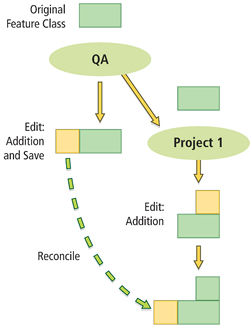
At a conceptual level, a reconcile process involves merging edits from one branch of the state tree with a different branch of the state tree. Figure 8 shows an example reconcile operation between two versions: QA and a child version of QA, Project 1. When Project 1 is initially created, it is the same as QA. An edit session is started on QA, a new feature is added, and that edit is saved. Next, a separate edit session is started on Project 1 and a new feature is added, but those changes are not saved yet. The editor for Project 1 then performs a reconcile process with the QA version, with QA as the target version and Project 1 as the edit version. All features that have been added, deleted, or modified in the QA version will be brought into the Project 1 version.

The reconcile process can occur either implicitly or explicitly.

* Implicit—A reconcile operation will occur implicitly when there are multiple editors editing the same version (see Figure 3A). Each editor maintains his or her own branch in the state tree for the duration of an edit session. When an editor attempts to save the edits in his or her edit session, a reconcile operation occurs to push the edits in the editor's branch to the branch currently referenced by the version. With multiple editors in one version, each time edits are saved, the reconcile process is executed. There is no choice of when the reconcile operation happens; it always occurs when edits are saved.
* Explicit—When performing a reconcile operation between different versions (as shown in Figure 8), an editor chooses when he or she wants the reconcile process to be executed. This differs from an implicit reconcile process, which occurs when edits are saved.

Regardless of how reconciliation occurs the mechanics are the same. The difference between implicit and explicit reconcile processes is when the reconcile process occurs and how the conflict detection options are specified.

*Figure 8: Example reconcile process*

[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_8-lg.jpg)

### Possible Conflicts during Reconciliation

In some cases, a small percentage of features and objects may be in conflict when comparing the target version and the edit version. Conflicts can occur in two editing scenarios: when the same feature is updated in both the target and edit versions or when the same feature is updated in one version and deleted in the other.

In practice, conflicts will not be encountered frequently for most reconciliation operations, because in many business workflows, versions typically represent different projects with distinct geographic areas (e.g., editing different areas of a map). Therefore, the likelihood of conflicts occurring is rare. Conflicts usually arise when editors are editing features that are in close proximity.

When performing a reconcile operation, ArcGIS finds conflicts in one of two ways: by object ID or by attribute. Conflict by object ID means that a feature is identified to be in conflict when any part of it (e.g., geometry or attributes) has been edited in both the target and edit versions. Conflict by attribute means that a feature is identified to be in conflict only when the same attribute (e.g., the same attribute field) has been edited in both the target and edit versions.

Default conflict resolution policies can be set to automatically resolve conflicts in favor of either the target version or the edit version. There is also the option to have the editor of the edit version resolve detected conflicts manually, by reviewing each conflict using the interactive Conflicts Resolution dialog box in ArcMap. Each conflict can be closely examined, and the editor decides whether to apply the target version edit, keep the edit version edit, or revert the feature to its state at the beginning of the edit session (i.e., the common ancestor state). After all conflicts (if any exist) are resolved, the reconcile process is considered completed and the editor can save edits and continue editing or proceed with a post operation.

### Post

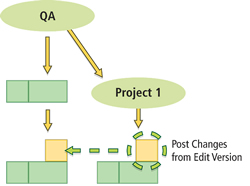
This is the second step when merging edits between two versions. This process must always follow a reconcile operation. A post process synchronizes the current edit version with the target version. All edits made in the edit version are saved into the target version, making both versions identical (see Figure 9).

*Figure 9: Diagram of the post process*

[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_9-lg.jpg)

Unlike a reconcile process, posting cannot be undone once it is performed because the changes are applied to a version outside of an edit session. Figure 10 conceptually illustrates a post operation between the QA and Project 1 versions. The post operation is performed immediately following the reconcile process previously discussed and shown in Figure 8. After posting, the new feature added in Project 1 (edit version) is merged into the QA version (target version). At the end of the reconcile and post workflow, both the QA and Project 1 versions will have the same view of the geodatabase. In other words, they are considered to be identical. At this point, the editor of Project 1 has the option to continue to make more edits in the edit session, then perform another reconcile and post process to synchronize the two versions or simply save edits and stop the edit session on the Project 1 version.

*Figure 10: Example post process*

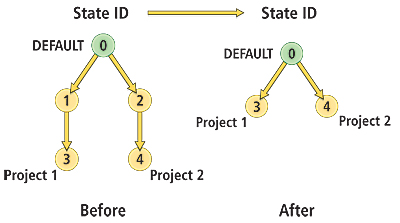
[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_10-lg.jpg)

### Compress

Over time, an actively edited enterprise geodatabase typically accumulates hundreds of thousands of state IDs (representing edits stored in delta tables) and a deep and complex state tree. This can negatively impact performance. Periodically, the administrator must compress the geodatabase to remove any states not referenced by a version. A compress operation can reduce the depth of the state tree and helps maintain performance.

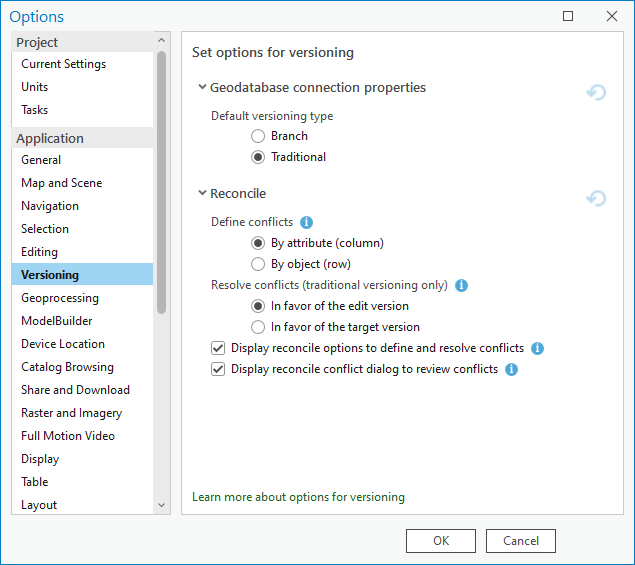
Compressing a geodatabase never removes data that is accessed through a version's lineage. It cleans up only unused data. A compress operation is implemented as a series of potentially large DBMS transactions that remove and renumber states inside one database transaction to ensure that the DBMS can restore the geodatabase to a consistent state. Figure 11 shows what happens to the state tree when a geodatabase is compressed. Before the compress operation, there are three versions: DEFAULT, Project 1, and Project 2, which reference states 0, 3, and 4, respectively. A compress operation removes states that are not directly referenced by a version (states 1 and 2 in this example) and deletes them from the state tree. The edits they reference in the delta tables are also removed. Unused data in the geodatabase is deleted. A compress also moves entries in delta tables common to all versions into the base tables, reducing the amount of data the DBMS will need to search through for version queries. Both actions help maintain performance in the geodatabase.

*Figure 11: State tree diagram before and after a compress operation*

[](https://www.esri.com/news/arcuser/0110/graphics/versioning101_11-lg.jpg)

### Versioning Options

On the project **Options** dialog box, on the **Versioning** tab, you can change versioning settings for the ArcGIS Pro application. The versioning settings are stored in your user profile and are honored for all ArcGIS Pro projects.



**Access versioning options**

To access versioning options for the project, complete the following steps:

1. There are two ways to access versioning options:

* From an open project, click the Project tab on the ribbon. In the list on the left, click Options.
* From the ArcGIS Pro start page, click Settings in the lower left corner. In the list on the left, click Options.

Tip: You can also access the Versioning options by clicking the dialog launcher in the Versioning group of the Versioning tab.

2. On the Options dialog box, under the Application heading, click the Versioning tab.

3. Click OK.

Your settings are saved and the dialog box closes.

Review the Geodatabase connection properties options and Reconcile options sections below for more details about each of the settings available.

**Geodatabase connection properties options**

The geodatabase connection properties section provides an option to control the default versioning type for database connections that are established for enterprise geodatabases using the Database Connection dialog box.

**Default versioning type**

You can set the default versioning type for database connections to use.

Branch—The versioning type for database connections is branch.

Traditional—The versioning type for database connections is traditional. This is the default setting.

**Reconcile options**

The reconcile section provides several options to control how conflicts are defined and resolved. Additionally, there are settings to control which prompts are received when performing reconcile operations.

To learn more, see Reconcile and post edits to a branch version and Reconcile and post edits to a traditional version.

**Define conflicts**

You can define a conflict as a discrepancy between corresponding attribute fields or between object geometry and attributes in a database row.

By attribute (by column)—Only changes to the same attribute (column) of the same row or feature in the target and edit versions will be flagged as a conflict. This is the default setting.

By object (by row)—Any changes to the same row or feature in the target and edit versions will be flagged as a conflict.

**Resolve conflicts**

You can set version conflicts to be resolved in favor of the edited version or the target version.

Note: For branch versioning, conflicts will only be resolved in favor of the edited version.

* In favor of the edit version—All conflicting features in the current version take precedence over conflicting representations in the target version. This is the default setting.
* In favor of the target version—All conflicting features in the current version are replaced by their representations in the target version.

Display reconcile options to define and resolve conflicts

When performing a reconcile, you can set a preference for displaying the prompt to choose how to define and resolve conflicts.

Display reconcile options to define and resolve conflicts:

* Checked (Default)—Each reconcile will provide a prompt to choose how to define and resolve conflicts.
* Unchecked—Reconcile options are not displayed for how to define and resolve conflicts and the project options are used.

Display the Conflict Manager dialog box to review conflicts

When conflicts are detected during reconcile, they are initially resolved in favor of the edit or target version. An additional dialog box is presented to give an option to display the Conflict Manager dialog box to review the conflicts interactively. You can decide to show or hide this prompt.

Display the Conflict Manager dialog box to review conflicts:

* Checked (Default)—When conflicts are present during the reconcile, provide a dialog box to show the Conflicts view.
* Unchecked—When conflicts are present during the reconcile, do not provide a dialog box to review conflicts.

## Summary

This article discussed the main concepts related to versioned editing in a geodatabase. It presented many of the common terms and concepts regarding concurrent multiuser editing in geodatabases. Versioning is the framework that supports historical archiving and geodatabase replication functionality. When implementing versioned editing, it is important to select the Summary

A GIS is only as good as the data that powers it. Geodatabase administration is crucial in keeping a well-maintained, performance geodatabase that users will be able to utilize efficiently. In this guide, we discussed how to create a geodatabase, connect to it, creates accounts for users to access it, load data into it, manage user privileges, manage user connections, and perform routine maintenance.

# FAQs

**Is the DBA going to be the geodatabase administrator?**  [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/setup-geodatabase-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fsetup-geodatabase-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299853901425%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3D1lUJdBVghnOkHH2QuFjT4Vkd03NXjAtjD7PreBqLmJk%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

See Topics:

* You are the SQL Server and geodatabase administrator
* The SQL Server administrator created the database; the geodatabase administrator creates the geodatabase

**Geodatabase schema – dbo or sde?**  [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/comparison-geodatabase-owners-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fcomparison-geodatabase-owners-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299853901425%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3DxfEeGMT9vE600m6W935pOZCfSnBZYR0uP4ny0vcKbng%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)  See Topic, Comparison Table

**Geodatabases in Microsoft SQL Server?**  [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/overview-geodatabases-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Foverview-geodatabases-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299853901425%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3DgkbbGFDSSBQA80eU32vC%252FxogEnczGthSOR0RbILIyO4%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

**Privileges for geodatabase in SQL Server** [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/privileges-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fprivileges-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3DNVw0g9BCt4hxY1aTyozRnVdRCGWRbzkYYwoui11tnPw%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

**Add logins and users to SQL Server** [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/add-users-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fadd-users-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3DzxCTjNu694bVgi%252BTKlac4KUZw4v55QAMSVZoIpMoohY%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

**Enterprise geodatabase maintenance tasks**  [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/enterprise-geodatabase-maintenance.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fenterprise-geodatabase-maintenance.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3Df9ODyRZqjlMRZxOjZ%252B8g6PmfTOuMp4oKw5UhfPAPTYs%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

**Connecting to MS SQL Server from ArcGIS** [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/connect-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fconnect-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3Ddi3zYS7HaFLFIA%252BKGfDaiU0roWwXgEypH%252BxOl6cSxco%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

**Advanced Topics** [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/connections-highly-available-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fconnections-highly-available-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3D98XEQ%252BQA%252FCuhvo9%252FKR5bsKF%252BAYvyVoKnOhmg0JEMZFQ%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

**Enterprise Geodatabase System Tables** [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/enterprise-geodatabase-internal-tables.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fenterprise-geodatabase-internal-tables.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3D%252B5gi75xcocLr08W2Wn6QF1Mzb9ftei6Pu%252FeRADHAcy4%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760) (implications for auditing)

**Geodatabsae system tables in SQL Server** [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/geodatabase-system-tables-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fgeodatabase-system-tables-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3DQbwTYDiY%252FqUHotaTwulNEwjhxWyT4DUFDzKyroyHw3U%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760) (implications for auditing)

**Auditing tools**  [https://community.esri.com/t5/data-management-questions/auditing-tools-for-sde-users-and-privileges/td-p/1229544](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fcommunity.esri.com%252Ft5%252Fdata-management-questions%252Fauditing-tools-for-sde-users-and-privileges%252Ftd-p%252F1229544%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3D6%252F5znA9Zy5htpQDSusgS2C%252B4EHqfuWdUYjh03YrEY7c%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

**Traditional versioning** [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/overview/recommended-version-administration-workflow.htm#:~:text=A%20recommended%20workflow%20for%20enterprise,or%20by%20building%20a%20model](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Foverview%252Frecommended-version-administration-workflow.htm%2523%253A~%253Atext%253DA%252520recommended%252520workflow%252520for%252520enterprise%252Cor%252520by%252520building%252520a%252520model%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3DS%252Bqn1i0GLPCVjs0%252BLwTQq%252FwaD6np9yqQauF%252Fqg%252FVcCA%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760).

**Data management strategies** [https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/overview/data-management-strategies.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Foverview%252Fdata-management-strategies.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3DTd0ySkVf4oZNxGr6iERd6Vt50ZRTaNa5zPRFTrhX4uM%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

**Slightly dated but relevant** – list of EGDB resources [https://community.esri.com/t5/esri-training-documents/deploying-and-maintaining-a-multiuser-geodatabase/ta-p/1042929](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fcommunity.esri.com%252Ft5%252Fesri-training-documents%252Fdeploying-and-maintaining-a-multiuser-geodatabase%252Fta-p%252F1042929%26data%3D05%257C02%257CDiazND%2540state.gov%257Ca9ed30bbd9f0477236be08dc11540a34%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638404299854057786%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C3000%257C%257C%257C%26sdata%3DQXi3m6ZC%252BA0gYyaxGKIqY%252B1Bw2zYpioEZnItGpg8Ca0%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=a266c0c17f76fcdcd94fc2bcd0dab4d0b27b6fe3880d817ac6e3065711702760)

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###### References

**GIS Bibliography**

A comprehensive index of journal articles, conference proceedings, books, and reports related to GIS, including references and full-text materials. gis.library.esri.com

**ArGIS Documentation and Tutorials**

In-depth information, tutorials, and documentation for ArcGIS Products.

ArcGIS Online: arcgis.com

ArcGIS Desktop: desktop.arcgis.com

ArcGIS Enterprise: enterprise.arcgis.com

**Esri Community**

Join the online community of GIS users and experts: community.esri.com

**Esri Events**

Esri conferences and user group meetings offer a great way to network and learn how to achieve results with ArcGIS. esri.com/events

**Esri Videos**

View an extensive collection of videos by Esri leaders, event keynote speakers, and product experts. youtube.com/user/esritv

**GIS Dictionary**

This browser defines and describes thousands of GIS terms. support.esri.com/other-resources/gis-dictionary

**Enterprise Geodatabase Resources:**

Database requirements SQL Server

[https://enterprise.arcgis.com/en/system-requirements/latest/windows/database-requirements-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fenterprise.arcgis.com%252Fen%252Fsystem-requirements%252Flatest%252Fwindows%252Fdatabase-requirements-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175812134%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DfX5SePY%252FVmYr%252BxNqIfU%252Bhi%252B%252FxBxa5vJrurtXsq72hwU%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Overview Geodatabases in SQL Server

[https://pro.arcgis.com/en/pro-app/3.1/help/data/geodatabases/manage-sql-server/overview-geodatabases-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252F3.1%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Foverview-geodatabases-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175824927%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DO6SfhPLSSNk3maJGBxwRJG3P9%252BV2D6PL3Xw3SEPVH6o%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Comparison of geodatabase owners in SQL Server

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/comparison-geodatabase-owners-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fcomparison-geodatabase-owners-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175832455%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DMCJykt%252FEyOvoyZcWq5%252FVSDfouK%252B3vfR9mrXIVPh5GYk%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Geodatabase administrator in SQL Server

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/geodatabase-administrator-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fgeodatabase-administrator-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175840919%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DGcCiRFRwxZfzzwQAu3bZQKHuAZuktDcfYCpKSpxY27o%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

User accounts and groups

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/user-accounts-groups.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fuser-accounts-groups.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175848187%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DURG7mQfO9PIn8F70AR0NutG09yGHQP5uvu%252FXUOG7JUg%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Add logins and users to SQL Server

[https://pro.arcgis.com/en/pro-app/3.1/help/data/geodatabases/manage-sql-server/add-users-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252F3.1%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fadd-users-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175854698%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DzdICU2nLxVSPxO3JxmkLVUfmfNhwVocb6w9pyY0ZcGw%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Privileges for geodatabase in SQL Server

[https://pro.arcgis.com/en/pro-app/3.1/help/data/geodatabases/manage-sql-server/privileges-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252F3.1%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fprivileges-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175861032%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3D4IhLG0kAE34XCsB%252FCJB9yr3IBHSi9PShhzojK87b6yo%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Grant and revoke dataset privileges in databases and enterprise geodatabases

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/overview/grant-dataset-privileges.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Foverview%252Fgrant-dataset-privileges.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175867336%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DHBz78HMZbQA3l%252FOR6Z0SUL6Ym5qfvhvJgDx8irLFzqQ%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Manage connections to enterprise geodatabases in SQL Server

[https://pro.arcgis.com/en/pro-app/3.1/help/data/geodatabases/manage-sql-server/manage-connections-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252F3.1%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fmanage-connections-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175873551%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DYwQDtqcbqHWgnwnY3cSZWVWtOI0LP59QrzVYsmT0f0s%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Connect to SQL Server from ArcGIS

[https://enterprise.arcgis.com/en/server/latest/manage-data/windows/connect-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fenterprise.arcgis.com%252Fen%252Fserver%252Flatest%252Fmanage-data%252Fwindows%252Fconnect-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175879887%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3D5Wm4P9JMiAhq1LEevGWReQFgdkD5LThQaBCo4oakXug%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Create a geodatabase in SQL Server

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/setup-geodatabase-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fsetup-geodatabase-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175886109%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3D1CShs%252BTZrE0T6oJYmaqooBps4tTiehjdYyX1y5zZnQI%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Geodatabase system tables in SQL Server

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/geodatabase-system-tables-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fgeodatabase-system-tables-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175892486%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3De3Fd8B8jlTwdFaPl6AA374FeOsBk30W6hsXkb7dMKSs%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Advanced Topics: Connect to HA

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/connections-highly-available-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fconnections-highly-available-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175898843%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DaKGjUCfUR5QYZb%252B1a0Fm%252FWKOdrBQlwbGGWf8VKBZx9Q%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Advanced Topics:  Encrypted connections

[https://pro.arcgis.com/en/pro-app/3.1/help/data/geodatabases/manage-sql-server/connections-encrypted.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252F3.1%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fconnections-encrypted.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175905185%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DW0EBBYJzATT6ntXEOzFr698j1do6MTd4jNnRxVPcicc%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

SQL Server configuration parameters

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/manage-sql-server/configuration-parameters-sqlserver.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Fmanage-sql-server%252Fconfiguration-parameters-sqlserver.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175911453%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DOfOwWtDtoqWAI8Tt2Y%252FZFfChBTYJrNJy7cQ8cYQYVpw%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Versioning Types

[https://pro.arcgis.com/en/pro-app/latest/help/data/geodatabases/overview/versioning-types.htm](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fpro.arcgis.com%252Fen%252Fpro-app%252Flatest%252Fhelp%252Fdata%252Fgeodatabases%252Foverview%252Fversioning-types.htm%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175917757%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3D91xL5l3TQBkyt%252FQb0Com7P0mTHlQPmT1dAVH5o%252BIKKg%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Enterprise Geodatabase: An Introduction

[https://mediaspace.esri.com/media/t/1\_svt4nf35](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fmediaspace.esri.com%252Fmedia%252Ft%252F1_svt4nf35%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175923988%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3D%252Fp8E1UEJFPCGus0xCLyaJAU6nNgwjCIfqiChV7lFbvo%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

**These are dated but recommend checking them out. They put a point on facts that can be buried in the documentation.**

Enterprise Geodatabase: Topics in MS SQL Server Administration

[https://www.esri.com/content/dam/esrisites/en-us/about/events/media/UC-2019/technical-workshops/tw-6208-479.pdf](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fwww.esri.com%252Fcontent%252Fdam%252Fesrisites%252Fen-us%252Fabout%252Fevents%252Fmedia%252FUC-2019%252Ftechnical-workshops%252Ftw-6208-479.pdf%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175929760%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DWW2MLf4idKAF0Mo9oPTZWwTfST4su6sWgaIrkBx9KLA%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Enterprise Geodatabase:  Intro to Multi-User GDB

[https://www.esri.com/content/dam/esrisites/en-us/about/events/media/UC-2019/technical-workshops/tw-6207-477.pdf](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fwww.esri.com%252Fcontent%252Fdam%252Fesrisites%252Fen-us%252Fabout%252Fevents%252Fmedia%252FUC-2019%252Ftechnical-workshops%252Ftw-6207-477.pdf%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175935918%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DpTmYlSj4e48wwyWW%252Be%252BCLfBxtnJeGjGLY9YnScE9fMc%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)

Migrate an on-premises enterprise geodatabase in SQL Server to Azure SQL Database

[https://support.esri.com/en-us/knowledge-base/migrate-an-on-premises-enterprise-geodatabase-in-sql-se-000023991](https://mcas-proxyweb.mcas.ms/certificate-checker?login=false&originalUrl=https%3A%2F%2Fgcc02.safelinks.protection.outlook.com.mcas.ms%2F%3Furl%3Dhttps%253A%252F%252Fsupport.esri.com%252Fen-us%252Fknowledge-base%252Fmigrate-an-on-premises-enterprise-geodatabase-in-sql-se-000023991%26data%3D05%257C02%257CDiazND%2540state.gov%257C13e8b872e6cf48b9f37a08dc48253d21%257C66cf50745afe48d1a691a12b2121f44b%257C0%257C0%257C638464572175941912%257CUnknown%257CTWFpbGZsb3d8eyJWIjoiMC4wLjAwMDAiLCJQIjoiV2luMzIiLCJBTiI6Ik1haWwiLCJXVCI6Mn0%253D%257C0%257C%257C%257C%26sdata%3DdAyWOo04Wc%252FnEKm8TFnpZPhHTHEhMYx%252BUTDTO%252BOC8ZI%253D%26reserved%3D0%26McasTsid%3D20893&McasCSRF=2607f9533d28776ca713f24cd018638d8ec440e9a4a0ef65a978a52b40b14cb5)