

## Summary of the Fix for Package Function Visibility

### The Problem

Ora2Pg couldn't tell which package functions were public (declared in the SPEC) and which were private (only inside the BODY).

Because of that, it ended up creating standalone PostgreSQL functions for everything — both public and private ones.

Now, Ora2Pg did try to handle visibility by adding a “REVOKE ALL ...” line, but since it didn't know which ones were actually public or private, it commented those lines out with “--”.

So the user had to manually go and uncomment the REVOKE lines for private helper functions after conversion.

This was messy as private functions were getting exposed in PostgreSQL, breaking the package encapsulation and also creating a security risk.

### The Fix – Two Pass Approach

I fixed this using a simple two-pass method, kind of like using a guest list.

#### Pass 1 – Build the guest list ( change made in `_convert_package`)

When Ora2Pg parses the PACKAGE SPEC, it now goes through and collects all the names of the functions and procedures declared there.

These are considered public, and I store them in a hash called self->{package\_public}.

This acts like a guest list of routines that are allowed to stay public.

## Pass 2 – Check the list (in `_convert_function`)

Later, when each function is being converted:

- I removed the old commented-out revoke code.
- Added a new if-check that acts like a “bouncer”.

If the function is on the guest list (public), nothing happens.

If it's not on the list (private), it automatically adds:

REVOKE ALL ON FUNCTION ... FROM PUBLIC;

So now private functions are still created (so public ones can call them), but they're not exposed to the outside anymore.

No manual fixing needed , Ora2Pg now handles it correctly on its own.

## Code Changes

### 1. Collecting public routines (in `convert_package`)

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#### Collect public function/procedure names from the SPEC

```
MY $PUB_DECL = $GLOB_DECLARE;
$SELF->_REMOVE_COMMENTS($PUB_DECL);
$SELF->{PACKAGE_PUBLIC}{LC($PNAME)} ||= {};
WHILE ($PUB_DECL =~ /\b(PROCEDURE|FUNCTION)\s+([^\s()]+)/ig) {
MY $N = $2;
$N =~ s/^\s*//;
$N =~ s/"//g;
NEXT IF (!$N);
$SELF->{PACKAGE_PUBLIC}{LC($PNAME)}{LC($N)} = 1;
}
```

### 2. Applying the REVOKE logic (in `convert_function`)

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## Generate REVOKE only for private routines inside packages

```
IF ($PNAME) {  
  MY $PKG_LC = LC($PNAME);  
  MY $FN_LC = LC($FCT_DETAIL{NAME});  
  IF (!EXISTS $SELF->{PACKAGE_PUBLIC}{$PKG_LC}{$FN_LC}) {  
    $REVOKE = "REVOKE ALL ON $TYPE $NAME $FCT_DETAIL{ARGS} FROM PUBLIC;\n";  
    $REVOKE .= "REVOKE ALL ON $TYPE $NAME$AT_SUFFIX $FCT_DETAIL{ARGS} FROM  
PUBLIC;\n" IF ($AT_SUFFIX);  
  }  
}
```

## Result

### Before the fix:

- Ora2Pg didn't know public vs private functions.
- REVOKE lines were commented out.
- Private helper functions were exposed.

### After the fix:

- Ora2Pg detects public vs private correctly.
- REVOKE is automatically added for private routines.
- Package encapsulation is preserved.
- No manual edits needed after export.

## *Summary*

*Now Ora2Pg behaves more like Oracle packages, public APIs stay open,  
private helper routines stay internal.  
This fix makes the conversion cleaner, safer, and fully automatic.*

## SCREENSHOTS

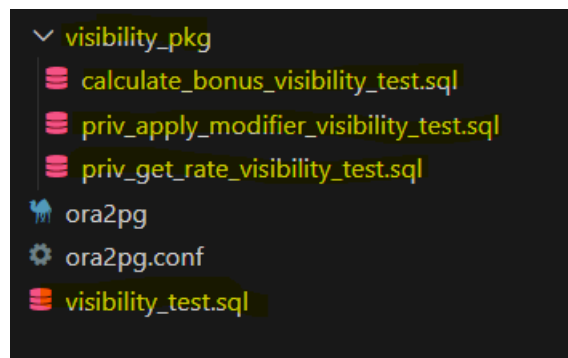
### BEFORE MAKING THE FIX IN ORA2PG CODEBASE:

1. visibility\_test.sql -- TESTCASE

```
visibility_test.sql
1  CREATE OR REPLACE PACKAGE visibility_pkg AS
2  |   FUNCTION calculate_bonus (p_salary IN NUMBER) RETURN NUMBER;
3  END visibility_pkg;
4  /
5
6  CREATE OR REPLACE PACKAGE BODY visibility_pkg AS
7  |   FUNCTION priv_get_rate RETURN NUMBER IS
8  |   BEGIN
9  |       RETURN 0.10;
10 |   END;
11
12 |   FUNCTION priv_apply_modifier (p_base_rate IN NUMBER) RETURN NUMBER IS
13 |   |   v_modifier NUMBER := 1.0;
14 |   BEGIN
15 |       RETURN p_base_rate * v_modifier;
16 |   END;
17
18 |   FUNCTION calculate_bonus (p_salary IN NUMBER) RETURN NUMBER IS
19 |   |   v_rate NUMBER;
20 |   BEGIN
21 |       v_rate := priv_apply_modifier(priv_get_rate());
22 |       RETURN p_salary * v_rate;
23 |   END;
24 END visibility_pkg;
25 /
26
```

## 2. MIGRATION BY CURRENT ORA2PG:

```
GIN PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgec
RE ases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest> ora2pg -o visibility_test.sql -c ora2pg.conf
END [2025-11-09 09:42:33] [=====>] 1/1 packages (100.0%) end of output.
```



### visibility\_test.sql

```
=====
=
```

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**-- DATASOURCE:**

**DBI:ORACLE:HOST=LOCALHOST;PORT=1522;SID=XE**

**SET**

**CLIENT\_ENCODING TO 'UTF8';**

**\SET ON\_ERROR\_STOP**

**ON**

**DROP SCHEMA IF**

**EXISTS VISIBILITY\_PKG CASCADE;**

**CREATE SCHEMA IF**

**NOT EXISTS VISIBILITY\_PKG;**

**\|**

**VISIBILITY\_PKG/PRIV\_GET\_RATE\_VISIBILITY\_TEST.SQL**

**\|**

**VISIBILITY\_PKG/PRIV\_APPLY\_MODIFIER\_VISIBILITY\_TEST.SQL**

**\|**

**VISIBILITY\_PKG/CALCULATE\_BONUS\_VISIBILITY\_TEST.SQL**

**visibility\_pkg\priv\_get\_rate\_visibility\_test.sql**

=====

=====

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**-- DATASOURCE:**

**DBI:ORACLE:HOST=LOCALHOST;PORT=1522;SID=XE**

**SET**

```
CLIENT_ENCODING TO 'UTF8';
```

```
SET SEARCH_PATH =
```

```
VISIBILITY_PKG, PUBLIC;
```

```
CREATE OR REPLACE
```

```
FUNCTION VISIBILITY_PKG.PRIV_GET_RATE()
```

```
RETURNS BIGINT AS
```

```
$BODY$
```

```
BEGIN
```

```
    RETURN 5; -- THE ACTUAL BONUS RATE
```

```
END;
```

```
$BODY$
```

```
LANGUAGE PLPGSQL
```

```
SECURITY DEFINER;
```

```
-- REVOKE ALL ON
```

```
FUNCTION VISIBILITY_PKG.PRIV_GET_RATE() FROM PUBLIC;
```

**visibility\_pkg\priv\_apply\_modifier\_visibility\_test.sql**

```
=====
```

```
=====
```

```
-- GENERATED BY
```

```
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```

```
-- COPYRIGHT
```

```
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```



**-- DATASOURCE:**

**DBI:ORACLE:HOST=LOCALHOST;PORT=1522;SID=XE**

**SET**

**CLIENT\_ENCODING TO 'UTF8';**

**SET SEARCH\_PATH =**

**VISIBILITY\_PKG, PUBLIC;**

**CREATE OR REPLACE**

**FUNCTION VISIBILITY\_PKG.PRIV\_APPLY\_MODIFIER(P\_BASE\_RATE BIGINT)**

**RETURNS BIGINT AS**

**\$BODY\$**

**DECLARE**

**V\_MODIFIER BIGINT := 2.0; -- EXAMPLE MODIFIER**

**BEGIN**

**-- THIS PRIVATE FUNCTION CALLS ANOTHER**

**PRIVATE FUNCTION**

**RETURN P\_BASE\_RATE \* V\_MODIFIER;**

**END;**

**\$BODY\$**

**LANGUAGE PLPGSQL**

**SECURITY DEFINER**

**STABLE;**

**-- REVOKE ALL ON**

**FUNCTION VISIBILITY\_PKG.PRIV\_APPLY\_MODIFIER(P\_BASE\_RATE BIGINT) FROM PUBLIC;**

## visibility\_pkg\calculate\_bonus\_visibility\_test.sql

=====

=====

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-- DATASOURCE:

**DBI:ORACLE:HOST=LOCALHOST;PORT=1522;SID=XE**

**SET**

**CLIENT\_ENCODING TO 'UTF8';**

**SET SEARCH\_PATH =**

**VISIBILITY\_PKG, PUBLIC;**

**CREATE OR REPLACE**

**FUNCTION VISIBILITY\_PKG.CALCULATE\_BONUS(P\_SALARY BIGINT)**

**RETURNS BIGINT AS**

**\$BODY\$**

**DECLARE**

**V\_RATE BIGINT;**

**BEGIN**

**-- PUBLIC CALLS LEVEL 1 PRIVATE**

**V\_RATE :=**

**VISIBILITY\_PKG.PRIV\_APPLY\_MODIFIER(**

**VISIBILITY\_PKG.PRIV\_GET\_RATE()**

); -- CALLS BOTH PRIVATE FUNCTIONS INDIRECTLY

RETURN P\_SALARY \* V\_RATE;

END;

\$BODY\$

LANGUAGE PLPGSQL

SECURITY DEFINER

STABLE;

-- REVOKE ALL ON

FUNCTION VISIBILITY\_PKG.CALCULATE\_BONUS(P\_SALARY BIGINT) FROM PUBLIC;

```
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest\TEST> docker exec -it postgres-db psql -U user -d migrated_db -f /tmp/visibility_test.sql
SET
psql:/tmp/visibility_test.sql:13: NOTICE: drop cascades to 3 other objects
DETAIL: drop cascades to function visibility_pkg.priv_get_rate()
drop cascades to function visibility_pkg.priv_apply_modifier(bigint)
drop cascades to function visibility_pkg.calculate_bonus(bigint)
DROP SCHEMA
CREATE SCHEMA
SET
SET
CREATE FUNCTION
SET
CREATE FUNCTION
SET
SET
CREATE FUNCTION
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest\TEST> |
```

*CREATING A NEW USER FOR TESTING:*

```
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest\TEST> docker exec -it postgres-db psql -U user -d migrated_db -c "CREATE ROLE test_user_2 LOGIN PASSWORD 'password';"
CREATE ROLE
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest\TEST> docker exec -it postgres-db psql -U user -d migrated_db -c "GRANT CONNECT ON DATABASE migrated_db TO test_user_2;"
GRANT
```

## CURRENT WRONG BEHAVIOUR

```
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgecases\implicitcursorattributesbugs\refcu
rsortest\packagetest\privatetest\TEST> docker exec -it postgres-db psql -U user -d migrated_db -c "GRANT USAGE ON SCHEMA visibility_pkg TO test_user_2;"
GRANT
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgecases\implicitcursorattributesbugs\refcu
rsortest\packagetest\privatetest\TEST> docker exec -it postgres-db psql -U user -d migrated_db -c "GRANT EXECUTE ON FUNCTION visibility_pkg.calculate_bonus(bigint) TO tes
t_user_2;"
GRANT
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgecases\implicitcursorattributesbugs\refcu
rsortest\packagetest\privatetest\TEST> docker exec -it postgres-db psql -U test_user_2 -d migrated_db -c "SELECT visibility_pkg.calculate_bonus(0);"
calculate_bonus
-----
      80
(1 row)

PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new new\edgecases\implicitcursorattributesbugs\refcu
rsortest\packagetest\privatetest\TEST> docker exec -it postgres-db psql -U test_user_2 -d migrated_db -c "SELECT visibility_pkg.priv_get_rate();"
priv_get_rate
-----
          5
(1 row)
```

It's because Ora2Pg doesn't know how to distinguish between private and public functions inside a package, so even though it injects a REVOKE statement, it ends up adding it to all functions and procedures. Since it can't risk revoking permissions from the public ones, it's forced to comment out those REVOKE lines, leaving it to the user to manually uncomment them later, which is messy and error-prone.

## OUTPUT AFTER MY FIX:

Running ora2pg:

```
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\ne
w new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest> ora2pg -o visibility_test.sql -c ora
2pg.conf
[2025-11-09 15:34:28] [=====>] 1/1 packages (100.0%) end of output.
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\ne
w new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest>
```

## MIGRATED SQL GIVEN BY MODIFIED ORA2PG:

visibility\_output.sql

```
=====
=
```

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**SET**

**CLIENT\_ENCODING TO 'UTF8';**

**\SET ON\_ERROR\_STOP**

**ON**

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**-- DATASOURCE: DBI:ORACLE:HOST=LOCALHOST;PORT=1522;SID=XE**

**SET CLIENT\_ENCODING TO 'UTF8';**

**\SET ON\_ERROR\_STOP ON**

**-- ORACLE PACKAGE 'VISIBILITY\_PKG' DECLARATION, PLEASE EDIT TO MATCH PostgreSQL SYNTAX.**

**DROP SCHEMA IF EXISTS VISIBILITY\_PKG CASCADE;**

**CREATE SCHEMA IF NOT EXISTS VISIBILITY\_PKG;**

\I /TMP/VISIBILITY\_PKG/PRIV\_GET\_RATE\_VISIBILITY\_OUTPUT.SQL

\I /TMP/VISIBILITY\_PKG/PRIV\_APPLY\_MODIFIER\_VISIBILITY\_OUTPUT.SQL

\I /TMP/VISIBILITY\_PKG/CALCULATE\_BONUS\_VISIBILITY\_OUTPUT.SQL

-- END OF ORACLE PACKAGE 'VISIBILITY\_PKG' DECLARATION

**visibility\_pkg\priv\_get\_rate\_visibility\_test.sql**

=====

=====

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-- DATASOURCE: DBI:ORACLE:HOST=LOCALHOST;PORT=1522;SID=XE

SET CLIENT\_ENCODING TO 'UTF8';

SET SEARCH\_PATH = VISIBILITY\_PKG,PUBLIC;

**CREATE OR REPLACE FUNCTION VISIBILITY\_PKG.PRIV\_GET\_RATE () RETURNS BIGINT AS**

**\$BODY\$**

**BEGIN**

**RETURN 5.00;**

**END;**

**\$BODY\$**

**LANGUAGE PLPGSQL**

**SECURITY DEFINER**

**STABLE;**

**REVOKE ALL ON FUNCTION VISIBILITY\_PKG.PRIV\_GET\_RATE () FROM PUBLIC;**

**visibility\_pkg\calculate\_bonus\_visibility\_test.sql**

=====

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**-- DATASOURCE: DBI:ORACLE:HOST=LOCALHOST;PORT=1522;SID=XE**

**SET CLIENT\_ENCODING TO 'UTF8';**

**SET SEARCH\_PATH = VISIBILITY\_PKG,PUBLIC;**

**CREATE OR REPLACE FUNCTION VISIBILITY\_PKG.CALCULATE\_BONUS (P\_SALARY BIGINT)  
RETURNS BIGINT AS \$BODY\$**

**DECLARE**

**V\_RATE BIGINT;**

**BEGIN**

**V\_RATE := VISIBILITY\_PKG.PRIV\_APPLY\_MODIFIER(VISIBILITY\_PKG.PRIV\_GET\_RATE());**

```
        RETURN P_SALARY * V_RATE;

    END;

$BODY$

LANGUAGE PLPGSQL

SECURITY DEFINER

STABLE;
```

**visibility\_pkg\priv\_apply\_modifier\_visibility\_output.sql**

```
=====
=====
```

```
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-- DATASOURCE: DBI:ORACLE:HOST=LOCALHOST;PORT=1522;SID=XE
```

```
SET CLIENT_ENCODING TO 'UTF8';

SET SEARCH_PATH = VISIBILITY_PKG,PUBLIC;
```

```
CREATE OR REPLACE FUNCTION VISIBILITY_PKG.PRIV_APPLY_MODIFIER (P_BASE_RATE
BIGINT) RETURNS BIGINT AS $BODY$
```

```
DECLARE
```

```
    V_MODIFIER BIGINT := 2.0;
```



**BEGIN**

**RETURN P\_BASE\_RATE \* V\_MODIFIER;**

**END;**

**\$BODY\$**

**LANGUAGE PLPGSQL**

**SECURITY DEFINER**

**STABLE;**

**REVOKE ALL ON FUNCTION VISIBILITY\_PKG.PRIV\_APPLY\_MODIFIER (P\_BASE\_RATE BIGINT)  
FROM PUBLIC;**

```
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new\new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest> docker exec -it postgres-db psql -U test_user_2 -d migrated_db -c "SELECT visibility_pkg.calculate_bonus(8);"
calculate_bonus
-----
80
(1 row)

PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new\new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest> docker exec -it postgres-db psql -U test_user_2 -d migrated_db -c "SELECT visibility_pkg.priv_get_rate();"
ERROR: permission denied for function priv_get_rate
PS C:\Users\anand\OneDrive\Desktop\learning--docker\oraclepostgres--together\ora2pg-25.0\scripts\testfinal\config\new\new\new\edgecases\implicitcursorattributesbugs\refcursortest\packagetest\privatetest>
```