Oracle Database 10*g*: SQL Fundamentals II

Electronic Presentation

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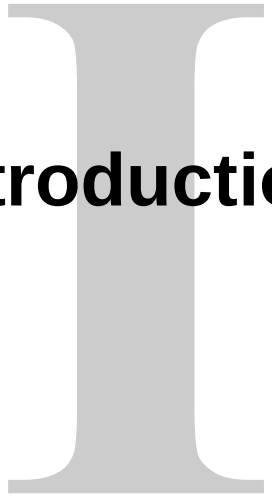


Introduction

Objectives

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

- **List the course objectives**
- **Describe the sample tables used in the course**

Course Objectives

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

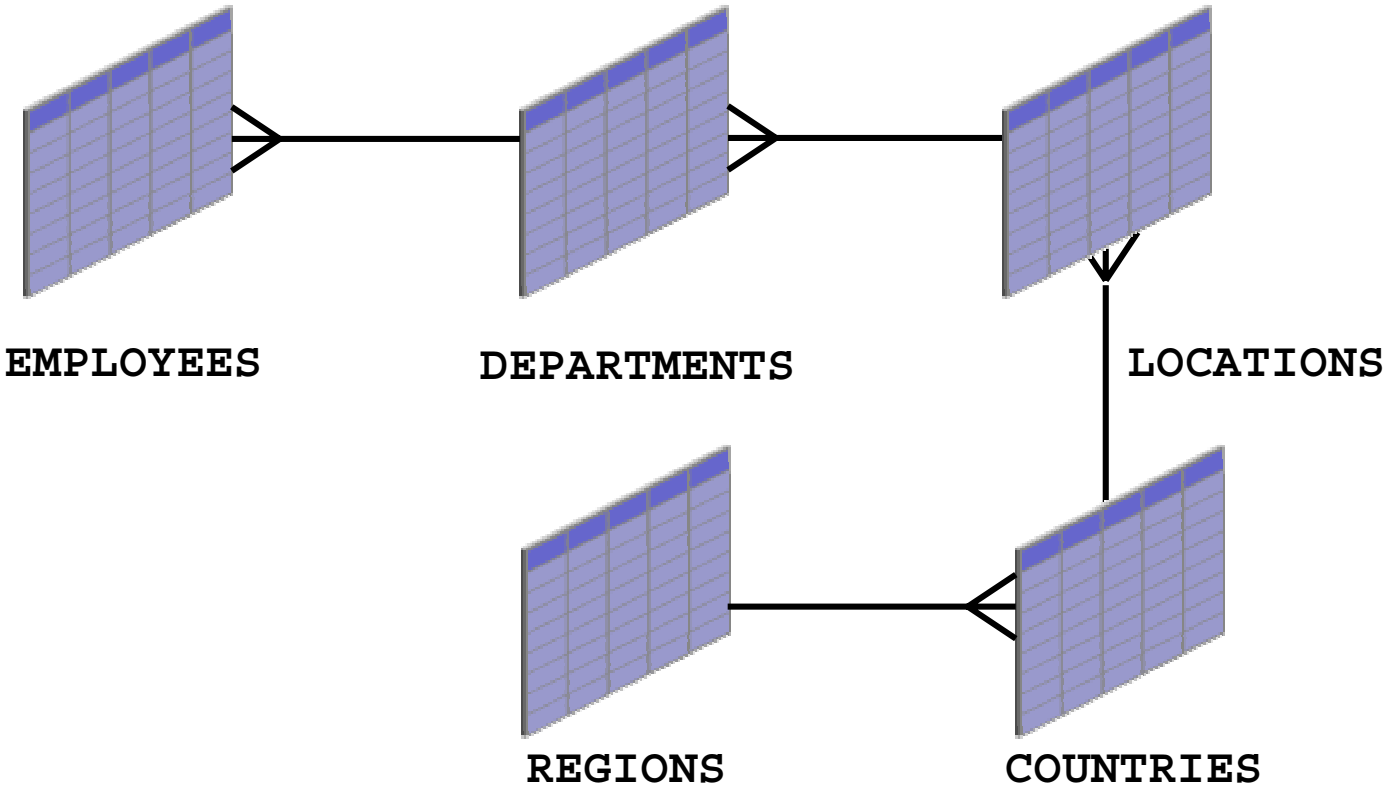
- **Use advanced SQL data retrieval techniques to retrieve data from database tables**
- **Apply advanced techniques in a practice that simulates real life**

Course Overview

In this course, you will use advanced SQL data retrieval techniques such as:

- **Datetime functions**
- **`ROLLUP`, `CUBE` operators, and `GROUPING SETS`**
- **Hierarchical queries**
- **Correlated subqueries**
- **Multitable inserts**
- **`Merge` operation**
- **External tables**
- **Regular expression usage**

Course Application



Summary

In this lesson, you should have learned the following:

- **The course objectives**
- **The sample tables used in the course**

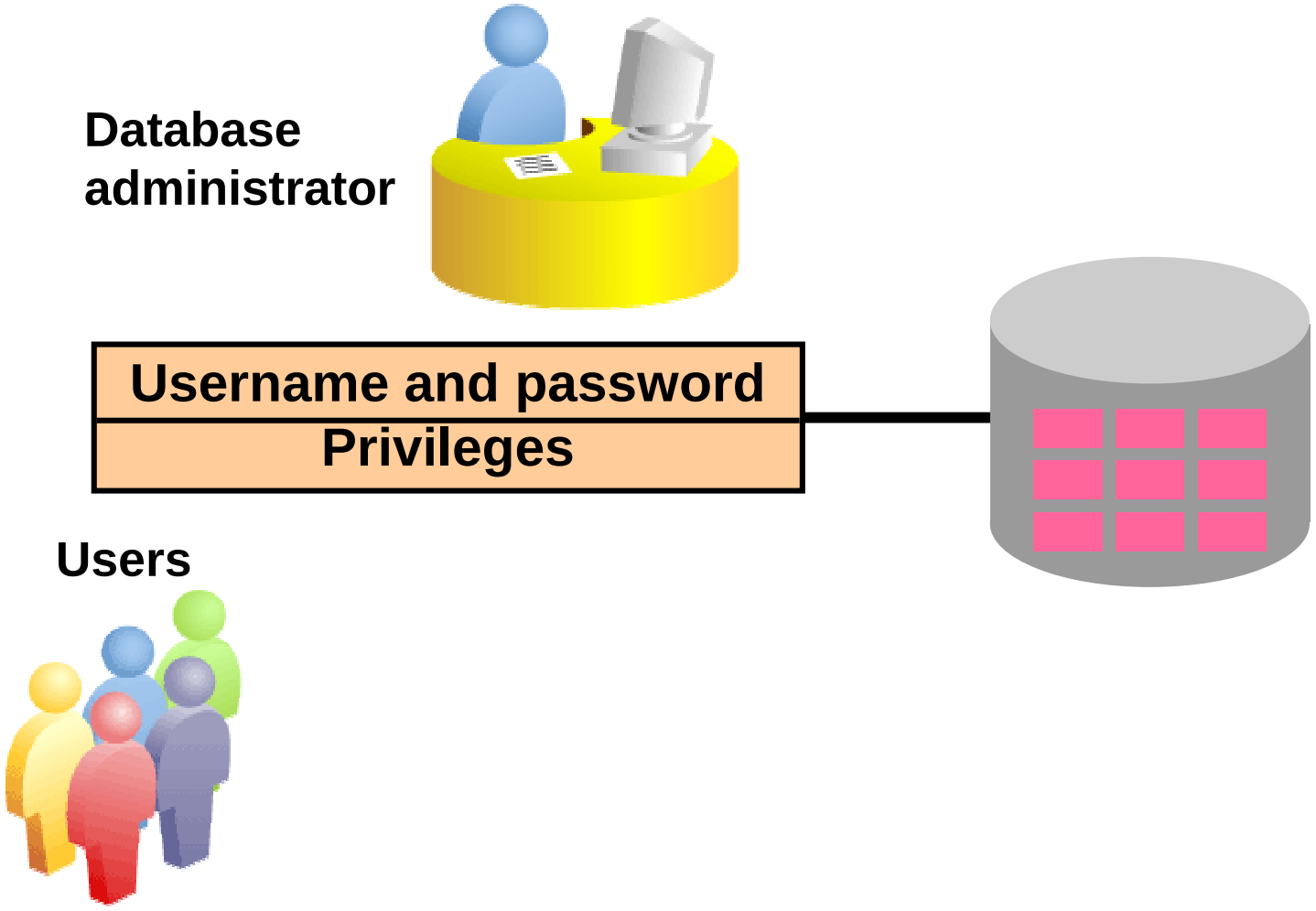
Controlling User Access

Objectives

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

- **Differentiate system privileges from object privileges**
- **Grant privileges on tables**
- **View privileges in the data dictionary**
- **Grant roles**
- **Distinguish between privileges and roles**

Controlling User Access



Privileges

- **Database security:**
  - **System security**
  - **Data security**
- **System privileges: Gaining access to the database**
- **Object privileges: Manipulating the content of the database objects**
- **Schemas: Collection of objects such as tables, views, and sequences**

System Privileges

- 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

Creating Users

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

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

```
CREATE USER  HR
IDENTIFIED BY   HR;
User created.
```

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...];
```

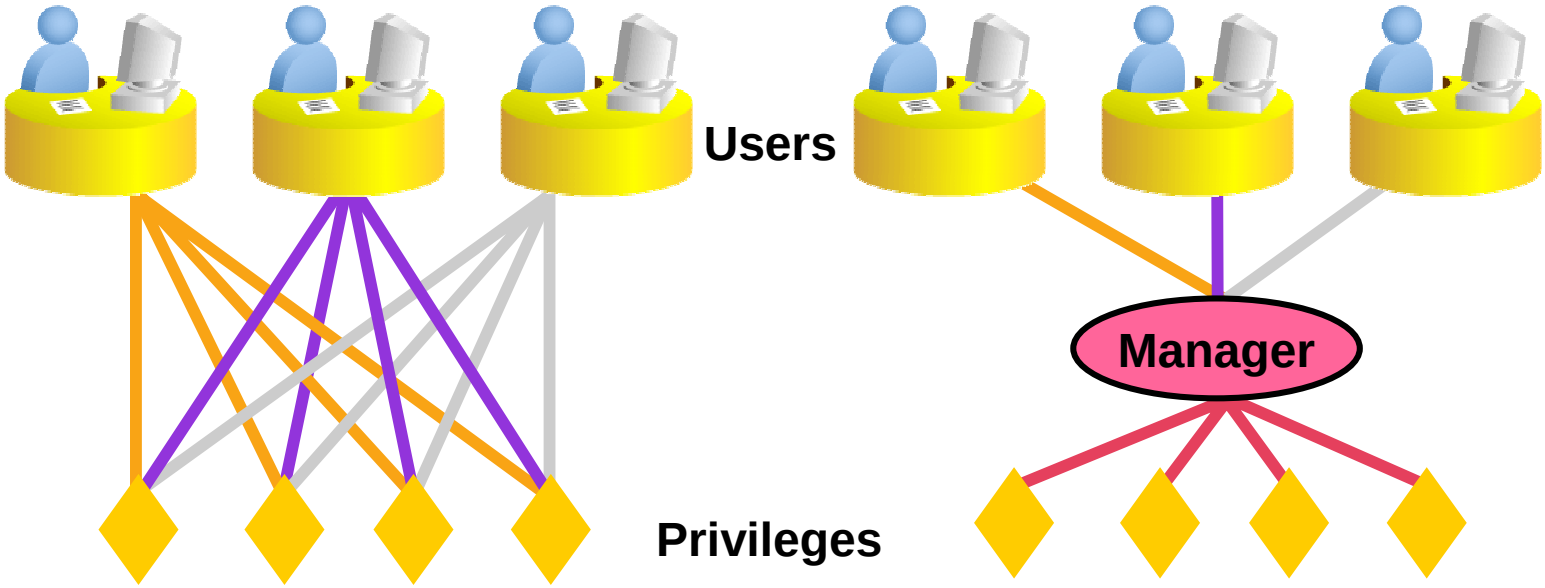
- An application developer, for example, may have the following system privileges:
  - CREATE SESSION
  - CREATE TABLE
  - CREATE SEQUENCE
  - CREATE VIEW
  - CREATE PROCEDURE

Granting System Privileges

The DBA can grant specific system privileges to a user.

```
GRANT  create session, create table,
       create sequence, create view
TO     scott;
Grant succeeded.
```

What Is a Role?



Creating and Granting Privileges to a Role

- Create a role

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

- Grant privileges to a role

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

- Grant a role to users

```
GRANT manager TO DE HAAN, 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;
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 `EMPLOYEES` table.

```
GRANT  select
ON     employees
TO     sue, rich;
Grant succeeded.
```

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

```
GRANT  update (department_name, location_id)
ON     departments
TO     scott, manager;
Grant succeeded.
```

Passing On Your Privileges

- Give a user authority to pass along privileges.

```
GRANT  select, insert
ON     departments
TO     scott
WITH   GRANT OPTION;
Grant succeeded.
```

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

```
GRANT  select
ON     alice.departments
TO     PUBLIC;
Grant succeeded.
```

Confirming Privileges Granted

Data Dictionary View	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
USER_SYS_PRIVS	System privileges granted to the user

Revoking Object Privileges

- You use the `REVOKE` statement to revoke privileges granted to other users.
- Privileges granted to others through the `WITH GRANT OPTION` clause are also 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 `DEPARTMENTS` table.

```
REVOKE  select, insert
ON      departments
FROM    scott;
Revoke succeeded.
```

Summary

In this lesson, you should have learned about statements that control access to the database and database objects.

Statement	Action
`CREATE USER`	Creates a user (usually performed by a DBA)
`GRANT`	Gives other users privileges to access the objects
`CREATE ROLE`	Creates a collection of privileges (usually performed by a DBA)
`ALTER USER`	Changes a user's password
`REVOKE`	Removes privileges on an object from users

Practice 1: Overview

This practice covers the following topics:

- **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**