

Añadir un nodo a un RAC en 11gr2

Documento generado por

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Para el sitio



La consigna es ayudar

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1. Introducción

El siguiente documento explica de manera completa , como añadir de una forma bastante sencilla un nodo a un RAC, el ejemplo se visualiza a partir de un RAC en 11gr2 que posee 2 nodos, agregándose un tercero a la infraestructura.

2. Chequeo de IPs para agregar el tercer nodo

Se debe chequear las IPs que utilizará nuestro nuevo nodo del RAC, para ello se debe configurar en el archivo de hosts , todas las IPs de los nodos existentes , como así también las nuevas IPs para el segmento público, el interconnect y la IP virtual.

El archivo de hosts en nuestro nuevo nodo debiese ser más o menos así.

```
[root@nodo3 ~]# more /etc/hosts
#IPs privadas
# Host only-VMnet1 eth0priv1
10.0.0.10 nodo1-priv nodo1-priv.oracleyyo.com
10.0.0.20 nodo2-priv nodo2-priv.oracleyyo.com
10.0.0.30 nodo3-priv nodo3-priv.oracleyyo.com

#IPs publicas
# NAT-VMnet8 eth1pub
192.168.84.10 nodo1 nodo1.oracleyyo.com
192.168.84.20 nodo2 nodo2.oracleyyo.com
192.168.84.30 nodo3 nodo3.oracleyyo.com

=====
#IPs VIPs
# NAT-VMnet8
192.168.84.11 nodo1-vip nodo1-vip.oracleyyo.com
192.168.84.21 nodo2-vip nodo2-vip.oracleyyo.com
192.168.84.31 nodo3-vip nodo3-vip.oracleyyo.com

# SCAN
192.168.84.100 clusterprod-scan
192.168.84.101 clusterprod-scan
192.168.84.102 clusterprod-scan
[root@nodo3 ~]#
```

Se aprecian todas las IPs que yo necesitaré para mi nuevo nodo

Además de lo anterior, necesito que estén realmente activos los segmentos de red que se ocuparán, puedo chequearlo a través del comando ifconfig

```
[root@nodo3 ~]# /sbin/ifconfig -a
eth0      Link encap:Ethernet HWaddr 00:0C:29:97:F9:28
          inet addr:10.0.0.30 Bcast:10.0.0.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe97:f928/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:67 errors:0 dropped:0 overruns:0 frame:0
          TX packets:72 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:12094 (11.8 KiB) TX bytes:16289 (15.9 KiB)
          Interrupt:67 Base address:0x2024

eth1      Link encap:Ethernet HWaddr 00:0C:29:97:F9:32
          inet addr:192.168.84.30 Bcast:192.168.84.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe97:f932/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:765 errors:0 dropped:0 overruns:0 frame:0
          TX packets:794 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:77629 (75.8 KiB) TX bytes:117144 (114.3 KiB)
          Interrupt:75 Base address:0x20a4

eth2      Link encap:Ethernet HWaddr 00:0C:29:97:F9:3C
          inet addr:10.0.0.31 Bcast:10.0.0.255 Mask:255.255.255.0
          inet6 addr: fe80::20c:29ff:fe97:f93c/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST MTU:1500 Metric:1
          RX packets:66 errors:0 dropped:0 overruns:0 frame:0
          TX packets:96 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:12238 (11.9 KiB) TX bytes:17502 (17.0 KiB)
          Interrupt:59 Base address:0x2424

lo        Link encap:Local Loopback
          inet addr:127.0.0.1 Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING MTU:16436 Metric:1
          RX packets:2246 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2246 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:3321048 (3.1 MiB) TX bytes:3321048 (3.1 MiB)

sit0      Link encap:IPv6-in-IPv4
          NOARP MTU:1480 Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:0 (0.0 b) TX bytes:0 (0.0 b)

[root@nodo3 ~]#
```

3. Creación de directorios y usuario en nuevo nodo

Se deben generar los directorios (ORACLE_HOME) para lo que es la infraestructura y para el motor Oracle, además de lo anterior, se debe generar el usuario oracle, en el ejemplo que estamos visualizando, el usuario oracle ya estaba generado en la máquina, dado que es una copia del S.O. que se encuentra en el nodo1 del RAC, después de la copia se hizo todo el trabajo de regularizar las interfaces de red, como así el hostname y todo vínculo que pudiese existir con el nodo1.

Creación de los directorios

```
[root@nodo3 ~]# mkdir -p /u01/app/11.2.0/grid
[root@nodo3 ~]# mkdir -p /u01/app/oracle/product/11.2.0/dbhome_1
[root@nodo3 ~]# chown oracle:oinstall -R /u01
[root@nodo3 ~]# chmod -R 775 /u01

[root@nodo3 ~]# ls -ltr /u01/
total 4
drwxrwxr-x 3 oracle oinstall 4096 Sep  3 17:59 app
```

4. Usuario oracle para nodo3

El usuario oracle en el nodo 3 debe tener las siguientes características

```
[root@nodo3 ~]# id -a oracle
uid=900(oracle) gid=800(oinstall)
groups=800(oinstall),801(dba),802(oper),803(asmadmin)
```

Con exactamente los mismos grupos y con los mismos id... Es requisito del RAC

5. Chequeo de prerequisites con cluvfy

Desde uno de los nodos existentes en el RAC, procedemos a generar una validación mediante cluvfy , el cual encontramos dentro de la instalación del clusterware

Antes de llevar a cabo la validación mediante cluvfy debemos generar los certificados para el tercer nodo de nuestro RAC.. para ello debemos seguir la siguiente nota

http://www.oracleyyo.com/index.php/2012/09/03/adding_third_node_rac

Después de eso , podemos chequear el estado del nuevo nodo

```
oracle@nodo1 $ ./cluvfy stage -post hws -n nodo3

Performing post-checks for hardware and operating system setup

Checking node reachability...
Node reachability check passed from node "nodo1"

Checking user equivalence...
User equivalence check passed for user "oracle"

Checking node connectivity...

Checking hosts config file...

Verification of the hosts config file successful

Node connectivity passed for subnet "10.0.0.0" with node(s) nodo3
TCP connectivity check passed for subnet "10.0.0.0"

Node connectivity passed for subnet "192.168.84.0" with node(s) nodo3
TCP connectivity check passed for subnet "192.168.84.0"

Interfaces found on subnet "10.0.0.0" that are likely candidates for a private
interconnect are:
nodo3 eth0:10.0.0.30

Interfaces found on subnet "10.0.0.0" that are likely candidates for a private
interconnect are:
nodo3 eth2:10.0.0.31

Interfaces found on subnet "192.168.84.0" that are likely candidates for a
private interconnect are:
nodo3 eth1:192.168.84.30

WARNING:
Could not find a suitable set of interfaces for VIPs

Node connectivity check passed
```

```
Checking multicast communication...

Checking subnet "10.0.0.0" for multicast communication with multicast group
"230.0.1.0"...
Check of subnet "10.0.0.0" for multicast communication with multicast group
"230.0.1.0" passed.

Checking subnet "192.168.84.0" for multicast communication with multicast
group "230.0.1.0"...
Check of subnet "192.168.84.0" for multicast communication with multicast
group "230.0.1.0" passed.

Check of multicast communication passed.
Check for multiple users with UID value 0 passed
Time zone consistency check passed

Checking shared storage accessibility...

Disk                               Sharing Nodes (1 in count)
-----
/dev/sda                           nodo3
/dev/sdb                           nodo3
/dev/sdc                           nodo3
/dev/sdd                           nodo3

Shared storage check was successful on nodes "nodo3"

Post-check for hardware and operating system setup was successful.
oracle@nod01 $
```

A este nivel, justo antes de llevar a cabo la validación mediante clufy, se tiene que haber validado lo siguiente :

- El usuario oracle
- La estructura de directorios
- La creación de los certificados SSH para el tercer nodo del RAC , esto se puede hacer mediante el siguiente paso a paso
- La visualización del storage en el nodo3, se debe tener en cuenta que el nuevo nodo debe ver exactamente los mismos Shared Disks que se están viendo desde el nodo1 y desde el nodo2, esta es una actividad que debiese hacer una persona que trabaje en Unix..., para nuestro ejemplo , nosotros visualizamos desde el nuevo nodo , estos discos :

```
Checking shared storage accessibility...

Disk                               Sharing Nodes (1 in count)
-----
/dev/sda                           nodo3
/dev/sdb                           nodo3
/dev/sdc                           nodo3
/dev/sdd                           nodo3
```

6. Agregar el nodo3 al Grid Infraestructure

El paso que tenemos que realizar a continuación, consiste en añadir el nodo3 al Grid Infraestructure, para ello ejecutamos la Shell addNode.sh ubicada en \$GRID_INFRAESTRUCTURE/oui/bin

La forma de ejecutarlo es la siguiente

```
cd $GRID_INFRAESTRUCTURE/oui/bin/  
./addNode.sh "CLUSTER_NEW_NODES={nodo3}" "CLUSTER_NEW_VIRTUAL_HOSTNAMES={nodo3-vip}"
```

Se debe colocar especial cuidado en coloca en la variable CLUSTER_NEW_NODES el hostname de la IP Pública y en CLUSTER_NEW_VIRTUAL_HOSTNAMES el nombre de la IP Virtual, ambas IPs correspondientes al nodo3

La Shell se debe ejecutar desde el nodo1, esto es una buena práctica de Oracle

```
oracle@nod01 $ ./addNode.sh "CLUSTER_NEW_NODES={nodo3}"  
"CLUSTER_NEW_VIRTUAL_HOSTNAMES={nodo3-vip}"
```

```
Starting Oracle Universal Installer...
```

```
Checking swap space: must be greater than 500 MB. Actual 1983 MB Passed  
Oracle Universal Installer, Version 11.2.0.3.0 Production  
Copyright (C) 1999, 2011, Oracle. All rights reserved.
```

```
Performing tests to see whether nodes nodo2,nodo3 are available  
..... 100% Done.
```

```
-----  
Cluster Node Addition Summary
```

```
Global Settings
```

```
Source: /u01/app/11.2.0/grid
```

```
New Nodes
```

```
Space Requirements
```

```
New Nodes
```

```
nodo3
```

```
/: Required 3.76GB : Available 22.89GB
```

```
Installed Products
```

```
Product Names
```

```
Oracle Grid Infrastructure 11.2.0.3.0
```

```
Sun JDK 1.5.0.30.03
```

```
Installer SDK Component 11.2.0.3.0
```

```
Oracle One-Off Patch Installer 11.2.0.1.7
```

```
Oracle Universal Installer 11.2.0.3.0
```

```
Oracle USM Deconfiguration 11.2.0.3.0
```

```
Oracle Configuration Manager Deconfiguration 10.3.1.0.0
```

```
Enterprise Manager Common Core Files 10.2.0.4.4
```

```
Oracle DBCA Deconfiguration 11.2.0.3.0
```

```
Oracle RAC Deconfiguration 11.2.0.3.0
```

```
Oracle Quality of Service Management (Server) 11.2.0.3.0
```

```
Installation Plugin Files 11.2.0.3.0
```

```
Universal Storage Manager Files 11.2.0.3.0
```

```
Oracle Text Required Support Files 11.2.0.3.0
```

```
Automatic Storage Management Assistant 11.2.0.3.0
```


Oracle Database 11g Multimedia Files 11.2.0.3.0
Oracle Multimedia Java Advanced Imaging 11.2.0.3.0
Oracle Globalization Support 11.2.0.3.0
Oracle Multimedia Locator RDBMS Files 11.2.0.3.0
Oracle Core Required Support Files 11.2.0.3.0
Bali Share 1.1.18.0.0
Oracle Database Deconfiguration 11.2.0.3.0
Oracle Quality of Service Management (Client) 11.2.0.3.0
Expat libraries 2.0.1.0.1
Oracle Containers for Java 11.2.0.3.0
Perl Modules 5.10.0.0.1
Secure Socket Layer 11.2.0.3.0
Oracle JDBC/OCI Instant Client 11.2.0.3.0
Oracle Multimedia Client Option 11.2.0.3.0
LDAP Required Support Files 11.2.0.3.0
Character Set Migration Utility 11.2.0.3.0
Perl Interpreter 5.10.0.0.1
PL/SQL Embedded Gateway 11.2.0.3.0
OLAP SQL Scripts 11.2.0.3.0
Database SQL Scripts 11.2.0.3.0
Oracle Extended Windowing Toolkit 3.4.47.0.0
SSL Required Support Files for InstantClient 11.2.0.3.0
SQL*Plus Files for Instant Client 11.2.0.3.0
Oracle Net Required Support Files 11.2.0.3.0
Oracle Database User Interface 2.2.13.0.0
RDBMS Required Support Files for Instant Client 11.2.0.3.0
RDBMS Required Support Files Runtime 11.2.0.3.0
XML Parser for Java 11.2.0.3.0
Oracle Security Developer Tools 11.2.0.3.0
Oracle Wallet Manager 11.2.0.3.0
Enterprise Manager plugin Common Files 11.2.0.3.0
Platform Required Support Files 11.2.0.3.0
Oracle JFC Extended Windowing Toolkit 4.2.36.0.0
RDBMS Required Support Files 11.2.0.3.0
Oracle Ice Browser 5.2.3.6.0
Oracle Help For Java 4.2.9.0.0
Enterprise Manager Common Files 10.2.0.4.3
Deinstallation Tool 11.2.0.3.0
Oracle Java Client 11.2.0.3.0
Cluster Verification Utility Files 11.2.0.3.0
Oracle Notification Service (eONS) 11.2.0.3.0
Oracle LDAP administration 11.2.0.3.0
Cluster Verification Utility Common Files 11.2.0.3.0
Oracle Clusterware RDBMS Files 11.2.0.3.0
Oracle Locale Builder 11.2.0.3.0
Oracle Globalization Support 11.2.0.3.0
Buildtools Common Files 11.2.0.3.0
Oracle RAC Required Support Files-HAS 11.2.0.3.0
SQL*Plus Required Support Files 11.2.0.3.0
XDK Required Support Files 11.2.0.3.0
Agent Required Support Files 10.2.0.4.3
Parser Generator Required Support Files 11.2.0.3.0
Precompiler Required Support Files 11.2.0.3.0
Installation Common Files 11.2.0.3.0
Required Support Files 11.2.0.3.0
Oracle JDBC/THIN Interfaces 11.2.0.3.0
Oracle Multimedia Locator 11.2.0.3.0
Oracle Multimedia 11.2.0.3.0
HAS Common Files 11.2.0.3.0
Assistant Common Files 11.2.0.3.0
PL/SQL 11.2.0.3.0
HAS Files for DB 11.2.0.3.0
Oracle Recovery Manager 11.2.0.3.0
Oracle Database Utilities 11.2.0.3.0

```
Oracle Notification Service 11.2.0.3.0
SQL*Plus 11.2.0.3.0
Oracle Netca Client 11.2.0.3.0
Oracle Net 11.2.0.3.0
Oracle JVM 11.2.0.3.0
Oracle Internet Directory Client 11.2.0.3.0
Oracle Net Listener 11.2.0.3.0
Cluster Ready Services Files 11.2.0.3.0
Oracle Database 11g 11.2.0.3.0
```

```
Instantiating scripts for add node (Thursday, September 13, 2012 12:52:25 PM CLT)
.
Instantiation of add node scripts complete
1% Done.

Copying to remote nodes (Thursday, September 13, 2012 12:54:06 PM CLT)
.....
...
96% Done.

Home copied to new nodes

Saving inventory on nodes (Thursday, September 13, 2012 6:49:54 PM CLT)
.
Save inventory complete
100% Done.

WARNING:
The following configuration scripts need to be executed as the "root" user in each new
cluster node. Each script in the list below is followed by a list of nodes.
/u01/app/11.2.0/grid/root.sh #On nodes nodo3
To execute the configuration scripts:
  1. Open a terminal window
  2. Log in as "root"
  3. Run the scripts in each cluster node

The Cluster Node Addition of /u01/app/11.2.0/grid was successful.
Please check '/tmp/silentInstall.log' for more details.
oracle@nod01
```

Al final de la ejecución en forma silenciosa del addNode.sh de la Grid Infraestructure, nos solicita ejecutar ciertos scripts como usuario root

7. Ejecución de root.sh para Grid Infraestructure

Terminada la instalación silenciosa, se debe ejecutar el comando root.sh para realizar la inscripción del nodo3 dentro del archivo OCR del RAC

La ejecución en sí es desde el nodo3

```
[root@nodo3 ~]# /u01/app/11.2.0/grid/root.sh
Performing root user operation for Oracle 11g

The following environment variables are set as:
  ORACLE_OWNER= oracle
  ORACLE_HOME=  /u01/app/11.2.0/grid

Enter the full pathname of the local bin directory: [/usr/local/bin]:
The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to overwrite.

Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.
Using configuration parameter file:
/u01/app/11.2.0/grid/crs/install/crsconfig_params
User ignored Prerequisites during installation
clscfg: EXISTING configuration version 5 detected.
clscfg: version 5 is 11g Release 2.
Successfully accumulated necessary OCR keys.
Creating OCR keys for user 'root', privgrp 'root'..
Operation successful.
/u01/app/11.2.0/grid/bin/srvctl start listener -n nodo3 ... failed
Failed to perform new node configuration at
/u01/app/11.2.0/grid/crs/install/crsconfig_lib.pm line 9037.
/u01/app/11.2.0/grid/perl/bin/perl -I/u01/app/11.2.0/grid/perl/lib -
I/u01/app/11.2.0/grid/crs/install
/u01/app/11.2.0/grid/crs/install/rootcrs.pl execution failed
[root@nodo3 ~]#
```

Podemos verificar la correcta ejecución de la Shell root.sh y la inscripción de nuevos servicios del RAC ejecutando una consulta directamente al OCR.. para ello desde cualquier de los nodos (ejemplo nodo2) ejecutamos los siguientes comandos :

```
oracle@nodo2 $ crsctl stat res -t
```

```

-----
NAME                TARGET  STATE        SERVER
STATE_DETAILS
-----
Local Resources
-----
ora.DATAP_DG.dg
      ONLINE  OFFLINE     nodo1
      ONLINE  OFFLINE     nodo2
      ONLINE  OFFLINE     nodo3
ora.DATA_DG.dg
      ONLINE  ONLINE      nodo1
      ONLINE  ONLINE      nodo2
      ONLINE  ONLINE      nodo3
ora.FRAPH_DG.dg
      ONLINE  OFFLINE     nodo1
      ONLINE  OFFLINE     nodo2
      ONLINE  OFFLINE     nodo3
ora.FRA_DG.dg
      ONLINE  ONLINE      nodo1
      ONLINE  ONLINE      nodo2
      ONLINE  ONLINE      nodo3
ora.LISTENER.lsnr
      ONLINE  ONLINE      nodo1
      ONLINE  ONLINE      nodo2
      ONLINE  ONLINE      nodo3
ora.OV_DG.dg
      ONLINE  ONLINE      nodo1
      ONLINE  ONLINE      nodo2
      ONLINE  ONLINE      nodo3
ora.asm
      ONLINE  ONLINE      nodo1          Started
      ONLINE  ONLINE      nodo2          Started
      ONLINE  ONLINE      nodo3          Started
ora.gsd
      OFFLINE OFFLINE     nodo1
      OFFLINE OFFLINE     nodo2
      OFFLINE OFFLINE     nodo3
ora.net1.network
      ONLINE  ONLINE      nodo1
      ONLINE  ONLINE      nodo2
      ONLINE  ONLINE      nodo3

```

```

ora.ons
      ONLINE ONLINE      nodo1
      ONLINE ONLINE      nodo2
      ONLINE ONLINE      nodo3
ora.registry.acfs
      ONLINE ONLINE      nodo1
      ONLINE ONLINE      nodo2
      ONLINE ONLINE      nodo3
-----
Cluster Resources
-----
ora.LISTENER_SCAN1.lsnr
  1      ONLINE ONLINE      nodo3
ora.cvu
  1      ONLINE ONLINE      nodo1
ora.nodo1.vip
  1      ONLINE ONLINE      nodo1
ora.nodo2.vip
  1      ONLINE ONLINE      nodo2
ora.nodo3.vip
  1      ONLINE ONLINE      nodo3
ora.oc4j
  1      ONLINE ONLINE      nodo1
ora.prod.db
  1      ONLINE OFFLINE
Shutdown
  2      ONLINE OFFLINE
ora.scan1.vip
  1      ONLINE ONLINE      nodo3
Instance

```

Figura un solo Listener Scan dado que se utilizó para el SCAN el archivo de host, no había a mano un servidor DNS para inscribir el SCAN.

Y chequeamos desde el nodo3, los nuevos servicios que están en ejecución

```

oracle@nodo3 $ crs_stat -t -v -c nodo3
Name                Type                R/R/A    F/FT    Target    State    Host
-----
ora....N1.lsnr     ora....er.type     0/5      0/0     ONLINE    ONLINE  nodo3
ora....SM3.asm     application         0/5      0/0     ONLINE    ONLINE  nodo3
ora....O3.lsnr     application         0/5      0/0     ONLINE    ONLINE  nodo3
ora.nodo3.ons      application         0/3      0/0     ONLINE    ONLINE  nodo3
ora.nodo3.vip      ora....tl.type     0/0      0/0     ONLINE    ONLINE  nodo3
ora.scan1.vip      ora....ip.type     0/0      0/0     ONLINE    ONLINE  nodo3

```

8. Chequeo post configuración de Grid Infraestructure

Posterior a la instalación y configuración del Grid Infraestructure podemos volver a chequear nuestros nodos, esta vez con el comando

```
./cluvfy stage -post nodeadd -n nodo3 -verbose
```

El cual visualizamos a continuación , la ejecución se hizo desde el nodo1, pero puede ser hecha desde cualquier nodo del RAC

```
oracle@nodo1 $ ./cluvfy stage -post nodeadd -n nodo3 -verbose
```

```
Performing post-checks for node addition
```

```
Checking node reachability...
```

```
Check: Node reachability from node "nodo1"
```

Destination Node	Reachable?
nodo3	yes

```
Result: Node reachability check passed from node "nodo1"
```

```
Checking user equivalence...
```

```
Check: User equivalence for user "oracle"
```

Node Name	Status
nodo3	passed

```
Result: User equivalence check passed for user "oracle"
```

```
Checking node connectivity...
```

```
Checking hosts config file...
```

Node Name	Status
nod01	passed
nodo3	passed
nodo2	passed

```
Verification of the hosts config file successful
```

```
Interface information for node "nodo1"
```

Name	IP Address	Subnet	Gateway	Def. Gateway	HW Address
eth0	10.0.0.10	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:AF
eth0	169.254.117.168	169.254.0.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:AF
eth1	192.168.84.10	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:B9
eth1	192.168.84.11	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:B9
eth2	10.0.0.11	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:C3

Añadir un nodo a un RAC 11gr2

Interface information for node "nodo3"

Name	IP Address	Subnet	Gateway	Def. Gateway	HW Address
eth0	10.0.0.30	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:28
eth0	169.254.5.186	169.254.0.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:28
eth1	192.168.84.30	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:32
eth1	192.168.84.31	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:32
eth1	192.168.84.100	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:32
eth2	10.0.0.31	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:3C

Interface information for node "nodo2"

Name	IP Address	Subnet	Gateway	Def. Gateway	HW Address
eth0	10.0.0.20	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:CA
eth0	169.254.190.157	169.254.0.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:CA
eth1	192.168.84.20	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:D4
eth1	192.168.84.21	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:D4
eth2	10.0.0.21	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:DE

Check: Node connectivity for interface "eth1"

Source	Destination	Connected?
nod01[192.168.84.10]	nod01[192.168.84.11]	yes
nod01[192.168.84.10]	nod03[192.168.84.30]	yes
nod01[192.168.84.10]	nod03[192.168.84.31]	yes
nod01[192.168.84.10]	nod03[192.168.84.100]	yes
nod01[192.168.84.10]	nod02[192.168.84.20]	yes
nod01[192.168.84.10]	nod02[192.168.84.21]	yes
nod01[192.168.84.11]	nod03[192.168.84.30]	yes
nod01[192.168.84.11]	nod03[192.168.84.31]	yes
nod01[192.168.84.11]	nod03[192.168.84.100]	yes
nod01[192.168.84.11]	nod02[192.168.84.20]	yes
nod01[192.168.84.11]	nod02[192.168.84.21]	yes
nod03[192.168.84.30]	nod03[192.168.84.31]	yes
nod03[192.168.84.30]	nod03[192.168.84.100]	yes
nod03[192.168.84.30]	nod02[192.168.84.20]	yes
nod03[192.168.84.30]	nod02[192.168.84.21]	yes
nod03[192.168.84.31]	nod03[192.168.84.100]	yes
nod03[192.168.84.31]	nod02[192.168.84.20]	yes
nod03[192.168.84.31]	nod02[192.168.84.21]	yes
nod03[192.168.84.100]	nod02[192.168.84.20]	yes
nod03[192.168.84.100]	nod02[192.168.84.21]	yes
nod02[192.168.84.20]	nod02[192.168.84.21]	yes

Result: Node connectivity passed for interface "eth1"

```
Check: TCP connectivity of subnet "192.168.84.0"
Source          Destination          Connected?
-----
nodol:192.168.84.10  nodol:192.168.84.11  passed
nodol:192.168.84.10  nodo3:192.168.84.30  passed
nodol:192.168.84.10  nodo3:192.168.84.31  passed
nodol:192.168.84.10  nodo3:192.168.84.100 passed
nodol:192.168.84.10  nodo2:192.168.84.20  passed
nodol:192.168.84.10  nodo2:192.168.84.21  passed
Result: TCP connectivity check passed for subnet "192.168.84.0"

Checking subnet mask consistency...
Subnet mask consistency check passed for subnet "192.168.84.0".
Subnet mask consistency check passed.

Result: Node connectivity check passed

Checking multicast communication...

Checking subnet "192.168.84.0" for multicast communication with multicast group
"230.0.1.0"...
Check of subnet "192.168.84.0" for multicast communication with multicast group "230.0.1.0"
passed.

Check of multicast communication passed.

Checking cluster integrity...

Node Name
-----
nodol
nodo2
nodo3

Cluster integrity check passed

Checking CRS integrity...

Clusterware version consistency passed
The Oracle Clusterware is healthy on node "nodol"
The Oracle Clusterware is healthy on node "nodo3"
The Oracle Clusterware is healthy on node "nodo2"

CRS integrity check passed

Checking shared resources...

Checking CRS home location...
"/u01/app/11.2.0/grid" is not shared
Result: Shared resources check for node addition passed

Checking node connectivity...

Checking hosts config file...
Node Name          Status
-----
nodol              passed
nodo3              passed
nodo2              passed

Verification of the hosts config file successful
```

Interface information for node "nodol"

Name	IP Address	Subnet	Gateway	Def. Gateway	HW Address
eth0	10.0.0.10	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:AF
eth0	169.254.117.168	169.254.0.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:AF
eth1	192.168.84.10	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:B9
eth1	192.168.84.11	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:B9
eth2	10.0.0.11	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:E4:05:C3

Interface information for node "nodo3"

Name	IP Address	Subnet	Gateway	Def. Gateway	HW Address
eth0	10.0.0.30	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:28
eth0	169.254.5.186	169.254.0.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:28
eth1	192.168.84.30	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:32
eth1	192.168.84.31	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:32
eth1	192.168.84.100	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:32
eth2	10.0.0.31	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:97:F9:3C

Interface information for node "nodo2"

Name	IP Address	Subnet	Gateway	Def. Gateway	HW Address
eth0	10.0.0.20	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:CA
eth0	169.254.190.157	169.254.0.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:CA
eth1	192.168.84.20	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:D4
eth1	192.168.84.21	192.168.84.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:D4
eth2	10.0.0.21	10.0.0.0	0.0.0.0	UNKNOWN	00:0C:29:7B:FB:DE

Check: Node connectivity for interface "eth0"

Source	Destination	Connected?
nodol[10.0.0.10]	nodol[10.0.0.11]	yes
nodol[10.0.0.10]	nodo3[10.0.0.30]	yes
nodol[10.0.0.10]	nodo3[10.0.0.31]	yes
nodol[10.0.0.10]	nodo2[10.0.0.20]	yes
nodol[10.0.0.10]	nodo2[10.0.0.21]	yes
nodol[10.0.0.11]	nodo3[10.0.0.30]	yes

```

nodo1[10.0.0.11]          nodo3[10.0.0.31]          yes
nodo1[10.0.0.11]          nodo2[10.0.0.20]          yes
nodo1[10.0.0.11]          nodo2[10.0.0.21]          yes
nodo3[10.0.0.30]          nodo3[10.0.0.31]          yes
nodo3[10.0.0.30]          nodo2[10.0.0.20]          yes
nodo3[10.0.0.30]          nodo2[10.0.0.21]          yes
nodo3[10.0.0.31]          nodo2[10.0.0.20]          yes
nodo3[10.0.0.31]          nodo2[10.0.0.21]          yes
nodo2[10.0.0.20]          nodo2[10.0.0.21]          yes

```

Result: Node connectivity passed for interface "eth0"

```

Check: TCP connectivity of subnet "10.0.0.0"
Source          Destination          Connected?
-----
nodo1:10.0.0.10  nodo1:10.0.0.11      passed
nodo1:10.0.0.10  nodo3:10.0.0.30      passed
nodo1:10.0.0.10  nodo3:10.0.0.31      passed
nodo1:10.0.0.10  nodo2:10.0.0.20      passed
nodo1:10.0.0.10  nodo2:10.0.0.21      passed

```

Result: TCP connectivity check passed for subnet "10.0.0.0"

```

Check: Node connectivity for interface "eth1"
Source          Destination          Connected?
-----
nodo1[192.168.84.10]  nodo1[192.168.84.11]  yes
nodo1[192.168.84.10]  nodo3[192.168.84.30]  yes
nodo1[192.168.84.10]  nodo3[192.168.84.31]  yes
nodo1[192.168.84.10]  nodo3[192.168.84.100]  yes
nodo1[192.168.84.10]  nodo2[192.168.84.20]  yes
nodo1[192.168.84.10]  nodo2[192.168.84.21]  yes
nodo1[192.168.84.11]  nodo3[192.168.84.30]  yes
nodo1[192.168.84.11]  nodo3[192.168.84.31]  yes
nodo1[192.168.84.11]  nodo3[192.168.84.100]  yes
nodo1[192.168.84.11]  nodo2[192.168.84.20]  yes
nodo1[192.168.84.11]  nodo2[192.168.84.21]  yes
nodo3[192.168.84.30]  nodo3[192.168.84.31]  yes
nodo3[192.168.84.30]  nodo3[192.168.84.100]  yes
nodo3[192.168.84.30]  nodo2[192.168.84.20]  yes
nodo3[192.168.84.30]  nodo2[192.168.84.21]  yes
nodo3[192.168.84.31]  nodo3[192.168.84.100]  yes
nodo3[192.168.84.31]  nodo2[192.168.84.20]  yes
nodo3[192.168.84.31]  nodo2[192.168.84.21]  yes
nodo3[192.168.84.100]  nodo2[192.168.84.20]  yes
nodo3[192.168.84.100]  nodo2[192.168.84.21]  yes
nodo2[192.168.84.20]  nodo2[192.168.84.21]  yes

```

Result: Node connectivity passed for interface "eth1"

```

Check: TCP connectivity of subnet "192.168.84.0"
Source          Destination          Connected?
-----
nodo1:192.168.84.10  nodo1:192.168.84.11  passed
nodo1:192.168.84.10  nodo3:192.168.84.30  passed
nodo1:192.168.84.10  nodo3:192.168.84.31  passed
nodo1:192.168.84.10  nodo3:192.168.84.100  passed
nodo1:192.168.84.10  nodo2:192.168.84.20  passed
nodo1:192.168.84.10  nodo2:192.168.84.21  passed

```

Result: TCP connectivity check passed for subnet "192.168.84.0"

Checking subnet mask consistency...

Subnet mask consistency check passed for subnet "10.0.0.0".

Subnet mask consistency check passed for subnet "192.168.84.0".

Subnet mask consistency check passed.

Result: Node connectivity check passed

Checking multicast communication...

Checking subnet "10.0.0.0" for multicast communication with multicast group "230.0.1.0"...
 Check of subnet "10.0.0.0" for multicast communication with multicast group "230.0.1.0"
 passed.

Checking subnet "192.168.84.0" for multicast communication with multicast group
 "230.0.1.0"...
 Check of subnet "192.168.84.0" for multicast communication with multicast group "230.0.1.0"
 passed.

Check of multicast communication passed.

Checking node application existence...

Checking existence of VIP node application (required)

Node Name	Required	Running?	Comment
nod01	yes	yes	passed
nod03	yes	yes	passed
nod02	yes	yes	passed

VIP node application check passed

Checking existence of NETWORK node application (required)

Node Name	Required	Running?	Comment
nod01	yes	yes	passed
nod03	yes	yes	passed
nod02	yes	yes	passed

NETWORK node application check passed

Checking existence of GSD node application (optional)

Node Name	Required	Running?	Comment
nod01	no	no	exists
nod03	no	no	exists
nod02	no	no	exists

GSD node application is offline on nodes "nod01,nod03,nod02"

Checking existence of ONS node application (optional)

Node Name	Required	Running?	Comment
nod01	no	yes	passed
nod03	no	yes	passed
nod02	no	yes	passed

ONS node application check passed

Checking Single Client Access Name (SCAN)...

SCAN Name	Node	Running?	ListenerName	Port	Running?
clusterprod-scan	nod03	true	LISTENER_SCAN1	1525	true

Checking TCP connectivity to SCAN Listeners...

Node	ListenerName	TCP connectivity?
nod01	LISTENER_SCAN1	yes

TCP connectivity to SCAN Listeners exists on all cluster nodes

Checking name resolution setup for "clusterprod-scan"...

```
ERROR:
PRVG-1101 : SCAN name "clusterprod-scan" failed to resolve
SCAN Name      IP Address      Status      Comment
-----
clusterprod-scan 192.168.84.100    failed      NIS Entry

ERROR:
PRVF-4657 : Name resolution setup check for "clusterprod-scan" (IP address: 192.168.84.100)
failed

ERROR:
PRVF-4664 : Found inconsistent name resolution entries for SCAN name "clusterprod-scan"

Verification of SCAN VIP and Listener setup failed

Checking to make sure user "oracle" is not in "root" group
Node Name      Status      Comment
-----
nodo3          passed      does not exist
Result: User "oracle" is not part of "root" group. Check passed

Checking if Clusterware is installed on all nodes...
Check of Clusterware install passed

Checking if CTSS Resource is running on all nodes...
Check: CTSS Resource running on all nodes
Node Name      Status
-----
nodo3          passed
Result: CTSS resource check passed

Querying CTSS for time offset on all nodes...
Result: Query of CTSS for time offset passed

Check CTSS state started...
Check: CTSS state
Node Name      State
-----
nodo3          Active
CTSS is in Active state. Proceeding with check of clock time offsets on all nodes...
Reference Time Offset Limit: 1000.0 msecs
Check: Reference Time Offset
Node Name      Time Offset      Status
-----
nodo3          0.0              passed

Time offset is within the specified limits on the following set of nodes:
"[nodo3]"
Result: Check of clock time offsets passed

Oracle Cluster Time Synchronization Services check passed

Post-check for node addition was unsuccessful on all the nodes.
```

Por lo visto, todo a salido de maravillas ☺ (hasta el momento)

9. Instalar en el nodo3 el motor Oracle

Para poder agregar el motor Oracle a nuestro nuevo nodo, se deben ejecutar los siguientes comandos

```
cd $ORACLE_HOME/oui/bin
$ ./addNode.sh -silent "CLUSTER_NEW_NODES={nodo3}"
```

Se debe colocar como nodo3, el hostname asociado a la IP pública

Se debe tener en cuenta el seteo del medio ambiente, desde el nodo1 de nuestro RAC procedemos a modificar las variables de medio ambiente

```
oracle@nod01 $ . db_env
oracle@nod01 $ env | grep ORACLE
ORACLE_UNQNAME=prod
ORACLE_SID=prod1
ORACLE_BASE=/u01/app/oracle
ORACLE_HOSTNAME=nod01
ORACLE_TERM=xterm
ORACLE_HOME=/u01/app/oracle/product/11.2.0/dbhome_1
oracle@nod01 $ cd $ORACLE_HOME
oracle@nod01 $ cd oui/bin/
```

Y ejecutamos el addNode en modo silencioso para nuestro ORACLE_HOME

```
oracle@nod01 $ ./addNode.sh -silent "CLUSTER_NEW_NODES={nodo3}"
Starting Oracle Universal Installer...

Checking swap space: must be greater than 500 MB.   Actual 1923 MB   Passed
Oracle Universal Installer, Version 11.2.0.3.0 Production
Copyright (C) 1999, 2011, Oracle. All rights reserved.

Performing tests to see whether nodes nod02,nod03 are available
..... 100% Done.

.
-----
Cluster Node Addition Summary
Global Settings
  Source: /u01/app/oracle/product/11.2.0/dbhome_1
New Nodes
Space Requirements
  New Nodes
    nod03
    /: Required 3.79GB : Available 19.80GB
Installed Products
  Product Names
    Oracle Database 11g 11.2.0.3.0
    Sun JDK 1.5.0.30.03
    Installer SDK Component 11.2.0.3.0
    Oracle One-Off Patch Installer 11.2.0.1.7
```

Oracle Universal Installer 11.2.0.3.0
Oracle USM Deconfiguration 11.2.0.3.0
Oracle Configuration Manager Deconfiguration 10.3.1.0.0
Oracle DBCA Deconfiguration 11.2.0.3.0
Oracle RAC Deconfiguration 11.2.0.3.0
Oracle Database Deconfiguration 11.2.0.3.0
Oracle Configuration Manager Client 10.3.2.1.0
Oracle Configuration Manager 10.3.5.0.1
Oracle ODBC Driver for Instant Client 11.2.0.3.0
LDAP Required Support Files 11.2.0.3.0
SSL Required Support Files for Instant Client 11.2.0.3.0
Bali Share 1.1.18.0.0
Oracle Extended Windowing Toolkit 3.4.47.0.0
Oracle JFC Extended Windowing Toolkit 4.2.36.0.0
Oracle Real Application Testing 11.2.0.3.0
Oracle Database Vault J2EE Application 11.2.0.3.0
Oracle Label Security 11.2.0.3.0
Oracle Data Mining RDBMS Files 11.2.0.3.0
Oracle OLAP RDBMS Files 11.2.0.3.0
Oracle OLAP API 11.2.0.3.0
Platform Required Support Files 11.2.0.3.0
Oracle Database Vault option 11.2.0.3.0
Oracle RAC Required Support Files-HAS 11.2.0.3.0
SQL*Plus Required Support Files 11.2.0.3.0
Oracle Display Fonts 9.0.2.0.0
Oracle Ice Browser 5.2.3.6.0
Oracle JDBC Server Support Package 11.2.0.3.0
Oracle SQL Developer 11.2.0.3.0
Oracle Application Express 11.2.0.3.0
XDK Required Support Files 11.2.0.3.0
RDBMS Required Support Files for Instant Client 11.2.0.3.0
SQLJ Runtime 11.2.0.3.0
Database Workspace Manager 11.2.0.3.0
RDBMS Required Support Files Runtime 11.2.0.3.0
Oracle Globalization Support 11.2.0.3.0
Exadata Storage Server 11.2.0.1.0
Provisioning Advisor Framework 10.2.0.4.3
Enterprise Manager Database Plugin -- Repository Support 11.2.0.3.0
Enterprise Manager Repository Core Files 10.2.0.4.4
Enterprise Manager Database Plugin -- Agent Support 11.2.0.3.0
Enterprise Manager Grid Control Core Files 10.2.0.4.4
Enterprise Manager Common Core Files 10.2.0.4.4
Enterprise Manager Agent Core Files 10.2.0.4.4
RDBMS Required Support Files 11.2.0.3.0
regexp 2.1.9.0.0
Agent Required Support Files 10.2.0.4.3
Oracle 11g Warehouse Builder Required Files 11.2.0.3.0
Oracle Notification Service (eONS) 11.2.0.3.0
Oracle Text Required Support Files 11.2.0.3.0
Parser Generator Required Support Files 11.2.0.3.0
Oracle Database 11g Multimedia Files 11.2.0.3.0
Oracle Multimedia Java Advanced Imaging 11.2.0.3.0
Oracle Multimedia Annotator 11.2.0.3.0
Oracle JDBC/OCI Instant Client 11.2.0.3.0
Oracle Multimedia Locator RDBMS Files 11.2.0.3.0
Precompiler Required Support Files 11.2.0.3.0
Oracle Core Required Support Files 11.2.0.3.0
Sample Schema Data 11.2.0.3.0
Oracle Starter Database 11.2.0.3.0
Oracle Message Gateway Common Files 11.2.0.3.0
Oracle XML Query 11.2.0.3.0
XML Parser for Oracle JVM 11.2.0.3.0
Oracle Help For Java 4.2.9.0.0
Installation Plugin Files 11.2.0.3.0

Enterprise Manager Common Files 10.2.0.4.3
Expat libraries 2.0.1.0.1
Deinstallation Tool 11.2.0.3.0
Oracle Quality of Service Management (Client) 11.2.0.3.0
Perl Modules 5.10.0.0.1
JAccelerator (COMPANION) 11.2.0.3.0
Oracle Containers for Java 11.2.0.3.0
Perl Interpreter 5.10.0.0.1
Oracle Net Required Support Files 11.2.0.3.0
Secure Socket Layer 11.2.0.3.0
Oracle Universal Connection Pool 11.2.0.3.0
Oracle JDBC/THIN Interfaces 11.2.0.3.0
Oracle Multimedia Client Option 11.2.0.3.0
Oracle Java Client 11.2.0.3.0
Character Set Migration Utility 11.2.0.3.0
Oracle Code Editor 1.2.1.0.0I
PL/SQL Embedded Gateway 11.2.0.3.0
OLAP SQL Scripts 11.2.0.3.0
Database SQL Scripts 11.2.0.3.0
Oracle Locale Builder 11.2.0.3.0
Oracle Globalization Support 11.2.0.3.0
SQL*Plus Files for Instant Client 11.2.0.3.0
Required Support Files 11.2.0.3.0
Oracle Database User Interface 2.2.13.0.0
Oracle ODBC Driver 11.2.0.3.0
Oracle Notification Service 11.2.0.3.0
XML Parser for Java 11.2.0.3.0
Oracle Security Developer Tools 11.2.0.3.0
Oracle Wallet Manager 11.2.0.3.0
Cluster Verification Utility Common Files 11.2.0.3.0
Oracle Clusterware RDBMS Files 11.2.0.3.0
Oracle UIX 2.2.24.6.0
Enterprise Manager plugin Common Files 11.2.0.3.0
HAS Common Files 11.2.0.3.0
Precompiler Common Files 11.2.0.3.0
Installation Common Files 11.2.0.3.0
Oracle Help for the Web 2.0.14.0.0
Oracle LDAP administration 11.2.0.3.0
Buildtools Common Files 11.2.0.3.0
Assistant Common Files 11.2.0.3.0
Oracle Recovery Manager 11.2.0.3.0
PL/SQL 11.2.0.3.0
Generic Connectivity Common Files 11.2.0.3.0
Oracle Database Gateway for ODBC 11.2.0.3.0
Oracle Programmer 11.2.0.3.0
Oracle Database Utilities 11.2.0.3.0
Enterprise Manager Agent 10.2.0.4.3
SQL*Plus 11.2.0.3.0
Oracle Netca Client 11.2.0.3.0
Oracle Multimedia Locator 11.2.0.3.0
Oracle Call Interface (OCI) 11.2.0.3.0
Oracle Multimedia 11.2.0.3.0
Oracle Net 11.2.0.3.0
Oracle XML Development Kit 11.2.0.3.0
Database Configuration and Upgrade Assistants 11.2.0.3.0
Oracle JVM 11.2.0.3.0
Oracle Advanced Security 11.2.0.3.0
Oracle Internet Directory Client 11.2.0.3.0
Oracle Enterprise Manager Console DB 11.2.0.3.0
HAS Files for DB 11.2.0.3.0
Oracle Net Listener 11.2.0.3.0
Oracle Text 11.2.0.3.0
Oracle Net Services 11.2.0.3.0
Oracle Database 11g 11.2.0.3.0

```
Oracle OLAP 11.2.0.3.0
Oracle Spatial 11.2.0.3.0
Oracle Partitioning 11.2.0.3.0
Enterprise Edition Options 11.2.0.3.0
-----
```

```
Instantiating scripts for add node (Friday, September 14, 2012 8:43:39 AM CLT)
.
Instantiation of add node scripts complete
1% Done.

Copying to remote nodes (Friday, September 14, 2012 8:43:42 AM CLT)
.....
...
Home copied to new nodes
96% Done.

Saving inventory on nodes (Friday, September 14, 2012 8:56:00 AM CLT)
.
Save inventory complete
100% Done.

WARNING:
The following configuration scripts need to be executed as the "root" user in each new
cluster node. Each script in the list below is followed by a list of nodes.
/u01/app/oracle/product/11.2.0/dbhome_1/root.sh #On nodes nodo3
To execute the configuration scripts:
1. Open a terminal window
2. Log in as "root"
3. Run the scripts in each cluster node

The Cluster Node Addition of /u01/app/oracle/product/11.2.0/dbhome_1 was successful.
Please check '/tmp/silentInstall.log' for more details.
oracle@nod01 $
```


10. Ejecución de root.sh para Oracle Home

A continuación debemos ejecutar el root.sh (en el nodo3) que nos indica el installer de nuestro Oracle Home, aparece al final

```
WARNING:
The following configuration scripts need to be executed as the "root" user in each new
cluster node. Each script in the list below is followed by a list of nodes.
/u01/app/oracle/product/11.2.0/dbhome_1/root.sh #On nodes nodo3
To execute the configuration scripts:
  1. Open a terminal window
  2. Log in as "root"
  3. Run the scripts in each cluster node
```

Al momento de ejecutarlo , debe aparecer algo así por pantalla

```
oracle@nodo3 $ su - root
Password:
[root@nodo3 ~]# /u01/app/oracle/product/11.2.0/dbhome_1/root.sh
Performing root user operation for Oracle 11g

The following environment variables are set as:
  ORACLE_OWNER= oracle
  ORACLE_HOME=  /u01/app/oracle/product/11.2.0/dbhome_1

Enter the full pathname of the local bin directory: [/usr/local/bin]:
The contents of "dbhome" have not changed. No need to overwrite.
The contents of "oraenv" have not changed. No need to overwrite.
The contents of "coraenv" have not changed. No need to overwrite.

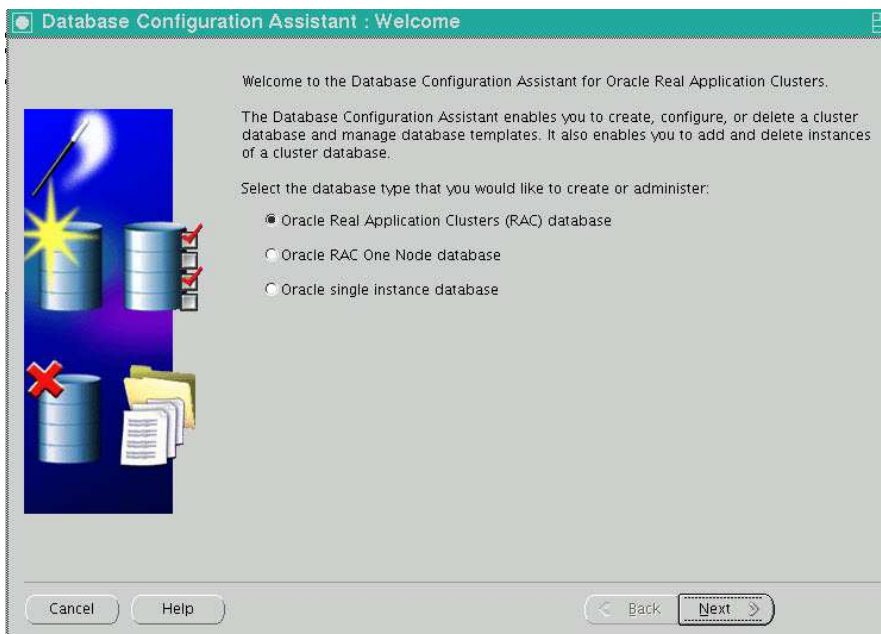
Entries will be added to the /etc/oratab file as needed by
Database Configuration Assistant when a database is created
Finished running generic part of root script.
Now product-specific root actions will be performed.
Finished product-specific root actions.
[root@nodo3 ~]#
```

11. Creación de la instancia del nodo3

Para la creación de la nueva instancia hay varias alternativas, unas les puede gustar a un grupo de DBAs, otras a otro grupo, yo seleccione para este pequeño How.to ,la forma más sencilla en que se puede generar una instancia en un RAC, ocupando el inefable DBCA ☺ , tal cual...

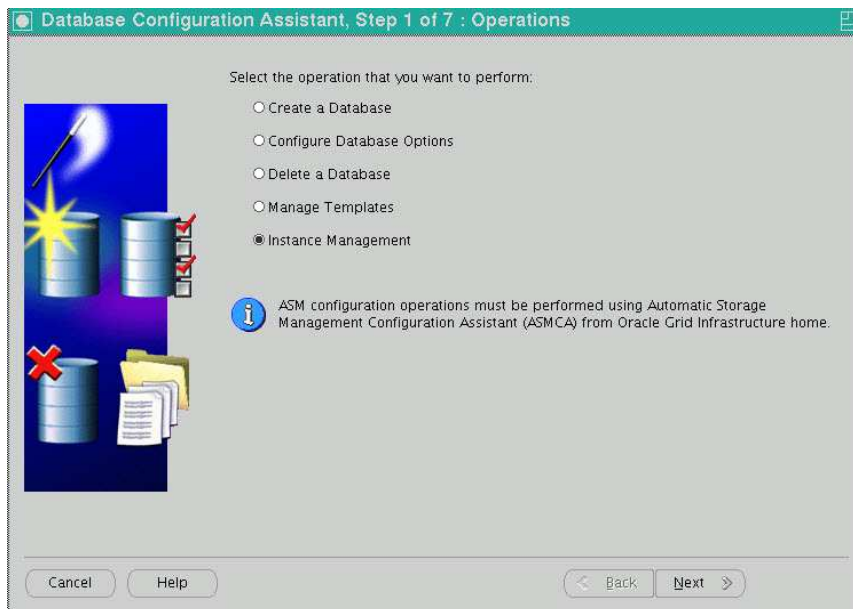
Seteamos nuestras variables de medio ambiente para el nuevo motor Oracle que hemos copiado en este nodo y ejecutamos mediante una interfaz gráfica el comando dbca

Aparecerá la siguiente pantalla

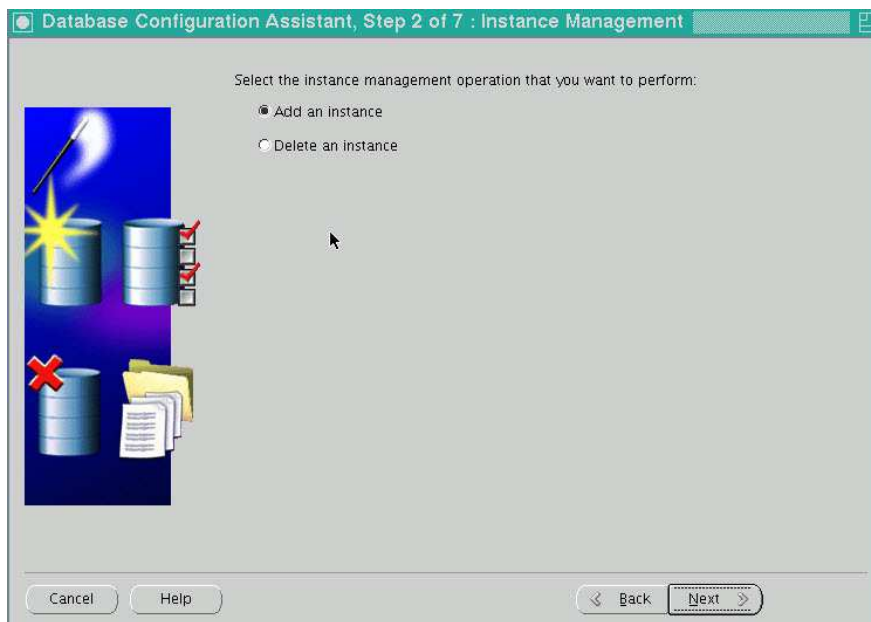


Seleccionamos Oracle Real Application Cluster (RAC) Database

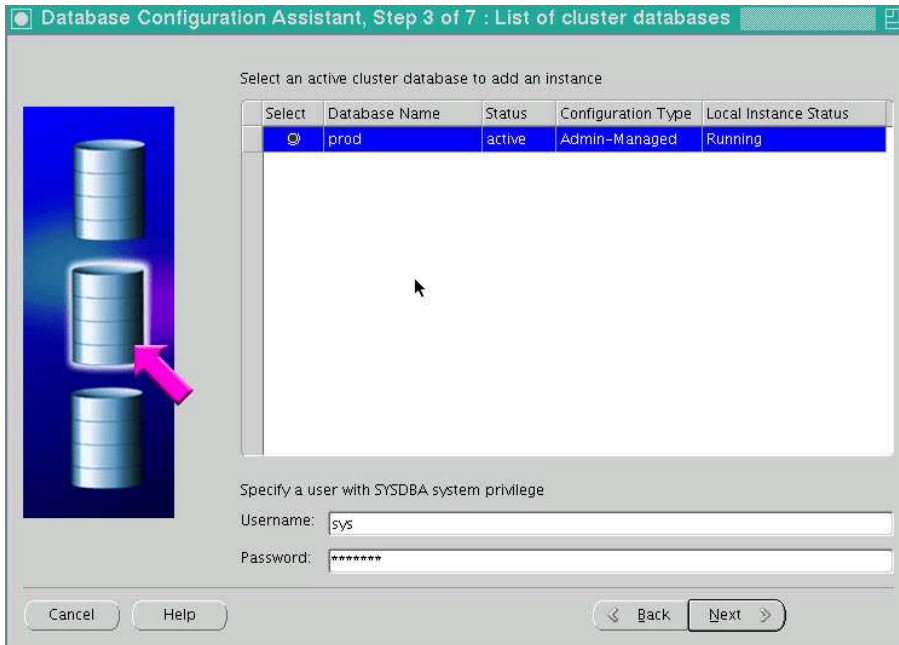
Seleccionamos "Instance Management"



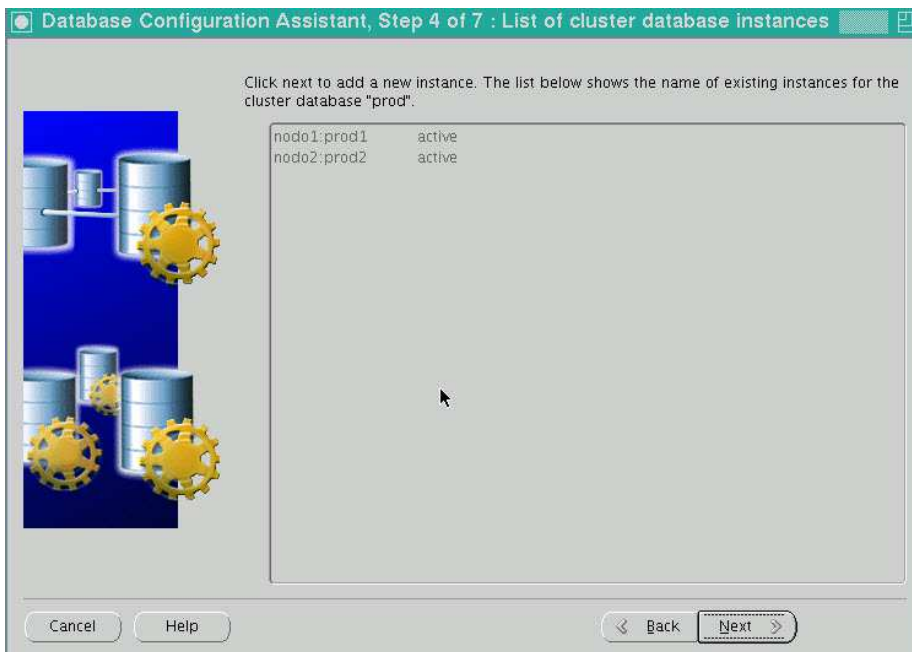
Y seleccionamos "Add a instance", teniendo en cuenta que estamos en el nodo3



Ingresamos la password del usuario sys y le indicamos a que base de datos vamos a apuntar nuestra nueva instancia

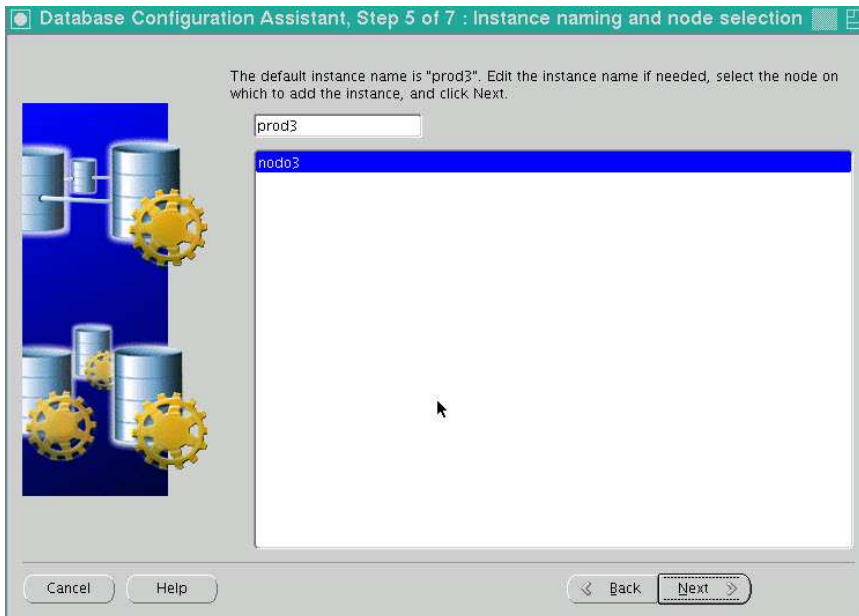


Acá nos señala el estado de las otras instancias de nuestra base de datos

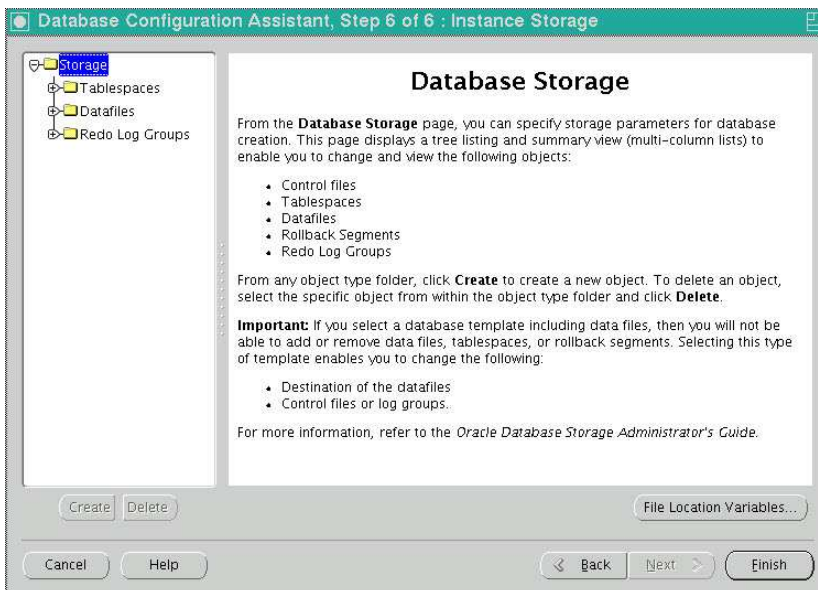


Añadir un nodo a un RAC 11gr2

Ingresamos el nombre de nuestra instancia, que debiese ser <nombre base de datos><número de nodo>

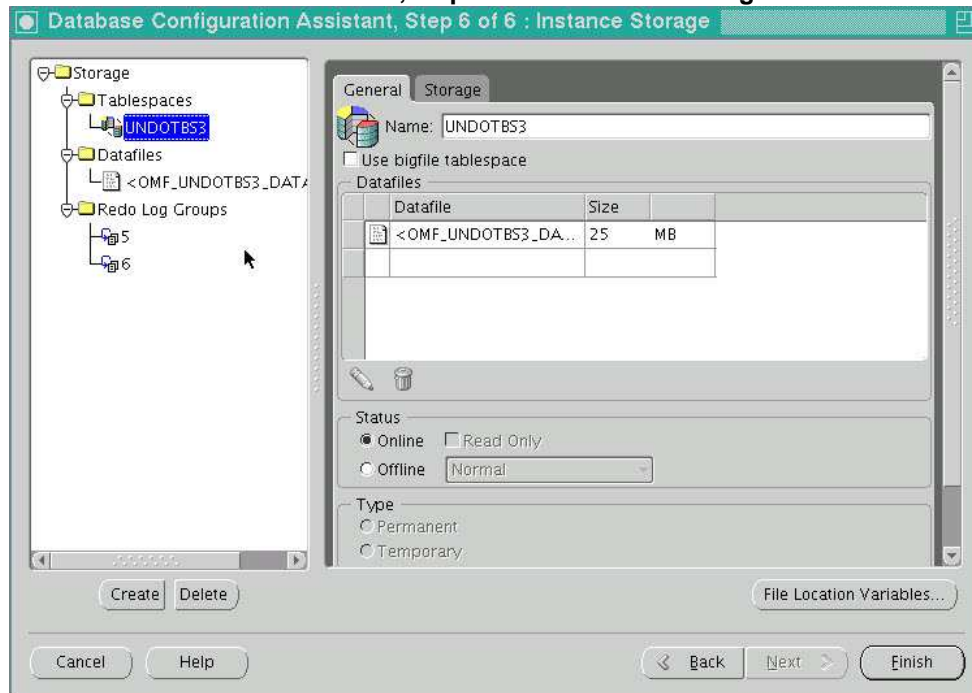


En la pantalla que sigue podemos cambiar algunas cosas de configuración de Storage, por ejemplo tamaños de redo

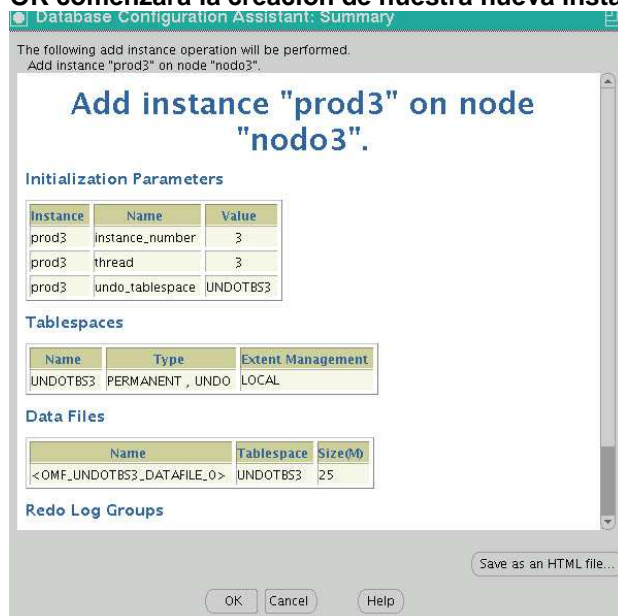


Añadir un nodo a un RAC 11gr2

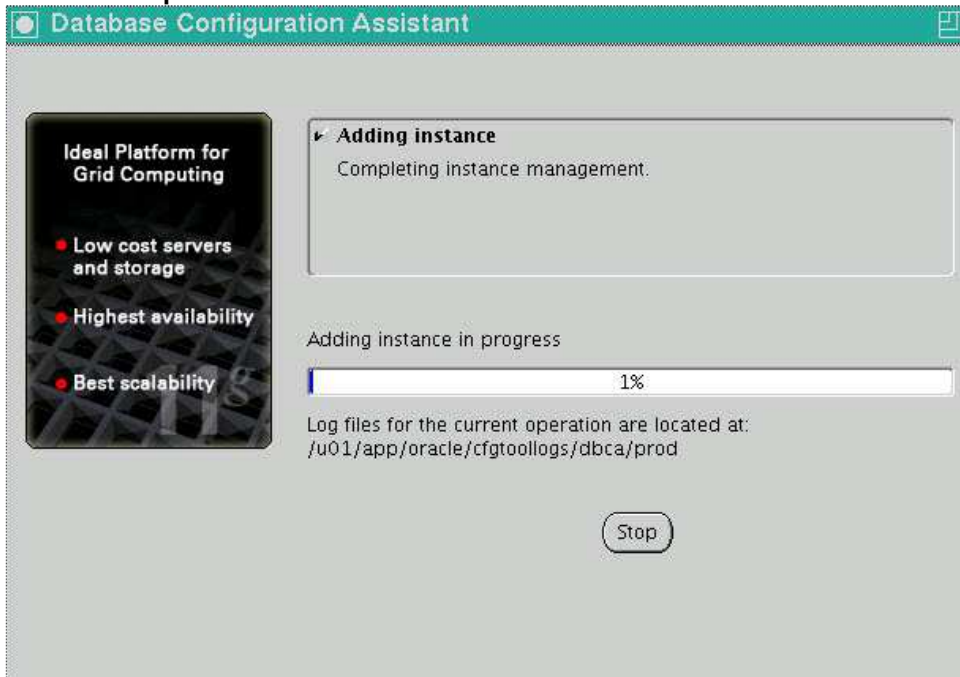
De lo comentado anteriormente, se pueden visualizar storage de nuestra base de datos



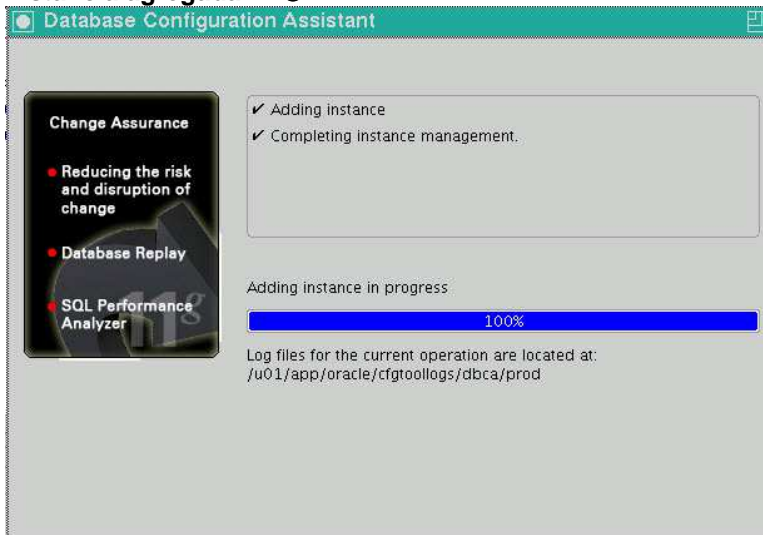
Una vez que presionamos "Finish" aparece una pantalla de resumen y cuando presionamos OK comenzará la creación de nuestra nueva instancia



Instancia en proceso de creación



Instancia agregada.... ☺



12. Chequeo de servicios Post-creación instancia

Podemos proceder a chequear los servicios de nuestro RAC de 3 nodos, para ello , desde cualquier nodo del RAC ejecutamos el comando `crsctl stat res -t` , previamente debemos setear nuestras variables de medio ambiente que apunten a la infraestructura

La salida del comando

```
oracle@nodo2 $ crsctl stat res -t
-----
NAME                TARGET    STATE     SERVER                          STATE_DETAILS
-----
Local Resources
-----
ora.DATAP_DG.dg
    ONLINE    OFFLINE   nodo1
    ONLINE    OFFLINE   nodo2
    ONLINE    OFFLINE   nodo3
ora.DATA_DG.dg
    ONLINE    ONLINE   nodo1
    ONLINE    ONLINE   nodo2
    ONLINE    ONLINE   nodo3
ora.FRAP_DG.dg
    ONLINE    OFFLINE   nodo1
    ONLINE    OFFLINE   nodo2
    ONLINE    OFFLINE   nodo3
ora.FRA_DG.dg
    ONLINE    ONLINE   nodo1
    ONLINE    ONLINE   nodo2
    ONLINE    ONLINE   nodo3
ora.LISTENER.lsnr
    ONLINE    ONLINE   nodo1
    ONLINE    ONLINE   nodo2
    ONLINE    ONLINE   nodo3
ora.OV_DG.dg
    ONLINE    ONLINE   nodo1
    ONLINE    ONLINE   nodo2
    ONLINE    ONLINE   nodo3
ora.asm
    ONLINE    ONLINE   nodo1                Started
    ONLINE    ONLINE   nodo2                Started
    ONLINE    ONLINE   nodo3                Started
ora.gsd
    OFFLINE    OFFLINE   nodo1
    OFFLINE    OFFLINE   nodo2
    OFFLINE    OFFLINE   nodo3
ora.net1.network
    ONLINE    ONLINE   nodo1
    ONLINE    ONLINE   nodo2
    ONLINE    ONLINE   nodo3
ora.ons
    ONLINE    ONLINE   nodo1
    ONLINE    ONLINE   nodo2
    ONLINE    ONLINE   nodo3
ora.registry.acfs
    ONLINE    ONLINE   nodo1
    ONLINE    ONLINE   nodo2
    ONLINE    ONLINE   nodo3
-----
Cluster Resources
-----
```

```
ora.LISTENER_SCAN1.lsnr
  1          ONLINE  ONLINE          nodo3
ora.cvu
  1          ONLINE  ONLINE          nodo1
ora.nodo1.vip
  1          ONLINE  ONLINE          nodo1
ora.nodo2.vip
  1          ONLINE  ONLINE          nodo2
ora.nodo3.vip
  1          ONLINE  ONLINE          nodo3
ora.oc4j
  1          ONLINE  ONLINE          nodo1
ora.prod.db
  1          ONLINE  ONLINE          nodo1          Open
  2          ONLINE  ONLINE          nodo2          Open
  3          ONLINE  ONLINE          nodo3          Open
ora.scan1.vip
  1          ONLINE  ONLINE          nodo3
oracle@nodo2 $
```

Se puede chequear también el status de la base de datos

```
oracle@nodo3 $ srvctl status database -d prod -v
Instance prod1 is running on node nodo1. Instance status: Open.
Instance prod2 is running on node nodo2. Instance status: Open.
Instance prod3 is running on node nodo3. Instance status: Open.
oracle@nodo3 $
```

Se puede apreciar claramente que en el nodo3 la instancia está OPEN

Y si vemos a nivel de instancias dentro de la base de datos, pues también vemos los servicios en funcionamiento

```
SQL> col host_name format a20
SQL> r
  1* select inst_id , instance_name , host_name , version from gv$instance

  INST_ID INSTANCE_NAME   HOST_NAME          VERSION
-----
      3 prod3             nodo3              11.2.0.3.0
      1 prod1             nodo1              11.2.0.3.0
      2 prod2             nodo2              11.2.0.3.0

SQL>
```