Veritas™ Cluster Server Database Agent for Oracle Configuration Guide

Windows 2000, Windows Server 2003

5.0

Veritas Cluster Server
Database Agent for Oracle, Configuration Guide

Symantec Corporation
20330 Stevens Creek Blvd.
Cupertino, CA 95014
www.symantec.com

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Introduction

VCS database agents monitor specific resources within an enterprise application, determine the status of these resources, and start or stop them according to external events. The VCS database agent for Oracle provides high availability for Oracle in a VCS cluster.

About the VCS database agent for Oracle

The VCS database agent for Oracle monitors the Oracle database and listener services, brings them online, and takes them offline.

The package contains two VCS agents:

■ The Oracle agent, which monitors the Oracle database services.

■ The Netlsnr agent, which monitors the listener services.

Both agents work together to provide high availability for Oracle.

Oracle agent

The Oracle agent monitors the database processes. The agent brings the Oracle database services online, monitors their status, and takes them offline. Specific agent operations include:

■ Online—Starts the Oracle service.

■ Offline—Stops the Oracle service. The operation also stops all the services that are dependent on the Oracle service.

■ Monitor—Verifies the status of Oracle services. The agent provides two levels of application monitoring: basic and detail.

   ■ Basic monitoring: The agent queries the Service Control Manager (SCM) to verify that Oracle services are continuously active.

   ■ Detail monitoring: The agent runs a SQL script to verify the status of the database. Detail monitoring is optional. It updates a temporary table in the Oracle database to verify the availability of the database instance. See "Configuring detail monitoring" on page 59 for instructions on configuring detail monitoring for an Oracle database.

■ Clean—Forcibly stops the Oracle database.

■ Info—Provides static and dynamic information about the state of the database. See "Info entry point" on page 11 for more information.

■ Action—Performs predefined actions on a resource. See "Action entry point" on page 12 for more information.

Netlsnr agent

The Netlsnr agent monitors the listener process. The agent controls the listener for the database. 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. Specific agent operations include:

■ Online—Starts the listener service.

■ Offline—Stops the listener service.

■ Monitor—Queries the SCM for the status of the listener service.

■ Clean—Forcibly stops the listener service.

Info entry point

The Info entry point provides static and dynamic information about the state of the database.

The entry point retrieves the following static information:

Version	InstanceNo	InstanceName
HostName	StartupTime	Parallel
Thread	InstanceRole	

The entry point retrieves the following dynamic information:

InstanceStatus	Logins	DatabaseStatus
ShutdownPending		

You can add additional attributes by adding `sql` statements to the file `%VCS_HOME%\bin\Oracle\scripts\info\db_info.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

The Action entry point enables you to perform predefined actions on a resource.

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

```
C:\> hares -action <res> <token> [-actionargs <arg1> ...] [-sys
<system>] [-clus <cluster>]
```

Table 1-1 includes the actions that the agent supports.

Table 1-1   Actions supported by Oracle agent

Token for Action	Description
VRTS_GetInstanceName	Retrieves the name of the configured instance.
VRTS_GetRunningServices	Retrieves the list of processes monitored by the agent.
DBRestrict	Changes the database session to enable the RESTRICTED mode.
DBUndoRestrict	Changes the database session to disable the RESTRICTED mode.
DBSuspend	Suspends a database.
DBResume	Resumes a suspended database.
DBTbspBackup	Backs up a tablespace; actionargs contains name of the tablespace to be backed up.

You can also add custom actions for the agent. For further information, refer to the *Veritas Cluster Server Agent Developer's Guide*.

Supported version and operating system

■ Oracle 9i, Release 2 (9.2.0.2) Standard Edition or Enterprise Edition
or
Oracle 10g, Release 1 (10.1.0.2) Standard Edition or Enterprise Edition
with
Windows 2000 Server, Advanced Server, or Datacenter Server (all require
Service Pack 4 with Update Rollup1)
or
Windows Server 2003 (Standard Edition, Enterprise Edition, or Datacenter
Edition) (SP 1 supported, but not required for all editions)

■ Storage Foundation HA 5.0 for Windows (SFW HA) with the Veritas Cluster
Server Database Agent for Oracle

Note: SFW HA support for Oracle is limited to 32-bit versions of the operating
system.

How the agent makes Oracle highly available

In the basic monitoring mode, the database agent for Oracle detects a failure if
the database or a listener service is not running. In the detail monitoring mode,
the agent detects failure if a preconfigured SQL script cannot execute or access
the database or if the listener service is not running.

When the agent detects a failure, the Oracle service group switches to the next
available system listed in the service group's SystemList attribute. VCS starts
the configured Oracle and listener services on the new system, thus ensuring
high availability for the Oracle services and data.

Typical Oracle configuration in a VCS cluster

In a typical configuration, VCS is configured in a two-node cluster (System 1 and System 2). Oracle is installed on both systems, and the data to be used by Oracle is installed on shared storage. The Oracle database agent is installed on both systems.

Figure 1-1   Typical Oracle configuration in a VCS cluster
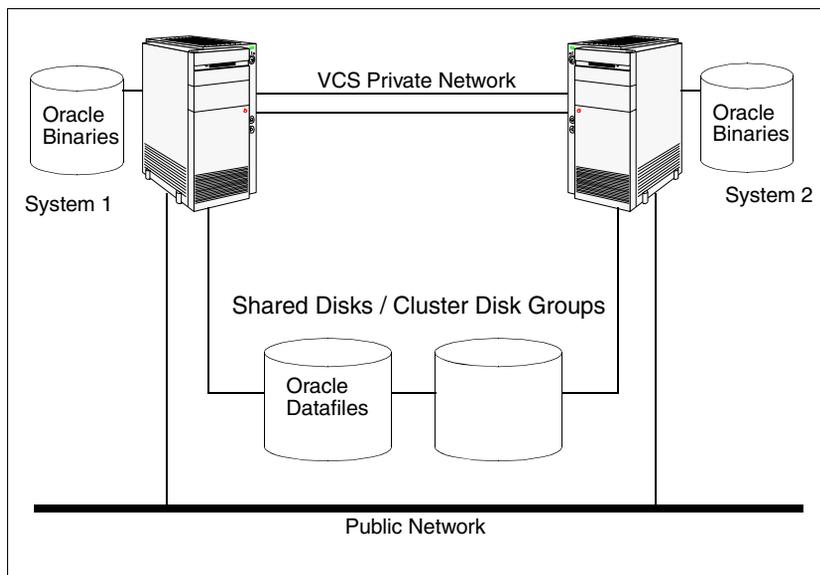
Setting up an Oracle cluster

Setting up an Oracle cluster in a VCS environment involves the following tasks.

■ Setting up a VCS cluster. See the *Veritas Cluster Server Administrator's Guide* for more information.

■ Installing and configuring Oracle. See "Installing and configuring Oracle" on page 17.

■ Installing the Oracle agent. See "Installing the Oracle agent" on page 41.

■ Configuring the Oracle service group. See "Configuring the Oracle service group" on page 43.

Each task is described in detail in subsequent chapters.

Installing and configuring Oracle

This chapter describes how to install and configure Oracle and its components in a VCS cluster. For specific instructions on how to install Oracle, see the Oracle documentation.

Prerequisites

■ Verify all nodes have adequate resources to run Oracle and SFW HA 5.0.

■ Verify that SFW HA is installed on all nodes in the cluster. Refer to the *Storage Foundation and High Availability Solutions, Installation and Upgrade Guide* for installation steps.

■ Verify you have run the VCS Configuration Wizard (VCW) to configure VCS on all nodes. Refer to the *Veritas Cluster Server Administrator's Guide* for configuration instructions.

■ Verify the network and the systems support the TCP/IP protocol.

■ Create volumes on the shared cluster disk groups before installing Oracle. See "Managing storage using SFW" on page 18 for instructions.

■ Log on as domain administrator to install Oracle binaries.

Note: After creating the database, you must log on to Oracle with database administrator privileges and complete the installation procedure on all nodes in the cluster.

Managing storage using SFW

Storage Foundation for Windows (SFW) manages data by creating disk groups from physical disks. These disk groups are further divided into volumes, which can be mounted from the cluster nodes.

Symantec recommends creating three volumes on shared disks, one each for the following:

■ database files

■ control files

■ log files, including the redo logs and archive logs

Perform the following tasks to create volumes and make them accessible from cluster nodes:

■ Create disk groups. See "Creating disk groups" on page 18.

■ Create volumes on disk groups. See "Creating volumes" on page 20.

■ Mount volumes. See "Mounting volumes" on page 25.

Creating disk groups

This section describes how to create disk groups.

To create a disk group

1 Open the VEA console by clicking **Start > All Programs > Symantec > Veritas Storage Foundation > Veritas Enterprise Administrator** and select a profile if prompted.

2 Click **Connect to a Host or Domain**.

3 In the Connect dialog box, select the host name from the pull-down menu and click **Connect**.
To connect to the local system, select **localhost**. Provide the user name, password, and domain if prompted.

4 To start the New Dynamic Disk Group wizard, expand the tree view under the host node, right click the **Disk Groups** icon, and select **New Dynamic Disk Group** from the context menu.

5 In the Welcome screen of the New Dynamic Disk Group wizard, click **Next**.

6   Specify the information related to the disk group and click **Next**.

Group name	Type a unique name for the disk group.
Create cluster group	Check this option.
Available disks	Select the disks to include in the disk group and **Add**. The selected disks appear in the Selected disks box. Optionally, check the **Disk names prefix** check box and enter a disk name prefix to give the disks in the disk group a specific identifier. For example, entering TestGroup as the prefix for a disk group that contains three disks creates TestGroup1, TestGroup2, and TestGroup3 as internal names for the disks in the disk group.

7   Click **Next** to accept the confirmation screen with the selected disks.

8   Click **Finish** to create the new disk group..
     The newly created disk group is imported on the system where you ran the wizard.

Creating volumes

This section describes how to create dynamic volumes.

To create dynamic volumes

1   If the VEA console is not already open, click **Start > All Programs >
    Symantec > Veritas Storage Foundation > Veritas Enterprise Administrator**
    and select a profile if prompted.

2   Click **Connect to a Host or Domain**.

3   In the Connect dialog box select the host name from the pull-down menu
    and click **Connect**.
    To connect to the local system, select **localhost**. Provide the user name,
    password, and domain if prompted.

4   To start the New Volume wizard, expand the tree view under the host node
    to display all the disk groups. Right click a disk group and select **New
    Volume** from the context menu.

5   At the New Volume wizard opening screen, click **Next**.

6   In the Assign Disks for Volume panel, assign disks to the volume, and then
    click **Next**. Make sure the appropriate disk group name appears in the Group
    name drop-down list.
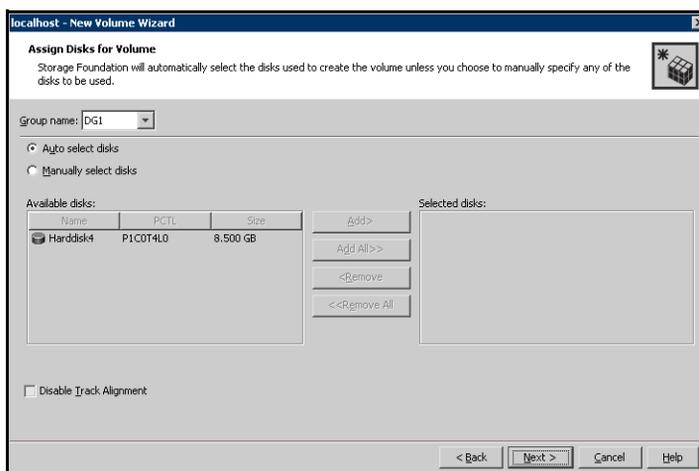
Group name	From the drop-down list, select the disk group on which to create a volume.
Auto select disks	Automatic disk selection is the default setting.

Manually select disks	To manually select the disks, click this option and use the **Add** and **Remove** buttons to move the appropriate disks to the Selected disks list. Manual selection of disks is recommended.
Disable Track Alignment	You may check Disable Track Alignment check box to disable track alignment for the volume. Disabling Track Alignment means that the volume does not store blocks of data in alignment with the boundaries of the physical track of the disk.

7 Specify the attributes for the volume and click **Next**.
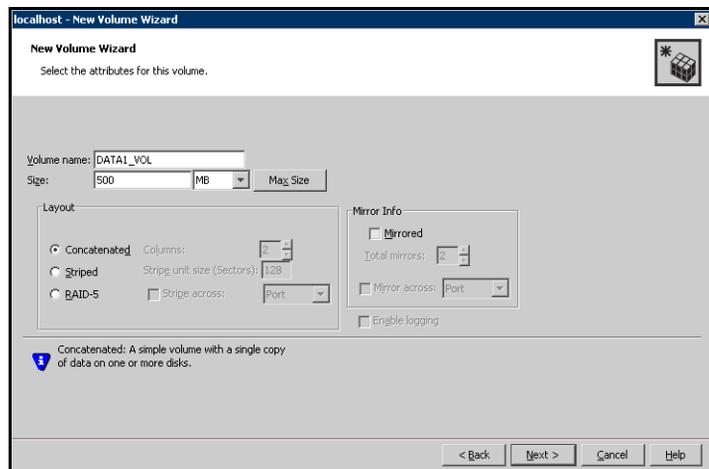
Volume name	Type a name for the volume. The name is limited to 18 ASCII characters and cannot contain spaces or forward or backward slashes.
Size	Specify the size for the volume. If you click on the **Max Size** button, a size appears in the Size box that represents the maximum possible volume size for that layout in the dynamic disk group.
Layout	Allow the default Concatenated layout or specify the layout preferences for the volume, if applicable. To select mirrored striped, click both the **Mirrored** checkbox and the **Striped** radio button. If you are creating a striped volume, the Columns and Stripe unit size boxes need to have entries. Defaults are provided.

Mirror Info   Specify the mirror information for the volume, if applicable.

8   In the Add Drive Letter and Path dialog box, assign a drive letter or mount
point to the volume and then click **Next**.
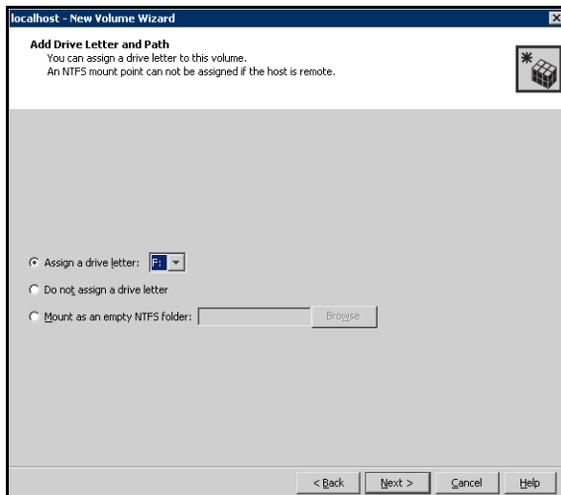
Assign a drive letter   To assign a drive letter, select this option, and from the
drop-down list select the drive letter to be assigned.
Verify the availability of the drive letter on all the systems
before assigning it. You must use the same drive letter or
mount point on all the systems in the cluster.

Mount as an empty   To mount the volume as a folder, select this option, and
NTFS folder   click **Browse** to locate an empty folder on the shared disk.

9 Create a file system on the new volume and then click **Next**.
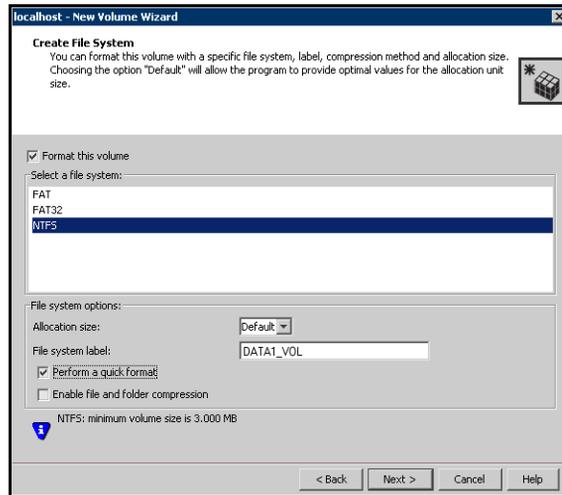
Format this volume	Check this option, if not already checked.
Select a file system	Click **NTFS**.
Allocation size	From the drop-down list select an allocation size or accept the default.
File system label	Type a label for the volume. This is optional. SFW makes the volume name the file system label.
Perform a quick format	Select **Perform a quick format** if you want to save time.
Enable file or folder compression	Select this option to save disk space. Note that compression consumes system resources and performs encryption and decryption, which may result in reduced system performance.

10 Review the information in the Summary panel and click **Finish** to create the new volume.

11 Repeat step 1 through step 10 for all the volumes to be created.

Installing and configuring Oracle

The strategy for installing Oracle into a VCS cluster is aimed at ensuring that installations on all cluster systems are uniform. This involves installing the Oracle binaries locally on each system and installing the Oracle control files, datafiles, and log files, and the flash recovery area on shared storage.

Note: Before installing Oracle, create volumes on shared disks. Symantec recommends at least three volumes on shared disks, one each for control files, log files, and database files. See "Creating volumes" on page 20.

Overview of tasks

You must perform these tasks on each node that will host the Oracle service group.

- Mount volumes for the Oracle installation. See "Mounting volumes" on page 25.

- Install Oracle binaries. See "Installing Oracle" on page 26.

- Create the database on shared disks. See "Creating the database on shared disks" on page 28.

- Create a virtual IP address for the databases and the listeners. See "Creating a virtual IP address" on page 30.

- Create the listener service. See "Creating the listener service" on page 30.

- Configure the listeners to use the virtual IP address. See "Configuring the listeners to use the virtual IP address" on page 30.

- Associate the database with the listener service. See "Associating the database with the listener" on page 31.

- Configure the database. See "Configuring the databases" on page 32.

- Configure the listeners to use the same virtual IP address. See "Configuring the listeners to use the virtual IP address" on page 30.

- Make sure that the Oracle registry points to the correct location of the initialization parameter file. See "Verifying the initialization file settings" on page 37.

- Unmount the volumes. See "Unmounting the volumes" on page 39.

- Delete the virtual IP address. See "Removing the virtual IP address" on page 39.

Mounting volumes

Mounting a volume involves importing the disk group and assigning a drive letter or the folder path. Unmounting a volume involves removing the drive letter or the folder path and deporting the disk group.

To mount a volume

1   Open the Veritas Enterprise Administrator. Click **Start > All Programs > Symantec > Veritas Storage Foundation > Veritas Enterprise Administrator**.

2   If the disk group is not imported, import it. From the VEA console's tree view, right-click the disk group and select **Import Dynamic Group** from the context menu.

3   Right-click the volume, and then click **File System** > **Change Drive Letter and Path**.

4   In the Drive Letter and Paths dialog box, click **Add**.

5   In the Assign Drive Letter panel, choose one of the following options depending on whether you want to assign a drive letter to the volume or mount it as a folder, and click **OK**.

   ■   To assign a drive letter
       Select **Assign a Drive Letter** and select a drive letter from the drop-down list.

   ■   To mount the volume as a folder
       Select **Mount as an empty NTFS folder** and click **Browse** to locate an empty folder on the shared disk.

   You must ensure that you use the same disk on all the nodes. To identify a disk, run `vmgetdrive -details` from the command prompt on one node. Note the disk number and signature of the disk. Rerun the command on the second node and identify the disk that has the same signature as the one on the first node. Once you have identified two identical disks, assign the same drive letter to the volumes on each disk.

6   Repeat step 3 through step 5 for all the volumes to be mounted.

Installing Oracle

Install Oracle from the Oracle software disc. The installer screens and options may vary slightly for different versions of Oracle.

Install the Oracle program files on a local disk and the Oracle data files on shared storage managed using SFW. Install all log files, including redo logs and archive logs, on the same volume.

Specify the same parameters on all nodes. For example, the database name, file locations, database credentials, must be the same on all nodes.

To install Oracle

1   Verify the shared drives created to store Oracle data are mounted on the node where you run the wizard. See "Mounting volumes" on page 25.

2   Insert the Oracle software disc in a drive connected to the node and run the Setup program.

3   From the browser menu, click **Install/Deinstall Products**.

4   Read the information in the Welcome panel and click **Next**.

5   Complete the following instructions depending on the version of Oracle:
    For Oracle 9i

    ■   In the File Locations dialog box, type or select a name and a path on the local disk, for the Oracle Home, and click **Next**.

    ■   This will install the Oracle binaries on the local disk. Use the same *Oracle_Home* name and path on all nodes.

    ■   In the Available Products panel, select the **Oracle 9i Database option** and click **Next**.

    ■   In the Installation Types panel, select the **Enterprise Edition** option and click **Next**.

    ■   In the Database Configuration panel, select the **Customized** or **Software Only** option and click **Next**. Select the **Customized** option if you want to migrate earlier databases to Oracle 9i.

    ■   If you chose the **Customized** option, then on the Database Identification panel, select or type a unique name and SID for the global database and click **Next**.

    For Oracle 10g

    ■   In the Available Products panel, select the **Oracle 10g Database** option and click **Next**.

    ■   Choose the **Basic** or **Advanced** installation type.
        For Basic installation:

- In the **Oracle Home Location** box, type or select a name and a path on the local disk for the Oracle Home.

  This installs the Oracle binaries on the local disk. Use the same *Oracle_Home* name and path on all nodes.

- Select **Enterprise Edition**.

- Uncheck the **Create Starter Database** check box and click **Next**.

For Advanced installation:

- Select the destination directory for the Oracle installation and click **Next**.

- Select **Enterprise Edition** and click **Next**.

- Select **Do not create a starter database**.

6   Follow the wizard instructions, select options as per your configuration, and complete the installation.

The Oracle installation also adds a Perl package. Make sure the path of the Perl package appears as the first value in the PERL5LIB environment variable.

To modify the path of the Perl variable

1   Right-click **My Computers** and then click **Properties**.

2   In the **System Properties** window, on the **Advanced** tab, click **Environment Variables**.

3   In the **System Variables** area of the **Environment Variables** window, double-click the PERL5LIB variable name to edit it.

4   In the **Variable Value** field, add the path of the Perl package installed by Symantec such that it is the first value in the definition. For example, add the path `C:\Program Files\Veritas\VRTSPerl\lib;` as the first value in the definition. Note that you must add a semi-colon at the end of the path.

After the Oracle installation is complete, verify if the Oracle home path (the path that you set while installing Oracle) is included in the Path environment variable. If not, then you have to manually add the Oracle home path to the Path variable, on all the cluster nodes.

To add the oracle home path to the Path variable

1   Right-click **My Computers** and then click **Properties**.

2   In the **System Properties** window, on the **Advanced** tab, click **Environment Variables**.

3   In the **System Variables** area of the **Environment Variables** window, double-click the Path variable name to edit it.

> 4   In the **Variable Value** field, add the Oracle home path.

> 5   Repeat steps 1 to 5 on all the cluster nodes.

Creating the database on shared disks

When run from the first node, this process creates an Oracle database on shared disks. Before running this process from other nodes, rename the directories containing the control files, redo log files, and the database files so that you create new files from each node.

For example, if the Oracle database was created at the path `H:\Oracle\Data`, rename it to `H:\Oracle\Data_old`. You can delete these renamed directories after installing and configuring Oracle on all nodes in the cluster.

To create a database on a shared disk

1   Start the Database Configuration Assistant (**Start > All Programs > Oracle-*Oracle_Home* > Configuration and Migration Tools > Database Configuration Assistant**). This launches the database installer.

2   In the Welcome panel, click **Next**.

3   In the Operation panel, select **Create a database** and click **Next**.

4   Complete the following instructions depending on the Oracle version.
    For Oracle 9i

   ■   In the Database Templates panel, select **New Database** and click **Next**.

   ■   Install the initialization file on the shared disk. In the Initialization Parameters dialog box, click the **File Locations** tab.
       In the **Initialization Parameter Filename** box, enter a path on the shared disk for the PFILE. If you create an SPFILE, in the **Server Parameters Filename** field, enter a path on the shared disk for the SPFILE.

    For Oracle 10g

   ■   In the Database Templates panel, select the **Custom Database** option and click **Next**.

   ■   Choose to install the database on the shared disk.

   ■   Choose to install the initialization parameter files on the local disk.

5   Follow the wizard instructions and select other options as per your desired database configuration.

6   Install the control files, data files, and log files on the shared disk. In the Database Storage panel, specify the locations of control files, data files, and redo log files.
    In the left pane, expand the **Storage** folder.

- Enter a path on the shared disk for each control file.
  To do so, click **Controlfile** and click the **General** tab in the right pane. In the **File Directory** field, enter a path on the shared disk.

- Enter a path on the shared disk for each data file.
  To do so, expand the **Datafiles** folder in the left pane. Select a data file, and click the **General** tab in the right pane. In the **File Directory** field, enter a path on the shared disk.

- Enter a path on the shared disk for each redo log file
  To do so, expand the **Redo Log Groups** folder in the left pane. Select a redo log group and click the **General** tab in the right pane. In the **File Directory** field, enter a path on the shared disk.

- Click **Next**.

7   Select the **Create database** and the **Generate Database Creation Scripts** options and click **Finish**.

8   Follow the wizard instructions and complete the installation.

Creating a virtual IP address

All databases and listeners configured must use the same virtual IP. Create a virtual IP address that can be set for all databases and listeners.

To create a virtual IP address

1   Open the **Network Connections** (**Start > Settings > Network Connections**).

2   Right-click the public network connection to be used and then click **Properties**.

3   Select **Internet Protocol (TCP/IP)** and click **Properties**.

4   Click **Advanced**, and on the IP Settings tab, under IP addresses, click **Add** to add a virtual IP address and subnet mask.

Creating the listener service

Create a listener service using the Net Configuration Assistant. Refer to the Oracle documentation for instructions. Make a note of the listener name; you will need it in subsequent configuration tasks.

Configuring the listeners to use the virtual IP address

In the file listener.ora file, change the host name to the virtual IP address that you created.

Replace

```
HOST=machine_name
```

with

```
HOST=virtual_IP_address
```

The default location of the file listener.ora is
%*ORACLE_HOME*%\NETWORK\ADMIN\.

Associating the database with the listener

Use these instructions to associate all the databases with the listeners.

Prerequisite

Ensure that the initialization parameter file contains the following entries:

■   SERVICE_NAMES (the name of the database service)

■   INSTANCE_NAME (the name of the database instance)

These parameters are created during installation or database creation.

To associate the database with the listener

1   Use one of the following ways to configure the new attribute listener_alias:
     Run the following SQL command:

     ```
     SQL> ALTER SYSTEM SET LOCAL_LISTENER='<listener_alias>'
     scope=spfile;
     OR
     ```

     Add the following entry to the initialization parameter file (pfile/spfile):

     ```
     LOCAL_LISTENER = <listener_alias>
     ```

2   Define the parameter listener_alias. If your Oracle configuration uses the
     file tnsnames.ora, edit the file as instructed below. The default location of
     tnsnames.ora is %ORACLE_HOME%\NETWORK\ADMIN.

     Add the following to tnsnames.ora file:

     ```
     <listener_alias>=
     (DESCRIPTION =
     (ADDRESS=(Protocol=TCP)(HOST=virtual_IP_address)(Port=1521))
     )
     ```

3   Stop and restart the database.

The listener_alias parameter gets appended by the default domain name
specified in the file sqlnet.ora.

Configuring the databases

Configuring the databases involves setting parameters in Oracle configuration files. It involves setting the same virtual IP address for all the databases and configuring the databases to use the OS authentication model of Oracle.

Updating the tnsnames.ora files

If your configuration has a tnsnames.ora file, edit the file as instructed below. The default location of the file is `%ORACLE_HOME%\NETWORK\ADMIN\`.

Change the host name for all the TCP protocol address databases to the virtual IP address that you created.

Replace
```
HOST=machine_name
```
with
```
HOST=virtual_IP_address
```

If you use a PFILE (initSID.ora)

Configure the PFILE to use the virtual IP address for the service group and set the database to use the OS authentication model of Oracle.

1   Edit the dispatchers parameter by adding or editing the HOST parameter. If the ADDRESS tag does not appear, add it. The edited dispatchers parameter should look like:
```
    dispatchers = '(ADDRESS=(Protocol=TCP)
(HOST=virtual_IP_address) (other entries))'
```
The variable *virtual_IP_address* represents the virtual IP address that you created.
For example:
```
dispatchers = '(ADDRESS=(Protocol=TCP) (HOST=10.100.101.102)
(SERVICE=Data1XDB)'
```

2   Configure the attribute `remote_login_passwordfile`. Symantec recommends setting the attribute to `NONE` so that the database uses OS authentication and the configuration does not require a password file. A sample entry appears as:
```
remote_login_passwordfile = 'NONE'
```

If you use an SPFILE

- If you use an SPFILE on Oracle 10g, proceed to "**Modifying the SPFILE (Oracle 9i and 10g)**" on page 33.

- If you use an SPFILE on Oracle 9i, first modify the PFILE to point to the SPFILE as instructed in "**Modifying the PFILE (Oracle 9i only)**" on page 33, then update the SPFILE as instructed in "**Modifying the SPFILE (Oracle 9i and 10g)**" on page 33.

Modifying the PFILE (Oracle 9i only)

On Oracle 9i, edit the PFILE so that it points to the SPFILE. The PFILE must contain only the following entry:

```
SPFILE = spfile_location
```

The variable *spfile_location* represents the fully qualified path of the SPFILE on the shared disk.

Modifying the SPFILE (Oracle 9i and 10g)

VCS requires a customized version of the SPFILE, which cannot be edited. But, you can create a PFILE from the SPFILE, edit the PFILE, and convert it to an SPFILE again.

1 Log on to the Oracle database as administrator and create a temporary PFILE from the SPFILE.

   ```
   C:\> sqlplus "/as sysdba"
   SQL> create pfile='tmp_pfile_name' from spfile='spfile_name';
   ```
   For example:
   ```
   SQL> create
   pfile='C:\oracle\product\10.1.0\Db_1\database\tempPF
   ILE.ora' from
   spfile='C:\oracle\product\10.1.0\Db_1\database\SPFIL
   EProd.ora';
   ```

2 Edit the dispatchers parameter by adding or editing the HOST parameter. If the ADDRESS tag does not appear, add it. The edited dispatchers parameter should look like:
   ```
   dispatchers = '(ADDRESS=(Protocol=TCP)(HOST=virtual_IP_address)
   (other entries))'
   ```
   The variable *virtual_IP_address* represents the virtual IP address that you created.

   For example:
   ```
   dispatchers = '(ADDRESS=(Protocol=TCP) (HOST=10.100.101.102)
   (SERVICE=Data1XDB)'
   ```

3 Configure the attribute remote_login_passwordfile. Symantec recommends setting the attribute to NONE so that the database uses OS

authentication and the configuration does not require a password file. A sample entry appears as:

```
remote_login_passwordfile = 'NONE'
```

4   Create a temporary SPFILE from the edited PFILE.

```
SQL> create spfile= 'tmp_spfile' from
pfile='temp_pfile_name';
```

For example:

```
SQL> create spfile=
'C:\oracle\product\10.1.0\Db_1\database\temp_SPFILE
Prod.ora'
      from
pfile='C:\oracle\product\10.1.0\Db_1\database\tempPF
ILE.ora';
```

5   Stop the database service.

6   Back up the original SPFILE by renaming it. For example, rename SPFILEProd.ora to original_SPFILE.ora.

7   Delete the original SPFILE (SPFILEProd.ora).

8   Rename the temporary SPFILE (temp_SPFILE.ora) to the name of the original SPFILE (SPFILEProd.ora).

9   Start the database service.

Moving the initialization file to shared disks (Oracle 10g)

For Oracle 10g, move the initialization files to the shared disk and configure the SPFILE to start a database instance.

1   Verify which of the following initialization files exist in your configuration. The default location of these files is %*ORACLE_HOME*%\database.

    ■   SPFILE*SID*.ora

    ■   SPFILE.ora

    ■   init*SID*.ora

    The variable *SID* represents the database instance.

2   Move the initialization files from the local disk to the shared disk, preferably at the same location as the database control files.

3   Create a PFILE to specify the location of the SPFILE. The PFILE must be in the same directory on the shared disk as the SPFILE.
    Modify the PFILE so that it contain only the following entry:

        SPFILE = *spfile_location*

    The variable *spfile_location* represents the fully qualified path of the SPFILE on the shared disk.

    For example, if your SPFILE is located at path H:\Oracle\Data, create a PFILE sp_init.ora in the same location H:\Oracle\Data with the following parameter:

        SPFILE = H:\Oracle\Data\spfile*SID*.ora

Setting the Oracle database parameters

1. Set the Oracle database parameters using the `oradim` utility. Type the following at the command-prompt:

   `set ORACLE_SID=SID`

   The variable *SID* represents the database instance.

2. Run the following command:

   `%ORACLE_HOME%\bin\oradim` **`-edit -sid`** *`SID`* **`-pfile`**
   `"pfile_location_on_shared_disk" -startmode auto -timeout 100`
   `-shuttype srvc,inst -shutmode i`

   The variable *SID* represents the database instance.

   This command performs the following tasks:

   - Sets the `-startmode` parameter to start the database instance automatically when Oracle service is started.

   - Sets the `-timeout` parameter to 100. The timeout parameter specifies the maximum wait time (in seconds) for the database shutdown to complete before the service for a particular SID stops.

   - Sets the `-shuttype` parameter to stop both the database instance and the service while shutting the database.

   - Sets the `-shutmode` parameter to shut the database instance as soon as the VCS database agent for Oracle requests.

Verifying the initialization file settings

If a PFILE is used:

1 Open the Registry Editor.
From the **Start** menu, choose **Run**. In the **Open** field, enter `regedit` and click **OK**.

2 Double-click the ORA_*SID*_PFILE registry key at
HKEY_LOCAL_MACHINE\SOFTWARE\ORACLE\HOME_*ID*\.
The variable *SID* represents the database instance.

3 Verify that the Value data field specifies the fully qualified path of the PFILE along with the file name.

If an SPFILE is used:

1 Stop and restart the database services.

2 Run sqlplus.exe.

3 Connect to the database.

4 Verify the following query returns the correct shared disk path for the SPFILE.
```
select value from v$parameter where name = 'spfile';
```

Configuring the Oracle and listener services

Set the startup type of the Oracle database and Listener services to manual and configure the Log On properties for the Oracle services.

1   Open the **Services** applet (**Start > All Programs > Administrative Tools > Services**).

2   Set the startup type of the Oracle database service to manual and configure its Log On properties:

   ■   Double-click the Oracle database service. In the SCM, Oracle database services appear as OracleService*SID*, where *SID* represents the database instance.

   ■   In the **Properties** window, click the **General** tab.

   ■   From the **Startup Type** drop-down list, select **Manual.**

   ■   Click **Stop** to stop the service.

   ■   Click the **Log On** tab.

   ■   Choose **This Account**.

   ■   Enter the credentials of the user in whose context Oracle was installed.

   ■   Click the **General** tab and click **Start** to start the service with the new Log On properties. Click **OK**.

3   Set the startup type of the Listener service to manual.

   ■   In the Services applet, double-click the listener service. Listener services appear as Oracle*Ora_Home*TNS*ListenerName*, where *Ora_Home* represents the Oracle home directory and *ListenerName* is the name of the listener set during the installation.

   ■   In the **Properties** window, click the **General** tab.

   ■   From the **Startup Type** drop-down list, select **Manual** and click **OK.**

Unmounting the volumes

Unmount the volumes only if you plan to install Oracle on more nodes. If this is the last node for the Oracle installation, do not unmount the volumes.

Before unmounting volumes, stop the database and listener services.

To unmount the volume

1   Open the Veritas Enterprise Administrator. Click **Start > All Programs > Symantec > Veritas Storage Foundation > Veritas Enterprise Administrator**.

2   From the VEA console's tree view, right-click on the volume, and then click **File System > Change Drive Letter and Path**.

3   In the Drive Letter and Paths dialog box, select **Remove**.

4   Click **OK**.

5   Repeat step 2 through step 4 for all the volumes to be unmounted.

6   From the VEA console's tree view, right-click the disk and then click **Deport Dynamic Group**.

Removing the virtual IP address

Remove the IP address if you plan to install Oracle on more nodes.

To remove the virtual IP address

1   Open the **Network Connections** (**Start > Settings > Network Connections**).

2   Right-click the public network connection to be used and click **Properties**.

3   Select **Internet Protocol (TCP/IP)** and click **Properties**.

4   Click **Advanced** and on the IP Settings tab, under IP Addresses, select the virtual IP address that you added and click **Remove**.

Repeat the instructions in section "Installing and configuring Oracle" on page 24 on each node in the cluster. If you have installed the Oracle agent, proceed to "Configuring the Oracle service group" on page 43. Otherwise, proceed to "Installing the Oracle agent" on page 41.

Installing the Oracle agent

This chapter describes how to install the VCS database agent for Oracle in a VCS cluster. Follow these instructions if you did not install the agent while installing Storage Foundation HA for Windows.

Prerequisites

- Verify you have SFW HA installed on all cluster nodes.
- Verify you have local administrator privileges on the node where you are installing the agent.
- Verify Oracle is installed and configured identically on all nodes in the cluster.

Installing the agent

This section instructs you on installing the Oracle agent.

Repeat these steps on all systems where the VCS database agent for Oracle is to be installed.

To install the agent

1   Start the installer for SFW. In the Add/Remove Programs applet, click **Storage Foundation 5.0 for Windows** and click **Change**.

2   In the Storage Foundation 5.0 for Windows dialog box, choose the **Add or Remove** option and click **Next**.

3   In the SFW product options dialog box, click **Next**.

4 Check the **Veritas Cluster Server Database Agent for Oracle** check box and click **Next**.

The disk space required for the installation is displayed toward the bottom of the screen. When you add or remove an option, the total space changes.

5 The installer validates the system for prerequisites. After the system is accepted, click **Next.**

If a system is rejected, the **Comments** column displays the cause for rejecting the system. Highlight the system to view a detailed information about the failure in the **Details** box. Resolve the error, highlight the system from the list, and click **Validate Again**.

6 An informational message appears if you selected the DMP option. Review the information and click **OK** to continue.

7 Review the summary of your selections and click **Update** to start the installation.

8 The installer displays the status of installation.

9 After the installation is complete, review the installation report and click **Next**.

10 Click **Finish**.

After the agent is successfully installed in the cluster, proceed to "Configuring the Oracle service group" on page 43 to configure the agent.

Configuring the Oracle service group

Configuring the Oracle database agent involves creating the Oracle service group, its resources, and defining attribute values for the configured resources.

VCS provides several ways to configure the Oracle agent: the agent configuration wizard, the Java and Web consoles, and the command line. This chapter provides instructions on how to use the agent configuration wizard to configure the agent.

Oracle configurations in VCS

You can set up Oracle in different ways in a VCS environment.

- Single Oracle instance configuration: Provides high availability for an Oracle instance associated with a listener.

- Multiple Oracle instances (single listener) configuration: Provides high availability for one or more Oracle instances sharing a common listener.

- Multiple Oracle instances (multiple listeners) configuration: Provides high availability for one or more Oracle instances that are configured to one or more listeners.

Configuring the agent using the agent configuration wizard

VCS provides an agent configuration wizard that guides you through the process of configuring the Oracle agent. The wizard creates and modifies Oracle service groups.

This section describes the steps required to create a new Oracle service group using the wizard. To modify an existing service group, see "Modifying an Oracle service group" on page 57.

Before configuring the Oracle agent, review the resource type and the attribute definitions of the Oracle agents, described in "Resource type definitions" on page 73. For sample configuration file and resource dependency graph of the Oracle service group, see "Sample configuration" on page 79.

Prerequisites

■   You must be a Cluster Administrator. This user classification is required to create and configure a service group.

■   You must be a Local or Domain Administrator on the node where you run the wizard.

■   Verify that SFW HA, along with the VCS database agent for Oracle, is installed on all cluster nodes. See "Installing the Oracle agent" on page 41 for instructions.

■   Verify a VCS cluster is configured using VCS Configuration Wizard (VCW).

■   Verify that the Veritas High Availability engine (HAD) is running on the system from where you run the wizard.

■   Mount the shared drives containing the data files, control files, and redo log files. Unmount the drives from other systems in the cluster.

■   Assign the virtual IP address on the system where you run the wizard. Remove the virtual IP address from other systems

■   Mount the database and start the Oracle instance on the node running the wizard.

■   Make sure that you have the following information ready; the wizard will prompt you for this information:

   ■   The databases and listeners to be monitored by VCS.

   ■   For the instances to be monitored in detail, name and location of the respective SQL files.

   ■   A valid domain name, user name, and password with which the database service was configured for the database.

Configuration instructions

This section describes how to create an Oracle service group.

To create an Oracle service group

1 Start the Oracle configuration wizard. Click **Start > All Programs > Symantec > Veritas Cluster Server > Configuration Wizards > Database Agent for Oracle > Oracle Configuration Wizard**.

2 In the Welcome panel click **Next**.

3 In the Wizard Options panel, select **Create service group** and click **Next**.

4 In the Service Group Configuration panel, complete the following and click **Next**. The wizard starts validating your configuration. Various messages indicate the validation status.
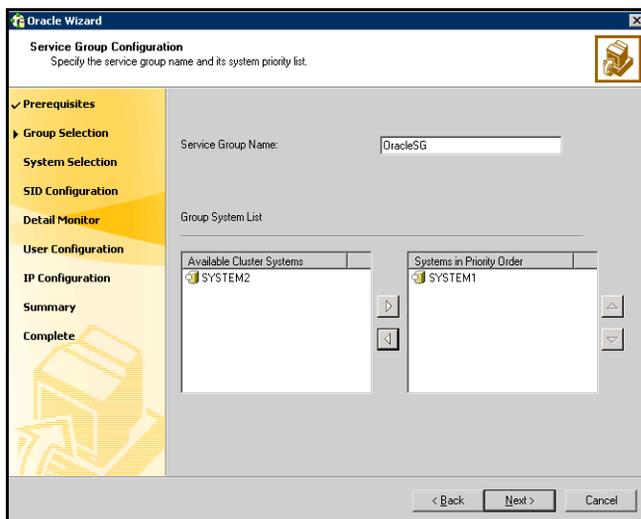
Service Group Name   Type a name for the Oracle service group.

| Available Cluster Systems	Select the systems on which to configure the service group and click the right arrow to move the systems to the Systems in Priority Order box.
	The Systems in Priority Order box represents the service group's system list. The system at the top of the list has the highest priority while the system at the bottom of the list has the lowest priority.
	To remove a system from the service group's system list, select a system in the Systems in Priority Order box and click the left arrow.
	To change a system's priority in the service group's system list, select the system from the Systems in Priority Order box, and click the up and down arrows.

5   In the Oracle Configuration panel, select the SIDs and the associated listeners to be added to the service group, and click **Next**.
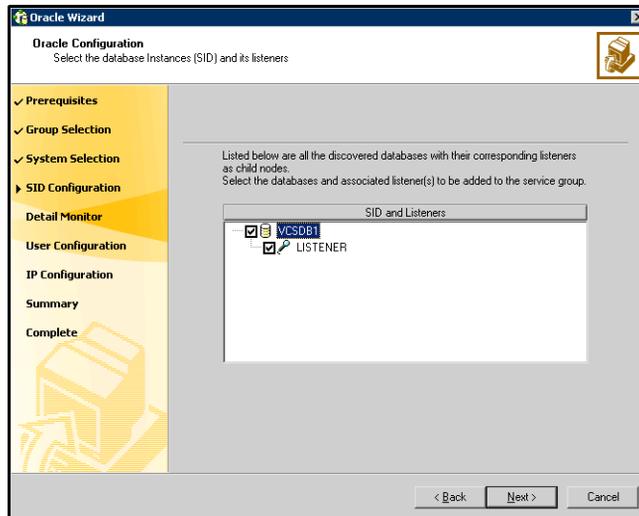
The SID is a system identifier that uniquely identifies the Oracle database instance, while the listener is the name of the corresponding listener service.

6   On the Detail Monitoring panel, configure detail monitoring for the Oracle
   database if required, and click **Next**.
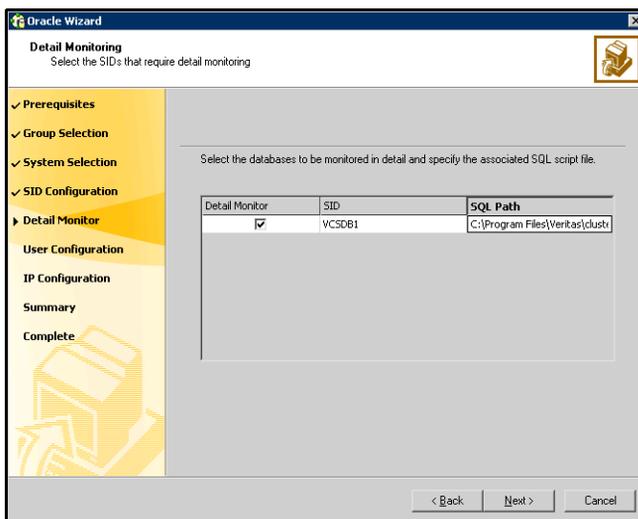
| Detail Monitor | Check the Detail Monitor option corresponding to each database that you want to configure detail monitoring for. |
| SQL Path | Type the path of the SQL file that will query the database to validate the status. Click the icon next to the field to browse for the SQL file. A sample SQL file, check.sql, is located at %*VCS_HOME*%\bin\Oracle\. |

7   In the Domain and User selection panel, type a valid domain name, user
    name, and password with which the database service was configured for the
    database and click **Next**. See "Configuring the Oracle and listener services"
    on page 38 for more information.

8 On the Network Configuration panel, specify the network related information and click **Next**.

The wizard discovers and displays the virtual IP address for the Oracle Server.
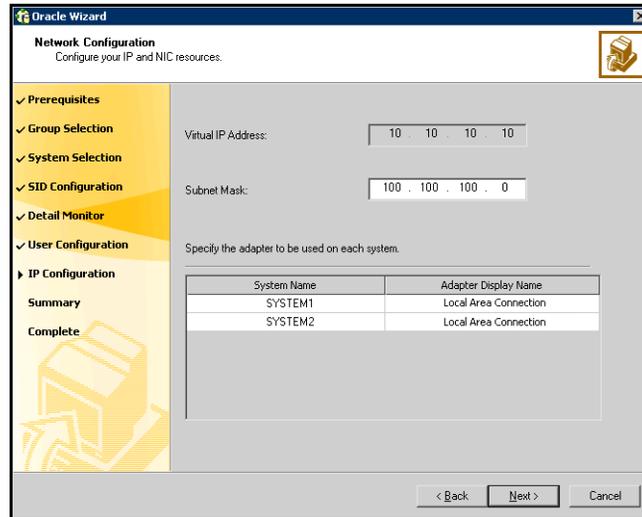
Subnet Mask	Type the subnet mask to which the virtual IP belongs.
Adapter Display Name	For each system in the cluster, select the public network adapter. Select the Adapter Name field to view the adapters associated with a system.

The wizard displays all TCP/IP enabled adapters on a system, including the private network adapters, if they are TCP/IP enabled. Make sure that you select the adapters to be assigned to the public network, and not those assigned to the private network.

9 Review the configuration on the Summary panel and click **Next**.
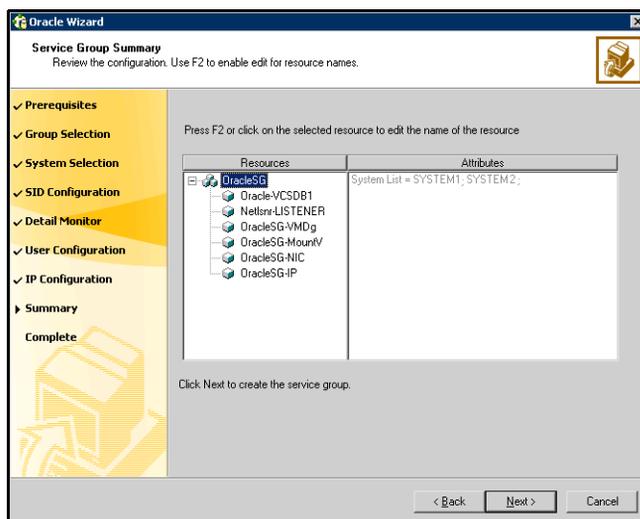
| Resources | Lists the configured resources. Click on a resource to view its attributes and their configured values in the Attributes box. The wizard assigns unique names to the resources. To edit a resource name, select the resource name and click on it, or press the F2 key. After the edit, press the Esc key to cancel the changes, or press the Enter key to confirm the changes. |

10 In the confirmation dialog box, click **Yes**. Click **No** if you wish to review your settings.

11 The wizard starts running commands to create the Oracle service group. On the Completing the Oracle Configuration panel, check **Bring the service group online** to bring the service group online on the local system, and click **Finish**. The Oracle service group is created in your cluster.

After verifying that the service group comes online on the node, remove the virtual IP address that you created earlier.

To remove the virtual IP address

1 Take the Oracle service group offline on the node.

2 Remove the virtual IP address. See "Removing the virtual IP address" on page 39 for instructions.

3 Bring the Oracle service group online.

Configuring dependent services

If the database service has other dependent services, make sure the dependent services are running on the node where the database service is online. Note that the online agent operation brings only the database service online and not the dependent services.

For example, on Oracle 10g, the DBConsole service corresponding to an Oracle database has a dependency on the database service. That is, for the Enterprise Manager to manage the databases, you must make sure the DBConsole service is running on the node where the database service is online.

To configure a dependent service

1   For the dependent service, add a GenericService resource manually.

2   Make the GenericService resource dependent on the corresponding Oracle resource.

3   Set the Critical attribute to False if the Oracle service group must not fail over when the GenericService resource faults.

Refer to the *Veritas Cluster Server Administrator's Guide* for configuration instructions.