

Oracle® Fail Safe

Tutorial

Release 3.4.2 for Microsoft Windows

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Oracle Fail Safe Tutorial, Release 3.4.2 for Microsoft Windows

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Preface

Oracle Fail Safe supports a wide variety of high-availability business solutions on Windows clusters. Oracle Fail Safe support includes Oracle databases and all applications that can be configured as a Windows service.

This guide provides step-by-step procedures to help you learn how to implement high-availability solutions with Oracle Fail Safe.

Audience

This guide is intended for anyone who wants to learn the basic operations of Oracle Fail Safe on Windows systems.

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<http://www.fcc.gov/cgb/consumerfacts/trs.html>, and a list of phone numbers is available at <http://www.fcc.gov/cgb/dro/trsphonebk.html>.

Related Documents

In addition to this document, the Oracle Fail Safe documentation set includes the following:

- *Oracle Fail Safe Release Notes*
- *Oracle Fail Safe Concepts and Administration Guide*
- *Oracle Fail Safe Error Messages*
- *Oracle Fail Safe Installation Guide*
- For online assistance, Oracle Fail Safe Manager provides online help topics, a quick tour, and this tutorial. On the Help menu in Oracle Fail Safe Manager, click "Search for Help on" to access the online help topics.

Refer to the following documentation for information about related products:

- For more information about cluster systems, see the Microsoft Cluster Server (MSCS) documentation. Microsoft also refers to MSCS as "server clusters" or "failover clusters".
- For more information about other related products, see the documentation for those products.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
<i>italic</i>	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
monospace	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

Using This Tutorial

This chapter provides information that you must know before using this tutorial.

1.1 Intended Uses

This tutorial is designed to be used in one of the following ways:

- A quick overview of the steps needed to configure resources (such as single-instance databases) using Oracle Fail Safe to ensure high availability of the same
- A step-by-step introduction to using Oracle Fail Safe Manager

If you intend to use the tutorial this way, first ask your cluster administrator for at least five IP addresses that you can use on the cluster for virtual addresses. In addition, it is best to follow the lessons in order.

This tutorial provides the basic steps for configuring resources to make them highly available; it does not provide detailed information on the concepts behind high availability. You may find it helpful to refer to the Oracle Fail Safe Concepts and Administration Guide while using this tutorial.

1.2 Cluster Setup

This tutorial is intended to be run on a two-node cluster.

1.3 Navigation

To navigate through the HTML version of the tutorial, use the left arrow and the right arrow to go through each lesson sequentially. You can return to the Table of Contents at any time by clicking the Contents link. You can access the rest of the Oracle Fail Safe documentation set by clicking the Product link.

1.4 Terminology

The following terminologies are frequently used in this tutorial:

- **Cluster:** A group of independent computing systems that operates as a single virtual system.
- **Failover:** The process of taking cluster resources offline on one node and bringing them back online on another node. This process can either be planned (upgrades or maintenance) or unplanned (system failure).

- **Group:** A logical collection of cluster resources that forms a minimal unit of failover. In a failover situation, the group is moved to a failover node. A group resides on only one cluster node at a time. In newer versions of failover clusters a group is referred to as a "service or application".
- **Resource:** A physical or logical component that is available to a computing system. For example, disks, the network IP address, Forms Servers, Reports Servers, and Web servers are resources.
- **Virtual address:** A network address at which the resources of a group can be accessed, regardless of the hardware server hosting those resources.
- **Virtual server:** A group with one or more virtual addresses.

Invoking Oracle Fail Safe Manager and Verifying the Cluster

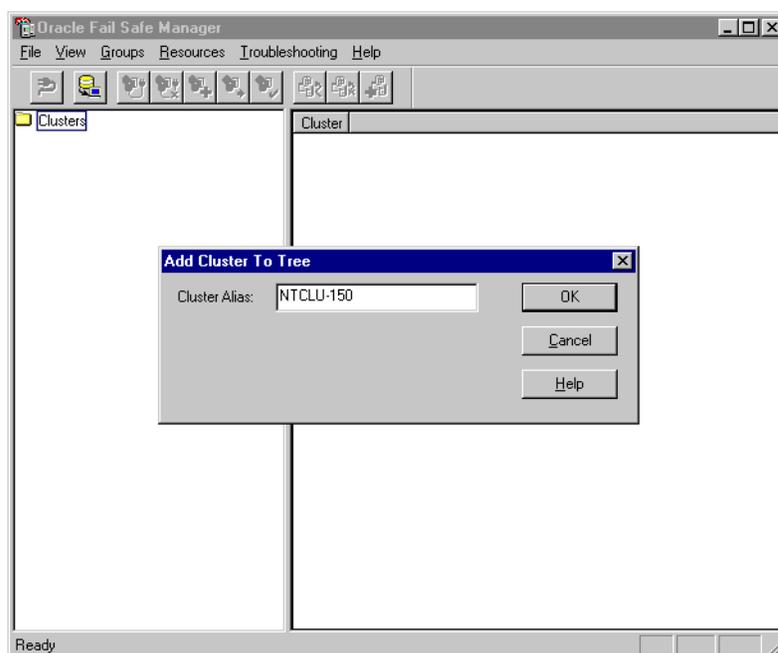
This chapter describes the steps necessary to invoke Oracle Fail Safe Manager and to verify the cluster.

2.1 Invoking Oracle Fail Safe Manager

To invoke Oracle Fail Safe Manager from the taskbar, click the **Start** button, select **Programs**, then the Oracle home into which you installed Oracle Fail Safe Manager, then select **Oracle Fail Safe Manager**.

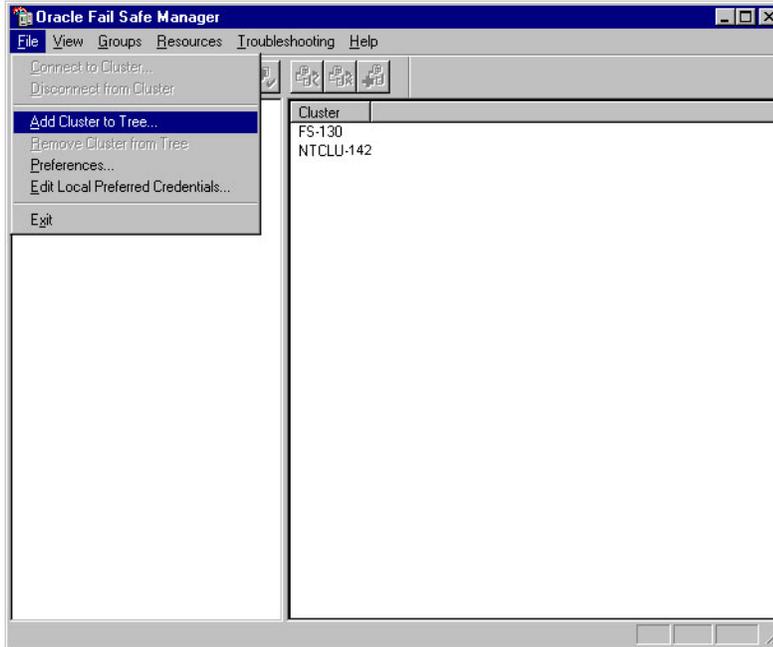
2.2 Populating the Tree View

When you invoke Oracle Fail Safe Manager, the Fail Safe Manager window opens. If there are no clusters added to the tree view, the Add Cluster to Tree dialog box opens. Once the dialog box opens, enter the cluster alias you want to manage. If the tree view is populated, but the cluster you want to manage is not in the tree view, see [Section 2.3](#).



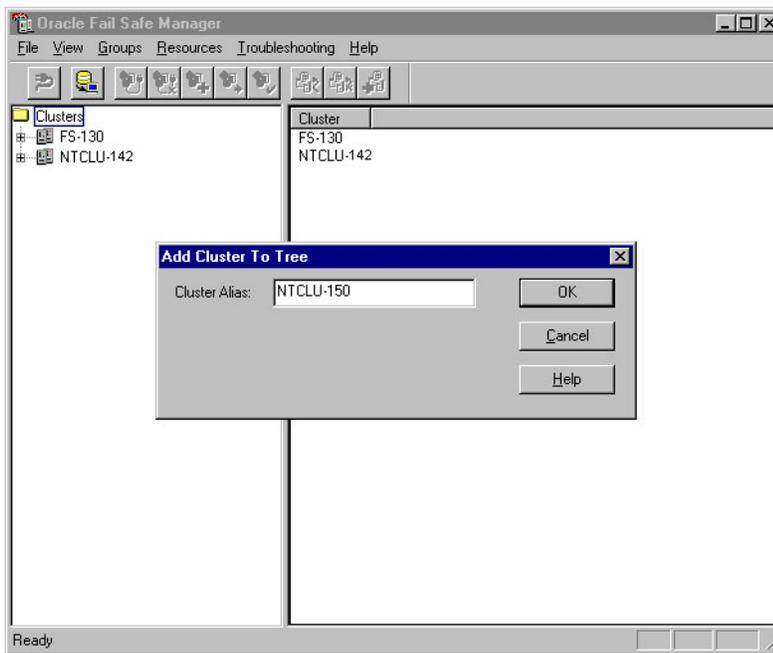
2.3 Adding a Cluster to a Populated Tree View

If the tree view contains a list of clusters, but not the one you want to manage, you can add a cluster to the populated tree view. On the **File** menu, select **Add Cluster to Tree**.



2.4 Using the Add Cluster to Tree Dialog Box

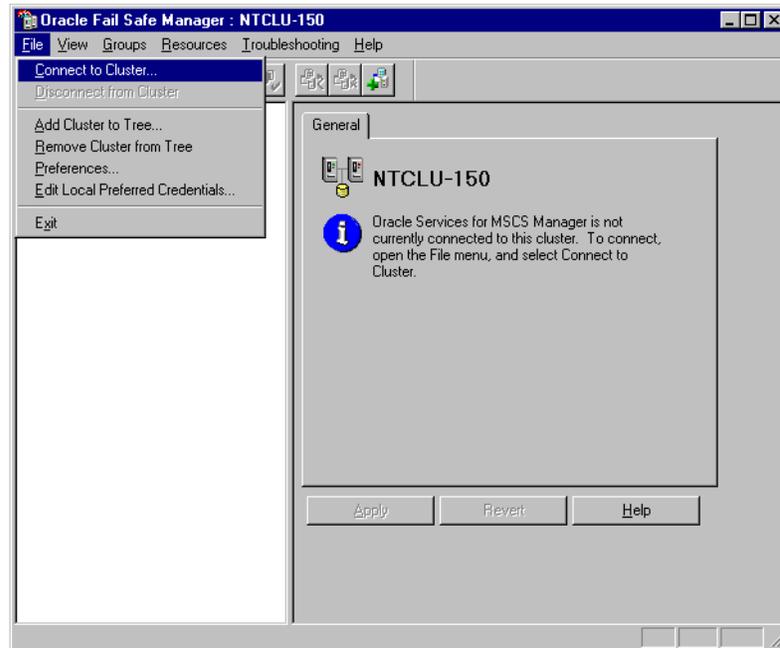
Enter the alias for the cluster to manage in the **Cluster Alias** field, then click **OK**.



2.5 Connecting to the Cluster

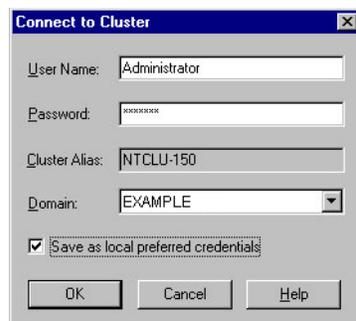
After the tree view is populated with one or more cluster aliases, you must connect to the cluster or clusters before you can manage them with Oracle Fail Safe Manager.

In the tree view, select the cluster to which you want Oracle Fail Safe Manager to connect. Then, on the **File** menu, select **Connect to Cluster**. Oracle Fail Safe Manager opens the Connect to Cluster dialog box.



2.6 Using the Connect to Cluster Dialog Box

Enter a user name and password for a domain account that has Administrator privileges on all nodes of the cluster to which you want to connect. Next, enter the account domain name. Select **Save As Local Preferred Credentials** if you want Oracle Fail Safe Manager to save the connection information in a file on the local system (the password will be encrypted). If you save local preferred credentials, the next time you open Oracle Fail Safe Manager, you can automatically connect to the cluster by expanding the tree view for that cluster.

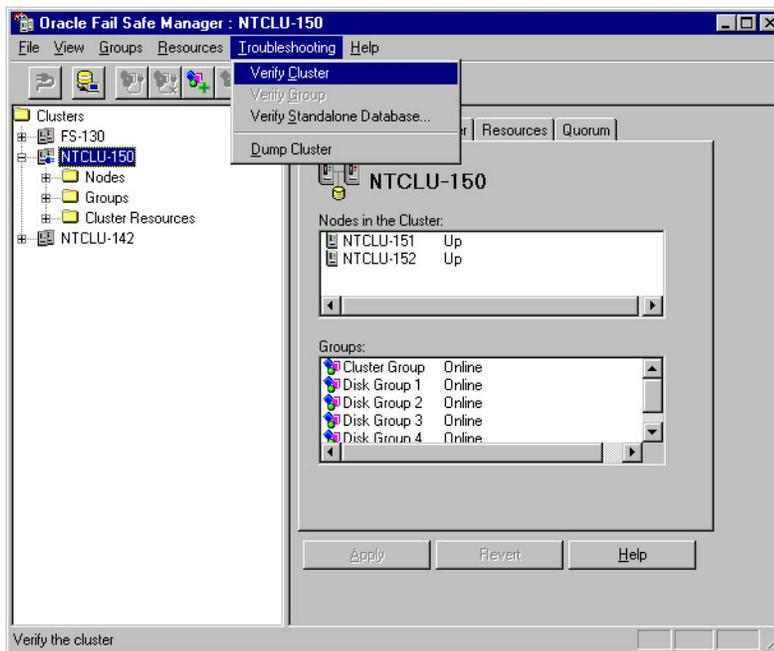


2.7 Verifying the Cluster

Before beginning work with Oracle Fail Safe Manager, verify that the cluster hardware and software are correctly configured by using the Verify Cluster command.

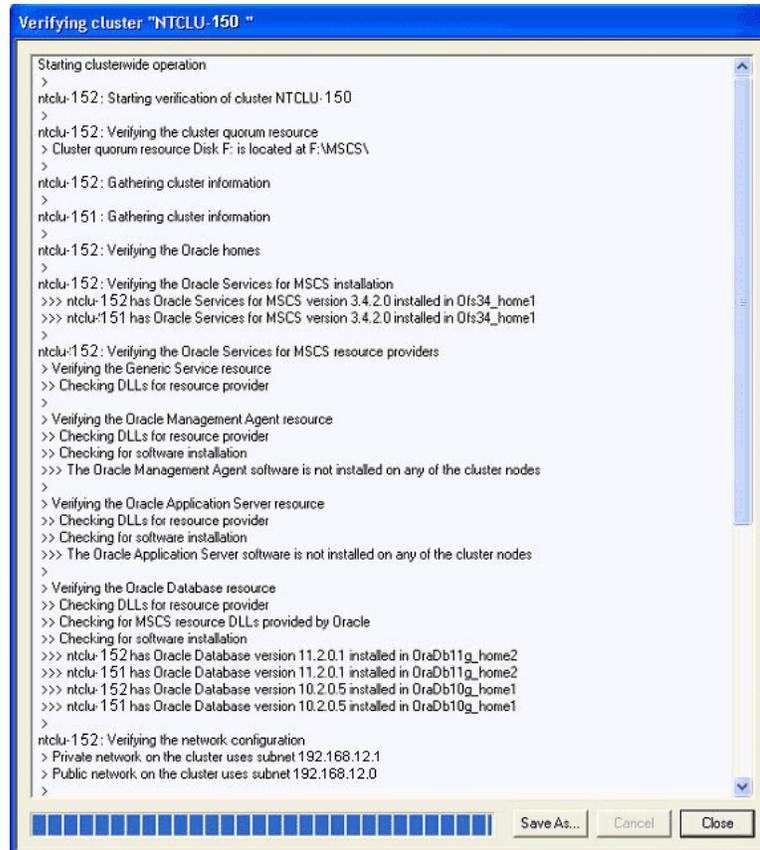
If this is your first time using Oracle Fail Safe with this cluster, a window asking you to verify the cluster opens immediately after you connect to the cluster. To verify the cluster, click the **Verify Cluster** button.

If this is not your first time using Oracle Fail Safe with this cluster, on the **Troubleshooting** menu, select **Verify Cluster**.



2.8 Viewing the Results of the Verify Cluster Operation

Oracle Fail Safe displays the progress of the Verify Cluster operation.

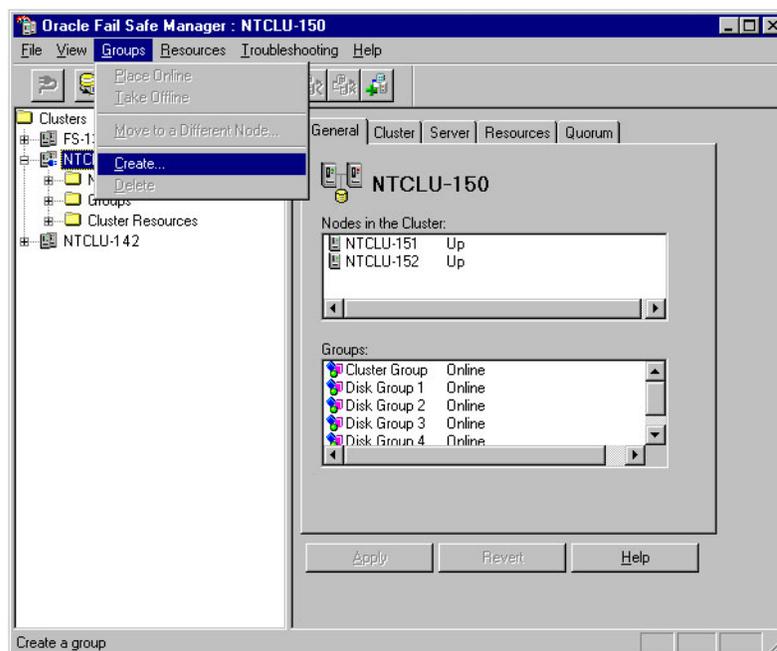


Creating a Group

This chapter describes the steps necessary to create a group with Oracle Fail Safe Manager. Creating a group is the first step in making most resources (such as single-instance databases) highly available. In newer releases of failover clusters a group is sometimes referred to as a "service or application".

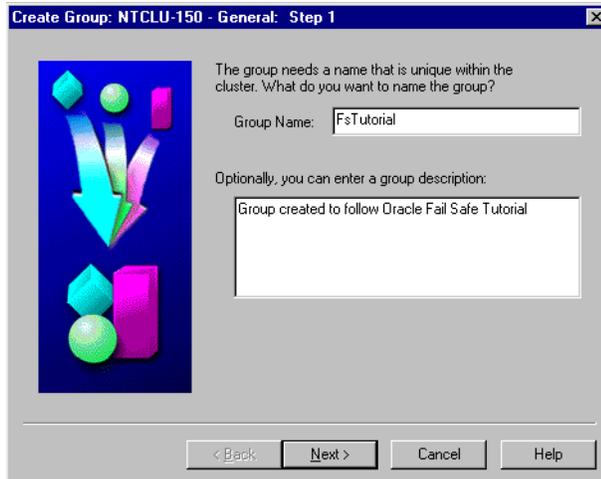
3.1 Invoking the Create Group Wizard

In the tree view, select the cluster on which you want to create a group. Then, on the **Groups** menu, select **Create** to open the Create Group Wizard.



3.2 Naming and Describing the Group

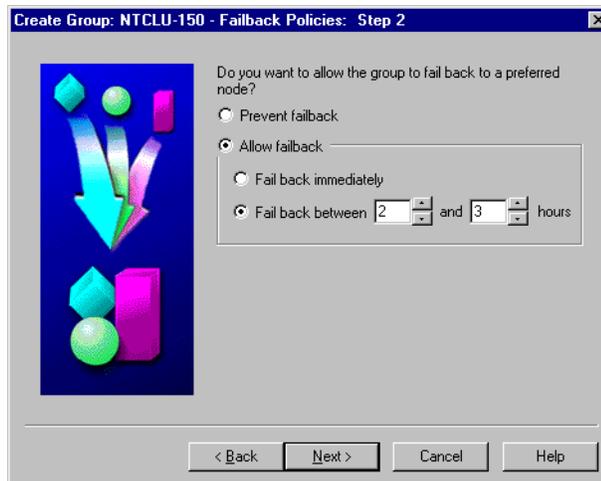
The Create Group Wizard guides you through the process of creating a group. Enter FSTutorial as the name of the group, and if you want, enter a description of the group.



3.3 Specifying the Failback Policy

The **Failback policy** determines whether a group that has previously failed over is returned to the node on which you prefer it to run when that node comes back online. Select **Allow failback**. Then select **Fail back between** and enter 2 and then 3. This specifies that if a previously unavailable node comes back online, failback will be scheduled to occur between the hours of 2 a.m. and 3 a.m.

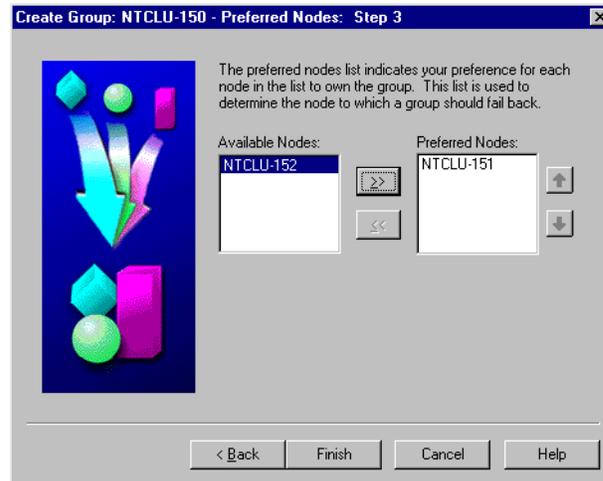
See the *Oracle Fail Safe Concepts and Administration Guide* for more information on the various failback policy options.



3.4 Specifying the Preferred Nodes

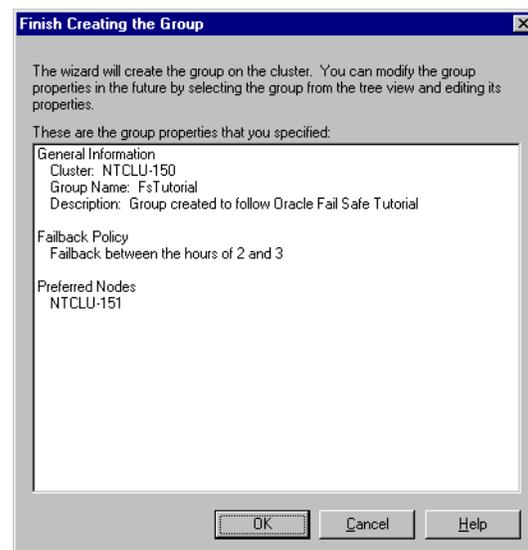
A preferred node is the node on which you want the group to run when all cluster nodes are in use. When a previously unavailable node comes back online, the cluster software reads the preferred nodes list to determine if the group should be failed back to a preferred node. The first running node in the preferred nodes list is the one to which the group fails back. If you do not specify a preferred nodes list, failback is disabled and the group never fails back.

Move a node in the Available Nodes list to the Preferred Nodes list.



3.5 Finishing Creating a Group

Before the group is created, you have an opportunity to review the properties you have selected. If the properties are incorrect, click **Cancel** and then **Back** to make corrections. If the properties are correct, click **OK**, and Oracle Fail Safe creates the group.

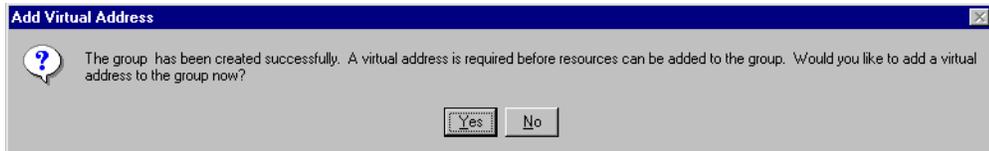


3.6 Responding to the Virtual Address Question

After creating the group, Oracle Fail Safe asks if you want to add a virtual address to the group. When a group contains a virtual address, the group is accessible by clients at the same network address, regardless of which cluster node is hosting the group.

If you click **Yes**, Oracle Fail Safe opens the Add Virtual Address Wizard immediately. Typically, you would click **Yes**. However, for the purposes of this tutorial, click **No**.

In [Chapter 4](#), the tutorial shows you how to create a virtual address as a separate step.

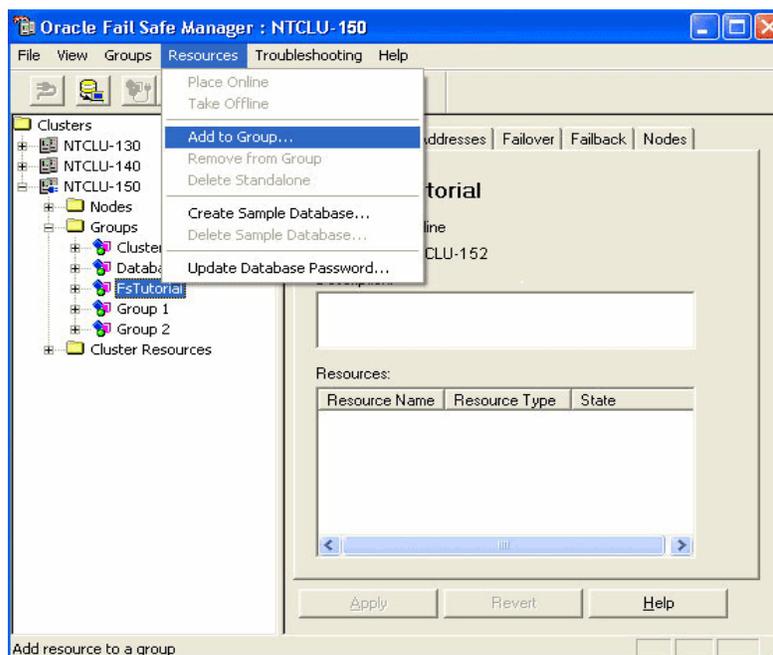


Adding a Virtual Address to a Group

This chapter describes the steps necessary to add a virtual address to a group with Oracle Fail Safe Manager. Oracle Fail Safe Manager does not allow you to add any other resources (other than a generic service) to a group until at least one virtual address has been added to the group. Without a virtual address, clients cannot connect to resources that have been added to a group.

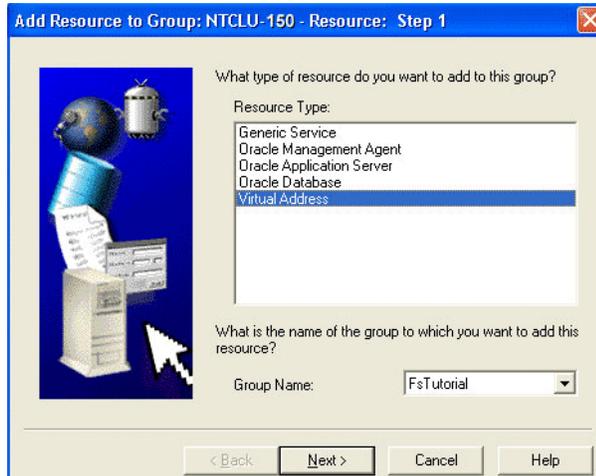
4.1 Opening the Add Resource to Group Wizard

In the tree view, select the group to which you want to add a virtual address. Next, on the **Resources** menu, select **Add to Group** to open the Add Resource to Group Wizard.



4.2 Specifying the Resource Type and Group

On the first page of the wizard, select the **Virtual Address** resource type, the **FSTutorial** group, and then click **Next**.



4.3 Describing the Network

When you add a virtual address to a group, you must define the network on which the virtual address runs. If you do not know which virtual nodes are available on your cluster, ask your cluster administrator.

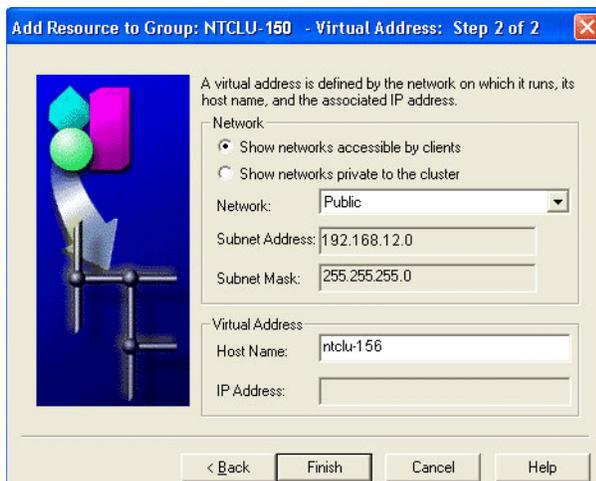
Enter the data on the wizard page as follows:

1. In the Network section of the page, select **Show networks accessible by clients**, and in the Network box, select **Public**.
2. In the Virtual Address section of the page, enter the host name for the virtual address that you want to create in the **Host Name** box (your value will be different than the one shown in the image), and then press the **Tab** key.

When you press the **Tab** key, Oracle Fail Safe resolves the host name to an IP address.

Your values for the virtual address will be different from the ones shown in the image. Also, do not use the cluster alias; in this example, the cluster alias is ntclu-150.

3. Click **Finish**.

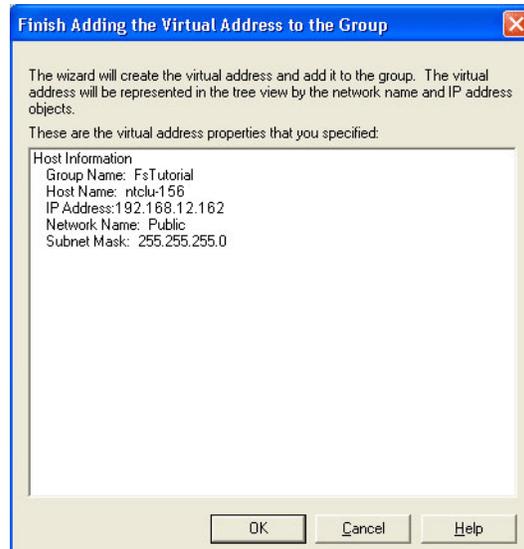


Network group, the

4.4 Finishing Adding the Virtual Address

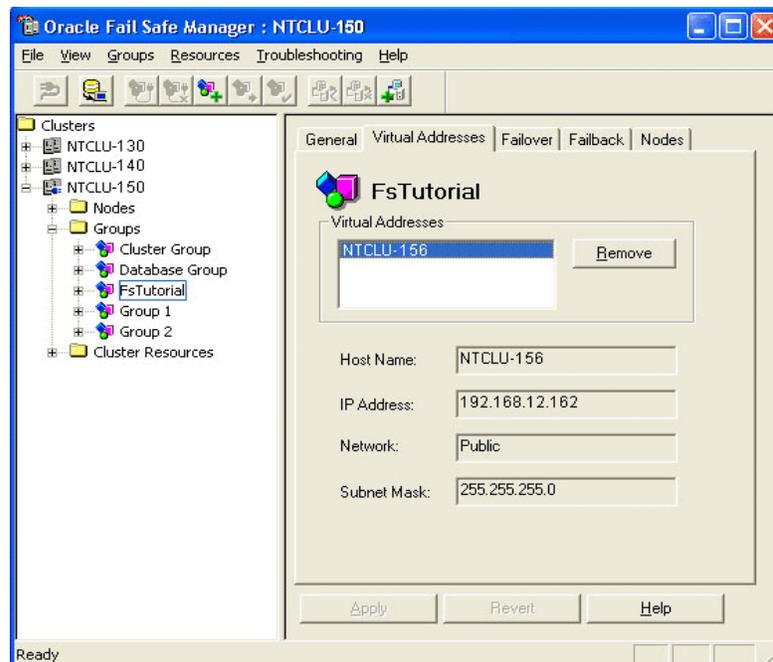
Oracle Fail Safe asks you to check the properties you have selected for the virtual address. If they are correct, click **OK**. Otherwise, click **Cancel** and then **Back** to change the properties.

After you add at least one virtual address to the group, you are ready to add a resource to the group (such as an Oracle single-instance database or other resource).



4.5 Viewing the Group Properties

You can see a list of addresses in the Virtual Addresses property page. This property page shows the virtual address that you just added to the group.

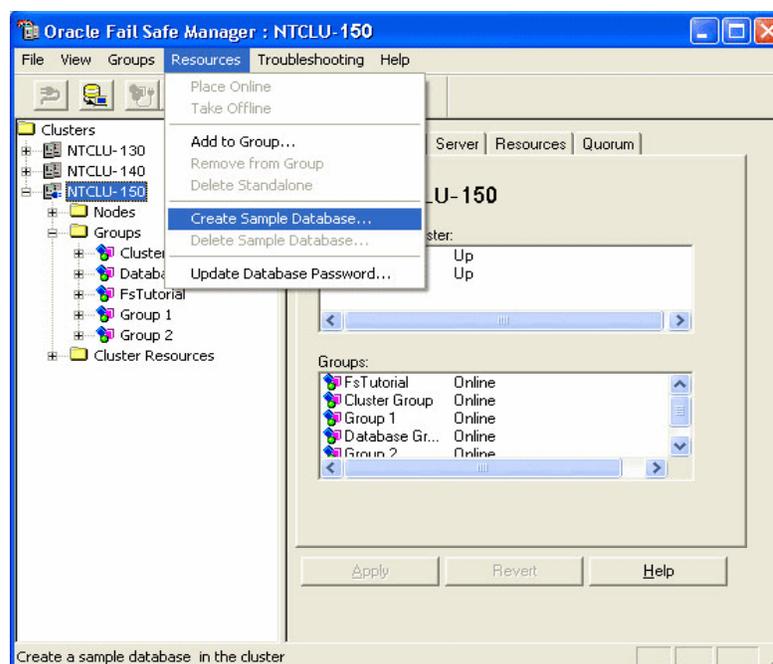


Creating a Sample Single-Instance Database

This lesson shows you how to create a sample single-instance database called TESTDB. The rest of this tutorial assumes you have created this database.

5.1 Opening the Create Sample Database Dialog Box

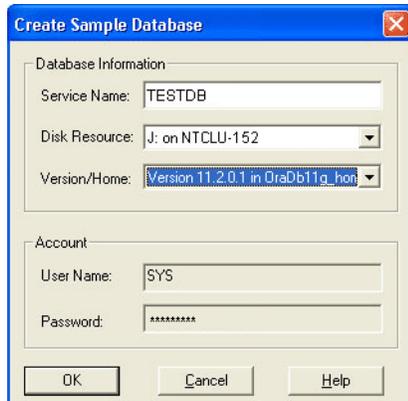
In the tree view, select the cluster (or an object on the cluster) on which you want to create the sample database. Then, on the **Resources** menu, select **Create Sample Database** to open the Create Sample Database dialog box.



5.2 Using the Create Sample Database Dialog Box

Enter a service name of TESTDB, select a disk and node combination on which to build the sample database, and then select the version of the Oracle database you want to create and the Oracle home in which to create it. For the disk resource, Oracle recommends you select a disk other than that which is used for the quorum resource. (To view the disk used for the quorum resource, select the cluster alias in the tree view, then click the **Quorum** tab.) Click **OK**.

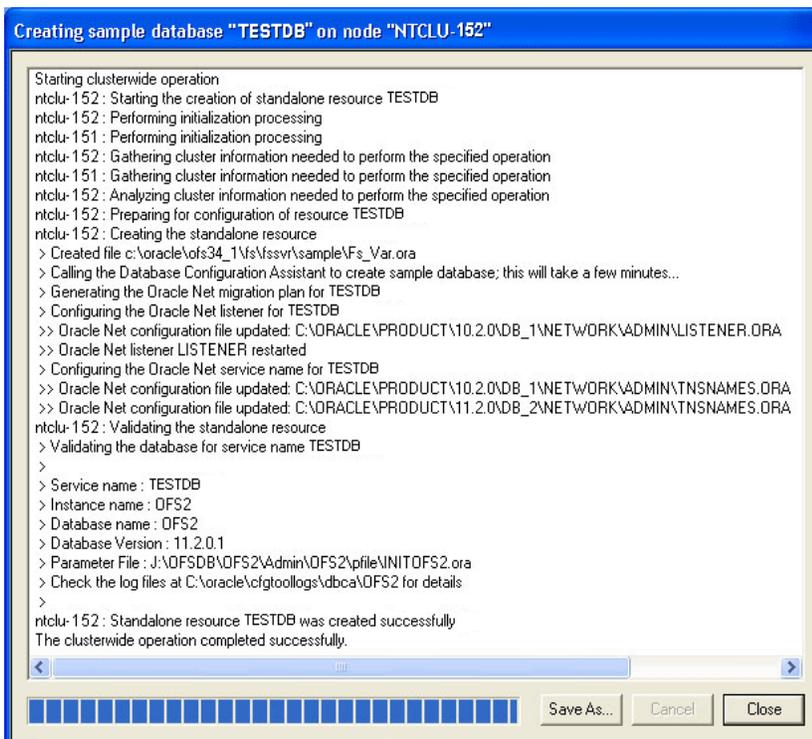
The sample database always uses the SYS account. Do not use the sample database as a production database.



5.3 Viewing the Progress of the Clusterwide Operation

When the operation completes, Oracle Fail Safe opens a Clusterwide Operation Status window to let you know whether the operation has completed successfully.

Click **OK**.



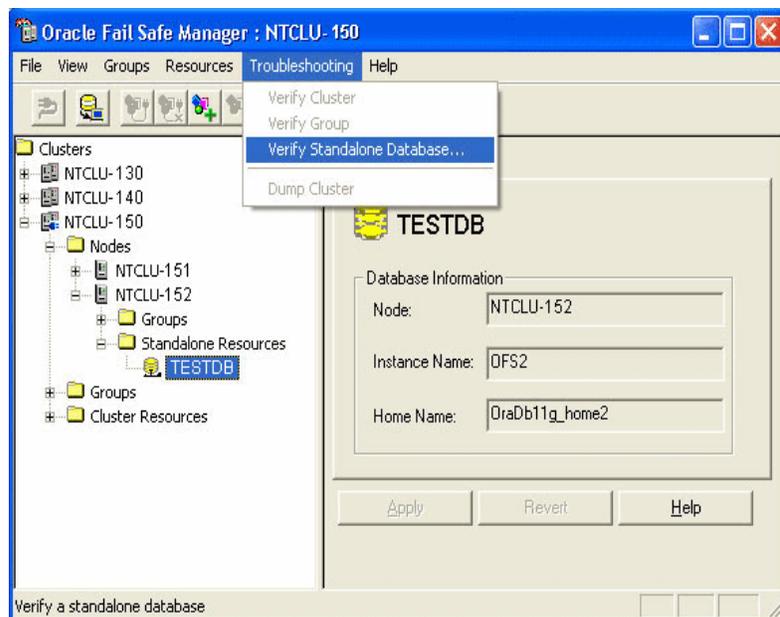
Verifying a Standalone Single-Instance Database

If you add a standalone database (that you did not create using Create Sample Database) to a group, you should verify the database before adding it to a group. When you verify a standalone database, Oracle Fail Safe uses data that you supply to attempt to fix any problems it finds clusterwide.

Because Oracle Fail Safe created it, you may not verify the database that you created in [Chapter 5](#). However, for the purpose of demonstration, you do so in this lesson.

6.1 Using the Verify Standalone Database Command

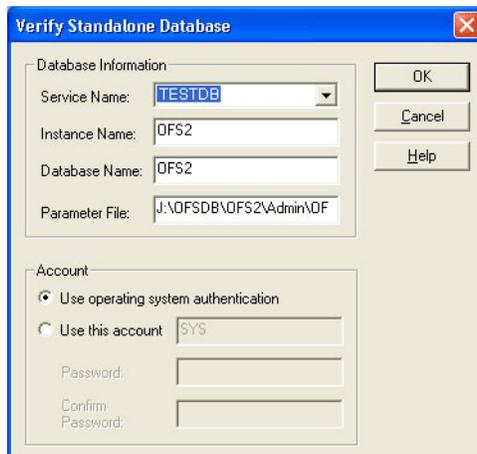
In the tree view, select the TESTDB database. Then, in the **Troubleshooting** menu, select **Verify Standalone Database**.



6.2 Using the Verify Standalone Database Dialog Box

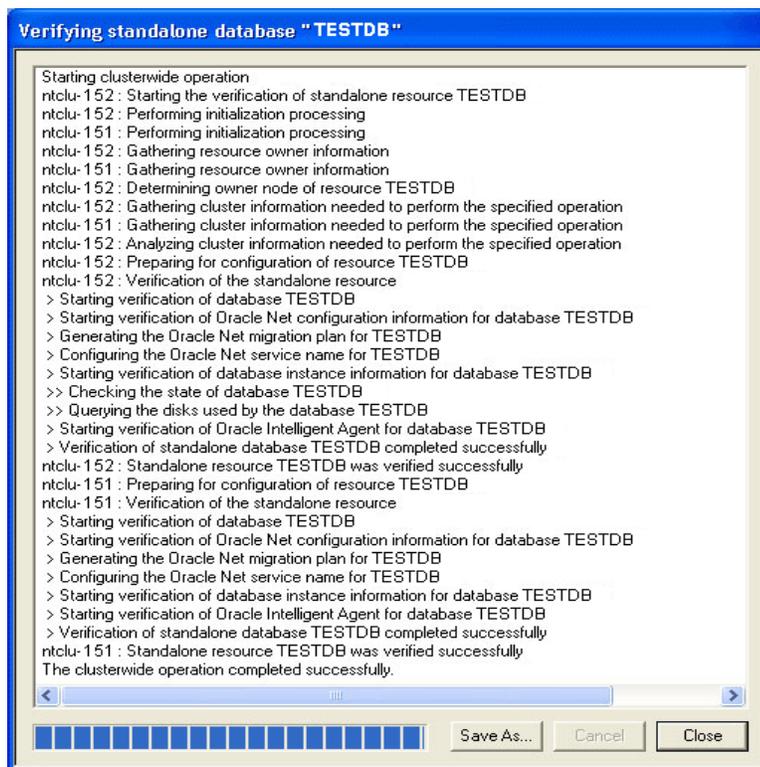
The contents of the database information fields are retrieved automatically. If a value is too long for a field, you may not see the entire value.

In the **Account** box, select the **Use operating system authentication** option. (If a window opens with a question similar to the following, click **Yes**: "To use operating system authentication, the user, domain\administrator must be added to the dba group ORA_OFS2_DBA. Should Oracle Fail Safe add this user for you?")



6.3 Viewing the Progress of the Clusterwide Operation

Oracle Fail Safe displays the results of the Verify Standalone Database operation. (During the operation, a message window may ask if you want to start the TESTDB instance. If this message is displayed, click **Yes**.)



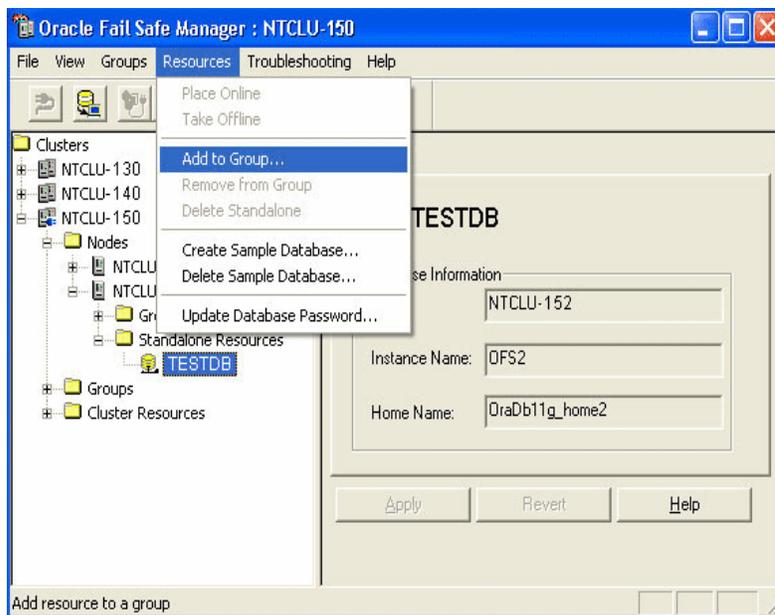
Adding a Single-Instance Database to a Group

This lesson shows how to add a single-instance database to a group. When you add a single-instance database to a group, you make that database highly available. If the node on which the database is currently running is taken offline or fails, the database is restarted on a surviving cluster node.

In this lesson, you will add the sample database that you created in [Chapter 5](#) to the FSTutorial group that you created in [Chapter 3](#).

7.1 Invoking the Add Resource to Group Wizard

In the tree view, select the TESTDB database, then on the **Resources** menu, select **Add to Group**.



7.2 Using the Add Resource to Group Wizard

The Add Resource to Group Wizard guides you through the process of adding the database to the group. On this page, select **Oracle Database** (if it is not selected) and then select the **FsTutorial** group from the Group Name menu.

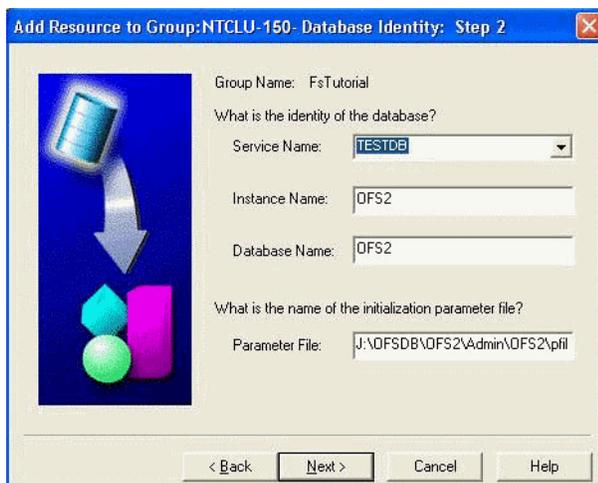
Click Next.



7.3 Specifying the Database Identity

Typically, the **Service Name**, **Instance Name**, **Database Name**, and **Parameter File** fields are retrieved automatically. However, if the parameter file disk is not on the same node as the database instance, then the database name may not be prefilled. If this is the case, enter the database name in the **Database Name** field.

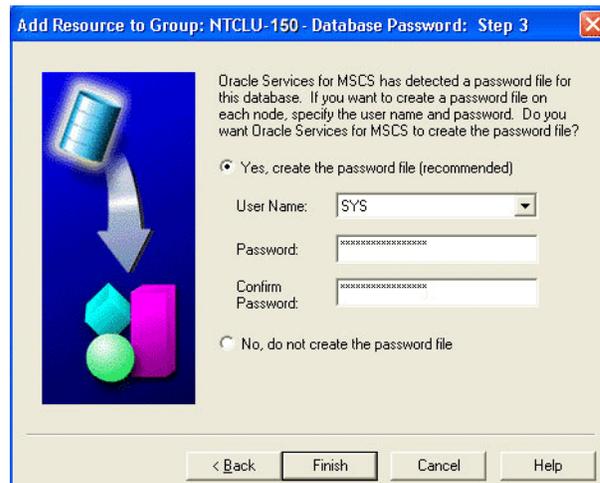
Click Next.



7.4 Specifying a Password File

On this page, you can choose whether Oracle Services for MSCS will create a password file for the database on each cluster node. If you choose not to have Oracle Services for MSCS, create a password file on each cluster node. Then, database administrators who want to access the database must become members of the `ORA_DB` or `ORA_SID_DBA` Windows operating system user group. They will only be able to perform database administration tasks from the node on which the database resides; applications such as Recovery Manager will not be able to access the database from a noncluster node.

This lesson specifies that Oracle Services for MSCS creates a password file. Select the **Yes, create the password file** option, and enter and confirm the password for the SYS account.



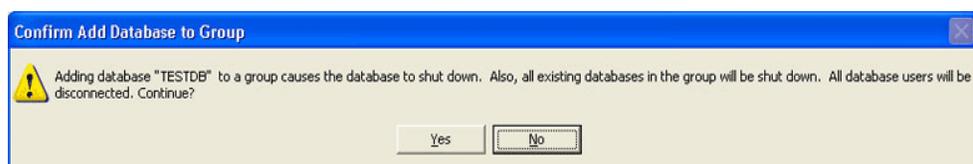
7.5 Finishing Adding the Database

Oracle Fail Safe asks you to check the properties you have selected for the database. If they are correct, click **OK**. Otherwise, click **Cancel** and then click **Back** to change the properties.



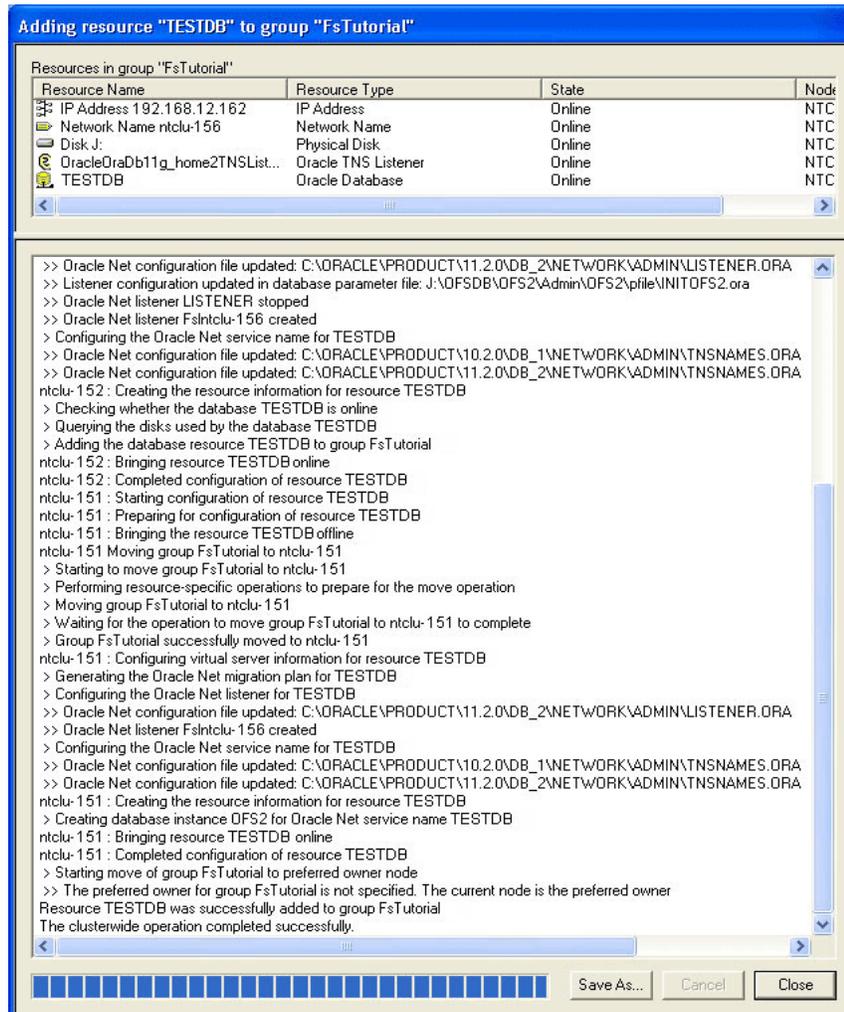
7.6 Shutting Down the Database

If the database is running, Oracle Fail Safe displays a window to warn you that it must shut down the database. Click **Yes** to shut down the database and continue the process.



7.7 Viewing the Progress of the Clusterwide Operation

Oracle Fail Safe displays the progress of the Add Database to Group operation.

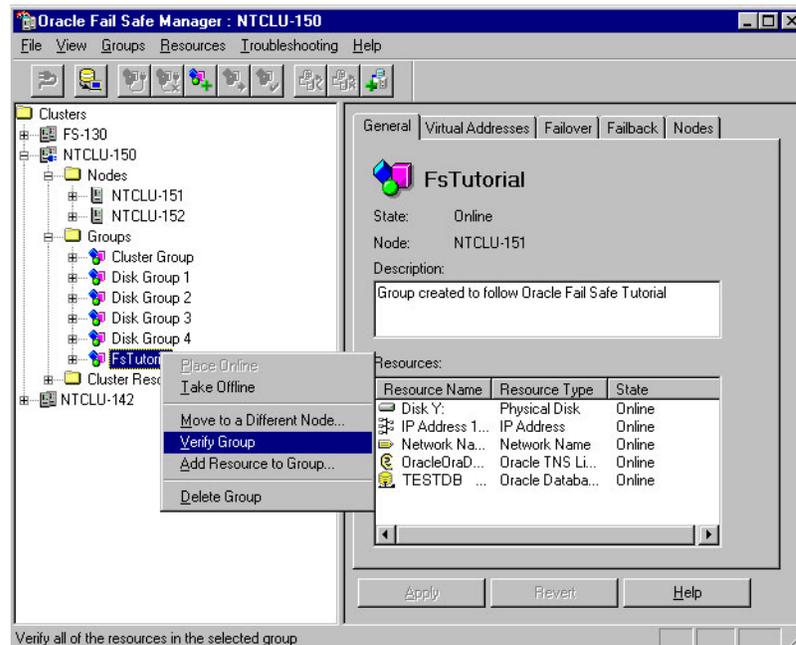


Verifying a Group

A group verification checks that the selected group is configured correctly. Over time, as your system becomes more complex and hardware and software configurations change, you may find that resource dependencies have changed. The Verify Group command makes it easy to restore the configuration to working order. When you use a Verify Group command, Oracle Fail Safe attempts to correct any configuration problem it finds. It is not necessary to verify a group immediately after you create it, but it is done in this lesson to demonstrate the operation.

8.1 Using the Verify Group Command

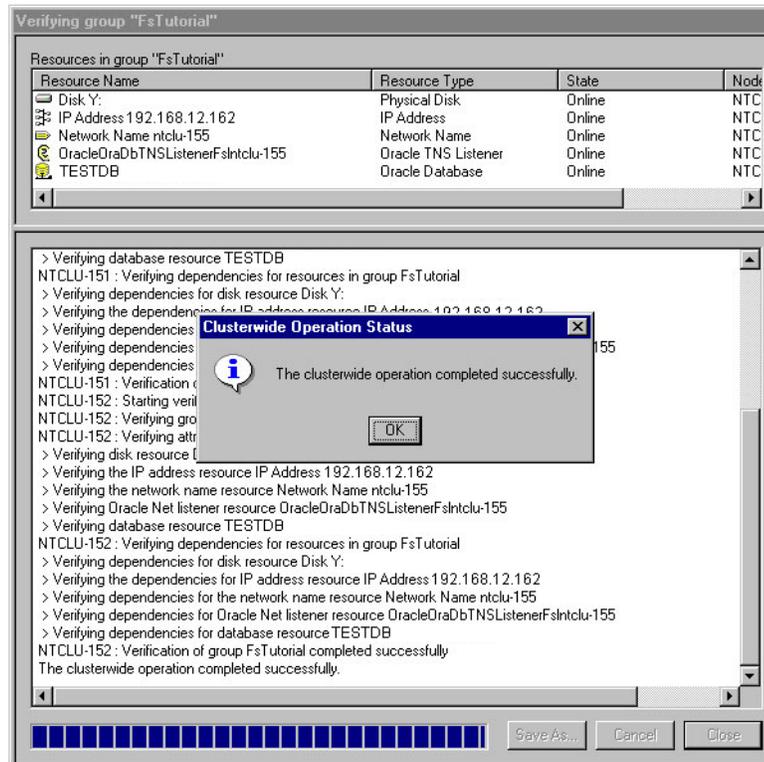
In the tree view, right-click the **FsTutorial** group name, then select **Verify Group**.



8.2 Viewing Progress

Because the Verify group operation is applied clusterwide and involves numerous steps, it can take a few minutes to complete. Oracle Fail Safe Manager displays the progress of the operation to you.

When the operation is complete, click **OK** in the Cluster Operation Status window and **Close** in the Verifying Group FsTutorial window.



Balancing the Workload

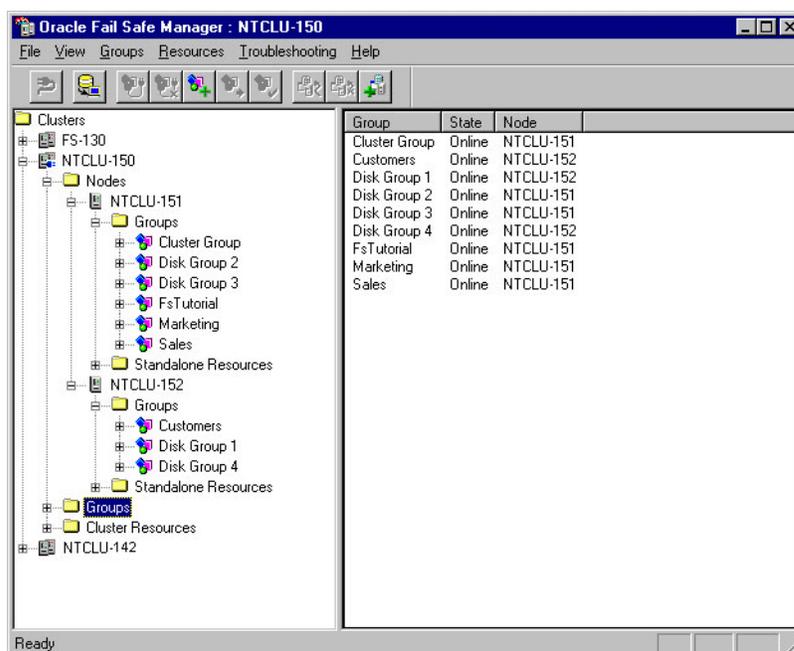
Oracle Fail Safe Manager makes it easy to balance the workload across the nodes in the cluster using a process called planned failover. You can use planned failover to adjust the initial setup of the cluster, or to adjust the setup if the cluster environment changes.

9.1 Initial Set Up for Performing a Planned Failover

Create three groups: Sales, Marketing, and Customers. Create Sales and Marketing on one node (NTCLU-151 is used in this example); create Customers on the other node (NTCLU-152 is used in this example).

Enable failback for each group, and set the current node of each group at the top of the Preferred Owner Nodes list. See [Chapter 3](#) for instructions on creating a group. For this example, you must not add virtual addresses to the new groups.

The following figure shows the initial configuration of the cluster:

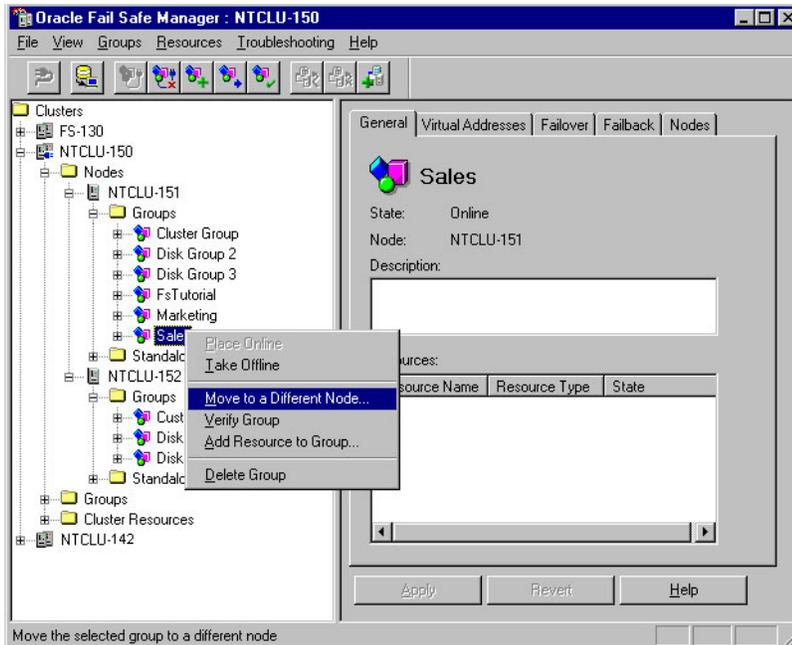


Suppose that you have recently added more CPUs to NTCLU-152. Node NTCLU-152 can better handle the load of the Sales and Marketing groups, and NTCLU-151 would now be a better place for the Customers group. You can move the groups to the new, more capable system with minimal interruption in service to your users.

9.2 Moving the Sales Group

Because NTCLU-152 is the more robust system, the first step is to move Sales and Marketing groups to NTCLU-152.

To move the Sales group from NTCLU-151 to NTCLU-152, right-click the **Sales** group and select **Move to a Different Node**. (Your node names will be different.)



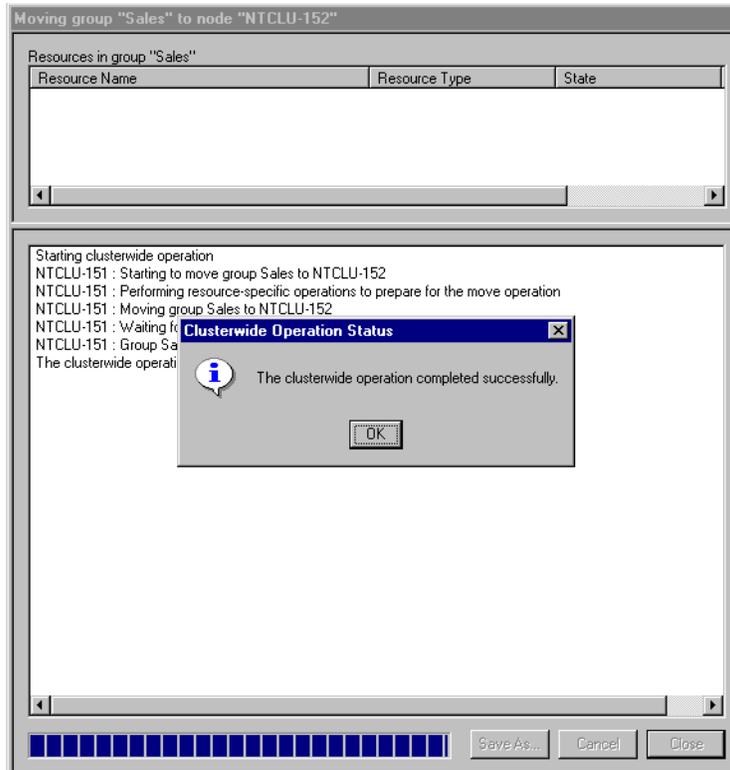
9.3 Confirming the Move Group Operation

A confirmation window asks if you want to move the Sales group to NTCLU-152. Click **Yes**.



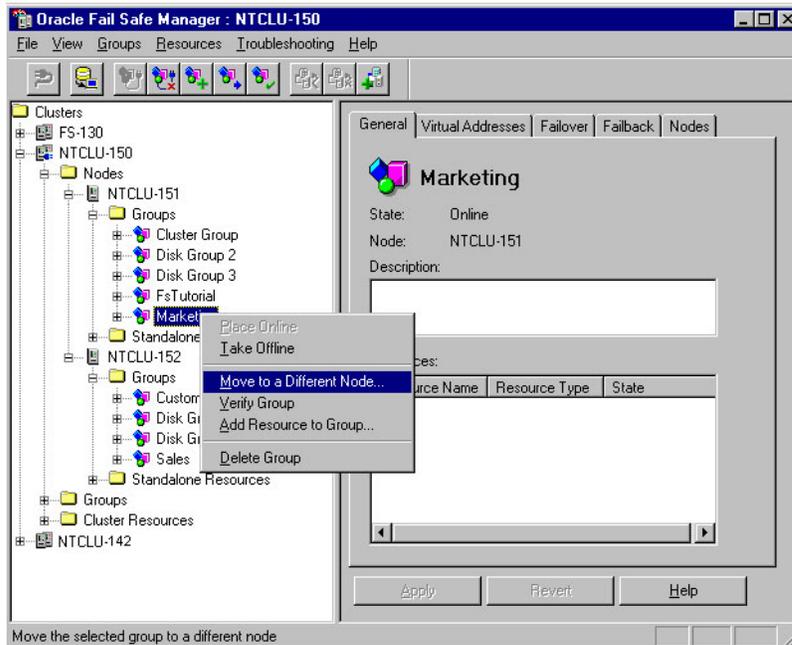
9.4 Finishing Moving the Group

The Moving Group window displays the progress of the move operation. When the move is finished, click **Yes** in the Clusterwide Operation Status window, then click **Close** in the Moving Group window.



9.5 Moving the Marketing Group

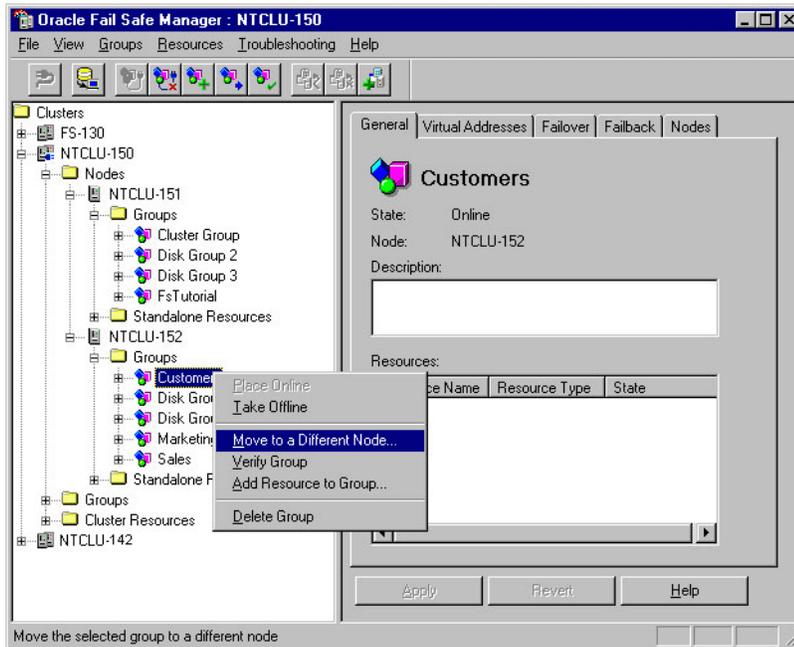
To move the Marketing group from NTCLU-151 to NTCLU-152, right-click the **Marketing** group and select **Move to a Different Node**.



Complete the move operation as described in [Section 9.3](#) and [Section 9.4](#).

9.6 Moving the Customers Group

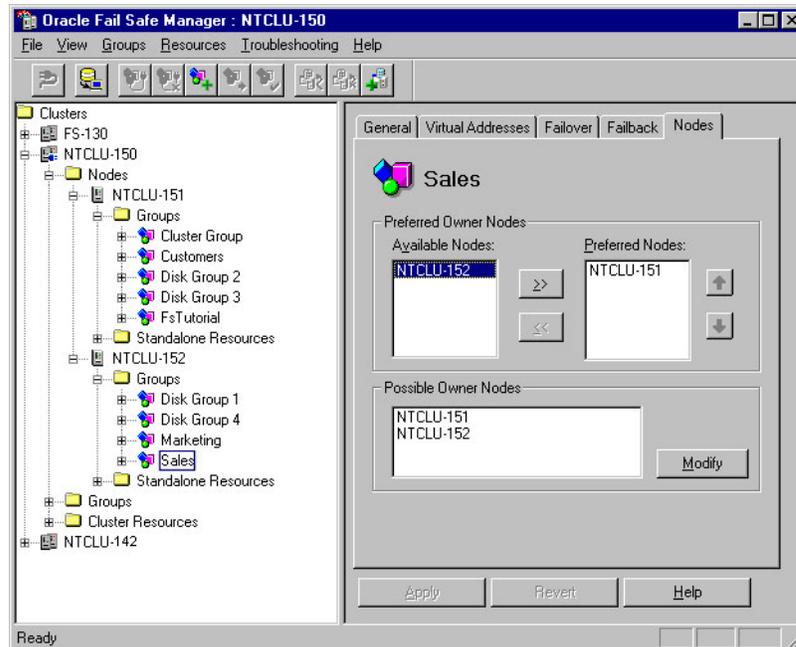
To move the Customers group from NTCLU-152 to NTCLU-151, right-click the **Customers** group and select **Move to a Different Node**.



Complete the move operation as described in [Section 9.3](#) and [Section 9.4](#).

9.7 Checking the Preferred Owner Nodes List

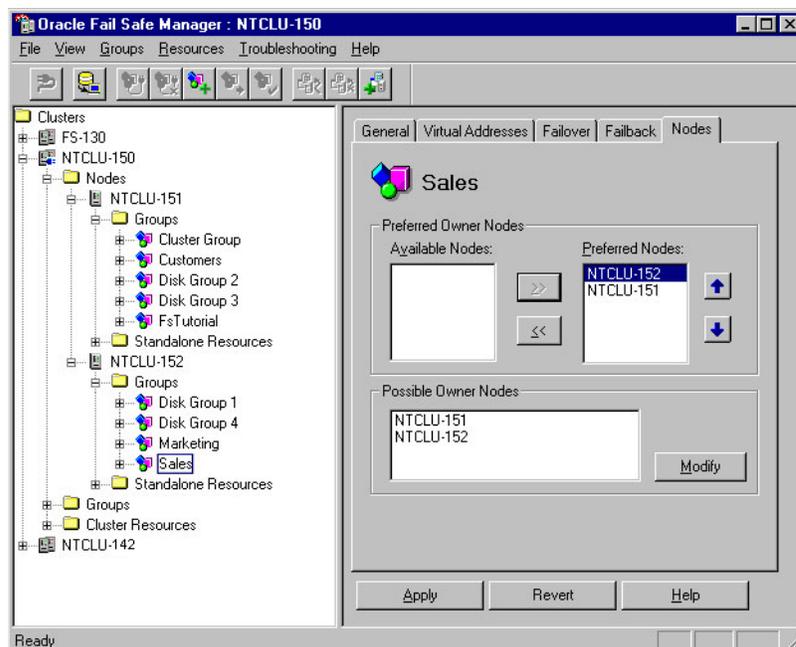
Check the **Preferred Owner Nodes** list. Select the **Sales** group from the tree view and click the **Nodes** tab. The data on this page indicates that NTCLU-151 is the preferred owner node. However, now that you have rearranged the configuration, you probably want NTCLU-152 to be the preferred owner node. With the current settings, if NTCLU-152 fails and the Sales group fails over to NTCLU-151, the **Preferred Nodes** list indicates that you prefer the Sales group to reside on NTCLU-151; failback does not occur when NTCLU-152 comes online.



9.8 Rearranging the Preferred Nodes List

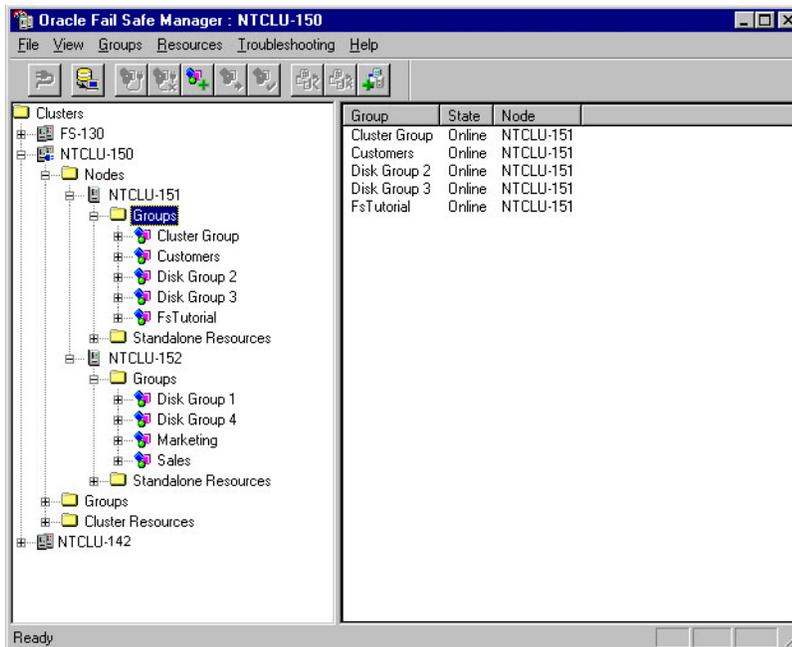
Re-arrange the **Preferred Nodes** list so that NTCLU-152 is first in the list and NTCLU-151 is second. Select NTCLU-152 from the **Available Nodes** list and click the right-arrow button, then select NTCLU-152 from the **Preferred Nodes** list and click the up-arrow button. The **Preferred Nodes** list should list NTCLU-152 first and NTCLU-151 second.

Repeat this process for Customers and Marketing, ensuring that the node on which you want each group to reside when both cluster nodes are up is first in their respective **Preferred Nodes** list.



9.9 Viewing the Balanced Workload

When you finish the planned failover, the Oracle Fail Safe Manager tree view should appear similar to the following image when you expand both of the Nodes folders for NTCLU-150 and the **Groups** folder below each Nodes folder in the tree view, then click a Groups folders.



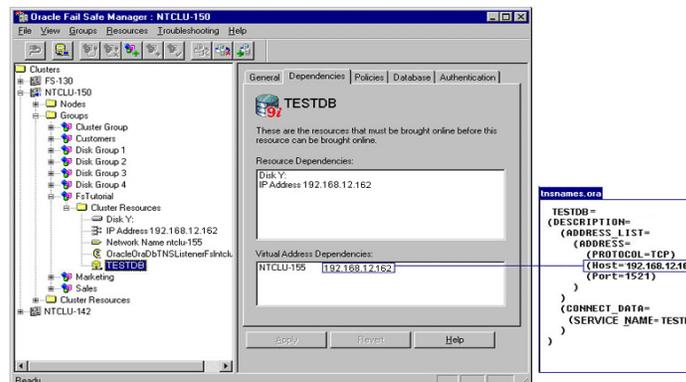
10

Identifying the Location of Fail-Safe Databases to Client Applications

Ordinarily, end-user applications identify the location of a database by its physical node address. When you add a database to a group, the location of the database in the group is identified by the virtual address of the group.

10.1 Updating the tnsnames.ora File

If your end-user applications use tnsnames.ora to locate databases, use a tool such as Oracle Net Assistant to change the host value in tnsnames.ora on client systems from the physical node address to the virtual address of the group. Oracle Fail Safe makes this update for you on the server systems and the client system from which you run Oracle Fail Safe Manager.

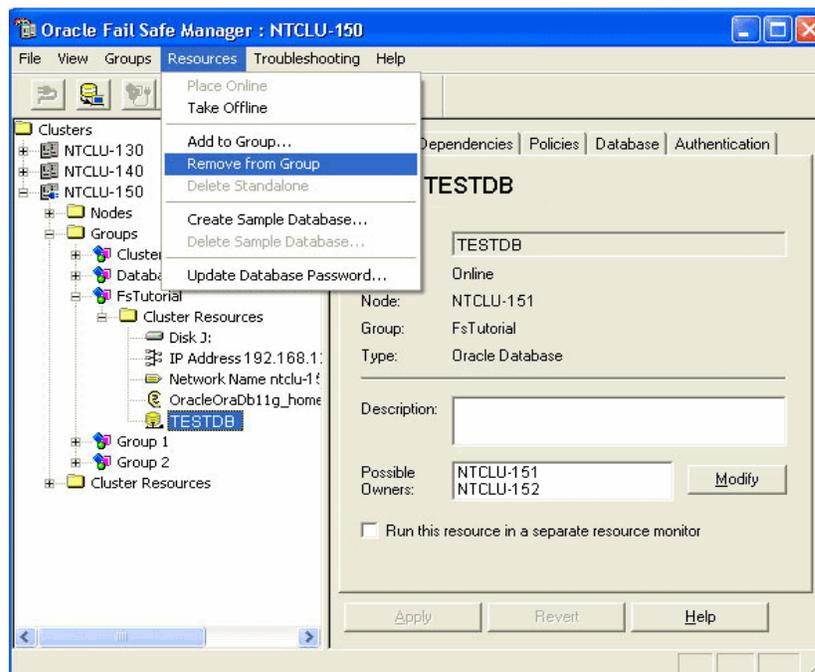


Removing a Resource from a Group

When you are done experimenting with a resource, you probably want to delete it from the cluster. Before you can delete it from the cluster, you must first remove it from the group to which you added it. Note that you can only use the Remove from Group command to remove those resources from a group that you added with the Add Resource to Group Wizard.

11.1 Using the Remove from Group Command

In the tree view, select **FsTutorial**. Then, on the **Resources** menu, select **Remove from Group**.



11.2 Confirmation Request

When you remove the **FsTutorial** from the group, Oracle Fail Safe asks, "Are you sure you want to remove the resource **FsTutorial** from the group?" Click **Yes**.

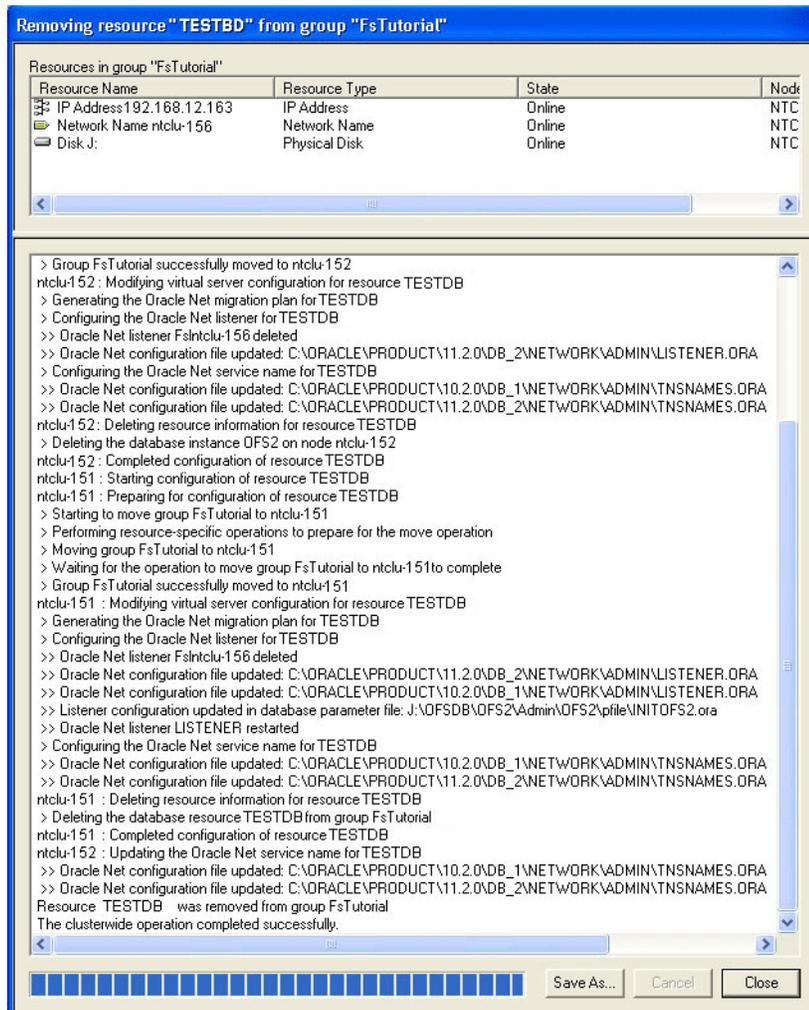
(Note that when you remove a database from a group, Oracle Fail Safe warns you about the database being shut down and all users being disconnected.)



11.3 Monitoring the Clusterwide Operation

Oracle Fail Safe opens a window and begins the remove operation. The upper portion of the window displays the status of individual resources in the group, and the lower portion of the window displays the progress of the remove operation.

Click **OK** in the Clusterwide Operation Status window, then click **Close** in the Removing Resource window.

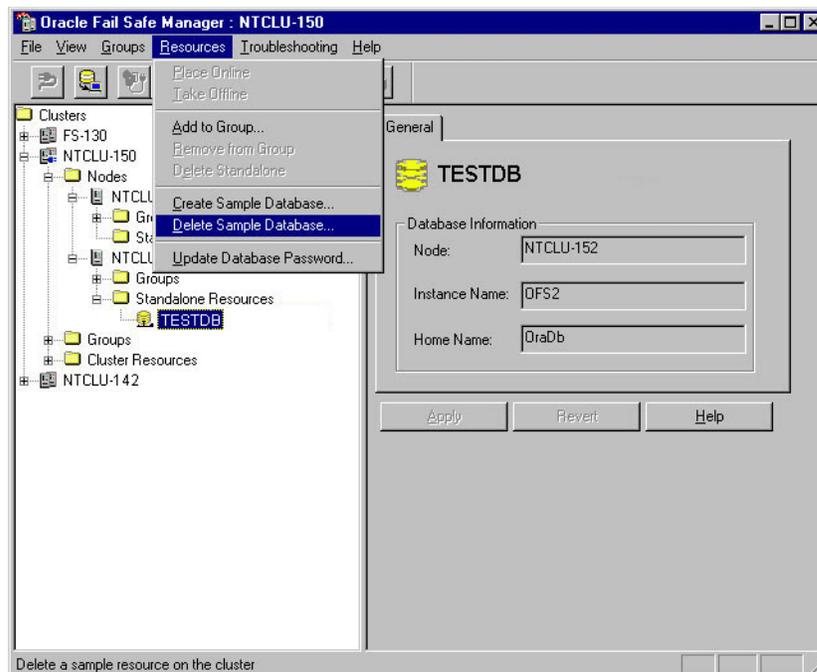


Deleting a Sample Database from the Cluster

Use the Delete Sample Database command to delete any database that you created with the Create Sample Database command. Do not use the Delete Sample Database command to delete databases created using other means.

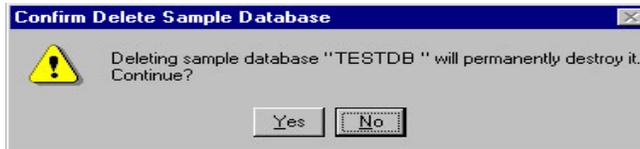
12.1 Using the Delete Sample Database Command

If the database is still in a group, remove it, using the method described in [Chapter 11](#). Then, in the tree view, select **TESTDB**. On the **Resources** menu, select **Delete Sample Database**.



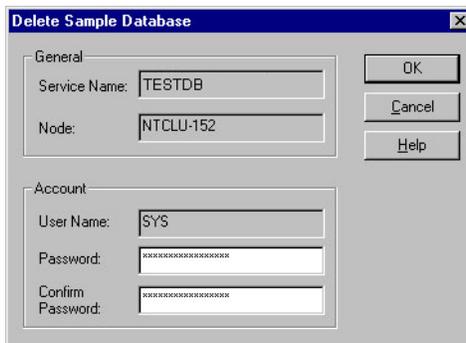
12.2 Confirming the Delete Sample Database Command

Oracle Fail Safe asks you to confirm whether to permanently destroy the sample database. Click **Yes** to delete the database resource.



12.3 Authenticating Your Privileges to Delete the Database

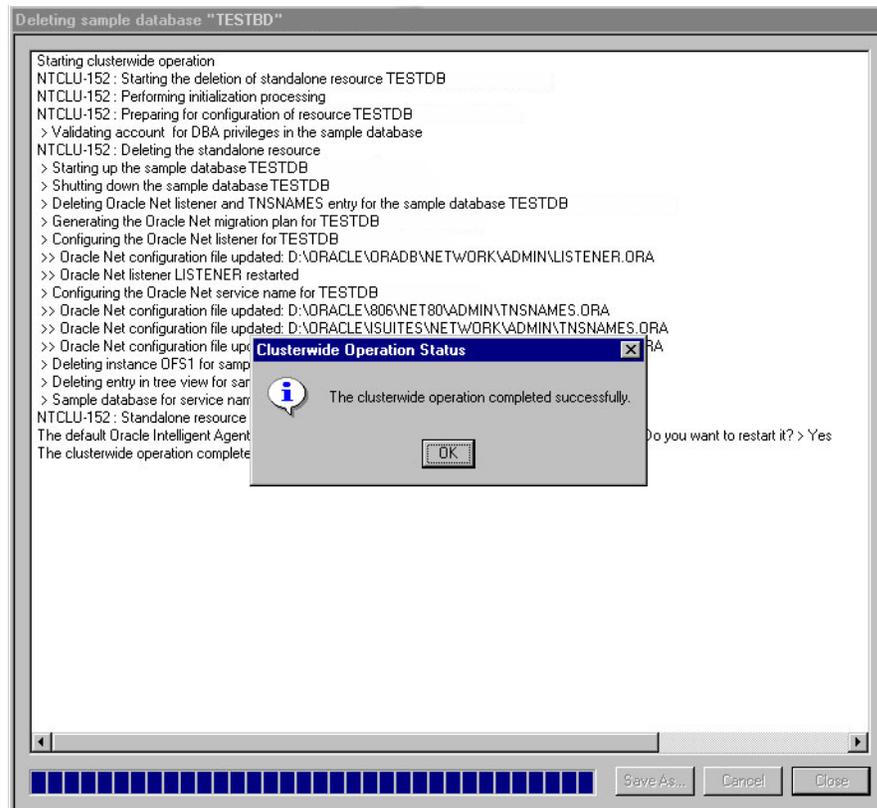
Depending on the privileges you have, Oracle Fail Safe may open a window to confirm that you have privileges to delete the sample database. If this window opens, enter and confirm the password for the SYS account.



12.4 Viewing the Progress of the Clusterwide Operation

When the operation completes, Oracle Fail Safe opens a Clusterwide Operation Status window to let you know whether the operation has completed successfully.

Click **OK** in the Clusterwide Operation Status window, then click **Close** in the Deleting Sample Database window.

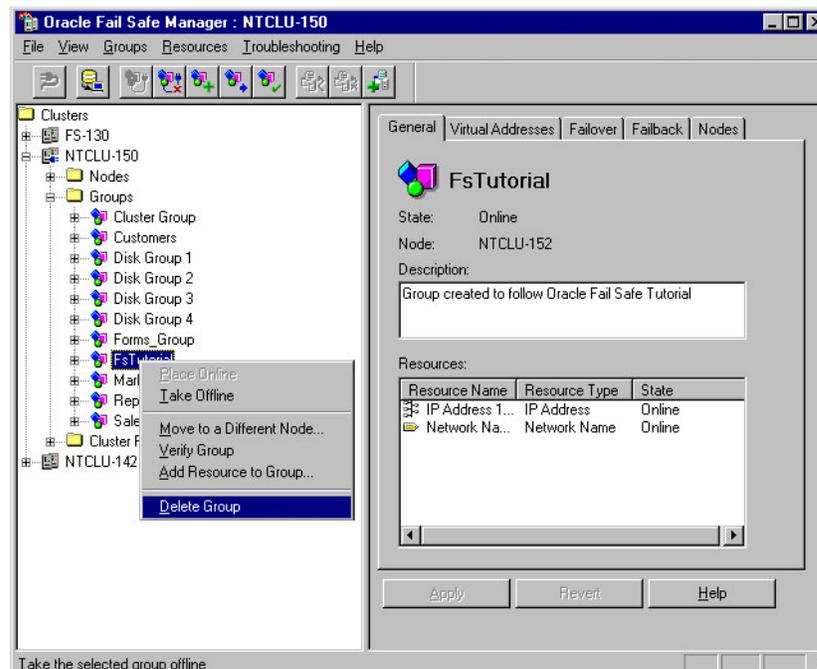


Deleting a Group from the Cluster

If you created a group using Oracle Fail Safe Manager, you can delete that group using Oracle Fail Safe Manager. Oracle Fail Safe requires that all resources, except the virtual address (network name and IP address), be removed from the group first. Groups created by MSCS Cluster Administrator cannot be deleted using Oracle Fail Safe Manager.

13.1 Using the Delete Group Command

After removing the resources from the FsTutorial group, delete the group from the cluster by right-clicking **FsTutorial** and selecting **Delete Group**.



13.2 Confirming the Delete Group Command

Oracle Fail Safe asks you to confirm whether to delete the group from the cluster. Click **Yes** to delete the group.

