14

Controlling User Access

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Objectives

After completing this lesson, you should be able to do the following:

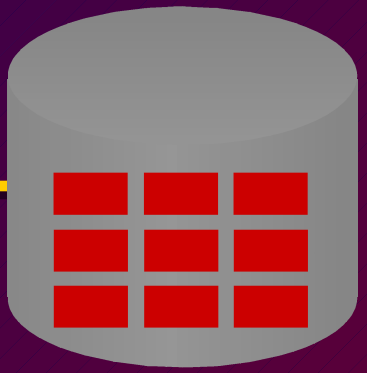
- Create users
- Create roles to ease setup and maintenance of the security model
- Use the GRANT and REVOKE statements to grant and revoke object privileges

Controlling User Access

Database administrator

Username and password

privileges



Users

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Privileges

- Database security:
  - System security
  - Data security
- System privileges: Gain access to the database
- Object privileges: Manipulate the content of the database objects
- Schema: Collection of objects, such as tables, views, and sequences

System Privileges

- More than 80 privileges are available.
- The DBA has high-level system privileges:
  - Create new users
  - Remove users
  - Remove tables
  - Back up tables

Creating Users

The DBA creates users by using the CREATE USER statement.

```
CREATE USER     user
IDENTIFIED BY  password;
```

```
SQL> CREATE   USER  scott
  2  IDENTIFIED BY tiger;
User created.
```

User System Privileges

- Once a user is created, the DBA can grant specific system privileges to a user.

```
GRANT privilege [, privilege...]
TO user [, user...];
```

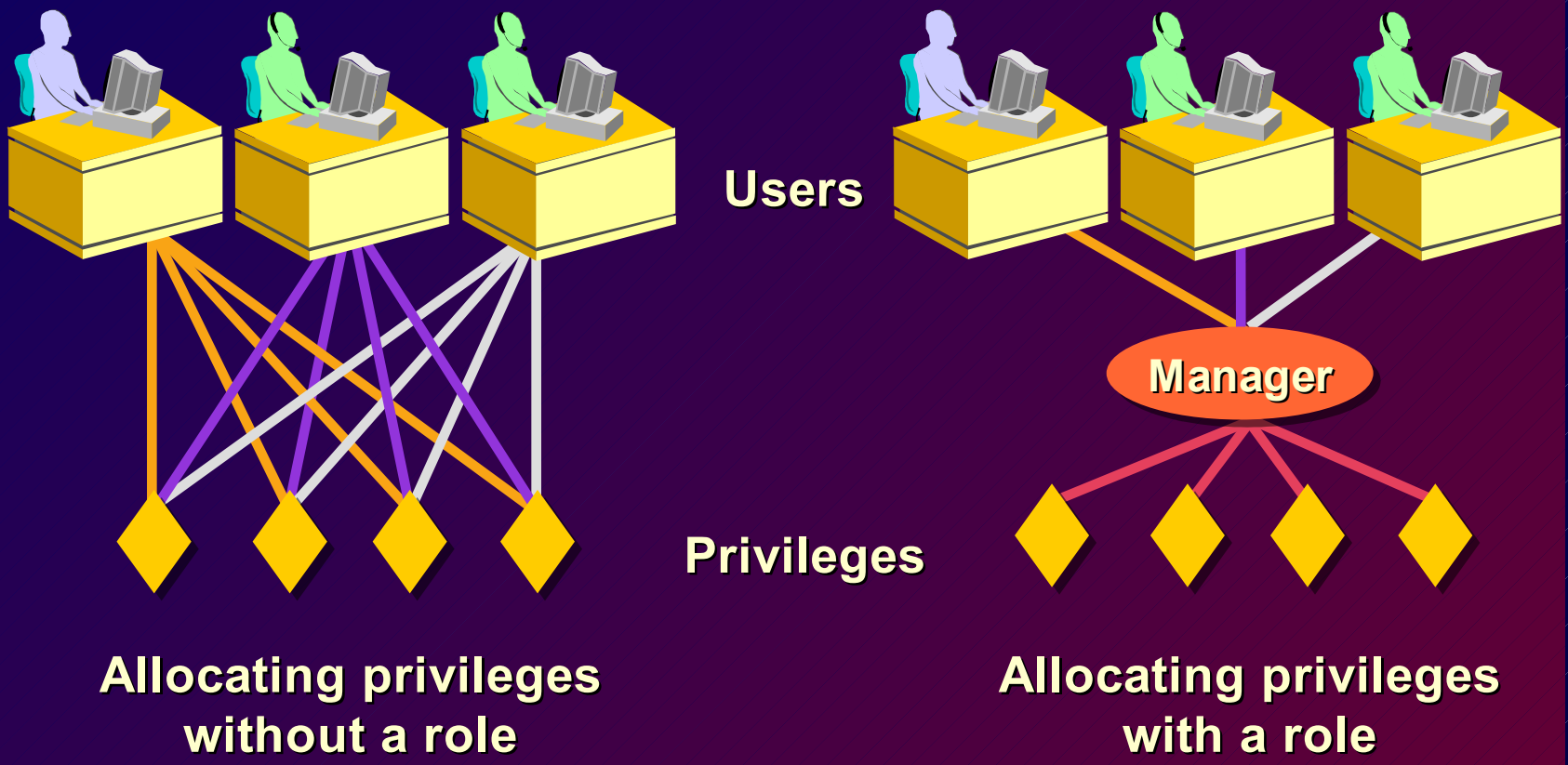
- An application developer may have the following system privileges:
  - CREATE SESSION
  - CREATE TABLE
  - CREATE SEQUENCE
  - CREATE VIEW
  - CREATE PROCEDURE

Granting System Privileges

The DBA can grant a user specific system privileges.

```
SQL> GRANT  create table, create sequence, create view
  2  TO      scott;
Grant succeeded.
```

What Is a Role?



Creating and Granting Privileges to a Role

```
SQL> CREATE ROLE manager;
Role created.
```

```
SQL> GRANT create table, create view
  2         to manager;
Grant succeeded.
```

```
SQL> GRANT manager to BLAKE, CLARK;
Grant succeeded.
```

Changing Your Password

- The DBA creates your user account and initializes your password.
- You can change your password by using the ALTER USER statement.

```
SQL> ALTER USER scott
  2         IDENTIFIED BY lion;
User altered.
```

Object Privileges

Object Privilege	Table	View	Sequence	Procedure
ALTER	√	√		
DELETE	√	√		
EXECUTE				√
INDEX	√			
INSERT	√	√		
REFERENCES	√			
SELECT	√	√	√	
UPDATE	√	√		

Object Privileges

- Object privileges vary from object to object.
- An owner has all the privileges on the object.
- An owner can give specific privileges on that owner's object.

```
GRANT        object_priv [(columns)]
ON           object
TO           {user|role|PUBLIC}
[WITH GRANT OPTION];
```

Granting Object Privileges

- Grant query privileges on the EMP table.

```
SQL> GRANT    select
  2  ON       emp
  3  TO       sue, rich;
Grant succeeded.
```

- Grant privileges to update specific columns to users and roles.

```
SQL> GRANT    update (dname, loc)
  2  ON       dept
  3  TO       scott, manager;
Grant succeeded.
```

Using WITH GRANT OPTION and PUBLIC Keywords

- Give a user authority to pass along the privileges.

```
SQL> GRANT    select, insert
  2  ON       dept
  3  TO       scott
  4  WITH GRANT OPTION;
Grant succeeded.
```

- Allow all users on the system to query data from Alice's DEPT table.

```
SQL> GRANT    select
  2  ON       alice.dept
  3  TO       PUBLIC;
Grant succeeded.
```

Confirming Privileges Granted

Data Dictionary Table	Description
ROLE_SYS_PRIVS	System privileges granted to roles
ROLE_TAB_PRIVS	Table privileges granted to roles
USER_ROLE_PRIVS	Roles accessible by the user
USER_TAB_PRIVS_MADE	Object privileges granted on the user's objects
USER_TAB_PRIVS_RECD	Object privileges granted to the user
USER_COL_PRIVS_MADE	Object privileges granted on the columns of the user's objects
USER_COL_PRIVS_RECD	Object privileges granted to the user on specific columns

How to Revoke Object Privileges

- You use the REVOKE statement to revoke privileges granted to other users.
- Privileges granted to others through the WITH GRANT OPTION will also be revoked.

```
REVOKE {privilege [, privilege...]|ALL}
ON     object
FROM   {user[, user...]|role|PUBLIC}
[CASCADE CONSTRAINTS];
```

Revoking Object Privileges

As user Alice, revoke the SELECT and INSERT privileges given to user Scott on the DEPT table.

```
SQL> REVOKE   select, insert
  2  ON       dept
  3  FROM     scott;
Revoke succeeded.
```

Summary

Statement	Action
CREATE USER	Allows the DBA to create a user
GRANT	Allows the user to give other users privileges to access the user's objects
CREATE ROLE	Allows the DBA to create a collection of privileges
ALTER USER	Allows users to change their password
REVOKE	Removes privileges on an object from users

Practice Overview

- Granting other users privileges to your table
- Modifying another user's table through the privileges granted to you
- Creating a synonym
- Querying the data dictionary views related to privileges