

HP OpenView Operations

Oracle Real Application Clusters (RAC) Support

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UNIX



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Conventions

The following typographical conventions are used in this manual.

Table 1 **Typographical Conventions**

Font	Meaning	Example
<i>Italic</i>	Book or manual titles, and man page names	Refer to the <i>OVO Administrator's Reference</i> and the <i>opc(1M)</i> manpage for more information.
	Emphasis	You <i>must</i> follow these steps.
	Variable that you must supply when entering a command	At the prompt, enter rlogin <i>username</i> .
	Parameters to a function	The <i>oper_name</i> parameter returns an integer response.
Bold	New terms	The HTTPS agent observes...
Computer	Text and other items on the computer screen	The following system message displays: Are you sure you want to remove current group?
	Command names	Use the <code>grep</code> command ...
	Function names	Use the <code>opc_connect()</code> function to connect ...
	File and directory names	<code>/opt/OV/bin/OpC/</code>
	Process names	Check to see if <code>opcmona</code> is running.
	Window/dialog-box names	In the Add Logfile window ...
	Menu name followed by a colon (:) means that you select the menu, then the item. When the item is followed by an arrow (->), a cascading menu follows.	Select Actions: Filtering -> All Active Messages from the menu bar.

Table 1 **Typographical Conventions (Continued)**

Font	Meaning	Example
Computer Bold	Text that you enter	At the prompt, enter ls -l
Keycap	Keyboard keys	Press Return .
[Button]	Buttons in the user interface	Click [OK].

In This Document

The purpose of this document is to introduce the HP OpenView Operations support for the Oracle Real Application Clusters (RAC).

The following terms are used in this document:

Oracle

Database Oracle product

cluster nodes Oracle RAC system used for the Oracle database

OVO database a database created in the Oracle Database and used by OVO

Information in this document is subject to change without prior notice.

Overview

Oracle Real Application Clusters (RAC) represents a highly available, scalable and manageable solution for sharing access to a single database among managed nodes in a cluster environment.

This shared access makes possible that, even during a system fault on one of the nodes, data can be accessed from any one of the remaining nodes. Work on the failed node is recovered automatically without administrator intervention and without data loss.

Oracle RAC is an Oracle Corporation exclusive technology that enables building large systems from commodity components and is the foundation for Enterprise GRID computing.

This chapter contains the following information:

- ❑ System requirements for Oracle and OVO. Refer to “Requirements” on page 11.
- ❑ OVO system limitations. Refer to “Limitations During the OVO Runtime” on page 12.
- ❑ Instructions for creating and configuring the database for OVO. Refer to “Creating and Configuring the OVO Database” on page 13.
- ❑ Instructions for enabling database access on the OVO Management Server. Refer to “Installing OVO” on page 33.

Requirements

Oracle RAC Requirements

Oracle RAC server requirements are described in the Oracle RAC documentation:

<http://www.oracle.com/technology/documentation/database10gR2.html>

Oracle Database server and Oracle Database client (on the OVO Management Server) should be of the same version, further requirements are described in *OVO Installation Guide for the Management Server*.

Oracle Database server can be installed and used with OVO for UNIX on any platform supported by the OVO for UNIX Management Server.

OVO Requirements

The following are OVO requirements:

- ❑ Supported with 8.23 OVO Management Server patch or later.
- ❑ Uses a pre-created Oracle database for OVO.
- ❑ Used in OVO *only* as an independent database server.
- ❑ Access to the OVO database should be configured (Oracle Net Services).

NOTE

OVO Management Server and database server requirements, limitations and configuration details are described in the *OVO Installation Guide for the Management Server*.

IMPORTANT

OVO supports *only* Oracle 10g Release 2 RAC (patch level 10.2.0.2 or later).

Limitations During the OVO Runtime

During the OVO runtime the following limitations apply:

- ❑ For a pre-created Oracle database setup the same limitations apply as for an independent database server setup.
- ❑ Removing the database or dropping the tablespaces using `opcdbsetup` is not supported. You can remove the database or drop tablespaces manually.

When removing the database manually, remove also the following files from the OVO Management Server when the database is removed:

- `/etc/opt/OV/share/conf/ovdbconf`
- `/etc/opt/OV/share/conf/OpC/mgmt_sv/.opcdbpwd.sec`

- ❑ `Mondbfile` policy (template) is not supported.
- ❑ `opcadddbf` tool is not supported.

Installation

Installing Oracle RAC

The Oracle RAC installation instructions are provided in the Oracle RAC documentation, at the following URL:

<http://www.oracle.com/technology/documentation/database10gR2.html>

Creating and Configuring the OVO Database

Before approaching the OVO software installation, perform the following pre-installation tasks to be able to use an independent Oracle Database server:

- ❑ Creating the OVO Database
- ❑ Configuring Access to the OVO Database

NOTE

OVO installation procedure is detailed in the *OVO Installation Guide for the Management Server*.

Creating the OVO Database

Creating the OVO database on the RAC cluster nodes involves the following actions:

- ❑ Creating and configuring the OVO database.

Before proceeding, verify that your system meets the following requirements:

- Oracle10g 10.2.0.2
- Oracle Net 10.2.0.2
- SQL * Plus 10.2.0.2
- 10.2.0.2 or higher Patch Set for the Oracle Database Server

Installation

To create and configure the OVO database on all cluster nodes, follow the procedure described below:

NOTE

It is possible to create database instances automatically on all cluster nodes or manually.

1. Login to the database server as user `oracle` and start the Database Configuration Assistant. Enter the following command:

`$ORACLE_HOME/bin/dbca`

The `Welcome` dialog opens.

NOTE

In the process of creating the database using the Oracle Database Creation Assistant, follow the wizard. Not all steps in the wizard are described in this procedure. In all steps, not described below, leave default values or make custom selections that suit your needs (for example, for storage options).

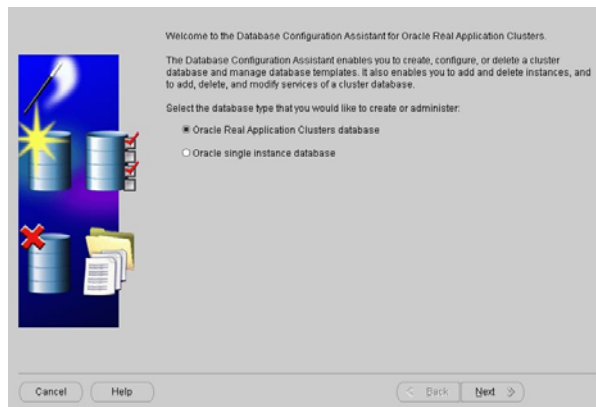
2. In the Welcome dialog, select Oracle Real Application Clusters database and click [Next].

Select Create a Database in the following window.

NOTE

This Welcome dialog is used specially for creating the Oracle RAC database, and it is displayed *only* if the Oracle home from which it is invoked is on the cluster system. Otherwise the generic Welcome dialog appears, which offers only the Oracle single instance database option.

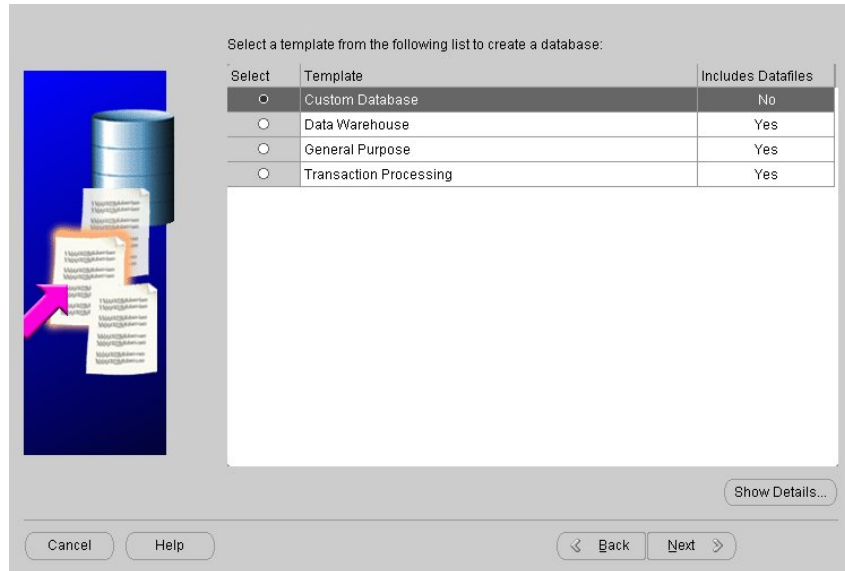
Figure 1-1 Welcome Dialog



3. In the Node Selection dialog, select all cluster nodes on which you want to create the cluster database.

4. In the Database Templates dialog, select the Custom Database template as shown in the Figure 1-2. Click [Next].

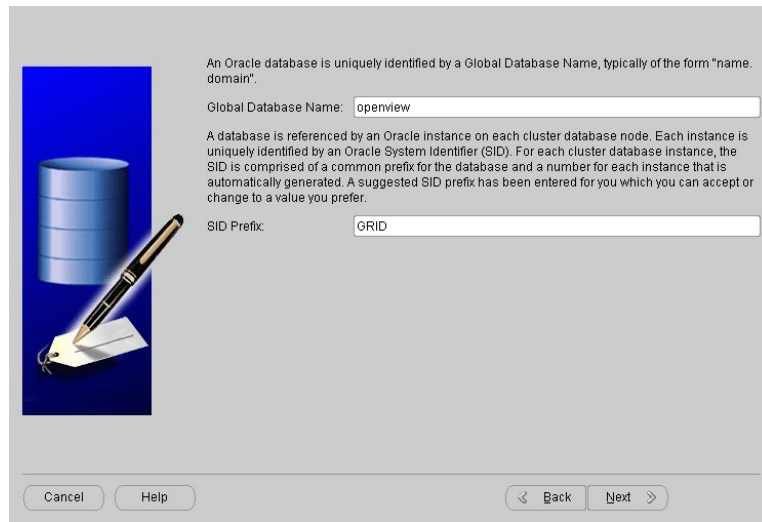
Figure 1-2 Database Templates Dialog



5. In the Database Identification dialog, enter the global database name (for example, **openview**), and the Oracle system identifier prefix (for example, **GRID**) for your cluster database. Click [Next].

These global database name and Oracle system identifier prefix examples are used in the remainder of the instructions, and can be replaced by values of your choice.

Figure 1-3 Database Identification Dialog



6. In the Database Templates dialog select **New Database** template in the list and click [Next].
7. In the Database Credentials dialog, set the SYS and SYSTEM user passwords.

IMPORTANT

Do not forget the passwords you defined. You will need these passwords for OVO configuration and later on for database administration.

8. In the Database Content dialog, remove the database components and the standard database components as shown in the Figure 1-4 and Figure 1-5.

Figure 1-4 Database Content Dialog

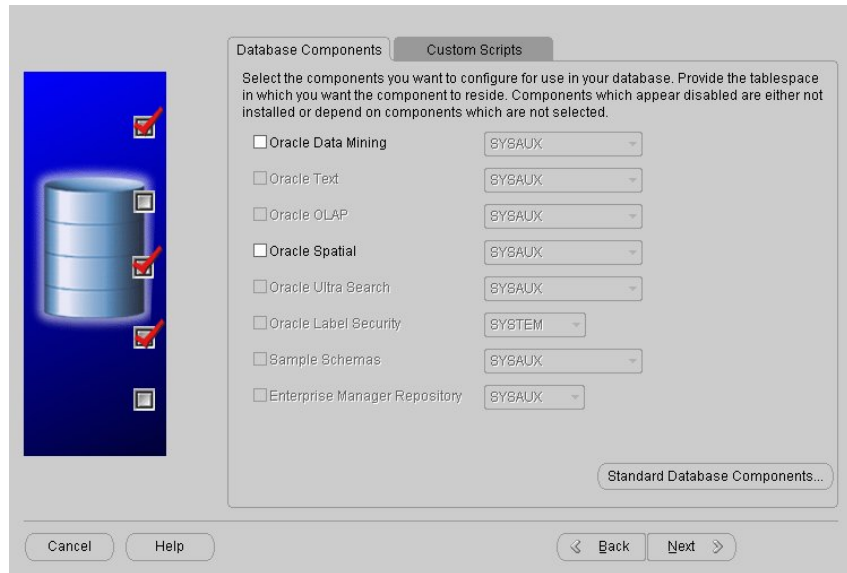
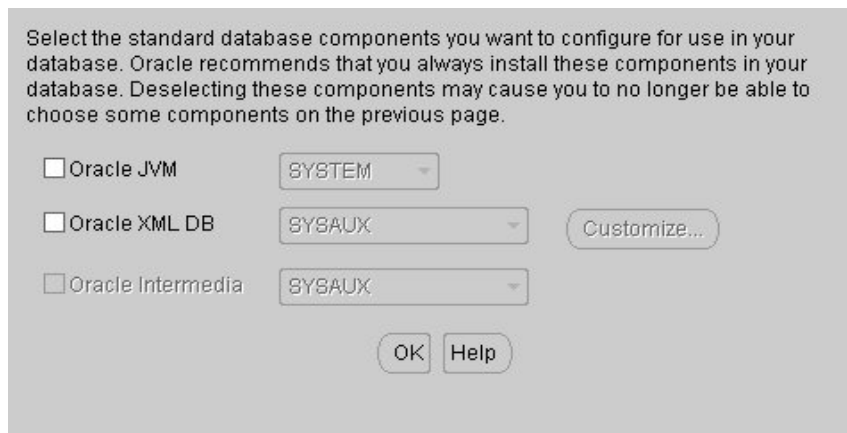


Figure 1-5 Standard Database Components



9. In the Database Connection Options dialog select **Dedicated Server Mode**.
10. In the Character Sets tab of the Initialization Parameters dialog, select a supported character set and NLS_LANG values. For example, select **WE8ISO8859P15** for the English database. Refer to Figure 1-6 on page 21.

NOTE

Refer to *OVO Administrator's Reference* for more information on supported character sets and NLS_LANG values.

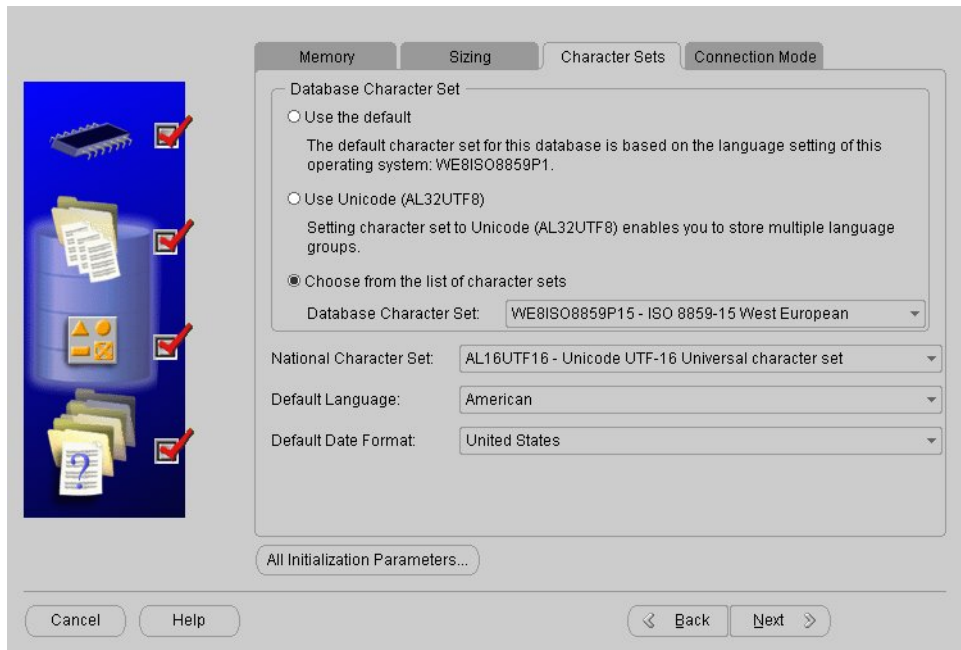
11. Click [All Initialization Parameters] and set initialization parameters according to your needs.

Table 1-1 OVO Recommended Parameter Values

Parameter	Value
db_block_size	8192
db_cache_size	81920000
db_file_multiblock_read_count	16
db_files	80
dml_locks	100
log_buffer	1572864
log_checkpoint_interval	99999
max_dump_file_size	10240
open_cursors	1024
processes	200
sga_target	367001600
sort_area_size	262144

OVO requires at least 3 redo logs with a size of 20M each. Having more and bigger redo logs may increase the performance. We also recommend that you create mirrored copies of the redo logs on another disk. For more information see the Maintaining OVO chapter in the OVO Administrator's Reference.

Figure 1-6 Database Character Set Dialog



12. Create tablespaces and their datafiles as specified in Table 1-2 on page 22. Follow the recommended initial sizes as listed in the table. Create the datafiles as autoextend files, so that the datafiles can grow as needed. Autoextend can be enabled in the "Datafiles" list under the "Storage" tab. Change the TEMP tablespace type to permanent, and set OPC_TEMP as a default temporary tablespace. Refer to Figure 1-7 on page 23 and Figure 1-8 on page 24.

Table 1-2 Required OVO Tablespaces

Tablespace Name	Tablespace Type	Datafile	
		Size	Next
SYSTEM	Locally managed/permanent	250M	1M
SYSAUX	Locally managed/permanent	120M	1M
TEMP	Locally managed/permanent (not temporary)	20M	5M
OPC_1	Locally managed/permanent	4M	6M
OPC_2	Locally managed/permanent	5M	6M
OPC_3	Locally managed/permanent	1M	1M
OPC_4	Locally managed/permanent	26M	2M
OPC_5	Locally managed/permanent	1M	1M
OPC_6	Locally managed/permanent	4M	2M
OPC_7	Locally managed/permanent	4M	2M
OPC_8	Locally managed/permanent	4M	2M
OPC_9	Locally managed/permanent	6M	2M
OPC_10	Locally managed/permanent	6M	6M
OPC_INDEX1	Locally managed/permanent	13M	1M
OPC_INDEX2	Locally managed/permanent	10M	1M
OPC_INDEX3	Locally managed/permanent	10M	1M
OPC_TEMP	Locally managed/temporary	4M	1M

NOTE

Additional tablespaces are required depending on whether you are planning on using Undo Tablespace Management or Rollback Segments.

Figure 1-7 Database Tablespaces

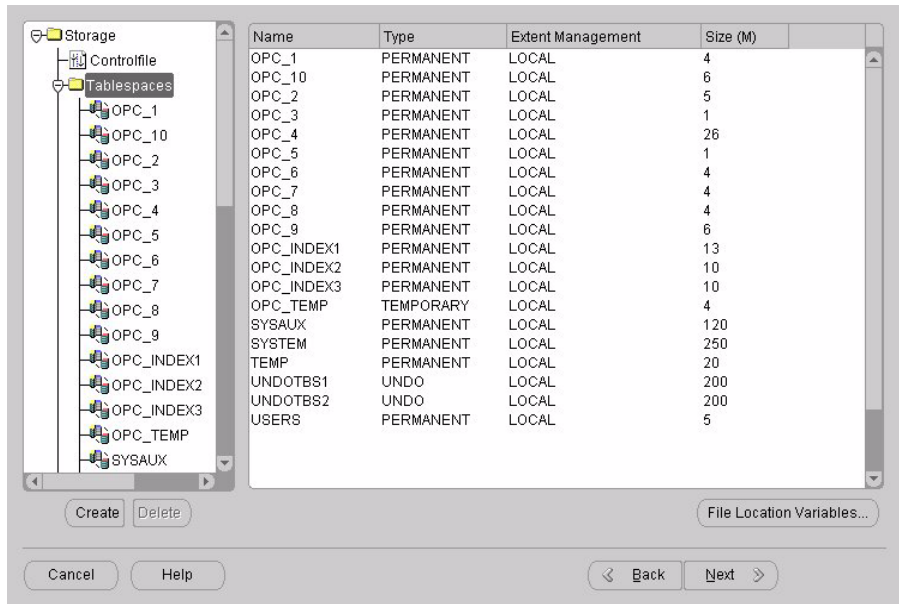
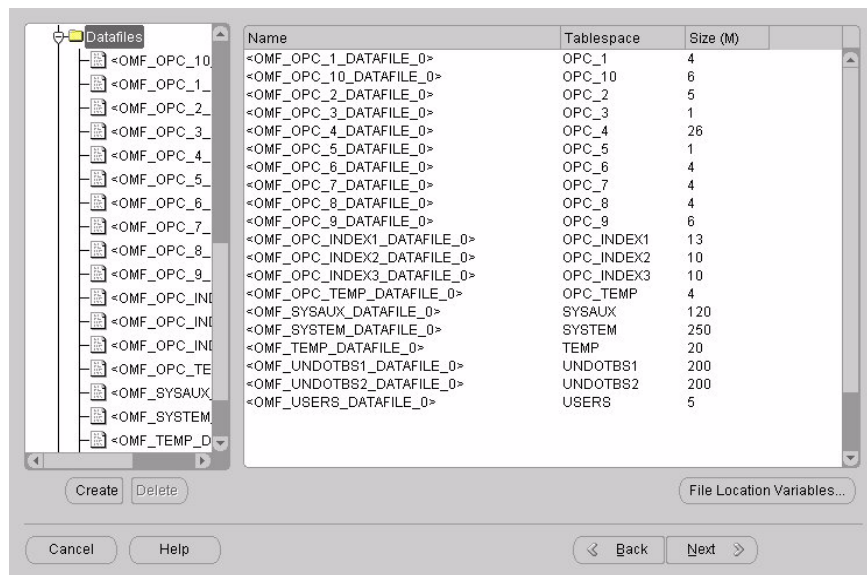


Figure 1-8 Database Datafiles



13. Click [Next] to create the database. Select Create Database option and click [Finish].

After you successfully created the OVO database using the Database Creation Assistant, manually configure users, passwords, and user rights on the database server. Perform the following steps:

1. Log in as user `oracle` and connect as `sysdba`. Enter the following commands:

```
su - oracle  
sqlplus "system as sysdba"
```

2. Enter the password for user `system`. This is the password you set when creating the database.

3. Enter the following command to create the user `opc_op`:

```
create user opc_op identified by <password> \  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

For example:

```
create user opc_op identified by pwd123 \  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

4. Enter the following command to create the user `opc_report`:

```
create user opc_report identified by <password> \  
default tablespace OPC_5 temporary tablespace OPC_TEMP;
```

5. Configure user rights for the users you created. Enter the following commands:

```
create role opc_report_role;

grant create session to opc_report_role;
grant opc_report_role to opc_report;

grant connect,
       resource,
       create public synonym,
       create table,
       create view,
       drop public synonym,
       alter tablespace
       to opc_op;
```

IMPORTANT

The `opc_report_role` is required and must be created.

6. Optionally, you can configure additional user rights on the database server. The following is needed if you want to use the `opc_odc` tool:

```
create role opc_monitorer;  
  
grant select on v_$datafile to opc_monitorer;  
grant select on v_$log to opc_monitorer;  
grant select on v_$logfile to opc_monitorer;  
  
grant select on dba_free_space to opc_monitorer;  
grant select on dba_data_files to opc_monitorer;  
grant select on dba_extents to opc_monitorer;  
grant select on dba_tablespaces to opc_monitorer;  
grant select on dba_tables to opc_monitorer;  
  
grant select on dba_indexes to opc_op;  
grant select on dba_ind_columns to opc_op;  
grant select on dba_cons_columns to opc_op;  
grant select on dba_constraints to opc_op;  
  
grant select on v_$parameter to opc_op;  
grant select on v_$sga to opc_op;  
  
grant opc_monitorer to opc_op;
```

7. To close `sqlplus`, enter `exit`.

Known Problems and Workarounds

1. Symptom

During database creation, a window may pop up with the following error displayed:

```
ORA-29807: Specified operator does not exist
```

Solution

Click **Ignore** and continue with database configuration.

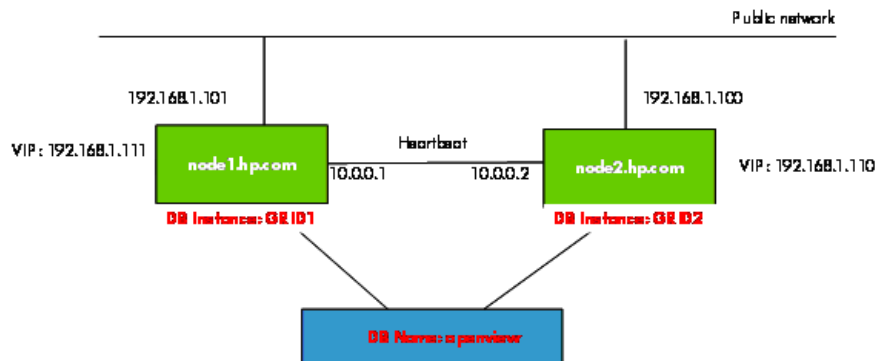
Configuring Access to the OVO Database

To configure access to the OVO database, you need to set up Net Services on all cluster nodes of the database server. You can either use Oracle tools to configure the Net Services, or create the Net Services manually. You can choose an Oracle Net alias (OVO default is `ov_net`). You can specify the used Net Services alias when configuring the OVO Management Server.

To enable the connection from the OVO management server to the database instances on all Oracle RAC nodes, specify your configuration preferences in the following file:

```
$ORACLE_HOME/network/admin/tnsnames.ora
```

Figure 1-9 Example of RAC Configuration



The Figure 1-9 shows the example of Oracle RAC configuration for the following managed nodes:

- ❑ `node1.hp.com`
(with IP address `192.168.1.101`, virtual node name `node1-vip`, and configured database instance `GRID1`).
- ❑ `node2.hp.com`
(with IP address `192.168.1.100`, virtual node name `node2-vip`, and configured database instance `GRID2`).

During the Oracle RAC configuration, the database name is specified, for example, `ov_net`. The database consists of both database instances, `GRID1` and `GRID2`.

The OVO management server uses `ov_net` alias to connect to the OVO database (service name `openview` in Figure 1-9). The Oracle RAC server handles the database connections as specified in the `tnsnames.ora` file using load balancing and failover (for more information refer to the Oracle RAC documentation).

To create the Net Services files manually, perform the steps below:

1. Configure Net Services, needed on all Oracle RAC cluster nodes.

Net files `tnsnames.ora` and `listener.ora` are required. Optionally, you can also configure `tnsnv.ora` and `sqlnet.ora` files. These files are located in the `$ORACLE_HOME/network/admin` directory.

❑ **Example of `tnsnames.ora` file:**

```
OPENVIEW =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node1-vip) (PORT = 1521))
    (ADDRESS = (PROTOCOL = TCP) (HOST = node2-vip) (PORT = 1521))
    (LOAD_BALANCE = yes)
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = openview)
    )
  )

ov_net =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP) (HOST = node1-vip) (PORT = 1521))
    (ADDRESS = (PROTOCOL = TCP) (HOST = node2-vip) (PORT = 1521))
    (LOAD_BALANCE = yes)
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = openview)
      (FAILOVER_MODE =
        (TYPE = SELECT)
        (METHOD = BASIC)
```

```
        (RETRIES = 180)
        (DELAY = 5)
    )
)
)

GRID1 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = node1-vip)(PORT =
1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = openview)
      (INSTANCE_NAME = GRID1)
    )
  )
)

GRID2 =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = node2-vip)(PORT =
1521))
    (CONNECT_DATA =
      (SERVER = DEDICATED)
      (SERVICE_NAME = openview)
      (INSTANCE_NAME = GRID2)
    )
  )
)

LISTENERS_OPENVIEW =
  (ADDRESS_LIST =
    (ADDRESS = (PROTOCOL = TCP)(HOST = node1-vip)(PORT =
1521))
    (ADDRESS = (PROTOCOL = TCP)(HOST = node2-vip)(PORT =
1521))
  )
)
```

❑ **Example of listener.ora file on node1.hp.com:**

```
LISTENER_NODE1 =  
  (DESCRIPTION_LIST =  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP) (HOST = node1-vip) (PORT =  
1521) (IP = FIRST))  
      )  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP) (HOST =  
192.168.1.101) (PORT = 1521) (IP = FIRST))  
      )  
    )  
  )
```

❑ **Example of sqlnet.ora file:**

```
TRACE_LEVEL_CLIENT = OFF  
TRACE_DIRECTORY_CLIENT =  
/opt/oracle/product/10.1.0/network/log  
LOG_DIRECTORY_CLIENT =  
/opt/oracle/product/10.1.0/network/log
```

❑ **Example of tnsnav.ora file:**

```
LOCAL_COMMUNITIES =  
  (COMMUNITY_LIST =  
    (COMMUNITY = OPENVIEW_COMMUNITY)  
  )
```

NOTE

In all example files, change hostnames, IPs, and directory paths according to your system settings.

2. Start listener as user `oracle` on all cluster nodes.

Installing OVO

Before you proceed with the OVO installation, verify that your OVO management server system or both OVO cluster server nodes meet the following requirements:

- Oracle10g Client 10.2.0.2
- Oracle Net 10.2.0.2
- SQL * Plus 10.2.0.2
- 10.2.0.2 or higher Patch Set for the Oracle Database Server

To set up OVO to use an Oracle RAC system, follow the OVO Management Server standalone or clustered installation procedures as described in the *OVO Installation Guide for the Management Server*, but with exceptions in the procedures as described below.

During the installation procedure, answer the following questions as follows:

- Do you want to set up the database manually
(local/remote) (y|n):

Answer **y**.

- Is the manually configured database already set up (y|n):

Answer **n**.

When the following message is displayed:

Once you are finished with applying patches/setting up the remote database, answer `y` to the following question to continue with the configuration of the database. Do you want to continue now (y|n):

leave the `ovoinstall` window open without answering the question and in another window perform the procedure below as the root user:

IMPORTANT

This procedure replaces the procedure for setting up an independent database server, described in the *OVO Installation Guide for the Management Server*.

If you are installing OVO for UNIX in a clustered environment, follow all of the steps below steps accordingly for the first cluster node, and only the first step below for the second cluster node.

-
1. Install the latest OVO for UNIX Management Server patch (8.23 or later).
 2. Export `ORACLE_HOME`, `ORACLE_SID`, and `LANG` (for an appropriate `LANG` value refer to *OVO Administrator's Reference*).
 3. Copy the following Net files from the Oracle database server to the OVO Management Server:
 - `$ORACLE_HOME/network/admin/sqlnet.ora`
 - `$ORACLE_HOME/network/admin/tnsnames.ora`
 - `$ORACLE_HOME/network/admin/tnsnv.ora`

These files are required on the database server and the OVO Management Server. When you copy the files to the OVO Management Server, check that the directory paths point to the correct locations and modify them if necessary.

NOTE

`tnsnv.ora` and `sqlnet.ora` files are optional. In case you configured these files on the RAC cluster, you should also configure them on the OVO Management Server.

4. If you are installing OVO for UNIX on the first cluster node of a clustered environment, export the `OPC_HA TRUE` and `OPC_MGMT_SERVER` variables using the following commands:

```
ovconfchg -ovrg server -ns opc -set OPC_HA TRUE  
ovconfchg -ovrg server -ns opc -set OPC_MGMT_SERVER \  
<valid virtual host>
```

where `<valid virtual host>` is the long hostname of the virtual host that was previously selected during `ovinstall`

5. Run `/opt/OV/bin/OpC/opcdbsetup -p`
6. Optionally, if you configured additional user rights on the database server in step 6 while creating the OVO database, you can run `/opt/OV/contrib/OpC/opc_odc` to verify the database setup (logfile is in `/tmp/opc_odc.log`).

Continue the installation procedure in the `ovinstall` window. Answer **y** to the previous question and proceed with the installation. For details refer to the *OVO Installation Guide for the Management Server*.

