Practices for Lesson 12

Managing High Availability of Services

Practices for Lesson 12: Overview

Practices Overview

In these practices, you will create, manage, and monitor services.

Practice 12-1: Working with Services

Overview

In this practice, you will create a service called `prod1`. You then observe what happens to your service when you terminate the instances on which it is running.

1. Use SRVCTL to create a singleton service called PROD1.

    1) Connect to your first node as the `oracle` user. Be sure to use the `-X` option. Set up your environment variables using the `oraenv` script. Change the directory to `/stage/RAC/labs/lab_12`.

    ```
    [oracle@ol7-122-rac1 ~]$ .
    oraenv ORACLE_SID = [oracle]
    ? orcl
    The Oracle base has been set to /u01/app/oracle


    [oracle@ol7-122-rac1 ~]$ cd


    /stage/RAC/labs/lab_12


    [oracle@ol7-122-rac1 lab_12]$
    ```

    2) Use SRVCTL to create a SINGLETON service called PROD1 using the `orcldb` server pool.

    ```
    [oracle@ol7-122-rac1 lab_12]$ srvctl add service -db orcl -
    service PROD1 -serverpool orcldb -cardinality singleton -policy
    manual


    [oracle@ol7-122-rac1 lab_12]$ srvctl status service -db orcl
    Service PROD1 is not running.


    [oracle@ol7-122-rac1 lab_12]$
    ```

    3) Use SRVCTL to start the PROD1 service.

    ```
    [oracle@ol7-122-rac1 lab_12]$ srvctl start service -db orcl -
    serviceprod1
    [oracle@ol7-122-rac1 lab_12]$ srvctl status service -db
    orclService PROD1 is running on nodes: ol7-122-rac2
    [oracle@ol7-122-rac1 lab_12]$
    ```

    4) Add the following entry for the PROD1 service in the `tnsnames.ora` on all three hosts.

    ```
    prod1 = (DESCRIPTION = (ADDRESS = (PROTOCOL = TCP)(HOST =
        cluster01-scan.cluster01.example.com)(PORT =
        1521))(LOAD_BALANCE = YES)(CONNECT_DATA = (SERVER =
        DEDICATED)(SERVICE_NAME = prod1)))
    ```

Use the `add_tns.sh` script to add the entries on all three hosts if you like.

```
[oracle@ol7-122-rac1 lab_12]$ cat add_tns.sh
cat /stage/RAC/labs/lab_12/prod1_tns.txt>>
/u01/app/oracle/product/12.1.0/dbhome_1/network/admin/tnsnames.ora

ssh ol7-122-rac2 "cat /stage/RAC/labs/lab_12/prod1_tns.txt>>
/u01/app/oracle/product/12.1.0/dbhome_1/network/admin/tnsnames.ora"

ssh ol7-122-rac3 "cat /stage/RAC/labs/lab_12/prod1_tns.txt>>
/u01/app/oracle/product/12.1.0/dbhome_1/network/admin/tnsnames.ora"

echo "PROD1 tnsnames.ora entry completed for OL7-122-
RAC1"echo "PROD1 tnsnames.ora entry completed for
OL7-122-RAC2"echo "PROD1 tnsnames.ora entry completed
for OL7-122-RAC3"

[oracle@ol7-122-rac1 lab_12]$ cat prod1_tns.txt

prod1 = (DESCRIPTION =
  (ADDRESS = (PROTOCOL = TCP)(HOST = cluster01-
scan.cluster01.example.com)(PORT = 1521))
    (LOAD_BALANCE = YES) (CONNECT_DATA = (SERVER =
DEDICATED)(SERVICE_NAME = prod1)))

[oracle@ol7-122-rac1 lab_12]$ ZZ
PROD1 tnsnames.ora entry completed for OL7-
122-RAC1PROD1 tnsnames.ora entry completed for
OL7-122-RAC2  PROD1    tnsnames.ora    entry
completed for OL7-122-RAC3

[oracle@ol7-122-rac1 lab_12]$
```

2. Use the `srvctl` command to check the status of the new service. On which host is your service running? (It may be different from the example below)

```
[oracle@ol7-122-rac1 lab_12]$ srvctl status service -db ORCL -s
prod1
Service prod1 is running on nodes: ol7-122-rac2
[oracle@ol7-122-rac1 ~]$
```

3. Change the user to `grid`, set the environment, and check the status of the PROD1 service using CRSCTL.

```
[oracle@ol7-122-rac1 lab_12]$ su - grid
Password:

[grid@ol7-122-rac1 ~]$ . oraenv
ORACLE_SID = [grid] ? +ASM1
```

```
The Oracle base has been set to /u01/app/grid

[grid@ol7-122-rac1 ~]$ crsctl stat res -t
--------------------------------------------------------------------------------
Name            Target  State        Server       State details
--------------------------------------------------------------------------------
Local Resources
--------------------------------------------------------------------------------
ora.DATA.dg
                ONLINE  ONLINE       ol7-122-rac1   STABLE
                ONLINE  ONLINE       ol7-122-rac2   STABLE
                ONLINE  ONLINE       ol7-122-rac3   STABLE
ora.FRA.dg
                ONLINE  ONLINE       ol7-122-rac1   STABLE
                ONLINE  ONLINE       ol7-122-rac2   STABLE
                ONLINE  ONLINE       ol7-122-rac3   STABLE
ora.LISTENER.lsnr
                ONLINE  ONLINE       ol7-122-rac1   STABLE
                ONLINE  ONLINE       ol7-122-rac2   STABLE
                ONLINE  ONLINE       ol7-122-rac3   STABLE
ora.net1.network
                ONLINE  ONLINE       ol7-122-rac1   STABLE
                ONLINE  ONLINE       ol7-122-rac2   STABLE
                ONLINE  ONLINE       ol7-122-rac3   STABLE
ora.ons
                ONLINE  ONLINE       ol7-122-rac1   STABLE
                ONLINE  ONLINE       ol7-122-rac2   STABLE
                ONLINE  ONLINE       ol7-122-rac3   STABLE
--------------------------------------------------------------------------------
Cluster Resources
--------------------------------------------------------------------------------
ora.LISTENER_SCAN1.lsnr
      1         ONLINE  ONLINE       ol7-122-rac2   STABLE
ora.LISTENER_SCAN2.lsnr
      1         ONLINE  ONLINE       ol7-122-rac3   STABLE
ora.LISTENER_SCAN3.lsnr
      1         ONLINE  ONLINE       ol7-122-rac1   STABLE
ora.MGMTLSNR
      1         ONLINE  ONLINE       ol7-
122-rac1169.254.68.205 192.1
                                                    68.1.101
192.168.2.1
                                                    01,STABLE
```

```
ora.asm
      1        ONLINE  ONLINE         ol7-
122-rac1Started,STABLE
      2        ONLINE  ONLINE         ol7-
122-rac2Started,STABLE
      3        ONLINE  ONLINE         ol7-
122-rac3Started,STABLE
ora.cvu
      1        OFFLINE OFFLINE                          STABLE
ora.gns
      1        ONLINE  ONLINE         ol7-122-rac1   STABLE
ora.gns.vip
      1        ONLINE  ONLINE         ol7-122-rac1   STABLE
ora.ol7-122-rac1.vip
      1        ONLINE  ONLINE         ol7-122-rac1   STABLE
ora.ol7-122-rac2.vip
      1        ONLINE  ONLINE         ol7-122-rac2   STABLE
ora.ol7-122-rac3.vip
      1        ONLINE  ONLINE         ol7-122-rac3   STABLE
ora.mgmtdb
      1        ONLINE  ONLINE         ol7-122-rac1   Open,STABLE
ora.oc4j
      1        ONLINE  ONLINE         ol7-122-rac1   STABLE
ora.orcl.db
      1        ONLINE  ONLINE         ol7-122-rac2   Open,STABLE
      2        ONLINE  ONLINE         ol7-122-rac3   Open,STABLE
      3        ONLINE  ONLINE         ol7-122-rac1   Open,STABLE
```
ora.orcl.prod1.svc
```
      1        ONLINE  ONLINE         ol7-122-rac2   STABLE
```
```
ora.scan1.vip
      1        ONLINE  ONLINE         ol7-122-rac2   STABLE
ora.scan2.vip
      1        ONLINE  ONLINE         ol7-122-rac3   STABLE
ora.scan3.vip
      1        ONLINE  ONLINE         ol7-122-rac1   STABLE
--------------------------------------------------------------------------------------------------


[grid@ol7-122-rac1 ~]$ exit
logout
[oracle@ol7-122-rac1 lab_12]$
```

4. Connect to the service and query `V$INSTANCE` and determine what instance you are connected to. Check the database status to determine the host on which the instance is running.

```
[oracle@ol7-122-rac1 lab_12]$ sqlplus
sys/sys_password@prod1 assysdba


SQL*Plus: Release 12.1.0.2.0 Production on Tue Sep 17 13:37:47
2014


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Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 -
64bit Production
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Advanced Analytics and Real Application Testing options


SQL> select instance_name from v$instance;


INSTANCE_NAME


orcl_1---------------

SQL> exit
Disconnected from Oracle Database 12c Enterprise Edition Release
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[oracle@ol7-122-rac1 lab_12]$ srvctl status database -db orcl
Instance orcl_1 is running on node ol7-
122-rac2Instance orcl_2 is running on node
ol7-122-rac3Instance orcl_3 is running on
node ol7-122-rac1
[oracle@ol7-122-rac1 lab 12]$
```

5. From a terminal session on the node hosting the PROD1 service, as the `oracle` user, crash the instance on that node. In this example, the service is running on `ol7-122-rac2`. Use `ssh` to log in to the host, find the database `pmon` process and kill the `ora_pmon_orcl_n`process. Use the `pkill -9 -f ora_pmon_orcl_n` command to crash the database instance. The `orcl_1` instance will crash and the Clusterware services will restart it veryquickly. Exit back to `ol7-122-rac1`.

```
[oracle@ol7-122-rac1 lab_12]$ ssh ol7-122-rac2
Last login: Tue Sep 17 13:45:52 2014 from ol7-122-
rac1.example.com[oracle@ol7-122-rac2 ~]$ ps -ef|grep
ora_pmon
oracle    4305    1  0 Sep13 ?        00:04:25 ora_pmon_orcl_1
oracle   26772 26746  0 13:47 pts/1    00:00:00 grep ora_pmon

[oracle@ol7-122-rac2 ~]$ pkill -9 -f ora_pmon_orcl_1

[oracle@ol7-122-rac2 ~]$ exit
logout
Connection to ol7-122-rac2
closed.[oracle@ol7-122-rac1
lab 12]$
```

6. Use SRVCTL to check the status of the PROD1 service. Where is the service running now?
    In the example below, the service has been failed over to ol7-122-rac3. What instance
    is running on the system hosting the service?

```
[oracle@ol7-122-rac1 lab_12]$ srvctl status service -db orcl
Service PROD1 is running on nodes: ol7-122-rac3

[oracle@ol7-122-rac1 lab_12]$ srvctl status database -db orcl
Instance orcl_1 is running on node ol7-
122-rac2Instance orcl_2 is running on node
ol7-122-rac3Instance orcl_3 is running on
node ol7-122-rac1
[oracle@ol7-122-rac1 lab 12]$
```

7. Make a connection to the database using the PROD1 service. What instance are you
    connected to?

```
[oracle@ol7-122-rac1 lab_12]$ sqlplus
sys/sys_password@prod1 assysdba

SQL*Plus: Release 12.1.0.2.0 Production on Fri Jan 9 11:07:01
2015

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```

```
SQL> select instance_name from v$instance;


INSTANCE_NAME
-----------------------
orcl_2


SQL> exit
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Storage Management, OLAP,
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[oracle@ol7-122-rac1 lab_12]$ srvctl status database -db orcl
Instance orcl_1 is running on node ol7-
122-rac2Instance orcl_2 is running on node
ol7-122-rac3Instance orcl_3 is running on
node ol7-122-rac1


[oracle@ol7-122-rac1 lab_12]$
```

8. Use SRVCTL to relocate the PROD1 service back to the original host.

```
[oracle@ol7-122-rac1 lab_12]$ srvctl relocate service -db
orcl -service PROD1 -c ol7-122-rac3 -n ol7-122-rac2


[oracle@ol7-122-rac1 lab_12]$
```

9. Verify that the PROD1 service has been relocated to the host specified in the previous step.

```
[oracle@ol7-122-rac1 lab_12]$ srvctl status service -db orcl
Service PROD1 is running on nodes: ol7-122-rac2


[oracle@ol7-122-rac1 lab_12]$
```

10. Close all terminal sessions opened for this practice.

Practice 12-2: Monitoring Services

Overview

In this practice, you will use EM Express to determine the amount of resources used by sessions executing under a particular service.

1. Connect to your first node as the `oracle` user. Set up your environment variables using the `oraenv` script. Change directory to `/stage/RAC/labs/lab_12`. Execute the `createuser.sh` script. This script creates a new user called `jmw` identified by the password `jmw`. The default tablespace of this user is `USERS`, and its temporary tablespace is `TEMP`. This new user has the `CONNECT`, `RESOURCE`, and `DBA` roles.

```
[vncuser@classroom_pc ~]$ ssh oracle@ol7-122-rac1
oracle@ol7-122-rac1's password:

[oracle@ol7-122-rac1 ~]$ . oraenv
ORACLE_SID = [oracle] ? orcl
The Oracle base has been set to /u01/app/oracle

[oracle@ol7-122-rac1 ~]cd

/stage/RAC/labs/lab_12

[oracle@ol7-122-rac1 lab_12]$ cat createuser.sh
export HOST=`hostname -s`
export ORACLE_HOME=/u01/app/oracle/product/12.1.0/dbhome_1
export ORACLE_SID=`$ORACLE_HOME/bin/srvctl status database -db
orcl|grep $HOST|cut -f2 -d" "`
export PATH=$PATH:$ORACLE_HOME/bin


/u01/app/oracle/product/12.1.0/dbhome_1/bin/sqlplus -s /NOLOG
<<EOF

 connect / as sysdba
 drop user jmw cascade;
 create user jmw identified by jmw default tablespace users
temporary tablespace temp;
 grant connect, resource, dba to jmw;

EOF

[oracle@ol7-122-rac1 lab_12]$ ./createuser.sh

User dropped.
```

```
User created.


Grant succeeded.

[oracle@ol7-122-rac1

lab_12]$
```

2. Open a second terminal to your first node as the `oracle` user. Be sure to use the **–X** option. Set up your environment variables using the `oraenv` script. Next, start Firefox and enter the following address: **https://ol7-122-rac1:5500/em**
Log in to EM Express as sys/*sys_password* as SYSDBA.

```
[vncuser@classroom_pc ~]$ ssh -X oracle@ol7-122-rac1
oracle@ol7-122-rac1's password:

[oracle@ol7-122-rac1 ~]$ . oraenv
ORACLE_SID = [oracle] ? orcl
The Oracle base has been set to /u01/app/oracle

[oracle@ol7-122-rac1 ~]$ firefox&

[oracle@ol7-122-rac1 ~]$
```

3. From the first terminal session, connect to `prod1` as `jmw` using SQL*Plus. When connected, determine the instance on which your session is currently running.

   Then execute the following query:

   select count(*) from dba_objects,dba_objects,dba_objects
   Do not wait; instead, proceed with the next step.

```
[oracle@ol7-122-rac1 lab_12]$ sqlplus jmw/jmw_password@PROD1
SQL> select instance_name from v$instance;


INSTANCE_NAME
-----------------------
orcl_1

SQL> select count(*) from dba_objects,dba_objects,dba_objects;
```

4. Check statistics on your service with `gv$service_stats` from a SQL*Plus session connected as SYSDBA as shown below.

```
[oracle@ol7-122-rac1 ~]$ sqlplus sys/sys_password@orcl as sysdba
```

```
SQL*Plus: Release 12.1.0.2.0 Production on Tue Sep 17 14:47:31
2014


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SQL> select stat_name, sum(value) from gv$service_stats where
service_name = 'PROD1' group by stat_name;


STAT_NAME                                              SUM(VALUE)
----------------------------------------------------- --------------
user calls                                                     18
DB CPU                                                  790706794
redo size                                                     704
db block changes                                                4
DB time                                                884881915
user rollbacks                                                  0
gc cr blocks received                                           2
gc cr block receive time                                        0
gc current blocks received                                      0
opened cursors cumulative                                     242
workarea executions - multipass                                 0


STAT_NAME                                              SUM(VALUE)
----------------------------------------------------- --------------
session cursor cache hits                                     190
user I/O wait time                                         876444
parse count (total)                                            99
physical reads                                                 29
gc current block receive time                                   0
workarea executions - optimal                                  52
concurrency wait time                                       70511
parse time elapsed                                        2149526
physical writes                                                 0
workarea executions - onepass                                   0
execute count                                                 244
```

```
STAT_NAME                                                            SUM(VALUE)
------------------------------------------------------------------- ---------------
session logical reads                                                       7219
cluster wait time                                                         875217
application wait time                                                           0
logons cumulative                                                              1
sql execute elapsed time                                               884654643
user commits                                                                   0


28 rows selected.


SQL> exit


[oracle@ol7-122-


rac1 ~]$
```

5. You can also use EM Express to view service activity. Click Performance, then
    Performance Hub, and then the Activity tab. On the activity timeline graph, select Session
    Identifiers > Service from the pull-down list.
    On the bottom-left summary graphic, again choose Session Identifiers > Service from the
    pull-down list.
    On the bottom-right summary graphic, choose Session Identifiers > User ID from the pull-
    down list. Spend a few moments and monitor the service activity for the PROD1 service.
    You should see the PROD1 service activity steadily increase.
    Go to the first terminal window. If the query is still running, stop it by pressing Ctrl + C.
    Returning to EM Express, you should see the service activity for PROD1 steadily decrease
    until it disappears from the monitored list due to inactivity.

6. Stop the PROD1 service and remove it.

    ```
    [oracle@ol7-122-rac1 ~]$ srvctl stop service -d orcl -s PROD1


    [oracle@ol7-122-rac1 ~]$ srvctl remove service -d orcl -s PROD1
    [oracle@ol7-122-rac1 ~]$
    ```

7. Dismiss Firefox and EM Express and close all terminal windows opened for this practice.