Oracle 11g - SQL

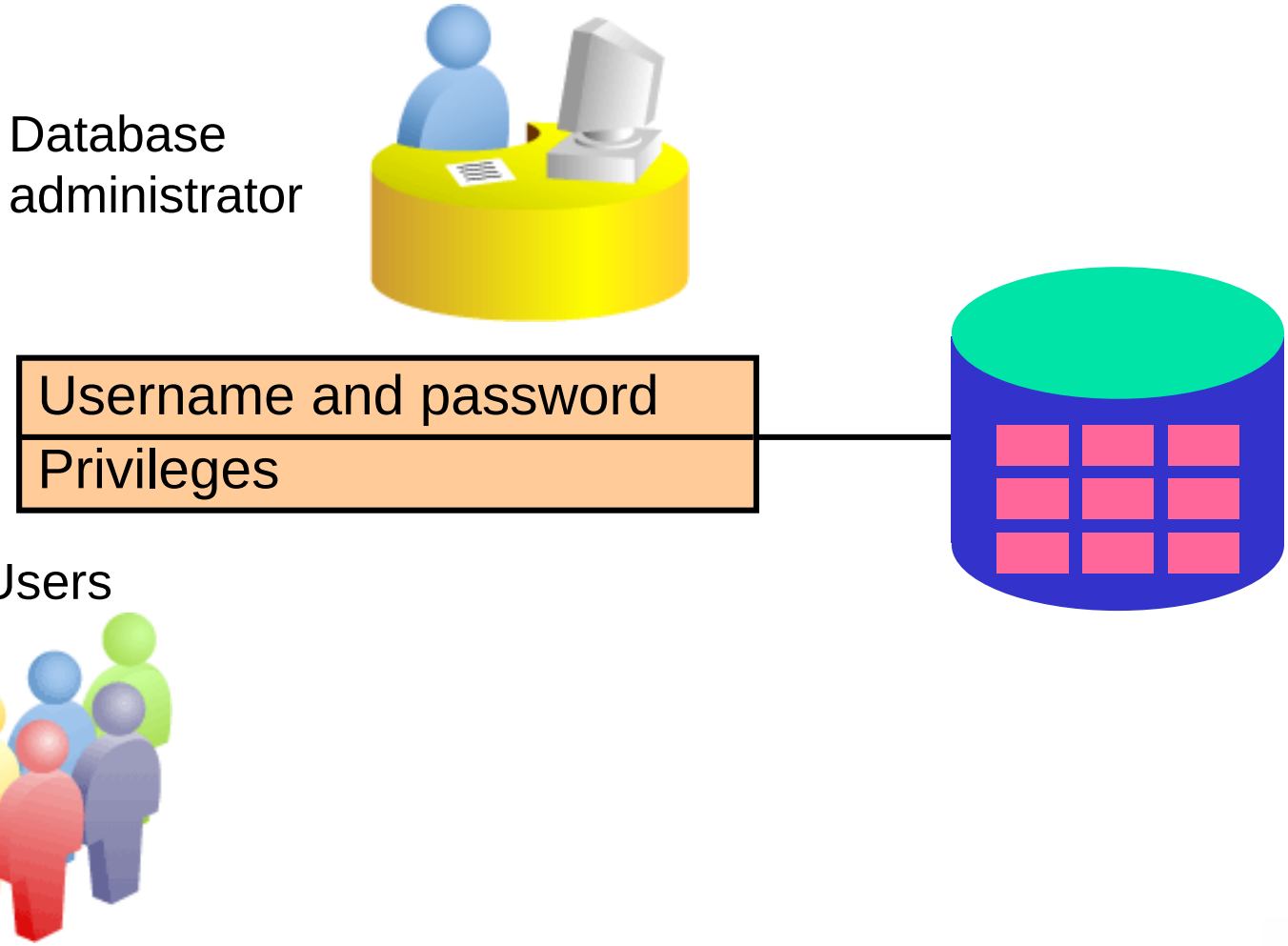
Controlling User Access
(DCL)

Objectives

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

- Differentiate system privileges from object privileges
- Granting System & Object privileges to Users
- Privileges with Admin/Grant Options
- View privileges in the data dictionary
- Grant roles
- Distinguish between privileges and roles

Controlling User Access



Privileges

- **Privilege** is the permission name, which is granted to the user.
- Database security:
  - System security
  - Data security
- ***System privilege :*** *At Schema Level (by DBA)*
- ***Object privilege :*** *At Object Level (by User)*
- **Schemas**: Collection of objects such as tables, views, and sequences

System privilege

- More than 100 privileges are available.
- The database administrator has high-level system privileges for tasks such as:
  - Creating new users
  - Removing users
  - Removing tables
  - Backing up tables
- ***System privilege*** – Schema level privilege which is granted by DBA to the users is known as System privilege. They include privilege to issue commands like CREATE (cluster, database link, directory, job, procedure, role, synonym, table, trigger, tablespace, types, view, database), ALTER, DROP, DEBUG, FLASHBACK, LOCK, CONNECT, RESOURCE etc. Please note that these privileges are not limited to an object access, but applicable at User level.

Object Privilege

- ***Object privilege*** – Object level privilege can be granted from object owning user (Grantor) to other user (GRANTEE). Grantor permits access on a specific object and grantee enjoys the access privilege only on the database object concerned. It may be DELETE, SELECT, INSERT, UPDATE, EXECUTE, INDEX, READ, WRITE, ALTER (table, sequence). Schemas: Collection of objects such as tables, views, and sequences

Creating Users

The DBA creates users with the `CREATE USER` statement.

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

```
CREATE USER  USER1
IDENTIFIED BY   USER1;
CREATE USER succeeded.
```

User System Privileges

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

```
GRANT privilege [, privilege...]
TO user [, user| role, PUBLIC...];
```

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

```
GRANT CREATE SESSION TO U1;
```

Granting System Privileges

The DBA can grant specific system privileges to a user.

```
GRANT   create session, create table,
        create sequence, create view
TO      user1;
GRANT CREATE succeeded.
```

Privilege will enable User1 to create a session in the database.

GRANT CREATE SESSION TO User1;

Privilege will enable User1 to connect to the database

GRANT CONNECT, **RESOURCE TO** User1;.

Granting Object Privilege

- **User1 can grant privileges on his table T1 and Procedure P1 to User2 in same database - Seeking access on T1 and P1. Grantor U1 can issue below DCL commands**
- Privilege will give only **SELLECT** access on T1 to User2

  GRANT SELECT ON T1 **TO** U2;

- Privilege will give only **EXECUTE** privilege on P1 to User2

  GRANT EXECUTE ON P1 **TO** User2;

ADMIN/GRANT option

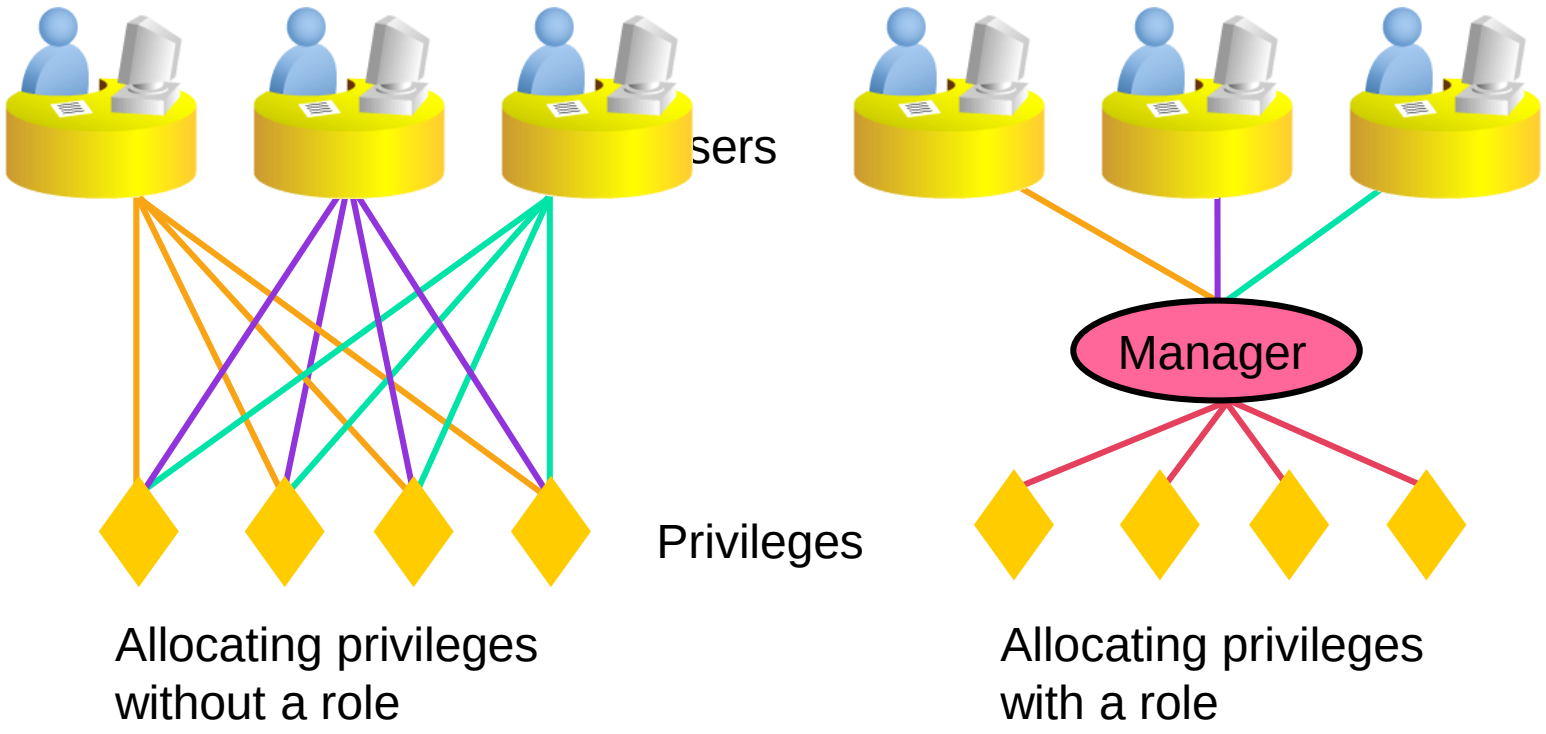
- **ADMIN** option allows the Grantee to grant a ***System privilege*** to other user. Only ***DBA*** or user with ***GRANT ANY PRIVILEGE*** system privilege can grant a system privilege to other users.

GRANT CREATE INDEX TO *User1* ***WITH*** *ADMIN* ***OPTION***

- **GRANT** option allows the Grantor (owner) to grant an ***Object privilege*** on an object to other user. He must have ***GRANT ANY OBJECT PRIVILEGE*** system privilege and an object privilege on the object

GRANT EXECUTE ON *P1* ***TO*** *User2* ***WITH*** *GRANT* ***OPTION***

What Is a Role?



Creating and Granting Privileges to a Role

- Create a role:

```
CREATE ROLE manager;
CREATE ROLE succeeded.
```

- Grant privileges to a role:

```
GRANT create table, create view
TO manager;
GRANT succeeded.
```

- Grant a role to users:

```
GRANT manager TO BELL, KOCHHAR;
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.

```
ALTER USER HR
IDENTIFIED BY employ;
ALTER USER HR succeeded.
```