Experiment No. 5: Execute DCL commands to control the access to data using SQL

I. Practical Significance

DCL stands for Data Control Language. This command is used to provide different user access to the stored data. It enables the data administrator to Grant and Revoke the required access to the database. The DCL commands are easier to implement with its simple syntax.

II. Industry/Employer Expected Program Outcomes (POs)

The aim of this practical is to create user and give access to users using Grant command and deny access using revoke command.

III. Course level learning outcomes

This practical is expected to develop the following skills in you:

1. Understand how to design the Database system based on the requirements.
2. Create user/ multiple users.
3. Provide access to Database.
4. Deny access to Database

IV. Laboratory Learning Outcome(s)

1. Write and execute SQL queries for creating Users.
2. Write queries for providing access to User to database.
3. Write queries to deny access to User.

V. Relevant Affective domain related Outcome(s)

1. Follow ethical practices.
2. Use appropriate DBMS software.
3. Demonstrate analytical and logical knowledge as an Individual.
4. Participate in team problem solving activities.
5. Prioritizes time effectively to meet the needs of the team and self.

VI. Minimum Theoretical Background

DDL Commands:

The Database Administrator has authority to create as many users as needed. The user is created using the CREATE USER command. Privileges is a right to execute the SQL statement or to access object. There are two types of privileges.

SYSTEM privileges: It is generally granted by DBA to users. Example: Create table, create user etc....

OBJECT privileges: This allows access to objects or privileges on objects, that is tables, table columns, Tables, Views etc. It includes Alter, delete, insert, select, update commands. The DBA user the GRANT statement to allocate system privileges to another user. The REVOKE command is used to remove privileges granted to users.

VII. Additional Software required

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VIII. Precautions

1) Use of appropriate syntax
2) Select required relations and use relevant conditions.

IX. Additional Resources used

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X. Result (Output of the procedure)

In this practical we learn to execute DCL commands to control the access to data using SQL

XI. Practical Related Questions

Note: Below are few sample questions for reference. Teacher must design more such questions so as to ensure the achievement of identified CO.

(Note: Use Point VII and XIII to XV for all relevant practical exercise use blank pages provided or attach more pages if needed.)

1. State the use of 'with grant options' clause in grant command.
2. Consider table EMPLOYEE and DEPARTMENT with following schema:
   EMP (empno, empname, salary, phno) Dept (deptno, empno, deptname, location, jobtype)
   Write the output of the following queries:

* Practical Related Questions.

1] →

The "WITH GRANT OPTION" clause in a GRANT Command allows the recipient of privileges to grant those same privileges to other users or roles. This enables the recipient to act as a privilege administrator for the specified privileges.

Syntax:

GRANT privilege(s) ON object TO user / role WITH GRANT OPTION;

Example:

GRANT SELECT, INSERT, UPDATE ON employees TO hr_manager WITH GRANT OPTION;

This grants the hr_manager user
- Select, Insert and update privileges on the employees table.
- The ability to grant these privileges to other users / role.

2] →

① Create Jay identifies by any admin:

CREATE USER Jay IDENTIFIED BY admin;

This statement creates a new database user named Jay with a password set to "admin".

output:

User Jay created.

② Grant create table, create view to Jay.

This statement grants the privileges to CREATE TABLE and CREATE VIEW to the user Jay.

output:

Grant Succeeded.

③ Grant Select, insert, update on Emp to Jay;

This statement grants the privileges to SELECT, INSERT, and UPDATE on the EMP table to the user Jay.

output:

Grant Succeeded.

④ Grant Select, update (deptno, empno) on Dept to Jay.

This statement grants the privileges to SELECT and UPDATE on the deptno and empno columns of the DEPT table to the user Jay.

output:

Grant Succeeded.

⑤ ~~Grant~~ Alter user Jay identified by admin;
This statement alters the password of the user Jay to "admin". (re-assigning the same Password).
output:
User Jay altered.

⑥ Revoke create table, create views from Jay;
This statement revokes the privileges to CREATE TABLE and CREATE VIEW from the user Jay.
output:
Revoke succeeded.

⑦ Revoke select, insert, update on Emp from Jay;
This statement revokes the privileges to SELECT, INSERT and update on the Emp table from the user Jay.
output:
Revoke succeeded.

⑧ Create role emp_pvr;
This statement creates a new role named emp_pvr
output:
Role emp_PVR created.

⑨ Grant Create table, Create Views to emp-pvr;
This statement grants the privileges to CREATE TABLE and CREATE VIEW to the role emp-pvr.
output:
Grant Succeeded.

⑩ Grant emp-pvr to Jay, John;
This statement grants the role emp-pvr to the users Jay and John.
output:
Grant Succeeded.

* Exercise

1] Create the user Jay & implement the following Commands on table Emp and Dept.

→ CREATE USER Jay IDENTIFIED by password;

2] write a query to grant select, insert, delete privileges on Emp and Dept table.

→ GRANT SELECT, INSERT, DELETE on EMP to Jay;

GRANT SELECT, INSERT, DELETE on Dept to Jay;

3] Write a query to grant update privilege on Columns of empno & Salary on Emp table.

→ GRANT UPDATE (empno, Salary) ON Emp To Jay;

4] Write a query to revoke all above privileges from Emp & Dept table.

→ REVOKE SELECT, INSERT, DELETE ON Emp From Jay;
REVOKE UPDATE (empno, Salary) ON Emp From Jay;
REVOKE SELECT, INSERT, DELETE ON Dept From Jay;

5] Write a query to create role dept_pvr.

→ CREATE ROLE dept_pvr;

6] Write a query to assign System privileges - Create table, Create view to role dept_pvr.

→ GRANT CREATE TABLE, CREATE VIEW TO dept_pvr;

7] Write a query to assign above system privileges to users Jay & John.

→ GRANT dept_pvr to Jay;
GRANT dept_Pvr to John;

8] write a query to assign object privileges - Select insert, delete to role dept - pvr.

→ GRANT SELECT, INSERT, DELETE on Emp to dept - pvr;
GRANT SELECT, INSERT, DELETE on Dept to dept - pvr;

9] write a query to assign above object privileges to users' Jay & John.

→ GRANT dept - pvr to Jay;
GRANT dept - pvr to John;