Top 10 Features in Oracle 12c
(For Developers)

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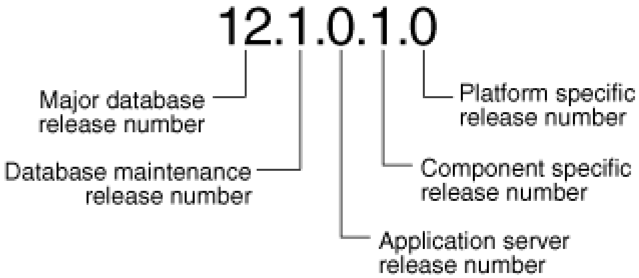
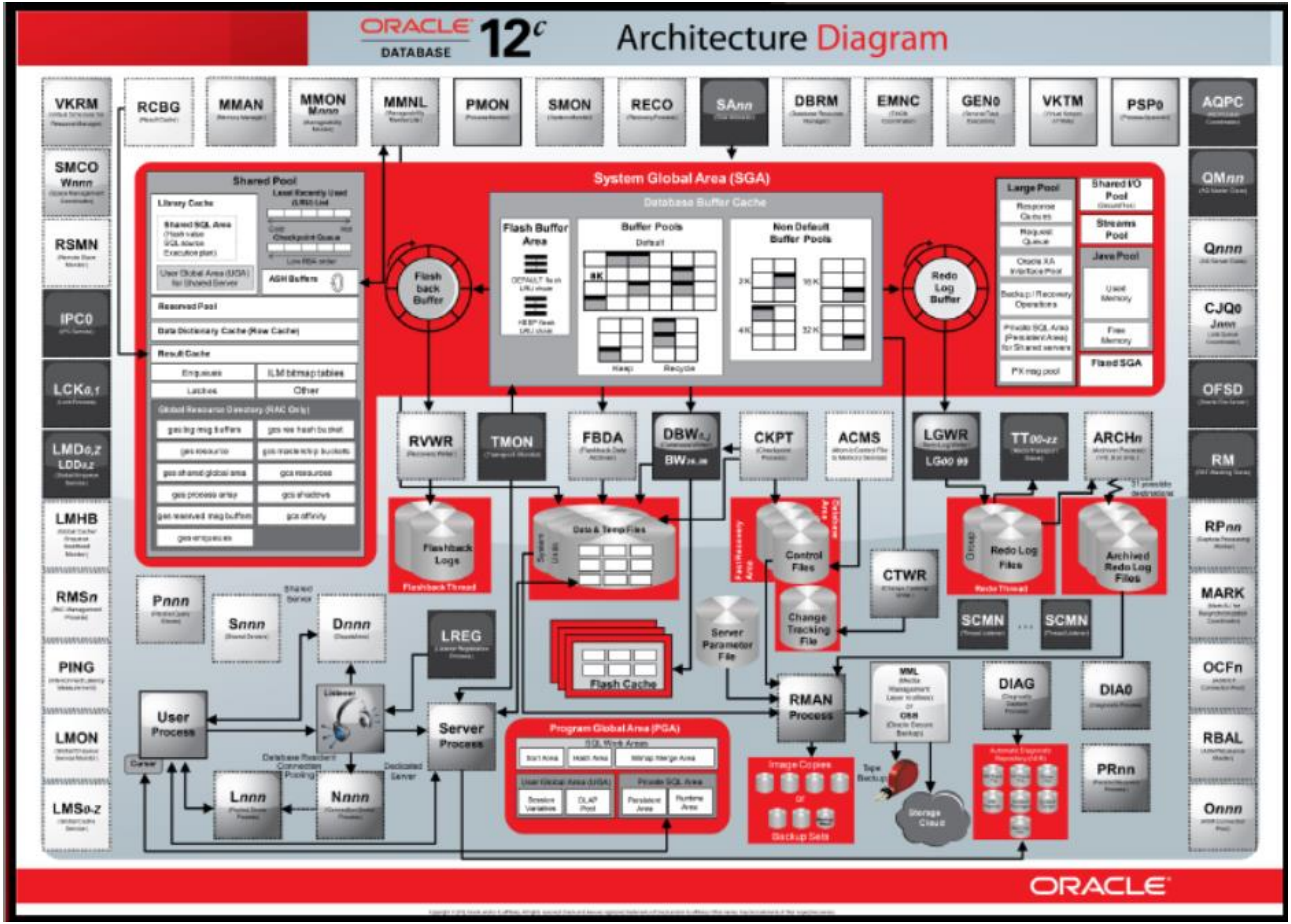
Oracle Version History

Year	Oracle Version History	Suffix Info	Releases	Desupport
2001	Oracle 9i	'i' stands for 'internet'	R1 & R2	Jul 2008 (extn)
2004	Oracle 10g	'g' stands for 'grid'	R1 & R2	R1 – Jan 2012 (extn) R2 – Jul 2013(extn)
2007	Oracle 11g	'g' stands for 'grid'	R1 & R2	R1 – Aug 2015(extn) R2 – Jan 2015(full)
2013	Oracle 12c	'c' stands for 'cloud ready'	Linux only	N/A

Understanding Oracle Database Releases Numbers


12.1.0.1.0
Major database release number
Database maintenance release number
Application server release number
Component specific release number
Platform specific release number



Source: Oracle 12c Interactive Reference Guide from Oracle

Top 10 Features in Oracle 12c (For Developers)

1. Pluggable Databases
2. Invisible Columns
3. Duplicate Indexes
4. PL/SQL Functions Defined in the SQL WITH Clause
5. PL/SQL Unit Security

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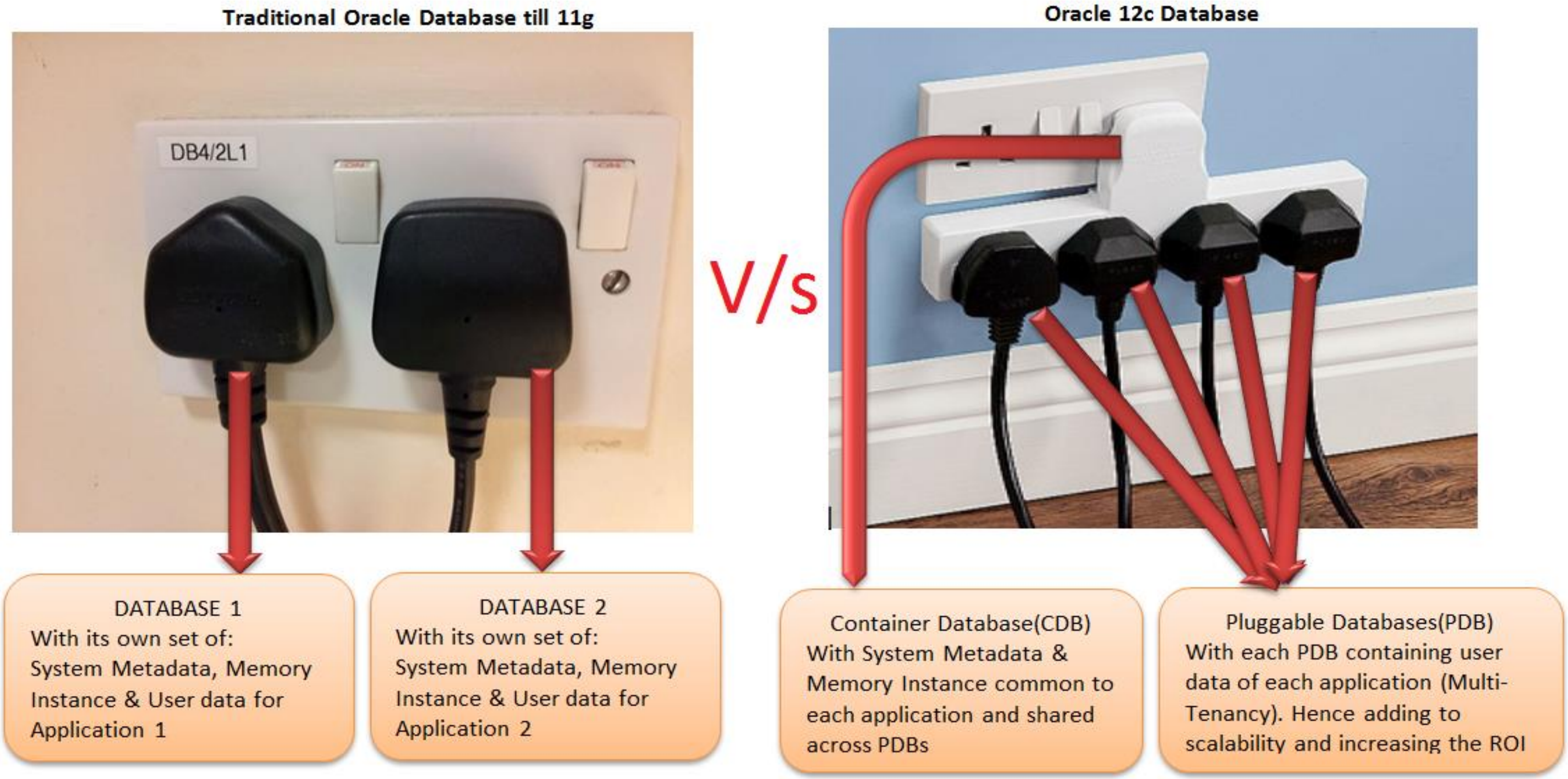
6. Interval Reference Partitions
7. INDENTITY columns
8. Increased Size Limit for VARCHAR2, NVARCHAR2, and RAW Data Types
9. Booleans in Dynamic PL/SQL
10. Implicit Result Sets

Top 10 Features in Oracle 12c (For Developers)

1. Pluggable Databases:



DATABASE 1
With its own set of:
System Metadata, Memory Instance & User data for Application 1

DATABASE 2
With its own set of:
System Metadata, Memory Instance & User data for Application 2

Container Database(CDB)
With System Metadata & Memory Instance common to each application and shared across PDBs

Pluggable Databases(PDB)
With each PDB containing user data of each application (Multi-Tenancy). Hence adding to scalability and increasing the ROI

Source: http://mahawar.net/blog/2013/07/07/oracle12c-pdb/

Top 10 Features in Oracle 12c (For Developers)

2. Invisible Columns and

Oracle 12c database allows to create columns which are invisible.

3. Duplicate Indexes:

Now multiple indexes on the same set of columns is also possible. This is possible by creating the duplicate indexes as invisible.

Parameter used to control the usage of invisible indexes - OPTIMIZER_USE_INVISIBLE_INDEXES.

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4. PL/SQL Functions Defined in the SQL WITH Clause:

In 12c, WITH clause is enhanced to now include PL/SQL units.

For instance;

```
WITH
FUNCTION Funtion_Name(arg1 IN datatype)
RETURN datatype
IS
BEGIN
RETURN;
END GET_TEXT;
SELECT column1,column2, Function_Name(column3) FROM TABLE;
```

Refer demo scripts for working example.

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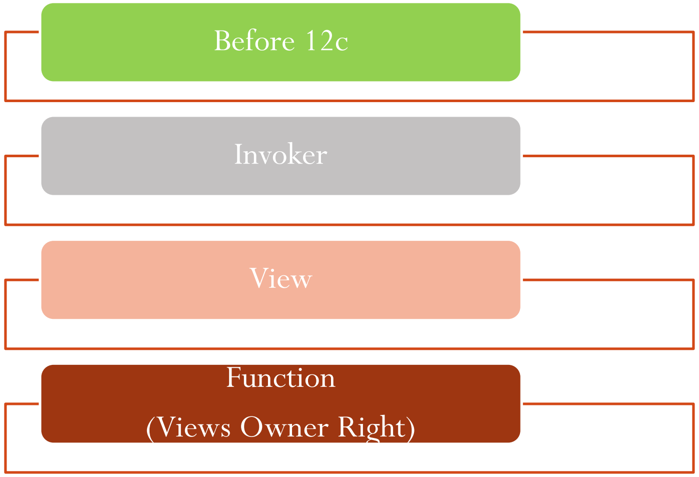
5. PL/SQL Unit Security:

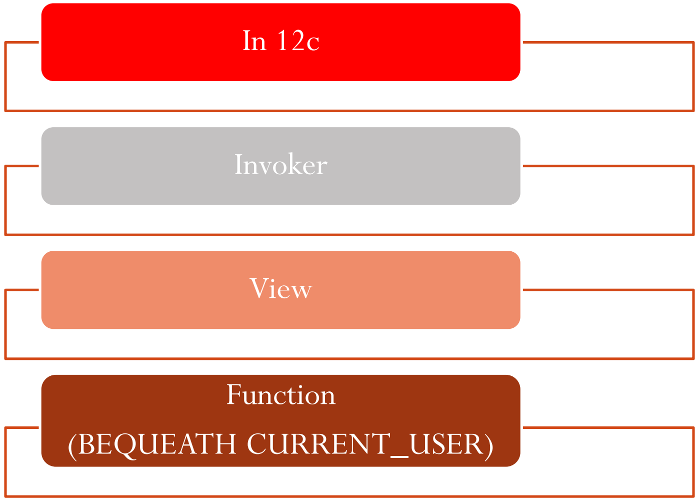
Oracle 12c now offers the users to override the default rights of function called from the view. Prior to 12c, the function executed with the rights of the views owner. Now in 12c this can be changed to execute with invokers rights


Before 12c

Invoker

View

Function
(Views Owner Right)


In 12c

Invoker

View

Function
(BEQUEATH CURRENT_USER)

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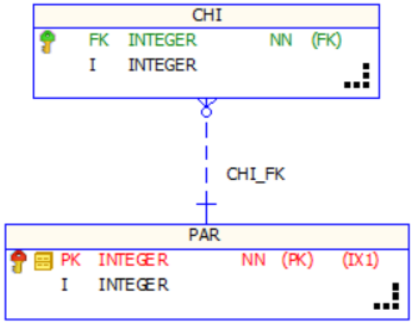
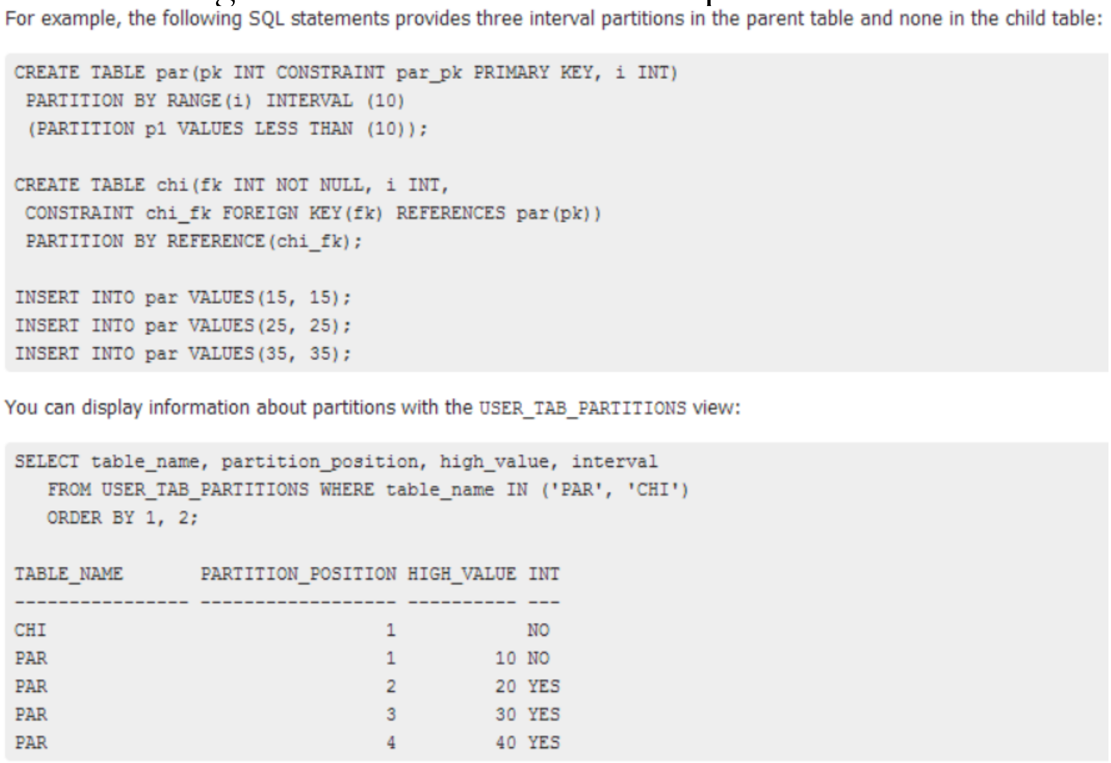
6. Interval-Ref Partitions:

You can use interval partitioned tables as parent tables for reference partitioning. Partitions in a reference-partitioned table corresponding to interval partitions in the parent table are created when inserting records into the reference partitioned table.





For example, the following SQL statements provides three interval partitions in the parent table and none in the child table:

```
CREATE TABLE par(pk INT CONSTRAINT par_pk PRIMARY KEY, i INT)
 PARTITION BY RANGE(i) INTERVAL (10)
 (PARTITION p1 VALUES LESS THAN (10));

CREATE TABLE chi(fk INT NOT NULL, i INT,
 CONSTRAINT chi_fk FOREIGN KEY(fk) REFERENCES par(pk))
 PARTITION BY REFERENCE(chi_fk);

INSERT INTO par VALUES(15, 15);
INSERT INTO par VALUES(25, 25);
INSERT INTO par VALUES(35, 35);
```

You can display information about partitions with the USER_TAB_PARTITIONS view:

```
SELECT table_name, partition_position, high_value, interval
   FROM USER_TAB_PARTITIONS WHERE table_name IN ('PAR', 'CHI')
   ORDER BY 1, 2;

TABLE_NAME       PARTITION_POSITION HIGH_VALUE INT
---------------- ------------------ ---------- ---
CHI                               1            NO
PAR                               1         10 NO
PAR                               2         20 YES
PAR                               3         30 YES
PAR                               4         40 YES
```

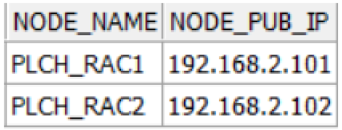
Top 10 Features in Oracle 12c (For Developers)

7. INDENTITY columns (auto-sequence on a PK), can now use a sequence as a default.

Oracle offers multiple ways to generate unique values for table columns. Use of sequence is one of the most commonly used methods for this - and in Oracle Database 12c you can now call the NEXTVAL function to get that next unique value right within the default value for the column!

```
CREATE TABLE plch_nodes
 (
   node_name      VARCHAR2(30) DEFAULT 'PLCH_RAC'|| plch_seq.NEXTVAL,
   node_pub_ip    VARCHAR2(15) UNIQUE,
   CONSTRAINT plch_nodes_pk PRIMARY KEY(node_name)
 );
INSERT INTO plch_nodes(node_pub_ip) VALUES('192.168.2.101');
INSERT INTO plch_nodes(node_pub_ip) VALUES('192.168.2.102');
```

Output:



NODE_NAME	NODE_PUB_IP
PLCH_RAC1	192.168.2.101
PLCH_RAC2	192.168.2.102

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8. Increased Size Limit for VARCHAR2, NVARCHAR2, and RAW Data Types Change the setting of MAX_STRING_SIZE in the PDB to EXTENDED.

Minimum size is 1 byte or 1 character for VARCHAR2 but now the maximum size for VARCHAR2 and NVARCHAR2 depends on the parameter MAX_STRING_SIZE.

32767 bytes or characters if MAX_STRING_SIZE = EXTENDED

4000 bytes or characters if MAX_STRING_SIZE = STANDARD

Note: You can change the value of MAX_STRING_SIZE from STANDARD to EXTENDED. However, you cannot change the value of MAX_STRING_SIZE from EXTENDED to STANDARD.

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9. Booleans in dynamic PL/SQL :

You can use booleans values in dynamic PL/SQL. Boolean can be passed to the PL/SQL routines as bind variable.

```
create or replace procedure are_you_happy(p_bool IN BOOLEAN)
IS
BEGIN
   if p_bool then
      dbms_output.put_line('Happy!');
   else
      dbms_output.put_line('Not yet!');
   end if;
END are_you_happy;
/
begin
        execute immediate 'begin are_you_happy(:a); end;' using TRUE;
        execute immediate 'begin are_you_happy(:a); end;' using FALSE;
END;
```

Output:

```
Happy!
Not yet!
```

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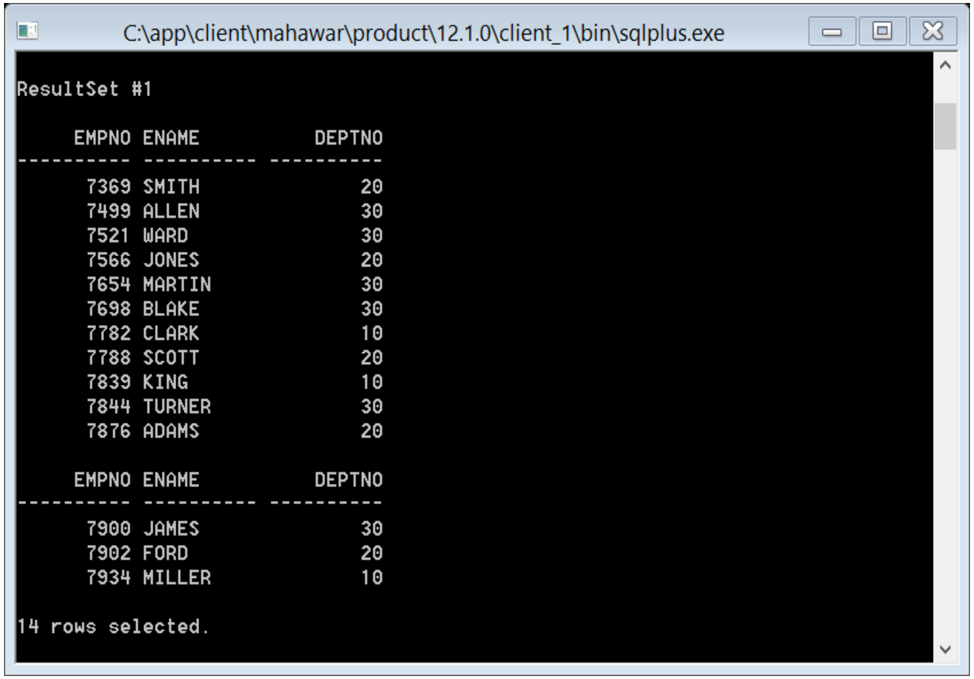
10. Implicit Result Sets:

Oracle 12c now offers PLSQL Developers to display the result of sql query directly to the screen. This is made possible the Oracle procedure DBMS_SQL.RETURN_RESULT.

For Instance,

```
DECLARE
  REF_CURSOR SYS_REFCURSOR;
BEGIN
  OPEN REF_CURSOR FOR
  SELECT EMPNO,ENAME,DEPTNO FROM EMP;
  DBMS_SQL.RETURN_RESULT(REF_CURSOR);
END;
/
```



C:\app\client\mahawar\product\12.1.0\client_1\bin\sqlplus.exe

```
ResultSet #1

     EMPNO ENAME          DEPTNO
---------- ---------- ----------
      7369 SMITH              20
      7499 ALLEN              30
      7521 WARD               30
      7566 JONES              20
      7654 MARTIN             30
      7698 BLAKE              30
      7782 CLARK              10
      7788 SCOTT              20
      7839 KING               10
      7844 TURNER             30
      7876 ADAMS              20

     EMPNO ENAME          DEPTNO
---------- ---------- ----------
      7900 JAMES              30
      7902 FORD               20
      7934 MILLER             10

14 rows selected.
```

References

- Oracle Database 12c: Interactive Quick Reference:
  - http://www.oracle.com/webfolder/technetwork/tutorials/obe/db/12c/r1/poster/OUTPUT_poster/poster.html
- PL/SQL Enhancements by Steven Feuerstein:
  - http://www.oracle.com/technetwork/issue-archive/2013/13-sep/o53plsql-1999801.html
- Lewis Cunningham – Top Features in 12c:
  - http://it.toolbox.com/blogs/oracle-guide/my-top-10-oracle-database-12c-new-features-53280
- Orafaq – Oracle Version History:
  - http://www.orafaq.com/wiki/Oracle_database
- Oracle Documentation – About Oracle Release Numbers:
  - http://docs.oracle.com/cd/E11882_01/server.112/e10819/intro.htm#i1008567

Q & A

Thanks You