Database Development and Design

Qinshift Academy

Database Development and Design

Developing and Design of databases using PostgreSQL - Powerful, open-source object-relational database

Agenda

- Session 7
  - Quiz
  - Homework discussion
  - Errors and messages
  - Basic database administration
    - Backups
    - Database roles

Errors and messages

Reporting messages and errors 1/2

- To raise a message, you use the raise statement as follows:
  - raise level format;
- Following the raise statement is the level option that specifies the error severity.
- PostgreSQL provides the following levels:
  - debug
  - log
  - notice
  - info
  - warning
  - exception
- If you don’t specify the level, by default, the raise statement will use exception level that raises an error and stops the current transaction.

Reporting messages and errors 2/2

- The format is a string that specifies the message. The format uses percentage (%) placeholders that will be substituted by the arguments.
- The number of placeholders must be the same as the number of arguments, otherwise, PostgreSQL will issue an error.
- To raise an error, you use the exception level after the raise statement. Note that raise statement uses the exception level by default.

Reporting messages and errors 2/2

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Basic database administration

Backup and restore

- PostgreSQL databases should be backed up regularly.
- The SQL dump method is to generate a text file with SQL commands that, when fed back to the server, will recreate the database in the same state as it was at the time of the dump. PostgreSQL provides the utility program pg_dump for this purpose.
- The text files created by pg_dump are intended to be read in by pgAdmin.
- To restore the backed up database, you can choose any existing database and run the generated file.

Database roles

Database roles

- PostgreSQL manages database access permissions using the concept of roles.
- A role can be thought of as either a database user, or a group of database users, depending on how the role is set up.
- Roles can own database objects (for example, tables and functions) and can assign privileges on those objects to other roles to control who has access to which objects.
- The concept of roles includes the concepts of "users" and "groups". Any role can act as a user, a group, or both.

Database roles

- Database roles are conceptually separate from operating system users.
- Database roles are global across a database cluster installation (and not per individual database).
- To create a role, use the CREATE ROLE SQL command:
  - CREATE ROLE name;
- To determine the set of existing roles, select from the pg_roles system catalog:
  - SELECT rolename FROM pg_roles;

Role attributes 1/2

- A database role can have several attributes that define its privileges and interact with the client authentication system.
  - login privilege
    - Only roles that have the LOGIN attribute can be used as the initial role name for a database connection. A role with the LOGIN attribute can be considered the same as a "database user".
    - CREATE ROLE name LOGIN;
    - CREATE USER name;
  - superuser status
    - A database superuser bypasses all permission checks, except the right to log in.
    - CREATE ROLE name SUPERUSER
  - database creation
    - A role must be explicitly given permission to create databases.
    - CREATE ROLE name CREATEDB

Role attributes 2/2

- role creation
  - A role must be explicitly given permission to create more roles.
    - CREATE ROLE name CREATEROLE
- initiating replication
  - CREATE ROLE name REPLICATION LOGIN
- password
  - A password is only significant if the client authentication method requires the user to supply a password when connecting to the database.
    - CREATE ROLE name PASSWORD ‘string’

Questions?

Trainer Name

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Assistant Name

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