Comparison of geodatabase owners in SQL Server

ArcGIS Pro 3.3|Other versions|[Help archive](https://pro.arcgis.com/en/pro-app/latest/get-started/archived-arcgis-pro-help.htm)

In geodatabases in a Microsoft SQL Server database, the tables, views, functions, and stored procedures that compose a geodatabase can be owned by a database user named sde or the dbo database user. Whichever user owns the geodatabase is considered the geodatabase administrator. Because user names and schema names must match in a geodatabase, geodatabases owned by the sde user are called sde-schema geodatabases and geodatabases owned by dbo are called dbo-schema geodatabases.

Note:

It is important that you understand how SQL Server manages access to data and other objects. Therefore, if you are unfamiliar with the SQL Server security model, read the Microsoft SQL Server documentation. SQL Server authenticates a login at the instance level and authorizes a corresponding user at the database level. Different privileges granted can apply to the entire instance, a specific database or databases, or data within a database. This could affect your decision for which type of geodatabase owner to use.

The login you connect with when you create the geodatabase determines which database user owns the geodatabase. If the operating system login or SQL Server login you connect with is mapped to the dbo user in the database, a dbo-schema geodatabase is created. If the operating system or SQL Server login you connect with is mapped to a user named sde in the database, an sde-schema geodatabase is created.

Sde user

The sde user in a database can be associated with a SQL Server-authenticated login or an operating system-authenticated login. The sde user must have authority on a schema named sde, and that schema must be the sde user's default schema. The sde user also must be granted privileges in the database that allow the user to create and administer the geodatabase.

Dbo user

The dbo user and its default schema exist in all databases automatically. Logins can be dbo in a database in one of two ways:

* By creating or being made owner of a specific database
* By being a member of the sysadmin fixed-server role

Logins that are mapped to the dbo user in a specific database have the highest possible privileges in that database; therefore, they have privileges sufficient to create and administer the geodatabase. Logins that are mapped to dbo in a specific database do not have elevated privileges in the SQL Server instance or other databases unless such privileges are explicitly granted to the login.

Logins that are members of the sysadmin fixed-server role are mapped to dbo in every database on the SQL Server instance and also have the highest possible privileges throughout the SQL Server instance. Such logins have privileges sufficient to create and administer the geodatabase and can create, alter, delete, and administer other securables in the instance.

All database objects owned by the dbo user are stored in the dbo schema.

Comparison table

There is no difference in the performance or functionality between the two types of geodatabase schemas. Each has benefits and drawbacks. Choose the user (and, consequently, schema) best suited to your system and chosen security model.

The following is a comparison of the two types of schema, based on the type of authentication you use:

| Schema | Authentication | Pros | Cons |
| --- | --- | --- | --- |
| Dbo (member of sysadmin) | Operating system or SQL Server login | * If the SQL Server database administrator also serves as the geodatabase administrator, it might make sense to use a dbo schema to avoid having the same person use two different logins depending on what task that person needs to do. * If more than one geodatabase administrator is needed, multiple logins can be added to the sysadmin fixed-server role. | * The login has elevated privileges on all securables in the SQL Server instance. * Dbo-schema geodatabases are not supported in Amazon Relational Database Service (RDS) for SQL Server. |
| Dbo (mapped to dbo in specific database) | Operating system or SQL Server login | * The geodatabase administrator can perform geodatabase and database administration in the specific database. * Elevated privileges do not extend beyond the specific database. * If additional geodatabase administrators are needed, other logins can be placed in the sysadmin fixed-server role, making them dbo in this database as well. | * The user has elevated privileges in the database. * The login must be set as the owner of the database, which means you must create both the login and database using database tools and cannot rely on the Create Enterprise Geodatabase tool to create them. * Dbo-schema geodatabases are not supported in Amazon Relational Database Service (RDS) for SQL Server. |
| Sde | SQL Server login | * The sde user only requires a few statement permissions within a specific database to administer the geodatabase. * An sde schema geodatabase is useful if the database administrator and geodatabase administrator are not the same person. The database administrator can use database tools to create the database, sde user (with required privileges), and sde schema, and the sde user can create the geodatabase using the Enable Enterprise Geodatabase geoprocessing tool. * An sde SQL Server login can be used when creating a geodatabase in [cloud-based database services](https://enterprise.arcgis.com/en/system-requirements/11.3/windows/databases-in-the-cloud.htm#ESRI_SECTION1_9FF9489173C741DD95472F21B5AD8374). | * Only a single login can map to the sde user. * The SQL Server instance must allow mixed-mode authentication. |
| Sde | Operating system login | * The sde user only requires a few statement permissions within a specific database to create and administer the geodatabase. * An sde schema geodatabase is useful if the database administrator and geodatabase administrator are not the same person. The database administrator can use database tools to create the database, sde user (with required privileges), and sde schema, and the sde user can create the geodatabase using the Enable Enterprise Geodatabase geoprocessing tool. * You can map an existing domain login to the sde user. * An operating system-authenticated sde login can be used at sites where the SQL Server instance allows only operating system authentication. | * Only a single login can map to the sde user. * If you want to use the Create Enterprise Geodatabase tool to create the geodatabase, you have to create the sde user first, because the tool will not map the sde user to an operating system login for yo |

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