Principals (Part-2) : Database Users, Database Roles

Database Users

- After you've set up your server-level logins, you can create database users that map back to those logins, whether they're Windows or SQL Server logins.
- can also create database users that do not map to logins.
- These types of logins are generally used for contained databases, impersonation, or development and testing.
- SQL Server provides the CREATE USER statement for creating database users. You must run this statement within the context of the database in which the user is being defined.
  - USE Adventureworks;

    CREATE USER [win10b\winuser01];

    GRANT ALTER ON SCHEMA::Sales TO [win10b\winuser01];
- The winuser01 user is based on the win10b\winuser01 login.
- When you create a database user that has the same name as a login, you do not need to specify the login.

Database Users (contd..)

- If you want to create a user with a different name, you must include the FOR LOGIN or FROM LOGIN clause.
  - CREATE USER winuser03 FOR LOGIN [win10b\winuser01];

    GRANT ALTER ON SCHEMA::Sales TO winuser03;
- You can create only one user in a database per login.
- If you want to try out both these statements, you'll need to drop the first user before creating the second.
- The two preceding examples also include a GRANT statement that assigns the ALTER permission to the user on the Sales schema. As a result, the user will be able to alter any object within that schema.
- When you grant a permission on a specific object, you must specify the type of object and its name, separated by the scope qualifier (double colons).
- In some GRANT statements, the securable is implied, so it does not need to be specified.

Database Users (contd..)

- Creating a database user that’s associated with a SQL Server login is just as simple as creating a user based on a Windows login, especially when you use the same name
  - CREATE USER sqluser01;
- The CREATE USER statement creates the sqluser01 user, but this time, the example grants no permissions.
- the user receives only the CONNECT permission, which you can verify by running the following SELECT statement:
  - SELECT pe.state_desc, pe.permission_name FROM sys.database_principals pr INNER JOIN sys.database_permissions pe

    ON pr.principal_id = pe.grantee_principal_id WHERE pr.principal_id = USER_ID('sqluser01');

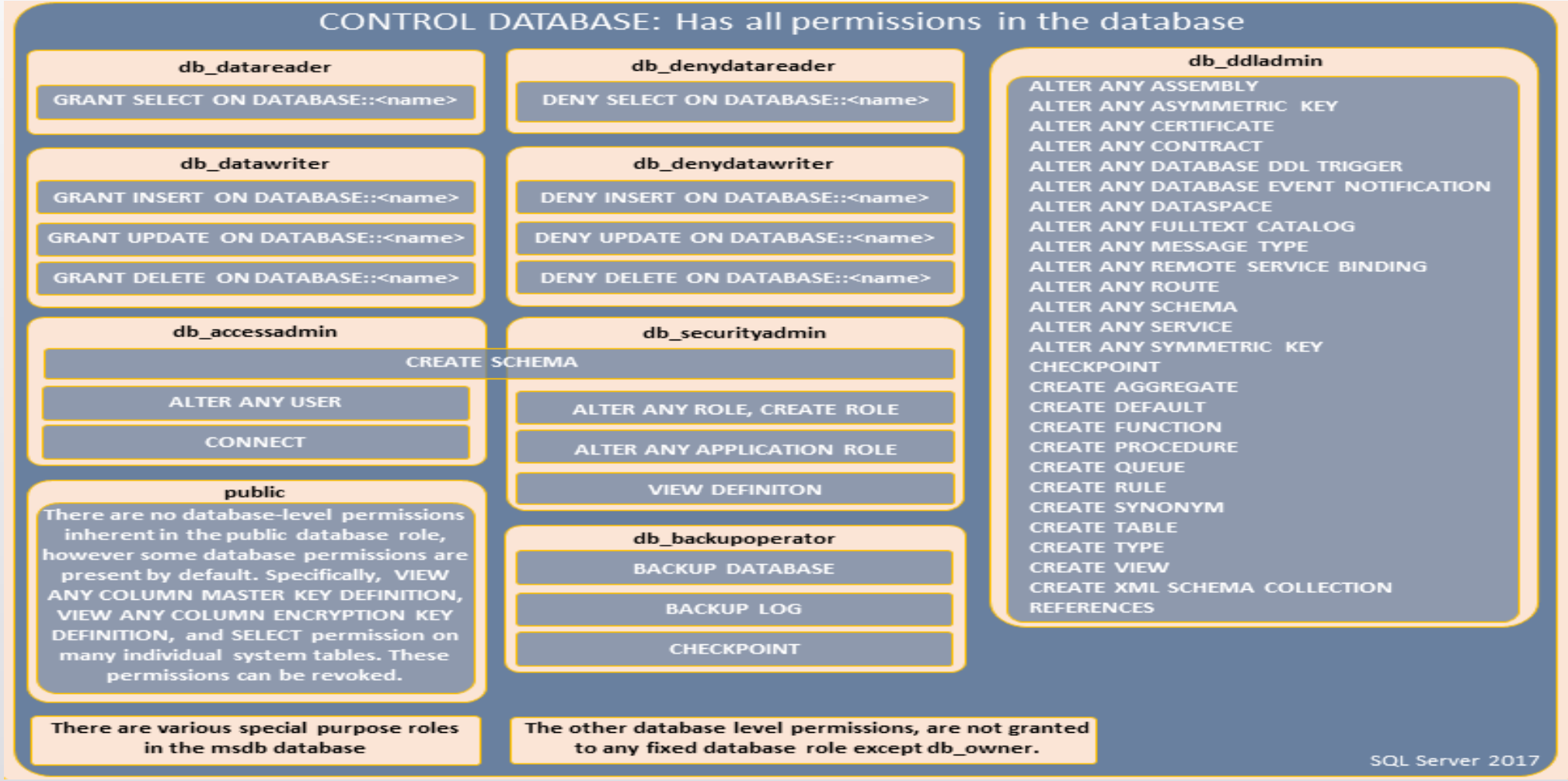
Database Roles

- A database role is a group of users that share a common set of database-level permissions.
- As with server roles, SQL Server supports both fixed and user-defined database roles.
- Database-level roles are database-wide in their permissions scope.
- Fixed-database roles are defined at the database level and exist in each database.
- There are also some special-purpose database roles in the msdb database.
- Members of the **db_owner** database role can manage fixed-database role membership.
- You can add any database account and other SQL Server roles into database-level roles.
- Server-level permissions cannot be granted to database roles.
- Logins and other server-level principals (such as server roles) cannot be added to database roles.

Fixed Database Roles

Fixed-Database role name	Description
db_owner	Members of the **db_owner** fixed database role can perform all configuration and maintenance activities on the database, and can also drop the database in SQL Server.
db_securityadmin	Members of the **db_securityadmin** fixed database role can modify role membership for custom roles only and manage permissions. Members of this role can potentially elevate their privileges and their actions should be monitored.
db_accessadmin	Members of the **db_accessadmin** fixed database role can add or remove access to the database for Windows logins, Windows groups, and SQL Server logins.
db_backupoperator	Members of the **db_backupoperator** fixed database role can back up the database.
db_ddladmin	Members of the **db_ddladmin** fixed database role can run any Data Definition Language (DDL) command in a database.
db_datawriter	Members of the **db_datawriter** fixed database role can add, delete, or change data in all user tables.
db_datareader	Members of the **db_datareader** fixed database role can read all data from all user tables and views. User objects can exist in any schema except *sys* and *INFORMATION_SCHEMA*.
db_denydatawriter	Members of the **db_denydatawriter** fixed database role cannot add, modify, or delete any data in the user tables within a database.
db_denydatareader	Members of the **db_denydatareader** fixed database role cannot read any data from the user tables and views within a database.

Database Level Roles and Permissions



User defined Database Roles

- To set up a user-defined database role, you must create the role, grant permissions to the role, and add members to the role (or add members and then grant permissions).
  - CREATE ROLE dbdev;

    GRANT SELECT ON DATABASE::WideWorldImporters TO dbdev;

    ALTER ROLE dbdev ADD MEMBER [win10b\winuser01];

    ALTER ROLE dbdev ADD MEMBER sqluser01;