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Administering User Security

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Objectives

After completing this lesson, you should be able to:

- Create and manage database user accounts:
 - Authenticate users
 - Assign default storage areas (tablespaces)
- Grant and revoke privileges
- Create and manage roles
- Create and manage profiles:
 - Implement standard password security features
 - Control resource usage by users

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Database User Accounts

Each database user account has:

- A unique username
- An authentication method
- A default tablespace
- A temporary tablespace
- A user profile
- An initial consumer group
- An account status



A schema:

- Is a collection of database objects that are owned by a database user
- Has the same name as the user account

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Predefined Administrative Accounts

- **SYS:**
 - Owns the data dictionary and the Automatic Workload Repository (AWR)
 - Used for startup and shutdown of the database instance
- **SYSTEM:** Owns additional administrative tables and views
- **SYSBACKUP:** Facilitates Oracle Recovery Manager (RMAN) backup and recovery operations
- **SYSDG:** Facilitates Oracle Data Guard operations
- **SYSKM:** Facilitates Transparent Data Encryption wallet operations

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Protecting Privileged Accounts

Privileged accounts can be protected by:

- Using a password file with case-sensitive passwords
- Enabling strong authentication for administrator roles



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Authenticating Users

- Password: User definition includes a password that must be supplied when the user attempts to log in to the database
- External: Authentication by a method outside the database (operating system, Kerberos, or Radius)
- Global: Users are identified by using an LDAP-based directory service



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Managing Users

ORACLE Enterprise Manager Database Express 12c

CRCL (12.1.0.1.0) Configuration Storage Security Performance Page Refreshed 1:06:55 PM GMT+00

Users

Create User Create Like Drop User

	Account Status	Expiration Date	Default Tablespace	Temporary Tablespace	Profile	Created
Create User						
Create Like						
Drop User						
View Details						
Alter Account						
Alter Tablespace						
Alter Privileges & Roles						
Grant Object Privileges						
CTXSYS		Sat Mar 23, 2013 2:42...	SYSAUX	TEMP	DEFAULT	Mon Sep 24, 2012 2:42...
DBSNMP		Mon Sep 24, 2012 3:30...	SYSAUX	TEMP	DEFAULT	Mon Sep 24, 2012 3:28...
DIP		Mon Sep 24, 2012 3:28...	USERS	TEMP	DEFAULT	Mon Sep 24, 2012 3:28...
DVF		Sat Mar 23, 2013 2:42...	SYSAUX	TEMP	DEFAULT	Mon Sep 24, 2012 2:42...
DVSYS		Sat Mar 23, 2013 2:28...	USERS	TEMP	DEFAULT	Mon Sep 24, 2012 2:28...
EXFSYS		Mon Apr 8, 2013 2:03:3...	USERS	TEMP	DEFAULT	Wed Oct 10, 2012 2:03...
FLOW_FILES		Sat Mar 23, 2013 3:13...	SYSAUX	TEMP	DEFAULT	Mon Sep 24, 2012 3:13...
QSMADMIN_INTERNAL		Sat Mar 23, 2013 12:2...	SYSAUX	TEMP	MONITORING_PROFILE	Mon Sep 24, 2012 2:42...
QSMCATUSER		Sat Mar 23, 2013 2:32...	USERS	TEMP	DEFAULT	Mon Sep 24, 2012 2:32...
QSMUSER		Sat Mar 23, 2013 3:53...	SYSAUX	TEMP	DEFAULT	Mon Sep 24, 2012 3:53...
HR		Sat Mar 23, 2013 3:53...	SYSAUX	TEMP	DEFAULT	Mon Sep 24, 2012 3:53...

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Creating a User

Create User

User Account Tablespaces Privilege

Name * HRDBA

Authentication * Password External Global

Password * *****

Confirm Password * *****

Profile DEFAULT

Password Expired ☐ *i*

Account Locked ☐

Show SQL

Create User

User Account Tablespaces Privilege

Default Tablespace USERS

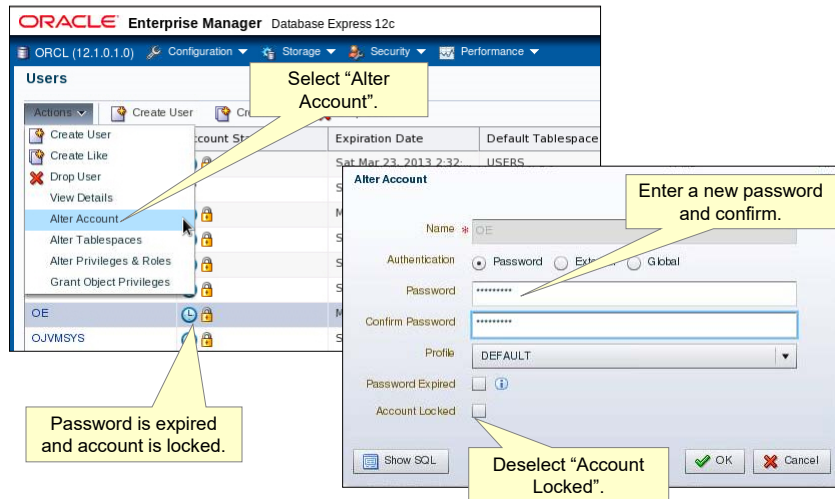
Temporary Tablespace TEMP

Show SQL OK Cancel

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Unlocking a User Account and Resetting the Password



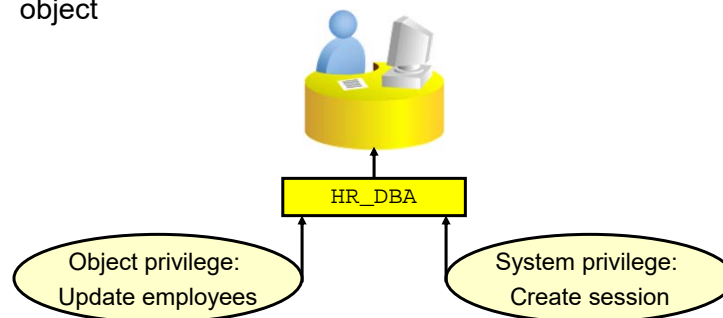
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Privileges

There are two types of user privileges:

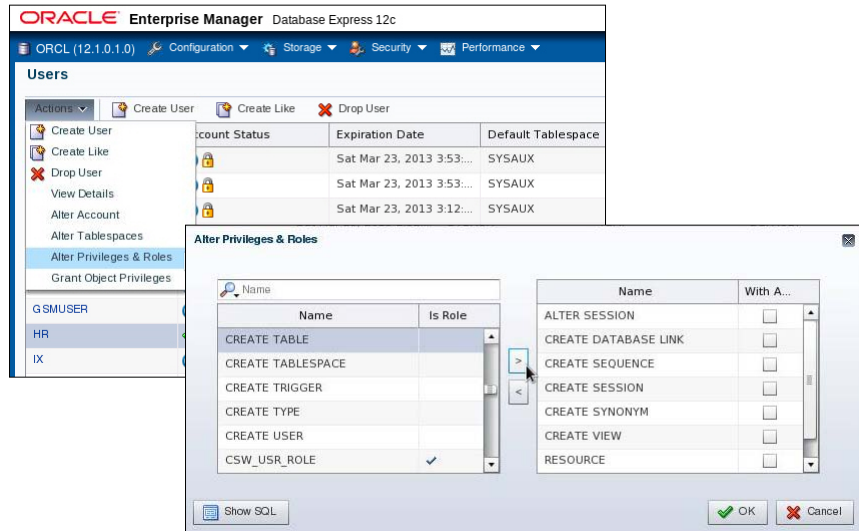
- System: Enables users to perform particular actions in the database
- Object: Enables users to access and manipulate a specific object



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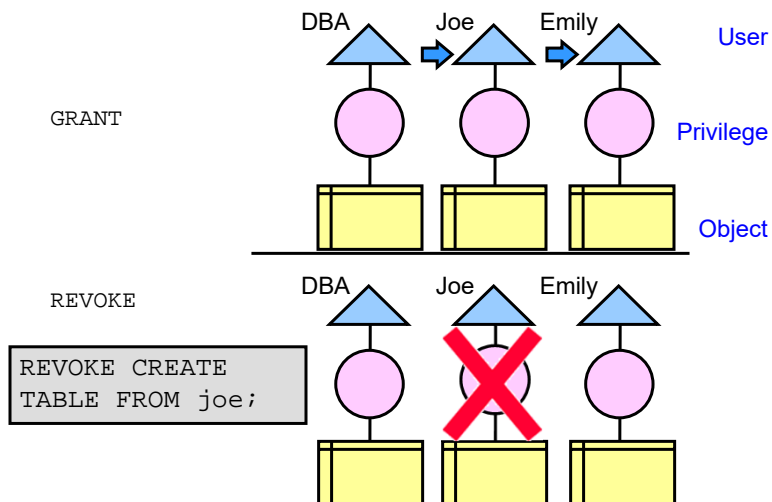
System Privileges



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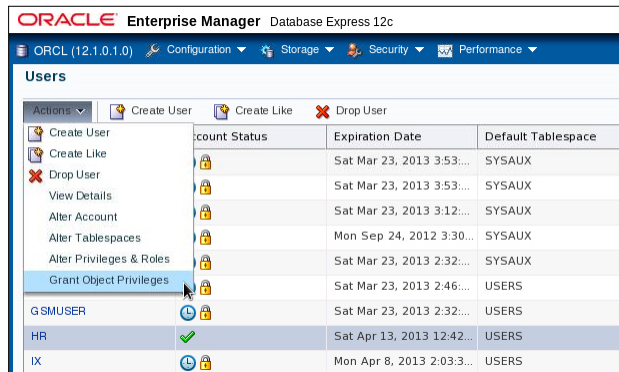
Revoking System Privileges with ADMIN OPTION



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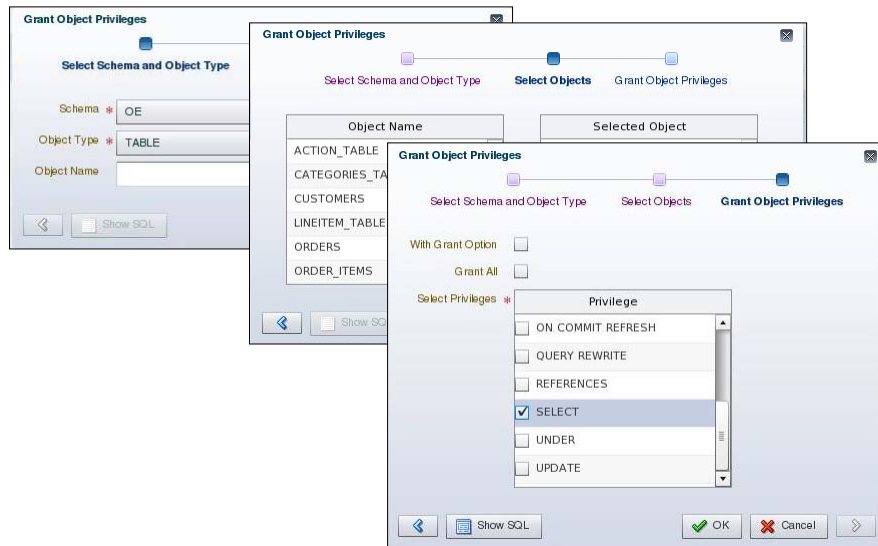
Granting Object Privileges



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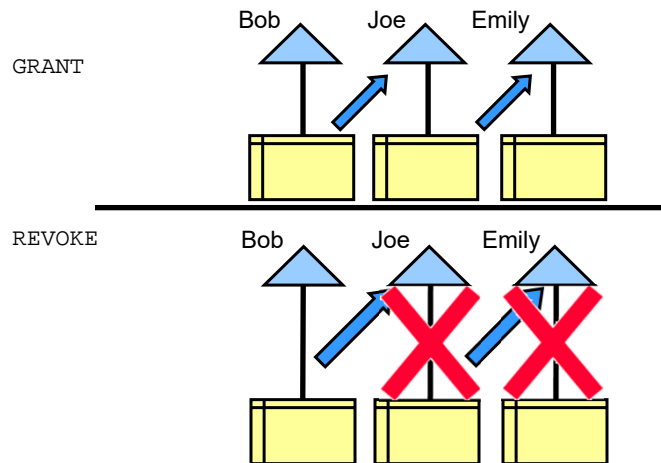
Object Privileges



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Revoking Object Privileges with GRANT OPTION



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Using Roles to Manage Privileges

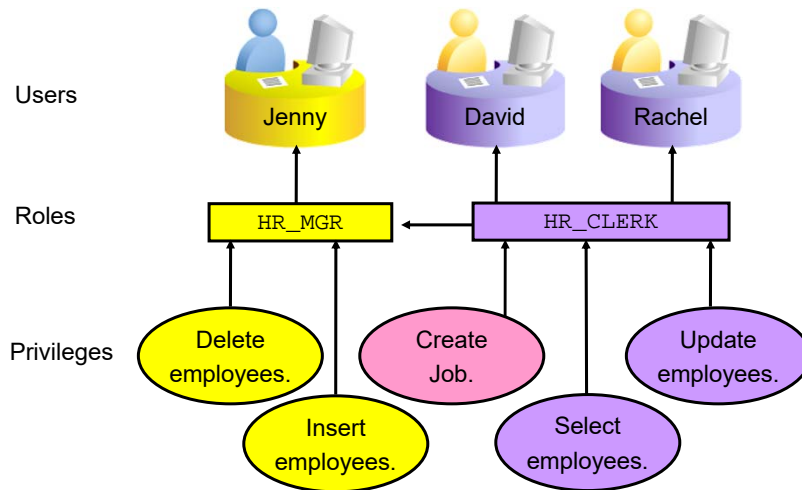
- Roles:
 - Used to group together privileges and roles
 - Facilitate granting of multiple privileges or roles to users
- Benefits of roles:
 - Easier privilege management
 - Dynamic privilege management
 - Selective availability of privileges



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Assigning Privileges to Roles and Assigning Roles to Users



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Predefined Roles

Role	Privileges Included
CONNECT	CREATE SESSION
DBA	Most system privileges; several other roles. Do not grant to non-administrators.
RESOURCE	CREATE CLUSTER, CREATE INDEXTYPE, CREATE OPERATOR, CREATE PROCEDURE, CREATE SEQUENCE, CREATE TABLE, CREATE TRIGGER, CREATE TYPE
SCHEDULER_ ADMIN	CREATE ANY JOB, CREATE EXTERNAL JOB, CREATE JOB, EXECUTE ANY CLASS, EXECUTE ANY PROGRAM, MANAGE SCHEDULER
SELECT_CATALOG_ROLE	SELECT privileges on data dictionary objects

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Creating a Role

Create Role

Role Name:

OK Cancel

Privilege

Name	Is Role
ADMINISTER DATABASE TRIGGERS	
ADMINISTER KEY MANAGEMENT	
ADMINISTER RESOURCE MANAGER	
ADMINISTER SQL MANAGEMENT	
ADMINISTER SQL TUNING SET	
ADM_PARALLEL_EXECUTE_TASK	<input checked="" type="checkbox"/>

Show SQL OK Cancel

Name	With A...
CREATE PROCEDURE	<input type="checkbox"/>
CREATE TABLE	<input type="checkbox"/>

OK Cancel

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Assigning Roles to Users

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ORCL (12.1.0.1.0) Configuration Storage Security Performance

Users

Actions: Create User Create Like Drop User

Username	Account Status	Expiration Date	Default Tablespace	Temporary Tablespace
HRDBA	Valid	Wed Apr 10, 2013 4:00:00 PM	USERS	TEMP
IX	Valid	Wed Apr 10, 2013 6:00:00 PM	SYSAUX	TEMP

Alter Privileges & Roles

Name	Is Role
DBA	<input checked="" type="checkbox"/>
DBA_ROLE	<input checked="" type="checkbox"/>
DBFS_ROLE	<input checked="" type="checkbox"/>
DBHADOOP	<input checked="" type="checkbox"/>
DEBUG ANY PROCEDURE	
DEBUG CONNECT SESSION	

Show SQL OK Cancel

Name	With A...
CONNECT	<input type="checkbox"/>
CREATE SESSION	<input type="checkbox"/>

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Profiles and Users

Users are assigned only one profile at a time.

Profiles:

- Control resource consumption
- Manage account status and password expiration

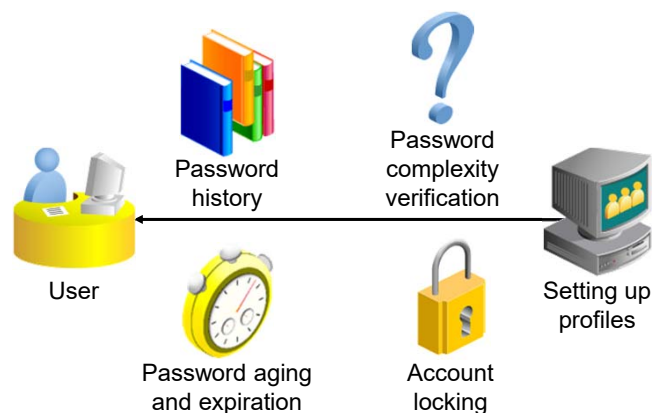


Note: RESOURCE_LIMIT must be set to TRUE before profiles can impose resource limitations.

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Implementing Password Security Features

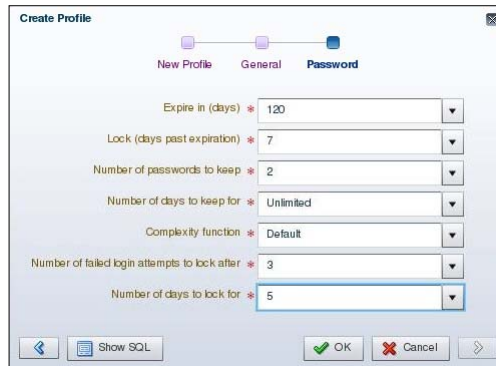


Note: Do not use profiles that cause the SYS, SYSMAN, and DBSNMP passwords to expire and the accounts to be locked.

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Creating a Password Profile



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Supplied Password Verification Functions

- The following functions are created by the `$ORACLE_HOME/rdbms/admin/utlpwdmg.sql` script:
 - `VERIFY_FUNCTION_11g`
 - `ORA12C_VERIFY_FUNCTION`
 - `ORA12C_STRONG_VERIFY_FUNCTION`
- The functions require the following of passwords:
 - Have a minimum number of characters
 - Not be the username, username with a number, or username reversed
 - Not be the database name or the database name with a number
 - Have at least one alphabetic and one numeric character
 - Differ from the previous password by at least three letters



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Modifications to the Default Profile

The `utlpwdmg.sql` script also modifies the DEFAULT profile as follows:

```
ALTER PROFILE DEFAULT LIMIT
PASSWORD_LIFE_TIME 180
PASSWORD_GRACE_TIME 7
PASSWORD_REUSE_TIME UNLIMITED
PASSWORD_REUSE_MAX UNLIMITED
FAILED_LOGIN_ATTEMPTS 10
PASSWORD_LOCK_TIME 1
PASSWORD_VERIFY_FUNCTION
    ora12c_verify_function;
```

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Assigning Quotas to Users

- Users who do not have the `UNLIMITED TABLESPACE` system privilege must be given a quota before they can create objects in a tablespace.
- Quotas can be:
 - A specific value in megabytes or kilobytes
 - Unlimited

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Summary

In this lesson, you should have learned how to:

- Create and manage database user accounts:
 - Authenticate users
 - Assign default storage areas (tablespaces)
- Grant and revoke privileges
- Create and manage roles
- Create and manage profiles:
 - Implement standard password security features
 - Control resource usage by users

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