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Practical 7

AIM: Distributed databases- Replication Fragmentation

Perform Replication Fragmentation

Create a global conceptual schema Emp (Eno; Ename; Address; Email; Salary) and insert 10 records.
Store the replication of Emp into two different nodes.

What is Database Replication?

- Data Replication is the process of storing data in more than one site or node.
- It is useful in improving the availability of data.
- It is simply copying data from a database from one server to another server so that all the users can share the same data without any inconsistency.
- The result is a distributed database in which users can access data relevant to their tasks without interfering with the work of others.
- Data replication encompasses duplication of transactions on an ongoing basis, so that the replicate is in a consistently updated state and synchronized with the source.
- However, in data replication data is available at different locations, but a particular relation has to reside at only one location.
- There can be full replication, in which the whole database is stored at every site.
- There can also be partial replication, in which some frequently used fragment of the database are replicated and others are not replicated.

Advantages of full replication:

- ✓ High Availability of Data.
- ✓ Improves the performance for retrieval of global queries as the result can be obtained locally from any of the local site.
- ✓ Faster execution of Queries.

Disadvantages of full replication:

- ✓ Concurrency is difficult to achieve in full replication.
- ✓ Slow update process as a single update must be performed at different databases to keep the copies consistent.

Fire the following queries:

1. Find the salary of all employees.
2. Find the email of all employees where salary=12,000.
3. Find the employee's name & email where employee number is known.
4. Find the employee's name & address where employee number is known.

Step 1: Connect to Global database using the following command:

SQL> Connect system@xe

```
SQL> spool 'D:\SADIQ\MSc\SEM 1\ADT\PRAC\Rep\sys.txt'
SQL>
SQL> Connect system@xe
Enter password:
Connected.
```

Step 2: Now our table already exists. But just to be use the command to check if our table exists:

SQL> select * from emp;

```
SQL> select * from emp;

       ENO ENAME                ADDRESS
---------- -------------------- ------------------------------
EMAIL                                 SAL
------------------------------ ----------
       101 sadiq                bandra
sadiq@gmail.com                     21000

       102 sova                 cst
sova@gmail.com                       9000

       103 reyna                dadar
reyna@gmail.com                     12000


       ENO ENAME                ADDRESS
---------- -------------------- ------------------------------
EMAIL                                 SAL
------------------------------ ----------
       104 sage                 andheri
sage@gmail.com                       8600

       105 viper                marine lines
viper@gmail.com                     18000

       106 harbor               chruchgate
harbor@gmail.com                    24000
```

```
       ENO ENAME                ADDRESS
---------- -------------------- ------------------------------
EMAIL                                SAL
------------------------------ ----------
       107 brim                 mahim
brim@gmail.com                       9900

       108 omen                 sandhrust road
omen@gmail.com                      16000

       109 pheonix              cotton green
pheonix@gmail.com                    9999


       ENO ENAME                ADDRESS
---------- -------------------- ------------------------------
EMAIL                                SAL
------------------------------ ----------
       110 fade                 khar
fade@gmail.com                      10001

       111 swordx               pearl
swordx@gmail.com                    14500


11 rows selected.
```

So our table exists

Step 3: Perform commit for system

SQL> commit;

```
SQL> commit;

Commit complete.

SQL> spool end;
SQL>
```

Step 4: Now open another sqlplus and login with user1 id and password

SQL> connect user1@xe

```
SQL> spool 'D:\SADIQ\MSc\SEM 1\ADT\PRAC\Rep\u1.txt'
SQL>
SQL> connect user1@xe
Enter password:
Connected.
```

Step 5: Create database link to global database in order to access the data of global database table.

SQL> create database link l11 connect to system identified by rdnc using 'xe';

```
SQL> create database link l11 connect to system identified by rdnc using 'xe';

Database link created.
```

Step 6: Now create a view of the global database

SQL> create view v1 as select * from emp@l11;

```
SQL> create view v1 as select * from emp@l11;

View created.
```

Step 7: We have inserted data from the global database into our v1 view. Now check that view:

SQL> select * from v1;

```
SQL> select * from v1;

       ENO ENAME                ADDRESS
---------- -------------------- ------------------------------
EMAIL                                SAL
------------------------------ ----------
       101 sadiq                bandra
sadiq@gmail.com                     21000

       102 sova                 cst
sova@gmail.com                       9000

       103 reyna                dadar
reyna@gmail.com                     12000
```

```
       ENO ENAME                ADDRESS
---------- -------------------- ------------------------------
EMAIL                                SAL
------------------------------ ----------
       104 sage                 andheri
sage@gmail.com                       8600

       105 viper                marine lines
viper@gmail.com                     18000

       106 harbor               chruchgate
harbor@gmail.com                    24000


       ENO ENAME                ADDRESS
---------- -------------------- ------------------------------
EMAIL                                SAL
------------------------------ ----------
       107 brim                 mahim
brim@gmail.com                       9900

       108 omen                 sandhrust road
omen@gmail.com                      16000

       109 pheonix              cotton green
pheonix@gmail.com                    9999


       ENO ENAME                ADDRESS
---------- -------------------- ------------------------------
EMAIL                                SAL
------------------------------ ----------
       110 fade                 khar
fade@gmail.com                      10001

       111 swordx               pearl
swordx@gmail.com                    14500


11 rows selected.
```

Step 8: Perform commit for User1

SQL> commit;

```
SQL> commit;

Commit complete.

SQL> spool end;
SQL>
```

Step 9: Now open another sqlplus and login with user2 id and password

SQL> connect user2@xe

```
SQL> spool 'D:\SADIQ\MSc\SEM 1\ADT\PRAC\Rep\u2.txt'
SQL>
SQL> connect user2@xe
Enter password:
Connected.
```

Step 10: Create database link to global database in order to access the data of global database table.

SQL> create database link l22 connect to system identified by rdnc using 'xe';

```
SQL> create database link l22 connect to system identified by rdnc using'xe';

Database link created.
```

Step 11: Now create a view of the global database

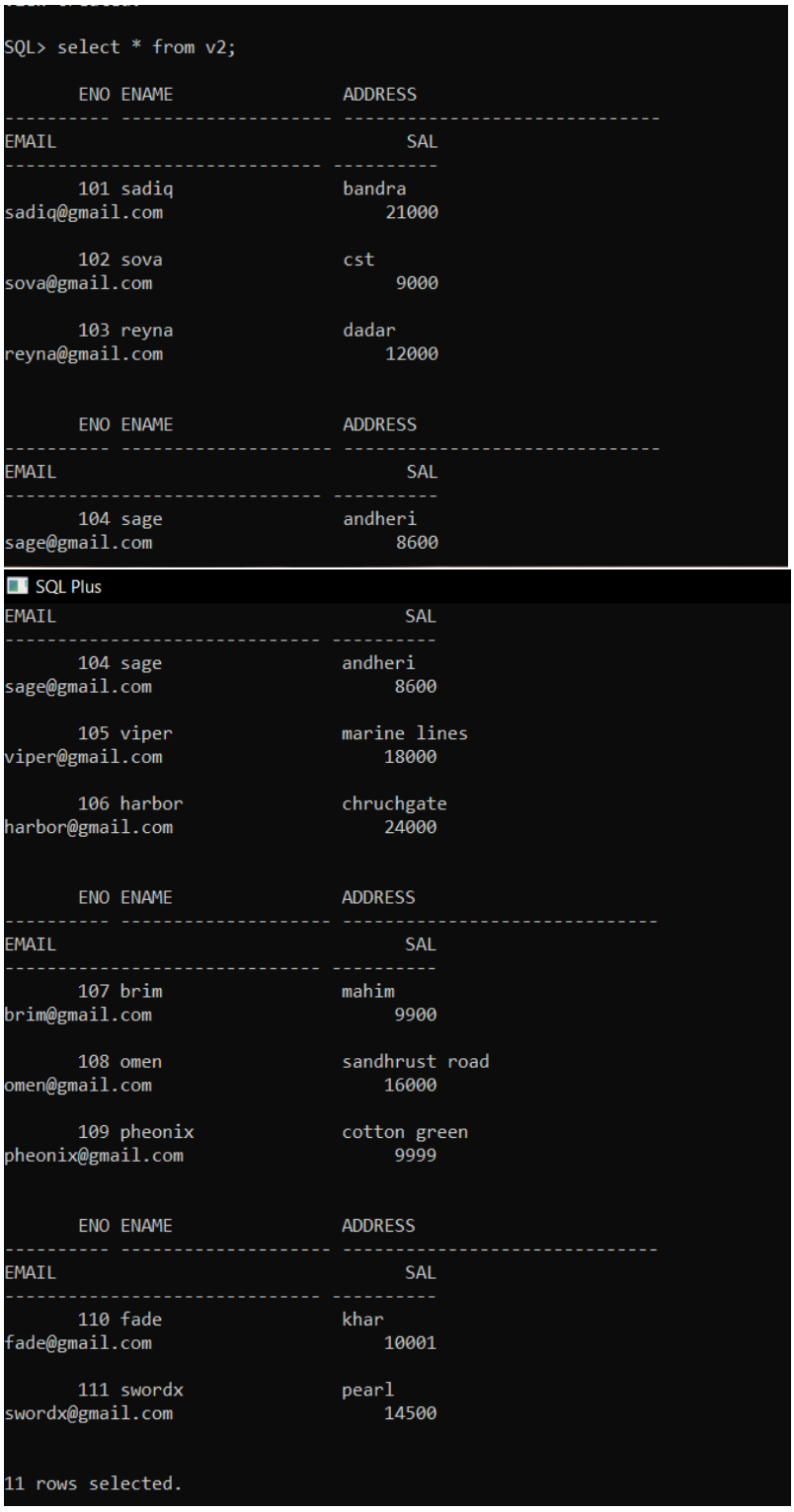
SQL> create view v2 as select * from emp@l22;

```
SQL> create view v2 as select * from emp@l22;

View created.
```

Step 12: We have inserted data from the global database into our v2 view. Now check that view:

SQL> select * from v2;



Step 13: Perform commit for User2

SQL> commit;

```
SQL> commit;

Commit complete.

SQL> spool end;
SQL>
```

Step 14: Now we will fire our queries in the third user. So open another sqlplus and login with user3 id and password.

SQL> connect user3@xe

```
SQL> spool 'D:\SADIQ\MSc\SEM 1\ADT\PRAC\Rep\u3.txt'
SQL>
SQL> connect user3@xe
Enter password:
Connected.
```

Step 15: Create database link for both the tables here in order to access various types of data based on given queries:

SQL> create database link l1 connect to user1 identified by u1 using 'xe';

Database link created.

SQL> create database link l2 connect to user2 identified by u2 using 'xe';

Database link created.

```
SQL> create database link l11 connect to user1 identified by u1 using'xe';

Database link created.

SQL> create database link l22 connect to user2 identified by u2 using 'xe';

Database link created.
```

Step 16: Fire the Queries:

1. **Find the salary of all employees.**
   SQL> select sal from v1@l11;

```
SQL> select sal from v1@l11;

       SAL
----------
     21000
      9000
     12000
      8600
     18000
     24000
      9900
     16000
      9999
     10001
     14500

11 rows selected.
```

2. **Find the email of all employees where salary=12,000.**
   SQL> select email from v2@l22 where sal=12000;

```
SQL> select email from v2@l22 where sal=12000;

EMAIL
----------------------------
reyna@gmail.com
```

3. **Find the employee's name & email where employee number is known.**
   SQL> select ename,email from v1@l11 where eno=&eno;
   Enter value for eno: 108

```
SQL> select ename,email from v1@l11 where eno=&eno;
Enter value for eno: 108
old   1: select ename,email from v1@l11 where eno=&eno
new   1: select ename,email from v1@l11 where eno=108

ENAME                EMAIL
-------------------- ------------------------------
omen                 omen@gmail.com
```

4. **Find the employee's name & address where employee number is known.**
   SQL> select ename,address from v2@l2 where eno=&eno;
   Enter value for eno: 111

```
SQL> select ename,address from v2@l2 where eno=&eno;
Enter value for eno: 111
old   1: select ename,address from v2@l2 where eno=&eno
new   1: select ename,address from v2@l2 where eno=111

ENAME                ADDRESS
-------------------- ------------------------------
swordx               pearl

SQL> commit;

Commit complete.

SQL> spool end;
SQL>
```

We have successfully performed Replication Fragmentation.