

# Veritas™ Cluster Server One Agent for Oracle Installation and Configuration Guide

AIX, HP-UX, Linux, Solaris

5.0 Service Pack 1

# Veritas Cluster Server One Agent for Oracle Installation and Configuration Guide

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Agent version: 6.2.0.0

Document version: 6.2.0.0.0

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# Introducing the Veritas Cluster Server One agent for Oracle

This chapter includes the following topics:

- [About the Veritas Cluster Server One agent for Oracle](#)
- [What's new in this release](#)
- [Supported software for VCS One agent for Oracle](#)
- [How the agent manages Oracle](#)
- [About Veritas Cluster Server One agent for Oracle agent functions](#)
- [Typical Oracle configuration in a VCS One cluster](#)
- [About setting up Oracle in a VCS One cluster](#)

## About the Veritas Cluster Server One agent for Oracle

The Veritas Cluster Server One agent for Oracle provides high availability for Oracle.

Veritas high availability agents do the following:

- Monitor specific resources within an enterprise application.
- Determine the status of these resources.
- Start or stop the resources according to external events.

The agents include resource type declarations and agent executables. The agent for Oracle monitors the Oracle and listener processes, brings them online, and takes them offline.

The agent package for Oracle contains the following agents that work together to make Oracle highly available:

- The Oracle agent monitors the Oracle database processes.
- The Netlsnr agent monitors the listener process.

See the following Technical Support TechNote for the latest updates or software issues for this agent:

<http://seer.entsupport.symantec.com/docs/282004.htm>

## What's new in this release

The Oracle agent introduces two new attributes DBAUser and DBAPword.

See “[Attribute definition for the Oracle agent](#)” on page 83.

## Supported software for VCS One agent for Oracle

The Veritas Cluster Server One agent for Oracle 5.0 Service Pack 1 supports the following software versions in a Veritas Cluster Server One (VCS One) environment:

Oracle	Oracle9i, Oracle 10g R1, Oracle 10g R2 and Oracle 11g R1 (including 64-bit versions)  <b>Note:</b> Veritas Cluster Server One agent for Oracle supports the specified Oracle versions on an operating system if Oracle supports that version on that operating system.
VCS One	VCS One 5.0 SP1 on AIX, HP-UX, Linux, and Solaris
AIX	AIX 5.3 and 6.1  Refer to the <i>Veritas Cluster Server One Release Notes</i> for more details.  <b>Note:</b> The agent does not support WPAR for AIX 6.1.
HP-UX	HP-UX 11i version 2.0  HP-UX 11i version 3.0  Refer to the <i>Veritas Cluster Server One Release Notes</i> for more details.

Linux	<p>The agent supports the following Linux distributions:</p> <ul style="list-style-type: none"><li>■ Red Hat Enterprise Linux 4</li><li>■ Red Hat Enterprise Linux 5</li><li>■ SUSE Linux Enterprise Server 10 with SP2</li></ul> <p>Refer to the <i>Veritas Cluster Server One Release Notes</i> for more details.</p>
Solaris	<p>Solaris SPARC: Solaris 9 and Solaris 10 (64-bit)</p> <p>Solaris x64: Solaris 10 (64-bit)</p> <p><b>Note:</b> For each platform, Symantec recommends applying the latest Solaris operating system patches available from Sun. Visit Sun's Web site to download the latest patches.</p> <p>Refer to the <i>Veritas Cluster Server One Release Notes</i> for more details.</p>

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**Note:** VCS One can manage Oracle that is installed on different operating systems. But the application failover can occur only between the client systems that run the same operating system version and patch level.

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## How the agent manages Oracle

The Veritas Cluster Server One agent for Oracle continuously monitors the Oracle database and listener processes to verify they function properly.

See [“About Veritas Cluster Server One agent for Oracle agent functions”](#) on page 15.

The agent provides the following levels of application monitoring:

- **Primary or Basic monitoring**

This mode has Process check and Health check monitoring options. With the default Process check option, the agent verifies that the Oracle and listener processes are present in the process table. Process check cannot detect whether processes are in a hung or stopped states.
- **Secondary or Detail monitoring**

In this mode, the agent runs a perl script that executes commands against the database and listener to verify their status.

The agent detects application failure if the monitoring routine reports an improper function of the Oracle or listener processes. When this application failure occurs, the Oracle service group fails over to another client system in the cluster. Thus the agent ensures high availability for the Oracle services and the database.

On Solaris 10, VCS One provides high availability to applications that run in the context of Solaris Containers. You can configure the Veritas Cluster Server One agent for Oracle to monitor these resources that run in the context of Solaris zones and projects.

See [“How the agent monitors Oracle instances running in Solaris zones”](#) on page 14.

See [“How the agent monitors Oracle instances running in the context of Solaris Resource Managers”](#) on page 14.

## How the agent monitors Oracle instances running in Solaris zones

Solaris 10 provides a means of virtualizing operating system services, allowing one or more processes to run in isolation from other activity on the system. Such a "sandbox" is called a "non-global zone." Each zone can provide a rich and customized set of services. The processes that run in a "global zone" have the same set of privileges that are available on a Solaris system today.

VCS One provides high availability to applications running in non-global zones by extending the failover capability to zones. VCS One is installed in a global zone, and all the VCS One agents and the engine components run in the global zone. For applications running within non-global zones, agents run script entry points inside the zones. If a zone configured under VCS One control faults, VCS One fails over the entire service group containing the zone.

See *Veritas Cluster Server One User's Guide*.

The Veritas Cluster Server One agent for Oracle is zone-aware and can monitor Oracle instances running in non-global zones.

## How the agent monitors Oracle instances running in the context of Solaris Resource Managers

Solaris 10 provides workload management through Solaris Resource Manager (SRM). SRM enables you to manage, allocate, and control resources at the workload level instead of the individual process level. A workload is a collection of all the process that constitute one or more applications.

VCS One lets you set workload at service group level to all the applications. VCS One enforces load restrictions through Solaris Resource Manager.

See *Veritas Cluster Server One User's Guide*.

VCS One provides high availability to applications running in the context of Solaris projects. For applications running in the context of projects, the agent's script entry points can execute the commands that run in the context of projects.

The Veritas Cluster Server One agent for Oracle is project-aware and can monitor Oracle instances running in the context of Solaris projects.

## About Veritas Cluster Server One agent for Oracle agent functions

The functions an agent performs are called entry points. Review the functions for the following agents that are part of the Veritas Cluster Server One agent suite for Oracle:

- Oracle agent functions  
See [“Oracle agent functions”](#) on page 15.
- Netlsnr agent functions  
See [“Netlsnr agent functions”](#) on page 22.

### Oracle agent functions

The Oracle agent monitors the database processes.

[Table 1-1](#) lists the Oracle agent functions.

**Table 1-1** Oracle agent functions

Agent operation	Description
Online	<p>Starts the Oracle database by using the following <code>svrmgrl</code> or <code>sqlplus</code> command:</p> <pre>startup force pfile=\$PFile</pre> <p>The default Startup option is <code>STARTUP_FORCE</code>. You can also configure the agent to start the database using different Startup options for Oracle.</p> <p>See <a href="#">“Startup and shutdown options for the Oracle agent”</a> on page 16.</p>
Offline	<p>Stops the Oracle database with the specified options by using the following <code>svrmgrl</code> or <code>sqlplus</code> command:</p> <pre>shutdown immediate</pre> <p>The default Shutdown option is <code>IMMEDIATE</code>. You can also configure the agent to stop the database using different Shutdown options for Oracle.</p> <p>See <a href="#">“Startup and shutdown options for the Oracle agent”</a> on page 16.</p>

**Table 1-1** Oracle agent functions (*continued*)

Agent operation	Description
Monitor	Verifies the status of the Oracle processes. The Oracle agent provides two levels of monitoring: basic and detail.  See <a href="#">“Monitor options for the Oracle agent”</a> on page 18.
Clean	Forcibly stops the Oracle database by using the following <code>svrmgrl</code> or <code>sqlplus</code> command:  <code>shutdown abort</code>  If the process does not respond to the <code>shutdown</code> command, then the agent does the following: <ul style="list-style-type: none"> <li>■ Scans the process table for the processes that are associated with the configured instance</li> <li>■ Kills the processes that are associated with the configured instance</li> </ul>
Info	Provides the static and dynamic information about the state of the database.  See <a href="#">“Info entry point for VCS One agent for Oracle”</a> on page 20.
Action	Performs the predefined actions on a resource.  See <a href="#">“Action entry point for VCS One agent for Oracle”</a> on page 21.

## Startup and shutdown options for the Oracle agent

You can specify Startup and Shutdown options for the Oracle instances that are configured.

[Table 1-2](#) lists the startup options that the agent supports.

**Table 1-2** Startup options

Option	Description
STARTUP_FORCE (Default)	Runs the command <code>startup force</code> <code>pfile='location_of_pfile'</code> if the pfile is configured.  If the pfile is not configured, the agent runs <code>startup force</code> . It picks up the default parameter files from their default locations.



**Table 1-2** Startup options (*continued*)

Option	Description
STARTUP	<p>Runs the command <code>startup pfile='location_of_pfile'</code> if the pfile is configured.</p> <p>If the pfile is not configured, the agent picks up the default parameter files from their default locations and runs <code>startup</code>.</p>
RESTRICTED	Starts the database in the RESTRICTED mode.
RECOVERDB	Performs a database recovery on instance startup.
CUSTOM	<p>Uses a predefined SQL script (<code>start_custom_\$\$SID.sql</code>) and runs custom startup options. The script must be in the <code>/opt/VRTSagents/ha/bin/Oracle</code> directory and must have access to the Oracle Owner OS user. If the file is not present, the agent logs an error message.</p> <p>With a custom script, the agent takes the following action:</p> <pre> sqlplus /nolog &lt;&lt;! connect / as sysdba; @start_custom_\$\$SID.sql exit; !</pre>

[Table 1-3](#) lists the shutdown options that the agent supports.

**Table 1-3** Shutdown options

Option	Description
IMMEDIATE (Default)	Shuts down the Oracle instance by running <code>shutdown immediate</code> .
TRANSACTIONAL	Runs the <code>shutdown transactional</code> command. This option is valid only for the database versions that support this option.
CUSTOM	Uses a predefined SQL script ( <code>shut_custom_\$\$SID.sql</code> ) and runs custom shutdown options. The script must be in the <code>/opt/VRTSagents/ha/bin/Oracle</code> directory and must have access to the Oracle Owner OS user. If the file is not present, the agent shuts the agent down with the default option.

### Monitor options for the Oracle agent

The Oracle agent provides two levels of monitoring: basic and detail. By default, the agent does a basic monitoring.

The basic monitoring mode has the following options:

- Process check
- Health check

The MonitorOption attribute of the Oracle resource determines whether the agent must perform basic monitoring in Process check or Health check mode.

Table 1-4 describes the basic monitoring options.

Table 1-4 Basic monitoring options

Option	Description
0 (Default)	Process check The agent scans the process table for the ora_dbw, ora_smon, ora_pmon, and ora_lgwr processes to verify that Oracle is running.
1	Health check (supported on Oracle 10g and later) The agent uses the Health Check APIs from Oracle to monitor the SGA and retrieve the information about the instance. See <a href="#">“How the agent manages Oracle”</a> on page 13.

Review the following considerations if you want to configure basic monitoring:

- This consideration is for AIX, HP-UX, and Linux:  
Basic monitoring of Oracle processes is user-specific. As a result, an Oracle instance started under the context of another user cannot be detected as online. For example, if an Oracle instance is started under the user "oraVRT" and the agent is configured for a user "oracle", the agent will not detect the instance started by "oraVRT" as online.  
This could lead to situations where issuing a command to online a resource on a client system might online an already running instance on that client system (or any other client system).  
So, Symantec recommends that instances started outside VCS One control be configured with the correct Owner attribute corresponding to the OS user for that instance.
- Within a failover service group, when the administrator online an Oracle resource on a client system and if the Oracle instance is online on any other client system within a cluster, the instance would come up. However, the database does not get mounted. In such circumstances, this failure is detected

only by health check monitoring option of basic monitoring or detail monitoring. Detail monitoring updates the database table after detecting a failure whereas health check monitoring does not.

If health check monitoring option of basic monitoring or detail monitoring is not configured, then such a conflict would go undetected.

In the detail monitoring mode, the agent performs a transaction on a test table in the database to ensure that Oracle functions properly. The agent uses this test table for internal purposes. Symantec recommends that you do not perform any other transaction on the test table. The DetailMonitor attribute of the Oracle resource determines whether the agent must perform detail monitoring.

See [“How the agent handles Oracle error codes during detail monitoring”](#) on page 19.

See [“Setting up detail monitoring for VCS One agent for Oracle”](#) on page 70.

## How the agent handles Oracle error codes during detail monitoring

The Veritas Cluster Server One agent for Oracle handles Oracle errors during detail monitoring. The agent classifies Oracle errors according to their severity and associates predefined actions with each error code.

The agent includes a reference file oraerror.dat, which lists Oracle errors and the action to be taken when the error is encountered.

The file stores information in the following format:

```
Oracle_error_string:action_to_be_taken
```

For example:

```
01035:WARN
01034:FAILOVER
```

[Table 1-5](#) lists the predefined actions that the agent takes when an Oracle error is encountered.

**Table 1-5**                      Predefined agent actions for Oracle errors

Action	Description
IGNORE	<p> Ignores the error.</p> <p>When the Veritas agent for Oracle encounters an error, the agent matches the error code in the oraerror.dat file. If the error does not have a matching error code in the file, then the agent ignores the error.</p>

**Table 1-5**            Predefined agent actions for Oracle errors *(continued)*

Action	Description
UNKNOWN	Marks the resource state as UNKNOWN and takes no action.  This action is typically associated with configuration errors or program interface errors.
WARN	Marks the resource state as ONLINE and takes no action.  This action is typically associated with errors due to exceeded quota limits, session limits/restricted sessions so on.
FAILOVER (Default)	Marks the resource state as OFFLINE. This faults the service group by default, which fails over to the next available system.  If the file oraerror.dat is not available, the agent assumes this default behavior for every Oracle error encountered.
NOFAILOVER	Freezes the service group temporarily and marks the resource state as OFFLINE.  This action is typically associated with the errors that are not system-specific. For example, if a database does not open from a client system due to corrupt Oracle files, failing it over to another client system does not help.

Info entry point for VCS One agent for Oracle

The Veritas Cluster Server One agent for Oracle supports the Info entry point, which provides static and dynamic information about the state of the database.

To invoke the Info entry point, type the following command:

```
# hares -value resource ResourceInfo [system] \  
[-clus cluster | -localclus]
```

The entry point retrieves the following static information:

- Version

■ DatabaseName

■ Parallel
- InstanceNo

■ HostName

■ Thread
- InstanceName

■ StartupTime

■ InstanceRole

The entry point retrieves the following dynamic information:

- InstanceStatus

■ Logins

■ OpenMode

- LogMode

■ ShutdownPending

■ DatabaseStatus
- Shared Pool Percent free

■ Buffer Hits Percent

You can add additional attributes by adding sql statements to the file /opt/VRTSagents/ha/bin/Oracle/resinfo.sql. For example:

```
select 'static:HostName:'||host_name from v$instance;
select 'dynamic:ShutdownPending:'||shutdown_pending from
v$instance;
```

The format of the selected record must be as follows:

```
attribute_type:userkey_name:userkey_value
```

The variable *attribute\_type* can take the value static and/or dynamic.

### Action entry point for VCS One agent for Oracle

The Veritas Cluster Server One agent for Oracle supports the Action entry point, which enables you to perform predefined actions on a resource.

To perform an action on a resource, type the following command:

```
# hares -action res token [-actionargs arg1 ...] \
[-sys system] [-user user@domain] [-domaintype domaintype]
```

You can also add custom actions for the agent.

For further information, refer to the *Veritas Cluster Server One Agent Developer's Guide*.

[Table 1-6](#) describes the agent's predefined actions.

**Table 1-6**            Predefined agent actions

Action	Description
VRTS_GetInstanceName	Retrieves the name of the configured instance. You can use this option for the Oracle and the Netlsnr resources.
VRTS_GetRunningServices	Retrieves the list of processes that the agent monitors. You can use this option for the Oracle and the Netlsnr resources.
DBRestrict	Changes the database session to enable the RESTRICTED mode.

**Table 1-6**                      Predefined agent actions (*continued*)

Action	Description
DBUndoRestrict	Changes the database session to disable the RESTRICTED mode.
DBSuspend	Suspends a database.
DBResume	Resumes a suspended database.
DBTbspBackup	Backs up a tablespace; <code>actionargs</code> contains name of the tablespace to be backed up.

## Netlsnr agent functions

The listener is a server process that listens to incoming client connection requests and manages traffic to the database. The Netlsnr agent brings the listener services online, monitors their status, and takes them offline.

[Table 1-7](#) lists the Netlsnr agent functions.

**Table 1-7**                      Netlsnr agent functions

Agent operation	Description
Online	Starts the listener process by using the following command: <code>lsnrctl start \$LISTENER</code>
Offline	Stops the listener process by using the following command: <code>lsnrctl stop \$LISTENER</code>  If the listener is configured with a password, the agent uses the password to stop the listener.
Monitor	Verifies the status of the listener process.  The Netlsnr agent provides two levels of monitoring, basic and detail: <ul style="list-style-type: none"><li>■ In the basic monitoring mode, the agent scans the process table for the <code>tnslsnr</code> process to verify that the listener process is running.</li><li>■ In the detail monitoring mode, the agent uses the <code>lsnrctl status \$LISTENER</code> command to verify the status of the Listener process. (Default)</li></ul>
Clean	Scans the process table for <code>tnslsnr \$Listener</code> and kills it.

**Table 1-7** Netlsnr agent functions (*continued*)

Agent operation	Description
Action	Performs the predefined actions on a resource. See “ <a href="#">Action entry point for VCS One agent for Oracle</a> ” on page 21.

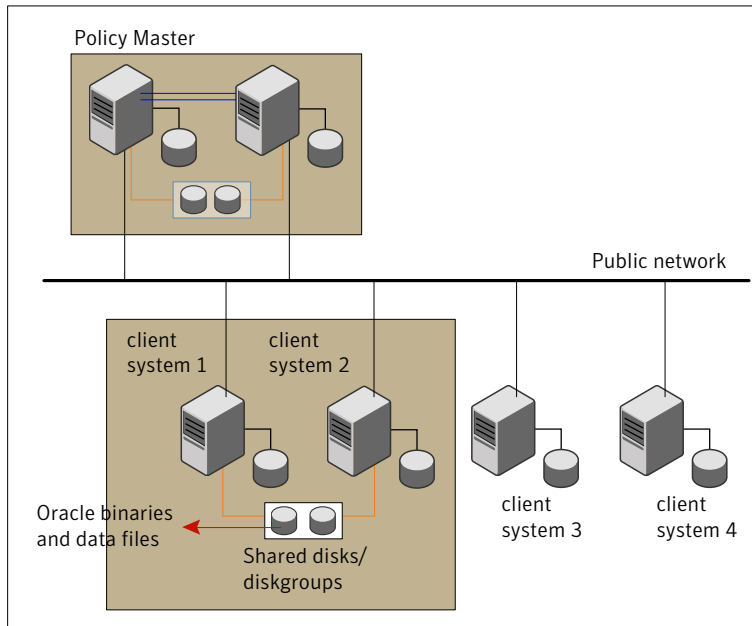
## Typical Oracle configuration in a VCS One cluster

A typical Oracle configuration in a VCS One cluster has the following characteristics:

- The Policy Master runs on two nodes in the cluster.
- The VCS One client is installed on all client systems.
- The Oracle data is installed on shared storage.
- The Oracle binaries are installed locally on both client systems or on shared disks.
- The Veritas Cluster Server One agent for Oracle is installed on both client systems.

[Figure 1-1](#) depicts a configuration where Oracle binaries and data are installed completely on shared disks.

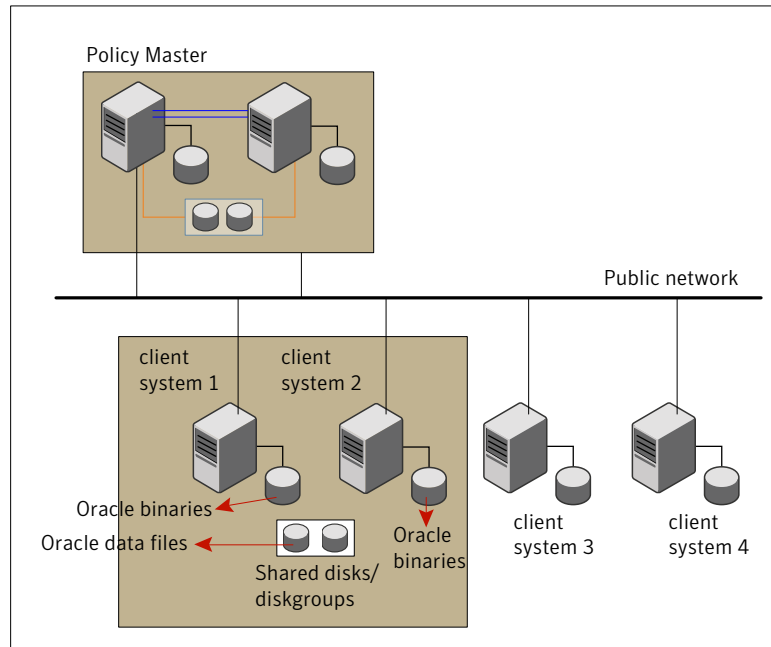
**Figure 1-1** Oracle binaries and data on shared disks



**Figure 1-2** depicts a configuration where Oracle binaries are installed locally on each client system and Oracle data is installed on shared disks.



**Figure 1-2** Oracle binaries on local disk and Oracle data on shared disk



## About setting up Oracle in a VCS One cluster

Tasks involved in setting up Oracle in a VCS One environment include:

- Setting up a VCS One cluster  
Refer to *Veritas Cluster Server One Installation Guide* for more information on installing and configuring VCS One.
- Installing and configuring Oracle  
See [“About installing Oracle in a VCS One environment”](#) on page 27.
- Installing the Veritas Cluster Server One agent for Oracle  
See [“Before you install the agent for Oracle”](#) on page 47.
- Configuring VCS One service groups for Oracle  
See [“About configuring a service group for Oracle”](#) on page 57.



# Installing and configuring Oracle

This chapter includes the following topics:

- [About installing Oracle in a VCS One environment](#)
- [Before you install Oracle in a VCS One environment](#)
- [About VCS One requirements for installing Oracle](#)
- [About Oracle installation tasks for VCS One](#)
- [Installing Oracle binaries in a VCS One environment](#)
- [Configuring the Oracle database in a VCS One environment](#)
- [Setting MLOCK privilege for DBA user \(HP-UX client system\)](#)
- [Copying the \\$ORACLE\\_BASE/admin/SID directory](#)
- [Verifying access to the Oracle database](#)

## About installing Oracle in a VCS One environment

The strategy for installing Oracle into a VCS One cluster is aimed at ensuring that installations on all client systems in the cluster are uniform.

See the Oracle documentation on AIX, HP-UX, Linux, and Solaris.

You can install Oracle in the following ways in a VCS One environment:

\$ORACLE_HOME on the shared disk	Oracle binaries and Oracle data are installed on shared disks.
----------------------------------	--

`$ORACLE_HOME` on the local disk      Oracle binaries are installed locally on each client system and Oracle data is installed on shared disks.

See [“About Oracle installation tasks for VCS One”](#) on page 35.

Note that Oracle data includes the datafiles, control files, redo log files, and archive log files.

When installing Oracle, ensure that the `login_id`, `id_name`, `group_id`, and `group_name` for the Oracle owner is the same on all the client systems. The user `oracle` and the group `dba` must be local and not Network Information Service (NIS and NIS+) users.

---

**Note:** If you upgraded Oracle after you installed and configured the VCS One agent for Oracle, you must restart the agent using the `haagent` command.

See the *Veritas Cluster Server One User's Guide*.

---

## Before you install Oracle in a VCS One environment

Make sure you meet the following prerequisites:

- Verify that VCS One client is installed on Policy Master or on all client systems.
- Verify that all client systems in the cluster have adequate resources to run Oracle and VCS One.
- Verify that the network supports the TCP/IP protocol.
- Make sure that you meet the VCS One requirements to install Oracle.  
See [“About VCS One requirements for installing Oracle”](#) on page 28.

## About VCS One requirements for installing Oracle

Make sure you meet the following requirements to install Oracle in a VCS One cluster:

Kernel parameter configuration	<p>Each client system on which you want to install Oracle must meet the following Oracle configuration requirements:</p> <ul style="list-style-type: none"> <li>■ Disk partitions</li> <li>■ Shared memory</li> <li>■ Swap size</li> <li>■ Semaphores</li> <li>■ File handles</li> </ul> <p>See Oracle documentation for the corresponding operating system for specific requirement details.</p>
Linux package group	<p>Symantec recommends you to select the Software Development package option when you install Linux. This option is required for relinking Oracle at install time and to take advantage of some Advanced Server features.</p>
Location of the \$ORACLE_HOME	<p>Depending on your environment, you can place the Oracle home directory (\$ORACLE_HOME) in one of the following ways:</p> <ul style="list-style-type: none"> <li>■ Locally on each server's disk</li> <li>■ On the shared storage.</li> </ul> <p>Review the advantages of each approach to make a decision.</p> <p>See <a href="#">“Location of the \$ORACLE_HOME”</a> on page 32.</p>
Configurations with multiple Oracle instances (SIDs)	<p>You can have multiple Oracle instances that are defined in a single cluster. In such cases, the parameter file for each instance must be accessible on all the client systems in the service group's SystemList attribute.</p> <p><b>Note:</b> If you installed multiple versions of Oracle on the same system, make sure that the SIDs are unique.</p>

Location of Oracle database tablespaces

If you plan to create the tablespaces using regular (JFS2 or VxFS on AIX, or UFS or VxFS on other supported platforms) files, the file systems that contain these files must be located on shared disks. Create the same file system mount points on each client system.

If you use raw devices on shared disks for Oracle tablespaces, you must meet the following requirements:

- The ownership must be Oracle dba user.
- The permissions or access mode must be 660 on the raw devices that store the Oracle data.

For example, if you use Veritas Volume Manager, type:

```
# vxedit -g diskgroup_name set group=dba \
user=oracle mode=660 volume_name
```

**Note:** The user `oracle` and the group `dba` must be local and not Network Information Service (NIS and NIS+) users

Location of core files for Oracle processes that terminate abnormally

The VCS One agent framework sets the current directory to `/opt/VRTSagents/ha/bin/Oracle` before it runs the Oracle agent scripts or the programs that execute the Oracle binaries. Oracle binaries, which run as the user `oracle`, do not have permission to write to `/opt/VRTSagents/ha/bin/Oracle`. So, any "core" files that the Oracle binaries generate when the processes terminate abnormally are lost. Symantec recommends using the `coreadm(1M)` command on Solaris to specify the name and the location of such core files.

Transparent listener failover

You can enable Oracle Server clients to reconnect after a client system switch without reconfiguring. For such reconnections you must include at least one IP resource in the service group for the Oracle resource. The hostname mapping the IP address of this resource must be used for the Host field in the file `$TNS_ADMIN/listener.ora`.

If you use the TCP/IP protocol for Oracle client/server communication, verify that the file `/etc/services` contains the service name of the Oracle Net Service. You must verify this file on each client system that is defined in the service group's `SystemList` attribute.

Listener authentication in VCS One environment	<p>The Netlsnr agent supports OS authentication as well as password authentication for the listener process. If you use Oracle 10g or later, Symantec recommends you to configure OS authentication. If you want to configure a listener password, make sure that you configure the password correctly. A misconfigured password can cause the listener to fault.</p> <p>See <a href="#">“Encrypting Oracle database user and listener passwords”</a> on page 69.</p> <p>Refer to the Oracle documentation for details on configuring the listener authentication.</p>
Long pathname limitation for \$ORACLE_HOME	<p>The AIX and Solaris process tables limit process pathnames to 79 characters.</p> <p>The full pathname of processes in \$ORACLE_HOME can possibly have 80 characters or more. In this case, you can create a soft link to the \$ORACLE_HOME directory. You can then use the soft link in place of the long filename in the Home attribute in the main.xml file.</p> <p>Review the instructions to replace the long pathnames for \$ORACLE_HOME in the agent attributes.</p> <p>See <a href="#">“Replacing the long pathnames for \$ORACLE_HOME in the agent attributes”</a> on page 33.</p>
Oracle NLS information	<p>On AIX, HP-UX, and Solaris, you can define the NLS information in one of the following ways:</p> <ul style="list-style-type: none"> <li>■ Define the appropriate parameters in the Oracle parameter file.</li> <li>■ Define the appropriate environment variables in the EnvFile attribute for the agents.</li> </ul> <p>See <a href="#">“About the resource type and attribute definitions”</a> on page 83.</p> <p>Defining the parameters in the Oracle parameters file affects NLS settings for the Oracle server. Defining the environment variables affects the NLS input and output of client utilities.</p>

Hot backup of Oracle database in VCS One environment

The hot backup of Oracle database is enabled by default in VCS One environment.

A client system can fail during a hot backup of an Oracle database. During such failures, VCS One can fail over to another client system only if the following requirements are met:

- The AutoEndBkup attribute value must be set to 1, which is the default.  
See [“Attribute definition for the Netlsnr agent”](#) on page 89.
- The Startup option of Oracle agent must be STARTUP, STARTUP\_FORCE, or CUSTOM.  
See [“Startup and shutdown options for the Oracle agent”](#) on page 16.

If you do not meet VCS One requirements, you must manually end the hot backup and then fail over Oracle to another client system.

See [“Failing over Oracle after a VCS One client system failure during hot backup”](#) on page 34.

**Note:** If you set the AutoEndBkup attribute value to 0, then to avoid unexpected VCS behavior you must set the DetailMonitor attribute value to 1.

See [“Setting up detail monitoring for VCS One agent for Oracle”](#) on page 70.

## Location of the \$ORACLE\_HOME

You can place the Oracle home directory (\$ORACLE\_HOME), which contains the Oracle binaries and configuration files, locally on each server’s disk. Alternatively, you can place the Oracle home directory on the shared storage. The correct location for Oracle binaries depends on your environment. The following points discuss the advantages of each approach.



<code>\$ORACLE_HOME</code> directory on shared disks	<p>You can install the Oracle Database Server (<code>\$ORACLE_HOME</code>) on shared disks. Each client system in the cluster must have the same mount point directory for the shared file system. Placing the Oracle binaries on shared storage simplifies setting up a given client system in a cluster to run an instance. Each database service group is self-contained. An instance can be moved to a new client system in the cluster that shares the storage.</p> <p>For example, in a cluster with four client systems, you can have three database instances or service groups, each at a different Oracle version. If the Oracle binaries are placed on shared storage, three copies of Oracle, that is, one per version are required on shared storage. By contrast, placing the Oracle binaries on local storage, would require as many as 12 copies of the binaries (three versions on four client systems).</p> <p>The disadvantage of this approach is that a rolling upgrade of Oracle binaries on shared storage is not possible.</p>
<code>\$ORACLE_HOME</code> directory on local disks	<p>You can install the Oracle Database Server (<code>\$ORACLE_HOME</code>) on the local disk. The advantage is that you can upgrade the Oracle database binaries on an offline client system while the database server runs on another client system. The database server can later be switched to the upgraded client system (provided the database is compatible), permitting a minimum amount of downtime.</p> <p>The disadvantage of this approach is that with a large number of client systems, it becomes difficult to maintain the various Oracle installations.</p>

## Replacing the long pathnames for `$ORACLE_HOME` in the agent attributes

You must create the soft link for `$ORACLE_HOME` on each of the client systems in the cluster, and then modify the values for the agent attributes.

### To replace the long pathnames

- 1 Create a soft link to the long pathname for \$ORACLE\_HOME. For example:

```
# ln -s /opt/apps/oracle/home/directory/is/longer/than\  
/eighty/characters/oracle /opt/link_to_longpath
```

- 2 In the file /etc/VRTSvcs/conf/config/main.xml, modify the Home and the Pfile attributes for the Oracle and the Netlsnr resource types.

See [“About the sample configurations for Oracle enterprise agent”](#) on page 95.

For example:

```
Home = "/opt/link_to_longpath"  
Pfile = "/opt/link_to_longpath/dbs/initVRT.ora"
```

## Failing over Oracle after a VCS One client system failure during hot backup

If a client system fails during a hot backup, VCS One can succeed with a client system failover only if you meet VCS One requirements for Oracle hot backup.

See [“About VCS One requirements for installing Oracle”](#) on page 28.

If you do not meet VCS One requirements, the agent cannot open the database in the backup mode on the failover client system. Therefore, VCS One cannot online the Oracle group on the failover client system. You may encounter the following Oracle errors in this situation:

```
$ ORA-1110 "data file %s: '%s'"
```

or

```
$ ORA-1113 "file %s needs media recovery"
```

In such cases, you must manually end the hot backup and then fail over Oracle to another client system.

**To manually fail over Oracle after a client system failure that occurs during hot backup**

- 1** Take the datafiles in the database out of the backup mode.  
Refer to the Oracle documentation for instructions on how to change the state of the database files.
- 2** Shut down the database.
- 3** Bring the Oracle service group online on the failover node.  
The agent can now start the Oracle instance, mount the database, and open the datafiles.

## About Oracle installation tasks for VCS One

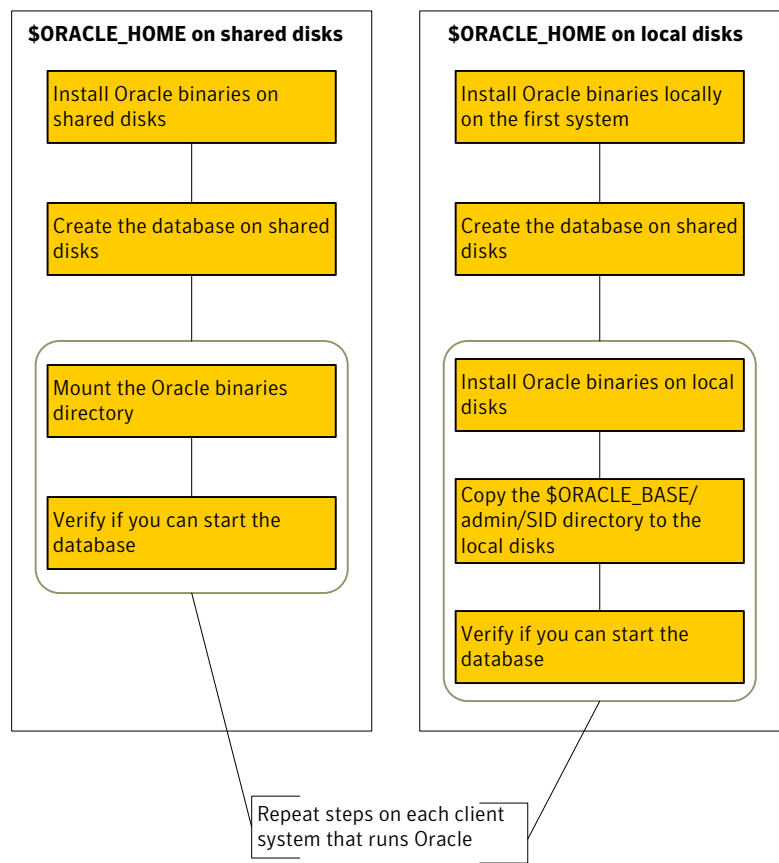
Tasks to complete Oracle installation in a VCS One cluster depend on whether you want the \$ORACLE\_HOME on shared disk or local disk.

See [“Installation tasks for \\$ORACLE\\_HOME on shared disks”](#) on page 36.

See [“Installation tasks for \\$ORACLE\\_HOME on local disks”](#) on page 37.

[Figure 2-1](#) illustrates the flow of the installation when the \$ORACLE\_HOME is on shared disk and on local disk.

Figure 2-1 Comparison of the installation flow



## Installation tasks for \$ORACLE\_HOME on shared disks

The methodology is to install the Oracle binaries and to create the Oracle database on shared disks during the first installation. Mount the Oracle binaries directory and verify that the database can be started from all client systems.

The tasks to install Oracle such that \$ORACLE\_HOME is on shared disks are as follows:

- From any client system in the cluster, install Oracle binaries on shared disks.
- See [“Installing Oracle binaries in a VCS One environment”](#) on page 38.
- Disable the Oracle clustering daemon for Oracle 10g and later.
- See [“Disabling the clustering daemon for Oracle 10g or later”](#) on page 40.

From the client system where you installed Oracle, create the database on shared disks.	See <a href="#">“Configuring the Oracle database in a VCS One environment”</a> on page 41.
On HP-UX client system: Set the MLOCK privileges for DBA user to prevent ASYNCH_IO errors.	See <a href="#">“Setting MLOCK privilege for DBA user (HP-UX client system)”</a> on page 44.
From each client system that would be a part of the Oracle cluster, verify access to the database on shared disks.	See <a href="#">“Verifying access to the Oracle database”</a> on page 44.

## Installation tasks for \$ORACLE\_HOME on local disks

The methodology is to install the Oracle binaries on the local disk and to create the Oracle database on shared disks during the first installation. Then, install the Oracle binaries on local disks of other client systems. This methodology ensures that all Oracle installations are identical and access the database from the same location on the shared disk.

The tasks to install Oracle such that \$ORACLE\_HOME is on local disks are as follows:

On the first client system in the cluster, install Oracle binaries on the local disk.	See <a href="#">“Installing Oracle binaries in a VCS One environment”</a> on page 38.
From the first client system where you installed Oracle, create the database on shared disks.	See <a href="#">“Configuring the Oracle database in a VCS One environment”</a> on page 41.
On HP-UX client system: Set the MLOCK privileges for DBA user to prevent ASYNCH_IO errors.	See <a href="#">“Setting MLOCK privilege for DBA user (HP-UX client system)”</a> on page 44.
On each client system in the cluster, perform the following tasks:	See <a href="#">“Installing Oracle binaries in a VCS One environment”</a> on page 38.
■ Install Oracle binaries on the local disk.	See <a href="#">“Copying the \$ORACLE_BASE/admin/SID directory”</a> on page 44.
■ Copy the \$ORACLE_BASE/admin/SID directory to the local disk.	
■ Verify if you can start the database.	See <a href="#">“Verifying access to the Oracle database”</a> on page 44.

# Installing Oracle binaries in a VCS One environment

Install a version of Oracle that the Veritas Cluster Server One agent for Oracle supports.

## To install Oracle9i for VCS One

- 1 Insert the Oracle CD.
- 2 Set the *DISPLAY* variable, mount the CD drive, and run the Oracle installer as Oracle User.

```
# /mnt/cdrom/runInstaller
```

- 3 Read the Welcome screen and click **Next**.
- 4 If you perform the Oracle installation for the first time, the Inventory Location dialog box is displayed. Specify the location of your base directory and click **OK**.
  - If you plan the \$ORACLE\_HOME to be on local disks in your installation, specify a location on the local disk.
  - If you plan the \$ORACLE\_HOME to be on shared disks in your installation, specify a location on the shared disk.
- 5 On the UNIX Group Name dialog box, enter the name of a UNIX group that has permissions to update the Oracle software and click **Next**.
- 6 The Oracle installer displays a message asking you to run the script \$ORACLE\_BASE/oraInventory/orainstRoot.sh. Run the script and click **Continue** to return to the Oracle installer.
- 7 On the File Locations dialog box, enter or select a name and a path for the Oracle Home and click **Next**.
- 8 On the Available Products dialog box, select the **Oracle9i Database** option and click **Next**.
- 9 On the Installation Types dialog box, select your installation type and click **Next**.
- 10 On the Database Configuration dialog box, select the **Software Only** option and click **Next**.
- 11 On the Summary dialog box, review your selections. Click **Back** to make changes. Otherwise click **Install**.
- 12 Click **Next** after the installation is complete.

13 On the End of Installation dialog box, click **Exit**.

14 Proceed to configure the database on shared disks.

See [“Configuring the Oracle database in a VCS One environment”](#) on page 41.

#### To install Oracle 10g for VCS One

1 Insert the Oracle CD.

2 Set the *DISPLAY* variable, mount the CD drive, and run the Oracle installer as Oracle User.

```
# /mnt/cdrom/runInstaller
```

3 Read the Welcome screen and click **Next**.

4 If you perform the Oracle installation for the first time, the Inventory Location dialog box is displayed. Specify the location of your base directory and click **OK**. Do one of the following:

- If you plan the \$ORACLE\_HOME to be on local disks in your installation, specify a location on the local disk.
- If you plan the \$ORACLE\_HOME to be on shared disks in your installation, specify a location on the shared disk.

5 The Oracle installer displays a message asking you to run the script \$ORACLE\_BASE/orainventory/orainstRoot.sh. Run the script and click **Continue** to return to the Oracle installer.

6 In the File Locations dialog box, enter or select a name and a path for the Oracle Home and click **Next**.

7 In the Installation Types dialog box, select your installation type and click **Next**.

8 In the Select Database Configuration dialog box, select the **Do not create a starter database** option and click **Next**.

9 In the Summary dialog box, review your selections. Click **Back** to make changes. Otherwise click **Install**.

10 Click **Next** after the installation is complete.

11 In the End of Installation dialog box, click **Exit**.

12 Disable the Oracle clustering daemon.

See [“Disabling the clustering daemon for Oracle 10g or later”](#) on page 40.

13 Proceed to configure the database on shared disks.

See [“Configuring the Oracle database in a VCS One environment”](#) on page 41.

### To install Oracle 11g for VCS One

- 1 Insert the Oracle CD.
- 2 Set the *DISPLAY* variable, mount the CD drive, and run the Oracle installer as Oracle User.

```
# /mnt/cdrom/runInstaller
```

- 3 In the Select Installation Method dialog box, choose the **Advanced Installation** method and click **Next**.
- 4 If you perform the Oracle installation for the first time, the Specify Inventory directory and credentials dialog box is displayed. Specify the location of your inventory directory and click **Next**. Do one of the following:
  - If you plan the \$ORACLE\_HOME to be on local disks in your installation, specify a location on the local disk.
  - If you plan the \$ORACLE\_HOME to be on shared disks in your installation, specify a location on the shared disk.
- 5 Follow the wizard instructions and select other options
- 6 In the Create Database dialog box, choose **Install database Software only**.
- 7 In the Summary dialog box, review your selections. Click **Back** to make changes. Otherwise click **Install**.
- 8 During the installation, the Oracle installer displays a message asking you to run some configuration scripts. Run the scripts and click **OK** to return to the Oracle installer.
- 9 Click **Next** after the installation is complete.
- 10 In the End of Installation dialog box, click **Exit**.
- 11 Disable the Oracle clustering daemon.  
See [“Disabling the clustering daemon for Oracle 10g or later”](#) on page 40.
- 12 Proceed to configure the database on shared disks.

See [“Configuring the Oracle database in a VCS One environment”](#) on page 41.

## Disabling the clustering daemon for Oracle 10g or later

If you installed Oracle binaries for Oracle versions 10g or later on shared disks, you must disable the Oracle clustering daemon.

Oracle versions 10g and later provide a clustering daemon called Oracle Cluster Synchronization Service Daemon (CSSD). If the Oracle binary files are on a shared



storage, the `init` command to start the daemon may result in an error. Because a VCS One cluster for Oracle does not require this daemon, Symantec recommends you to disable the daemon.

#### To disable the daemon on AIX, HP-UX, Linux, and Solaris

- ◆ Remove the following line from the `/etc/inittab` file on the client system from where you ran the Oracle installation wizard:

```
hl:23:respawn:/etc/init.d/init.cssd run >/dev/null 2>&1 >
</dev/null
```

#### To disable the daemon on Solaris 9 and below

- ◆ Remove the following line from the `/etc/inittab` file on the client system from where you ran the Oracle installation wizard:

```
hl:23:respawn:/etc/init.d/init.cssd run >/dev/null 2>&1 >
</dev/null
```

#### To disable the daemon on Solaris 10

- ◆ On the client system from where you ran the Oracle installation wizard:
  - Find out the Fault Management Resource Identifier (FMRI) for the `cssd` daemon. Type the following from the command prompt:

```
# svcs | grep cssd
```

The FMRI for the `cssd` daemon is displayed.

- Modify the Service Configuration Repository such that the SVC does not control the daemon. Type the following from the command prompt:

```
# svccfg delete -f <FMRI>
```

*FMRI* is the `cssd` FMRI you obtained.

## Configuring the Oracle database in a VCS One environment

Configure an Oracle database on shared disks using the Database Configuration Assistant. You need to configure the database only once, from the client system on which you installed Oracle first.

### To configure the Oracle9i database

- 1 Set the *DISPLAY* variable and start the Oracle Database Configuration Assistant as Oracle User.

```
# dbca
```

- 2 Read the Welcome screen, click **Next**.
- 3 On the Operations dialog box, select the **Create a database** option and click **Next**.
- 4 On the Database Templates dialog box, select a template to create the database and click **Next**.
- 5 On the Database Identification dialog box, enter or select a unique name and SID for the global database and click **Next**.
- 6 On the Database Connection Options dialog box, select the **Dedicated Server Mode** or the **Shared Server Mode** and click **Next**.
- 7 On the Initialization Parameters dialog box, specify the locations of the archive logs and the initialization parameter files:
  - If you want to enable archive logs for the database, click the **Archive** tab and select the **Archive Log Mode** check box. In the Archive Log Destination(s) list, enter a path on the shared disk to ensure that the Archive Log is created on the shared disk.
  - Click the **File Locations** tab.
  - If installing Oracle locally on all systems, make sure that the initialization parameter file and the trace file directories are on the local disk.
  - Modify other parameters, if desired.
  - Click **Next**.
- 8 On the Database Storage dialog box, specify the locations of the Control, Data, and Redo log files:
  - In the left pane, expand the **Storage** folder by clicking the + next to it.
  - Click **Controlfile** and click the **General** tab in the right pane.
  - In the **File Directory** field, enter a path on the shared disk for each control file.
  - Expand the **Datafiles** folder by clicking the + next to it.
  - Select the datafile in the left pane and click the **General** tab in the right pane. In the **Name** field, enter a path on the shared disk for each datafile.

- Expand the **Redo Log Groups** folder by clicking the + next to it.
  - Select the Redo Log file in the left pane. In the **File Directory** field in the right pane, enter the path of a directory on the shared disk for each Redo Log file. Specify file sizes for the Redo Log files, if desired.
  - Click **Next**.
- 9 On the Creation Options dialog box, select the **Create Database** check box and click **Finish**.
  - 10 On the Summary dialog box, review your selections and click **OK**.

**To configure the Oracle 10g database**

- 1 Set the *DISPLAY* variable and start the Oracle Database Configuration Assistant as Oracle User.  
  
# **dbca**
- 2 Read the Welcome screen, click **Next**.
- 3 In the Operations dialog box, select the **Create a database** option and click **Next**.
- 4 In the Database Templates dialog box, select a template to create the database and click **Next**.
- 5 In the Database Identification dialog box, enter or select a unique name and SID for the global database and click **Next**.
- 6 Follow the wizard instructions and select other options.
- 7 In the Storage Options dialog box, select the **File System** or **Raw Devices** option and click **Next**.
- 8 In the Database File Locations dialog box, specify a location on the shared disk for the database files to be created and click **Next**.
- 9 In the Recovery Configuration dialog box, specify the **Flash Recovery Area** on the shared disk and click **Next**.
- 10 If you use Oracle 11g, in the Security Settings dialog box, choose the recommended security setting. Choose the **Keep the enhanced 11g default security settings** option and click **Next**.
- 11 Follow the wizard instructions and complete creating the database.

## Setting MLOCK privilege for DBA user (HP-UX client system)

You must perform this procedure only on HP-UX client system.

To prevent ASYNCH\_IO errors from occurring during select and update queries on the Oracle database, set the MLOCK privilege for the dba user.

**To set MLOCK privilege for DBA user**

- 1 Give the MLOCK privilege to the dba group:

```
# setprivgrp dba MLOCK
```

- 2 Create the /etc/privgroup file and add the line:

```
dba MLOCK
```

- 3 Verify the availability of MLOCK privilege for the dba group:

```
# /usr/bin/getprivgrp dba
```

## Copying the \$ORACLE\_BASE/admin/SID directory

Follow the instruction on each client system in the cluster, only if the \$ORACLE\_HOME is on local disks.

**To copy the \$ORACLE\_BASE/admin/SID directory**

- ◆ Remote copy \$ORACLE\_BASE/admin/*SID* on the client system where you first configured the database instance to the local disk (\$ORACLE\_BASE/admin) on other client systems in the cluster.

The variable *SID* represents the database instance.

Refer to Oracle's documentation on OFA Structure for more information.

## Verifying access to the Oracle database

You can verify access to the database by running an SQL query. Depending on the location of your \$ORACLE\_HOME, perform one of the following procedures.

Upon completion, the Oracle database is started from the client system in the cluster that you last performed this procedure.

### To verify access to the Oracle database

- ◆ Depending on the location of your \$ORACLE\_HOME, perform one of the following procedures:

For \$ORACLE\_HOME on shared disks, start the Oracle database.

Verify that you can access the shared database from each client system. Perform the steps from each client system that would be a part of the Oracle cluster.

To start the Oracle database (for \$ORACLE\_HOME on shared disks)

- 1 If the Oracle binaries are mounted on any other client system, unmount it.
- 2 If the data files on shared disk are mounted on any client system, unmount it.
- 3 Mount the Oracle binaries and data files.
- 4 Start the database.

For \$ORACLE\_HOME on local disks, start the Oracle database.

Verify that you can access the database individually on each client system that would be a part of the Oracle cluster.

To start the Oracle database (for \$ORACLE\_HOME on local disks)

- 1 Make sure you have installed Oracle binaries on the client system.
- 2 If the data files on shared disk are mounted on any client system, unmount it.
- 3 Mount the data files.
- 4 Start the database.



# Installing and removing the agent for Oracle

This chapter includes the following topics:

- [Before you install the agent for Oracle](#)
- [Installing the Veritas Cluster Server One agent for Oracle on UNIX](#)
- [Disabling the Veritas Cluster Server One agent for Oracle](#)
- [Removing the Veritas Cluster Server One agent for Oracle on UNIX](#)

## Before you install the agent for Oracle

Meet the following prerequisites to install the Veritas Cluster Server One agent for Oracle:

- Make sure SSH or rsh communications is set up.  
You must be able to communicate from the client system where you run the installation program to the client systems where you want to install the VCS One agent pack software.  
For information on configuring SSH for remote communication, refer to *Veritas Cluster Server One Installation Guide*.
- Make sure the VCS One client is installed on Policy Master node or on all client systems.  
Refer to the *Veritas Cluster Server One Installation Guide*.
- If Veritas Cluster Server agent for Oracle is installed on any of the client systems, uninstall it.
- If a previous version of the agent is installed, uninstall it.

- Verify that the Oracle Server and the add-on Listener are installed and configured.  
See Oracle documentation.  
See [“About installing Oracle in a VCS One environment”](#) on page 27.

# Installing the Veritas Cluster Server One agent for Oracle on UNIX

You must install the VCS One agent for Oracle on all the client systems of the VCS One cluster that will host the Oracle service group. You can install the VCS One agent for Oracle using the installagpack program or using the command line interface (CLI).

The installation of the agent packs involves the following phases:

Installing the agent packages	See <a href="#">“Installing the agent packages using the installer”</a> on page 48.
Adding the agent resource type definitions	See <a href="#">“Adding the agent resource type definitions to the Policy Master Server on UNIX”</a> on page 50.

---

**Note:** The installagpack program supports only the -addtypes, -rmtypes, -responsefile, and -rsh options. Symantec recommends that you do not use any of the other options from the `installagpack` command help output.

---

## Installing the agent packages using the installer

You can install the agent packages on one or more client systems of a specific platform type.

---

**Note:** To install the VCS One client for managing VMware ESX Servers, use the software disc for Red Hat Enterprise Linux 4 (RHEL 4) x86 (32-bit) or RHEL 5 x86\_64

---



**Perform the following steps to install the agent packages using the installer**

- 1 Mount the VCS One Agent Pack software disc on the client system where you plan to run the installation.
- 2 Depending on the platform type, navigate to the directory containing the agent installer:

AIX `cd1/aix/vcsone/vcsone_version`

HP-UX `cd1/hpux/hpuxos_version/vcsone/vcsone_version`  
Where *os\_version* is the HP-UX version.

Linux `cd1/linux/dist_arch/vcsone/vcsone_version`  
Where *dist* is the Linux distribution and *arch* is the architecture.

Solaris `cd1/solaris/dist_arch/vcsone/vcsone_version`  
Where, *dist\_arch* is 'sol\_sparc' or 'sol\_x64'.

- 3 Enter the following command to start the agent pack installation:

```
# ./installagpack [-rsh]
```

You can use the `-rsh` option if `rsh` and `rcp` are used for communication between systems instead of the default `ssh` and `scp`. This option requires that systems be preconfigured such that the `rsh` commands between systems execute without prompting for passwords or confirmations.

- 4 Enter the name of the client systems where you want to install the agents.
- 5 Choose whether to install all the agents or any specific agent. Follow the installer prompt to specify your option.
- 6 Review the output as the installation program installs the agent packages.  
You can view installation logs in the `/var/VRTS/install/logs` directory.

## Installing the agent package using the CLI

You can install the desired agent package using the CLI, on one or more client systems of a specific platform type.

**Perform the following steps to install the agent packages using CLI**

- 1** Mount the VCS One Agent Pack software disc on the client system where you plan to run the installation.
- 2** Depending on the platform type, navigate to the directory containing the agent installer:

AIX	# <code>cd1/aix/vcsone/vcsone_version/pkgs</code>
HP-UX	# <code>cd1/hpux/hpuxos_version/vcsone/vcsone_version/depot</code>
Linux	# <code>cd1/linux/dist_arch/vcsone/vcsone_version/rpms</code>  Where, <i>dist</i> is the Linux distribution and <i>arch</i> is the architecture
Solaris	# <code>cd1/solaris/dist_arch/vcsone/vcsone_version/pkgs</code>  Where <i>dist_arch</i> is 'sol_sparc' or 'sol_x64'

- 3** Type the following command on each client system to install the agent.  
 Answer the prompt accordingly:

AIX	# <code>installp -ac -d . VRTSvcsor.rte</code>
HP-UX	# <code>swinstall -s `pwd` VRTSvcsor</code>
Linux	# <code>rpm -ivh VRTSvcsor_rpm_filename</code>
Solaris	# <code>pkgadd -d . VRTSvcsor</code>

## Adding the agent resource type definitions to the Policy Master Server on UNIX

You must add the agent resource type definitions to the Policy Master database configuration. You can perform this task from any client system in the VCS One cluster.

---

**Note:** You must add the agent resource type definitions only one time per platform type.

---

### To add the VCS One agent resource types to the policy master database configuration

- 1 Set up RSH or SSH communications between the client system and the policy master system.

For information on configuring SSH for remote communication, refer to the *Veritas Cluster Server One Installation Guide*.

- 2 Make sure that the PM daemon is running.

```
# /opt/VRTSvcsone/bin/haclus -display
```

The output should show ClusterState is RUNNING.

- 3 If you have just installed the agents on VCS One client systems and still have the VCS One Agent Pack software disc mounted, skip to step 6.
- 4 Mount the VCS One Agent Pack software disc.
- 5 Depending on the platform type, navigate to the directory containing the agent installer:

AIX `cdl/aix/vcsone/vcsone_version`

HP-UX `cdl/hpux/hpuxos_version/vcsone/vcsone_version`  
Where *os\_version* is the HP-UX version.

Linux `cdl/linux/dist_arch/vcsone/vcsone_version`  
Where *dist* is the Linux distribution and *arch* is the architecture.

Solaris `cdl/solaris/dist_arch/vcsone/vcsone_version`  
Where *dist\_arch* is the sol\_sparc or sol\_x64.

- 6 Enter the command to start the agent pack installer for adding resource types to the Policy Master configuration database. Use the `-addtypes` option:

```
# ./installagpack -addtypes
```

- 7 When the installer prompts, enter the virtual IP address of the Policy Master.
- 8 Review the output as the installer verifies communication with the Policy Master system.

- 9 Choose whether to add the type definitions for all the agents or for specific agents. Follow the installer prompts to add the type definitions.
- 10 Review the output as the installer adds the agent types to the PM database configuration and copies the appropriate types.xml files to the PM system.  
You can view installation logs in the /var/VRTS/install/logs directory.

## Disabling the Veritas Cluster Server One agent for Oracle

To disable the Veritas Cluster Server One agent for Oracle, you must change the Oracle service group to an OFFLINE state. You can stop the application completely or switch the agent to another system.

### To disable the agent

- 1 To remove a system from the service group's SystemList, check if the service group is online:

```
# hagrps -state service_group -sys system_name
```

- 2 If the service group is online, take it offline. Use one of the following commands:

- To take the service group offline on one client system and online it on another client system, you can use the -switch option:

```
# hagrps -switch service_group -to system_name
```

- To take the service group offline without bringing it online on any other client system in the cluster, enter:

```
# hagrps -offline service_group -sys system_name
```

- 3 Stop the agent on the client system:

```
# haagent -stop Oracle -sys system_name
```

- 4 When you get the message "Please look for messages in the log file," check the file `/var/VRTSvcsone/log/vcsoneclientd_A.log` for a message confirming the agent has stopped.

You can also use the `ps` command to confirm the agent is stopped.

- 5 You can now remove the service group, the resource type, or both from the VCS One configuration after disabling the agent on all client systems.

See the *Veritas Cluster Server One User's Guide* for more information.

## Removing the Veritas Cluster Server One agent for Oracle on UNIX

Removing the agent package involves removing the agent files from each client system where it was installed.

You can remove the packages using the agent pack installer or the command line.

See [“Removing the VCS One agent packages using the installer”](#) on page 53.

See [“Removing the VCS One agent package using CLI”](#) on page 55.

After removing the agent packages you can remove the agent type definition from the Policy Master system.

See [“Removing the agent type definition from the Policy Master system on UNIX”](#) on page 55.

## Removing the VCS One agent packages using the installer

You can remove all the VCS One agent packages or the desired agent package using the `uninstallagpack` program.

---

**Note:** The `uninstallagpack` program supports only the `-responsefile` and `-rsh` options. Symantec recommends that you do not use any of the other options from the `uninstallagpack` command help output.

---

**To remove the VCS One agent packages from the client systems**

- 1 Freeze the service groups that hosts the application, on the system from which you want to remove the agent package.

```
# hagr -freeze <groupname>
```

- 2 Stop the agent on all client systems before you remove the agent package from the system.

```
# haagent -stop -notransition <AgentName> -sys <system_name>
```

- 3 Ensure that the agent operations are stopped on all the cluster systems.

```
# haagent -display <AgentName>
```

- 4 Mount the VCS One Agent Pack software disc on the client system where you plan to run the uninstallagpack program.

- 5 Depending on the platform type, navigate to the directory containing the agent uninstaller:

AIX                    `cd1/aix/vcsone/vcsone_version`

HP-UX                `cd1/hpux/hpuxos_version/vcsone/vcsone_version`

Where *os\_version* is the HP-UX version.

Linux                `cd1/linux/dist_arch/vcsone/vcsone_version`

Where *dist* is the Linux distribution and *arch* is the architecture.

Solaris              `cd1/solaris/dist_arch/vcsone/vcsone_version`

Where *dist\_arch* is the *sol\_sparc* or *sol\_x64*.

- 6 Start the uninstallagpack program.

```
# ./uninstallagpack [-rsh]
```

- 7 Enter the name of the client systems on which you want to uninstall the agent pack. The names must be separated by spaces.

- 8 Choose whether to remove all the agent packages or a specific agent package. Follow the installer prompt to remove the agent package.

- 9 Review the output as the program verifies the agent pack that you installed and removes the agent packages.

You can view logs in the `/var/VRTS/install/logs` directory.

## Removing the VCS One agent package using CLI

You can remove a desired agent package using the CLI.

---

**Note:** You must remove this agent package from each client system in the cluster.

---

### To remove the VCS One agent for Oracle from a client system

- ◆ Type the following command on each client system to remove the agent. Answer prompts accordingly:

AIX                   # **installp -u VRTSvcsor**

HP-UX                # **swremove VRTSvcsor**

Linux                # **rpm -e VRTSvcsor**

Solaris              # **pkgrm VRTSvcsor**

## Removing the agent type definition from the Policy Master system on UNIX

After you remove the agent packages, you can remove the agent type definitions for agents you removed, from the Policy Master system.

### To remove the agent type definition from the Policy Master system on UNIX

- 1 Navigate to the following directory on the client system.

```
# cd /opt/VRTS/install
```

- 2 Run the following command to remove the agent type definition from the Policy Master system:

```
# ./installagpack -rmtypes
```

- 3 When the installer prompts, enter the virtual IP address of the Policy Master.
- 4 Choose whether to remove the type definitions for all the agents or for specific agents. Follow the installer prompts to remove the type definitions.

You can view logs in the /var/VRTS/install/logs directory.





# Configuring VCS One service groups for Oracle

This chapter includes the following topics:

- [About configuring a service group for Oracle](#)
- [Configuring Oracle instances in VCS One](#)
- [Before you configure the VCS One service group for Oracle](#)
- [Configuring the VCS One service group for Oracle](#)
- [Setting up detail monitoring for VCS One agent for Oracle](#)

## About configuring a service group for Oracle

Configuring the Oracle service group involves creating the Oracle service group, its resources, and defining attribute values for the configured resources. You must have administrator privileges to create and configure a service group.

You can configure a VCS One service group for Oracle using the command-line.

See [“Configuring the VCS One service group for Oracle”](#) on page 66.

## Configuring Oracle instances in VCS One

You can set up Oracle in different ways in a VCS One environment. Configuring Oracle for VCS One involves configuring the Oracle files listener.ora and tnsnames.ora as per VCS One requirements.

For Solaris 10 on SPARC, if you are configuring a service group for an Oracle instance running in a non-global zone, you must make sure that the zone is created on all the systems that will be part of the service group.

**Table 4-1** Oracle configurations in VCS One

Configuration type	Reference
Single Oracle instance configuration	See <a href="#">“Configuring a single Oracle instance in VCS One”</a> on page 58.
Multiple Oracle instances (single listener) configuration	See <a href="#">“Configuring multiple Oracle instances (single listener) in VCS One”</a> on page 60.
Multiple Oracle instances (multiple listeners) configuration	See <a href="#">“Configuring multiple Oracle instances (multiple listeners) in VCS One”</a> on page 61.
Configuration with shared server support	See <a href="#">“Configuring an Oracle instance with shared server support in VCS One”</a> on page 63.

See [“Best practices for multiple Oracle instance configurations in a VCS One environment”](#) on page 111.

## Configuring a single Oracle instance in VCS One

Review the resource dependency graph and sample configuration of service groups involving a single Oracle instance.

See [“Sample single Oracle instance configuration”](#) on page 95.

### To configure an Oracle instance in VCS One

- 1 Review the Oracle and Netlsnr resource types and their attribute definitions. See [“About the resource type and attribute definitions”](#) on page 83.

- 2 Configure the Oracle file tnsnames.ora as per VCS One requirements. The changes required in the file depends on your Oracle configuration.

For clients to connect to the failover instance, in the file tnsnames.ora located at \$TNS\_ADMIN, change the host name for all TCP protocol address databases to the virtual IP address for the service group.

The following example assumes that the host name for the database is set to oraprod, which represents the virtual IP address for the service group.

```
prod =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = oraprod) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = prod)
    )
  )
```

- 3 Configure the Oracle file listener.ora as per VCS One requirements. The changes required in the file depends on your Oracle configuration.

In the file listener.ora located at \$TNS\_ADMIN, edit the "Host=" line in the ADDRESS\_LIST section and add the name of the high availability address for the service group, in this case, oraprod.

```
LISTENER_PROD =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS_LIST =
        (ADDRESS = (PROTOCOL = TCP) (HOST = oraprod) (PORT = 1521))
      )
    )
  )
```

- 4 Create the Oracle service groups using the command-line. See [“Configuring the VCS One service group for Oracle”](#) on page 66.
- 5 Bring the Oracle service group online.

## Configuring multiple Oracle instances (single listener) in VCS One

Review the resource dependency graph and sample configuration of a service group involving multiple Oracle instances.

See [“Sample multiple Oracle instances \(single listener\) configuration”](#) on page 96.

### To configure multiple Oracle instances (single listener)

- 1 Review the Oracle and Netlsnr resource types and their attribute definitions.  
See [“About the resource type and attribute definitions”](#) on page 83.
- 2 Configure the Oracle file tnsnames.ora as per VCS One requirements. The changes required in the file depends on your Oracle configuration.

For clients to connect to the failover instance, in the file tnsnames.ora located at \$TNS\_ADMIN, change the host name for all TCP protocol address databases to the virtual IP address for the service group.

The following example assumes that the host name for the database is set to oraprod, which represents the virtual IP address for the service group.

```
prod =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = oraprod) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = prod)
    )
  )
mktg =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = oramktg) (PORT = 1522))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = mktg)
    )
  )
```

- 3 Configure the Oracle file listener.ora as per VCS One requirements. The changes required in the file depends on your Oracle configuration.

In the file listener.ora located at \$TNS\_ADMIN, edit the "Host=" line in the ADDRESS\_LIST section and add the name of the high availability address for the service group, in this case, oraprod.

```
LISTENER_ORACLE =  
  (DESCRIPTION_LIST =  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP) (HOST = oraprod) (PORT = 1521))  
        (ADDRESS = (PROTOCOL = TCP) (HOST = oramktg) (PORT = 1522))  
      )  
    )  
  )
```

- 4 Create the Oracle and Listener service groups using the command-line.  
See [“Configuring the VCS One service group for Oracle”](#) on page 66.
- 5 Bring the Oracle service group online.

## Configuring multiple Oracle instances (multiple listeners) in VCS One

Review the resource dependency graph and sample configuration of a service group involving multiple Oracle instance.

See [“Sample multiple instance \(multiple listeners\) configuration”](#) on page 99.

### To configure multiple Oracle instances (multiple listeners)

- 1 Review the Oracle and Netlsnr resource types and their attribute definitions.  
 See [“About the resource type and attribute definitions”](#) on page 83.
- 2 Configure the Oracle file tnsnames.ora as per VCS One requirements. The changes required in the file depends on your Oracle configuration.

For clients to connect to the failover instance, in the file tnsnames.ora located at \$TNS\_ADMIN, change the host name for all TCP protocol address databases to the virtual IP address for the service group.

```
prod =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = oraprod) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = prod)
    )
  )
mktg =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = oramktg) (PORT = 1522))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = mktg)
    )
  )
```

- 3 Configure the Oracle file listener.ora as per VCS One requirements. The changes required in the file depends on your Oracle configuration.  
In the file listener.ora, create independent configurations for each listener.

```
LISTENER_PROD =  
  (DESCRIPTION_LIST =  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP) (HOST = oraprod) (PORT = 1521))  
      )  
    )  
  )  
  
LISTENER_MKTG =  
  (DESCRIPTION_LIST =  
    (DESCRIPTION =  
      (ADDRESS_LIST =  
        (ADDRESS = (PROTOCOL = TCP) (HOST = oramktg) (PORT = 1522))  
      )  
    )  
  )
```

- 4 Create the Oracle service groups using the command-line.  
See [“Configuring the VCS One service group for Oracle”](#) on page 66.
- 5 Bring the Oracle service group online.

## Configuring an Oracle instance with shared server support in VCS One

Review the resource dependency graph and sample configuration.

See [“Sample Oracle configuration with shared server support”](#) on page 99.

### To configure Oracle with shared server support

- 1 Review the Oracle and Netlsnr resource types and their attribute definitions. See [“About the resource type and attribute definitions”](#) on page 83.
- 2 Configure the Oracle file tnsnames.ora as per VCS One requirements. The changes required in the file depends on your Oracle configuration.

For clients to connect to the failover instance, in the file tnsnames.ora located at \$TNS\_ADMIN, change the host name for all TCP protocol address databases to the virtual IP address for the service group.

The following example assumes that the host name for the database is set to oraprod, which represents the virtual IP address for the service group.

```
prod =
  (DESCRIPTION =
    (ADDRESS_LIST =
      (ADDRESS = (PROTOCOL = TCP) (HOST = oraprod) (PORT = 1521))
    )
    (CONNECT_DATA =
      (SERVICE_NAME = prod)
    )
  )
```

- 3 Configure the Oracle file listener.ora as per VCS One requirements. The changes required in the file depends on your Oracle configuration.

In the file listener.ora located at \$TNS\_ADMIN, edit the "Host=" line in the ADDRESS\_LIST section and add the name of the high availability address for the service group, in this case, oraprod.

```
LISTENER_PROD =
  (DESCRIPTION_LIST =
    (DESCRIPTION =
      (ADDRESS_LIST =
        (ADDRESS = (PROTOCOL = TCP) (HOST = oraprod) (PORT = 1522))
      )
    )
  )
```



- 4 In the initialization parameter file, for the dispatchers parameter, set the host name for all TCP protocol address dispatchers to the virtual IP address for the service group.

In the following example, the host name for the dispatcher is set to oraprod.

```
dispatchers =
  "(ADDRESS = (PROTOCOL = TCP) (HOST = oraprod))
  (MUL=ON) (TICK=15) (POOL=true) "
```

- 5 In the initialization parameter file, set the LOCAL\_LISTENER attribute to a listener alias, so that the Oracle PMON process registers information with the listener.

```
local_listener=listener_alias
```

This listener alias gets appended by the default domain set in the file sqlnet.ora.

- 6 In the file tnsnames.ora, create an entry for the listener alias to resolve the address information. In the address parameter, set the host name to the virtual IP address for the service group, without the CONNECT\_DATA portion of the connect descriptor.

In the following example, the listener *listener\_alias* uses TCP/IP port 1521 and the virtual IP address for the service group is oraprod.

```
listener_alias=
  (address = (PROTOCOL = TCP) (HOST = oraprod)
  (PORT= 1521))
```

- 7 Create the Oracle service groups using the command-line.  
 See [“Configuring the VCS One service group for Oracle”](#) on page 66.
- 8 Bring the Oracle service group online.

## Before you configure the VCS One service group for Oracle

Before you configure the Oracle service group, you must:

- Verify that VCS One client is installed and configured on all client systems in the cluster where you will configure the service group.  
 Refer to the *Veritas Cluster Server One Installation Guide* for more information.

- Verify that Oracle is installed and configured identically on all client systems in the cluster.  
See [“About installing Oracle in a VCS One environment”](#) on page 27.
- Verify that the Veritas Cluster Server One agent for Oracle is installed on all client systems in the cluster.  
Make sure that the agent resource type definitions are added to the Policy Master database configuration.  
See [“Before you install the agent for Oracle”](#) on page 47.
- Make sure that the agent resource type definitions are added to the Policy Master database configuration.  
See [“Installing the Veritas Cluster Server One agent for Oracle on UNIX”](#) on page 48.
- If you have installed Oracle 10g, make sure that the Oracle services are not started on reboot by the init script.

## Configuring the VCS One service group for Oracle

You can configure Oracle in a VCS One environment in one of the ways that VCS One supports.

You can configure VCS One agent for Oracle using the command-line. You can modify an existing service group using the VCS One console.

See [“Configuring the VCS One service group for Oracle using the command-line”](#) on page 67.

Review the following to configure the service group:

- Sample configuration files and resource dependency graphs of the Oracle service group.  
See [“About the sample configurations for Oracle enterprise agent”](#) on page 95.
- Resource type and the attribute definitions of the Oracle and Netlsnr agents.

---

**Note:** For Solaris 10, if you are configuring a service group for an Oracle instance running in a Solaris container, you must make sure that the ContainerOpts attribute for the agent is set to monitor these Oracle instances running. By default, the attribute is set to monitor these Oracle instances.

---

See [“About the resource type and attribute definitions”](#) on page 83.

## Configuring the VCS One service group for Oracle using the command-line

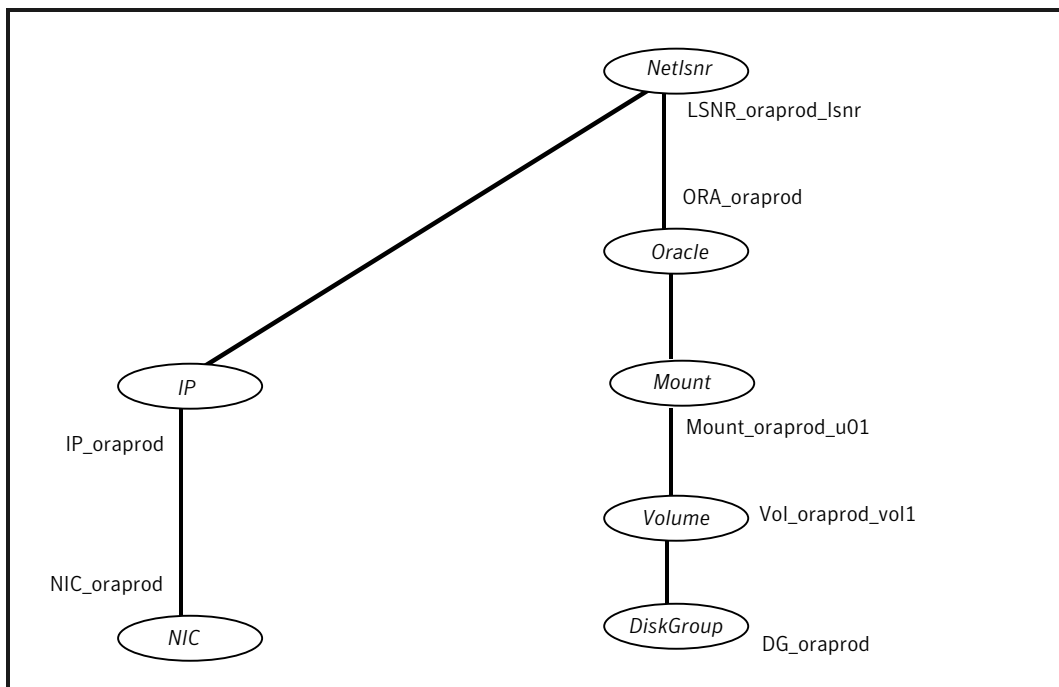
A typical VCS One service group to monitor the state of an Oracle instance in a VCS One cluster has the following characteristics:

- The shared disk groups and volumes in the cluster are configured as resources of type DiskGroup and Volume respectively.
- The volumes are mounted using the Mount agent.
- The virtual IP address for the service group is configured using the IP and NIC resource types.
- The Oracle and Listener processes are configured as resources of type Oracle and Netlsnr respectively.

You can start the Oracle server after each of these resources is brought online. For more information on the VCS One resources and their attributes, refer to the *Veritas Cluster Server One Bundled Agents Reference Guide*.

**Figure 4-1** illustrates the dependency graph for a typical VCS One service group for Oracle.

**Figure 4-1** Dependency graph for typical VCS One service group for Oracle



See [“About the sample configurations for Oracle enterprise agent”](#) on page 95.

**To configure a typical service group using the command-line**

- 1** Create the Oracle service group.

```
# hagrps -add ora_group
```

- 2** Specify the service group SystemList.

```
# hagrps -modify ora_group SystemList system_1 0 system_2 1 ...  
system_n (n-1)
```

where 0, 1, are the priorities for the systems.

- 3** Configure the Mount, Volume, and DiskGroup resources.

- 4** Configure the NIC and IP resources.

The listener requires the device name and the IP address for public network communication.

- 5** Add Oracle and Netlsnr resources to the service group.

```
# hares -add oracle_resource Oracle ora_group  
# hares -add netlsnr_resource Netlsnr ora_group
```

- 6** Configure the Oracle resource attributes. Review the example commands to configure the required resource attributes.

```
# hares -modify oracle_resource Home ORACLE_HOME  
# hares -modify oracle_resource Owner ORACLE_OWNER  
# hares -modify oracle_resource Sid ORACLE_SID
```

You may also configure other optional resource attributes.

See [“About the resource type and attribute definitions”](#) on page 83.

- 7** Configure the Netlsnr resource attributes. Review the example commands to configure the required resource attributes.

```
# hares -modify netlsnr_resource Home ORACLE_HOME  
# hares -modify netlsnr_resource Owner ORACLE_OWNER
```

You may also configure other optional resource attributes.

See [“About the resource type and attribute definitions”](#) on page 83.

- 8 Define the dependencies of resources in the group.

```
# hares -link vol_res dg_res
# hares -link mnt_res vol_res
# hares -link ip_res nic_res
# hares -link oracle_resource mnt_res
# hares -link netlsnr_resource ip_res
```

Figure 4-1

- 9 Enable the resources in the Oracle service group.

```
# hagrps -enableresources ora_group
```

- 10 Monitor the resources on a system and verify whether the resources are ready to come online.

For example, type the following commands to verify whether the Oracle and Netlsnr resources are ready to come online:

```
# hares -probe oracle_resource -sys system_1
# hares -probe netlsnr_resource -sys system_1
```

- 11 Bring the Oracle service group online on the system.

```
# hagrps -online ora_group -sys system_1
```

## Encrypting Oracle database user and listener passwords

VCS One provides a utility to encrypt database user passwords and listener passwords. You must encrypt the Pword attribute in the Oracle agent and the LsnrPwd attribute in the Netlsnr agent before you configure these attributes.

See the `haencrypt(1M)` manual page.

Oracle provides the option of storing the listener password in the `listener.ora` file, in both clear text and encrypted formats. Irrespective of the format in which the password is stored in Oracle, you must encrypt the password using the `haencrypt` utility before you configure the `LsnrPwd` attribute.

If you encrypted the listener password using the Oracle `lsnrctl` utility, do the following depending on the Oracle version you use:

- For Oracle 9i, pass the encrypted password to the `vcseencrypt` utility.  
For example, if the password after you encrypt using the Oracle `lsnrctl` utility is as follows:

```
PASSWORDS_LISTENER = 652C5971EE3A8DF9
```

You must pass the Oracle-encrypted password to the `haencrypt` utility. For example:

```
# haencrypt -agent 652C5971EE3A8DF9
```

The `haencrypt` utility displays the encrypted password. For example:  
*ciiIhiEkfIhiLijIdkHkhIfkDikKgkLil*

- For Oracle 10g or later, pass the clear text password to the `vcseencrypt` utility. For example, if the listener password is “oracle” pass this clear text password to the `haencrypt` utility as follows:

```
# haencrypt -agent oracle
```

The `haencrypt` utility displays the encrypted password. For example:  
*bnqPdnCneNnnG*

#### To encrypt passwords

- 1 From the path `$VCSONE_HOME/bin/`, run the `haencrypt` utility.

- Type the following command:

```
# haencrypt -agent
```

- Enter the password and confirm it by entering it again. Press Enter.

```
# Enter New Password:
```

```
# Enter Again:
```

- 2 Review as the utility encrypts the password and displays the encrypted password.
- 3 Enter this encrypted password as the value for the attribute.
- 4 Copy the encrypted password for future reference.

## Setting up detail monitoring for VCS One agent for Oracle

The Veritas Cluster Server One agent for Oracle provides two levels of application monitoring: primary (basic monitoring) and secondary (detail monitoring).

- In the basic monitoring mode, the agent monitors the Oracle processes to verify that they are continuously active.
- In the detail monitoring mode, the agent executes the script defined in the attribute `MonScript` of the Oracle and the `Netlsnr` resources. If the script

successfully executes, the agent considers the resource available. You can customize the default script according to your configuration.

See “[Monitor options for the Oracle agent](#)” on page 18.

You can use the agent’s detail monitoring capability to monitor the status of a database and listener and increase the confidence in their availability. Before setting up detail monitoring, you must have the agent running satisfactorily at the basic level of monitoring.

---

**Note:** Disable detail monitoring before undertaking any database maintenance that involves disabling database access to external users.

---

## Setting up detail monitoring for Oracle

Detail monitoring for an Oracle resource verifies whether a database is ready for transactions by performing an update transaction against a table within the database. The update action is taken by the two scripts, `SqlTest.pl` and `SimpleTest.pl`, provided with the Veritas Cluster Server One agent for Oracle. The scripts are available under the directory `/opt/VRTSagents/ha/bin/Oracle/`. Both scripts update the timestamp to monitor the database.

The `SqlTest.pl` script checks whether the database is open before updating the timestamp. If the database is found to be in restricted mode, quiesced mode, or suspended mode, the monitor returns success. In such a case, only basic monitoring occurs. The `SimpleTest.pl` script does not perform database checks but only issues update statements against the table.

Before enabling detail monitoring for Oracle, you must create a test table (with a timestamp) in the Oracle database. The agent uses this test table for internal purposes. Symantec recommends that you do not perform any other transaction on the test table. The detail monitor script, `MonScript`, must exist and have execute permission for root. You can use a custom monitor script, or the scripts provided with the agent. In the monitor script, the return code 100 indicates failure. Return codes from 101 to 110 indicate success.

The example to set up detail monitoring, based on the use of the supplied script, shows how to create and test a table for use by detail monitoring, and how to enable detail monitoring.

### To set up detail monitoring for Oracle

- 1 Freeze the service group to avoid automated actions by VCS One caused by an incomplete reconfiguration:

```
hagrp -freeze service_group
```

- 2 Log on as an Oracle user.

```
su - <Owner>
```

- 3 Set the environment variables for ORACLE\_HOME and ORACLE\_SID.

```
export ORACLE_HOME=<Home>
export ORACLE_SID=<Sid>
```

- 4 Start the `svrmgrl` or `sqlplus` utility to set up a database table:

```
$ORACLE_HOME/bin/svrmgrl
```

or

```
$ORACLE_HOME/bin/sqlplus /nolog
```

- 5 As the database administrator, issue the following statements at the `svrmgrl` or `sqlplus` prompt to create the test table:

```
connect / as sysdba
```

```
create user <User>
identified by <Pword>
default tablespace USERS
```

```
temporary tablespace TEMP
quota 100K on USERS;
```

```
grant create session to <User>;
```

```
create table <User>.<Table> ( tstamp date );
insert into <User>.<Table> (tstamp) values (SYSDATE);
```



**6 To test the database table for use, do the following:**

```
disconnect
connect <User>/<Pword>
update <User>.<Table> set ( tstamp ) = SYSDATE;

select TO_CHAR(tstamp, 'MON DD, YYYY HH:MI:SS AM')
from <User>.<Table>;
exit
```

**7 Enable the detail monitoring for the Oracle resource using the following VCS One commands:**

```
hares -modify OracleResource User User
hares -modify OracleResource Pword Pword
hares -modify OracleResource Table Table
hares -modify OracleResource MonScript "./bin/Oracle/SqlTest.pl"
hares -modify OracleResource DetailMonitor 1

hagrp -unfreeze service_group
```

## Enabling and disabling detail monitoring for Oracle resource

Review the instructions to enable or disable detail monitoring.

### To enable detail monitoring

- ◆ Set the DetailMonitor attribute to 1.

```
hares -modify OracleResource DetailMonitor 1
```

### To disable detail monitoring

- ◆ Set the DetailMonitor attribute to 0.

```
hares -modify OracleResource DetailMonitor 0
```

## Setting up detail monitoring for Netlsnr

For Netlsnr agent, the detail monitoring is enabled by default to monitor the listener process.

You can disable detail monitoring by setting the value of the attribute MonScript to an empty string.

You can enable detail monitoring for Netlsnr by specifying a value for the MonScript attribute. The example to set up detail monitoring uses the supplied monitor script for Netlsnr, /opt/VRTSagents/ha/bin/Netlsnr/LsnrTest.pl. The detail monitoring script for the Netlsnr resource uses the Listener command `lsnrctl status $Listener` to test the Listener process.

#### To disable detail monitoring for Netlsnr

- ◆ Disable detail monitoring by setting the MonScript attribute to an empty string:

```
hagrp -freeze service_group
hares -modify SqlResource MonScript ""
hagrp -unfreeze
```

#### To set up detail monitoring for Netlsnr

- 1 Freeze the service group to avoid automated actions by VCS One caused by an incomplete reconfiguration:

```
hagrp -freeze service_group
```

- 2 Enable detail monitoring by entering the following commands:

```
hares -modify LsnrResource MonScript "./bin/Netlsnr/LsnrTest.pl"
hagrp -unfreeze service_group
```

# Troubleshooting Veritas Cluster Server One agent for Oracle

This chapter includes the following topics:

- [About troubleshooting Veritas Cluster Server One agent for Oracle](#)
- [Error messages common to the Oracle and Netlsnr agents](#)
- [Error messages specific to the Oracle agent](#)
- [Error messages specific to the Netlsnr agent](#)

## About troubleshooting Veritas Cluster Server One agent for Oracle

Review the description of the error messages for the following agents and the possible solutions:

- Oracle agent
- Netlsnr agent

## Error messages common to the Oracle and Netlsnr agents

[Table 5-1](#) lists the Veritas Cluster Server One agent for Oracle error messages with the description and a recommended solution, if available.

**Table 5-1** Veritas Cluster Server One agent for Oracle error messages

Message	Description and solution
No ORACLE_HOME specified	<p>The Home attribute in the Oracle or Netlsnr type has not been set.</p> <p>Solution: Set the Home attribute value to the correct full path name of the Oracle home.</p>
Oracle home directory %s does not exist	<p>The string that is specified for the Home attribute in the Oracle or Netlsnr type is incorrect.</p> <p>Solution: Set the Home attribute value to the correct full path name of the Oracle home.</p>
File %s is not a valid text file	<p>The file that the EnvFile attribute specifies for sourcing the environment variables is not present, not readable, or is not a text file.</p> <p>Solution: Set the EnvFile attribute value to the correct full path name. Ensure that the file format is valid.</p>
VCSAgExec returned failure when trying to execute in-depth test	<p>Internal error.</p> <p>Solution: Contact Technical Support for further assistance.</p>
Unable to open pipe from %s	<p>Internal error.</p> <p>Solution: Contact Technical Support for further assistance.</p>
Process %s restarted	<p>Warning message to indicate that the PID for the Oracle process that is specified is different than the one registered by the previous monitor cycle.</p>
Monitor procedure %s returned %s	<p>MonScript failed to execute correctly.</p> <p>Solution: Debug MonScript to assess the exact cause of failure.</p>
Monitor procedure %s did not exit, return value is %s	<p>Internal error while executing MonScript.</p> <p>Solution: Contact Technical Support for further assistance.</p>
No owner for Oracle executables was specified	<p>The Owner attribute in the Oracle type has not been set.</p> <p>Solution: Set the Owner attribute value to the correct owner of the database binaries.</p>

**Table 5-1** Veritas Cluster Server One agent for Oracle error messages  
*(continued)*

Message	Description and solution
Invalid owner %s for Oracle executables was specified	<p>The Operating System user that the Owner attribute specifies is invalid.</p> <p>Solution: Set the Owner attribute value to the correct owner of the database binaries.</p>
Access to Monscript %s denied. Detail Monitoring will not be enabled!! Please specify a valid file.	<p>The file that the MonScript attribute specifies is not accessible or not found.</p> <p>Solution: Make sure that the file name indicates a valid and accessible file.</p>
Encountered errors while decrypting password!	<p>The agent cannot decrypt the password you specified.</p> <p>Solution: Use haencrypt utility to create a new encrypted password and supply the password.</p>

## Error messages specific to the Oracle agent

[Table 5-2](#) lists the error messages for the VCS One agent for Oracle with the description and a recommended solution, if available.

**Table 5-2** Oracle agent error messages

Message	Description and solution
No SID specified	<p>The Sid attribute in the Oracle type has not been set.</p> <p>Solution: Set the Sid attribute value to the correct database instance.</p>
sqlplus/svrmgrl not found in %s/bin	<p>The client utilities svrmgrl or sqlplus are not found in the \$ORACLE_HOME/bin directory.</p> <p>Solution: Verify that the Oracle home has been correctly specified and that these executables are present.</p>

**Table 5-2** Oracle agent error messages (*continued*)

Message	Description and solution
srvctl not found in %s/bin	<p>The client utility srvctl is not found in the \$ORACLE_HOME/bin directory.</p> <p>Solution: Verify that the Oracle home has been correctly specified and that this executable is present.</p>
Oracle %s failed to stop	<p>Warning message to indicate that the following commands were not successful in closing the Oracle instance in the clean or offline entry point:</p> <ul style="list-style-type: none"> <li>■ Shutdown immediate</li> <li>■ Shutdown abort</li> </ul>
Oracle database %s not running	<p>Warning message to indicate that the database instance was not running even before the clean or offline entry points were executed.</p> <p>Solution: No action required.</p>
Oracle (%s) kill TERM %s	<p>Warning message to indicate that the Oracle processes would be signaled with SIGTERM.</p> <p>Solution: No action required.</p>
Oracle (%s) kill KILL %s	<p>Warning message to indicate that the Oracle processes would be signaled with SIGKILL.</p> <p>Solution: No action required.</p>
Database in QUIESCING/QUIESCED mode	<p>Warning message to indicate that database is in QUIESCING or QUIESCED mode.</p>
Database in RESTRICTED mode	<p>Warning message to indicate that database is in RESTRICTED mode.</p>
Database in SUSPENDED state	<p>Warning message to indicate that database is in SUSPENDED state.</p>

**Table 5-2** Oracle agent error messages (*continued*)

Message	Description and solution
Resource %s - monitor procedure did not complete within the expected time.	<p>Refer to Oracle's alert log for more information.</p> <p>When a monitor times out as many times as the value specified, the corresponding resource is brought down by calling the clean entry point. The resource is then marked FAULTED, or it is restarted, depending on the RestartLimit attribute value.</p> <p>Solution: Set the FaultOnMonitorTimeouts attribute value to 0 so that the monitor failures are not considered indicative of a resource fault.</p> <p>Another possible reason could be that automatic archiving was not enabled while setting up the database.</p> <p>Solution: Archive the database manually. If automatic archival is enabled, set the LOG_ARCHIVE_START parameter value in the file init.ora to TRUE.</p>
Custom script /opt/VRTSagents/ha/bin/Oracle/start_custom_%s.sql does not exist. Will not be able to start the database.	<p>The agent could not find the custom script at the specified location to start the database.</p> <p>Solution: Make sure the custom file exists at the specified location and has valid permissions.</p>
Custom script /opt/VRTSagents/ha/bin/Oracle/shut_custom_%s.sql does not exist. Using default shutdown option.	<p>The agent could not find the custom script at the specified location to stop the database.</p> <p>Solution: Make sure the custom file exists and the specified location and has valid permissions.</p>
oraerror.dat did not have records that could be parsed	<p>The file oraerror.dat is not present or has records in an unsupported format.</p> <p>Solution: Make sure the file exists and has data in the supported format.</p>
Incorrect Monitor Option	<p>The MonitorOption value is less than 0 or greater than 1.</p> <p>Solution: Set the MonitorOption attribute value to 0 or 1.</p>

Table 5-2 Oracle agent error messages (continued)

Message	Description and solution
MonitorOption value not applicable for this Oracle Version	<p>The health check monitoring option is selected when Oracle version is not Oracle 10g or later.</p> <p>Solution: Set the MonitorOption value to 0 to select the process check monitoring option.</p>
VCSAgExec returned failure when trying to execute health check monitor test	<p>Internal error.</p> <p>Solution: Contact Technical Support for further assistance.</p>
VCSAgExec returned failure while trying to find Oracle version	<p>Internal error.</p> <p>Solution: Contact Technical Support for further assistance.</p>
One or more of the attributes User:Pword:Table:MonScript are not set correctly. Detail monitoring will not be enabled!! Unset the DetailMonitor attribute if you want to disable DetailMonitoring.	<p>Detail Monitoring has been enabled but the necessary attributes for detail monitoring have not been set correctly.</p> <p>Solution: Set the values of the required attributes for detail monitoring correctly or set DetailMonitor attribute value to 0 to disable detail monitoring.</p>

## Error messages specific to the Netlsnr agent

Table 5-3 lists the Netlsnr agent error messages with the description and a recommended solution, if available.

Table 5-3 Netlsnr agent error messages

Message	Description and solution
Cannot open process directory.	<p>The agent could not process the /proc entries in the particular monitor cycle.</p> <p>Solution: No action required.</p>
Listener process %s not running	<p>Warning message to indicate that the Listener process was not running even before the clean or offline entry points were executed.</p> <p>Solution: No action required.</p>



**Table 5-3** Netlsnr agent error messages (*continued*)

Message	Description and solution
Listener %s kill TERM %s	Warning message to indicate that the Listener process would be signaled with SIGTERM. Solution: No action required.
Listener %s kill KILL %s	Warning message to indicate that the Listener process would be signaled with SIGKILL. Solution: No action required.
lsnrctl not found in %s/bin	The client utility lsnrctl is not found in the \$ORACLE_HOME/bin directory. Solution: Verify that the Oracle home has been correctly specified and that this executable is present.
lsnrctl operation timed out	The tnslnsr process does not respond. Solution: Verify the underlying network protocol.



# Resource type definitions

This appendix includes the following topics:

- [About the resource type and attribute definitions](#)
- [Resource type definition for the Oracle agent](#)
- [Resource type definition for the Netlsnr agent](#)

## About the resource type and attribute definitions

The resource type represents the VCS One configuration definition of the agent and specifies how the agent is defined in the configuration file `main.xml`. The Attribute Definitions explain the attributes associated with the agent. The Required attributes explain the attributes that must be configured for the agent to function properly.

Refer to the sample `OracleTypes.platform.xml` files in `/etc/VRTSagents/ha/conf/Oracle` directory.

## Resource type definition for the Oracle agent

The Oracle agent of the Veritas Cluster Server One agent for Oracle is represented by the Oracle resource type in VCS One.

## Attribute definition for the Oracle agent

Review the description of the Oracle agent attributes. The agent attributes are classified as required, optional, and internal.

[Table A-1](#) lists the required attributes. You must assign values to the required attributes.

Table A-1 Required attributes for Oracle agent

Required attributes	Type and dimension	Definition
Sid	string-scalar	The variable \$ORACLE_SID that represents the Oracle instance. The Sid is considered case-sensitive by the Oracle agent and by the Oracle database server.
Owner	string-scalar	The Oracle user, as the defined owner of executables and database files in /etc/passwd.  The agent also supports LDAP users as Oracle user.
Home	string-scalar	The \$ORACLE_HOME path to Oracle binaries and configuration files. For example, you could specify the path as /opt/ora_home.  <b>Note:</b> Do not append a slash (/) at the end of the path.

Table A-2 lists the optional attributes for Oracle agent. You can configure the optional attributes if necessary.

**Table A-2** Optional attributes for Oracle agent

Optional Attributes	Type and Dimension	Definition
ContainerOpts (Only Solaris 10)	static-assoc-int	<p>This resource-type level attribute specifies the container options for the Oracle instances that run in the context of Solaris containers (zones or projects). This attribute has the following keys, which can take values 0 or 1:</p> <ul style="list-style-type: none"> <li>■ RunInContainer (RIC) Set the key value as 1 for the Oracle agent to monitor Oracle instances running in the context of Solaris container. Set the key value as 0 if you do not want to run the Oracle resource in the context of Solaris container. Default is 1.</li> <li>■ PassCInfo (PCI) Set the key value as 1 for the Oracle resource to get the container information defined in the VCS One service group's ContainerInfo attribute. Set the key value as 0 if you do not want to get the container information. Default is 0.</li> <li>■ PassLoadInfo (PLI) Set the key value as 1 for the Oracle resource to get the load dimensions defined in the VCS One service group's Load attribute. Set the key value as 0 if you do not want to get the load information. Default is 0.</li> </ul> <p>See the <i>Veritas Cluster Server One User's Guide</i>.</p>
DBAUser	string-scalar	The database user who has sysdba privileges to start or stop the database.
DBAPword	string-scalar	<p>Encrypted password for DBAUser.</p> <p>Encrypt passwords only when entering them using the command-line. Passwords must be encrypted using the VCS One Encrypt utility.</p> <p>See <a href="#">“Encrypting Oracle database user and listener passwords”</a> on page 69.</p>

**Table A-2** Optional attributes for Oracle agent (*continued*)

Optional Attributes	Type and Dimension	Definition
StartUpOpt	string-scalar	<p>Startup options for the Oracle instance. This attribute can take the following values:</p> <ul style="list-style-type: none"> <li>■ STARTUP</li> <li>■ STARTUP_FORCE</li> <li>■ RESTRICTED</li> <li>■ RECOVERDB</li> <li>■ SRVCTLSTART</li> <li>■ CUSTOM</li> </ul> <p>Default is STARTUP_FORCE.</p> <p>See <a href="#">“Startup and shutdown options for the Oracle agent”</a> on page 16.</p>
ShutDownOpt	string-scalar	<p>Shut down options for the Oracle instance. This attribute can take the following values:</p> <ul style="list-style-type: none"> <li>■ IMMEDIATE</li> <li>■ TRANSACTIONAL</li> <li>■ SRVCTLSTOP</li> <li>■ CUSTOM</li> </ul> <p>Default is IMMEDIATE.</p> <p>See <a href="#">“Startup and shutdown options for the Oracle agent”</a> on page 16.</p>
EnvFile	string-scalar	<p>The full path name of the file that is sourced by the entry point scripts. This file contains the environment variables set by the user for the Oracle database server environment such as LD_LIBRARY_PATH, NLS_DATE_FORMAT, and so on.</p> <p>The syntax for the contents of the file depends on the login shell of Owner. File must be readable by Owner. The file must not contain any prompts for user input.</p>

**Table A-2** Optional attributes for Oracle agent (*continued*)

Optional Attributes	Type and Dimension	Definition
Pfile	string-scalar	<p>The name of the initialization parameter file with the complete path of the startup profile.</p> <p>You can also use the server parameter file. Create a one-line text initialization parameter file that contains only the SPFILE parameter. See the Oracle documentation for more information.</p> <p>See <a href="#">“Using the SPFILE in a VCS One cluster”</a> on page 114.</p>
AutoEndBkup	integer-scalar	<p>Setting the AutoEndBkup attribute to a non-zero value takes the datafiles in the database out of the backup mode, during Online.</p> <p>Default = 1</p> <p>See <a href="#">“Failing over Oracle after a VCS One client system failure during hot backup”</a> on page 34.</p>
MonitorOption	integer-scalar	<p>Monitor options for the Oracle instance. This attribute can take values 0 or 1.</p> <ul style="list-style-type: none"> <li>■ 0—Process check monitoring (recommended)</li> <li>■ 1—Health check monitoring</li> </ul> <p>Default = 0</p> <p>See <a href="#">“Monitor options for the Oracle agent”</a> on page 18.</p>
DetailMonitor	integer-scalar	<p>Setting this flag to a non-zero enables detail monitoring for Oracle. The value indicates the number of monitor cycles after which the agent will monitor Oracle in detail. For example, the value 5 indicates that the agent will monitor Oracle in detail every five monitor intervals.</p> <p><b>Note:</b> If you set the AutoEndBkup attribute value to 0, then you must set the DetailMonitor attribute value to 1.</p> <p>Default = 0</p>

**Table A-2** Optional attributes for Oracle agent (*continued*)

Optional Attributes	Type and Dimension	Definition
MonScript	string-scalar	<p>Pathname to the script provided for detail monitoring. The default (basic monitoring) is to monitor the database PIDs only.</p> <p><b>Note:</b> Detail monitoring is disabled if the value of the attribute MonScript is invalid or is set to an empty string.</p> <p>The pathname to the supplied detail monitor script is /opt/VRTSagents/ha/bin/Oracle/SqlTest.pl.</p> <p>MonScript also accepts a pathname relative to /opt/VRTSagents/ha. A relative pathname should start with "./", as in the path ./bin/Oracle/SqlTest.pl.</p>
User	string-scalar	Internal database user. Connects to the database for detail monitoring.
Pword	string-scalar	<p>Encrypted password for internal database-user authentication.</p> <p>Encrypt passwords only when entering them using the command-line. Passwords must be encrypted using the VCS One Encrypt utility.</p> <p>See <a href="#">“Encrypting Oracle database user and listener passwords”</a> on page 69.</p>
Table	string-scalar	Table for update by User/Pword.
Encoding	string-scalar	<p>Specifies operating system encoding that corresponds to Oracle encoding for the displayed Oracle output.</p> <p>For example, if Oracle output is in "JAPANESE_JAPAN.JA16EUC," then "eucJP" is the Solaris value for Encoding. Refer to the Oracle and Solaris documentation for respective encoding values.</p> <p>Default is "".</p>



**Table A-2** Optional attributes for Oracle agent (*continued*)

Optional Attributes	Type and Dimension	Definition
AgentDebug	boolean-scalar	Additional debug messages are logged when this flag is set.  Default = 0

[Table A-3](#) lists the internal attribute for Oracle agent. This attribute is for internal use only. Symantec recommends not to modify the value of this attribute.

**Table A-3** Internal attributes for Oracle agent

Optional Attributes	Type and Dimension	Definition
AgentDirectory	static-string	Specifies the location of binaries, scripts, and other files related to the Oracle agent.  Default is /opt/VRTSagents/ha/bin/Oracle.

## Resource type definition for the Netlsnr agent

The Netlsnr agent of the Veritas Cluster Server One agent for Oracle is represented by the Netlsnr resource type in VCS One.

### Attribute definition for the Netlsnr agent

Review the description of the Netlsnr agent attributes. The agent attributes are classified as required, optional, and internal.

[Table A-4](#) lists the required attributes for Netlsnr agent. You must assign values to the required attributes.

**Table A-4** Required attributes for Netlsnr agent

Required attributes	Type and dimension	Definition
Owner	string-scalar	The Oracle user, as the defined owner of executables and database files in /etc/passwd.  The agent also supports LDAP users as Oracle user.

**Table A-4** Required attributes for Netlsnr agent *(continued)*

Required attributes	Type and dimension	Definition
Home	string-scalar	The \$ORACLE_HOME path to Oracle binaries and configuration files. For example, you could specify the path as /opt/ora_home.  Do not append a slash (/) at the end of the path.

[Table A-5](#) lists the optional attributes for Netlsnr agent. You can configure the optional attributes if necessary.

**Table A-5** Optional attributes for Netlsnr agent

Optional attributes	Type and dimension	Definition
ContainerOpts (Only Solaris 10)	static-assoc-int	<p>This resource-type level attribute specifies the container options for the listener processes that run in the context of Solaris containers (zones or projects). This attribute has the following keys, which can take values 0 or 1:</p> <ul style="list-style-type: none"> <li>■ RunInContainer (RIC) Set the key value as 1 for the Netlsnr agent to monitor listener processes running in the context of Solaris container. Set the key value as 0 if you do not want to run the Netlsnr resource in the context of Solaris container. Default is 1.</li> <li>■ PassCInfo (PCI) Set the key value as 1 for the Netlsnr resource to get the container information defined in the VCS One service group's ContainerInfo attribute. Set the key value as 0 if you do not want to get the container information. Default is 0.</li> <li>■ PassLoadInfo (PLI) Set the key value as 1 for the Netlsnr resource to get the load dimensions defined in the VCS One service group's Load attribute. Set the key value as 0 if you do not want to get the load information. Default is 0.</li> </ul> <p>See the <i>Veritas Cluster Server One User's Guide</i>.</p>
TnsAdmin	string-scalar	<p>The \$TNS_ADMIN path to directory in which the Listener configuration file resides (listener.ora). Default is /var/opt/oracle.</p>
Listener	string-scalar	<p>Name of Listener. The name for Listener is considered case-insensitive by the Netlsnr agent and the Oracle database server. Default is LISTENER.</p>

**Table A-5** Optional attributes for Netlsnr agent (*continued*)

Optional attributes	Type and dimension	Definition
LsnrPwd	string-scalar	<p>The VCS One encrypted password used to stop and monitor the listener. This password is set in the Listener configuration file.</p> <p>Encrypt passwords only when entering them using the command-line. Passwords must be encrypted using the VCS One Encrypt utility.</p> <p>See <a href="#">“Encrypting Oracle database user and listener passwords”</a> on page 69.</p>
EnvFile	string-scalar	<p>Specifies the full path name of the file that is sourced by the entry point scripts. This file contains the environment variables set by the user for the Oracle listener environment such as LD_LIBRARY_PATH and so on.</p> <p>The syntax for the contents of the file depends on the login shell of Owner. This file must be readable by Owner. The file must not contain any prompts for user input.</p>
MonScript	string-scalar	<p>Pathname to the script provided for detail monitoring. By default, the detail monitoring is enabled to monitor the listener process.</p> <p><b>Note:</b> If the value of the attribute MonScript is set to an empty string, the agent disables detail monitoring.</p> <p>The pathname to the supplied detail monitoring script is /opt/VRTSagents/ha/bin/Netlsnr/LsnrTest.pl.</p> <p>MonScript also accepts a pathname relative to /opt/VRTSagents/ha. A relative pathname should start with "./", as in the path ./bin/Netlsnr/LsnrTest.pl.</p>

**Table A-5** Optional attributes for Netlsnr agent (*continued*)

Optional attributes	Type and dimension	Definition
Encoding	string-scalar	<p>Specifies operating system encoding that corresponds to Oracle encoding for the displayed Oracle output.</p> <p>For example, if Oracle output is in "JAPANESE_JAPAN.JA16EUC," then "eucJP" is the Solaris value for Encoding. Refer to the Oracle and Solaris documentation for respective encoding values.</p> <p>Default is "".</p>
AgentDebug	boolean	<p>Additional debug messages are logged when this flag is set.</p> <p>Default = 0</p>

[Table A-6](#) lists the internal attribute for Netlsnr agent. This attribute is for internal use only. Symantec recommends not to modify the value of this attribute.

**Table A-6** Internal attributes for Netlsnr agent

Optional Attributes	Type and Dimension	Definition
AgentDirectory	static-string	<p>Specifies the location of binaries, scripts, and other files related to the Netlsnr agent.</p> <p>Default is /opt/VRTSagents/ha/bin/Netlsnr.</p>



# Sample configurations

This appendix includes the following topics:

- [About the sample configurations for Oracle enterprise agent](#)
- [Sample single Oracle instance configuration](#)
- [Sample multiple Oracle instances \(single listener\) configuration](#)
- [Sample multiple instance \(multiple listeners\) configuration](#)
- [Sample Oracle configuration with shared server support](#)
- [Sample configuration for Oracle instances in Solaris zones](#)

## About the sample configurations for Oracle enterprise agent

The sample configuration includes descriptions for typical service groups that are configured to monitor the state of Oracle in a VCS One cluster.

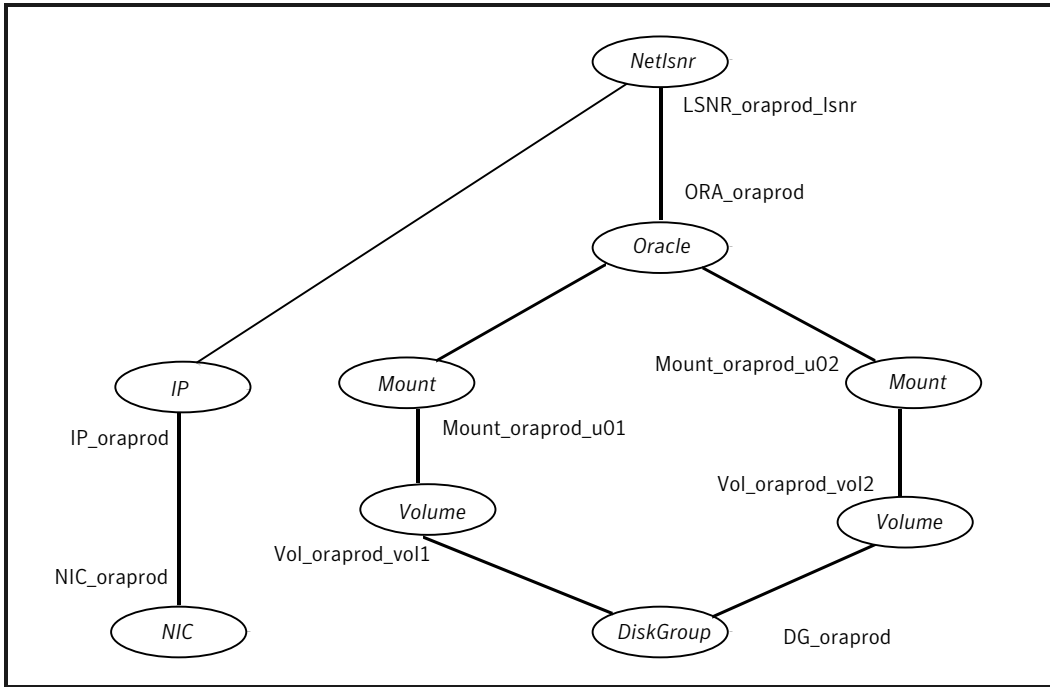
The sample dependency graphs depict the resource types, resources, and resource dependencies within the service group.

Review these dependencies carefully before configuring the agent. For more information about VCS One resource types, see the *Veritas Cluster Server One Bundled Agents Reference Guide*.

## Sample single Oracle instance configuration

[Figure B-1](#) describes a typical service group configured to monitor the state of an Oracle instance in a VCS One cluster.

**Figure B-1** Dependency graph for single Oracle instance



The shared disk groups and volumes in the cluster are configured as resources of type **DiskGroup** and **Volume** respectively. The volumes are mounted using the **Mount** agent. The virtual IP address for the service group is configured using the **IP** and **NIC** resource types. The Oracle server can be started after each of these resources is brought online.

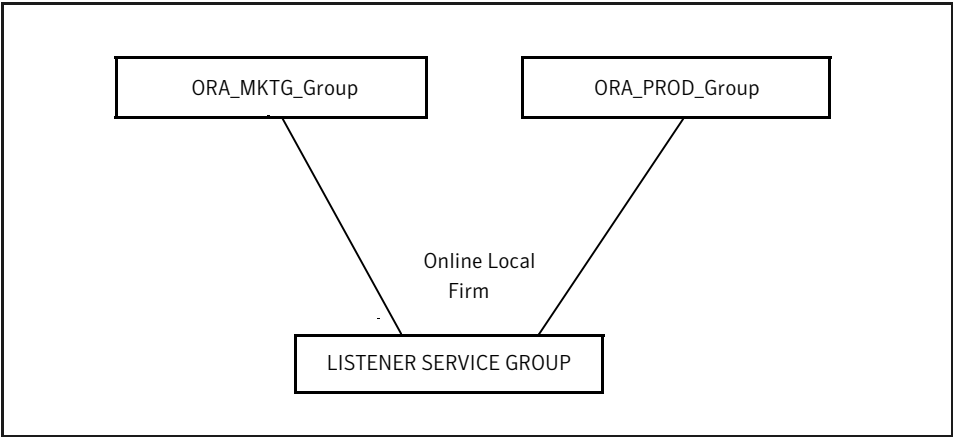
If your configuration does not use Veritas Volume Manager, use the **DiskReservation** resource type to configure shared storage instead of the **DiskGroup** and **Volume** resource types.

## Sample multiple Oracle instances (single listener) configuration

**Figure B-2** describes a typical VCS One configuration to monitor two Oracle instances sharing a listener. This configuration has a service group for each Oracle instance. The Listener too is configured in a separate service group.



Figure B-2 Two Oracle instances sharing a listener



The Oracle service groups are made dependent on the Listener service group using an Online Local Firm dependency.

Figure B-3 shows the dependency graph for one of the Oracle instances in the VCS One configuration. In the Oracle service group, the shared disk groups and volumes in the cluster are configured as resources of type DiskGroup and Volume respectively. The volumes are mounted using the Mount agent.

Figure B-3 Dependency graph for one of the Oracle instances

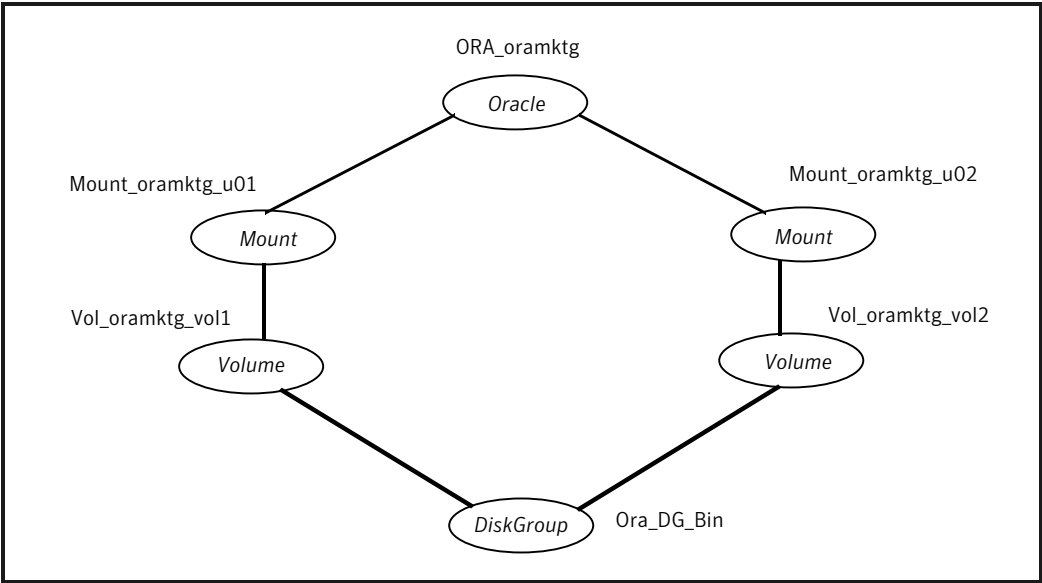
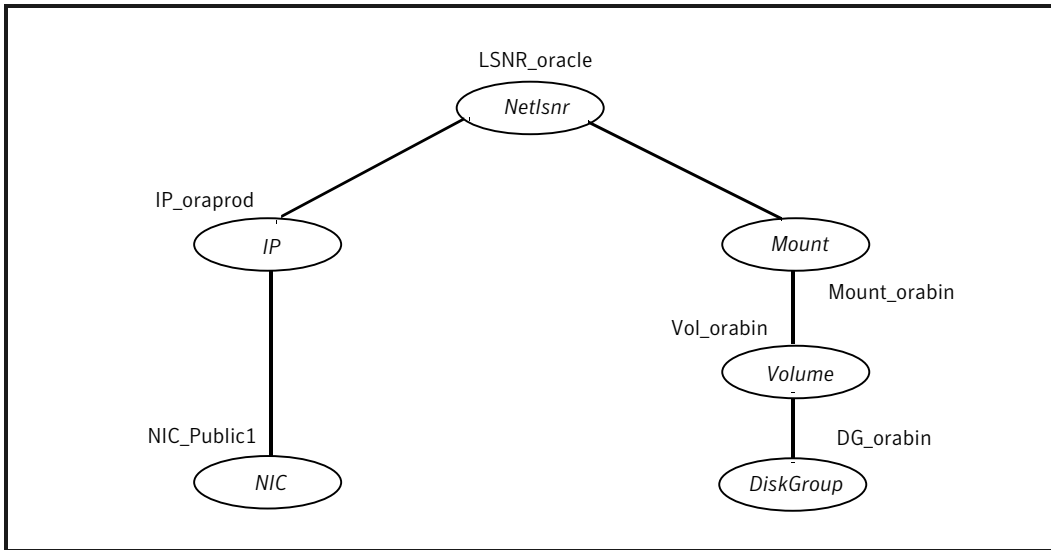


Figure B-4 shows the dependency graph for the listener that the two Oracle instances share in the VCS One configuration. In the Listener service group, the virtual IP address is configured using the IP and NIC resource types. The Listener can be started after the IP and NIC resources are brought online.

**Figure B-4** Dependency graph for the single listener



The Oracle server can be started after the Listener service group and the resources in the Oracle service group are brought online.

If your configuration does not use Veritas Volume Manager, use the **DiskReservation** resource type to configure shared storage instead of the **DiskGroup** and **Volume** resource types.

---

**Note:** In this case, make sure you have modified all proper system files, such as `/etc/system`, `/etc/passwd`, `/etc/group`, and `/etc/shadow` to support multiple databases. Pay particular attention to system requirements like physical memory and shared memory segment availability. Also ensure a single system is capable of sustaining a multiple instance load in the event of a server failure and extended operation on the backup server.

---

## Sample multiple instance (multiple listeners) configuration

This configuration has several single-instance configurations. Each Oracle instance is configured in a separate service group. The resource dependencies are similar to the single Oracle instance configuration.

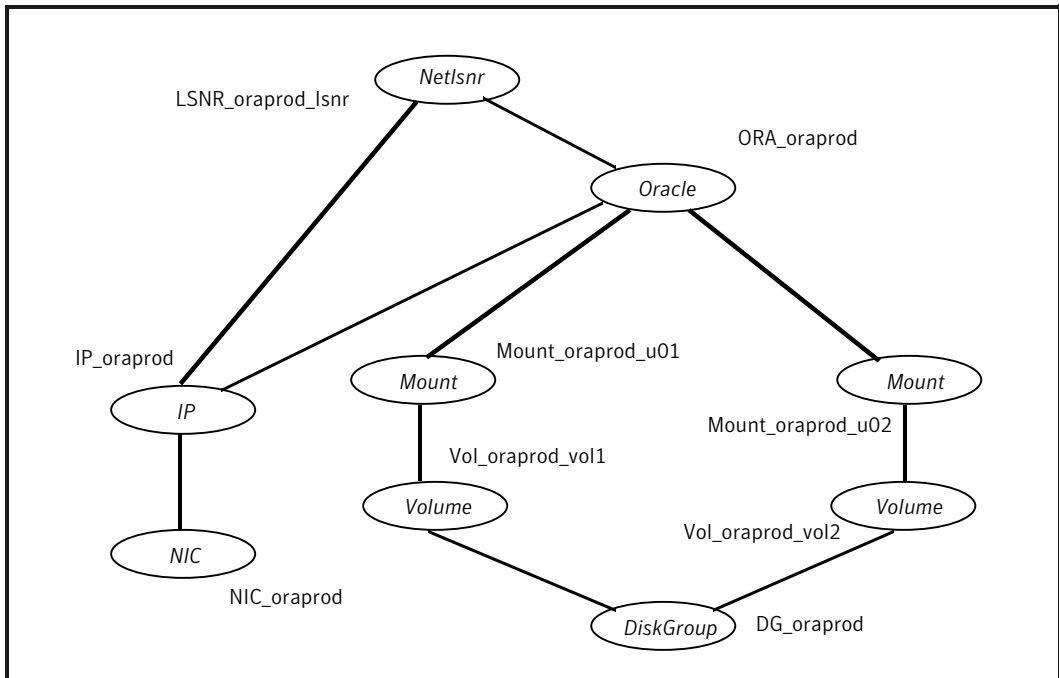
See “[Sample single Oracle instance configuration](#)” on page 95.

## Sample Oracle configuration with shared server support

[Figure B-5](#) describes a typical service group configured to monitor Oracle with shared server support.

You can also configure Oracle instances with shared server support in Solaris zones.

**Figure B-5** Dependency for Oracle configured with shared server support



The shared disk groups and volumes in the cluster are configured as resources of type DiskGroup and Volume respectively. The volumes are mounted using the Mount agent. The virtual IP address for the service group is configured using the IP and NIC resource types. The Oracle server can be started after each of these resources is brought online.

On Linux, if your configuration does not use Veritas Volume Manager, use the DiskReservation resource type to configure shared storage instead of the DiskGroup and Volume resource types.

## Sample configuration for Oracle instances in Solaris zones

You can configure Oracle instances in a Solaris zone with the zone root on either the local disk or the shared disk.

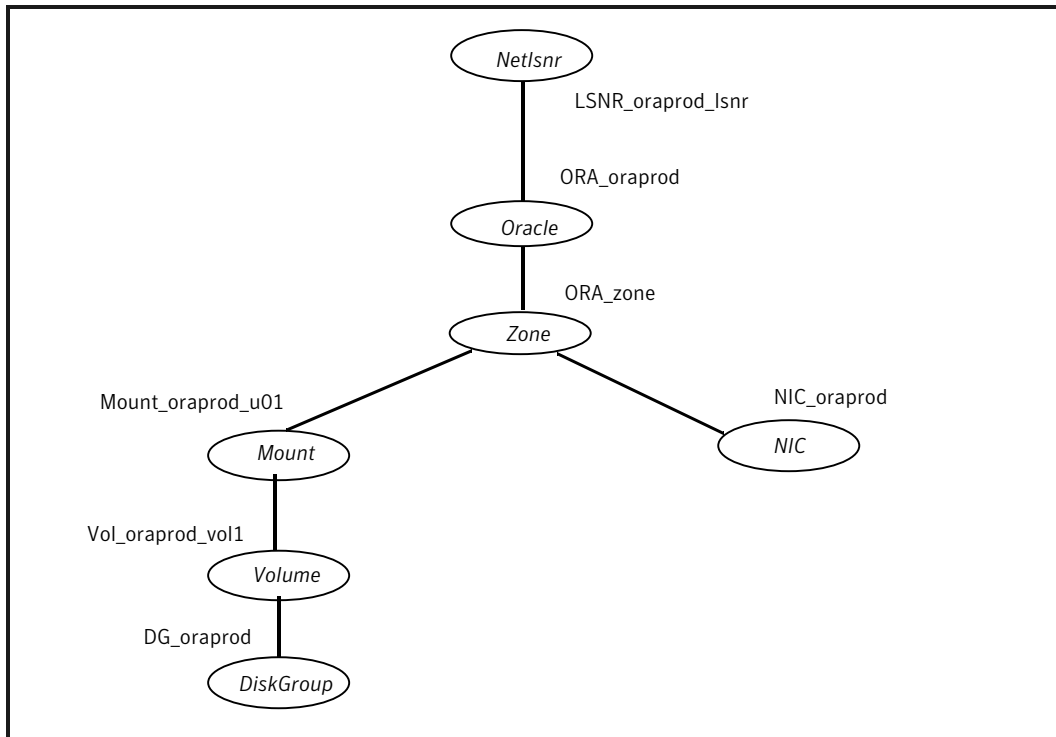
Review the following dependency charts for the different Oracle configurations in Solaris zones that VCS One supports:

- Single Oracle instance configuration
  - See [“Zone root on local disk for single Oracle instance”](#) on page 100.
  - See [“Zone root on shared disk for single Oracle instance”](#) on page 101.
- Multiple Oracle instances (single listener) configuration
  - See [“Zone root on local disk for multiple Oracle instances”](#) on page 103.
  - See [“Zone root on shared disk for multiple Oracle instances”](#) on page 104.
- Multiple Oracle instances (multiple listeners) configuration
- Oracle configuration with shared server support
  - See [“Zone root on local disk for Oracle instance with shared server support”](#) on page 106.
  - See [“Zone root on shared disk for Oracle instance with shared server support”](#) on page 107.

### Zone root on local disk for single Oracle instance

[Figure B-6](#) describes a typical service group in a Solaris zone that is on local disk. If the root file system of a zone is on the local disk of each client system, the file system is mounted when the system is booted. Hence, the service group does not need to have separate DiskGroup and Volume resources for the zone.

**Figure B-6** Single Oracle instance in zone on local disk



The shared disk groups and volumes in the cluster are configured as resources of type DiskGroup and Volume respectively. The volumes are mounted using the Mount agent. The Solaris zone is monitored through a zone resource, which is dependent on the Mount and NIC resources. The Oracle server can be started after each of these resources is brought online.

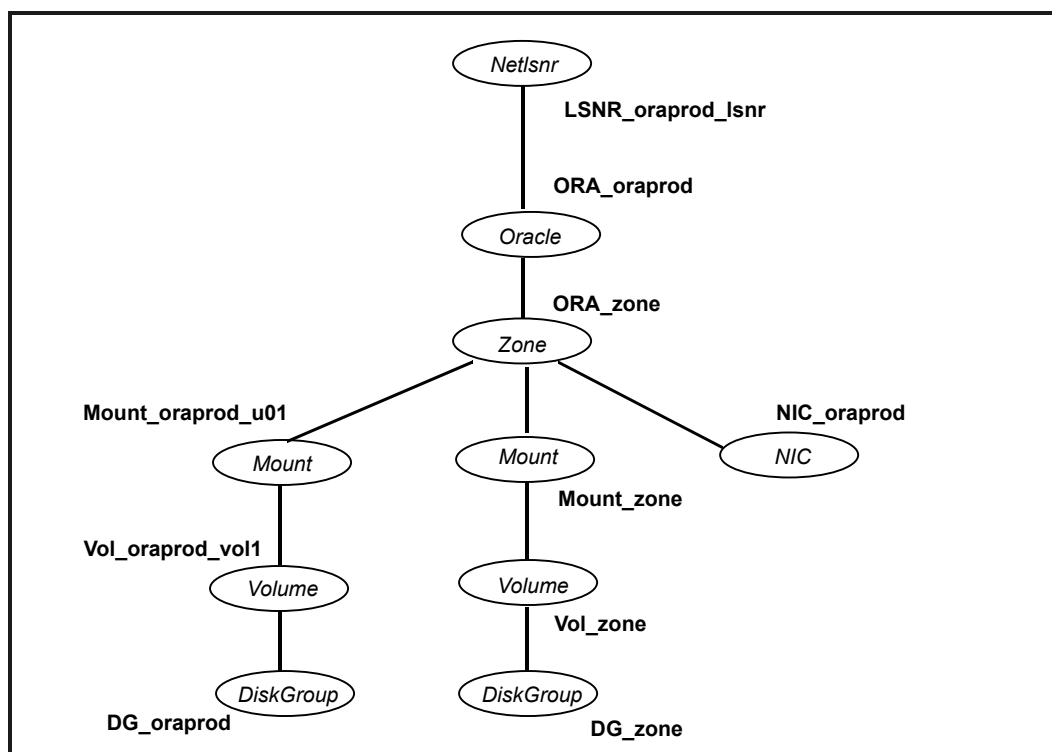
If your configuration does not use Veritas Volume Manager, use the DiskReservation resource type to configure shared storage instead of the DiskGroup and Volume resource types.

Make sure that the value of the group-level attribute ContainerInfo and the value of the ContainerOpts attribute are set correctly.

## Zone root on shared disk for single Oracle instance

[Figure B-7](#) describes a typical service group in a Solaris zone that is on shared disk. If the root file system of a zone is on a shared disk, the file system should be mounted by VCS One. Hence, separate DiskGroup and Volume resources are required for the zone.

**Figure B-7** Single Oracle instance in zone on shared disk



8

The shared disk groups and volumes in the cluster are configured as resources of type DiskGroup and Volume respectively. The volumes are mounted using the Mount agent. The Solaris zone is monitored through a zone resource, which is dependent on the Mount and NIC resources. The Oracle server can be started after each of these resources is brought online.

If your configuration does not use Veritas Volume Manager, use the DiskReservation resource type to configure shared storage instead of the DiskGroup and Volume resource types.

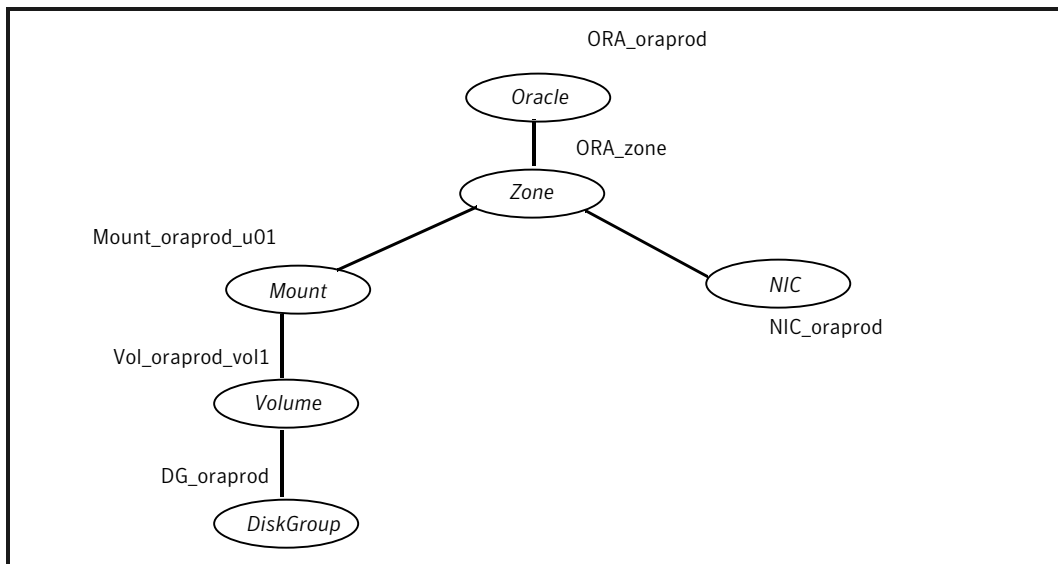
Make sure that the value of the group-level attribute ContainerInfo and the value of the ContainerOpts attribute are set correctly.

## Zone root on local disk for multiple Oracle instances

If the root file system of a zone is on the local disk of each client system, the file system is mounted when the system is booted. Hence, the service group does not need to have separate DiskGroup and Volume resources for the zone.

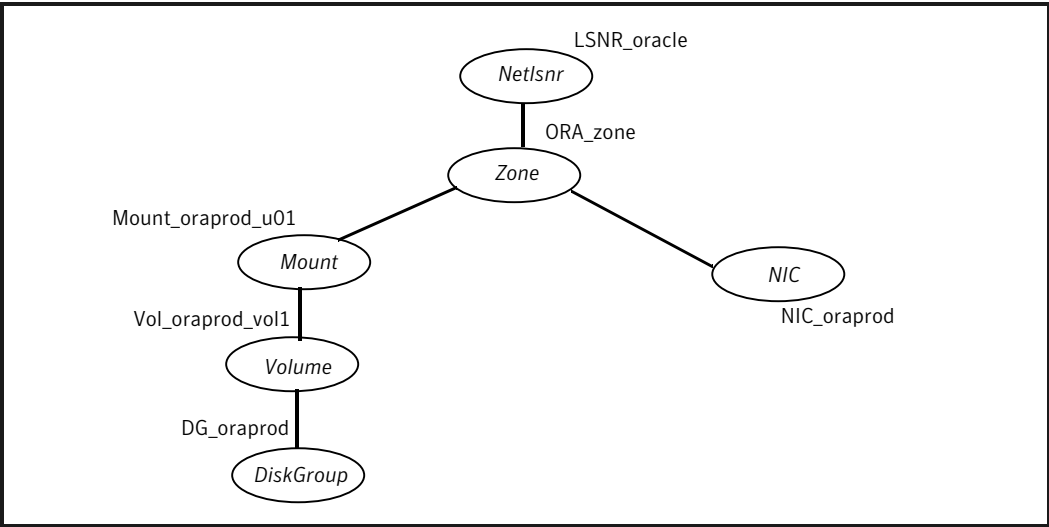
In the Oracle service group, the shared disk groups and volumes in the cluster are configured as resources of type DiskGroup and Volume respectively. The volumes are mounted using the Mount agent. The Solaris zone is monitored through a zone resource, which is dependent on the Mount and NIC resources.

**Figure B-8** Dependency for an Oracle instance in a zone on local disk



In the Listener service group, the Listener resource is dependent on the zone resource. The Listener can be started after the zone resource is brought online.

Figure B-9      Dependency for the single listener in a zone on local disk



The Oracle server can be started after the Listener service group and the resources in the Oracle service group are brought online.

If your configuration does not use Veritas Volume Manager, use the DiskReservation resource type to configure shared storage instead of the DiskGroup and Volume resource types.

Make sure that the value of the group-level attribute ContainerInfo and the value of the ContainerOpts attribute are set correctly.

**Note:** In this case, make sure you have modified all proper system files, such as /etc/system, /etc/passwd, /etc/group, and /etc/shadow to support multiple databases. Pay particular attention to system requirements like physical memory and shared memory segment availability. Also ensure a single system is capable of sustaining a multiple instance load in the event of a server failure and extended operation on the backup server.

## Zone root on shared disk for multiple Oracle instances

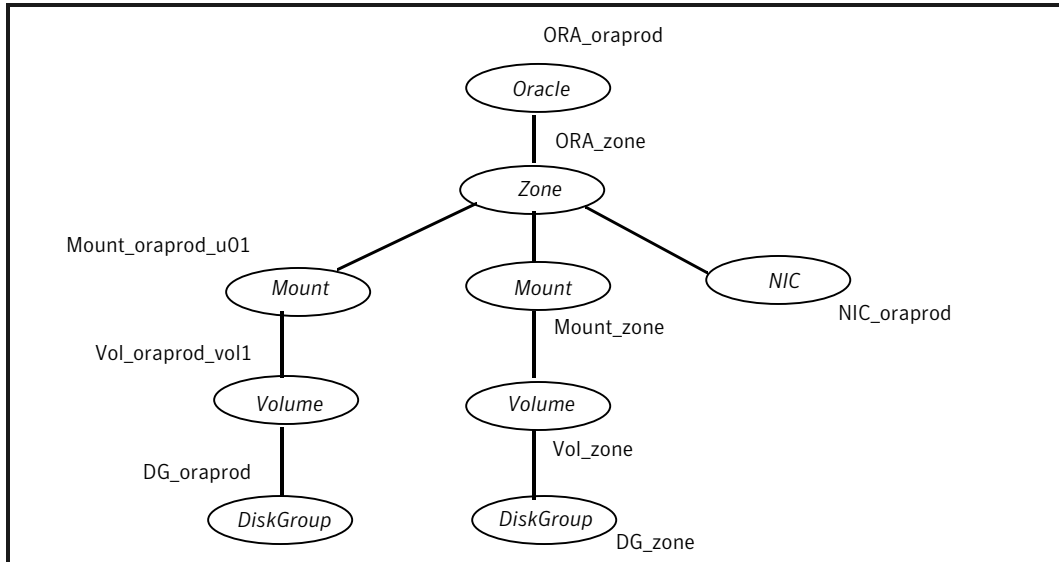
If the root file system of a zone is on a shared disk, the file system should be mounted by VCS One. Hence, separate DiskGroup and Volume resources are required for the zone.

In the Oracle service group, the shared disk groups and volumes in the cluster are configured as resources of type DiskGroup and Volume respectively. The volumes



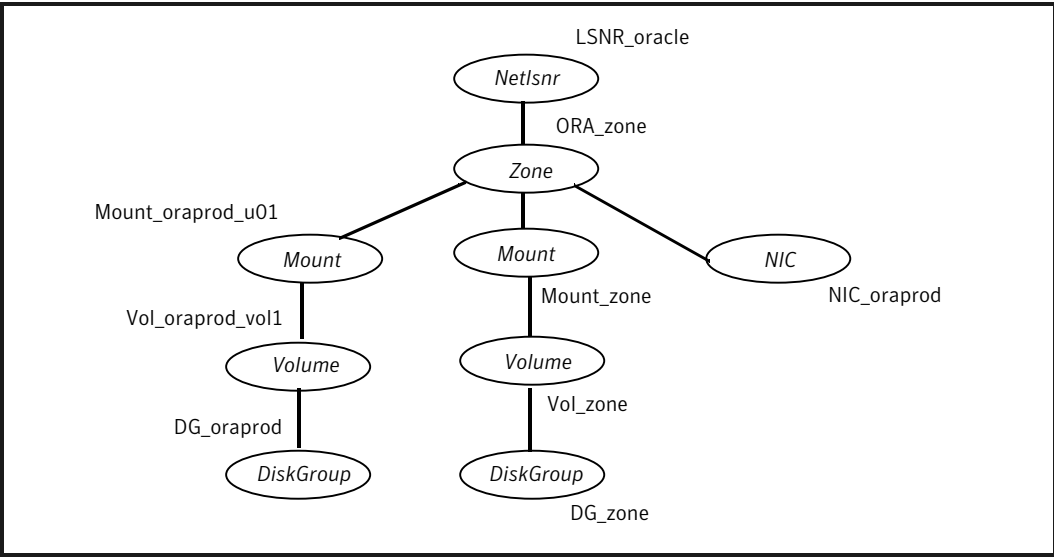
are mounted using the Mount agent. The Solaris zone is monitored through a zone resource, which is dependent on the Mount and NIC resources.

**Figure B-10**      Dependency for an Oracle instance in a zone on shared disk



In the Listener service group, the Listener resource is dependent on the zone resource. The Listener can be started after the zone resource is brought online.

Figure B-11      Dependency for the single listener in a zone on shared disk



The Oracle server can be started after the Listener service group and the resources in the Oracle service group are brought online.

If your configuration does not use Veritas Volume Manager, use the DiskReservation resource type to configure shared storage instead of the DiskGroup and Volume resource types.

Make sure that the value of the group-level attribute ContainerInfo and the value of the ContainerOpts attribute are set correctly.

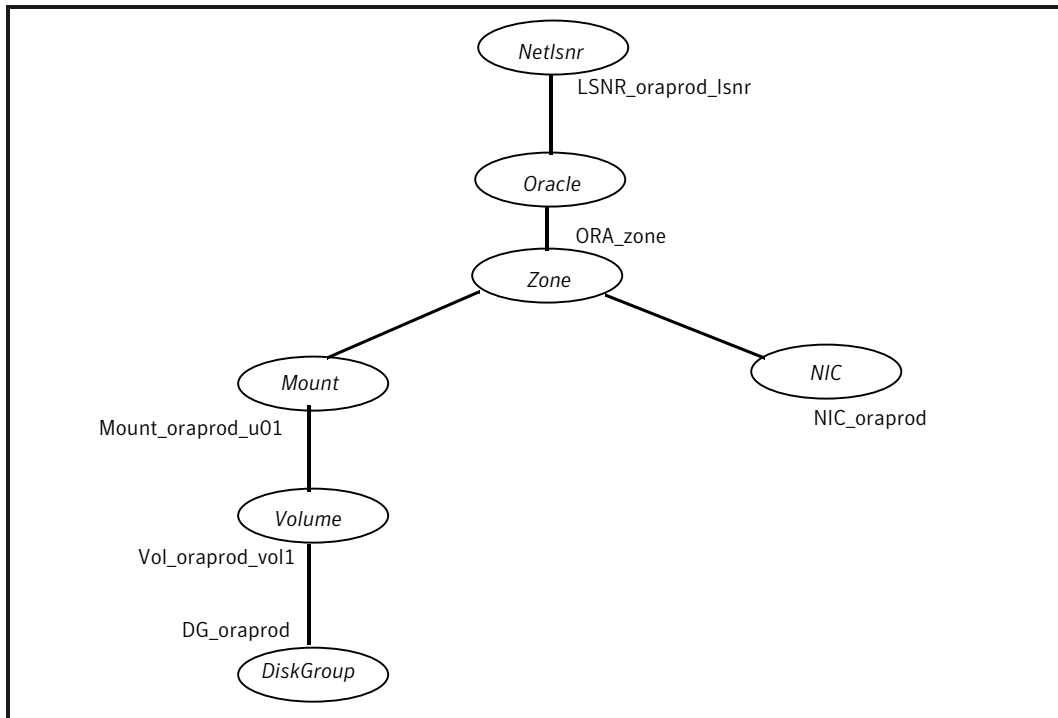
---

**Note:** In this case, make sure you have modified all proper system files, such as /etc/system, /etc/passwd, /etc/group, and /etc/shadow to support multiple databases. Pay particular attention to system requirements like physical memory and shared memory segment availability. Also ensure a single system is capable of sustaining a multiple instance load in the event of a server failure and extended operation on the backup server.

---

## Zone root on local disk for Oracle instance with shared server support

If the root file system of a zone is on the local disk of each client system, the file system is mounted when the system is booted. Hence, the service group does not need to have separate DiskGroup and Volume resources for the zone.

**Figure B-12** Oracle instance with shared server support in zone on local disk

The shared disk groups and volumes in the cluster are configured as resources of type DiskGroup and Volume respectively. The volumes are mounted using the Mount agent. The Solaris zone is monitored through a zone resource, which is dependent on the Mount and NIC resources. The Oracle server can be started after each of these resources is brought online.

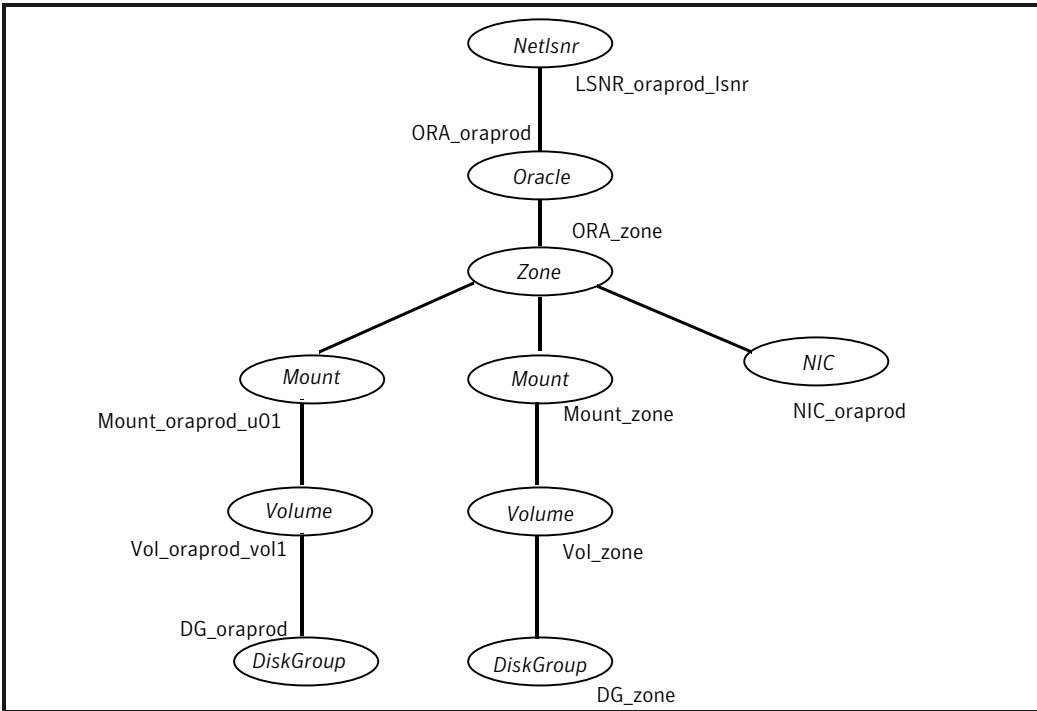
If your configuration does not use Veritas Volume Manager, use the DiskReservation resource type to configure shared storage instead of the DiskGroup and Volume resource types.

Make sure that the value of the group-level attribute ContainerInfo and the value of the ContainerOpts attribute are set correctly.

## Zone root on shared disk for Oracle instance with shared server support

If the root file system of a zone is on a shared disk, the file system should be mounted by VCS One. Hence, separate DiskGroup and Volume resources are required for the zone.

**Figure B-13** Oracle instance with shared server support in zone on shared disk



The shared disk groups and volumes in the cluster are configured as resources of type `DiskGroup` and `Volume` respectively. The volumes are mounted using the `Mount` agent. The Solaris zone is monitored through a `zone` resource, which is dependent on the `Mount` and `NIC` resources. The Oracle server can be started after each of these resources is brought online.

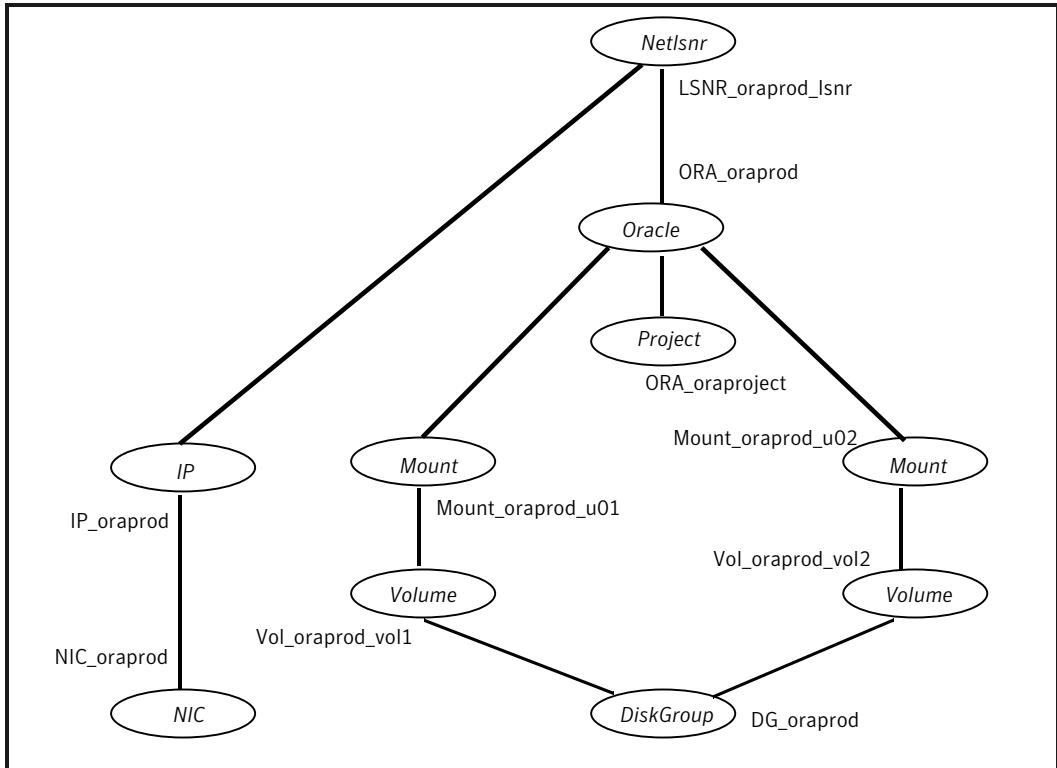
If your configuration does not use Veritas Volume Manager, use the `DiskReservation` resource type to configure shared storage instead of the `DiskGroup` and `Volume` resource types.

Make sure that the value of the group-level attribute `ContainerInfo` and the value of the `ContainerOpts` attribute are set correctly.

## Oracle instance in the context of project

[Figure B-14](#) describes a typical service group configured to monitor the state of an Oracle instance running in the context of a Solaris project.

**Figure B-14** Single Oracle instance running in the context of Solaris project



The Solaris project is monitored through a project resource.



# Best practices

This appendix includes the following topics:

- [Best practices for multiple Oracle instance configurations in a VCS One environment](#)

## Best practices for multiple Oracle instance configurations in a VCS One environment

Review some of the best practices for using multiple Oracle instances in a VCS One environment:

- For each SID to be configured, create UNIX accounts with DBA privileges.
- Make sure that each Oracle instance has a separate disk group and is configured as a separate service group.
- Define the system parameters such that the allocation of semaphore and shared memory is appropriate on all systems.
- Use a dedicated set of binaries for each Oracle instance, even if each instance uses the same Oracle version.
- If your configuration uses the same Oracle version for all instances, install a version on the root disk or preferably on a secondary disk. Locate the pfiles in the default location and define several listener processes to ensure clean failover.
- If your configuration has different versions of Oracle, create a separate \$ORACLE\_HOME for each Oracle version.
- Follow the Optimal Flexible Architecture (OFA) standard (/uwx/<SID>). In VCS One configurations, you could adapt the standard to make it more application-specific. For example, /app/uwx/<SID>.

- Listeners accompanying different versions of Oracle may not be backward-compatible. So, if you want to create a single listener.ora file, you must verify that the listener supports the other versions of Oracle in the cluster. You must also create a separate Envfile for each version of Oracle.
- Make sure that each listener listens to a different virtual address. Also, assign different names to listeners and make sure that they do not listen to the same port.
- The pfiles must be coordinated between systems. For the same instance of a database, ensure that the pfiles referenced are identical across the client systems.



# Using the SPFILE in a VCS One cluster for Oracle

This appendix includes the following topics:

- [About the Oracle initialization parameter files](#)
- [Starting an Oracle instance](#)
- [Using the SPFILE in a VCS One cluster](#)

## About the Oracle initialization parameter files

Oracle versions earlier than Oracle9i used an initialization file `initSID.ora`, a text file, to start database instances. Changes that were applied to instance parameters during a database session were not saved to the file. You had to manually apply them to the initialization file.

Oracle9i introduced the SPFILE, which is a binary file stored on the database server. With this feature, changes to the instance parameters can be set to be persistent across all startup and shutdown procedures.

## Starting an Oracle instance

For versions above Oracle9i, you can start an Oracle instance in the following ways:

- Using the default SPFILE `spfileSID.ora`
- Using the default `init.ora` file `initSID.ora`
- By specifying an initialization file `init.ora`
- By specifying an SPFILE in the initialization file `init.ora`

When you run the `startup` command without a PFILE clause, Oracle reads the initialization parameters from the SPFILE. On AIX, HP-UX, Linux, and Solaris platforms, the default location for the SPFILE or PFILE is `$ORACLE_HOME/dbs`.

Oracle locates the initialization parameter file by examining file names in the following order:

- `SPFILESID.ora`
- `SPFILE.ora`
- `initSID.ora`

## Using the SPFILE in a VCS One cluster

When using the Veritas Cluster Server One agent for Oracle, you can start a database instance by specifying a PFILE. If you do not specify the PFILE, the database instance starts up using the default SPFILE.

The agent attribute `Pfile` must specify the location of the PFILE. If your configuration uses the SPFILE, the contents of the PFILE must specify the location of the SPFILE, which must be created from the PFILE.

---

**Note:** If you want the SPFILE's session parameter changes be persistent across an instance failover, then Symantec recommends you to save the SPFILE on shared storage.

---

### To create the SPFILE from a PFILE

- ◆ The SPFILE must be created from the PFILE. You must have the `sysdba` or the `sysoper` system privileges to create an SPFILE.

You can run the following command to create the SPFILE:

```
CREATE SPFILE [= spfile_name] FROM PFILE [= pfile_name ];
```

If you do not specify the complete path for the SPFILE, this command creates an SPFILE at the default location (`$ORACLE_HOME/dbs` on AIX, HP-UX, Linux, and Solaris).

**To specify the SPFILE location in the PFILE**

- ◆ To specify the location of the SPFILE in a PFILE, create a PFILE and specify the following entry in the PFILE:

```
SPFILE = spfile_location
```

The variable *spfile\_location* represents the complete path of the SPFILE. For example:

```
SPFILE = /database/startup/spfileora1.ora
```

In this case, to start the database use the following command:

```
startup pfile=location_of_pfile
```



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