**Practices for Lesson 12**

**Managing High Availability of Services**

Practices for Lesson 12: Managing High Availability of Services

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**Practices for Lesson 12: Overview**

**Practices Overview**

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

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# Practice 9-1: 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/less\_09.

|  |
| --- |
| [vncuser@*classroom\_pc* ~]$ **ssh -X oracle@host01**  oracle@host01's password: [oracle@host01 ~]$ **. oraenv** ORACLE\_SID = [oracle] ? **orcl**  The Oracle base has been set to /u01/app/oracle [oracle@host01 ~]$ **cd /stage/RAC/labs/less\_09**  [oracle@host01 less\_09]$ |

* 1. Use SRVCTL to create a SINGLETON service called PROD1 using the orcldb

server pool.

|  |
| --- |
| [oracle@host01 less\_09]$ **srvctl add service -db orcl -service PROD1 -serverpool orcldb -cardinality singleton -policy manual**  [oracle@host01 less\_09]$ **srvctl status service -db orcl**  Service PROD1 is not running.  [oracle@host01 less\_09]$ |

* 1. Use SRVCTL to start the PROD1 service.

|  |
| --- |
| [oracle@host01 less\_09]$ **srvctl start service -db orcl -service prod1**  [oracle@host01 less\_09]$ **srvctl status service -db orcl** Service PROD1 is running on nodes: host02 [oracle@host01 less\_09]$ |

* 1. 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)))

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Use the add\_tns.sh script to add the entries on all three hosts if you like.

|  |
| --- |
| [oracle@host01 less\_09]$ **cat add\_tns.sh**  cat /stage/RAC/labs/less\_09/prod1\_tns.txt>>  /u01/app/oracle/product/12.1.0/dbhome\_1/network/admin/tnsnames.ora  ssh host02 "cat /stage/RAC/labs/less\_09/prod1\_tns.txt>>  /u01/app/oracle/product/12.1.0/dbhome\_1/network/admin/tnsnames.ora"  ssh host03 "cat /stage/RAC/labs/less\_09/prod1\_tns.txt>>  /u01/app/oracle/product/12.1.0/dbhome\_1/network/admin/tnsnames.ora"  echo "PROD1 tnsnames.ora entry completed for HOST01" echo "PROD1 tnsnames.ora entry completed for HOST02" echo "PROD1 tnsnames.ora entry completed for HOST03"  [oracle@host01 less\_09]$ **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@host01 less\_09]$ **ZZ**  PROD1 tnsnames.ora entry completed for HOST01 PROD1 tnsnames.ora entry completed for HOST02 PROD1 tnsnames.ora entry completed for HOST03  [oracle@host01 less\_09]$ |

1. 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@host01 less\_09]$ **srvctl status service -db ORCL -s prod1**  Service prod1 is running on nodes: **host02**  [oracle@host01 ~]$ |

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

|  |
| --- |
| [oracle@host01 less\_09]$ **su - grid**  Password:  [grid@host01 ~]$ **. oraenv**  ORACLE\_SID = [grid] ? **+ASM1** |

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|  |
| --- |
| The Oracle base has been set to /u01/app/grid  [grid@host01 ~]$ **crsctl stat res -t**  Name Target State Server State details Local Resources  ora.DATA.dg  ONLINE ONLINE host01 STABLE  ONLINE ONLINE host02 STABLE  ONLINE ONLINE host03 STABLE  ora.FRA.dg  ONLINE ONLINE host01 STABLE  ONLINE ONLINE host02 STABLE  ONLINE ONLINE host03 STABLE  ora.LISTENER.lsnr  ONLINE ONLINE host01 STABLE  ONLINE ONLINE host02 STABLE  ONLINE ONLINE host03 STABLE  ora.net1.network  ONLINE ONLINE host01 STABLE  ONLINE ONLINE host02 STABLE  ONLINE ONLINE host03 STABLE  ora.ons  ONLINE ONLINE host01 STABLE  ONLINE ONLINE host02 STABLE  ONLINE ONLINE host03 STABLE  Cluster Resources ora.LISTENER\_SCAN1.lsnr  1 ONLINE ONLINE host02 STABLE ora.LISTENER\_SCAN2.lsnr  1 ONLINE ONLINE host03 STABLE ora.LISTENER\_SCAN3.lsnr  1 ONLINE ONLINE host01 STABLE ora.MGMTLSNR  1 ONLINE ONLINE host01 169.254.68.205 192.1  68.1.101  192.168.2.1  01,STABLE |

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|  |
| --- |
| ora.asm   1. ONLINE ONLINE host01 Started,STABLE 2. ONLINE ONLINE host02 Started,STABLE 3. ONLINE ONLINE host03 Started,STABLE   ora.cvu  1 OFFLINE OFFLINE STABLE ora.gns  1 ONLINE ONLINE host01 STABLE ora.gns.vip  1 ONLINE ONLINE host01 STABLE ora.host01.vip  1 ONLINE ONLINE host01 STABLE ora.host02.vip  1 ONLINE ONLINE host02 STABLE ora.host03.vip  1 ONLINE ONLINE host03 STABLE ora.mgmtdb  1 ONLINE ONLINE host01 Open,STABLE ora.oc4j  1 ONLINE ONLINE host01 STABLE ora.orcl.db   1. ONLINE ONLINE host02 Open,STABLE 2. ONLINE ONLINE host03 Open,STABLE 3. ONLINE ONLINE host01 Open,STABLE   **ora.orcl.prod1.svc**  **1 ONLINE ONLINE host02 STABLE**  ora.scan1.vip  1 ONLINE ONLINE host02 STABLE ora.scan2.vip  1 ONLINE ONLINE host03 STABLE ora.scan3.vip  1 ONLINE ONLINE host01 STABLE  [grid@host01 ~]$ **exit**  logout  [oracle@host01 less\_09]$ |

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1. 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@host01 less\_09]$ **sqlplus sys/*sys\_password*@prod1 as sysdba**  SQL\*Plus: Release 12.1.0.2.0 Production on Tue Sep 17 13:37:47  2014  Copyright (c) 1982, 2014, Oracle. All rights reserved.  Connected to:  Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options SQL> **select instance\_name from v$instance;**  INSTANCE\_NAME  orcl\_1 SQL> **exit**  Disconnected from Oracle Database 12c Enterprise Edition Release  12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options  [oracle@host01 less\_09]$ **srvctl status database -db orcl**  ***Instance orcl\_1 is running on node host02*** Instance orcl\_2 is running on node host03 Instance orcl\_3 is running on node host01  [oracle@host01 less\_09]$ |

1. 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 host02. 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 very quickly. Exit back to host01.

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|  |
| --- |
| [oracle@host01 less\_09]$ **ssh host02**  Last login: Tue Sep 17 13:45:52 2014 from host01.example.com [oracle@host02 ~]$ **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@host02 ~]$ **pkill -9 -f ora\_pmon\_orcl\_1**  [oracle@host02 ~]$ **exit**  logout  Connection to host02 closed. [oracle@host01 less\_09]$ |

1. 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 host03. What instance is running on the system hosting the service?

|  |
| --- |
| [oracle@host01 less\_09]$ **srvctl status service -db orcl**  Service PROD1 is running on nodes: ***host03***  [oracle@host01 less\_09]$ **srvctl status database -db orcl**  Instance orcl\_1 is running on node host02 ***Instance orcl\_2 is running on node host03*** Instance orcl\_3 is running on node host01  [oracle@host01 less\_09]$ |

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

|  |
| --- |
| [oracle@host01 less\_09]$ **sqlplus sys/*sys\_password*@prod1 as sysdba**  SQL\*Plus: Release 12.1.0.2.0 Production on Fri Jan 9 11:07:01  2015  Copyright (c) 1982, 2014, Oracle. All rights reserved.  Connected to:  Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options |

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|  |
| --- |
| SQL> ***select instance\_name from v$instance;***  INSTANCE\_NAME  orcl\_2 SQL> exit  Disconnected from Oracle Database 12c Enterprise Edition Release  12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options  [oracle@host01 less\_09]$ **srvctl status database -db orcl**  Instance orcl\_1 is running on node host02 ***Instance orcl\_2 is running on node host03*** Instance orcl\_3 is running on node host01  [oracle@host01 less\_09]$ |

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

|  |
| --- |
| [oracle@host01 less\_09]$ **srvctl relocate service -db orcl - service PROD1 -c host03 -n host02**  [oracle@host01 less\_09]$ |

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

|  |
| --- |
| [oracle@host01 less\_09]$ **srvctl status service -db orcl**  ***Service PROD1 is running on nodes: host02***  [oracle@host01 less\_09]$ |

1. Close all terminal sessions opened for this practice.

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# Practice 9-2: 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/less\_09. 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@host01**  oracle@host01's password:  [oracle@host01 ~]$ **. oraenv**  ORACLE\_SID = [oracle] ? **orcl**  The Oracle base has been set to /u01/app/oracle [oracle@host01 ~]**cd /stage/RAC/labs/less\_09**  [oracle@host01 less\_09]$ **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:$ORACLE\_HOME/bin  /u01/app/oracle/product/12.1.0/dbhome\_1/bin/sqlplus -s /NOLOG  <<EOF  connect / as sysdba drop user jmw cascade;  create user jmw identified by jmw default tablespace users temporary tablespace temp;  grant connect, resource, dba to jmw; EOF  [oracle@host01 less\_09]$ **./createuser.sh**  User dropped. |

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|  |
| --- |
| User created.  Grant succeeded. [oracle@host01 less\_09]$ |

1. 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://host01:5500/em**

Log in to EM Express as sys/*sys\_password* as SYSDBA.

|  |
| --- |
| [vncuser@*classroom\_pc* ~]$ **ssh -X oracle@host01**  oracle@host01's password:  [oracle@host01 ~]$ **. oraenv**  ORACLE\_SID = [oracle] ? orcl  The Oracle base has been set to /u01/app/oracle [oracle@host01 ~]$ **firefox&**  [oracle@host01 ~]$ |

1. 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@host01 less\_09]$ **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; |

1. Check statistics on your service with gv$service\_stats from a SQL\*Plus session connected as SYSDBA as shown below.

|  |
| --- |
| [oracle@host01 ~]$ **sqlplus sys/*sys\_password*@orcl as sysdba** |

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|  |
| --- |
| SQL\*Plus: Release 12.1.0.2.0 Production on Tue Sep 17 14:47:31  2014  Copyright (c) 1982, 2014, Oracle. All rights reserved. Connected to:  Oracle Database 12c Enterprise Edition Release 12.1.0.2.0 - 64bit Production  With the Partitioning, Real Application Clusters, Automatic Storage Management, OLAP,  Advanced Analytics and Real Application Testing options  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 |

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|  |
| --- |
| 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@host01 ~]$ |

1. 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.

1. Stop the PROD1 service and remove it.

|  |
| --- |
| [oracle@host01 ~]$ **srvctl stop service -d orcl -s PROD1**  [oracle@host01 ~]$ **srvctl remove service -d orcl -s PROD1**  [oracle@host01 ~]$ |

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

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