## Oracle® Fail Safe Tutorial



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ORACLE

Oracle Fail Safe Tutorial, Release 4.2.1 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 is 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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#### **Related Documents**

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

- Oracle Fail Safe Release Notes for Microsoft Windows
- Oracle Fail Safe Concepts and Administration Guide for Microsoft Windows
- Oracle Fail Safe Error Messages for Microsoft Windows
- Oracle Fail Safe Installation Guide for Microsoft Windows
- For online assistance, Oracle Fail Safe Manager provides online help topics and a link to the online documentation set. From the Help menu bar in Oracle Fail Safe Manager, select Help Topics 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 Windows Failover Clusters documentation.



• 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.
italic	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.



## 1 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 singleinstance databases) using Oracle Fail Safe to ensure high availability of the same
- A step-by-step introduction to using Oracle Fail Safe Manager

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, "service or application" or "clustered role" is referred to as a group.
- **Resource:** A physical or logical component that is available to a computing system. For example, disks, the network IP address, Oracle databases 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.



## 2 Starting Oracle Fail Safe Manager and Validating the Cluster

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

#### 2.1 Starting Oracle Fail Safe Manager

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

#### 2.2 Starting and Populating the Tree View

Oracle Fail Safe Manager \_ \_ ħ File Action View Help 🔶 🏟 🛛 📰 🚺 🐐 Fail Safe Manager Actions ORACLE' Fail Safe Manager Fail Safe Manager Add Cluster. View ? Help More Information Fail Safe Documentation Fail Safe Documentation on the web Oracle Technology Network Fail Safe Home Page My Oracle Support Adds a cluster to Fail Safe Manager

Start Oracle Fail Safe Manager and the following window opens.

If there are no clusters added to the tree view, then select **Add Cluster** action under the **Actions** menu to open the Add Cluster dialog box. 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 Adding a Cluster to a Populated Tree View (page 2-1).

#### 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. From the **Actions** menu in the right pane of the screen, select **Add Cluster**. This opens the Add Cluster dialog box with Cluster Alias field and Connect using different credentials check box.

6	Oracle Fail Safe Manager	_ 🗆 🗙
File Action View He	lp	
Fail Safe Manager	ORACLE' Fail Safe Manager	Actions
D K Cluster-1		Fail Safe Manager 🔺
	Use this tool to manage cluster properties for Uracle resources in a Windows Server failover cluster. The Failover Cluster Manager tool should be used for general cluster administration.	Add Cluster
	Clusters	View 🕨
		🕜 Help
	discuster-1	
	More Information	
	Fail Safe Documentation	
	Fail Safe Documentation on the web	
	Oracle Technology Network Fail Safe Home Page	
	My Oracle Support	
Adds a cluster to Fail Safe Ma	anager	

#### 2.4 Using the Add Cluster and Windows Security Dialog Box

Enter the alias for the cluster to manage in the Cluster Alias field.

If you want to use another user's credentials, then select **Connect using different credentials** option. This opens a Windows Security Cluster Credentials dialog box that enables you to enter new credentials for administering the cluster.

	Add Cluster	x
Cluster Alias	cluster-1 Connect using different credentials	
	OK Can	icel

Enter the username and password in the fields provided. If you want to save the credentials, then select the **Remember my credentials** option and click **OK**. The credential is saved in the Windows credentials cache so that when you connect to the cluster, Oracle Fail Safe Manager checks to see if there are any saved credentials for that cluster and use the same to connect to the cluster.



	Windows Security	×
Cluster Cro	edentials ials for administering the cluster.	
	,	
	example\admin	
m	•••••	
Rem	ember my credentials	
	OK Car	ncel

### 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 select **Connect** in the **Actions** menu on the right pane of the screen. It establishes a connection with Oracle Fail Safe Server immediately.

6	Oracle Fail Safe Manager	_ 🗆 🗙
File Action View Help		
Fail Safe Manager	Cluster cluster-2         Fail Safe Manager > cluster-2         Oracle Fail Safe Manager is not currently connected to this cluster. To connect, select Connect from the Actions menu.	Actions cluster-2  Connect Disconnect Dump Validate View  F Help
Connect to the cluster		



#### 2.6 Validating the Cluster

Before beginning work with Oracle Fail Safe Manager, validate that the cluster hardware and software are correctly configured by choosing the **Validate** cluster action.

The first time you connect to a cluster after you install or upgrade Oracle Fail Safe software, Oracle Fail Safe Manager prompts you to run the **Validate** operation to validate the installation of the cluster.

If this is not your first time using Oracle Fail Safe with this cluster, select **Validate** from the **Actions** menu on the right pane of the screen.



### 2.7 Viewing the Results of the Validate Cluster Operation

Oracle Fail Safe displays the progress of the **Validate** cluster operation in the progress window.



Validating cluster cluster-2
NODE4 : Starting verification of cluster cluster-2
NODE4 : Gathering cluster information
NODE3 : Gathering cluster information
NODE4 : Verifying the Oracle homes
NODE4 : Verifying the Oracle Services for MSCS installation
NODE4 has Oracle Fail Safe Server version 4.1.1.0 installed in Ofs41_home1
NODE3 has Oracle Fail Safe Server version 4.1.1.0 installed in Ofs41_home1
NODE4 : Veritying the Oracle Services for MSCS resource providers
Verifying the Generic Service resource
Checking DLLs for resource provider
Verifying the Oracle Management Agent resource
Checking DLLs for resource provider
Checking for software installation
The Oracle Management Agent software is not installed on any of the cluster nodes
Verifying the Oracle Database resource
Checking DLLs for resource provider
Checking for MSCS resource DLLs provided by Oracle
Checking for software installation
NODE4 has Oracle Database version 12.1.0.2 installed in OraDB12Home1
NODE3 has Oracle Database version 12.1.0.2 installed in OraDB12Home1
The clusterwide operation completed successfully.
Print Save As Cancel Close



## 3 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.

#### 3.1 Opening the Create Sample Database Dialog Box

Select **Create Sample Database** from the **Actions** menu of Oracle Resources. The Create Sample Database dialog box opens.

🛍 Oracle Fail Safe Manager						-	×
File Action View Help							
🗢 🄿 🙍 🖬 👔 🖬							
Fail Safe Manager	ORACLE.	Fail Safe Manac	ier	admin . 🔿	Actions		
Cluster-1      Oracle Resources		T dil Galo Manag	,01		Oracle Resources		-
Customers	Eail Safa Managar a sh				🎁 Create Sample Database		
Marketing	Oracle Resources in Cl	ister-1 > Oracle Resources uster			View		•
🔐 Sales	Name	Status			Q Refresh		
	Available Oracle Besou	irces			👔 Help		
	Name	Resource Type	Current Owner	_			
	OFS1	Oracle Database	Node1	Sample D			
	<			>			

#### 3.2 Using the Create Sample Database Dialog Box

Perform the following steps:

- 1. Enter a service name of **TestDb** to be used across the cluster for the sample database in the **Service Name** field.
- 2. In the Disk resource field, select a disk on which to build the sample database, and then in the Database Version field, select the version of the Oracle database you want to create. If you click the drop-down list against Database Version, it shows the Oracle home names in which to create it.



#### Note:

Starting with Oracle Database 12c Release 1 (12.1), Oracle Database supports the use of Oracle Home User, specified at the time of installation. An Oracle Home User is a low-privileged Windows User Account specified during installation that runs most of the Windows services required by Oracle for the Oracle home. If the user selects an Oracle Home User, the user must enter a password and confirm the same in the fields provided under Oracle Home User Password group.

3. Click OK

#### Note:

You must not use the sample database as a production database.

Create Sample Dat	abase 🛛 🗶
Database	
Service Name	TestDb
Disk	F:
Database Version	12.1.0.2
SYS Account	
Password	••••
Confirm Password	••••
Oracle Home User P NT AUTHORITY\SY	<b>'assword</b> STEM
Password	
Confirm Password	
	OK Cancel

#### See Also:

- "Specify Oracle Home User Name and Password" in Oracle Real
   Application Clusters Installation Guide for Microsoft Windows
- "Supporting Oracle Home User on Windows" in Oracle Database Platform Guide for Microsoft Windows



### 3.3 Viewing the Progress of the Clusterwide Operation

A progress window opens displaying the progress of the creation of sample database on node 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.



Creating sample database "TestDb" on node "Node4"	
NODE4 : Performing initialization processing	
NODE3: Gathering cluster information needed to perform the	e specified operation
NODE4 : Gathering cluster information needed to perform the	specified operation
NODE4 : Analyzing cluster information needed to perform the	e specified operation
NODE4 : Preparing for configuration of resource TestDb	
NODE4 : Creating the standalone resource	
Calling the Database Configuration Assistant to create sample	e database; this will take
a few minutes	
Copying database files	
1% complete	
3% complete	
11% complete	
18% complete	
26% complete	
33% complete	
37% complete	
Creating and starting Oracle instance	
40% complete	
45% complete	
50% complete	
55% complete	
56% complete	
60% complete	
62% complete	
Completing Database Creation	
66% complete	
70% complete	
73% complete	
85% complete	
96% complete	
100% complete	
Look at the log file "C:\Oracle\cfgtoollogs\dbca\TestDb\TestD	b.log" for further
details.	-
Starting database TestDb	
Instance name : INS4	
Database name : TestDb	
Database Version : 12.1.0.2	
Parameter File : F:\OFSDB\Admin\TestDb\pfile\INIT.ora	
NODE4 : Validating the standalone resource	
Validating the database for service name TestDb.	
NODE4 : Standalone resource TestDb.was created successful	lý
The clusterwide operation completed successfully.	
Print Save As	Cancel Close







## 4 Validating a Standalone Single-Instance Database

The Validate Standalone Database operation ensures that the standalone database is configured correctly on its node and removes any references to the database which may exist on other cluster nodes, before adding the database to a group. (References to the database may exist on other cluster nodes if the database was added to a group and then later removed.) This ensures that the database can be made highly available using Oracle Fail Safe.

#### 4.1 Using the Validate Standalone Database Command

Perform the following steps:

- 1. Select the TestDb database.
- 2. Select Validate from the Actions menu of the Oracle Resources view.

You can also right-click the resource in the Available Oracle Resources list to view actions at Available Resource level and select **Validate**.



### 4.2 Using the Validate Standalone Database Dialog Box

If the operating system authentication is enabled, Oracle Fail Safe shows the **Enter Database SYS Account Password** window. Use this window to confirm that you have SYS account privileges to validate the sample database. When this window opens, enter the password for the SYS account.



Enter Database	SYS Account Pass	word 🛛 🛛
Database		
Instance Name	OFS1	
Node	NODE4	
SYS Account		
Password		· · · ·
		OK Cancel

### 4.3 Viewing the Progress of the Clusterwide Operation

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



Validating standalone database "TestDb"
NODE4 : Starting the verification of standalone resource TestDb
NODE4 : Performing initialization processing
NODE3 : Performing initialization processing
NODE4 : Gathering resource owner information
NODE3 : Gathering resource owner information
NODE4 : Determining owner node of resource TestDb
NODE4 : Gathering cluster information needed to perform the specified operation
NODE3 : Gathering cluster information needed to perform the specified operation
NODE4 : Analyzing cluster information needed to perform the specified operation
NODE4 : Preparing for configuration of resource TestDb
NODE4 : Verification of the standalone resource
Starting verification of database TestDb
Starting verification of Oracle Net configuration information for database TestDb
Generating the Oracle Net migration plan for TestDb
Configuring the Oracle Net service name for TestDb
Starting verification of database instance information for database TestDb
Checking the state of database TestDb
Querying the disks used by the database TestDb
Verification of standalone database TestDb completed successfully
NODE4 : Standalone resource TestDb was verified successfully
NODE3 : Preparing for configuration of resource TestDb
NODE3 : Verification of the standalone resource
Starting verification of database TestDb
Starting verification of Oracle Net configuration information for database TestDb
Generating the Oracle Net migration plan for TestDb
Configuring the Oracle Net Service name for TestDo
Starting venification of database instance information for database restud
Venification of standalone database restud completed successfully
The slustenuide exercise completed successfully
The clusterwide operation completed successfully.
Print Save As Cancel Close



## 5 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 Creating a Sample Single-Instance Database (page 3-1) to Group 1 group.

#### 5.1 Starting the Add This Resource to a Group Wizard

Select the resource you want to add to a group, then select **Add Resource** action from the **Actions** menu of the Oracle Resources view. Or right-click the selected resource in the Available Oracle Resources group to select **Add Resource** from the Available Oracle Resources actions.

🔋 Oracle Fail Safe Manager			•				-	×
File Action View Help								
🗧 🏟 🙍 📊 🚺 🖬								
🐐 Fail Safe Manager		Fail Safe Manac	ier	admin 🚬 🔿	Act	ions		 
Cluster-1     Oracle Resources		T di Odio Manag		· —	Ora	cle Resources		-
Group2	Fail Safe Manager > cl	uster 1 > Oracle Resources			6	Create Sample Database		
Group1	Oracle Resources in C	luster				View		)
Cle Groups	Available Oracle Reso	urces			a	Refresh		
	Name	Resource Type	Current Owner		?	Help		
	OFS1	Oracle Database	Node1	Sample	Te	stDb		
	🗊 TestDb	Oracle Database	Node2		6	Add Resource		
	ALFA1	Oracle Database	Node3			Validate		
	<			>	×	Delete Sample Database		
						Properties		
					?	Help		

#### 5.2 Adding Cluster Resource Name

The Add Resource to Group guided process wizard opens to assist in the configuration of the cluster resource. Microsoft failover clusters allows you to use any text string for the name of a resource. By default, Oracle Fail Safe uses the instance ID for the database. You can change the name to something more meaningful if desired. For example, the cluster resource name is changed to "Test Database" here.



au Resource To Group					
Name Group Nodes	Network Names	Parameters	Authenticat	tion Confir	mation
Cluster Resource Name		Back	Next	Finish	Cancel
What name should be used for	the cluster resou	rce?			
Test Database					

### 5.3 Select the Cluster Group

On this page, select the cluster group that will own the database. This group should own the disks used by the database. If Oracle Fail Safe finds that any of the disks are owned by a different group, then it asks you if you want to move those disks to the selected group.

Click Next.



dd Resource To Gro	qu			
	<u> </u>			
Name Group	Nodes Network Name	s Parameters Au	thentication Confi	rmation
Group		Back N	ext Finish	Cancel
What is the name of th	ne group to which you wa	int to add this resou	rce?	
	Group 1	-		

#### 5.4 Specifying the Nodes

If there are more than two nodes in the cluster, then it is necessary to determine which nodes could possibly host the database. Select the desired nodes from the **Available** list and move them to the **Selected** list. If any of the resources currently residing in the group exclude one of the nodes as a possible owner, then that node is shown in the **Unavailable** list. Also, the nodes that are not currently online is shown in the **Unavailable** list.



s will be the
2
7
7
Z



ossible Ov	wner Nodes		Back Next	Finish Cance
On which no possible ow	odes should this re ner nodes list for th	source be allow	ed to run? The list of s	elected nodes will be the
	Available		Selected	
			NODEL	
			NODE3	云
			v	
			0	$\bigtriangledown$
			0	Y
		1	88	
		Unavailable	,	
		NODE2		

### 5.5 Specifying the Virtual Host

If the cluster group has multiple network virtual addresses and it currently does not have any Oracle network TNS listeners configured, then you must select the addresses the new network listener should use for incoming database connections. Select the desired virtual addresses from the **Available** list and move them to the **Selected** list.



Network Na	imes	Back	Finish Cance
This resour virtual addr	rce needs to be associated ess or addresses would yo	with one or more virtual addresses i u like to use?	in this group. Which
	Available	Selected	
	Group 1 Group 2	8	
		>>	
		3	
		35	

#### 5.6 Specifying the Database Parameters

The **Database Parameters** file field is retrieved automatically. Enter the file name for the database parameters file (pfile). For most applications it is best to store the pfile on a shared disk in the group rather than on a node local disk. However, in situations where some nodes may not have the same resources available (such as memory or CPUs), it may be helpful to use a different pfile for each node in the cluster so that the database can be started using parameters that are appropriate for each particular node. However, when using local files, the pfile must have the same path and file name, that is, each node must use the exact file name that is entered on this page.

Click Next.



Hame Group Housa Netwo	
Database Parameters	Back Next Finish Cance
What is the name of the initialization p	parameter file?
F:\OFSDB\Admin\TestDb\pfile\INIT.	ora

### 5.7 Specifying Database Authentication

On this page, if the operating system authentication is not enabled, then the database is configured to use either operating system authentication or password authentication through the SYS database account.

Click Next.



dd Resource To Group				
Name Group Nodes Network Names	Parameters	Authentica	tion Confir	nation
Database Authentication	Back	Next	Finish	Cancel
The Oracle Fail Safe Server must access the d account do you want to use?	atabase for co	nfiguration ir	formation.	What
Use operating system authentication				
Use SYS account				
Password assas				
	Charles and Charles			
Confirm Password   •••••				

If an Oracle Home User is configured, then Oracle Fail Safe displays an additional set of password fields for the Oracle Home User. Ensure that you provide the Oracle Home User password too.



Database Authenticat	ion	Back	Next	Finish	Cance
The Oracle Fail Safe S account do you want t	erver must access the onuse?	database for o	configuration info	rmation. W	hat
<ul> <li>Use operating sys</li> </ul>	tem authentication				
Use SYS account					
Passw	and seen				
Confirm Passwo	and eeee				
Oracle Home User Pa	assword				
domain\user					
Password	••••				
Confirm Password	••••				

### 5.8 Confirming the Addition of the Database Resource

Click **Finish** to begin the process of configuring the database so that it may be accessed as a cluster resource.



Add Resourc	e To Gr	oup					×
Name	Group	Nodes	Network Names	Parameters	Authentication	Confirm	nation
Confirmation				Back	Next	inish	Cancel
Adding	) a resol	urce to a	group causes the	resource and	all existing resou	irces in t	he group to
	own.						

### 5.9 Viewing the Progress of Add Resource to Group Operation

Clicking **Finish** opens the Adding resource to group progress window.



NODE3 : Starting confi	guration of resou	rce TestDb		
NODE3 : Preparing for	configuration of	resource TestDb		
NODE3 : Bringing the r	esource TestDb (	offline		
NODE3 Moving group (	Group 1 to NODE	3		
Starting to move grou	p Group 1 to NO	DE3		
Performing resource-s	pecific operations	s to prepare for	the move operat	ion
Moving group Group 1	to NODE3			
Waiting for the operat	ion to move grou	p Group 1 to N	DDE3 to complet	e
Group Group 1 succes	sfully moved to N	NODE3		
NODE3 : Configuring vi	rtual server infor	mation for reso	urce TestDb	
Generating the Oracle	Net migration pla	n for TestDb		
Configuring the Oracle	Net listener for T	TestDb		
Oracle Net configurati	on file updated: ADMIN\LISTENE	D:\ORACLE\PRO R.ORA	DUCT\12.1.0.2	
Oracle Net listener Fs	Group1 creat	ed		
Configuring the Oracle	Net service name	e for TestDb		
Oracle Net configurati	on file updated: ADMIN\TNSNAM	D:\ORACLE\PRC IES.ORA	DUCT\12.1.0.2	
NODE3 : Creating the r	esource informat	tion for resource	TestDb	
Creating database insta Instance created.	ance INS4 for Or	acle Net service	name TestDb	
NODE3 : Bringing reso	urce TestDb onlin	ie		
NODE3 : Completed co Starting move of grou	nfiguration of res p Group 1 to pref	source TestDb ferred owner no	de	
The preferred owner	for group Group	1 is not specified	I. The current no	de is the
Resource TestDb was su	ccessfully added	to group Group	1	
The clusterwide operation	on completed suc	cessfully.		



## 6 Validating a Group

A group validation process 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 **Validate** action makes it easy to restore the configuration of the Oracle Resources to working order. When you use the **Validate** action, Oracle Fail Safe attempts to correct any configuration problem it finds. It is not necessary to validate a group immediately after you create it, but it is done in this lesson to demonstrate the operation.

#### 6.1 Using the Validate Group Command

Click on the desired group in the tree view and then select the **Validate** action from the Actions menu in the right pane.



#### 6.2 Viewing Progress

As the **Validate** 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 in a progress window.

When the operation is complete, click **OK** in the Cluster Operation Status window and **Close** in the Validating group "Group 1" window.



Vali	dating	droup	"Grou	p 1"
		9.000		PT - 1 - 1 - 1

			and the second se	and the second second second second second
NODE4 : Performing initialization	ation process	ing		
NODE3 : Performing initialization	ation process	ing		
NODE4 : Determining owner	node of res	ource		
NODE4 : Gathering cluster in	nformation n	eeded to perfo	rm the specifi	ied operation
NODE3 : Gathering cluster in	nformation n	eeded to perfo	rm the specifi	ied operation
NODE3 : Starting verification	n of group Gr	oup 1		
NODE3 : Verifying group att	ributes for gr	oup Group 1		
NODE3 : Verifying attributes	for resource	s in group Gro	up 1	
Verifying disk resource Clust	ter Disk 1	1 T G 74 D 1		
Verifying the IP address reso	ource IP Add	ress 192.0.2.0		
Verifying Oracle Net listener	resource			
OracleOraDB12Home1TNSLi	istnerFslclus	ter_2		
Verifying database resource	TestDb			
NODE3 : Verifying depender	ncies for reso	urces in group	Group 1	
Verifying dependencies for d	lisk resource	Cluster Disk 1		
Verifying the dependencies f	for IP addres	s resource IP /	Address 192.0	).2.0
Verifying dependencies for t	he network n	ame resource	cluster-2	
Verifying dependencies for C	Dracle Net list	tener resource		
OracleOraDB12Home1TNSLi	istnerFslclus	ter_2		
Verifying dependencies for d	latabase reso	ource TestDb		
NODE3 : Verification of grou	ip Group 1 co	mpleted succe	essfully	
NODE4 : Starting verification	n of group Gr	oup 1		
NODE4 : Verifying group att	ributes for gr	oup Group 1		
NODE4 : Verifying attributes	for resource	s in group Gro	up 1	
Verifying disk resource Clust	ter Disk 1			
Verifying the IP address reso	ource IP Add	ress 192.0.2.0	)	
Verifying Oracle Net listener	resource			
OracleOraDB12Home1TNSLi	istnerFslclus	ter_2		
Verifying database resource	TestDb			
NODE4 : Verifying depender	ncies for reso	urces in group	Group 1	
Verifying dependencies for d	lisk resource	Cluster Disk 1		
Verifying the dependencies f	for IP addres	s resource IP /	Address 192.0	).2.0
Verifying dependencies for t	he network n	ame resource	cluster-2	
Verifying dependencies for C	Dracle Net list	tener resource		
OracleOraDB12Home1TNSLi	istnerFslclus	ter_2		
Verifying dependencies for d	latabase reso	ource TestDb		
NODE4 : Verification of grou	ip Group 1 co	mpleted succe	essfully	
The clusterwide operation cor	mpleted succ	essfully.		
r i i i i i i i i i i i i i i i i i i i	0	C. A.	Const 1	Channel
the second s	Print	Save As	Cancei	Liose

## 7 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.

#### 7.1 Performing a Planned Failover

Create three groups: **Sales**, **Marketing**, and **Customers**. Create **Sales**, **Marketing**, and **Customers** on **Node4**.

Enable failback for each group, and set the current node of each group at the top of the Preferred Owner Nodes list.

The following figure shows the initial configuration of the cluster:

1		Oracle Fail Safe	Manager		- • ×
File Action View Help					
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Fail Safe Manager		Safe Manager		admin 🔘	Actions
cluster-1		oure manager		_	cluster-2
Oracle Resources	Cluster cluster-2				Connect
Customers	Manage Oracle Resources				Disconnect
C Marketing	Nodes				Dump
Lag Suics	Name	Status			🚇 Validate
	NODE3	🔂 Up			View 🕨
	NODE4	Û Up			🛛 Help
	Groups				Sales 🔺
	News	Charles	C		1 Start Role
	Name	Status	Current Owner		🐥 Stop Role
	Customers	Online	NODE4		🗮 Move
	Marketing	Unline	NODE4		🖙 Validate
	Sales	1 Online	NODE4		👔 Help
		Including and the second s			
This action moves this service	or application to another node in the	e cluster.			

Suppose that you have recently added more CPUs to **Node3**. **Node3** can better handle the load of the **Sales**, **Marketing**, and **Customers** groups. You can move the groups to the new, more capable system with minimal interruption in service to your users.

#### 7.2 Moving the Sales Group

Because **Node3** is the more robust system, the first step is to move **Sales**, **Marketing**, and **Customers** groups to **Node3**.

To move the Sales group from **Node4** to **Node3**, right-click the **Sales** group and select **Move**. (Your node names will be different.) Or select **Move** in the **Actions** menu of the **Sales** Group view.



If there are more than two nodes in the cluster, then a submenu listing the possible nodes is displayed. You must select the desired target node from the submenu.



### 7.3 Confirming the Move Group Operation

A confirmation window asks to move the Sales group to Node3. Click Yes.

Confirm Move Group	
Are you sure you want to move the group "Sales"?	
Yes No	

### 7.4 Finishing Moving the Group

The Moving Group window displays the progress of the move operation. When the move is finished, click **OK** in the Clusterwide Operation Status window, then click **Close** in the Moving Group "Sales" to node NODE3 window.



Moving grou	up "Sales" to node NODE3
NODE4 : Starting to move group NODE4 : Performing resource-sp NODE4 : Moving group Sales to NODE4 : Waiting for the operation NODE4 : Group Sales successful The clusterwide operation complete	o Sales to NODE3 Decific operations to prepare for the move operation NODE3 on to move group Sales to NODE3 to complete ly moved to NODE3 eted successfully.
	Print Save As Cancel Close

### 7.5 Checking the Preferred Owner Nodes List

Select the **Sales** group in Microsoft Windows Failover Cluster Manager window, then click the **Properties** action under the **Actions** menu in the right bottom pane of the window. This opens the General property page of Sales group.

L.		Failo	ver Cluster Manage	r		
File Action View Help						
P 🤎 📶 🔟 🔟						Actions
a is cluster-1.example.com	Roles (3)		a an		11.1	Dalas
Roles	Search			P∏Qu	ieries 🕶 🔛 💌 🗸	Roles
Nodes	Name	Status	Туре	Owner Node	Priority In	Configure Kole
D Storage Networks	Customer	Running	Other	Node4	Medium	Virtual Machines
Cluster Events	marketing	Running	Other	Node4	Medium	Create Empty Role
-	📆 Sales	Running	Other	Node4	Medium	View
						Refresh
						Help
						Sales
						C Start Role
						Stop Role
						Add Ella Shara
						Add File Share
	,					In Move
	<	ш			\$	Change Startup Priority
	rea.				and the second	Information Details
	Sales			Preterre	d Owners: Any node	B Show Critical Events
	- taken and	States and				🛔 🍰 Add Storage
	Status:	Running				Add Resource
	Priority:	Medium NODE4			≡	More Actions
	Client Access Name	cluster-4				X Remove
	IP Addresses:	2001:0db8:0000:00	000:0000:0000:0000:0000			Properties
	<	III			5	
	Summary Resources					neib

Check the **Preferred owners** list. The data on this window indicates that **Node4** is the preferred owner node. However, now that you have rearranged the configuration, you probably want **Node3** to be the preferred owner node. With the current settings, if **Node3** fails and the **Sales** group fails over to **Node4**, the **Preferred owners** list indicates that you prefer the **Sales** group to reside on **Node4**; failback does not occur when **Node3** comes online.



	Sales Properties	x
General Fa	ilover	
s	ales	
<u>N</u> ame:		
Sales		
at the bot	E4	
	E 3	
P <u>r</u> iority:	Medium 🗸	
Status:	Running	
Node:	NODE 3	
	OK Cancel Apply	/

### 7.6 Rearranging the Preferred Nodes List

Re-arrange the **Preferred owners** list so that **Node3** is first in the list and **Node4** is second. Select **Node3** from the **Preferred owners** list and click the **Up** button. The **Preferred owners** list should list **Node3** first and **Node4** second.

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

	Sales Properties	x
General F	ailover	
	Sales	
Name:		
Sales		
Preferre	d Owners	
Select the	he preferred owners for this clustered role. Use the bu	uttons
at the bo	em in order from most preferred at the top to least pre	rerred
	DE4	
		p
	Des	WD.
Pnonty:	Medium V	
Statue:	Rupping	
Judius.	nunning	
Node:	NODE3	
	OK Cancel	Apply

### 7.7 Viewing the Balanced Workload

When you finish the planned failover, the Oracle Fail Safe Manager tree view should appear similar to the following image. In this image, the **cluster-2** folder in the left pane of the window is expanded, and the **Sales** group shows as selected in the middle pane. Its corresponding actions are displayed in the bottom right pane. Cluster actions are listed in the **Actions** menu on the right.



1		Oracle Fail Safe	Manager		- 🗆 🗙
File Action View Help	)				
🗢 🔿 🖄 🖬 🖬 🖬					
🚡 Fail Safe Manager		Safe Manager		admin 🔾	Actions
Cluster-1		oure manager		<u> </u>	cluster-2
Oracle Resources	Cluster cluster-2				Connect
Customers	Manage Oracle Resources				Disconnect
Call Marketing	Nodes				Dump
Lag Juies	Name	Status			🚇 Validate
	NODE3	🔂 Up			View 🕨
	NODE4	🔂 Up			<table-cell> Help</table-cell>
	Groups				Sales 🔺
	Groups	-			1 Start Role
	Name	Status	Current Owner		🐥 Stop Role
	Customers	Online	NODE4		🗮 Move
	😂 Marketing	1 Online	NODE4		Sev Validate
	😂 Sales	🕜 Online	NODE3		Help
		أأألمهما وأعصانا بعد			

## 8 Identifying the Location of Fail-Safe Databases to Client Applications

Typically, 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.

#### 8.1 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.



DracleOraDB12Home1TNSListenerFslcluster_2Properties
General Dependencies Policies Advanced Policies
Resource Name OracleOraDB12Home1TNSListenerFslcluster_2 Resource Type Oracle TNS Listener Status Online
Listener Name Fslcluster_2 Home Name OraDB12Home1
TCP Protocol
Host Port
192.0.2.0
IPC Protocol EXTPROCcluster_2
SID List INS4
Use the Listener Control Utility for "Is Alive" polling
OK Cancel Apply

## 9 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. 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.

# 9.1 Selecting the Remove This Resource From The Group Action

Select **TestDb** from the middle pane of the window. Then, from the **Actions** menu in the left pane of the window, select **Remove**.

🛍 Oracle Fail Safe Manager					_	×
<u>File</u> <u>Action</u> <u>View</u> <u>H</u> elp						 
Fail Safe Manager		ail Safe Manager		admin 🔾	Actions	
Custer-1     Oracle Resources	Oracla Descurses	an oaro manago.			Oracle Resources	-
Group2	Fail Safe Manager > cluster	1 > Oracla Pacourcas			🎁 Create Sample Database	
Group1	Oracle Resources in Cluster	r > Olacie Resources			View	•
Group3	Name	Status			Q Refresh	
	Group1 on Node1				👔 Help	
	TslGroup1	Online			TestDb	
	TortDh		Container Database		Bring Online	
			Container Database		🐣 Take Offline	
	TESTPORT	Read Only Read Only	Restricted		Remove	
	R TESTPDB3	Read Write			Group Actions	•
	Auriable Ornale Beaureau				Properties	
	Name	Pasauras Tursa C	urrent Oumer			
		Oracle Database	Node3		м нер	
	<b>G</b> OFST	Cracle Database	NOUES			
					I)	

#### 9.2 Confirming the Remove Resource from Group Request

When you remove **TestDb** resource from the group, Confirm Remove Resource from Group dialog box opens asking, "Removing the database "TestDb" from the group causes all of the databases in the group to shut down. All database users will be disconnected. Continue?" Click **Yes**.





### 9.3 Monitoring the Clusterwide Operation

Oracle Fail Safe opens a window and begins the remove operation.

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



NODE3 : Preparing for co	onfiguration of r	esource Test	Db			
Starting to move group	Group 2 to NO	DE3				
Performing resource-spe	cific operations	to prepare fo	or the m	ove operat	ion	
Moving group Group 2 t	0 NODE3					
Waiting for the operation	n to move grou	p Group 2 to	NODE3	to comple	te	
Group Group 2 successf	ully moved to N	ODE3				
NODE3 : Modifying virtua	al server configu	iration for res	ource Te	estDb		
Generating the Oracle Ne	et migration pla	n for TestDb				
Configuring the Oracle N	et listener for T	estDb				
Oracle Net listener Fslo	luster-2 delete	d				
Oracle Net configuration	n file updated: [ NER.ORA	D:\ORACLE\P	RODUCT	\12.1.0.2\ <mark>D</mark>	BHOME_1	
Listener configuration u \pfile\INIT.ora	pdated in datab	ase paramet	er file: H	:\OFSDB\A	ldmin\/INS	<b>;4</b>
Oracle Net listener LIST	ENER restarted					
Configuring the Oracle N	et service name	for TestDb				
Oracle Net configuration	n file updated: I AMES.ORA	D:\ORACLE\P	RODUCT	\12.1.0.2\ <mark>D</mark>	BHOME_1	
NODE3 : Deleting resour	ce information f	or resource T	estDb			
Deleting the database re	source TestDb f	rom group G	roup 2			
NODE3 : Completed conf	iguration of res	ource TestDb	el.			
NODE3 : Updating the O	racle Net service	e name for Te	estDb			0000
Oracle Net configuration	n file updated: I AMES.ORA	D:\ORACLE\P	RODUCT	12.1.0.2	BHOME_1	Ę
Resource TestDb was rem	oved from grou	p Group 2				
The clusterwide operation	completed succ	cessfully.				



## 10 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 methods.

#### 10.1 Using the Delete Sample Database Command

If the database is still in a group, remove it, using the method described in Removing a Resource from a Group (page 9-1). Then, in the tree view or the middle pane of the screen, select **TestDb**. On the **Actions** menu in the right pane of the screen, select **Delete Sample Database**.

🛍 Oracle Fail Safe Manager						-	×
File Action View Help							
<= ⇒   2 🖬 🛿 🗖							
<ul> <li><sup>™</sup> Fail Safe Manager</li> <li>✓</li></ul>		Fail Safe Manag	er	admin 🧕	Actions Oracle Resources		*
Group2	Fail Safe Manager S cluc	tor 1 > Oracla Bacourcoc			🎁 Create Sample Database		
Group1	Oracle Resources in Clus	iter			View		•
🔤 Groups	Name	Status			Refresh		
	Group1 on Node1				😰 Help		
	3 FslGroup1	1 Online			OFS1		
	⊳ 👩 TestDb	1 Online			😂 Add Resource		
	A with the Owneds Descent				🎁 Validate		
	Name	Resource Type	Current Owner		🗙 Delete Sample Database		
	DES1	Oracle Database	Node1	Sample	Properties		
	OFS2	Oracle Database	Node2	Sample	👔 Help		
	<			>			
					,		

#### 10.2 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.





#### 10.3 Authenticating Your Privileges to Delete the Database

Depending on whether an operating system authentication is enabled, Oracle Fail Safe may open the Enter Database SYS Account Password window to confirm that you have SYS account privileges to delete the sample database. If this window opens, enter the password for the SYS account.

Enter Data	base SYS Account Password
Database Service Name Node SYS Account Password	TestDb NODE3
	OK Cancel

#### 10.4 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 sample database "OFS1"
Node1 : Starting the deletion of standalone resource OFS1 Node1 : Performing initialization processing
Node1 : Preparing for configuration of resource OFS1
Node1 : Deleting the standalone resource
Starting to delete the standalone sample database OFST
Connecting to database
4% complete
9% complete
14% complete
19% complete
23% complete
28% complete
47% complete
Updating network configuration files
48% complete
52% complete
Deleting instance and datafiles
100% complete
Look at the log file "C:\Oracle\cfgtoollogs\dbca\`OES1_log" for further details
Look at the log me C. (Chatle (Ligtoologs (ubta ( CF 31.log Tor further details.
Node1 : Standalone resource OFS1 was deleted successfully The clusterwide operation completed successfully.
Print Save As Cancel Close