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Database Programming with PL/SQL

9-4
Managing Procedures and Functions

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Objectives

This lesson covers the following objectives:

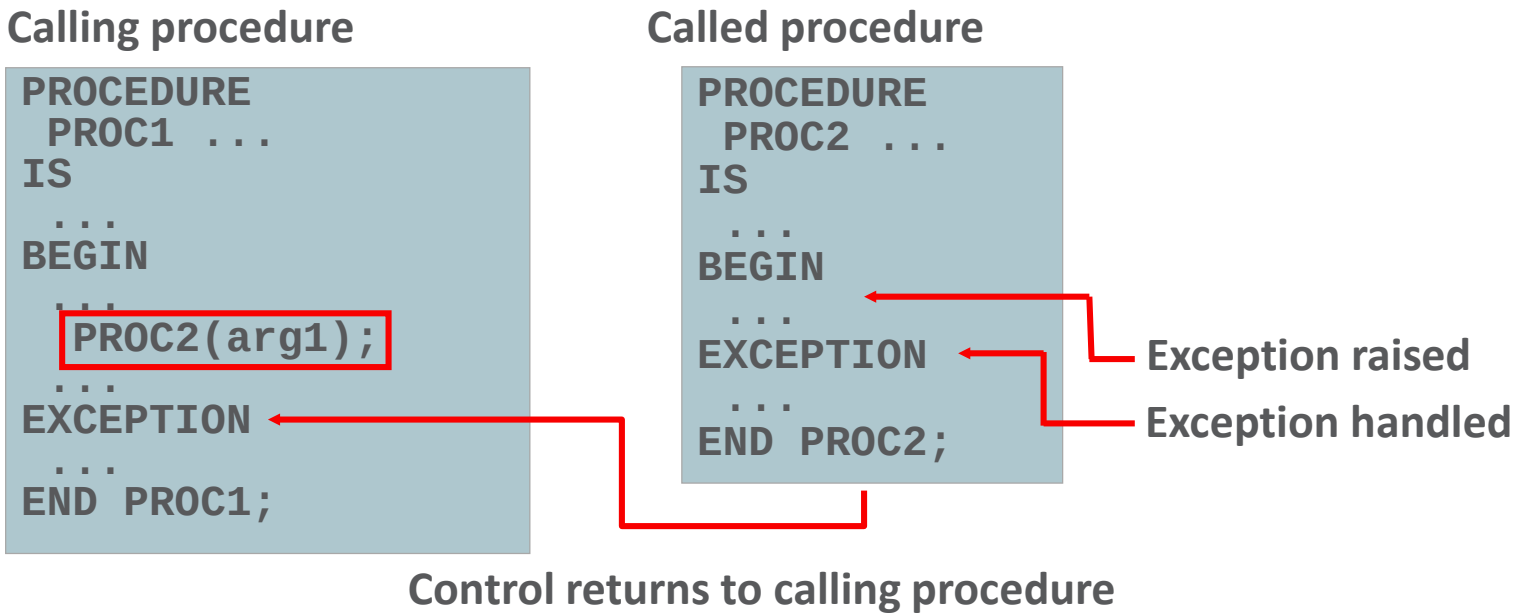
- Describe how exceptions are propagated
- Remove a function and a procedure
- Use Data Dictionary views to identify and manage stored programs

Purpose

- In this lesson, you learn to manage procedures and functions.
- To make your programs robust, you should always manage exception conditions by using the exception-handling features of PL/SQL.

Handled Exceptions

- The following slides use procedures as examples, but the same rules apply to functions.



Handled Exceptions

When an exception occurs and is handled in a called procedure or function, the following code flow takes place:

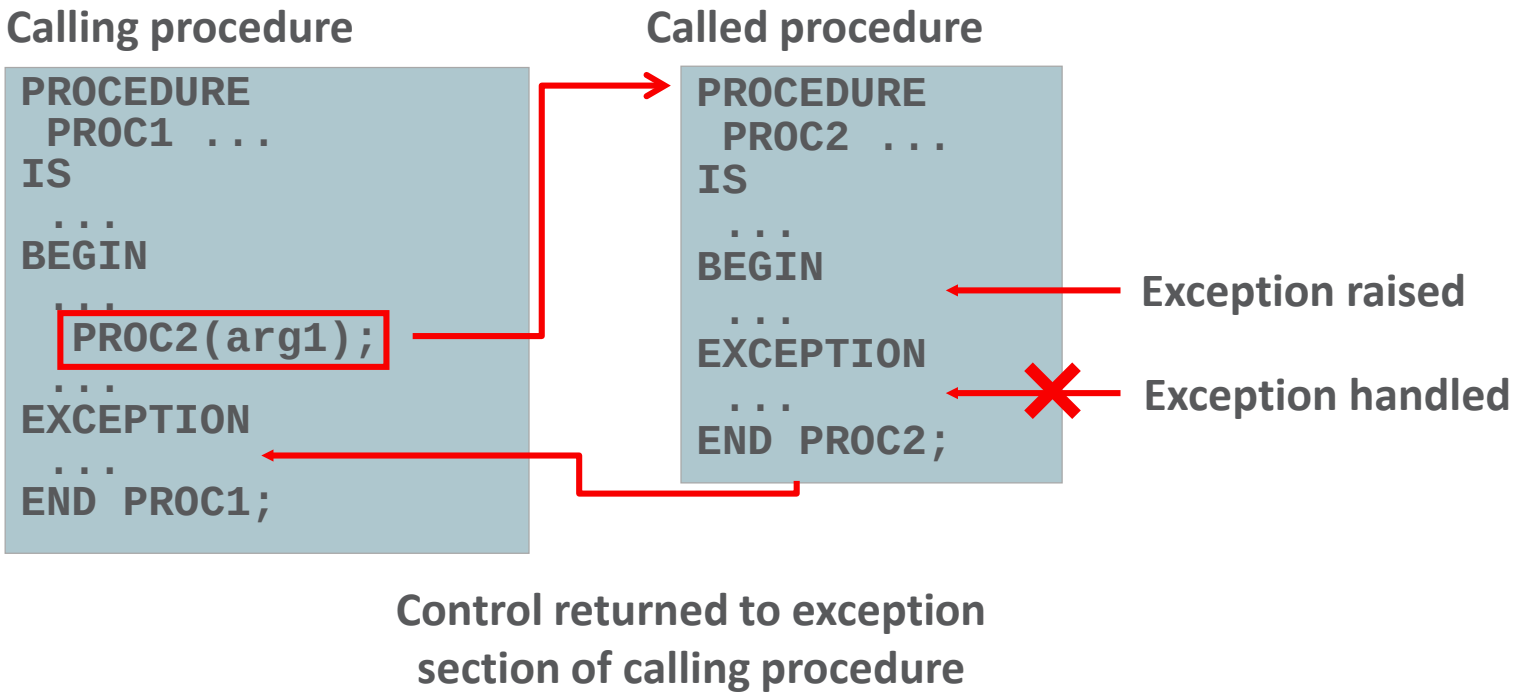
- 1. The exception is raised.
- 2. Control is transferred to the exception handler of the block that raised the exception.
- 3. The exception code is executed and the block is terminated.
- 4. Control returns to the calling program.
- 5. The calling program/block continues to execute.

Handled Exceptions: Example

```
CREATE OR REPLACE PROCEDURE add_department(
  p_name VARCHAR2, p_mgr NUMBER, p_loc NUMBER) IS
BEGIN
  INSERT INTO DEPARTMENTS (department_id,
    department_name, manager_id, location_id)
  VALUES (DEPARTMENTS_SEQ.NEXTVAL, p_name, p_mgr, p_loc);
  DBMS_OUTPUT.PUT_LINE('Added Dept: ' || p_name);
EXCEPTION
  WHEN OTHERS THEN
    DBMS_OUTPUT.PUT_LINE('Error adding dept: ' || p_name);
END;
```

```
BEGIN
  add_department('Media', 100, 1800);
  add_department('Editing', 99, 1800);
  add_department('Advertising', 101, 1800);
END;
```

Exceptions Not Handled



Exceptions Not Handled

If the exception section does not provide a handler for the raised exception, then it is not handled. The following code flow occurs:

- 1. The exception is raised.
- 2. Control is transferred to the exception handler of the block that raised the exception.
- 3. Since no exception handler exists, the block terminates and any DML operations performed within the block that raised the exception are rolled back.

Exceptions Not Handled

If the exception section does not provide a handler for the raised exception, then it is not handled. The following code flow occurs:

- 4. Control returns to the calling program and the exception propagates to the exception section of the calling program.
- 5. If the exception is not handled by the calling program, the calling program terminates and any DML operations performed prior to the occurrence of the unhandled exception are rolled back.

Exceptions Not Handled: Example

```
CREATE OR REPLACE PROCEDURE add_department_noex(
    p_name VARCHAR2, p_mgr NUMBER, p_loc NUMBER) IS
BEGIN
  INSERT INTO DEPARTMENTS (department_id,
    department_name, manager_id, location_id)
  VALUES (DEPARTMENTS_SEQ.NEXTVAL, p_name, p_mgr, p_loc);
  DBMS_OUTPUT.PUT_LINE('Added Dept: ' || p_name);
END;
```

```
BEGIN
  add_department_noex('Media', 100, 1800);
  add_department_noex('Editing', 99, 1800);
  add_department_noex('Advertising', 101, 1800);
END;
```

Result:

```
ORA-02291: integrity constraint (US_1217_S90_PLSQL.DEPT_MGR_FK) violated - parent
key not found
```

Removing Procedures and Functions

- You can remove a procedure or function that is stored in the database.
- Syntax:

```
DROP {PROCEDURE procedure_name | FUNCTION function_name}
```

- Examples:

```
DROP PROCEDURE my_procedure;
```

```
DROP FUNCTION my_function;
```

Viewing Subprogram Names in the USER_OBJECTS Table

- This example lists the names of all the PL/SQL functions that you own:

```
SELECT object_name
  FROM   USER_OBJECTS
  WHERE  object_type = 'FUNCTION';  -- use 'PROCEDURE' to
                                       see procedures
```

OBJECT_NAME
TAX
DML_CALL_SQL

Viewing PL/SQL Source Code in the USER_SOURCE Table

- This example shows the source code of the TAX function, which you own.
- Make sure you include ORDER BY line to see the lines of code in the correct sequence.

```
SELECT text
  FROM   USER_SOURCE
  WHERE  name = 'TAX'
  ORDER BY line;
```

TEXT
FUNCTION tax(value IN NUMBER)
RETURN NUMBER IS
BEGIN
RETURN (value*0.08);
END tax;

Viewing Object Names and Source Code in Application Express

You can easily view subprogram information in Application Express:

- From SQL Workshop, click Object Browser, then Browse, and choose either Procedures or Functions as required.
- A list of subprograms appears.
- Click the required subprogram name.
- The source code of the subprogram appears.
- From here, you can edit and recompile it, or drop it if you want.

Terminology

Key terms used in this lesson included:

- ALL_SOURCE
- USER_OBJECTS
- USER_SOURCE

Summary

In this lesson, you should have learned how to:

- Describe how exceptions are propagated
- Remove a function and a procedure
- Use Data Dictionary views to identify and manage stored programs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