Restricting Data Access Using the Virtual Private Database

Setup:

```
2018-09-30 13:41:35 SYS AS SYSDBA> @/home/oracle/Desktop/vpd_lab_scripts/create_admin_users_and_roles;
*** Create admin users: sec_admin and hr_sec

Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


Grant succeeded.


Grant succeeded.


Grant succeeded.


***** Create roles: employee_role and customer_role
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


Role created.


Role created.
```

```
    ***** Grant system and object privileges to roles and users
    Connected.

    Session altered.

    You are running SQL*Plus in directory /home/oracle


    Grant succeeded.


    Grant succeeded.

    Connected.

    Session altered.

    You are running SQL*Plus in directory /home/oracle


    Grant succeeded.


    Grant succeeded.


    Grant succeeded.


    Grant succeeded.

    Connected.
```

Session altered.

You are running SQL*Plus in directory /home/oracle

Grant succeeded.

Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle

***** Create Steven King (President)

User created.

Grant succeeded.

***** Create Karen Partners (Sales Manager rep. to SKing)

User created.

Grant succeeded.

***** Create Louise Doran (Sales Rep in Karen Partners team)

User created.

Grant succeeded.

***** Create Louise Doran (Sales Rep in Karen Partners team)

User created.

Grant succeeded.

***** Create Eleni Zlotkey (another Sales Manager)

User created.

Grant succeeded.

***** Create Matthias Hannah (Customer)

User created.

Grant succeeded.

2018-09-30 13:41:59 HR_SEC > █

Enabling a VPD Policy on the ORDERS Table

1.

```
2018-09-30 13:41:59 HR_SEC > @/home/oracle/Desktop/vpd_lab_scripts/enable_vpd_policy;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle

*** Create policy function to be called when 'ORDERS' table is accessed

Function created.

2018-09-30 14:40:46 SEC_ADMIN >
```

Applications Places System

oracle@localhost:~

2.

```
2018-09-30 14:40:46 SEC_ADMIN > @/home/oracle/Desktop/vpd_lab_scripts/apply_vpd_policy;

PL/SQL procedure successfully completed.

2018-09-30 14:44:08 SEC_ADMIN >
```

Applications Places System

oracle@localhost:~

Testing the VPD Policy on the ORDERS table

1.

```
2018-09-30 14:44:08 SEC_ADMIN > @/home/oracle/Desktop/vpd_lab_scripts/select_orders_as_matthias;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


  ORDER_ID ORDER_TOTAL CUSTOMER_ID
---------- ----------- -----------
      2381     23034.6         106
      2359      5543.1         106
      2418      5546.6         106
      2441      2075.2         106

2018-09-30 14:50:11 MATTHIAS.HANNAH@GREBE.COM >
```

Applications Places System

oracle@localhost:~

2.

```
2018-09-30 14:50:11 MATTHIAS.HANNAH@GREBE.COM > @/home/oracle/Desktop/vpd_lab_scripts/select_orders_as_ldoran;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


  ORDER_ID CUSTOMER_ID ORDER_TOTAL SALES_REP_ID
---------- ----------- ----------- ------------
      2455         145     14087.5          160
      2416         104         384          160
      2419         107       31574          160
      2420         108       29750          160
      2423         145     10367.7          160
      2441         106      2075.2          160

6 rows selected.

2018-09-30 14:52:03 LDORAN >
```
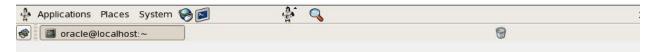
Applications   Places   System   📷   🖼   🐜   🔍

🌐   ▣ oracle@localhost:~   🗑

3.

```
2018-09-30 14:52:03 LDORAN > @/home/oracle/Desktop/vpd_lab_scripts/select_orders_as_kpartner;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


  ORDER_ID CUSTOMER_ID ORDER_TOTAL SALES_REP_ID
---------- ----------- ----------- ------------
      2391         153     48070.6          156
      2410         168       45175          156
      2381         106     23034.6          156
      2440         107     70576.9          156
      2411         169     15760.5          156
      2394         109       21863          158
      2357         108     59872.4          158
      2404         163         510          158
      2448         145        1388          158
      2445         144      5537.8          158
      2412         170       66816          158
      2408         166         309          158
      2452         149       12589          159
      2435         144       62303          159
      2430         101     29669.9          159
      2405         164        1233          159
      2457         118     21586.2          159
      2439         105     22150.1          159
      2450         147        1636          159
      2423         145     10367.7          160
      2416         104         384          160
      2419         107       31574          160
```

```
2412          170          66816          158
2408          166            309          158
2452          149          12589          159
2435          144          62303          159
2430          101        29669.9          159
2405          164           1233          159
2457          118        21586.2          159
2439          105        22150.1          159
2450          147           1636          159
2423          145        10367.7          160
2416          104            384          160
2419          107          31574          160
2441          106         2075.2          160
2420          108          29750          160
2455          145        14087.5          160
2406          148         2854.2          161
2434          149       268651.8          161
2436          116         6394.8          161
2446          117       103679.3          161
2415          103            310          161
2413          101          48552          161
2400          159        69286.4          161
2399          158        25270.3          161
2393          155        23431.9          161
2392          154          26632          161
2396          147          34930          161
2447          101        33893.6          161
2379          146        17848.2          161
```

38 rows selected.

2018-09-30 14:54:34 KPARTNER >

4.

2018-09-30 14:54:34 KPARTNER > @/home/oracle/Desktop/vpd_lab_scripts/select_count_orders_as_oe;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle

```
  COUNT(*)
----------
       105
```

2018-09-30 14:58:36 OE > █

5.

```
2018-09-30 14:58:36 OE > @/home/oracle/Desktop/vpd_lab_scripts/select_count_orders_as_sking;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


  COUNT(*)
----------
       105

2018-09-30 15:00:57 SKING > █
```

Viewing the Policy on the ORDERS Table

1.

```
2018-09-30 15:00:57 SKING > @/home/oracle/Desktop/vpd_lab_scripts/vpd_where_clause_orders;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


predicate (WHERE clause)
-----------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------
-----------------------------------------------------------------------------------------------

1=2 or customer_id = 106

1=2 or sales_rep_id = 160



1=2 or 1=1
1=2 or sales_rep_id in (select employee_id from hr.employees where manager_id = 146)

10 rows selected.

2018-09-30 15:11:45 SYSTEM > █
```

Enabling a VPD Policy with Relevant Columns and Column Filtering on the CUSTOMERS Table

1.

```
2018-09-30 15:11:45 SYSTEM > @/home/oracle/Desktop/vpd_lab_scripts/enable_vpd_policy2;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


Function created.

2018-09-30 15:15:04 SEC_ADMIN >
```

2.

```
2018-09-30 15:15:04 SEC_ADMIN > @/home/oracle/Desktop/vpd_lab_scripts/apply_vpd_policy2;

PL/SQL procedure successfully completed.

2018-09-30 15:18:48 SEC_ADMIN >
```

Testing the VPD Policy on the CUSTOMERS table

1.

```
2018-09-30 15:18:48 SEC_ADMIN > @/home/oracle/Desktop/vpd_lab_scripts/select_customers_as_matthias;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle

select * from oe.customers
               *
ERROR at line 1:
ORA-00942: table or view does not exist


2018-09-30 15:21:40 MATTHIAS.HANNAH@GREBE.COM >
```

2.

```
2018-09-30 15:21:40 MATTHIAS.HANNAH@GREBE.COM > @/home/oracle/Desktop/vpd_lab_scripts/select_customers_as_ezlotkey;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


CUST_FIRST_NAME      CUST_LAST_NAME       CREDIT_LIMIT ACCOUNT_MGR_ID
-------------------- -------------------- ------------ --------------
Malcolm              Kanth                                       145
Sharmila             Fonda                                       145
Prem                 Walken                                      145
Helmut               Capshaw                                     145
Markus               Rampling                                    145
Cyndi                Griem                                       145
Mammutti             Sutherland                                  145
Amanda               Tanner                                      145
Fritz                Hackman                                     145
Dan                  Williams                                    145
Sharmila             Kazan                                       145
Emily                Pollack                                     145
M. Emmet             Olin                                        145
Romy                 McCarthy                                    145
Kevin                Goodman                                     145
Malcolm              Broderick                                   145
Mary                 Lemmon                                      145
Emmet                Walken                                      145
Prem                 Cardinale                                   145
Prem                 Garcia                                      145
Dom                  McQueen                                     145
Dom                  Hoskins                                     145
```

```
Fred            Lithgow
Meg             Derek
Holly           Kurosawa
Kurt            Heard
G?tz            Falk
Keir            George
Keir            Weaver
Richard         Coppola
Rob             Russell
Robert          de Niro
Rolf            Ashby
Roy             Bates
Rufus           Belushi
Matthias        MacGraw
Maurice         Daltrey
Charles         Broderick
Isabella        Reed
Louis           Edwards
Doris           Spacek
Sissy           Puri
Placido         Kubrick
Claudia         Kurosawa
Elia            Fawcett
Goldie          Slater
Eddie           Boyer
Claude          Powell
Grace           Belushi
Mary Beth       Roberts

319 rows selected.

2018-09-30 15:23:23 EZLOTKEY >
```

3.

```
2018-09-30 15:23:23 EZLOTKEY > @/home/oracle/Desktop/vpd_lab_scripts/select_customers_as_sking;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


CUST_FIRST_NAME      CUST_LAST_NAME       CREDIT_LIMIT ACCOUNT_MGR_ID
-------------------- -------------------- ------------ --------------
Malcolm              Kanth                        2400            145
Sharmila             Fonda                         500            145
Prem                 Walken                       3700            145
Helmut               Capshaw                      3600            145
Markus               Rampling                      600            145
Cyndi                Griem                        1400            145
Mammutti             Sutherland                    500            145
Amanda               Tanner                       2300            145
Fritz                Hackman                      1400            145
Dan                  Williams                     2400            145
Sharmila             Kazan                         500            145
Emily                Pollack                      1400            145
M. Emmet             Olin                         3700            145
Romy                 McCarthy                     5000            145
Kevin                Goodman                       700            145
Malcolm              Broderick                    2400            145
Mary                 Lemmon                       2400            145
Emmet                Walken                       3600            145
Prem                 Cardinale                    3700            145
Prem                 Garcia                       3700            145
Dom                  McQueen                      5000            145
Dom                  Hoskins                      5000            145
```

```
Fred            Lithgow              3600
Meg             Derek                3700
Holly           Kurosawa             5000
Kurt            Heard                5000
G?tz            Falk                 5000
Keir            George                700
Keir            Weaver                700
Richard         Coppola               500
Rob             Russell              5000
Robert          de Niro              3700
Rolf            Ashby                5000
Roy             Bates                5000
Rufus           Belushi              1900
Matthias        MacGraw               100
Maurice         Daltrey               200
Charles         Broderick             300
Isabella        Reed                  300
Louis           Edwards               400
Doris           Spacek                400
Sissy           Puri                  400
Placido         Kubrick               500
Claudia         Kurosawa              500
Elia            Fawcett               500
Goldie          Slater                700
Eddie           Boyer                 700
Claude          Powell               1200
Grace           Belushi              1200
Mary Beth       Roberts              1200

319 rows selected.

2018-09-30 15:27:19 SKING >
```

Viewing the Policy on the CUSTOMERS Table

1.

```
2018-09-30 15:27:19 SKING > @/home/oracle/Desktop/vpd_lab_scripts/vpd_where_clause_customers;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


predicate (WHERE clause)
------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------------------------
------------------------------------------------------------------------------------------------

1=2 or ACCOUNT_MGR_ID = 149
1=2 or 1=1

2018-09-30 15:30:24 SYSTEM >
```

Applications   Places   System

oracle@localhost:~

Cleanup

1.

```
2018-09-30 15:30:24 SYSTEM > @/home/oracle/Desktop/vpd_lab_scripts/vpd_cleanup;
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


User dropped.


User dropped.


User dropped.


User dropped.


User dropped.


Role dropped.


Role dropped.

Connected.

Session altered.
```

```
Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


PL/SQL procedure successfully completed.


PL/SQL procedure successfully completed.


Function dropped.


Function dropped.

Connected.

Session altered.

You are running SQL*Plus in directory /home/oracle


User dropped.


User dropped.

2018-09-30 15:33:02 SYS AS SYSDBA>
```