

PRIMECLUSTER Wizard for Oracle 4.2

Configuration and Administration Guide

Oracle Solaris

J2S2-0360-01ENZ0(01)
September 2013

Preface

Purpose

The purpose of the document is to outline functions of PRIMECLUSTER Wizard for Oracle. Further, it describes the procedures from installation to operation management.

Readers

This document is intended for system engineers and system administrators who design, configure, and manage PRIMECLUSTER systems. The reader should have expertise in the PRIMECLUSTER and Oracle system.

Outline

The document consists of the following six chapters and four appendices:

- Chapter 1 Feature
- Chapter 2 Environment setup
- Chapter 3 Operation
- Chapter 4 Command
- Chapter 5 Notice
- Chapter 6 Message
- Appendix A Setup Method with CUI
- Appendix B Failure case studies
- Appendix C Using PRIMECLUSTER Wizard for Oracle in Oracle Solaris Zones Environments
- Appendix D (Information) Action Definition File

Technical term

For technical words related to clusters in this document, see the manual. Unless otherwise specified, the following words are used for Oracle products. For details, see the Oracle manuals.

- Oracle instance:
Referred to as “instance”, “Oracle instance”, or “Oracle RAC instance” in this document
- Oracle listener:
Referred to as “Listener”, or “Oracle listener” in this document
- Oracle Real Application Clusters:
Referred to as “RAC”, “Oracle9iRAC”, or “Oracle RAC10g” in this document
- Oracle Clusterware:
Referred to as “Oracle Clusterware” in this document
If you operate Oracle RAC 10g Release1, “Oracle9 Clusterware” is referred to as “Cluster Ready Services (CRS)”.
- Oracle user:
Referred to “Oracle user” or “DBA user” in this document
Oracle users are those who install, operate, and manage Oracle systems.
Users need to belong to the Oracle inventory group (oinstall) and OSDBA group (dba:Database Administrator)

Notational convention

The document conforms to the following notational conventions:



Note

Describes points to be taken notice of.



Information

Describes information a user can refer to.



Example

Describes by using an example.



See

Provides the names of manuals to be referenced.

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Additions and changes	Section	Edition
Added the description of using Oracle Solaris Legacy Containers(OSLC)	1.2 Operating Environment Appendix C Using PRIMECLUSTER Wizard for Oracle in Oracle Solaris Zones Environments	1.1
Added the clgetalog command collects information	4.5 clgetalog - Collect Troubleshooting Information	
Added the Notice of PRIMECLUSTER Wizard for Oracle.	Chapter 5 Notice	

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Chapter 1 Feature

1.1 Feature outline

PRIMECLUSTER Wizard for Oracle is a software product that facilitates cluster operation management for Oracle operating on a PRIMECLUSTER system.

The scalable operation requires Oracle Real Application Clusters (Oracle9i RAC or Oracle RAC 10g). The standby operation requires Oracle cold standby instances.

Module structure

The modules for operating Oracle on PRIMECLUSTER are as follows:

Environment setup Wizard	Environment setup tool to enable Oracle operation on PRIMECLUSTER
Detector	Module to monitor Oracle
Scripts	Control Oracle startup and stop
Setup/operation command	Commands used to set up and operate

Environment setup

The environment setup tool provides “ORACLE” Wizard that generates userApplication in the environment configuration by executing the “hvw” command of PRIMECLUSTER RMS Wizard.

Monitoring

A detector monitors Oracle instances and Oracle listeners.

The detector connects itself to Oracle as a SYSTEM user to monitor the Oracle instance. Then, it periodically creates, updates, and deletes a table, which is created in the SYSTEM user’s default table space by executing the SQL command so that it can monitor the process state of the Oracle instance as well as logical failures. If the Oracle instance hangs, so the SQL command is not returned within a specified time, then the detector will time out to notify a user of the error.

The two types of monitoring the Oracle listener are process detection and the “tnsping” command.

In operation with Oracle RAC 10g, a detector monitors Oracle instances and Oracle listeners. If the Oracle instances and listeners fail, they will be recovered by Oracle Clusterware.

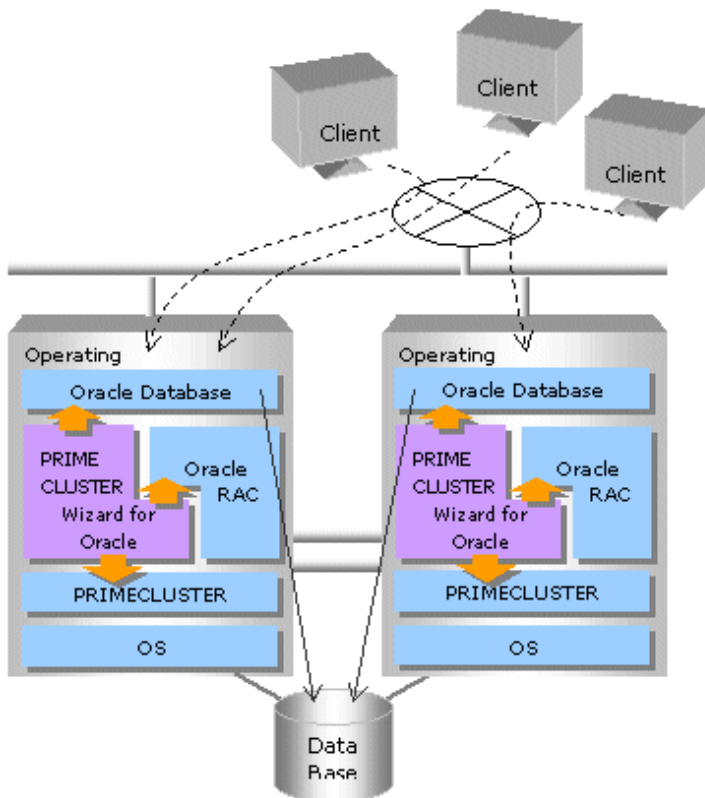
Startup and stop control

Along with the state transition of a cluster system, scripts automatically start or stop Oracle instances or Oracle listeners. These scripts first check and then start up the Oracle instances. If damage occurs, the scripts automatically recover the Oracle instances. For example, if the Oracle instance fails during online backup, the scripts automatically execute “end backup” to start up the Oracle instance (When the AutoRecover is set to “Yes”.) When stopping the Oracle instance, the scripts stop it in the immediate mode (default). If this does not occur properly, the scripts will stop the instance in the abort mode. This means operating node switchover can be performed at high-speed.

In operation with Oracle RAC 10g, start and stop of Oracle Clusterware are managed.

1.2 Operating Environment

Scalable operation

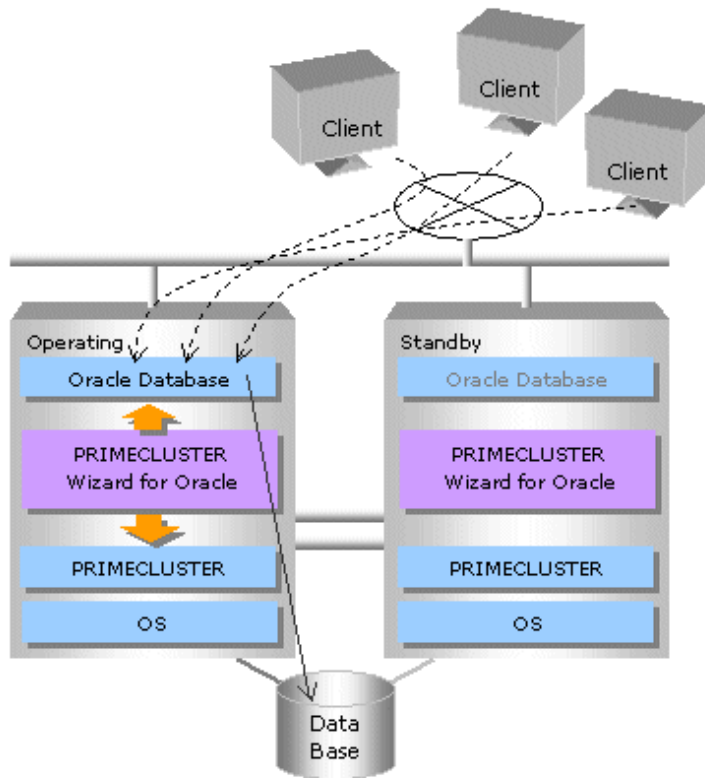


In scalable operation with Oracle9i RAC or Oracle RAC 10g, Oracle is operated on all nodes. The clients can access to the database regardless of which node they are connected to.

Note

In operation with Oracle RAC 10g, start and stop of Oracle Clusterware are managed by PRIMECLUSTER Wizard for Oracle.

Standby operation



In standby operation, a cluster system consists of an operating node and standby nodes. On the operating node, the resources such as Oracle applications, a logical IP address and shared disks are active. On the standby node, these resources are inactive. In the event of a failure, userApplication is switched to the standby node, and the resources on this standby node become activated. Then, the client can connect itself to the operating node using the logical IP address without changing any settings.

Note

When using PRIMECLUSTER Wizard for Oracle in Oracle Solaris Zones environments, refer to "[Appendix C Using PRIMECLUSTER Wizard for Oracle in Oracle Solaris Zones Environments](#)".

Chapter 2 Environment setup

2.1 Oracle Environment Setting

This section explains a general setup procedure of Oracle operating on a PRIMECLUSTER system.

Scalable operation (Oracle9i RAC)

No	Procedure	
	One arbitrary node	Other nodes
1	Install and configure PRIMECLUSTER	Install and configure PRIMECLUSTER
2	Install PRIMECLUSTER Wizard for Oracle	Install PRIMECLUSTER Wizard for Oracle
3	Install and configure Oracle software	Install and configure Oracle software (*Installation automatically done)
4	Create userApplication	-
5	Create and set up an Oracle database	-
6	-	Set up an Oracle database
7	Create and set up Oracle resources	-

For details, see "2.2 Standby Operation and Oracle9i RAC Scalable Operation".

Scalable operation (Oracle RAC 10g)

No	Procedure	
	One arbitrary node	Other nodes
1	Install and configure PRIMECLUSTER	Install and configure PRIMECLUSTER
2	Install PRIMECLUSTER Wizard for Oracle	Install PRIMECLUSTER Wizard for Oracle
3	Install and configure Oracle software	Install and configure Oracle software (*Installation automatically done)
4	Create and set up an Oracle database	-
5	Create and set up Oracle resources	-

For details, see "2.3 Oracle RAC 10g Scalable Operation".

Standby operation

No	Procedure	
	Operating node	Standby node
1	Install and configure PRIMECLUSTER	Install and configure PRIMECLUSTER
2	Install PRIMECLUSTER Wizard for Oracle	Install PRIMECLUSTER Wizard for Oracle
3	Install and configure Oracle software	Install and configure Oracle software
4	Create userApplication	-
5	Create and set up an Oracle database	-
6	-	Set up an Oracle database
7	Create and set up Oracle resources	-

For details, see "2.2 Standby Operation and Oracle9i RAC Scalable Operation".

2.2 Standby Operation and Oracle9i RAC Scalable Operation

This section describes how to configure an environment for standby operation and Oracle9i RAC scalable operation”.

For the configuration procedure for Oracle RAC 10g scalable operation, see “[2.3 Oracle RAC 10g Scalable Operation](#)”.

2.2.1 PRIMECLUSTER Installation and Configuration

Set up hardware

Set up hardware required for PRIMECLUSTER. The shared disk is also required to create an Oracle database.

Install software

Install PRIMECLUSTER first, referring to the “PRIMECLUSTER Installation Guide”.

Then, install Oracle Wizard following the instructions of the “PRIMECLUSTER Wizard for Oracle Installation Guide”.

Scalable operation requires the PRIMECLUSTER Enterprise Edition.

Standby operation requires the PRIMECLUSTER Enterprise Edition or PRIMECLUSTER HA Server or PRIMECLUSTER Clustering Base.

Configure a cluster system

Configure a cluster system including network systems and shared disk units according to the PRIMECLUSTER manual.

2.2.2 Oracle Installation and Configuration

This section explains how to install and configure Oracle.

Initial setup

- Set up the kernel parameter

Set up values in the “/etc/system” file for Oracle in addition to the values for PRIMECLUSTER.

The kernel parameter values vary depending on the implemented Oracle versions.

Refer to the Oracle installation guide. The parameter values should be the same on all the nodes.

Note

Before installing Oracle, it is necessary to change the “/etc/system” file and reboot the node.

- /etc/services

Set up a port number for the Oracle listener.

Example

```
listener 1521/tcp oracle
```

- Oracle User

Create a DBA (database administrator) to allow users to install and operate Oracle. The user ID and the group ID must be the same on all the nodes.

Example

```
# groupadd -g <groupID> dba
# groupadd -g <groupID> oinstall
```

```
# useradd -u <userID> -g oinstall -G dba -d /home/oracle -s /bin/sh -m oracle
# passwd oracle
```

Normally, the group name should be “dba” and “oinstall”.

Set up an environment variable of Oracle user.

Example

(.profile)

```
ORACLE_BASE=/opt/oracle; export ORACLE_BASE
ORACLE_HOME=/opt/oracle/product/9.0.1; export ORACLE_HOME
ORACLE_TERM=sun-cmd; export ORACLE_TERM
ORA_NLS33=$ORACLE_HOME/ocommon/nls/admin/data; export ORA_NLS33
LD_LIBRARY_PATH=$ORACLE_HOME/lib; export LD_LIBRARY_PATH
PATH=$ORACLE_HOME/bin:/usr/bin:/usr/ccs/bin:/usr/ucb; export PATH
```

When “/usr/ucb” is contained in PATH, it needs to be set up after ”/usr/ccs/bin”.

Note

PRIMECLUSTER Wizard for Oracle controls Oracle as the Oracle DBA user.

- Be sure to include "\$ORACLE_HOME/bin" in the PATH environment variable of the DBA user.
- Check if root user access privileges can switch the user to the Oracle user, using the su(1M) command.

```
# su - <Oracle user>
```

- A command (e.g. script) that has interactive mode should not be described in Oracle user's profile. (e.g. /etc/profile, .bash_profile, .cshrc, .profile) It may cause failure of resource monitoring or userApplication startup or shutdown.
- Environment that Oracle user's home directory and profile are located on the shared disk is not supported. Oracle user's home directory and profile must be located on the local disk of each node.

See

For further details, refer to the Oracle manual.

Installation

- Standby operation

Install Oracle using Oracle user access privileges. Install a program on the local disk of each node. The database needs to be created on the shared disk when configuration of the cluster system is completed, not when Oracle is installed. The details will be described later in this document.

- Scalable operation

For information on how to install RAC, see the RAC Installation Guide.

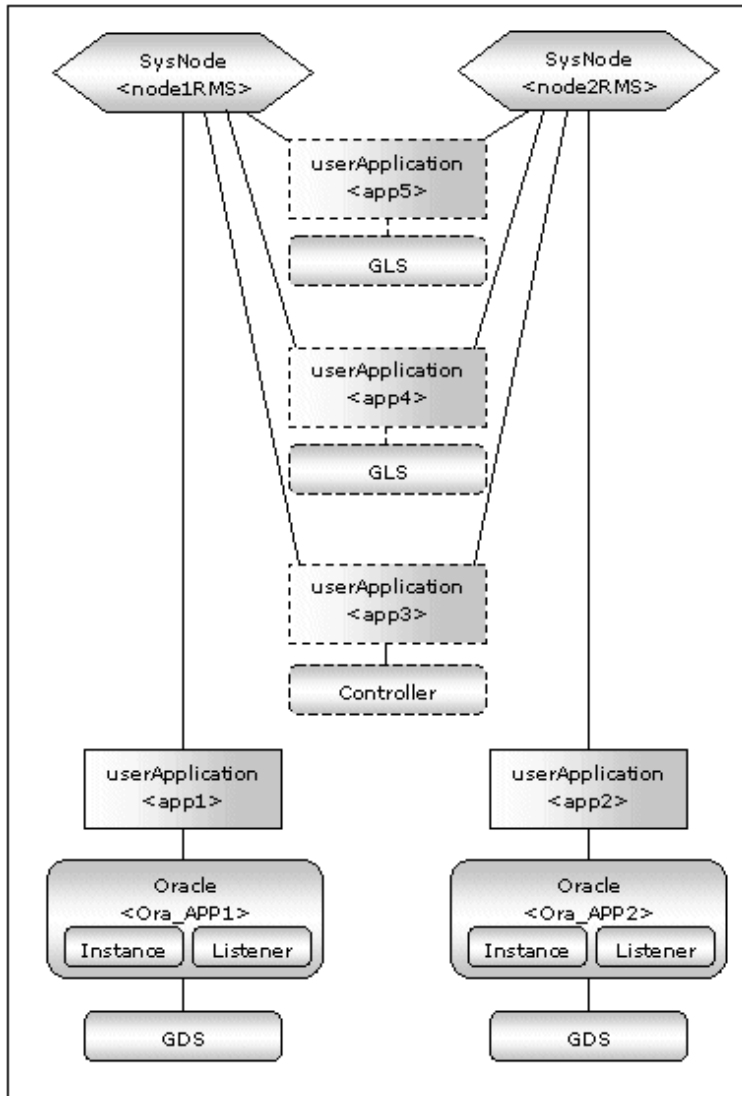
See

For further details, refer to the Oracle manual.

2.2.3 userApplication Creation

Operating userApplication is configured as follows:

Oracle9i RAC scalable operation



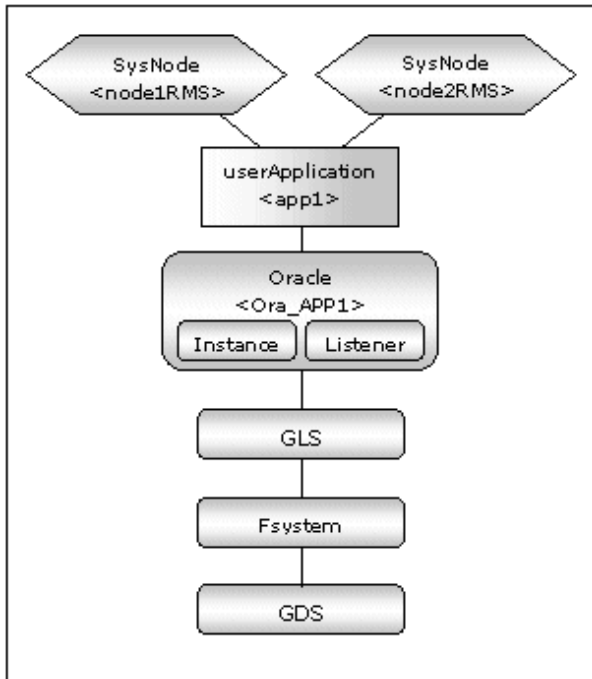
userApplication	Description	Resources
app1,app2	Controls Oracle instances and listeners. It is created on each node.	Gds resource
app3	Starts up or stops userApplication (app1 and app2) simultaneously on all nodes. Optional	Controller resource
app4,app5	Used as standby for GlS or takeover network.(Option) Create them according to operating conditions.	GlS resource, Cmdline resource, etc

Information

The following setup values are recommended for app1 and app2. The other attributes not described below are optional.

Attributes	Values
Operation method	Standby
AutoStartUp	Optional If you control userApplication startup and stop on all nodes by using the controlling userApplication, be sure to specify No.
AutoSwitchOver	No
PersistentFault	1

Standby operation



userApplication	Description	Resources
app1	userApplication on all operation nodes	Oracle resource (instance, listener) Gds resource Fsystem resource Gls resource

Information

The following setup values are recommended for userApplication app1. The other attributes not described below are optional.

Attributes	Values
Operation method	Standby
AutoSwitchOver	HostFailure ResourceFailure ShutDown
PersistentFault	1
HaltFlag	yes

The flow of userApplication creation is as follows:

1	userApplication with No Oracle Resources userApplication Operation Check	2.2.4 2.2.5 2.2.6
2	Oracle Database Creation and Setting	2.2.7
3	userApplication with Oracle Resources userApplication Operation Check	2.2.9 2.2.10 2.2.11 2.2.12

 **Information**

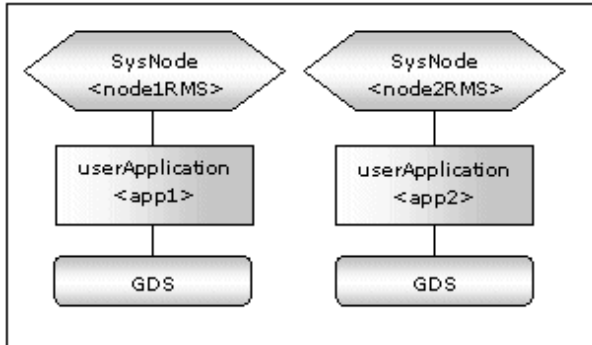
PersistentFault remains the same resource status (Faulted) even after RMS is restarted in the event of a resource failure. Users are supposed to locate the fault and check completion of recovery processing then start userApplication manually. For example, if a failure occurs, users can detect which userApplication failed even after server reboot. Even though AutoStartUp setup is set, userApplication will not be started, and automatic startup will prevent recurrence of the failure.

2.2.4 userApplication with No Oracle Resources

This section discusses the configuration of userApplication that does not include Oracle resources.

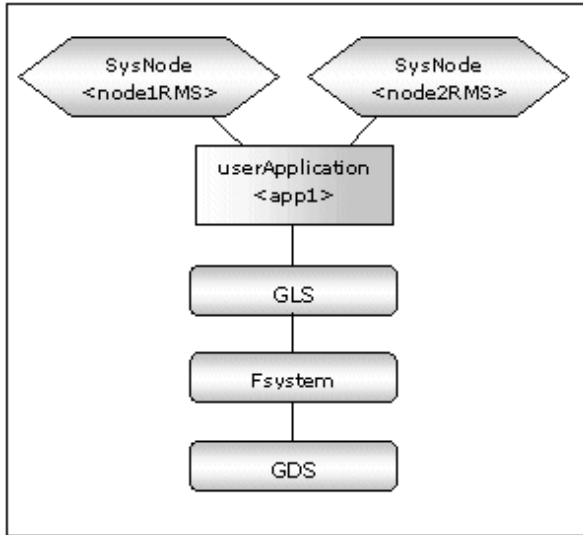
Oracle9i RAC scalable operation

In Oracle9i RAC scalable operation, non-Oracle resources are configured first as follows:



Standby operation

Non-Oracle resources are configured first as follows:



GDS setup

GDS is set as “shared disk for concurrent access” for scalable operation and “switching disk” for standby operation. We recommend that you prepare the disk class for Oracle system table space and other Oracle data respectively. In that case, the MONITORONLY attribute of the disk class should be set to “NO” for the Oracle system table space and “YES” for the other Oracle data.

userApplication setup

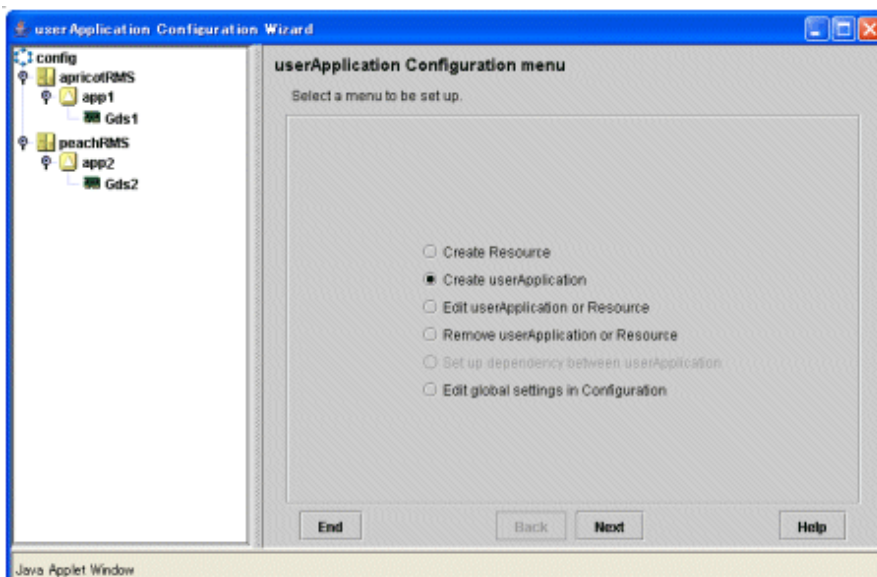
Create userApplication using the userApplication Configuration Wizard. See “6.6 Setting Up Cluster Applications” of the “PRIMECLUSTER Installation and Administration Guide”.

Set up userApplication using the userApplication Configuration Wizard. The RMS Configuration Wizard uses the format that allows you to select information in the menu.

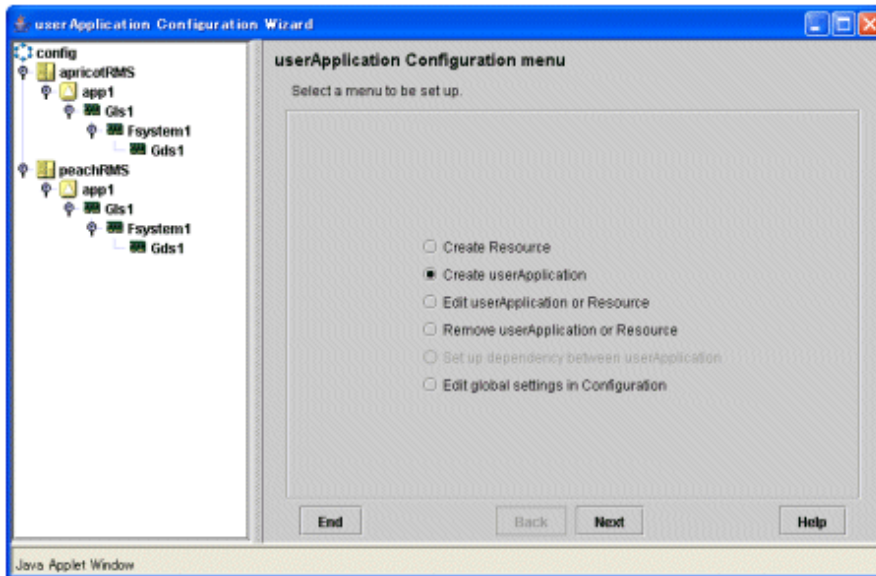
2.2.5 Configuration-Generate and Configuration-Activate

Check the set contents and then generate and activate the configuration. The image screens after activation are as follows:

Oracle9i RAC scalable operation



Standby operation



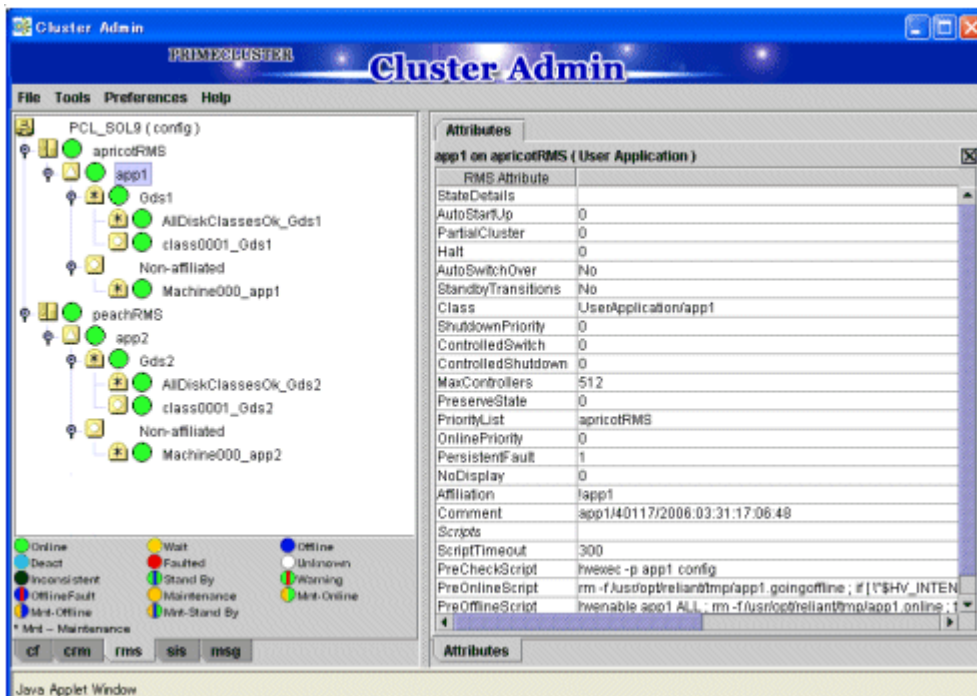
2.2.6 userApplication Operation Check

Start up userApplication and check if it is normally running on all the nodes by.

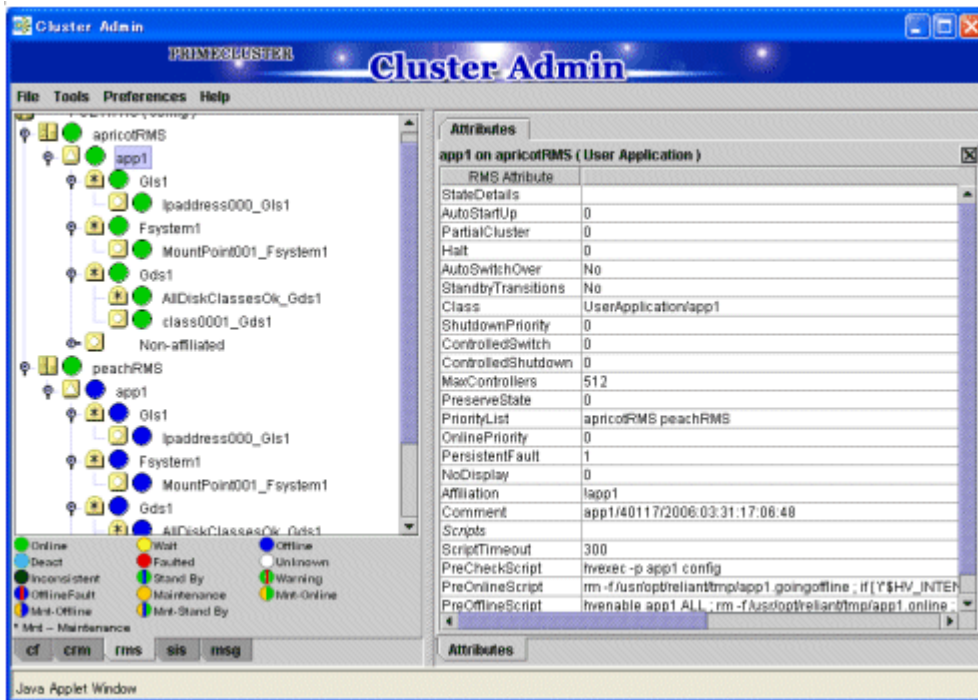
Configuration of operations

Check if the configuration is correct in the Cluster Admin screen of Web-Based Admin View. The image screens of Cluster Admin are as follows:

- Oracle9i RAC scalable operation



- Standby operation



Shared disk

Check if you can access to the shared disk from the operating node. Also, check if a file can be created on the shared disk using Oracle user access privileges.

Logical IP address

Check if you can access the operating node from the client using the logical IP address.

2.2.7 Oracle Database Creation and Setting

Allocate a database

Create a database on the shared disk. The shared disk must be activated.

The files are allocated as follows:

Files	Locations	Note
Init.ora file	Local	Allocate on a local disk of each node
Server parameter file	Share	-
Control files	Share	-
Data files	Share	-
Redo log files	Share	-
Archive log files	Arbitrary	Allocate either on a local disk or a shared disk
Alert log files	Local	Allocate on a local disk of each node

Information

Check if the Oracle user has privileges to write in a shared disk before creating the database.

If you use ASM (Automatic Storage Management) for Oracle 10g, it is necessary to register the ASM as an RMS resource. See “[2.4.2 ASM \(Automatic Storage Management\)](#)”.

Create a database (Scalable operation with Oracle9i RAC)

Create a database on any one of the nodes. The database must be accessible from the standby nodes.



See

Refer to the Oracle RAC manual.

Create a database (Standby operation)

- Operation node

Create a database on the operating node. The database must be accessible from the standby nodes.



See

Refer to the Oracle manual.

- Standby node

Set up the standby nodes in the same configuration (directory creation, file copy, and links) as the operating node.

- Under <\${ORACLE_HOME}/dbs
- Under <\${ORACLE_BASE}/admin/<\${ORACLE_SID}>

The access privilege to the directories and files must be also the same as that on the operating node.

If you set where archive log is output on the operating node, it is necessary to set the same on the standby nodes.



See

The required files on the operating node can be backed up in the tar format with the “cloracpy” command. See “[4.4 cloracpy - Create Backup File for Oracle Database Setup](#)”.

- Mutual standby / N:1 Standby operation

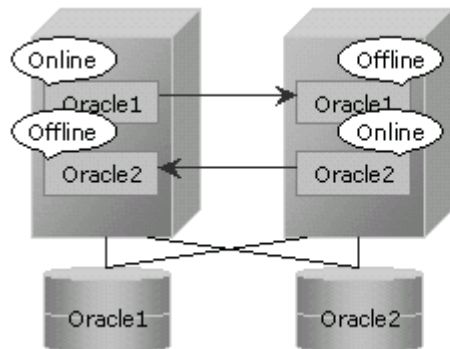
Create a database on an operating node.

The database on the shared disk created on the operating node must be accessible from the standby nodes. This is the same as the other operation modes.

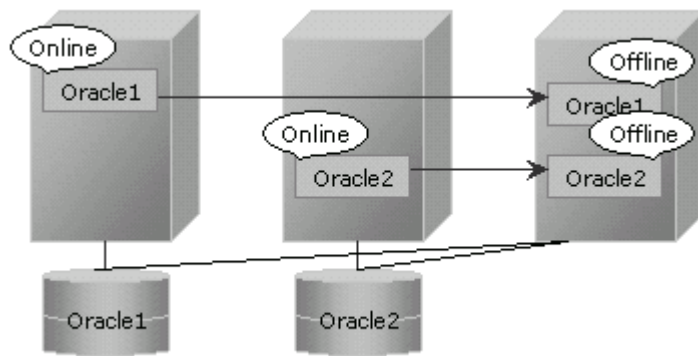


Example

Mutual standby



2:1 Standby



Parameter file

The initial parameter setting of LOCAL_LISTENER must be compatible with that of listener.ora and tnsnames.ora. If it is not, Oracle startup might encounter an error. You should also pay close attention to set up Oracle network.

If you operate Oracle servers, parameters, and files (parameter files), configure them on a shared disk. If they are not configured on the shared disk, the settings will be inconsistent between operating and standby nodes. Specify the path in the initial parameter file to allocate the servers, parameters, and files.

Example

How to set the initialized parameter file:

(<\${ORACLE_HOME}/dbs/init<\${ORACLE_SID}>.ora

```
spfile = /mnt2/o9idb/parameter/spfile.ora
```

Note

If you create a database using DBCA (Database Configuration Assistant) in the Oracle 10g environment, you might not be able to specify where the server parameter file is stored. If this occurs, move the server parameter file to the shared disk after creating the database as follows:

1. Mount the shared disk if it is not mounted. Start userApplication that is created at “[2.2.3 userApplication Creation](#)”.
2. Move the server parameter file to the shared disk.

```
#mv <${ORACLE_HOME}/dbs/spfile<${ORACLE_SID}>.ora <shared disk>/spfile<${ORACLE_SID}>.ora
```

3. Edit the initialized parameter file <\${ORACLE_HOME}/dbs/init<\${ORACLE_SID}>.ora as follows:

```
spfile=< shared disk >/spfile<${ORACLE_SID}>.ora
```

Execute step 3 on both of the operating node and standby nodes.

You can also use the cloracpy command to execute it on the standby nodes after the operating node.

Network setup

Set up the Oracle network.

```
${ORACLE_HOME}/network/admin/listener.ora, tnsnames.ora
```

- listener.ora

If you use Oracle listener switching operation using a logical IP address for standby operation, specify the logical IP address for the IP address of the Oracle listener.

Example

```
LISTENER =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = <logical IP address>)(PORT = 1521))
  )

SID_LIST_LISTENER =
  (SID_LIST =
    (SID_DESC =
      (GLOBAL_DBNAME = ora9i)
      (ORACLE_HOME = /opt/oracle/product/9.0.1)
      (SID_NAME = ora9i)
    )
  )
```

Note

- Operating system authentication (OS authentication) of Listener must be enabled. OS authentication is enabled in default. If the following parameter is defined in listener.ora file, OS authentication is enabled.

```
LOCAL_OS_AUTHENTICATION_<LISTENER_NAME> = ON
```

- tnsnames.ora

If the Oracle listener is monitored through tnsping, set up the “tnsnames.ora” file. Then, specify the network service name set for tnsnames.ora in the environment setting of the Oracle listener of PRIMECLUSTER Wizard for Oracle. In that case, ORACLE_SID, host (logical IP address), and port number must be the same as those of the Oracle listener.

Example

```
Network service name =
  (DESCRIPTION =
    (ADDRESS = (PROTOCOL = TCP)(HOST = <logical IP address>)(PORT = 1521))
    (CONNECT_DATA = (SID = ora9i))
  )
```

SYSTEM user password

PRIMECLUSTER Wizard for Oracle accesses and monitors Oracle as the Oracle SYSTEM user. Therefore, the SYSTEM user's password must be registered in PRIMECLUSTER Wizard for Oracle. See “4.3 clorapass - Register Password for Monitoring” to register the password.

Check Oracle operation

Check if Oracle is properly running by starting and stopping the Oracle instance and Oracle listener manually.

Note

- The Oracle “TWO_TASK” environment variable must not be changed. It is used to add a connect identifier to connect to Oracle then automatically connect to network. In PRIMECLUSTER Wizard for

Oracle, network connection is not supported. Users are supposed to connect to Oracle in local connection ("/ as sysdba"). If network connection is required, specify "@connect identifier" instead of using the "TWO_TASK" environment variable when connecting at the connecting.

- The processes other than definition of system environment variables must not be added to login.sql of Oracle DBA users. SQL can be described in the SQL*Plus profile login.sql. However, it might automatically be executed and affect ongoing operations because Oracle is controlled through SQL*Plus in PRIMECLUSTER Wizard for Oracle. It is available to setup the system environment variables to login.sql by SET command.

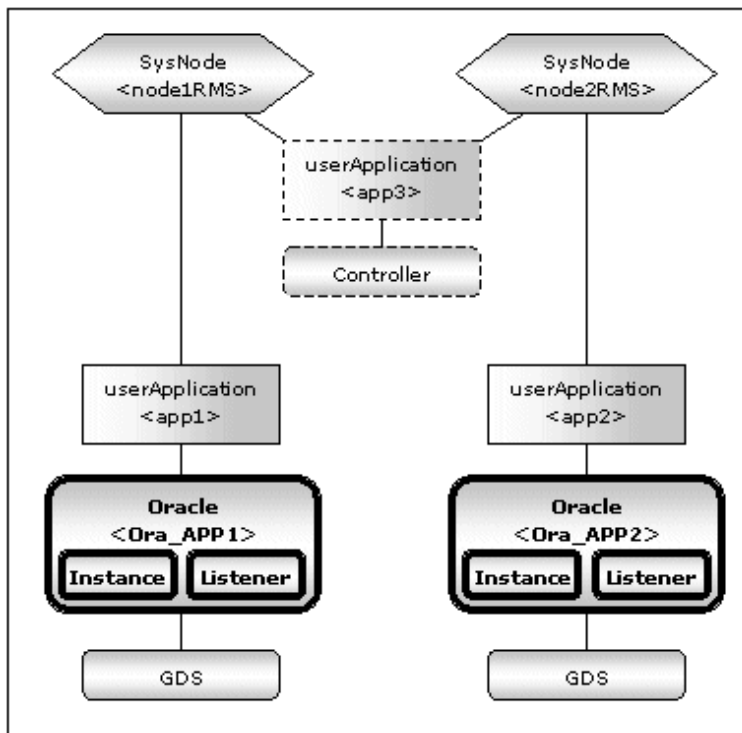
2.2.8 Oracle Resource Creation and Setting

Register Oracle resources in userApplication that is created at "2.2.4 userApplication with No Oracle Resources".

Oracle9i RAC scalable operation

In Oracle9i RAC scalable operation, userApplication is configured as follows.

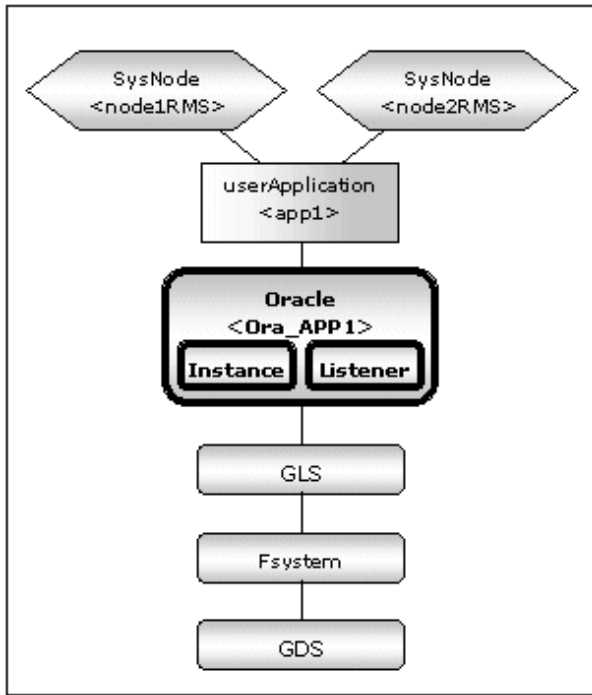
Note that resources (Ora_App1 and Ora_App2) are being created and added.



Standby operation

In standby operation, userApplication is configured as follows.

Note that resource (Ora_App1) is being created and added.



 **Note**

Check if Oracle is properly running by starting and stopping manually before starting Oracle Resource Creation and Setting.
 Before starting this procedure, Oracle instances, Oracle listeners and RMS on all the cluster nodes should stop.

 **See**

This section explains how to create userApplication and Oracle resources, referring to “8.1.1 Changing the Cluster Application Configuration” of the “PRIMECLUSTER Installation and Administration Guide”.

2.2.9 userApplication with Oracle Resources

userApplication with Oracle resources are created using the userApplication Configuration Wizard.

The flow of userApplication creation is as follows:

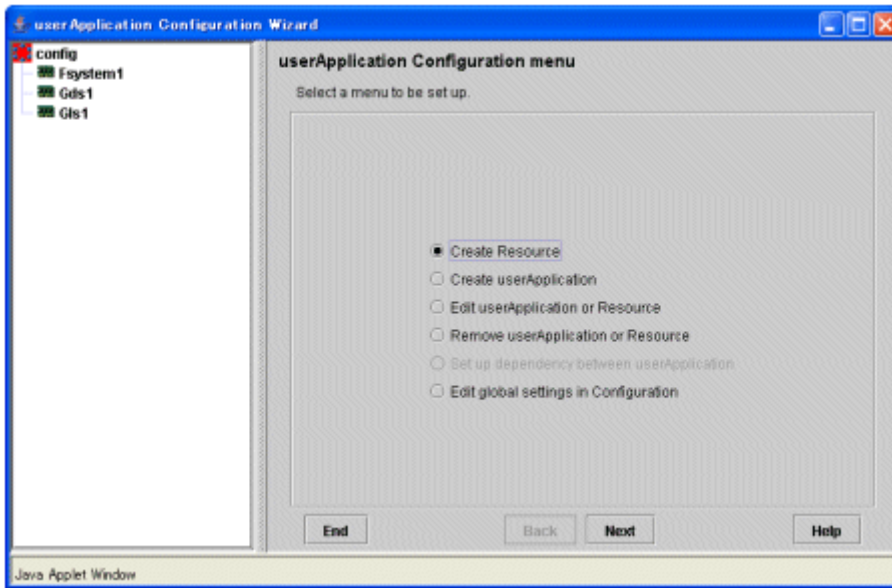
1	userApplication delete
2	Resources creation
3	userApplication creation

This section explains only about “2. Resources creation”.

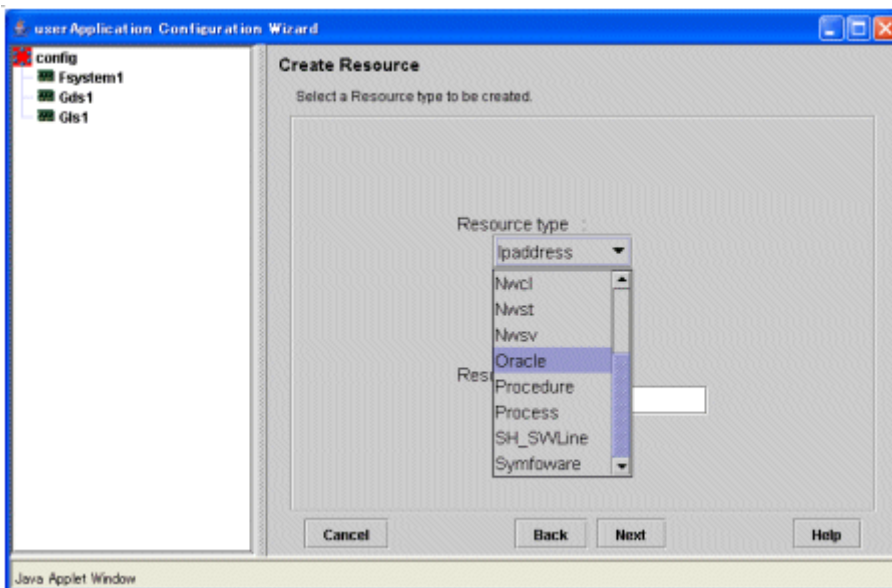
 **See**

For further details of “1. userApplication delete” and “3. userApplication creation”, refer to “8.1.1 Changing the Cluster Application Configuration” of the “PRIMECLUSTER Installation and Administration Guide”.

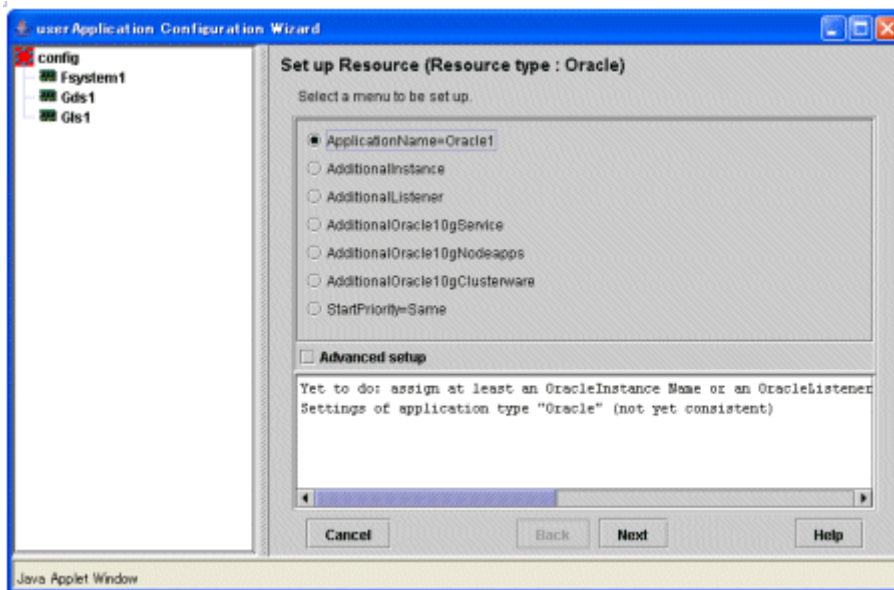
1. Select "Create Resource" in the "userApplication Configuration" menu.



2. Select "Oracle" in the "Resource Type" menu.



3. Add the Oracle instance and Oracle listener in the “Set up Resource” menu.



Attributes	Description
ApplicationName (SubApplicationName)	Change the application name.
AdditionalInstance	Add an Oracle instance resource.
AdditionalListener	Add an Oracle listener resource.
AdditionalOracle10gService	Not used.
AdditionalOracle10gNodeapps	Not used.
AdditionalOracle10gClusterware	Not used.
StartPriority	Set up the startup order of the Oracle instance and Oracle listener. The default is “Simultaneous startup”.

Information

A resource name on RMS is based on the application name (SubApplicationName) entered in "ApplicationName" on this step.

- Oracle instance resource/ASM instance resource
ORACLE_<SubApplicationName>_<OracleSID>
- Oracle listener resource
LISTENER_<SubApplicationName>_<ListenerName>

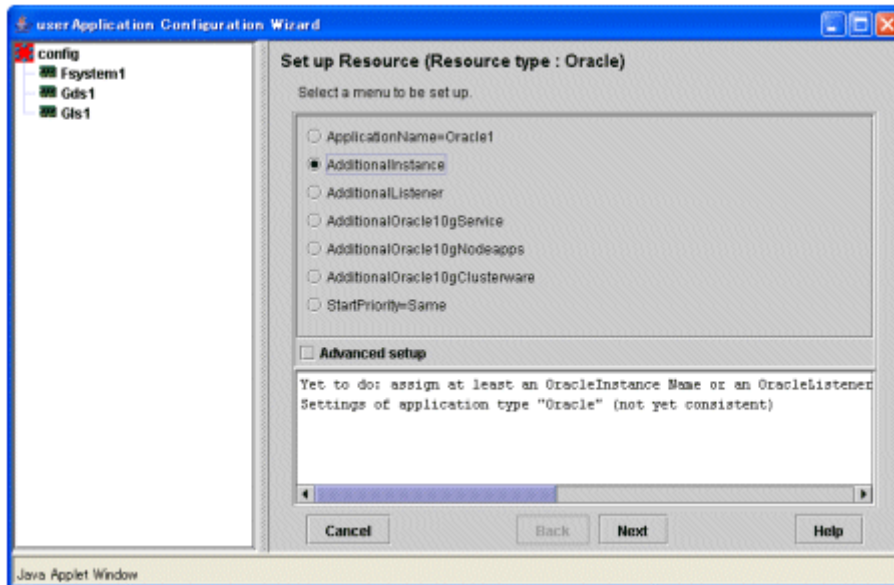
These resource names have the following convention and rules.

- Characters per resource name must be less than 40 characters.
- "ORACLE_" and "LISTENER_" are fixed words.

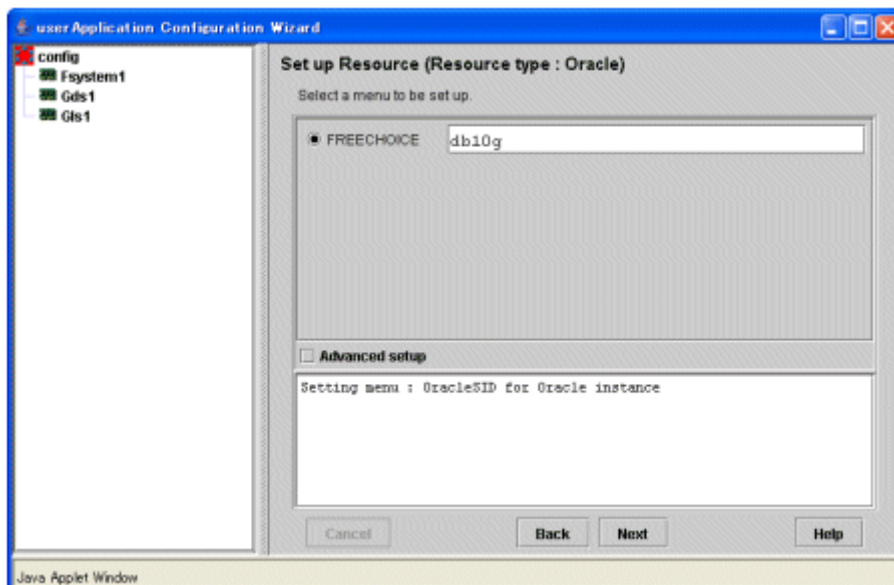
Example

If you use the Oracle multi-threaded server (MTS), the Oracle listener must be started first.

4. Set up the Oracle instance as follows:



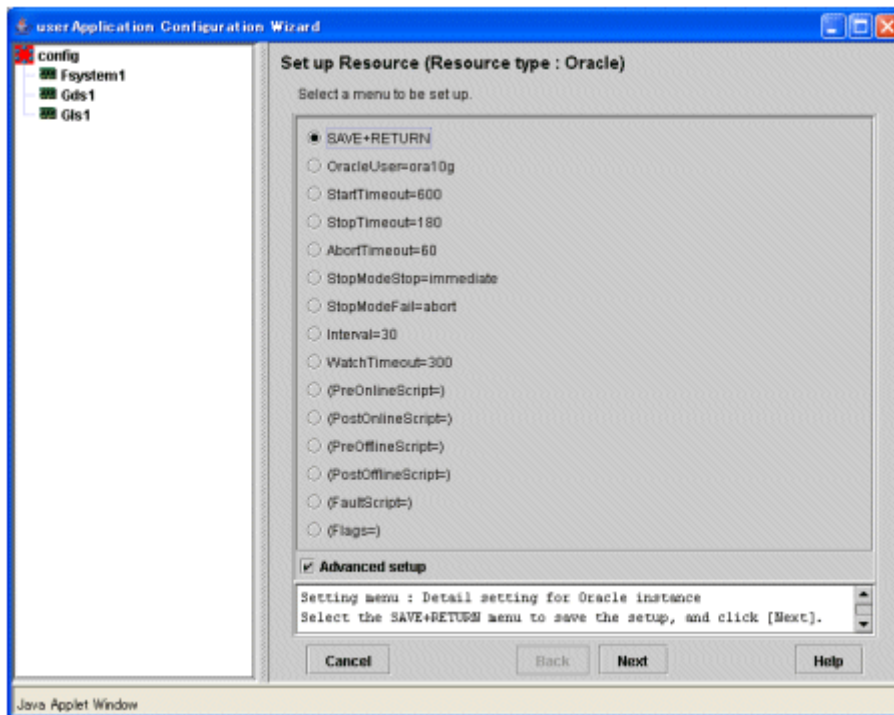
Enter ORACLE_SID.



5. Oracle instance settings

To change the settings, select setting item and click “Next” button.

To change the advanced settings, check “Advanced setup”.



The settings for Oracle instance resource are as follows:

Attributes	Description
OracleSID	ORACLE_SID
OracleUser	Oracle Installation user
StartTimeout	Timeout duration of Oracle startup. Default: 600s (300s - 86400s)
StopTimeout	Timeout duration of forced termination in the event of an Oracle stop error. Default: 60s (60s - 86400s)
AbortTimeout	Oracle stop mode in normal time. Default: Immediate mode (abort, immediate, transactional)
StopModeStop	Oracle stop mode in normal time. Default: Immediate mode (abort, immediate, transactional)
StopModeFail	Oracle stop mode in the event of a failure. Default: Abort mode (abort, immediate)
Interval	Monitoring interval of Oracle instance. Default: 30s (5s - 86400s)
WatchTimeout	No response time during monitoring Oracle. Default: 300s (30s - 3600s)

The advanced settings are as follows. These settings are optional:

Attributes	Description
PreOnlineScript	Executed before online processing. No default
PostOnlineScript	Executed after online processing. No default
PreOfflineScript	Executed before offline processing. No default

PostOfflineScript		Executed after offline processing. No default
FaultScript		Executed when a fault occurs. No default
Flags	NullDetector (D)	Selects whether or not resource monitoring is enabled. If it is enabled, resource monitoring will not be performed. The resource monitoring is disabled as default.
	AutoRecover (A)	Selects whether or not resource restart is attempted before failover in the event of a resource failure. If it is enabled, the resource will be restarted. The resource is not restarted as default.
	MonitorOnly (M)	Selects whether or not a failover is generated in the event of a resource failure. If it is enabled, the resource will not be switched. The resource will be switched as default.

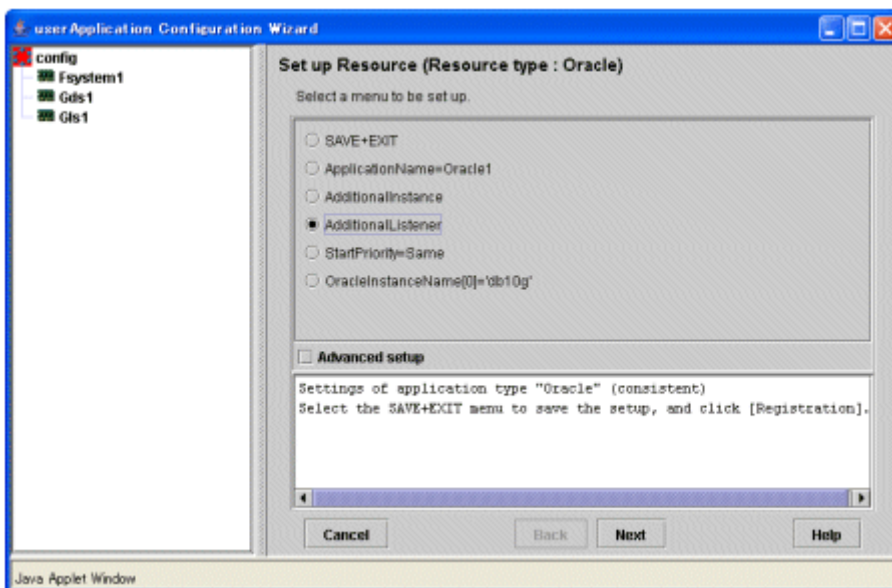
 See

- For details about Scripts, see "2.4.1 Oracle Online/Offline Script".
- For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".

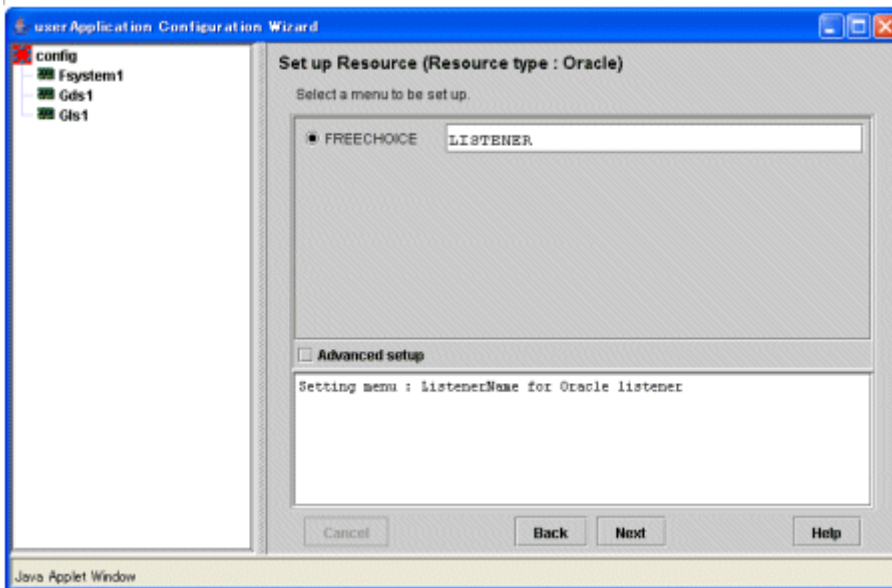
 Note

- If NullDetector is enabled, the AutoRecover and MonitorOnly attribute will automatically be disabled.
- If "Instance" or "Listener" is specified for StartPriority, MonitorOnly cannot be enabled. To enable it, specify "Same".
- Flags=<Initial letter> indicates that the flag attribute is enabled.

6. Set up the Oracle listener as follows:



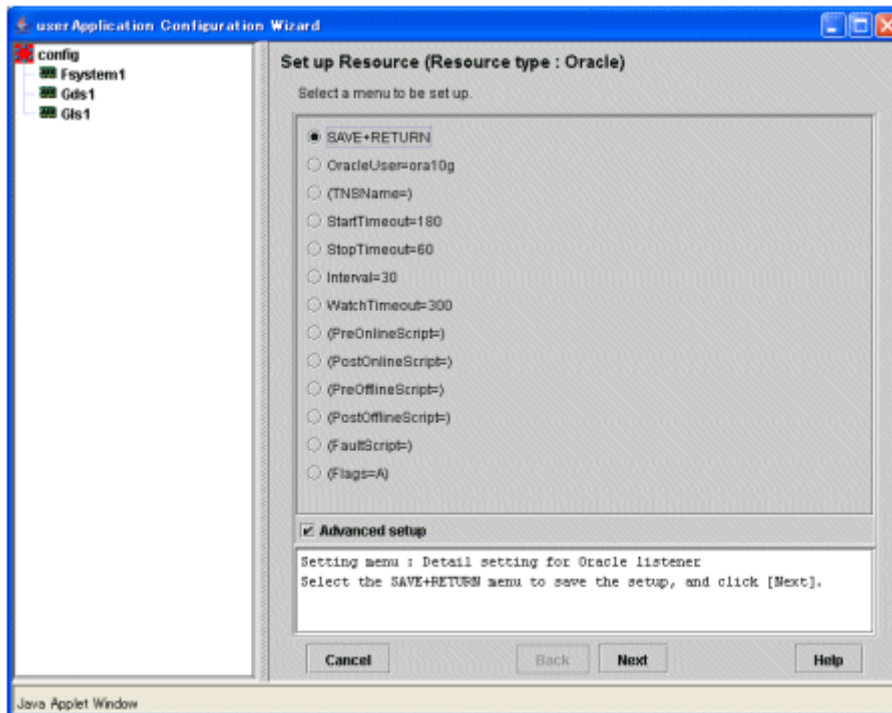
Enter the listener name.



7. Oracle instance settings

To change the settings, select setting item and click “Next” button.

To change the advanced settings, check “Advanced setup”.



The settings for Oracle listener resource are as follows:

Attributes	Description
ListenerName	Listener name
OracleUser	DBA user for Oracle control.
StartTimeout	Timeout duration of Oracle startup. Default: 180s (120s - 86400s)
StopTimeout	Timeout duration of forced termination in the event of an Oracle stop error. Default: 60s (60s - 86400s)

Interval	Monitoring interval of Oracle instance. Default: 30s (5s - 86400s)
WatchTimeout	No response time during monitoring Oracle. Default: 300s (30s - 3600s)

The advanced settings are as follows. These settings are optional:

Attributes		Description
TNSName		Network service for listener monitoring Execute the tnsping command to monitor the Oracle listener when TNSName is set (tnsnames.ora). If the TNSName is omitted, process monitoring of the Oracle listener will only be performed.
PreOnlineScript		Executed before online processing. No default
PostOnlineScript		Executed after online processing. No default
PreOfflineScript		Executed before offline processing. No default
PostOfflineScript		Executed after offline processing. No default
FaultScript		Executed when a fault occurs. No default
Flags	NullDetector (D)	Selects whether or not resource monitoring is enabled. If it is enabled, resource monitoring will not be performed. The resource monitoring is disabled as default.
	AutoRecover (A)	Selects whether or not resource restart is attempted before failover in the event of a resource failure. If it is enabled, the resource will be restarted. The resource is not restarted as default.
	MonitorOnly (M)	Selects whether or not a failover is generated in the event of a resource failure. If it is enabled, the resource will not be switched. The resource will be switched as default.

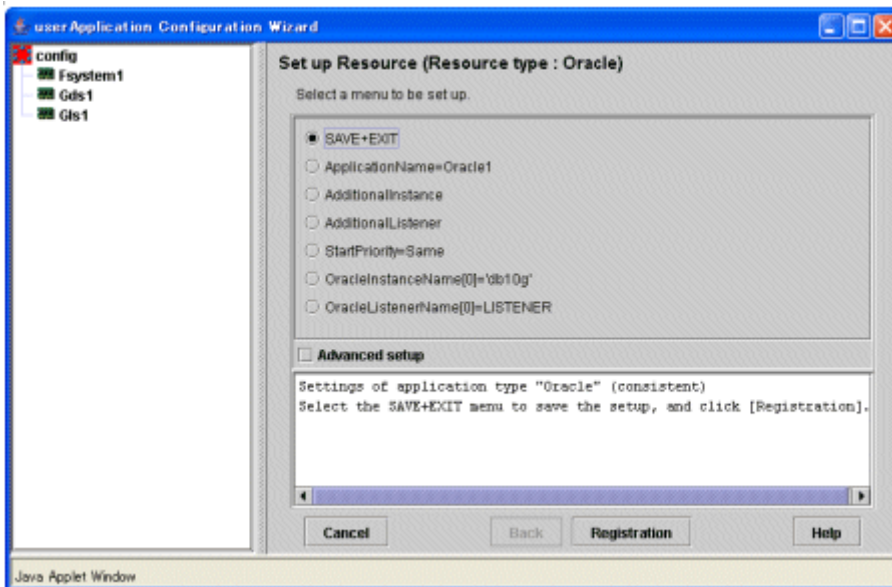
See

- For details about Scripts, see "2.4.1 Oracle Online/Offline Script".
- For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".

Note

- If NullDetector is enabled, the AutoRecover and MonitorOnly attribute will automatically be disabled.
- If "Instance" or "Listener" is specified for StartPriority, MonitorOnly cannot be enabled. To enable it, specify "Same".
- Flags=<Initial letter> indicates that the flag attribute is enabled.

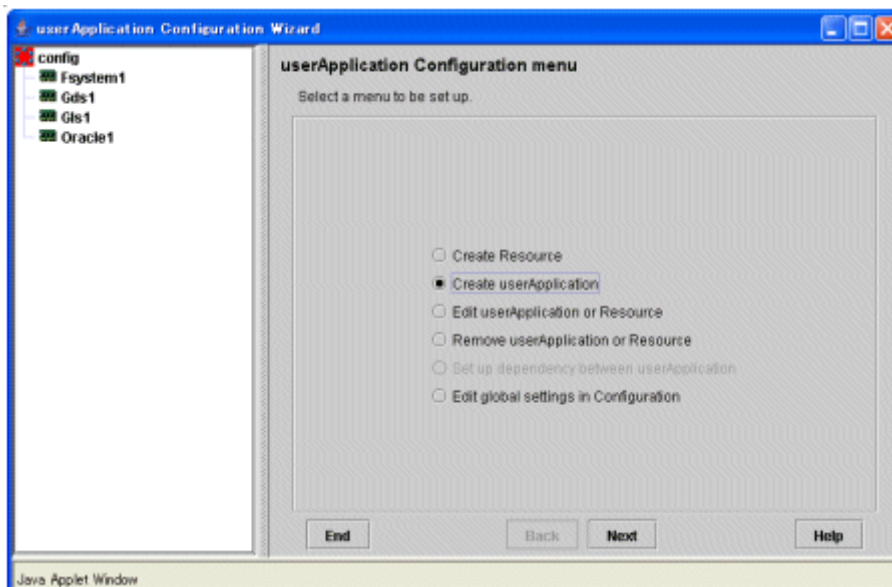
8. Save the settings by selecting “SAVE+EXIT”.
Check that the Oracle resource is set then save the settings by selecting SAVE+EXIT.



Note

When using Oracle9i RAC, follow the setup procedure from 1 through 8 for each userApplication.

9. If you have any other required resources, create them.
10. Select “Create userApplication” in the “userApplication Configuration” menu.
For further details of the attributes of userApplication, refer to “2.2.3 userApplication Creation”.



Note

HELP description is common to GUI and CUI, so a part of them includes a description about CUI.



- For further details of the attributes of userApplication, refer to “[2.2.3 userApplication Creation](#)”.
- After set up userApplication, the settings in this section can be confirmed with clorainfo -c command. See "[4.6 clorainfo - Display Resource Configuration and Monitoring Status](#)" for details.

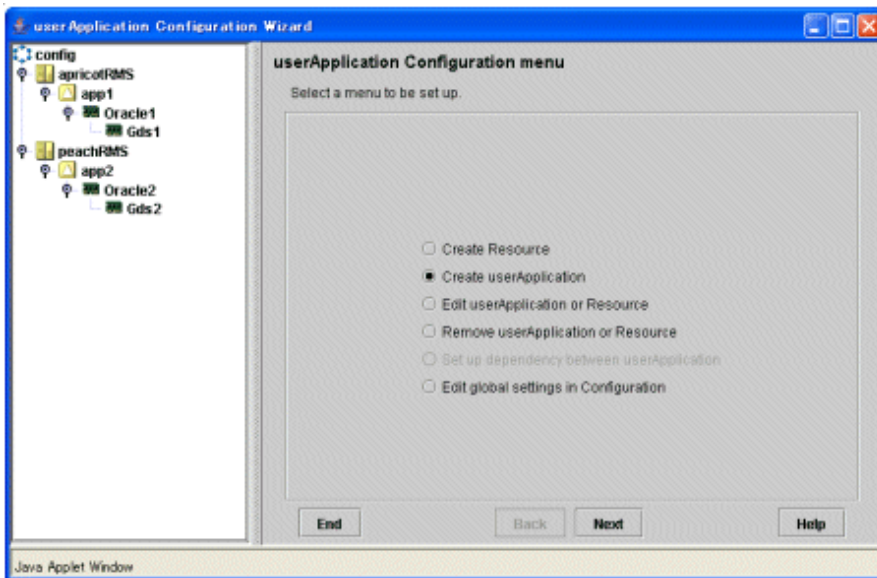
2.2.10 Other Resource and userApplication Registration

If you have any other required resources and userApplication, register and create them using the RMS Configuration Wizard.

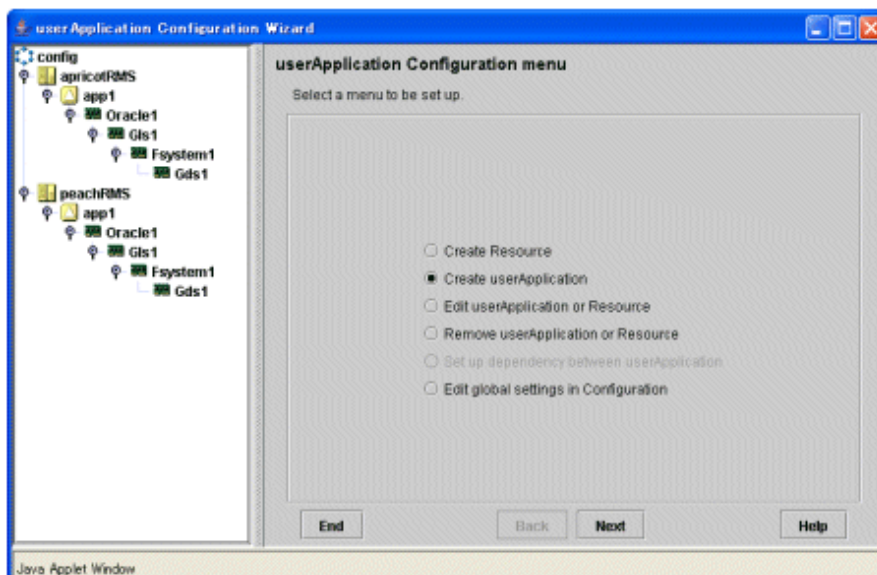
2.2.11 Configuration-Generate and Configuration-Activate

Check the set contents and then generate and activate the configuration. The image screens after activation are as follows:

Oracle9i RAC scalable operation



Standby operation



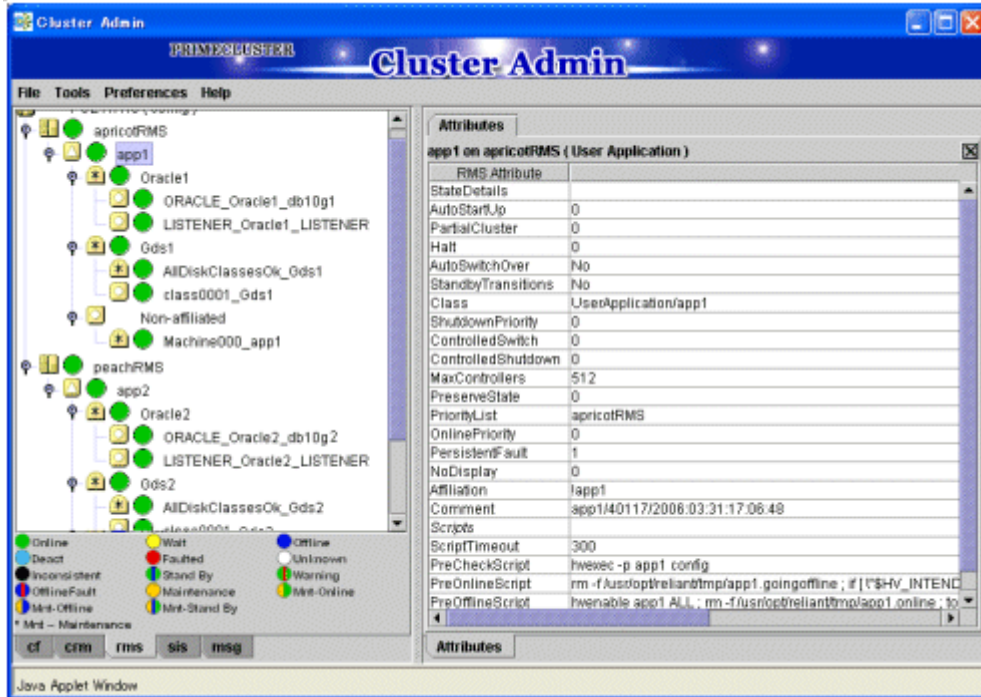
2.2.12 userApplication Operation Check

Start userApplication by executing the hvcm command then check if it is properly running on all the nodes.

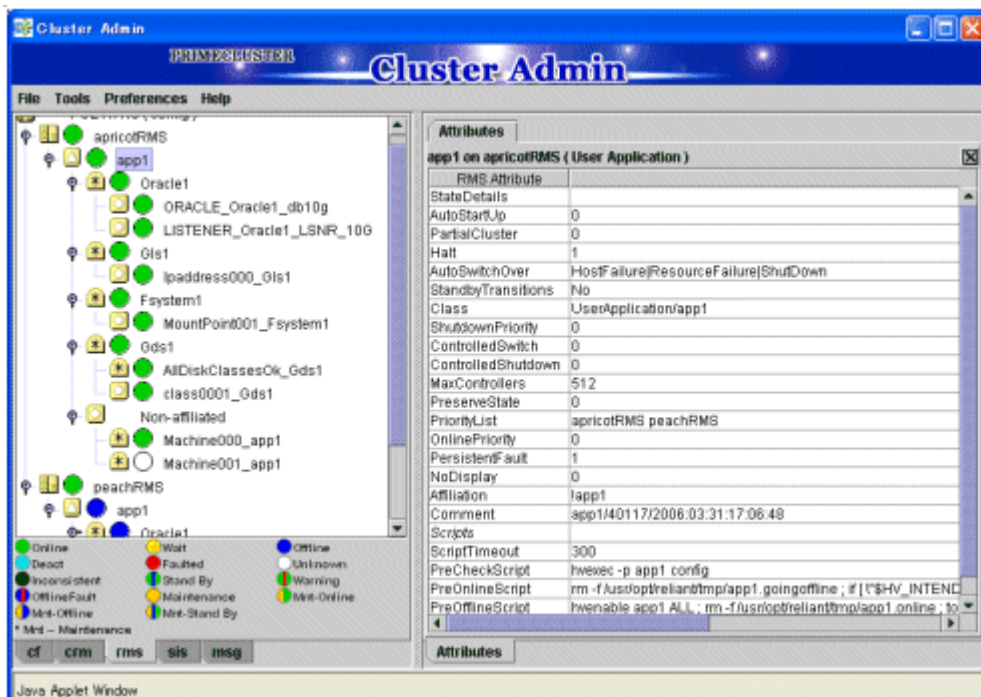
Configuration of operations

Check if the configuration is correct in the Cluster Admin screen of Web-Based Admin View. The image screens of Cluster Admin are as follows:

- Oracle9i RAC scalable operation



- Standby operation



Shared disk

Check if you can access to the shared disk from the operating node. Also, check if a file can be created on the shared disk using Oracle user access privileges.

Logical IP address

Check if you can access the operating node from the client using the logical IP address.

Oracle

Check if you can access to Oracle running on the operating node from the client using the logical IP address.

2.3 Oracle RAC 10g Scalable Operation

2.3.1 PRIMECLUSTER Installation and Configuration

Hardware configuration

Configure hardware required to operate PRIMECLUSTER. A shared disk device is also required to create Oracle database files.

Software installation

Install PRIMECLUSTER Enterprise Edition according to the “PRIMECLUSTER Enterprise Edition Installation/Administration Guide”. Install PRIMECLUSTER Wizard for Oracle according to the “PRIMECLUSTER Wizard for Oracle Installation Guide”.

Cluster configuration

Configure a cluster system, network, and shared disk device according to the PRIMECLUSTER manuals.

Startup method of Oracle Clusterware

In Oracle RAC 10g operation, there are two methods of starting up Oracle Clusterware as follows:

1. Automatically starts along with OS startup without registering Oracle Clusterware in a PRIMECLUSTER RMS resource.
2. Oracle Clusterware in a PRIMECLUSTER RMS resource then relies on userApplication behavior.



Note

If you choose 1., be aware that Oracle Clusterware accesses a shared disk device as soon as it is activated. A volume on the shared disk must be active when the Oracle Clusterware is activated.

2.3.2 Oracle Software Installation and Configuration

Site Preparation

Set kernel parameters and user groups according to the Oracle manual and installation guide. It is necessary to set a logical IP address for RAC on each node.

If you create a DBA (Database Administrator) user to install Oracle, start, or stop Oracle operation, make sure that user ID and group ID are identical on all the nodes.

For semopm, specify a value of 4 or more.

Oracle Clusterware installation

Install Oracle Clusterware by referring to the Oracle manual and installation guide.

Note

The PRIMECLUSTER Wizard for Oracle determines a directory where to install Oracle Clusterware with the “\$ORA_CRS_HOME” environment variable. Set an installation directory of Oracle Clusterware for the “\$ORA_CRS_HOME” environment variable of an Oracle DBA user.

Example

See the following setup example:

```
ORA_CRS_HOME=/opt/oracle/product/10.1.0/crs; export ORA_CRS_HOME
```

Oracle RAC 10g installation

Install Oracle 10g with the RAC option by referring to the Oracle manual and installation guide.

Note

PRIMECLUSTER Wizard for Oracle controls Oracle as the Oracle DBA user.

- Be sure to include ORACLE_HOME/bin and \$ORA_CRS_HOME/bin in the PATH environment variable of the DBA user.
- A command (e.g. script) that has interactive mode should not be described in Oracle user's profile. (e.g. /etc/profile, .bash_profile, .cshrc, .profile) It may cause failure of resource monitoring or userApplication startup or shutdown.
- Environment that Oracle user's home directory and profile are located on the shared disk is not supported. Oracle user's home directory and profile must be located on the local disk of each node.

Example

See the following setup example:

```
ORACLE_HOME=/opt/oracle/product/10.1.0/db; export ORACLE_HOME  
ORA_CRS_HOME=/opt/oracle/product/10.1.0/crs; export ORA_CRS_HOME  
PATH= $ORACLE_HOME/bin: $ORA_CRS_HOME/bin; export PATH
```

Database creating and settings

Create a database by referring to the Oracle manual and installation guide.

Information

In Oracle RAC 10 scalable operation, the RMS resource name is generated based on the resource name of Oracle RAC 10g as follows:

- Oracle RAC 10g instance resource

```
<SubApplicationName>_<inst_name>.i
```

- Oracle 10g listener resource

```
<SubApplicationName>_<inst_name>.l
```

The default value of <lsnr_name> is “LISTENER_<node name>”.

- Oracle Clusterware resource

```
<SubApplicationName>_Clusterware
```

The resource name begins with “<SubApplicationName>_” instead of “ora” of the resource name displayed with the crs_stat command of Oracle RAC 10g.

- <ApplicationName> must be up to 39 characters.
- For information on how to set up <ApplicationName>, see [“2.3.4 userApplication with Oracle Clusterware”](#) and [“2.3.5 userApplication with Oracle RAC Instances and Listeners”](#).

Disabling automatic startup of Oracle Clusterware

Disable automatic startup of Oracle Clusterware by executing the following command on each node with super user access privileges.



Example

See the following setup example:

```
# /etc/init.d/init.crs disable
```



Note

This setup is required when the Oracle Clusterware is registered in an RMS resource.

Operation check

Check if Oracle instances and listeners are properly operating. Also, check if the crs_stat command can be executed using the DBA user.



Example

The following example shows the operation results:

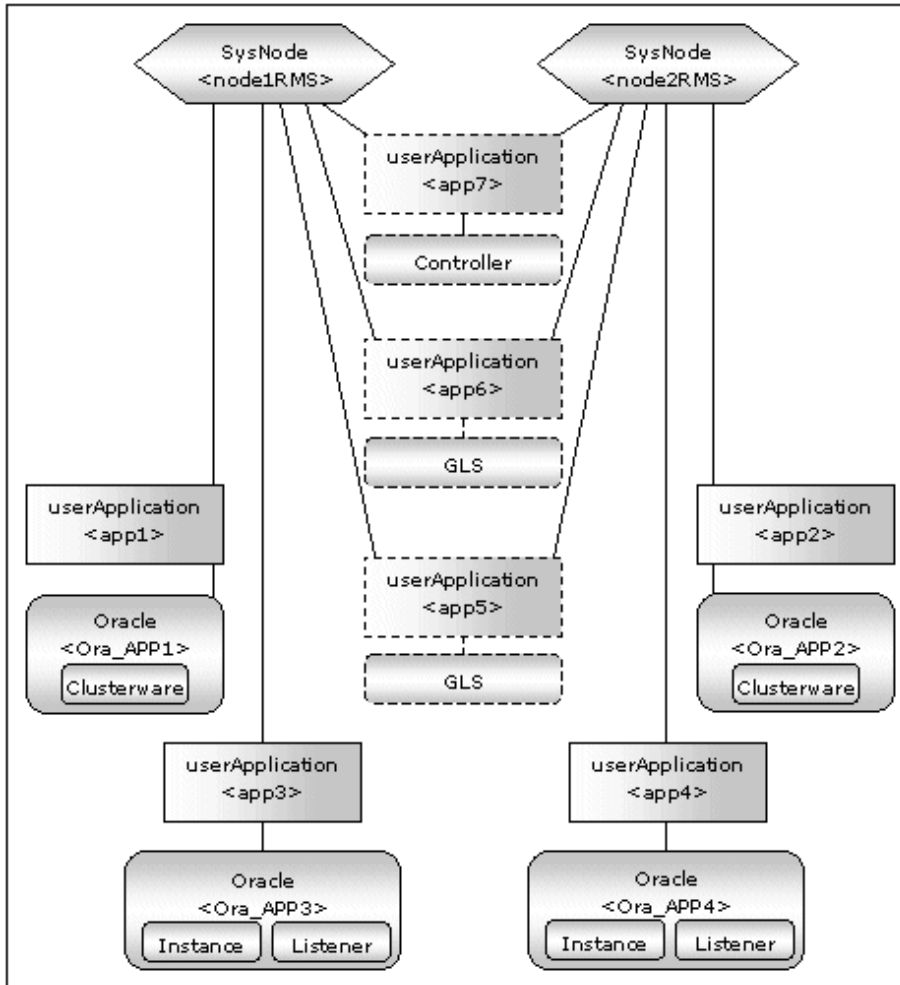
```
% crs_stat -t
Name                Type           Target         State         Host
-----
ora...T2.lsnr      application    ONLINE        ONLINE        node2
ora.node2.gsd      application    ONLINE        ONLINE        node2
ora.node2.ons      application    ONLINE        ONLINE        node2
ora.node2.vip      application    ONLINE        ONLINE        node2
ora...T1.lsnr      application    ONLINE        ONLINE        node1
ora.node1.gsd      application    ONLINE        ONLINE        node1
ora.node1.ons      application    ONLINE        ONLINE        node1
ora.node1.vip      application    ONLINE        ONLINE        node1
ora.rac.db          application    ONLINE        ONLINE        node1
ora.rac.pcl.cs     application    ONLINE        ONLINE        node1
ora...ac1.srv      application    ONLINE        ONLINE        node1
ora...ac2.srv      application    ONLINE        ONLINE        node2
ora...c1.inst      application    ONLINE        ONLINE        node1
ora...c2.inst      application    ONLINE        ONLINE        node2
```

2.3.3 userApplication Creation

In Oracle RAC 10g, Oracle instances and listeners are managed as PRIMECLUSTER RMS resources. Also, the Oracle Clusterware can be registered in an RMS resource optionally.

Configuration A

The Oracle Clusterware and Oracle RAC instance are registered in different userApplication.



userApplication	Description	Resources
app1, app2	Controls Oracle Clusterware. It is created on each node.	Oracle resource (Clusterware)
app3, app4	Controls Oracle instances and listeners. It is created on each node.	Oracle resource (instances, listeners)
app5, app6	Used as standby for GLs or takeover network.(Option) Create them according to operating conditions.	GLs resource, Cmdline resource, etc
app7	Starts up or stops Oracle instance userApplication (app3 and app4) simultaneously on all nodes. Optional	Controller resource

If userApplication app3 and app4 are stopped due to an Oracle RAC instance resource failure, userApplication app1 and app2 of Oracle Clusterware will not be affected.

Information

- Use the configuration A if Oracle Clusterware is registered in an RMS resource, and each node has multiple Oracle RAC instances.

- The controlling userApplication (app7) is optional and can be used to start up or stop userApplication (app3 and app4) for Oracle instances on all nodes at the same time
- The following setup values are recommended for userApplication which controls Oracle Clusterware(app1, app2). The other attributes that are not described below are optional.

Attributes	Values
Operation method	Standby
AutoSwitchOver	No
PersistentFault	1

- The following setup values are recommended for userApplication which controls Oracle instances and listeners(app3, app4). The other attributes that are not described below are optional.

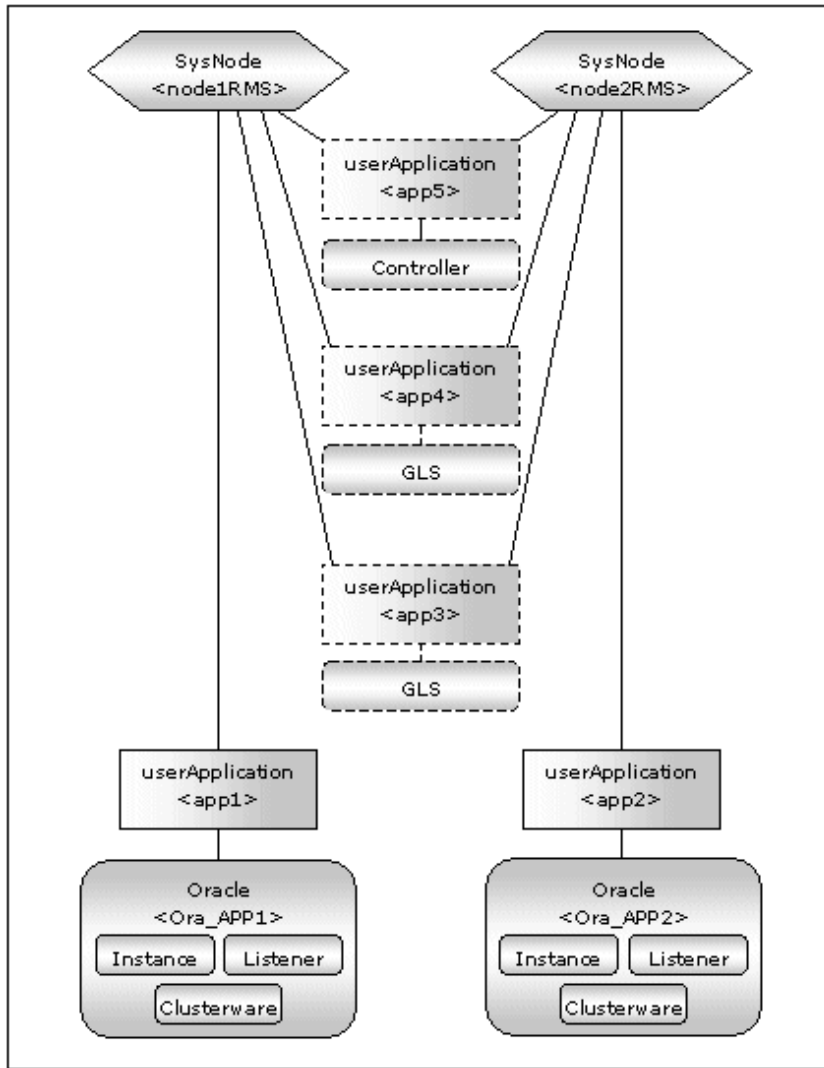
Attributes	Values
Operation method	Standby
AutoStartUp	Optional If you control userApplication startup and stop on all nodes by using the controlling userApplication, be sure to specify No.
AutoSwitchOver	No
PersistentFault	1

 **Note**

If the "KeepOnline" flag of Oracle Clusterware resource is enabled, the userApplication which controls Oracle instances should be stopped first, and then the userApplication which controls Oracle Clusterware should be stopped.
(In the above image, app3 should be stopped before app1 stopping. app4 should be stopped before app2 stopping.)
For further details of the "KeepOnline" flag, refer to ["2.3.4 userApplication with Oracle Clusterware"](#).

Configuration B

The Oracle Clusterware and Oracle RAC instance are registered in the same userApplication.



userApplication	Description	Resources
app1, app2	Controls Oracle Clusterware. It is created on each node.	Oracle resource (Clusterware, instances, listeners)
app3, app4	Used as standby for GLs or takeover network.(Option) Create them according to operating conditions.	GLs resource, Cmdline resource, etc
app5	Starts up or stops Oracle instance userApplication (app1 and app2) simultaneously on all nodes. Optional	Controller resource

If userApplication app1 and app2 are stopped due to an Oracle RAC instance resource failure, Oracle Clusterware will also be stopped (when the KeepOnline flag is disabled).

Information

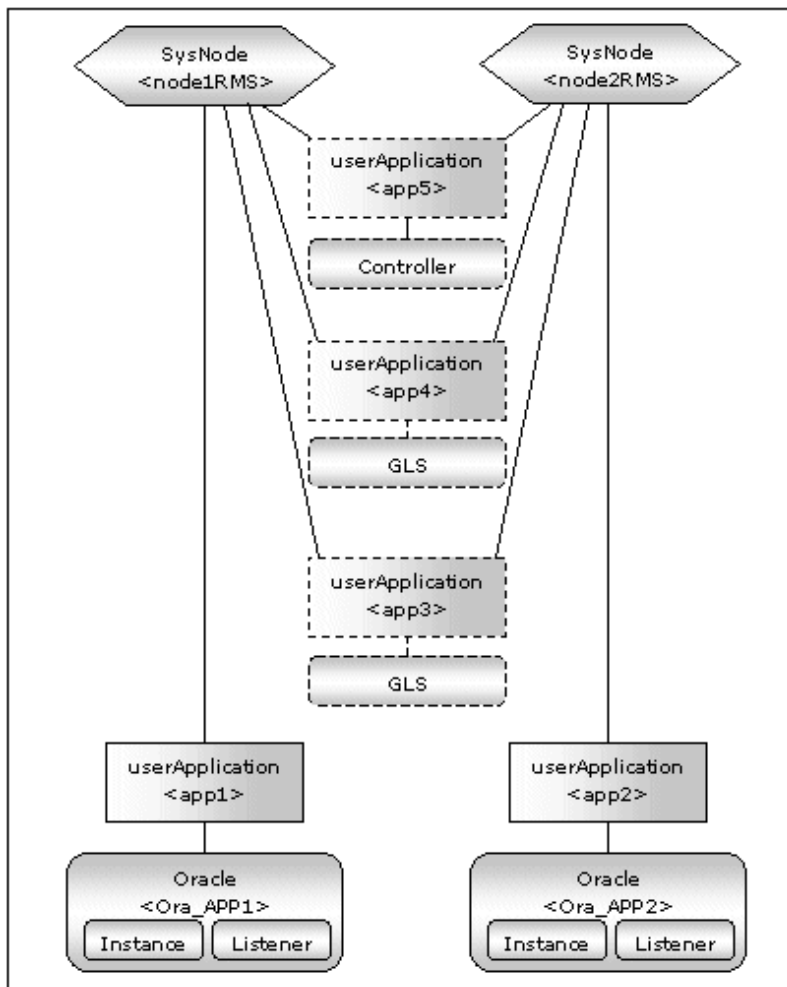
- Use the configuration B if Oracle Clusterware is registered in an RMS resource, and an Oracle RAC instance exists on one node only. If you are planning to add Oracle RAC instances in the future, use the configuration A.
- The controlling userApplication (app5) is optional and can be used to start up or stop userApplication (app1 and app2) for Oracle instances on all nodes at the same time.

- The following setup values are recommended for userApplication which controls Oracle Clusterware, Oracle instance and listener(app1, app2). The other attributes that are not described below are optional.

Attributes	Values
Operation method	Standby
AutoStartUp	Optional If you control userApplication startup and stop on all nodes by using the controlling userApplication, be sure to specify No.
AutoSwitchOver	No
PersistentFault	1

Configuration C

The Oracle Clusterware is not registered.



userApplication	Description	Resources
app1, app2	Controls Oracle instances and listeners. It is created on each node.	Oracle resources (instances, listeners)
app3, app4	Used as standby for GLs or takeover network.(Option) Create them according to operating conditions.	GLs resource, Cmdline resource, etc

app5	Starts up or stops Oracle instance userApplication (app1 and app2) simultaneously on all nodes. Optional	Controller resource
------	---	---------------------

Information

- Select the configuration C if you want to make Oracle Clusterware automatically start up along with OS startup without registering it in an RMS resource.
- The controlling userApplication (app5) is optional and can be used to start up or stop userApplication (app1 and app2) for Oracle instances on all nodes at the same time
- The following setup values are recommended for userApplication which controls Oracle instances and listeners(app1, app2). The other attributes that are not described below are optional.

Attributes	Values
Operation method	Standby
AutoStartUp	Optional If you control userApplication startup and stop on all nodes by using the controlling userApplication, be sure to specify No.
AutoSwitchOver	No
PersistentFault	1

The flow of userApplication creation is as follows:

1	Register Oracle Clusterware resources	2.3.4
2	Register Oracle instance and listener resources	2.3.5
3	Register the other required resources	2.3.6
4	Create userApplication	2.3.7 2.3.8

userApplication is configured with the RMS Configuration Wizard. This RMS Configuration Wizard forms Wizard format as follows:
Menu -> Settings -> Next button

Information

- For setting the userApplication Configuration Wizard, see “Chapter 6 Cluster application configuration” of the “PRIMECLUSTER Installation/Administration Guide”.
- PersistentFault remains the same resource status (Faulted) even after RMS is restarted in the event of a resource failure. Users are supposed to locate the fault and check completion of recovery processing then start userApplication manually. For example, if a failure occurs, users can detect which userApplication failed even after server reboot. Even though AutoStartUp setup is set, userApplication will not be started, and automatic startup will prevent recurrence of the failure.
- Be sure to set AutoStartUp=yes when the Oracle instance is activated from Oracle Clusterware right after OS startup, data inconsistency might occur. If the controlling userApplication is not used, select AutoStartUp=yes.

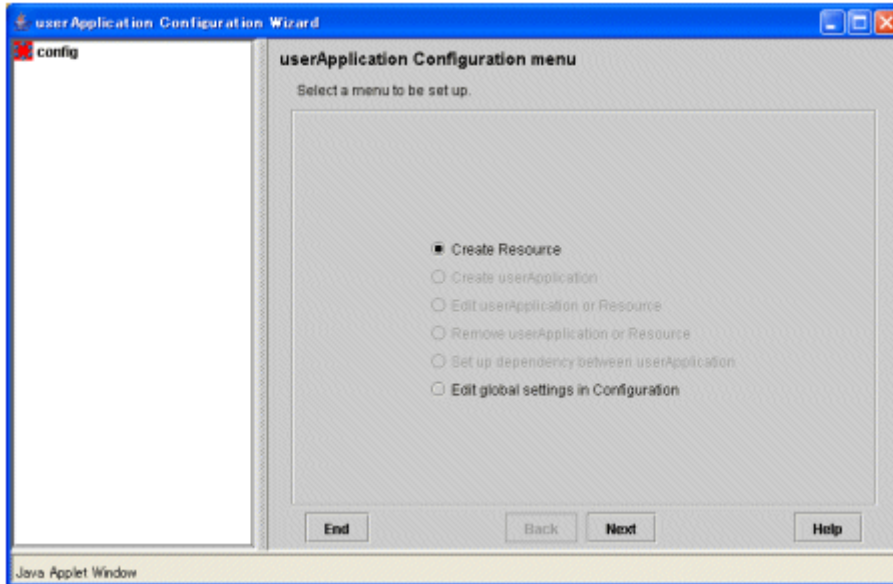
2.3.4 userApplication with Oracle Clusterware

This section describes how to register the Oracle Clusterware in an RMS resource using the userApplication Configuration Wizard.

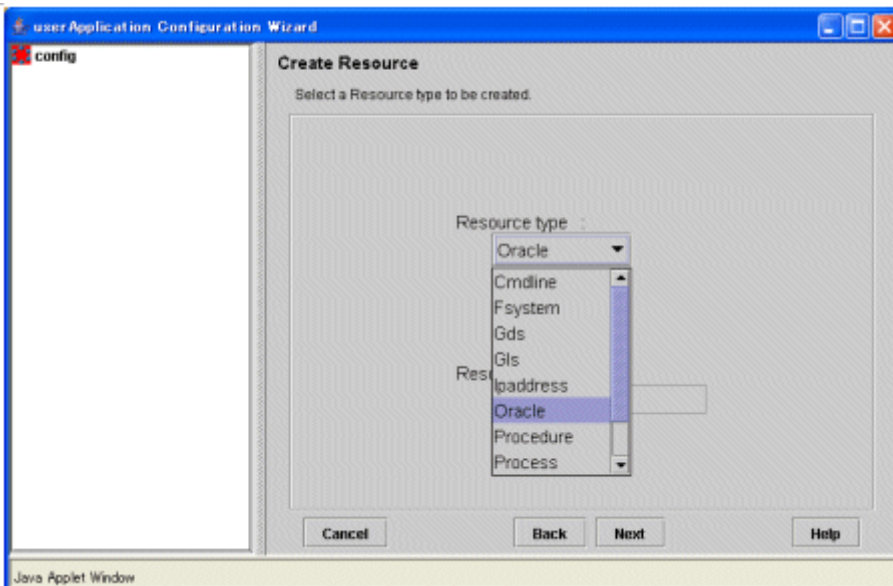
Note

If the Oracle Clusterware resource is not registered in an RMS resource (Configuration C), skip the procedure then go to “2.3.5 userApplication with Oracle RAC Instances and Listeners”.

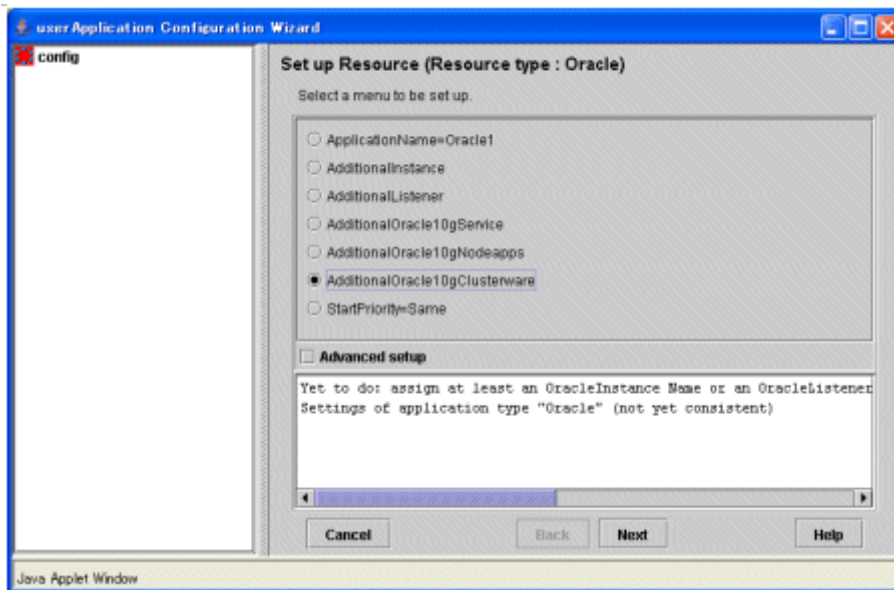
1. Select “Create Resource” in the “userApplication Configuration” menu.



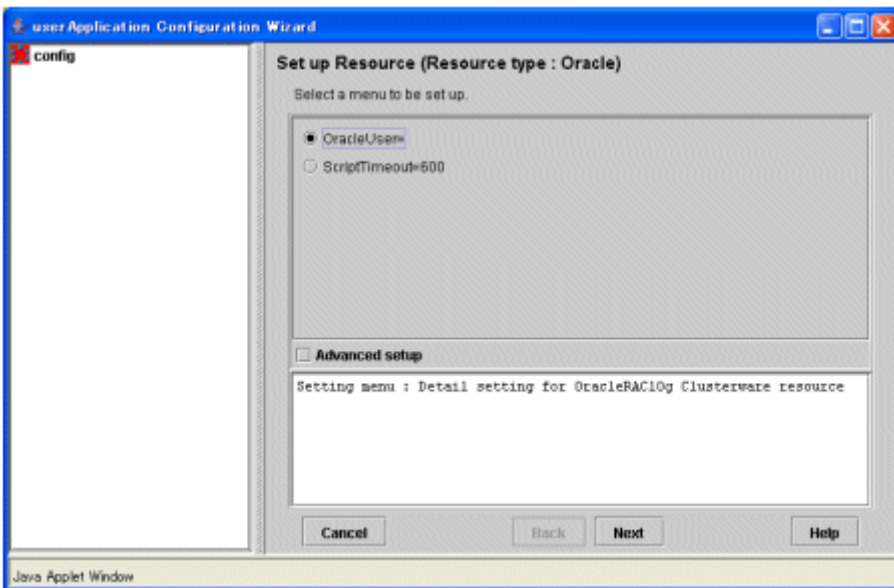
2. Select “Oracle” in the “Resource Type” menu.



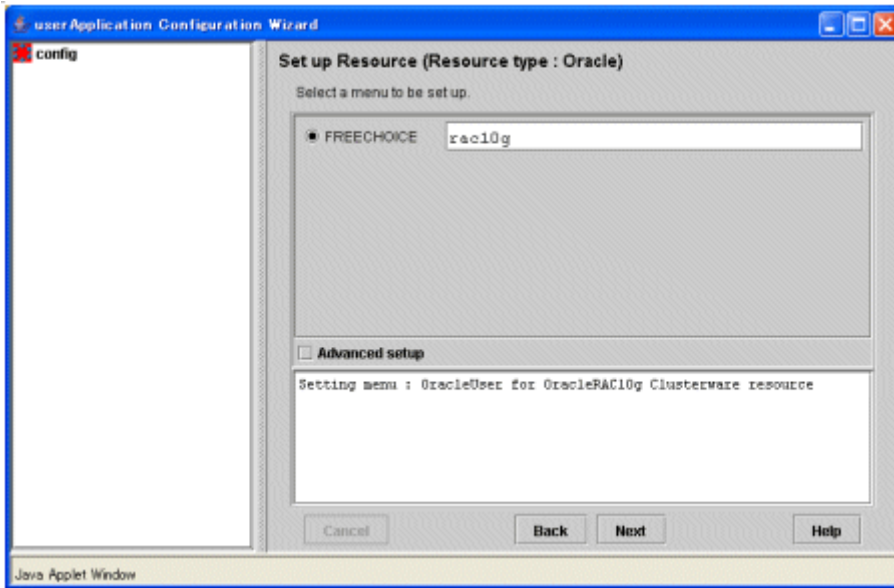
3. For changing a resource name, select “ApplicationName”, and change the name. If you register the resource without changing the name, select “AdditionalOracle10gClusterware”.



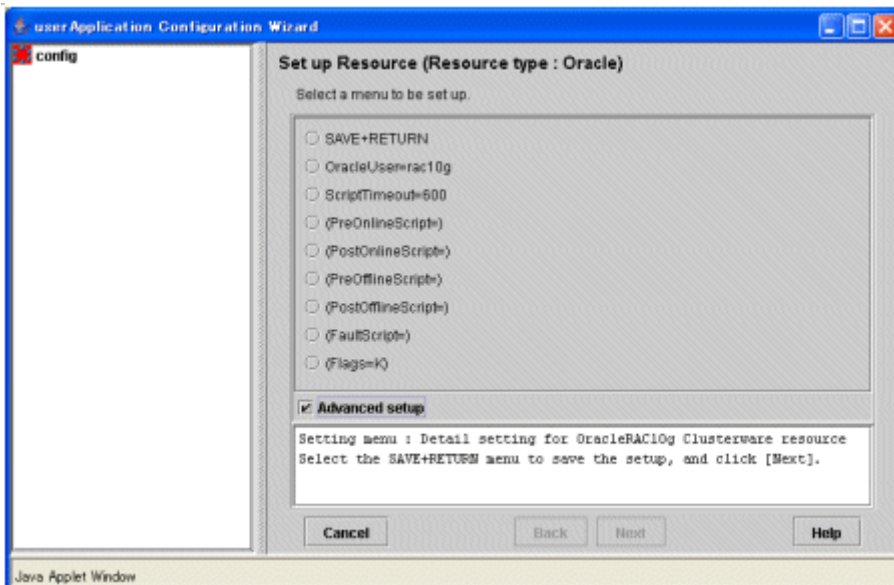
4. Set up the Oracle Clusterware as follows:



Enter a DBA user for Oracle control.



5. To change the settings, select setting item and click “Next” button.
To change the advanced settings, check “Advanced setup”.



Attributes		Description
OracleUser		DBA user for Oracle control
ScriptTimeout		Timeout of Oracle instance resource startup Default : 600s (300s - 86400s)
PreOnlineScript		Executed before online processing
PostOnlineScript		Executed after online processing
PreOfflineScript		Executed before offline processing
PostOfflineScript		Executed after offline processing
FaultScript		Executed in the event of a fault
Flags	KeepOnline (K)	Selects whether or not Online should remain without stopping resources when userApplication is stopped. If it is enabled, Online will remain. The Online state remains as default.



See

For details about Scripts, see "2.4.1 Oracle Online/Offline Script".

For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".



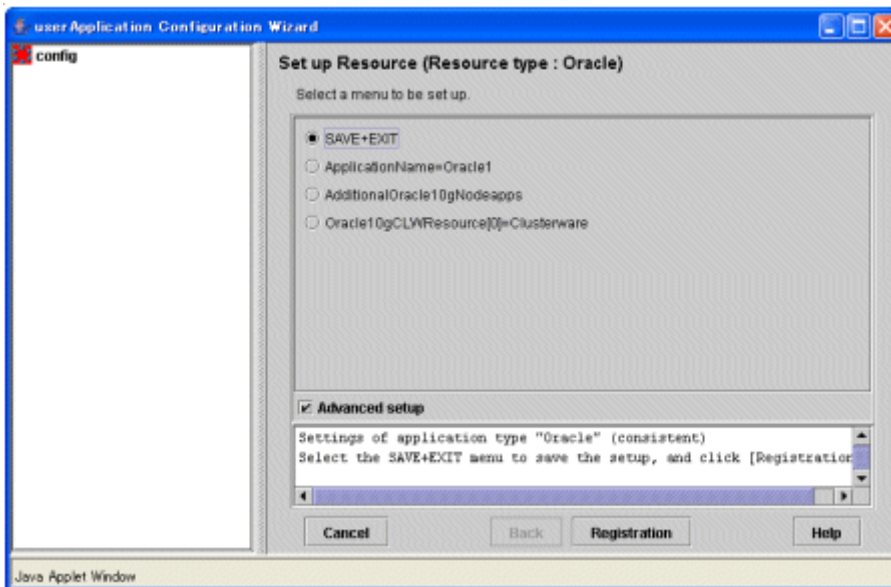
Note

Flags=<Initial letter> indicates that the flag attribute is enabled.

If the "KeepOnline" flag is enabled, and userApplication is stopped, an Oracle Clusterware resource will look Offline on the Cluster admin view. Actually, it remains active.

6. Save the settings by selecting "SAVE+ RETURN".

Check that the Oracle10gCLWResources is set then save the settings by selecting "SAVE+EXIT".



See

If you register the Oracle Clusterware and Oracle RAC instance in the same userApplication (Configuration B), select AdditionalOracle10gNodeapps then register Oracle RAC instances and listeners. For details, see Step 7 to 13 of "2.3.5 userApplication with Oracle RAC Instances and Listeners".

7. Repeat from Step 1 to 6 for each node.

2.3.5 userApplication with Oracle RAC Instances and Listeners

This section describes how to register Oracle instance resources on each node using the userApplication Configuration Wizard. Before resource registration, it is necessary to associate the Oracle instances with Oracle 10g RAC. Out of the Oracle 10g resources that are displayed with the "crs_stat" command, the ora.*.inst resources must be registered.



Example

See the following example:

```

% crs_stat -t
Name                Type                Target              State              Host

```

```

-----
ora....e1.lsnr application ONLINE ONLINE node1
ora.node1.gsd application ONLINE ONLINE node1
ora.node1.ons application ONLINE ONLINE node1
ora.node1.vip application ONLINE ONLINE node1
ora.ora10.db application ONLINE ONLINE node2
ora....01.inst application ONLINE ONLINE node1
ora....02.inst application ONLINE ONLINE node2
ora....pcl.cs application ONLINE ONLINE node2
ora....101.srv application ONLINE ONLINE node1
ora....102.srv application ONLINE ONLINE node2
ora....e2.lsnr application ONLINE ONLINE node2
ora.node2.gsd application ONLINE ONLINE node2
ora.node2.ons application ONLINE ONLINE node2
ora.node2.vip application ONLINE ONLINE node2

```

In the above configuration, “ora...c1.inst” included in node1, and “ora...c2.inst” included in node2 are registered as a resource respectively.



Note

Before configuring userApplication, make sure that Oracle Clusterware has been activated on the node where RMS Configuration Wizard is running, so the “crs_stat” command can be executed correctly with Oracle DBA user.

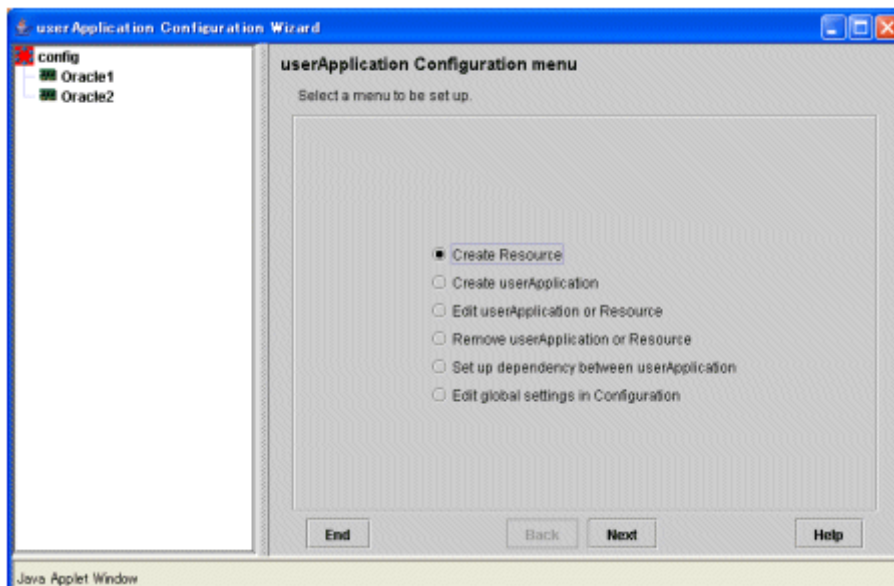
If Oracle Clusterware has not been activated, execute the following command as a root user.

```
# /etc/init.d/init.crs start
```

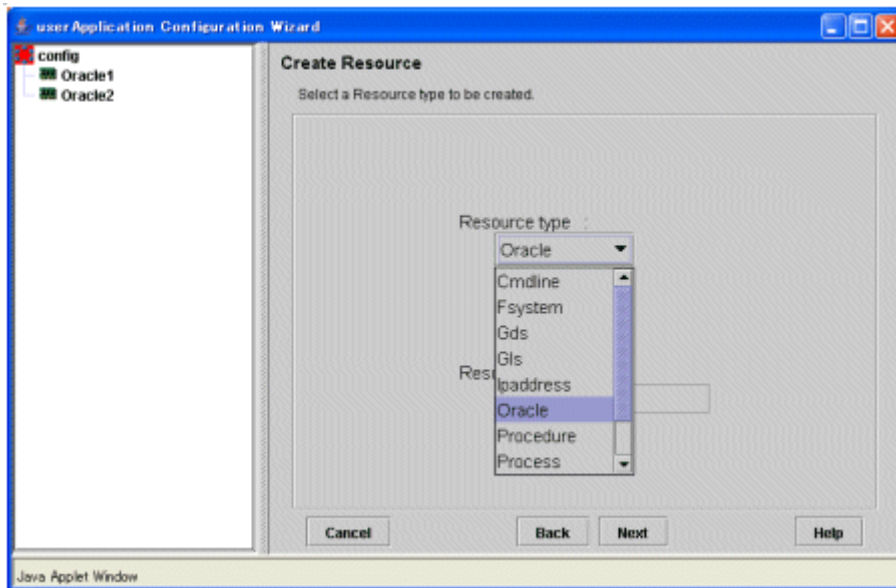
When Oracle Clusterware startup is completed, be sure to confirm that the “crs_stat” command can be executed correctly.

```
# su - <Oracle User>
$ crs_stat
```

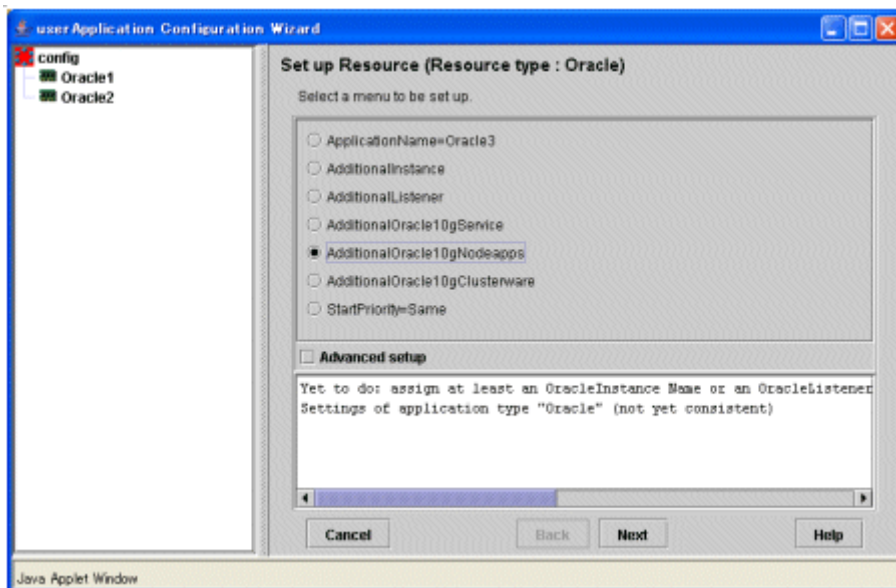
1. Select “Create Resource”.



2. Select "Oracle" of "Resource type".



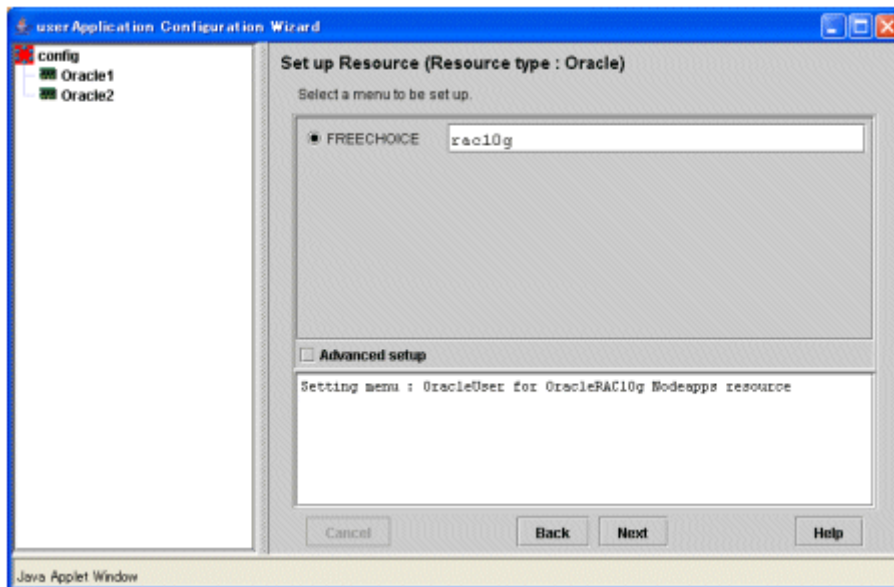
3. For changing a resource name, select "ApplicationName", and change the name. If you register the resource without changing the name, select "AdditionalOracle10gNodeapps".



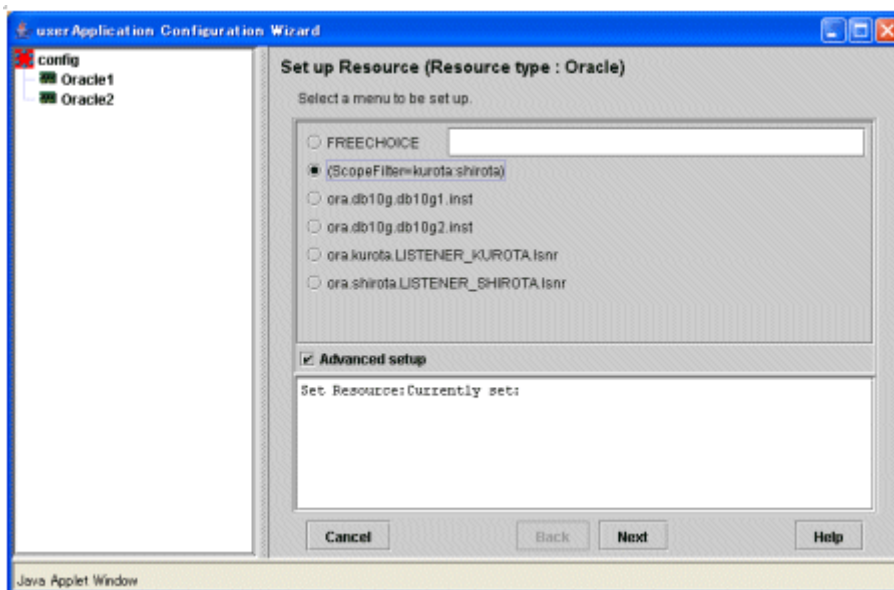
 See

Based on the Oracle RAC 10g resource name that is set in the AdditionalOracle10gNodeapps, the Wizard for Oracle resource name is created on the RMS instance. For details, see "2.3.2 Oracle Software Installation and Configuration".

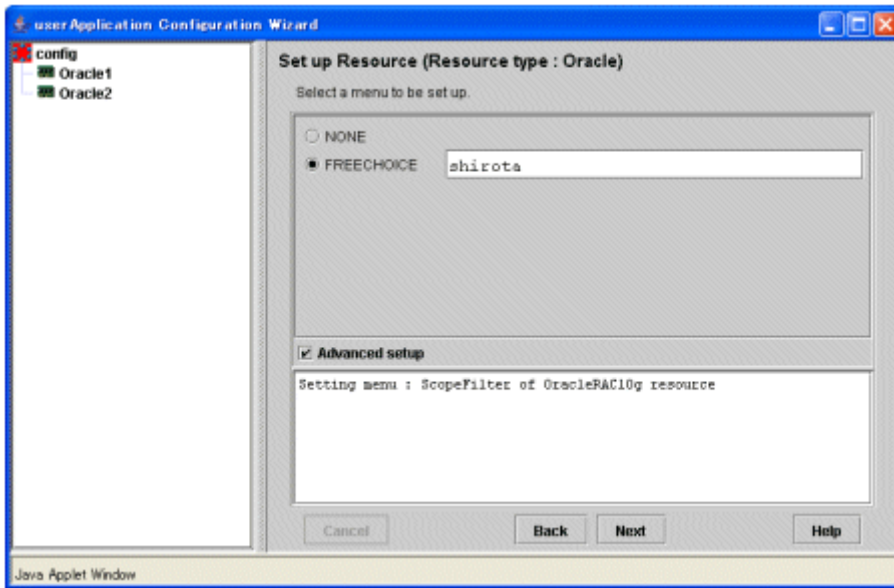
4. Enter the Oracle DBA user name.



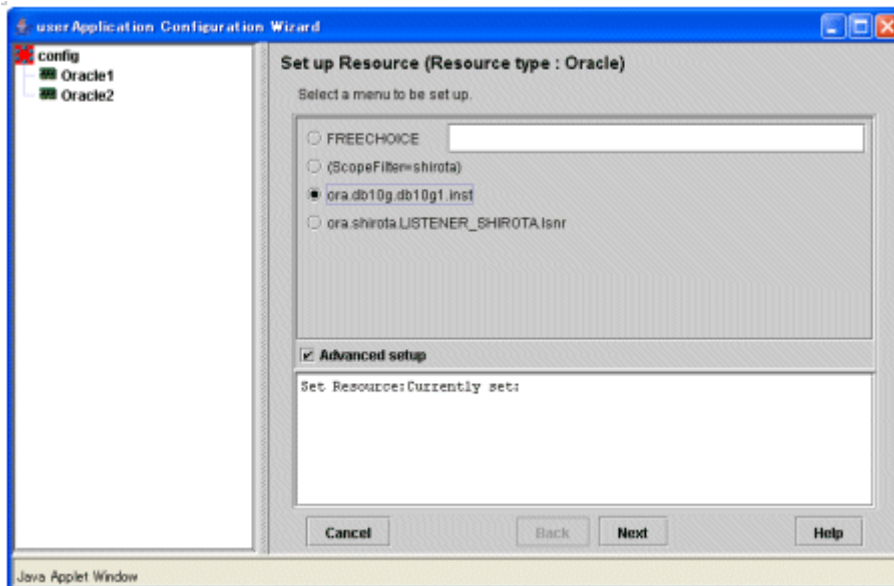
5. A list of available resources is displayed.
If it is not displayed, check "Advanced setup", then specify a node with "ScopeFilter".



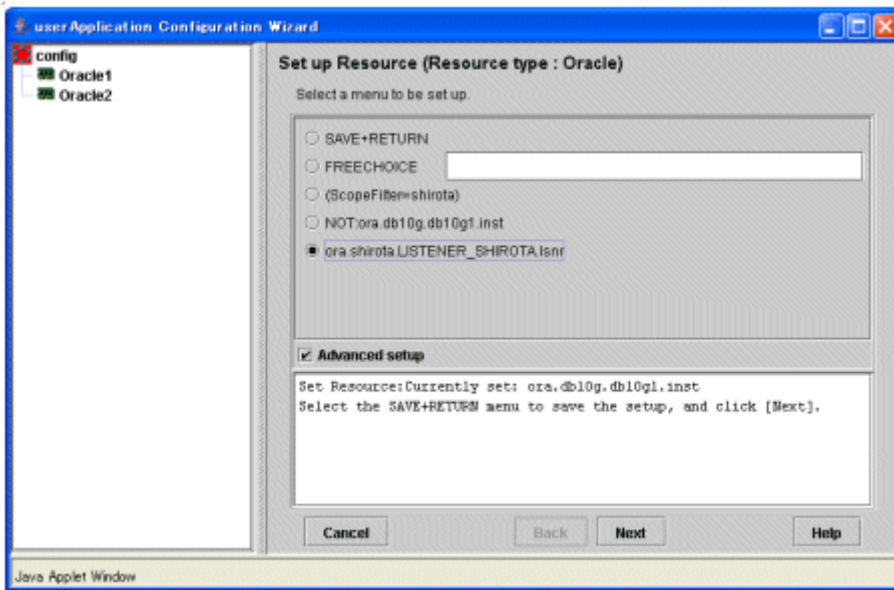
Input the name of a host where the resource belongs.



6. Select the resource (Oracle instance).



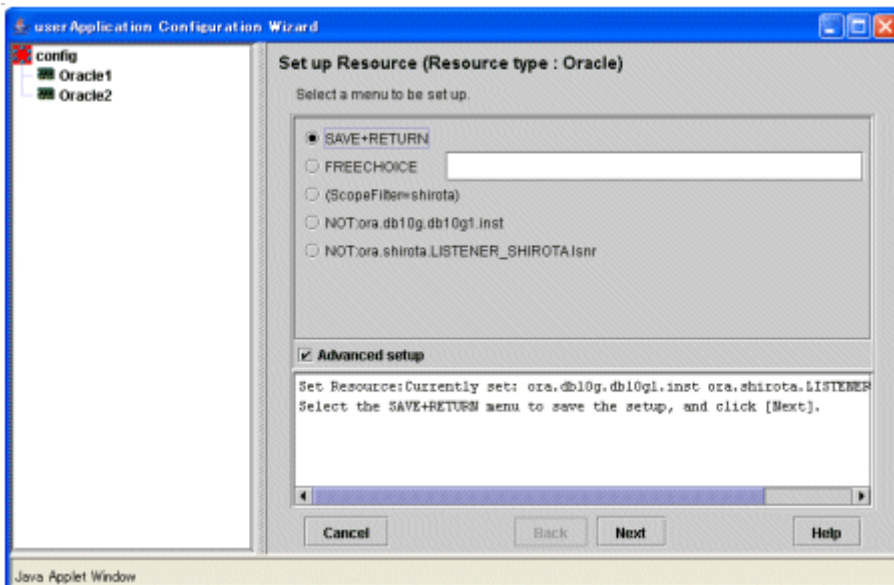
7. The resource will be displayed in the following message box, “Set Resource: Currently set:”. Select the resource (Oracle listener).



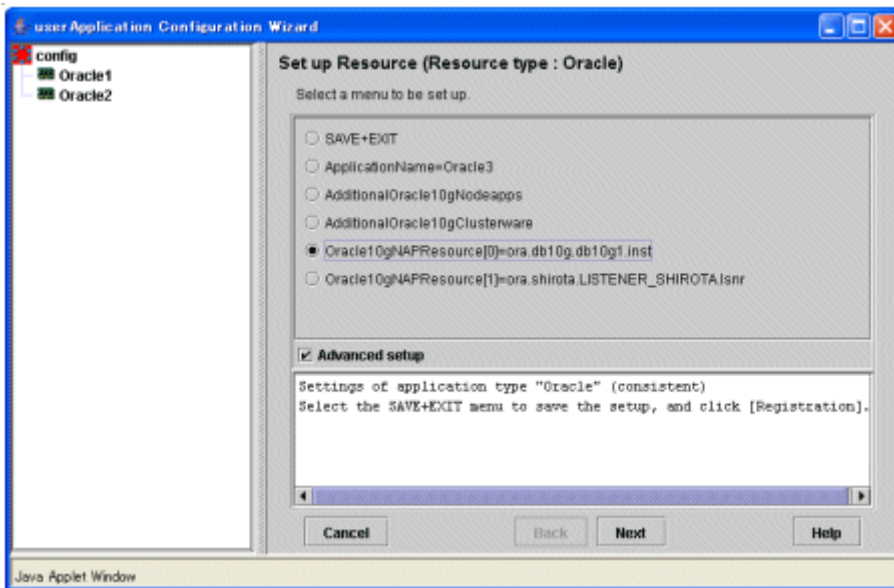
Note

Do not register the resources of the other nodes at the same time.

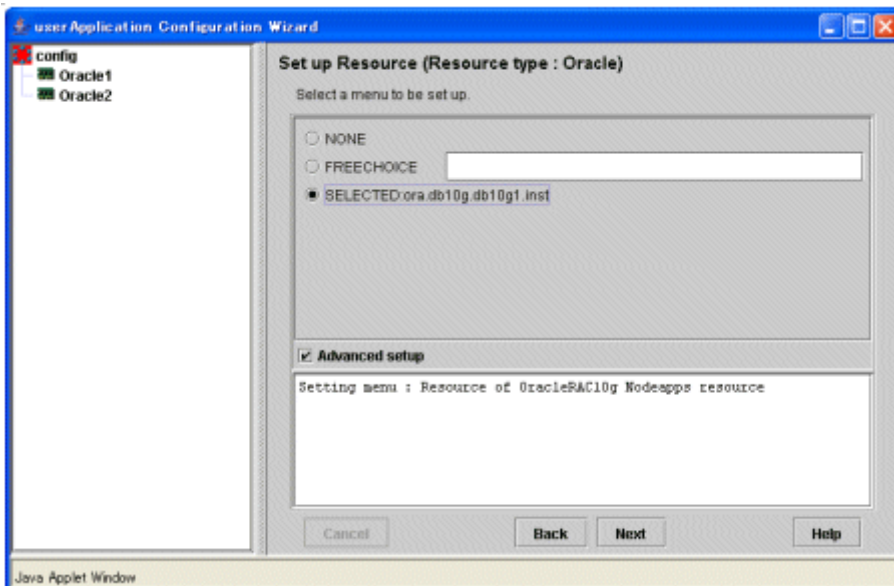
8. Check that the Oracle resource is set then save the settings by selecting “SAVE+RETURN”.



9. If you want to further set it, select each resource, then click the “Next” button.

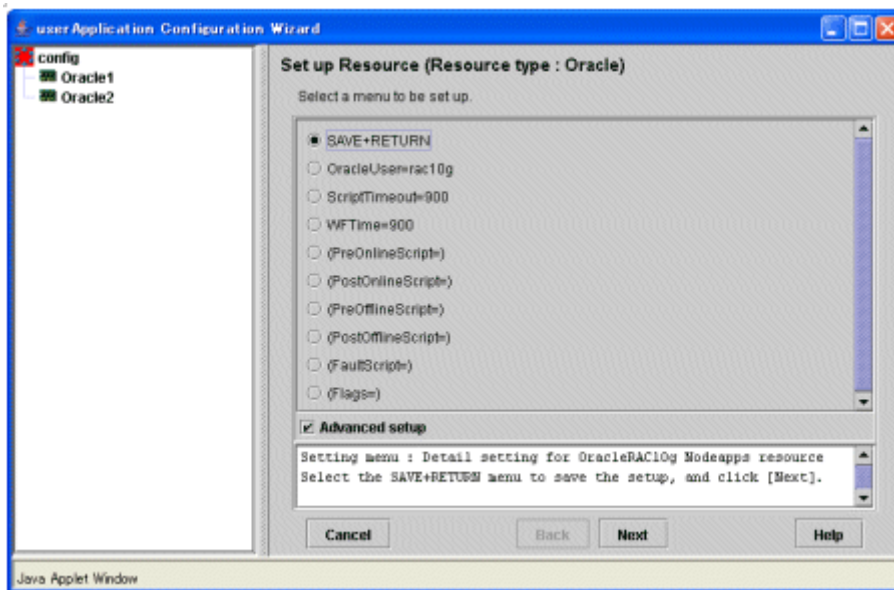


Select “SELECTED:<Resource>”, then click the “Next” button.



Select the menu, then click the “Next” button.

Selecting the “Advanced setup” allows you to set more details.



Attributes		Description
OracleUser		Oracle DBA user name
ScriptTimeout		Timeout of each resource startup and stop Default : 900 s (300s - 86400s)
WFTime		Waiting time for resource failure recovery through Oracle Clusterware - PersistentWarning : Notifies Warning until resource recovery - ImmediateFault : Notifies Faulted without waiting resource recovery - 60s - 86400s Default time for instance resources: 900s Default time for listener resources: PersistentWarning
PreOnlineScript		Executed before online processing. No default
PostOnlineScript		Executed after online processing. No default
PreOfflineScript		Executed before offline processing. No default
PostOfflineScript		Executed after offline processing. No default
FaultScript		Executed when a fault occurs. No default
Flags	NullDetector (D)	Selects whether or not a resource should be monitored. If it is enabled, the resource will be monitored. Resource monitoring is disabled as default.



- For details about Scripts, see "2.4.1 Oracle Online/Offline Script".
- For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".

Note

- Startup of Oracle Clusterware userApplication through PreOnlineScript

If Oracle Clusterware and Oracle RAC instance are registered in different userApplication (Configuration A), set up the following script in PreOnlineScript of the Oracle RAC instance resource;

```
/opt/FJSVclora/sbin/clorastartwait <userApplication with Oracle Clusterware>
```

Specify the following userApplication:

For app3 : app1

For app4: app2

- WFTime

In Oracle RAC 10g, Oracle Clusterware will recover a failure of an RAC instance or listener instance. PRIMECLUSTER Wizard for Oracle, the wait time for the failure recovery can be set for WFTime

If WFTime=PersistentWarning is set, completion of the failure recovery will be waited forever. In the meantime, an RMS resource will enter Warning, so userApplication will not be degenerated. As soon as recovery is detected, the RMS resource will get back to Online.

If WFTime=ImmediateFault is set, completion of the failure recovery will not be waited but an RMS resource will be considered as fault. As soon as the RMS resource fails, userApplication will be degenerated.

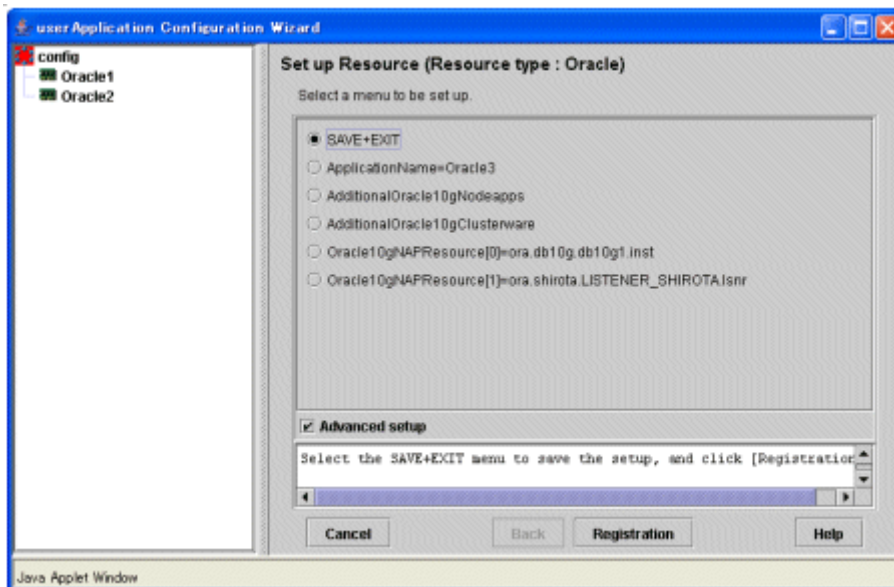
WFTime=<second> is set, completion of the failure recovery will be waited for a certain period of time. After the predetermined amount of wait time passes, an RMS resource will be considered as fault then userApplication will be degenerated. During the wait time, the RMS resource indicates Warning. If recovery is detected within the wait time, the RMS resource will get back to Online.

- Flags

Flags=<Initial letter> indicates that the flag attribute is enabled.

10. Save the settings by selecting "SAVE+RETURN".

Check that the Oracle10gNAPResource is set then save the settings by selecting "SAVE+EXIT".



11. Repeat steps 1 through 10 for each node.

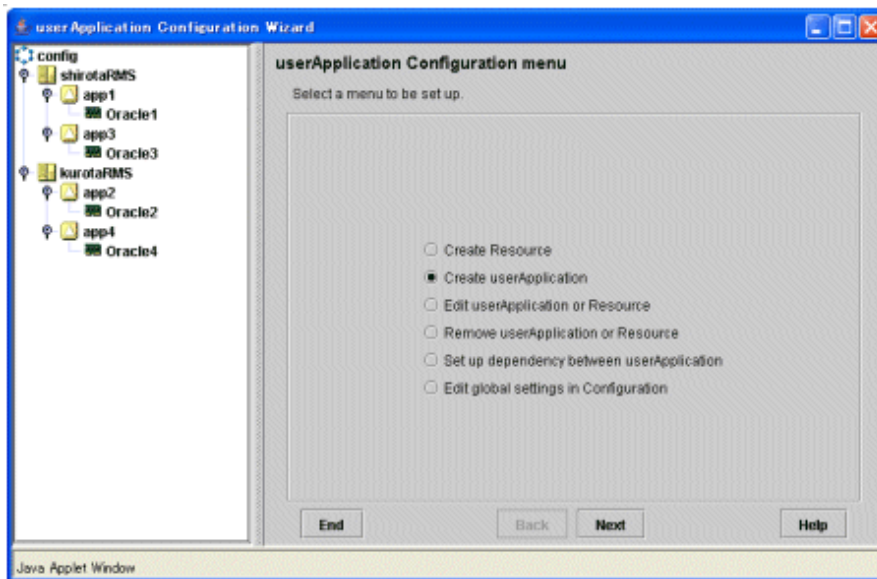
2.3.6 Other Resource and userApplication Registration

If there are other necessary resources, register them using the userApplication Configuration Wizard. As described in “[2.3.1 PRIMECLUSTER Installation and Configuration](#)”, PRIMECLUSTER GDS volumes on which OCR and Voting Disk Oracle databases are configured must not be registered as RMS resources.

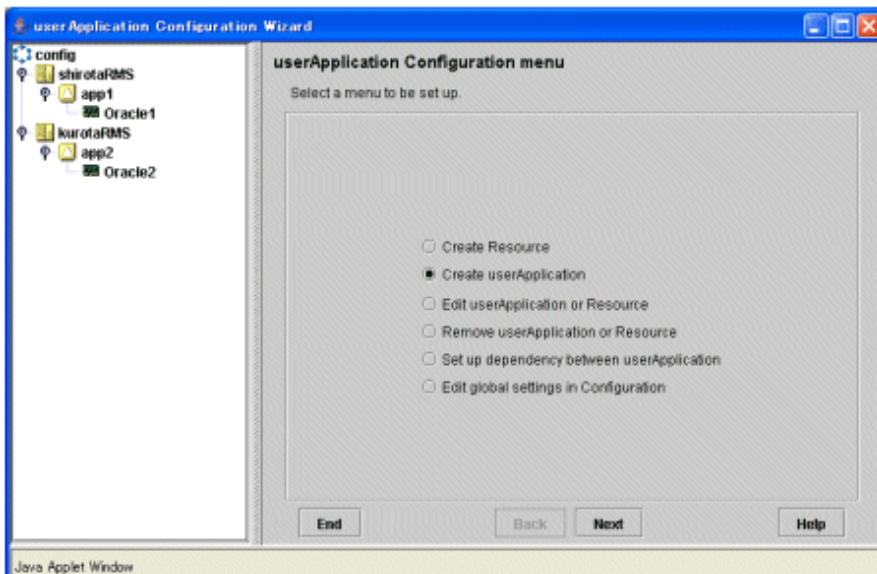
2.3.7 Configuration-Generate and Configuration-Activate

Check the set contents and then generate and activate the configuration. The image screens after activation are as follows:

- Configuration A



- Configuration B
- Configuration C



See

You can check userApplication setup using the `clorainfo -c` command. For details, see "[4.6 clorainfo - Display Resource Configuration and Monitoring Status](#)".

Note

Before creating and distributing RMS configuration, make sure that Oracle Clusterware has been activated on the node where RMS Configuration Wizard is running, so the “crs_stat” command can be executed correctly with Oracle DBA user.

If Oracle Clusterware has not been activated, execute the following command as a root user.

```
# /etc/init.d/init.crs start
```

When Oracle Clusterware startup is completed, be sure to confirm that the “crs_stat” command can be executed correctly.

```
# su - <Oracle user>
$ crs_stat
```

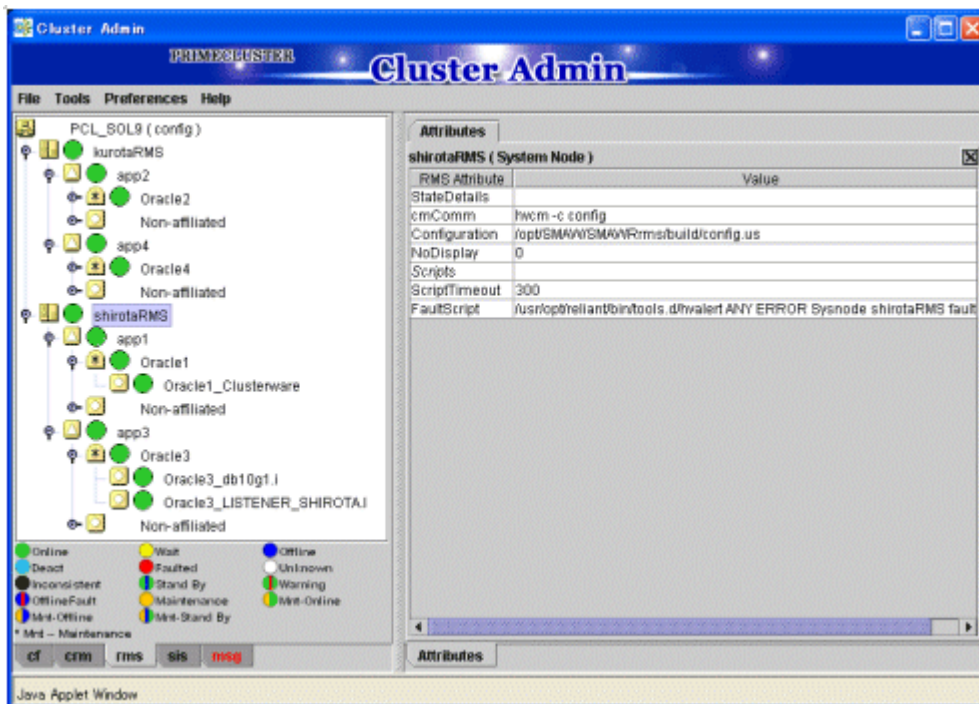
2.3.8 userApplication Operation Check

Start userApplication by executing the hvcm command then check if it is properly running on all the nodes.

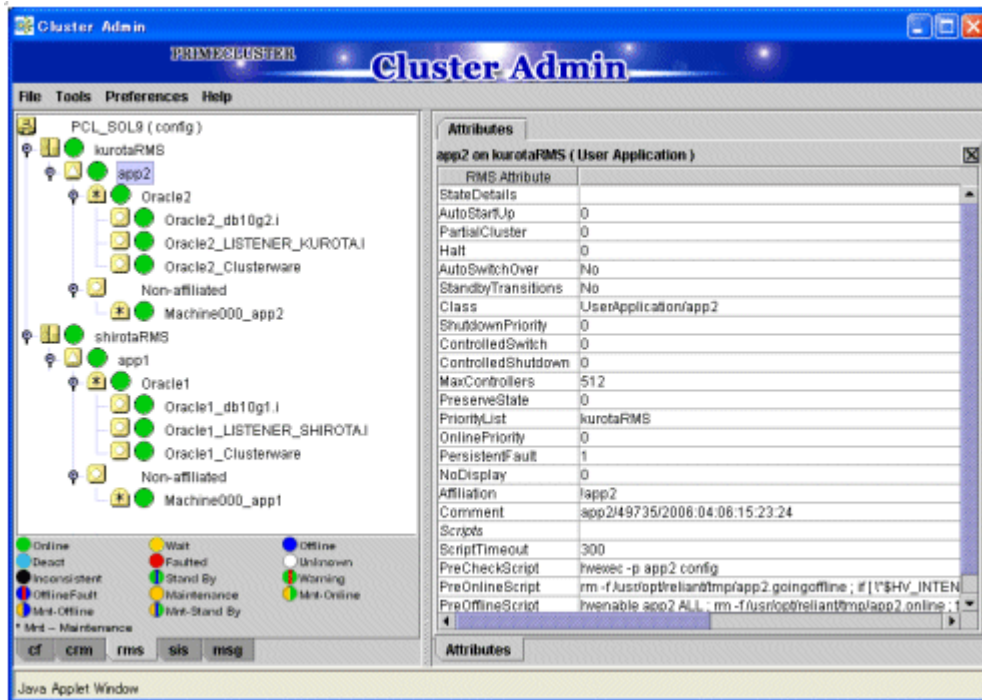
Configuration of operations

Check if the configuration is correct in the Cluster Admin screen of Web-Based Admin View. The image screens of Cluster Admin are as follows:

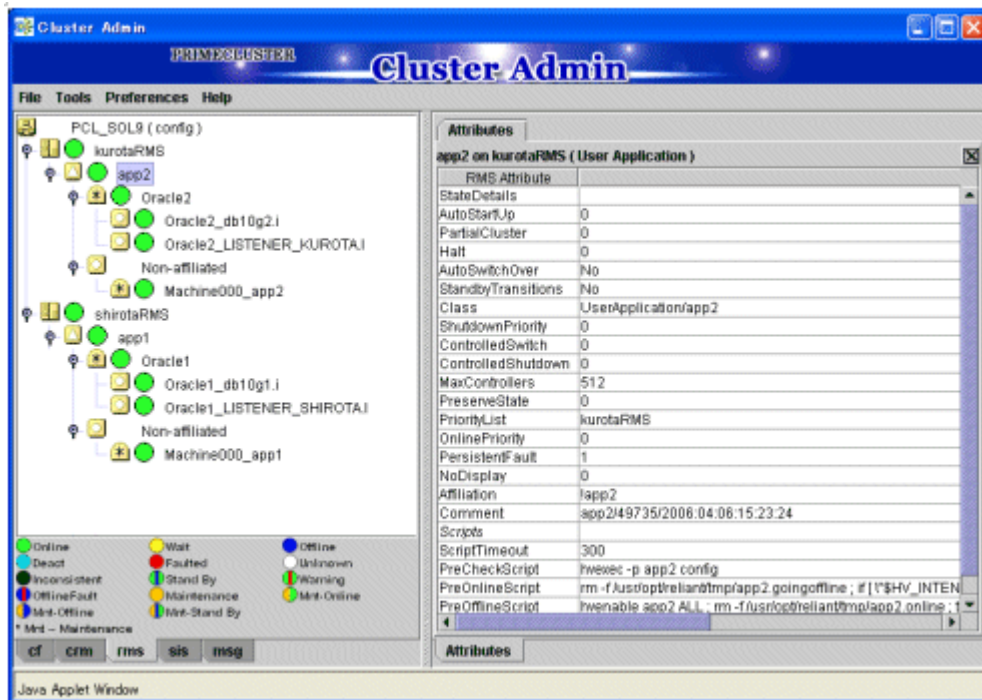
- Configuration A



- Configuration B



- Configuration C



Shared disk

Check if you can access to the shared disk from the operating node. Also, check if a file can be created on the shared disk using Oracle user access privileges.

Logical IP address

Check if you can access the operating node from the client using the logical IP address.

Oracle

Check if you can access to Oracle running on the operating node from the client using the logical IP adders.

2.4 Information

2.4.1 Oracle Online/Offline Script

PRIMECLUSTER Wizard for Oracle allows users to execute their own unique processing before or after startup or stop of Oracle instances and listeners (Online/ Offline processing). For example, application startup/stop and batch processing can be executed along with startup or stop of Oracle instances and listeners.



See

.....
For information on how to set up the script, see “2.2.8 Oracle Resource Creation and Setting” or “2.3.5 userApplication with Oracle RAC Instances and Listeners”.

Script

- PreOnlineScript
Executed before Online processing
- PostOnlineScript
Executed after Online processing
- PreOfflineScript
Executed before Offline processing
- PostOfflineScript
Executed after Offline processing
- FaultScript
Executed when failures occur

Notice

- Execute the scripts using root privileges.
- The exit code 0 indicates normal termination. The value other than 0 indicates abnormal termination or Online processing and Offline processing of userApplication failure.
- If the script exceeds the maximum execution time (ScriptTimeout), switching process will fail.
- Each script has the environment variable defined in RMS.



See

.....
For details of each script, see “2.6.3 Script” of the “PRIMECLUSTER RMS Configuration and Administration Guide”.

2.4.2 ASM (Automatic Storage Management)

Automatic Storage Management (hereafter ASM), which is one of the new Oracle 10g features, can be used for 1:1 standby operation or scalable operation only, but not for mutual standby operation and N:1 standby operation.

1:1 standby operation

Create an ASM instance resource.

The ASM instance will not be monitored, but only started or stopped

If the ASM instance fails, an Oracle instance resource error will be detected, so userApplication will be switched to the standby node, and ongoing operations will never be disrupted.

Scalable operation

Do not create an ASM instance resource if ASM is used for Oracle RAC 10g. The ASM instance will be controlled by Oracle Clusterware.

2.4.2.1 Environment configuration

Creation and configuration of ASM instances

- Operation node

The ASM instance and database are only created on the operating node. The standby nodes will only operate the database on the shared disk of the operating node.



ASM instance name must begin with "+". The default name is "+ASM".



Refer to the Oracle manual.

- Standby node

Set up the standby nodes in the same configuration (directory creation, file copy, and links) as the operating node where the AMS instance and database are created.

- Under \$ORACLE_HOME/dbs
- Under \$ORACLE_BASE/admin/\$ORACLE_SID
- \$ORACLE_BASE/admin/<ASM instance name>

The access privilege to the directories and files must be also the same as that on the operating node.

If you set where archive log is output on the operating node, it is necessary to set the same on the standby nodes.



If required files on the operating node is backed up in the tar format with the /opt/FJSVclora/sbin/cloracpy command, configuration information of the ASM instance will not be backed up. Copy the following file manually in the tar format:

\$ORACLE_BASE/admin/<ASM instance name>

ASM initialization parameter check

Check if the disk group in which the Oracle database is created is set for the ASM instance initialization parameter "ASM_DISKGROUPS".



For the initialized parameter of the ASM instance, see the Oracle manual.

userApplication creation

When creating userApplication, create an ASM instance resource and Oracle instance resource. Register them in each userApplication.

Information

The NULLDETECTOR attribute is automatically set to the flag of the ASM instance resource. This value cannot be changed.

2.4.2.2 Precaution for ASM operation

A disk group that is used for the ASM instance must not be mounted or unmounted manually. If the disk group is mounted, the following message might be output to the console when the ASM resource is activated, but no action needs to be taken.

- ORA-15032: not all alterations performed
- ORA-15017: diskgroup "diskgroup name" cannot be mounted
- ORA-15030: diskgroup name "diskgroup name" is in use by another diskgroup

Chapter 3 Operation

3.1 Oracle Control through PRIMECLUSTER Wizard for Oracle

3.1.1 Standby Operation and Oracle9i RAC Scalable Operation

This section discusses how PRIMECLUSTER Wizard for Oracle controls Oracle in standby operation or scalable operation (Oracle9i RAC).

Oracle startup

Oracle is started through a shell script. The startup procedure is as follows:

1. su - <Oracle DBA user>
2. sqlplus / nolog
3. connect / as sysdba
4. startup nomount or startup mount
5. alter database mount (if “startup nomount” was executed at step 4.)
6. alter database open

- Initialized parameter file and server parameter file

The initialized parameter file is not specified for Oracle startup through PRIMECLUSTER Wizard for Oracle, so the default initialized parameter file will be used instead. Specify the initialized parameter file for the following default path (symbolic link).

```
<$ORACLE_HOME>/dbs/init<$ORACLE_SID>.ora
```

A server parameter file should be located in the shared disk because the file contents are changed dynamically. When a server parameter file is used, enter the full path of the server parameter file in an initialization parameter file.

It is recommended that the same values for initialization parameters are set between cluster nodes.

The server parameter file must be located on the shared disk device because it is dynamically changed. When you use the server parameter file, enter the full path for the initialized parameter file. See “[2.2.7 Oracle Database Creation and Setting](#)”.

It is recommended that the initialized parameter file settings are the same on the operating nodes and standby nodes.

- Recovery processing

PRIMECLUSTER Wizard for Oracle recovers the Oracle instance in the following cases:

1. When there is ACTIVE table space in the V\$BACKUP view.
2. When there are files required to be recovered in the V\$RECOVER_FILE view.

When RAC is running, the above recovery processing is exception.

Oracle shutdown

- When users shut down and switch Oracle, the procedure is as follows:

1. su - <Oracle DBA user>
2. sqlplus / nolog
3. connect / as sysdba
4. shutdown <immediate / abort / transactional> (Setup with StopModeStop)
Default : immediate
5. If Oracle is not stopped at step 4 (except for abort), use shutdown abort.
6. If Oracle is not stopped at step 4 or step 5, shut it down forcibly by sending SIGKILL to the background process.

- The procedure of stopping failed Oracle resources including non-Oracle resources is as follows:

1. su - <Oracle DBA user>
2. sqlplus / nolog
3. connect / as sysdba
4. shutdown <immediate / abort / transactional> (Setup with StopModeFail)
Default : abort
5. If Oracle is not stopped at step 4 (except for abort), use shutdown abort.
6. If Oracle is not stopped at step 4, shut it down forcibly by sending SIGKILL to the background process.

Oracle monitoring

Oracle is monitored through binary programs. The monitoring procedure is as follows:

1. Check the background process (PMON, SMON) periodically. If the process status can be confirmed, go to step 2.
2. su - <Oracle DBA user>
3. Local connection to the Oracle instance as a SYSTEM user
4. Check if Oracle status is OPEN
5. Check if the background process (PMON, SMON, DBWn, LGWR, CKPT) are alive.
6. Check if "insert", "update" and "delete" can be properly executed using the monitoring table on the SYSTEM user's default table space
7. Oracle is reconnected once every 24 hours.

If Oracle is stopped, 1 is executed at a 30 second interval (static). If Oracle gets activated, 2 or after is executed. If node startup is completed then the node is operating, only 5 and 6 are executed at a regular interval. The default value is 30 seconds, and can be changed.

- SYSTEM user password

PRIMECLUSTER Wizard for Oracle monitors Oracle as a SYSTEM user. Register the SYSTEM user's password. See "2.2.7 Oracle Database Creation and Setting".

- Monitoring table

PRIMECLUSTER Wizard for Oracle creates a monitoring table on the SYSTEM user's default table space if the monitoring table does not exist. The table is only a few bytes, and will not be deleted.

- Warning notification

If the following symptoms are detected, PRIMECLUSTER Wizard for Oracle will notify RMS of the warning state. It is not the Fault state, so a failover will not occur.

- Oracle cannot be connected due to incorrect SYSTEM user's password that is registered with the "clorapass" command (ORA-01017 detected)
- Since the SYSTEM user password is wrong, so Oracle connection is not allowed
- When the max session or max process error occurs, so Oracle connection is not allowed
- While monitoring SQL (e.g. insert and update) is not replied for a certain period of time, but Oracle connection is allowed, and the Oracle status is OPEN.

- Monitoring timeout

If monitoring SQL (insert, update) is released, and there is no reply from Oracle after a certain period of time, the monitoring timeout will be considered then the Oracle instance resource will be put into Warning. If the monitoring timeout occurs for twice in a row, a resource will be considered as fault then a failover or degradation will be performed.

The monitoring timeout (the wait time from Oracle) can be changed with WatchTimeout.

Listener startup

Listener is started through a shell script. The startup procedure is as follows:

1. su - <Oracle user>
2. lsnrctl start <ListenerName>
3. Make sure that a listener process does exist.

Listener shutdown

Listener is shutdown through a shell script. The startup procedure is as follows:

1. su - <Oracle user>
2. lsnrctl stop <ListenerName>
3. Make sure that a listener process does not exist.
4. If Listener is not stopped at step 3, shut it down forcibly by sending SIGKILL to the background process.

Listener monitoring

Listener is monitored through binary programs. The monitoring procedure is as follows:

1. Make sure that a listener process does not exist.
2. Make sure that the net service name is valid with tnsping if TNSName is set.

If a listener of a standby node is stopped, execute 1 at regular time intervals. If the listener gets activated and becomes an operating node, execute 1. and 2. at regular time intervals. The default interval time is 30 seconds, and it can be changed with Interval. Note that 2. is executed at a 60-second interval at least.

3.1.2 Oracle RAC 10g Scalable Operation

In Oracle RAC 10g, the Oracle instances and listeners are automatically started, monitored, and recovered through the Oracle Clusterware. If PRIMECLUSTER Wizard for Oracle detects a resource failure, it will notify RMS of the “Warning” state then ask Oracle Clusterware to generate a failover or recover the failed resource (depending on the WFTIME setting).

Also, the resources are started or stopped along with userApplication startup and stop.

Oracle RAC instance startup

Start an Oracle RAC instance as follows:

1. su - <Oracle user>
2. srvctl start instance -d *\$DB_NAME* -i *\$ORACLE_SID*

Oracle RAC instance stop

Stop an Oracle RAC instance as follows:

1. su - <Oracle user>
2. srvctl stop instance -d *\$DB_NAME* -i *\$ORACLE_SID*

Oracle RAC instance monitoring

The Oracle monitoring setup is the same as standby operation and Oracle9i scalable operation. However, the monitoring interval is 60 seconds and cannot be changed.

For details, see “Oracle monitoring” of “[3.1.1 Standby Operation and Oracle9i RAC Scalable Operation](#)”.

Listener startup

Listener startup depends on Oracle Clusterware, not PRIMECLUSTER Wizard for Oracle.

Listener shutdown

Listener stop depends on Oracle Clusterware, not PRIMECLUSTER Wizard for Oracle.

Listener monitoring

The Oracle monitoring setup is the same as standby operation and Oracle9i scalable operation.

However, the monitoring interval is fixed at 60 seconds, and tns ping monitoring is not performed.

For details, see “Oracle monitoring” of “[3.1.1 Standby Operation and Oracle9i RAC Scalable Operation](#)”.

Oracle Clusterware startup

Start Oracle Clusterware as follows:

1. `/etc/init.d/init.crs start`
2. Check if Oracle Clusterware is activated using `crs_stat -t`.

Oracle Clusterware stop

Stop Oracle Clusterware as follows:

1. `/etc/init.d/init.crs stop`

Oracle Clusterware monitoring

PRIMECLUSTER Wizard for Oracle does not monitor Oracle Clusterware. NullDetector flag is automatically enabled.



Note

- Oracle listeners are started or stopped through Oracle Clusterware. The other resources such as vip, gsd, and ons are also started or stopped.
- If you want to startup, stop, or switch Oracle instances, execute `hvs` and `hvu` on RMS userApplication. If you execute the Oracle Clusterware `srvctl` command or shutdown command to the Oracle instance directly, PRIMECLUSTER will consider that the instance fails, and recovery processing might be initiated for the Oracle instance. To executing the command, put userApplication into maintenance mode.

3.2 Oracle Maintenance

This section discusses how to change Oracle settings, apply Oracle patches, back up and recover Oracle databases. In a cluster system, the shared disk device in which Oracle data is stored is activated and deactivated along with Oracle startup and stop.

- Oracle is monitored during userApplication operation. If Oracle is stopped manually, then the cluster system will consider that the Oracle resource fails, so Oracle will be restarted or Oracle operation will be switched to the standby node.
- While userApplication is not running, the shared disk is deactivated.

If you need to control Oracle manually for Oracle cold backup or other maintenance tasks, put PRIMECLUSTER in maintenance mode, or stop monitoring the Oracle instances and listeners temporarily.

The basic maintenance procedure is as follows:

1. Start userApplication
Start userApplication that includes the Oracle instance resource if it is stopped.
2. Put userApplication into maintenance mode or stop monitoring
Put userApplication into maintenance mode or stop monitoring the Oracle instance and listener resources by executing the “`hvoradisable`” command. This will prevent resource failures when Oracle is stopped manually.
Before going on to the next step, be sure to check that userApplication is put into maintenance mode or resource monitoring is disrupted.

3. Stop Oracle-dependent resources
Before stopping Oracle, stop Oracle-dependent resources manually if there are any. If userApplication is in maintenance mode, stop them manually. If resource monitoring is disrupted with the “hvoradisable” command, stop monitoring the Oracle-dependent resources using the RMS command hvdisable then stop them manually.
4. Stop Oracle
Stop Oracle manually.
5. Do maintenance on Oracle
Change the Oracle settings, apply Oracle patches, back up and recovery Oracle databases.
6. Start Oracle
After the maintenance is completed, start Oracle. Restart the Oracle listener, if it is also stopped. Before going on to the next step, be sure to check that Oracle instance and listener are properly running. The Oracle instance must be OPEN.
7. Start Oracle-dependent resources
If Oracle-dependent resources are stopped, start them manually before canceling maintenance mode or start resource monitoring again. If userApplication is in maintenance mode, start them manually. If resource monitoring is disrupted with the “hvoradisable” command, start monitoring the Oracle-dependent resources again using the RMS command hvdisable, then start them manually.
8. Cancel maintenance mode and restart resource monitoring
Cancel maintenance mode of userApplication, or start monitoring the Oracle instance and listener resources again using the hvoraenable command.

Information

- Maintenance mode and resource monitoring

To stop Oracle with userApplication active, use “Maintenance mode” of PRIMECLUSTER or the “monitoring disruption” function of PRIMECLUSTER Wizard for Oracle.

“Maintenance mode” - Stop monitoring all resources registered in userApplication so that users can perform maintenance of all the resources including Oracle.

“Monitoring disruption” - Stop the Oracle resource monitoring only. If non-Oracle resource fails, a failover will be generated.

- Oracle RAC 10g

To operate Oracle RAC 10g resources, control RMS userApplication without using the srvctl or shutdown command. If you execute these commands to the Oracle instance directly, PRIMECLUSTER will consider that the resource fails, and recovery processing might be initiated for the Oracle resource. To execute these commands, put userApplication into maintenance mode.

- Maintenance mode of userApplication

For information on how to put userApplication into maintenance mode, see “5.4.11 Maintenance mode” of the “PRIMECLUSTER RMS Configuration and Administration Guide”.

- Oracle instance and listener monitoring

For information on how to cancel or restart monitoring the Oracle instance and listener resources, see “[4.1 hvoradisable - Discontinue Monitoring Resources](#)” and “[4.2 hvoraenable - Restart Monitoring Resources](#)”.

Note

- Monitoring restart

If Oracle instances and Oracle listeners are stopped manually after resource monitoring disruption, start them manually before starting resource monitoring again. If you restart resource monitoring with the Oracle resources inactive, the Oracle resources will fail.

- State transition during maintenance

If Oracle monitoring is stopped with the “hvoradisable” command, the Oracle resources will fail, or the state transition will not occur even though the resources are stopped manually. However, the state transition might occur due to other reasons than Oracle.

- Resource state during monitoring

If the “hvoradisable” command properly stops monitoring the resources, they will enter Warning.

3.2.1 Oracle Setting Change

You can change Oracle settings such as initialized parameters and data files using the procedures described below.



Oracle must be stopped depending on the settings. For details, see the Oracle manual.

3.2.1.1 Oracle must be stopped

If Oracle must be stopped, change the settings as follows:

1. Maintenance mode / Monitoring disruption

```
# hvutil -m on <userApplication> (Maintenance mode)
# hvoradisable -a <userApplication> (Monitoring disruption)
```

2. Oracle stop

```
# su - <Oracle user>
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> shutdown immediate
```

3. Setup change

Change Oracle settings such as initialized parameters and data files.

4. Oracle startup

```
# su - <Oracle use>
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> startup
```

5. Monitoring restart / Maintenance mode stop

```
# hvoraenable -a <userApplication> (Monitoring restart)
# hvutil -m off <userApplication> (Maintenance mode stop)
```



If there are Oracle-dependent resources, the procedure with the monitoring disruption command might not work. When Oracle resources are stopped with the monitoring disruption command then Oracle is stopped manually, the Oracle-dependent resource might fail.

You need to check the status of the Oracle-dependent resource when you stop Oracle manually.

3.2.2 Patch Application

The method of applying an Oracle patch (e.g. Oracle PSR: Patch Set Release) varies depending on database mounting.

If a database does not need to be mounted before and after patch application, be sure to stop RMS before applying a patch.

If a database needs to be mounted before and after patch application, monitoring must be cancelled before applying a patch as follows:

1. Maintenance mode / Monitoring disruption

```
# hvutil -m on <userApplication> (Maintenance mode)
# hvoradisable -a <userApplication> (Monitoring disruption)
```

2. Oracle stop (if necessary)

```
# su - <Oracle user>
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> shutdown immediate
```

3. Patch application

Apply patches according to the Oracle manual.

4. Oracle startup (if stopped)

```
# su - <Oracle user>
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> startup
```

5. Monitoring restart / Maintenance mode stop

```
# hvoraenable -a <userApplication> (Monitoring restart)
# hvutil -m off <userApplication> (Maintenance mode stop)
```

3.2.3 Backup

This section discusses how to back up Oracle databases.

3.2.3.1 Cold backup

You can perform Oracle cold backup (offline backup) as follows. If there are Oracle-dependent resources (e.g. SAP R/3), a resource failure might occur during Oracle stop, so it is necessary to stop them manually in advance.

1. Maintenance mode / Monitoring disruption

```
# hvutil -m on <userApplication> (Maintenance mode)
# hvoradisable -a <userApplication> (Monitoring disruption)
```

2. Oracle stop

```
# su - < Oracle user >
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> shutdown immediate
```

3. Cold backup

Perform cold backup of the database.

4. Oracle startup

```
# su - < Oracle user >
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> startup
```

5. Monitoring restart / Maintenance mode stop

```
# hvoraenable -a <userApplication> (Monitoring restart)
# hvutil -m off <userApplication> (Maintenance mode stop)
```

Note

If there are Oracle-dependent resources, the procedure with the monitoring disruption command might not work. When Oracle resources are stopped with the monitoring disruption command then Oracle is stopped manually, the Oracle-dependent resource might fail.

You need to check the status of the Oracle-dependent resource when you stop Oracle manually.

3.2.3.2 Hot backup

You can perform Oracle hot backup (online backup) as follows.

1. Maintenance mode / Monitoring disruption

```
# hvutil -m on <userApplication> (Maintenance mode)
# hvoradisable -a <userApplication> (Monitoring disruption)
```

2. Hot backup

Perform hot backup of the database. Be sure to check that the Oracle instance and listener are properly running before going on to the next step.

3. Monitoring restart / Maintenance mode stop

```
# hvoraenable -a <userApplication> (Monitoring restart)
# hvutil -m off <userApplication> (Maintenance mode stop)
```

3.2.4 Recovery

Recover the Oracle database according to the necessity of Oracle stop.

Information

When Oracle must be stopped to recover the Oracle database:

- The data file belongs to SYSTEM table area or UNDO table area
- The whole database is recovered
- Incomplete recovery is performed

When Oracle does not have to be stopped to recover the Oracle database:

- The data file does not belong to SYSTEM table area or UNDO table area
- Complete recovery is performed

For details, see the Oracle manual

3.2.4.1 Oracle must be stopped

If Oracle must be stopped, recover the Oracle database as follows. If there are Oracle-dependent resources (e.g. SAP R/3), a resource failure might occur during Oracle stop, so it is necessary to stop them manually in advance.

1. userApplication stop

```
# hvutil -f <userApplication>
```

2. Monitoring disruption

Resource which monitoring is stopped by hvoradisable command will not start up even if the userApplication starts up. Using this function, the resources other than Oracle can start up.

```
# hvoradisable -a <userApplication>
```

3. userApplication startup

```
# hvswitch <userApplication>
```

4. Recovery

Recover the database.

5. Oracle startup

```
# su - < Oracle user >
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> startup
```

6. Monitoring restart

```
# hvoraenable -a <userApplication>
```

3.2.4.2 Oracle does not need to be stopped

If the Oracle does not need to be stopped, recover the Oracle database as follows;

1. Maintenance mode / Monitoring disruption

```
# hvutil -m on <userApplication> (Maintenance mode)
# hvoradisable -a <userApplication> (Monitoring disruption)
```

2. Recovery

Recover the database. Be sure to check if the Oracle instance and listener are properly running before going on to the next step.

3. Monitoring restart / Maintenance mode stop

```
# hvoraenable -a <userApplication> (Monitoring restart)
# hvutil -m off <userApplication> (Maintenance mode stop)
```

3.3 Oracle SYSTEM User Password Change

You can change the Oracle SYSTEM user password without stopping operation by using the following steps on the node where userApplication is Online.

1. Discontinue monitoring the Oracle instance resources.

Execute the command as follows on all the cluster nodes.

```
# hvoradisable -a <userApplication>
```

Be sure to check the following message in syslog before going to the next step:

```
[Info] [0101] Fault Watching is disable
```

2. Change the Oracle SYSTEM user password

Change the Oracle SYSTEM user password.

In standby operation, change the password on the operating node. In scalable operation with Oracle9i RAC or Oracle RAC 10g, change the password on any one of the nodes.



Example

The following example shows how to change password to “oracle”.

```
# su - <Oracle user>
$ sqlplus /nolog
SQL> connect / as sysdba
```

```
SQL> alter user system identified by oracle;
SQL> exit
```

3. Register the Oracle SYSTEM user password to PRIMECLUSTER Wizard for Oracle

Register the Oracle SYSTEM user password to PRIMECLUSTER Wizard for Oracle using the clorapass command. In standby operation, register the password on the operating node. In scalable operation with Oracle9i RAC or Oracle RAC 10g, register the passwords for each instance on any one of the nodes.

```
# /opt/FJSVclora/sbin/clorapass
Enter OracleSID > sid          (Enter ORACLE_SID)
Enter Password > *****      (Enter "oracle" for password.)
Re-enter Password > *****  (Re-enter "oracle" for password.)
Finished
```

4. Restart monitoring the Oracle instance resources

Execute the command as follows on all the cluster nodes.

```
# hvoraenable -a <userApplication>
```

Be sure to check the following message in syslog after execution:

```
[Info] [0102] Fault Watching is enable
```



See

- For the hvoradisable command, see "[4.1 hvoradisable - Discontinue Monitoring Resources](#)".
For the hvoraenable command, see "[4.2 hvoraenable - Restart Monitoring Resources](#)".
- For information on how to change the Oracle SYSTEM user password, refer to the Oracle manual.
- For the clorapass command, refer to "[4.3 clorapass - Register Password for Monitoring](#)".

3.4 Corrective Action against Failover

Oracle logging

If a failover or degeneration occurs in the event of a failure in PRIMECLUSTER operation with Oracle, solve the problem referring to the Oracle alert log or trace log.

PRIMECLUSTER Wizard for Oracle logging

PRIMECLUSTER Wizard for Oracle provides information what kind of failure is detected and what corrective action should be taken in the following log files:

```
/var/opt/reliant/log/FJSVclora_<OracleSID>*.log
/var/opt/reliant/log/FJSVclora_<ListenerName>*.log
```

The log file formats are as follows:

```
Date/type/ID/text
2002/04/25 15:18:40 [Info] [1101] Starting Oracle detector
2002/04/25 15:18:40 [Info] [1102] Connected to Oracle
2002/04/25 15:18:40 [Error] [1299] ORA-01034 Oracle not available.
```

- Date
Output in the format of YYYY/MM/DD HH:MM:SS.
- Type
Indicates classification. (Information, Error, Warning)

- ID
Indicates a message number.
- Text
Indicates message content.

Note

There is no restriction of space or memory for log files. RMS manages the log files.
The log files will be used for troubleshooting. Do not delete or delete the files.

3.5 Troubleshooting Information

If you encounter any problems with PRIMECLUSTER Wizard for Oracle operation you will need to conduct troubleshooting from log files and setup files of PRIMECLUSTER Wizard for Oracle and its related products.

You may use the following files:

Oracle information

- Configuration files
 - \$ORACLE_HOME/network/admin/*.ora
 - \$ORACLE_HOME/dbs/*.ora
 - \$ORACLE_BASE/admin/\$ORACLE_SID/pfile/*.ora
- Log files
 - \$ORACLE_HOME/rdbms/log/alert_\$ORACLE_SID.log
 - \$ORACLE_BASE/admin/\$ORACLE_SID/bdump/alert_\$ORACLE_SID.log
 - \$ORACLE_HOME/network/log/<ListenerName>.log
 - \$ORA_CRS_HOME/crs/log/<nodename>.log (Oracle RAC 10g)

PRIMECLUSTER information

You can collect troubleshooting information by executing the “fjsnap” command of PRIMECLUSTER. Refer to the “PRIMECLUSTER Configuration and Administration Guide”.

PRIMECLUSTER Wizard for Oracle information

- Configuration files
 - /opt/FJSVclora/etc/*
 - /usr/opt/reliant/etc/hvgdconfig
 - /usr/opt/reliant/build/< configuration name >.usfiles/*
- Log files
 - /var/opt/reliant/log/*

See

You can collect troubleshooting information for Oracle and PRIMECLUSTER Wizard for Oracle using the pclsnap command. The pclsnap command is a system information tool and is included in ESF (Enhanced Support Facility). If an error occurs on a PRIMECLUSTER system, the command will collect required information to solve the problem. Oracle information can be collected only if PRIMECLUSTER Wizard for Oracle is correctly set.

For information on how to collect troubleshooting information of PRIMECLUSTER Wizard for Oracle only, see “[4.5 clgetoralog - Collect Troubleshooting Information](#)”.

3.6 User Scripts for Oracle Startup

PRIMECLUSTER Wizard for Oracle provides user interfaces that allow users to perform unique operation during Oracle instance startup.

- prestartup script
Called before Oracle instance startup. If the Oracle state (STATUS of the V\$INSTANCE view) has to be checked
Put the executable file that begins with "prestartup" in the "/opt/FJSVclora/usr" directory.
- nomount script
Called when the Oracle status (STATUS column in V\$INSTANCE view) is "STARTED" during Oracle startup. Put the executable file that begins with "nomount" in the "/opt/FJSVclora/usr" directory.
- mount script
Called when the Oracle status (STATUS column in V\$INSTANCE view) is "MOUNTED" during Oracle startup. Put the executable file that begins with "mount" in the "/opt/FJSVclora/usr" directory.

The rules for the user interfaces are as follows:

- The file is stored in /opt/FJSVclora/usr. If there are two or more files, they will be executed in alphabetical order of the file name.
- A return code of 0 indicates normal termination. A return code of other than 0 indicates abnormal termination. If the script terminates abnormally, Oracle instance startup will also fail.
- System administrator access privileges are used for script execution.
- The parameters are as follows:
\$1:\$ORACLE_HOME
\$2:\$ORACLE_SID
\$3:Oracle user name
- If the script is not completed within the timeout period for Oracle instance startup, it will be considered as abnormal exit. See step 5 of "2.2.9 userApplication with Oracle Resources".
- Using of the "su -" command is not supported for user scripts(prestartup*, nomount*, mount*) under /opt/FJSVclora/usr.

Note

The user scripts above are enabled in standby operation or Oracle9i RAC scalable operation.

Note that they cannot be used in Oracle RAC 10g scalable operation.

Chapter 4 Command

4.1 hovoradisable - Discontinue Monitoring Resources

User

Super user

Format

`/opt/FJSVclora/sbin/hovoradisable application_name resource_name`

`/opt/FJSVclora/sbin/hovoradisable -a [application_name]`

Function

hovoradisable discontinues monitoring the Oracle instance and Oracle listener resources on the local node where the command is executed. The command is used to stop the Oracle instances or Oracle listeners for maintenance. Also, it is available regardless of whether userApplication is activated or deactivated.

If the command is executed while userApplication is stopped, and then it is started, the Oracle resources will enter Warning without being started.

If the command is executed while userApplication is running, it will disable resource monitoring. The Oracle resources will enter Warning. Even though the Oracle instance and Oracle listener are stopped, they will remain Warning. When you execute the command while userApplication is running, be sure to check the resource state is Warning the stop the Oracle instance and Oracle listener.

Stopping userApplication will automatically cancel resource monitoring.



See

.....
The ASM instance resource is not monitored, so it is not necessary to discontinue monitoring the resource with the command. For further details about ASM instance resources, see “2.4.2 ASM (Automatic Storage Management)”.
.....

Parameter

application_name

Specify userApplication including Oracle resources that will be disrupted monitoring.

resource_name

Specify either of the Oracle instance or Oracle listener that will be disrupted monitoring.

application_name and *resource_name*

Specify all the resources on the local node.

-a [*application_name*]

The option discontinues monitoring all Oracle instance and listener resources that belong to userApplication that is running on a local node and is specified for *application_name*.

If *application_name* is omitted, the option will discontinue monitoring all the Oracle resources on the local node.

Exit status

0: Normal termination

Non-0: Abnormal termination

2: Abnormal termination (disruption of resource monitoring with the -a option fails)



Note

Do not execute the command during the state transition of userApplication.

4.2 hvoraenable - Restart Monitoring Resources

User

Super user

Format

```
/opt/FJSDVclora/sbin/hvoraenable application_name resource_name
```

```
/opt/FJSDVclora/sbin/hvoraenable -a [ application_name ]
```

Function

hvoraenable restarts monitoring the Oracle instance and Oracle listener resources on the local node where resource monitoring is disrupted. It is available regardless of whether userApplication is activated or deactivated.

If the command is executed while userApplication is stopped, disabling resource monitoring with hvoradisable will be cancelled.

If the command is executed while userApplication is running, it will restart resource monitoring.

The command must be executed after the Oracle instance and Oracle listener are started manually. Be sure to check the resource state is changed from Warning to Online.



See

The ASM instance resource is not monitored, so it is not necessary to cancel resource monitoring with the command. For further details about ASM instance resources, see “2.4.2 ASM (Automatic Storage Management)”.

Parameter

application_name

Specify userApplication including Oracle resources that will be disrupted monitoring.

resource_name

Specify either of the Oracle instance or Oracle listener that will be disrupted monitoring.

application_name and *resource_name*

Specify all the resources on the local node.

-a [*application_name*]

The option restarts monitoring all Oracle instance and listener resources that belong to userApplication that is running on a local node and is specified for *application_name*.

If *application_name* is omitted, the option will restart monitoring all the Oracle resources on the local node.

Exit status

0: Normal termination

Non-0: Abnormal termination

2: Abnormal termination (disruption of resource monitoring with the -a option fails)



Note

Do not execute the command during the state transition of userApplication.

4.3 clorapass - Register Password for Monitoring

User

Super user

Format

/opt/FJSVclora/sbin/clorapass

Function

clorapass registers the Oracle SYSTEM user password for PRIMECLUSTER Wizard for Oracle. The detector monitors Oracle instances using the SYSTEM user privileges, so it requires the SYSTEM user password.

If the password is not registered, the detector will use “manager” as the SYSTEM user password.

Execute the command on any one of the nodes. In scalable operation (RAC) with multiple Oracle instances, execute the command for each Oracle instance then set the Oracle SYSTEM user password.

Parameter

None.

Exit status

0: Normal termination

Non-0: Abnormal termination



See

For information on how to change the password of the Oracle SYSTEM operating on a cluster system, see "[3.3 Oracle SYSTEM User Password Change](#)".



Note

For scalable operation, the Oracle SYSTEM user password needs to be registered for each instance.

Example: In case of DB_NAME=ora, ORACLE_SID=ora1, ORACLE_SID=ora2,

Execute the command twice then register password for ora1 and ora2 respectively.

4.4 cloracpy - Create Backup File for Oracle Database Setup

User

Oracle DBA user

Format

/opt/FJSVclora/sbin/cloracpy

Function

cloracpy enables users to back up files required for Oracle database setup on the operating node in the tar format. Also, the users can copy the file and set links by extracting the backup data on the standby nodes.

- The command can be used in the following cases:
 - The \$ORACLE_HOME and \$ORACLE_BASE settings are the same between the operating node and the standby nodes.
 - The Oracle configuration is the same between the operating node and the standby nodes.
 - Database creation and setup is already completed on the operating node.
 - The command is executed with Oracle user access privileges
 - \$ORACLE_BASE, \$ORACLE_HOME, and \$ORACLE_SID are set in the Oracle user environment variables.
- The following backup files can be created in the tar format:
 - All files under \$ORACLE_HOME/dbs/
 - All files under \$ORACLE_BASE/admin/\$ORACLE_SID/
 - \$ORACLE_HOME/network/admin/*.ora

The files on the operating node will be stored in the “/tmp/oracle.\$ORACLE_SID.tar” file. Then, they will be deployed on the standby node with the “tar xvfP /tmp/oracle.\$ORACLE_SID.tar” command.

Since cloracpy creates and deploy the backup files in the tar format using the full path, it cannot be used if the “\$ORACLE_BASE” and “\$ORACLE_HOME” settings are incompatible between the operating and standby nodes.

Also, if the operation method is different between the operating node and standby nodes, the command cannot be used. If a file with the same name exists, it will be overridden.

Parameter

None.

Exit status

0: Normal termination

Non-0: Abnormal termination

4.5 clgetoralog - Collect Troubleshooting Information

User

Super user

Format

```
/opt/FJSVclora/bin/clgetoralog [ -n RMSconfiguration ] [ -d output_directory ] [ -a ]
```

Function

clgetoralog collects Oracle information for troubleshooting. The “clgetoralog” command collects Oracle setup information and log files on a PRIMECLUSTER system.

The information will be collected in the “<hostname>_<yymmddHHMMSS>_clgetoralog.tar” file.

The “clgetoralog” command collects

- initialization parameter file
 - \$ORACLE_HOME/dbs/*.ora
 - \$ORACLE_BASE/admin/\$ORACLE_SID/pfile/*.ora
- Oracle alert log
 - background_dump_dest/*.log

- \$ORACLE_BASE/admin/\$ORACLE_SID/bdump/*.log
- \$ORACLE_HOME/rdbms/log/*.log
- \$ORACLE_HOME/dbs/*.log
- listener.ora, tnsnames.ora
- \$ORACLE_HOME/network/admin/*.ora
- Listener log
- \$ORACLE_HOME/network/log/*.log
- Oracle Clusterware information
- \$ORA_CRS_HOME/crs/admin/*
- \$ORA_CRS_HOME/crs/log/* (\$ORA_CRS_HOME/log/<hostname>/crsd/*)
- V/L, configuration, and log files of PRIMECLUSTER Wizard for Oracle
- V/L and log files (switchlog) of RMS
- V/L, configuration, and patch information of PRIMECLUSTER
- System information
- uname -a (system basic information)
- uptime (system operating time)
- psrinfo -v
- /usr/platform/^arch -k`/sbin/prtdiag(*1)
- cat /etc/release (Solaris version)
- cat /var/sadm/ptf/newprev/Rcontents (PTF information)
- pkgparam -v FJSVbse (ESF information)
- sysdef -i (kernel parameter)
- ipcs (shared resources)
- swap -l (swap information)
- ptree -a, ps -ef (process information)
- ntpq -p (NTP information)
- /var/adm/messages files

In the environment that applied the patch 914425-04 or later of PRIMECLUSTER Wizard for Oracle, the following information is gathered.

- System information (Solaris 10 only)
- ptree -a, ps -efZ, ps -efL -o (process information)
- zonename, zoneadm list -vc (zone information)

(*1) In the environment that applied the patch 914425-04 or later of PRIMECLUSTER Wizard for Oracle, it is not gathered in a non-global zone.

Information

The `fjsnap` command can also be used to collect troubleshooting information.

Parameter

[-n *RMSconfiguration*]

Specify RMS configuration name for *RMSconfiguration*.

If this option is specified, `clgetoralog` command collects RMS configuration information in addition to the information described in “Function”. When the cluster application has been built by using GUI (userApplication Configuration Wizard), the RMS configuration name is “config”. The RMS configuration name can be confirmed by the following command while RMS is running.

```
# /opt/SMAW/bin/hvdisp -a | grep Configuration
Configuration: /opt/SMAW/SMAWRrms/build/config.us
```

If this option is not specified, `clgetoralog` command collects only information described in “Function”.

[-d *output_directory*]

Specify the directory where information is collected. Then, the command will store the “<hostname>_<yymmddHHMMSS>_clgetoralog.tar” file in the directory. If the directory specified does not exist, it will automatically be created.

If this option is omitted, the command will store the “<hostname>_<yymmddHHMMSS>_clgetoralog.tar” file under the default directory (/var/tmp/).

[-a]

The option will collect the following information in addition to the information described in [Function]:

- Group of currently active RMS configuration files (all RMS configuration files with the -n option)
- RMS log files (/var/opt/reliant/log/*)
- RMS environment variable configuration file (/usr/opt/reliant/bin/hvenc.local)
- /var/adm/messages*
- /etc/hosts, /etc/inet/hosts
- /etc/passwd
- /etc/services, /etc/inet/services
- /etc/system
- /etc/vfstab
- # showrev -p

If this option is omitted, the command will collect information described in [Function] only.

Exit status

0: Normal termination

Non-0: Abnormal termination



The clgetoralog command searches the Oracle alert log in background_dump_dest or \$ORACLE_BASE/admin/<SID>/bdump/*.log of the initialized parameter file (\$ORACLE_HOME/dbs/init<SID>.ora). If the server parameter file is being used or there is no definition in the initialized parameter file (background_dump_dest), the Oracle alert log cannot be acquired.

Define the alert log in /opt/FJSVclora/etc/clgetoralog.conf using the full path so that you can acquire the alert log. Where the alert log is stored is defined in background_dump_dest parameter. (background_dump_dest parameter can be found in the initialized parameter file or the server parameter file. It can be also displayed by SQL "show parameter background_dump_dest".)

The following example shows how to define /opt/FJSVclora/etc/clgetoralog.conf:

```
COLLECTOBJ=/oracle/admin/orclsid/bdump/alert_orclsid.log
```

* background_dump_dest = /oracle/admin/orclsid/bdump

Start with “COLLECTOBJ=” and specify the file name using the full path after “=”.

Wild card characters “*” cannot be used in the middle of the path name.

```
COLLECTOBJ=/oracle/admin/orclsid/bdump/*.trc [OK]  
COLLECTOBJ=/oracle/admin/*/bdump/*.trc [NG]
```

If wild card characters are frequently used, and the data size becomes large, troubleshooting information might not be collected.

4.6 clorainfo - Display Resource Configuration and Monitoring Status

User

Super user

Format

```
/opt/FJSVclora/bin/clorainfo { -c [ RMSconfiguration ] | -e | -m [ ResourceName ] | -v }
```

Function

clorainfo displays configuration information and monitoring state of Wizard for Oracle.

Parameter

-c [*RMSconfiguration*]

The option displays setup information of Wizard for Oracle resources that are defined in the specified RMS configuration. Specify the RMS configuration name for *RMSconfiguration*

If *RMSconfiguration* is omitted, setup information of Wizard for Oracle resources that are currently active in the RMS configuration will be displayed.

-e

The option displays kernel parameter values and Oracle setup information on the local node.

-m [*ResourceName*]

The option displays whether or not Wizard for Oracle resources are being monitored (enable: monitoring is active, disable: monitoring is inactive).

If *ResourceName* is specified, it will check the status of resource monitoring and returns the one of the following codes:

0: Monitoring is active (RMS is running)

2: Monitoring is inactive (RMS is running)

10: Monitoring is active (RMS is not running)

12: Monitoring is inactive (RMS is not running)

The resource name of Wizard for Oracle (*ResourceName*) must exist on the local node.

If *ResourceName* is omitted, whether or not all the resources of Wizard for Oracle on the local node are monitored will be displayed.

-v

The option displays package information of Wizard for Oracle that is installed on the local node.

Exit status

0: Normal termination or RMS is running and resource monitoring is active ("-m *ResourceName*" specified)

2: RMS is running and resource monitoring is inactive ("-m *ResourceName*" specified)

10: RMS is stopped, and resource monitoring is active ("-m *ResourceName*" specified)

12: RMS is stopped, and resource monitoring is inactive ("-m *ResourceName*" specified)

Other than the above values: Abnormal termination

4.7 clorabr - Integrated Backup and Restoration of Configuration Files

User

Super user

Format

```
/opt/FJSVclora/bin/clorabr { backup | restore } [ -d backup_directory ]
```

Function

PRIMECLUSTER Wizard for Oracle supports integrated backup and restoration (cfbackup/cfrestore) of PRIMECLUSTER systems. The clorabr command can only back up and restore PRIMECLUSTER Wizard for Oracle configuration information.



For integrated backup and restoration of PRIMECLUSTER systems, refer to "Chapter 11 Backing Up and Restoring a PRIMECLUSTER System" of the "PRIMECLUSTER Installation and Administration Guide".

The following files can be backed up and restored:

- /opt/FJSVclora/etc/FJSVclora.pwd
- /opt/FJSVclora/etc/clgetoralog.conf
- /opt/FJSVclora/usr/*

Parameter

backup

Backs up PRIMECLUSTER Wizard for Oracle configuration information. With this option, a list of configuration files that will be backed up in standard output is displayed. The configuration information will be stored in FJSVclora on the specified directory or the directory (current directory) that is created with the clorabr command. For example, if this command is executed when the current directory is /var/tmp, the backup information will be stored in /var/tmp/FJSVclora.

restore

Restores the PRIMECLUSTER Wizard for Oracle configuration information that have previously been configured. With this option, a list of configuration files that will be restored in standard output is displayed. Check that backed up configuration information are stored in the specified directory or in FJSVclora in the directory (current directory) that is created with the clorabr command. For example, if the backup information is stored in /var/tmp/FJSVclora, execute the command after moving it to /var/tmp.

[-d *backup_directory*]

Specifies the directory where data will be backed up or restored using the full path. With the backup option, the FJSVclora directory will be created on the specified directory, and data will be stored in the FJSVclora. With the restore option, data will be restored from the FJSVclora.

Without this option, data will be backed up or restored in the current directory where the command is executed.

Exit status

0: Normal termination

Non-0: Abnormal termination

Chapter 5 Notice

Particular attention must be given to the operation of PRIMECLUSTER Wizard for Oracle.

Prerequisites and requirements

PRIMECLUSTER Wizard for Oracle has specific system requirements and component prerequisites that need to be understood prior to operation.

- More than one Oracle product which version/release is different can be installed on the same node. However, the version and release should be same on an operating node and standby nodes.
For the Oracle products supported, see “Installation Guide” and “Handbook”.
- A user name, user ID, group name, and group ID should be identical on all the nodes to install Oracle.
- If multiple ORACLE_HOME are configured on one server, a different user name must be assigned respectively.
- An Oracle database must be configured on the shared disk.
- Setting Oracle log output on the shared disk is not recommended. When a disk device fails, log might not be output, or the Oracle instance might not be started.
- Oracle archive log files can be set on local disks. In such a case, if Oracle recovery is required, the Oracle archive log files on both nodes will be put together.
- The Oracle “TWO_TASK” environment variable cannot be used. For details, see “[2.2.7 Oracle Database Creation and Setting](#)”.
- The setting to connect to an Oracle database must not be described in login.sql of an Oracle user. For details, see “[2.2.7 Oracle Database Creation and Setting](#)”.
- PRIMECLUSTER Wizard for Oracle connects to Oracle instance with SYSDBA system privilege to start up or stop Oracle instance/database. In this case, local connection in operating system authentication is used. Therefore, the following requirements should be satisfied. (If not, startup and stop of Oracle instance/database might fail.)
 - Oracle user that is set for Oracle instance resource in “[2.2.9 userApplication with Oracle Resources](#)” or “[2.3.5 userApplication with Oracle RAC Instances and Listeners](#)” should belong to OSDBA group.
 - SQLNET.AUTHENTICATION_SERVICES parameter should not be defined in sqlnet.ora file.

The other connections (e.g. user own connection for maintenance) can use the password file authentication.

- A command (e.g. script) that has interactive mode should not be described in Oracle user's profile(e.g. /etc/profile, .bash_profile, .cshrc, .profile). It may cause failure of resource monitoring or userApplication startup or shutdown.
For details, refer to “[2.2.2 Oracle Installation and Configuration](#)” or “[2.3.2 Oracle Software Installation and Configuration](#)”.
- Environment that Oracle user's home directory and profile are located on the shared disk is not supported. Oracle user's home directory and profile must be located on the local disk of each node.
- Operating system authentication of Listener should be enabled. For details, refer to “[2.2.7 Oracle Database Creation and Setting](#)”.
- Oracle user should have access privileges for /tmp directory.
The programs of PRIMECLUSTER Wizard for Oracle working with Oracle user use /tmp directory. If Oracle user does not have access privileges for /tmp directory, the programs do not work correctly and startup or shutdown of Oracle fails.
- Using of the "su -" command is not supported for user scripts(prestapup*, nomount*, mount*) under /opt/FJSVclora/usr.

Features and functions

Below are guidelines and precautions to be taken in using the features and functions provided by PRIMECLUSTER Wizard for Oracle.

- The detector connects itself to the database using SYSTEM user access privileges to monitor Oracle instances. It also monitors Oracle operation by creating a monitoring table on the SYSTEM user default table space. The size of the table is only a few bytes. The table data is periodically updated, so the REDO log is updated, and the archive log data is output.
- Stopping an Oracle instance in the “immediate” mode fails in the following situations:
 - A DBA user is being connected to the Oracle instance, or

- Online backup is the Oracle instance is in progress
If this occurs, Wizard for Oracle will shut down the Oracle instance with “abort” mode.
- The time required for Oracle instance startup and stop varies depending on the database size. The default startup timeout is 10 minutes. The default stop timeout is 3 minutes.
The RMS command “hvshut” has its own timeout. Even though hvshut times out, userApplication stop processing will be continued along with RMS stop.
- If a database failure is detected during Oracle instance startup, the database will automatically be recovered. Note that if Oracle9iRAC is used in a system, automatic recovery will not be performed. If recovery is required, specify the following file names under the “/opt/FJsvclora/usr” directory:

Example

```
# cd /opt/FJsvclora/usr
# mv ./_mount10EndBackup.sh ./mount10EndBackup.sh
# mv ./_mount20EndBackup.sh ./mount20EndBackup.sh
# mv ./mount05EndBackup_MediaRecover.sh
    ./_mount05EndBackup_MediaRecover.sh
```

See

For details, see “[3.6 User Scripts for Oracle Startup](#)”.

- In Oracle RAC 10g scalable operation, an RMS resource is created based on the resource name of Oracle RAC 10g. For details, see ”[2.3.2 Oracle Software Installation and Configuration](#)”.
- If “Instance” or “Listener” is specified for StartPriority, MonitorOnly cannot be enabled. To enable it, specify “Same”. For details, see ”[2.2.9 userApplication with Oracle Resources](#)”.

Configuration

Below are guidelines and precautions to be taken in configuring an environment that allows for PRIMECLUSTER Wizard for Oracle operations.

- Be aware of the exit code and timeout duration when the following scripts are set:
PreOnlineScript, PostOnlineScript, PreOfflineScript, PostOfflineScript, FaultScript.
For details, see “[2.4.1 Oracle Online/Offline Script](#)”.

Operations

Users need to take a special precaution when changing the SYSTEM password for PRIMECLUSTER Wizard for Oracle as follows:

- For information on how to change the Oracle SYSTEM user password while a cluster system is running, see “[3.3 Oracle SYSTEM User Password Change](#)”.

Others

Users need to take the following special precaution when operating PRIMECLUSTER Wizard for Oracle:

- If an Oracle instance is stopped in the abort mode, it will automatically be recovered at the next instance startup.

Chapter 6 Message

This chapter describes messages generated by PRIMECLUSTER Wizard for Oracle and lists the possible causes and actions you can take to resolve any problems indicated by a message.

Oracle instance resource messages

ERROR: 1202: Cannot map shared memory or get semaphore

[Content]

A system error occurred. Acquisition of shared memory or semaphores failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 1203: Cannot open actionlist

[Content]

The action definition file cannot be opened.

[Corrective action]

Check if the action definition file already exists, or file access privileges have been changed.

ERROR: 1204: Corrupted actionlist: Invalid errno, line=xx

[Content]

The “errno” setting of the action definition file is incorrect.

[Corrective action]

Check the “errno” setting of “line=%d” in the action definition file.

ERROR: 1205: Corrupted actionlist: Invalid status, line=xx

[Content]

The “status” setting of the action definition file is incorrect.

[Corrective action]

Check the “status” setting of “line=%d” in the action definition file.

ERROR: 1206: Corrupted actionlist: Invalid action, line=xx

[Content]

The “action” setting of the action definition file is incorrect.

[Corrective action]

Check the “action” setting of “line=%d” in the action definition file.

ERROR: 1208: <Oracle process> process error

[Content]

An Oracle process error was detected.

[Corrective action]

Check if Oracle is properly running by referring to the Oracle alert log.

ERROR: 1213: Action error detected: Offline

[Content]

The “Offline” state of the resource will be notified.

[Corrective action]

Check if Oracle is properly running by referring to the Oracle alert log.

ERROR: 1214: Action error detected: Faulted

[Content]

The “Faulted” state of the resource will be notified.

[Corrective action]

Check if Oracle is properly running by referring to the Oracle alert log.

ERROR: 1215: Action error detected: Restart

[Content]

Monitoring will be retried.

[Corrective action]

Check if Oracle is properly running by referring to the Oracle alert log.

ERROR: 1219: Cannot read hvgdconfig

[Content]

The RMS configuration file (hvgdconfig file) cannot be read.

[Corrective action]

Modify the RMS configuration file manually then check the file settings.

ERROR: 1220: Not Found xx setting in hvgdconfig

[Content]

The “%s” setting of the RMS configuration file (hvgdconfig file) is incorrect.

[Corrective action]

If you modify the RMS configuration file manually, check the settings.

ERROR: 1223: Not found *AttributeName* in hvgdconfig

[Content]

The “*AttributeName*” setting of the RMS configuration file (hvgdconfig file) is incorrect.

[Corrective action]

If you modify the RMS configuration file manually, check the settings.

ERROR: 1224: Receiving of monitoring instruction failed (*detail*)

[Content]

An internal error occurred. Acquisition of shared memory or semaphores failed.

[Corrective action]

Contact system administrators.

ERROR: 1225: Reporting of monitoring result failed : *status*

[Content]

An internal error occurred. Notification of monitoring result failed.

[Corrective action]

Contact system administrators.

ERROR: 1226: Checking existence of Detector process failed

[Content]

An internal error occurred. Checking whether or not the detector process is alive failed.

[Corrective action]

Contact system administrators.

ERROR: 1227: Invalid setting in hvgdconfig : *AttributeName*

[Content]

The “*AttributeName*” setting of the RMS configuration file (hvgdconfig file) is incorrect.

[Corrective action]

If you modify the RMS configuration file manually, check the settings.

ERROR: 1299: ORA-xxxxx

[Content]

An Oracle error “ORA-xxxxx” is output.

[Corrective action]

Check if Oracle is properly running by referring to the Oracle alert log.

WARN: 1302: Action error detected: Warning

[Content]

The warning state of the resource will be notified.

[Corrective action]

Check if Oracle is properly running by referring to the Oracle alert log.

ERROR: 3402: clorainstance detected Oracle error! (ORA-xxxxx:)

[Content]

An Oracle error occurred while Oracle startup or shutdown was in progress (svrmgrl).

[Corrective action]

Check if Oracle is properly running by referring to the Oracle alert log.

ERROR: 3403: clorainstance detected Oracle error! (ORA-xxxxx:)
ERROR: 7301: clasminstance detected Oracle error! (ORA-xxxxx:)

[Content]

An Oracle error occurred while Oracle startup or shutdown was in progress (sqlplus).

[Corrective action]

Check if Oracle is properly running by referring to the Oracle alert log.

Oracle listener resource messages

ERROR: 2202: Cannot map shared memory or get semaphore

[Content]

A system error occurred. Acquisition of shared memory or semaphores failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 2203: Cannot get ORACLE_HOME

[Content]

ORACLE_HOME cannot be acquired.

[Corrective action]

Check if ORACLE_HOME is correctly set for the environment variable.

ERROR: 2204: Cannot read hvgdconfig

[Content]

The RMS configuration file (hvgdconfig file) cannot be read.

[Corrective action]

Modify the RMS configuration file manually then check the file settings.

ERROR: 2205: Not Found xx setting in hvgdconfig

[Content]

The “%s” setting of the RMS configuration file (hvgdconfig file) is incorrect.

[Corrective action]

If you modify the RMS configuration file manually, check the settings.

ERROR: 2206: Not Found *AttributeName* in hvgdconfig

[Content]

The “*AttributeName*” setting of the RMS configuration file (hvgdconfig file) is incorrect.

[Corrective action]

If you modify the RMS configuration file manually, check the settings.

ERROR: 2210: Tnsping detected the error (xx)

[Content]

Listener monitoring with the tnsping command failed.

[Corrective action]

Check the Listener log and if the Listener is properly running.

ERROR: 2211: The listener name is invalid

[Content]

The Oracle listener name is incorrect.

[Corrective action]

Check the Listener settings such as listener.ora and tnsnames.ora.

ERROR: 2214: The process of the listener does not exist**[Content]**

An Oracle listener process failure was detected. It will be output along with userApplication stop.

[Corrective action]

If the error is output during userApplication is online, check the Listener log and if the Listener is properly running.

ERROR: 2215: Process ID of the listener is not found**[Content]**

The Listener process ID is unknown.

[Corrective action]

Check the Listener log and if the Listener is properly running.

ERROR: 2219: Reporting of monitoring result failed : *status***[Content]**

An internal error occurred. Notification of monitoring result failed.

[Corrective action]

Contact system administrators.

ERROR: 2220: System error occurred(*detail*)**[Content]**

A system error occurred.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 2221: Receiving of monitoring instruction failed (*detail*)**[Content]**

An internal error occurred. Acquisition of shared memory or semaphores failed.

[Corrective action]

Contact system administrators.

ERROR: 2222: Checking existence of Detector process failed**[Content]**

An internal error occurred. Checking whether or not the detector process is alive failed.

[Corrective action]

Contact system administrators.

Common messages

INFO: 0101: Fault Watching is disable**[Content]**

Monitoring resource was discontinued after the hvoradisable was executed.

[Corrective action]

None. Execute the hvoraenable command to restart resource monitoring.

INFO: 0102: Fault Watching is enable

[Content]

Resource monitoring was restarted after the “hvoraenable” command was executed.

[Corrective action]

None.



See

.....
For details of the commands, see “[4.1 hvoradisable - Discontinue Monitoring Resources](#)” , “[4.2 hvoraenable - Restart Monitoring Resources](#)” .
.....

ERROR: 0207: Cannot allocate memory for hvgdconfig : *AttributeName*

[Content]

A system error occurred. Acquisition of memory failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 0208: Data init error

[Content]

A system error occurred. Acquisition of semaphore failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 0209: Fork error

[Content]

A system error occurred. Generation of process failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 0211: User xx not found.

[Content]

The Oracle user settings are incorrect.

[Corrective action]

Check if Oracle user information (e.g. username) is correct.

ERROR: 0212: Cannot create log xx

[Content]

Log files cannot be created.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 0213: Library init error**[Content]**

A system error occurred. Initialization failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 0219: Detector aborted**[Content]**

A system error occurred. The detector will be terminated.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 0220: Not found <AttributeName> in hvgdconfig.**[Content]**

The “*AttributeName*” setting of the RMS configuration file (hvgdconfig file) is not set.

[Corrective action]

If you modify the RMS configuration file manually, check the settings.

ERROR: 0221: Invalid setting in hvgdconfig : *AttributeName***[Content]**

The “*AttributeName*” setting of the RMS configuration file (hvgdconfig file) is incorrect.

[Corrective action]

If you modify the RMS configuration file manually, check the settings.

ERROR: 0222: Checking permission of resource monitoring failed**[Content]**

An internal error occurred. Checking monitoring disruption failed.

[Corrective action]

Contact system administrators.

ERROR: 0223: Checking existence of fault monitor process failed**[Content]**

An internal error occurred. Checking whether or not the monitoring process is alive failed.

[Corrective action]

Contact system administrators.

ERROR: 0224: Sending monitoring instruction failed (*detail*)**[Content]**

A system error occurred. Acquisition of shared memory or semaphores failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 0225: Receiving of monitoring result failed (*detail*)

[Content]

A system error occurred. Acquisition of shared memory or semaphores failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

ERROR: 0226: Watch Timeout error occurred (*count*)

[Content]

Since there's no response from Oracle or Listener, timeout occurs.

[Corrective action]

Check if Oracle or Listener is properly running by referring to the Oracle alert log or Listener log.

ERROR: 0227: Receiving of Script notice failed

[Content]

An internal error occurred. Communication with the script failed.

[Corrective action]

Contact system administrators.

ERROR: 0228: Starting fault monitor failed

[Content]

Startup of the monitoring process failed.

[Corrective action]

Contact system administrators.

ERROR: 0229: Pipe error

[Content]

A system error occurred. Creation of output pipe failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

 **Note**

.....
PRIMECLUSTER Wizard for Oracle outputs error messages to system console other than messages described above if error in Oracle instance startup occurs.
.....

clgetoralog messages

clgetoralog [ERROR] Creation of temporary directory failed! (*directory_name*)

[Content]

Cannot make a temporary directory.

[Corrective action]

Check the system environment.

clgetalog [ERROR] Invalid RMS Configuration name! (RMS_configuration)**[Content]**

The specified RMS configuration RMS_configuration does not exist.

[Corrective action]

Retry with a correct RMS configuration name.

clgetalog [ERROR] No space in path_name (details)!**[Content]**

Not enough disk space in path_name.

[Corrective action]

Check the system environment.

clgetalog [ERROR] Creation of directory failed! (directory_name)**[Content]**

Cannot make a directory directory_name where collected information is stored.

[Corrective action]

Check the system environment.

clgetalog [ERROR] "file_name" already exists!**[Content]**

Cannot make file_name because the same name file already exists.

[Corrective action]

The directory where the collected information has been stored is shown in the following message. Create an archive file from the directory manually with other file name.

clgetalog [ERROR] Creation of "file_name" failed!"**[Content]**

Cannot create an archive file file_name.

[Corrective action]

The directory where the collected information has been stored is shown in the following message. Create an archive file from the directory manually.

clgetalog [WARN] Obtaining local SysNode Name failed!**[Content]**

Cannot get local SysNode name, but clgetalog continues collecting information.

[Corrective action]

None.

clgetalog [WARN] Execution of hvw failed!**[Content]**

Cannot execute an RMS command hvw(1M) correctly, but clgetalog continues collecting information.

[Corrective action]

None.

clgetoralog [WARN] Result of hvw is invalid!

[Content]

An RMS command hvw(1M) has returned unexpected result, but clgetoralog continues collecting information.

[Corrective action]

None.

clgetoralog [WARN] Wizard for Oracle resources not found in hvgdconfig!

[Content]

There are no definitions of Wizard for Oracle resources in hvgdconfig file, but clgetoralog continues collecting information.

[Corrective action]

None.

clgetoralog [WARN] Obtaining RMS Configuration name from CONFIG.rms failed!

[Content]

Cannot get RMS configuration name, but clgetoralog continue collecting information.

[Corrective action]

None.

clgetoralog [WARN] Invalid RMS Configuration name! (RMS_configuration)

[Content]

Cannot get RMS configuration name, but clgetoralog continue collecting information.

[Corrective action]

None.

clorainfo messages

clorainfo: ERROR: Obtaining local SysNode Name failed!

[Content]

Cannot get a local SysNode name.

[Corrective action]

Check if CF (Cluster Foundation) has been configured and is "UP" state.

clorainfo: ERROR: Checking RMS running status failed! (details)

[Content]

Cannot check if RMS is running or not.

[Corrective action]

Check if PRIMECLUSTER installation, cluster setup and building a cluster application (userApplication) have been completed.

clorainfo: ERROR: Obtaining RMS configuration name failed! (details)

[Content]

Cannot get an RMS configuration name.

[Corrective action]

Check if building a userApplication (cluster application) has been completed.

clorainfo: ERROR: CONFIG.rms does not exist! (details)

[Content]

CONFIG.rms file does not exist.

[Corrective action]

Check if building a userApplication (cluster application) has been completed.

clorainfo: ERROR: Wizard for Oracle resources not found

[Content]

There are no Wizard for Oracle resources in a build userApplication (cluster application).

[Corrective action]

Check if building a userApplication (cluster application) has been completed or Oracle instance resources or Listener resources are included in the userApplication.

clorainfo: ERROR: The specified resource does not exist on this SysNode (SysNode_name), or does not belong to Wizard for Oracle! - resource_name

[Content]

The specified resource resource_name does not exist on the local node SysNode_name, or is not a Wizard for Oracle resource.

[Corrective action]

Retry with a correct resource name.

clorainfo: ERROR: Resource does not belong to Wizard for Oracle - resource_name

[Content]

The specified resource resource_name is not a Wizard for Oracle resource.

[Corrective action]

Retry with a correct resource name.

clorainfo: ERROR: Invalid RMS Configuration.

[Content]

RMS configuration is invalid.

[Corrective action]

Check if building a userApplication (cluster application) has been completed.

clorainfo: ERROR: RMS_configuration does not exist.

[Content]

The specified RMS configuration does not exist.

[Corrective action]

Retry with a correct RMS configuration name.

hvoradisable/hvoraenable messages

command: ERROR: Internal error! (details)

[Content]

Internal error occurred.

[Corrective action]

Contact your system administrator.

command: ERROR: Failed to disable/enable resource monitoring - resource_name

[Content]

Cannot disable or enable monitoring.

[Corrective action]

Contact your system administrator.

command: ERROR: hvgdconfig does not exist!

[Content]

hvgdconfig file does not exist.

[Corrective action]

Check if building a userApplication (cluster application) has been completed.

command: ERROR: Obtaining local SysNode Name failed!

[Content]

Cannot get a local SysNode name.

[Corrective action]

Check if CF (Cluster Foundation) has been configured and is "UP" state.

command: ERROR: Obtaining RMS configuration Name failed!

[Content]

Cannot get an RMS configuration name.

[Corrective action]

Check if building a userApplication (cluster application) has been completed.

command: ERROR: Execution of hvw failed!

[Content]

Cannot execute an RMS command hvw(1M) correctly.

[Corrective action]

Check if building a userApplication (cluster application) has been completed.

command: ERROR: Result of hvw is invalid!

[Content]

Cannot execute an RMS command hvw(1M) correctly.

[Corrective action]

Check if building a userApplication (cluster application) has been completed.

command: ERROR: Failed to disable/enable resource monitoring! (details)**[Content]**

Cannot disable or enable monitoring because of details.

[Corrective action]

Check if PRIMECLUSTER installation, cluster setup and building a cluster application (userApplication) have been completed.

command: ERROR: No Wizard for Oracle resources belong to specified userApplication! - userApplication_name**[Content]**

There are no Wizard for Oracle resources in the specified userApplication userApplication_name.

[Corrective action]

Retry with a correct userApplication name.

command: ERROR: No Wizard for Oracle resources are in the current RMS configuration!**[Content]**

There are no Wizard for Oracle resources in the current RMS configuration.

[Corrective action]

Check if building a userApplication (cluster application) has been completed or Oracle instance resources or Listener resources are included in the userApplication.

command: ERROR: No Wizard for Oracle resources exist on this node! - SysNode_name**[Content]**

There are no Wizard for Oracle resources on a local node SysNode_name.

[Corrective action]

Check if building a userApplication (cluster application) has been completed or Oracle instance resources or Listener resources are included in the userApplication.

command: ERROR: Invalid userApplication or Resource!**[Content]**

The specified userApplication name or resource name is invalid.

[Corrective action]

Retry with a correct userApplication name and resource name.

command: ERROR: The specified resource does not exist on SysNode_name! - resource_name**[Content]**

The specified resource does not exist on a local node SysNode_name.

[Corrective action]

Retry with a correct resource name or retry on a correct node.

command: WARNING: RMS is not running, but the monitoring of resource_name is disabled/enabled.**[Content]**

The monitoring is disabled or enabled although RMS is not running.

[Corrective action]

This setting will become effective in the next RMS startup.

cloracpy messages

ORACLE_SID not found.

[Content]

ORACLE_SID cannot be acquired.

[Corrective action]

Check if ORACLE_SID is correctly set for the environment variable.

ORACLE_HOME not found.

[Content]

ORACLE_HOME cannot be acquired.

[Corrective action]

Check if ORACLE_HOME is correctly set for the environment variable.

ORACLE_BASE not found.

[Content]

ORACLE_BASE cannot be acquired.

[Corrective action]

Check if ORACLE_BASE is correctly set for the environment variable.

ORACLE_HOME/dbs is invalid.

[Content]

ORACLE_HOME/dbs directory does not exist.

[Corrective action]

Check if the directory exists.

ORACLE_HOME/network/admin is invalid.

[Content]

ORACLE_HOME/network/admin directory does not exist.

[Corrective action]

Check if the directory exists.

ORACLE_BASE/admin/ORACLE_SID is invalid.

[Content]

ORACLE_BASE/admin/*ORACLE_SID* directory does not exist.

[Corrective action]

Check if the directory exists.

cloracpy:tar is error.(EXIT_CODE).

[Content]

Cannot execute tar(1) command correctly.

[Corrective action]

Check the disk space or authority of /tmp directory.

clorapass messages

Cannot read password_file.

[Content]

Cannot read the password file.

[Corrective action]

Check the password file.

File format error password_file.

[Content]

Password file occurred format error.

[Corrective action]

Delete the password file, set password again. If more than one password was registered in the file, set all of them.

Cannot allocate memory.

[Content]

A system error occurred. Acquisition of memory failed.

[Corrective action]

The problem might be due to insufficient system resource. Check the system environment.

Cannot write password_file.

[Content]

Cannot write the password file.

[Corrective action]

Check the password file.

Password not match.

[Content]

An incorrect password was entered.

[Corrective action]

Enter a correct password.

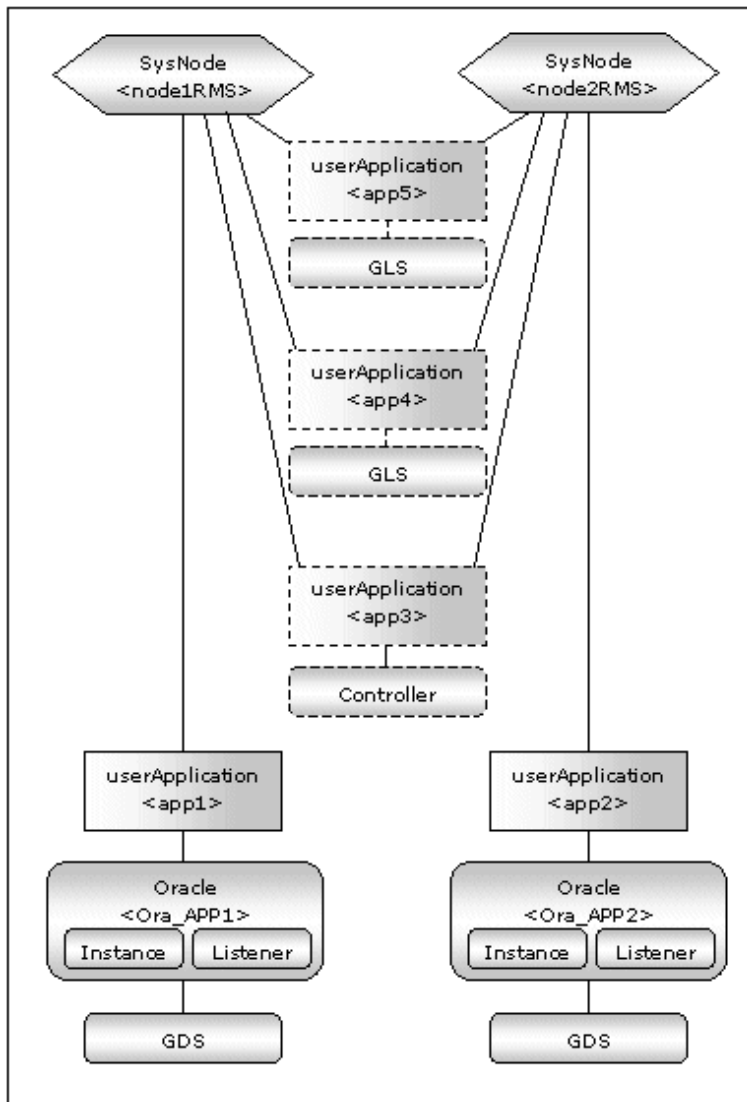
Appendix A Setup Method with CUI

It is also available to setup RMS configurations using by CUI instead of GUI (userApplication Configuration Wizard) explained in "Chapter 2 Environment setup". This section explains how to setup RMS configurations using by CUI.

Note

RMS configurations by CUI may differ slightly from the one by GUI.

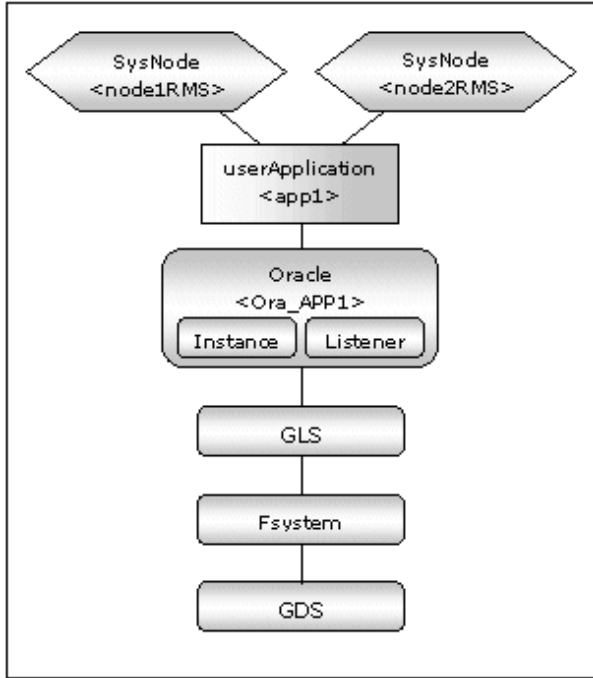
- Oracle9i RAC scalable operation



userApplication	Description	Resources
app1,app2	Controls Oracle instances and listeners. It is created on each node.	Gds resource
app3	Starts up or stops userApplication (app1 and app2) simultaneously on all nodes. Optional	Controller resource

app4,app5	Used as standby for GLs or takeover network.(Option) Create them according to operating conditions.	GLs resource, Cmdline resource, etc
-----------	--	---

- Standby operation



userApplication	Description	Resources
app1	userApplication on all operation nodes	Oracle resource (instance, listener) Gds resource Fsystem resource GLs resource

This section explains userApplication creation and non-Oracle resource setup. Oracle resources must be set after a database is created. userApplication is configured with the RMS Configuration Wizard. This RMS Configuration Wizard forms Wizard format.

<ol style="list-style-type: none"> 1. Application-Create 2. Configuration-Generate 3. Configuration-Activate 	
---	--

 See

For further details, refer to the PRIMECLUSTER manuals.

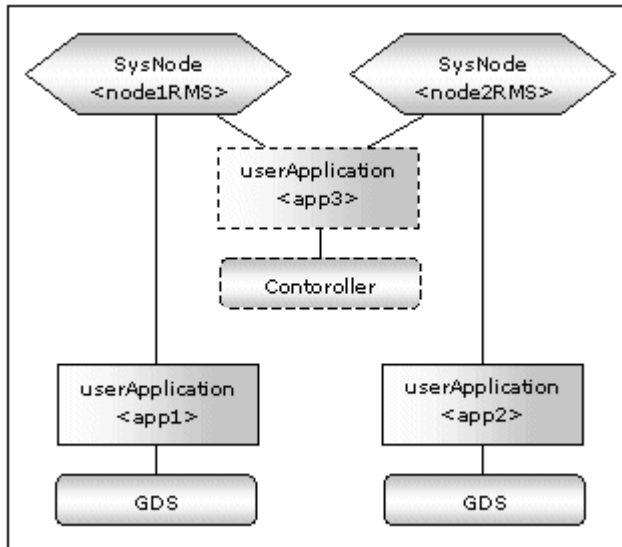
A.1 userApplication with No Oracle Resources

This section describes how to create userApplication and set up non-Oracle resources.

Set up Oracle resources after creating a database.

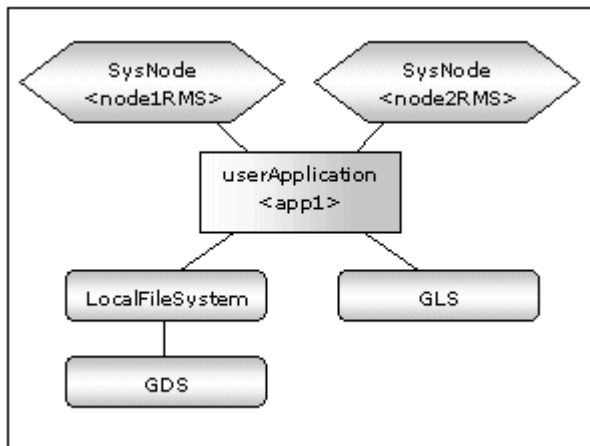
- Oracle9i RAC scalable operation

In Oracle9i RAC scalable operation, non-Oracle resources are configured first as follows:



- Standby operation

Non-Oracle resources are configured first as follows:



GDS setup

GDS is set as “shared disk for concurrent access” for scalable operation and “switching disk” for standby operation. We recommend that you prepare the disk class for Oracle system table space and other Oracle data respectively. In that case, the MONITORONLY attribute of the disk class should be set to “NO” for the Oracle system table space and “YES” for the other Oracle data.

userApplication setup

Create userApplication according to “6.6 Setting Up Cluster Applications” of the “PRIMECLUSTER Installation and Administration Guide”.

Set up userApplication using the RMS Configuration Wizard. The RMS Configuration Wizard uses the format that allows you to select information in the menu.

The following command is executed on any one of the cluster nodes:

```
# hvw -n <Definition name>
```

A.1.1 Oracle9i RAC scalable operation setup

1. Select Application-Create in the “Main RMS management menu” page to create userApplication.

```
node1: Main configuration menu, current configuration: oraconf
No RMS active in the cluster
 1) HELP                      10) Configuration-Remove
 2) QUIT                      11) Configuration-Freeze
 3) Application-Create      12) Configuration-Thaw
 4) Application-Edit          13) Configuration-Edit-Global-Settings
 5) Application-Remove        14) Configuration-Consistency-Report
 6) Application-Clone         15) Configuration-ScriptExecution
 7) Configuration-Generate    16) RMS-CreateMachine
 8) Configuration-Activate    17) RMS-RemoveMachine
 9) Configuration-Copy
Choose an action: 3
```

2. Select ORACLE (all caps) in the “Application type selection menu” page.

```
Creation: Application type selection menu:
 1) HELP                      7) ORACLE
 2) QUIT                      8) SCALABLE
 3) RETURN                   9) STANDBY
 4) OPTIONS
 5) DEMO
 6) GENERIC
Application Type: 7
```

3. Specify the userApplication name of ApplicationName in the “Settings of turnkey wizard ORACLE” page.

```
Settings of turnkey wizard "ORACLE"
 1) HELP                      4) REMOVE+EXIT          7) Machines+Basics(-)
 2) NO-SAVE+EXIT             5) ApplicationName=APP1
 3) SAVE+EXIT                6) BeingControlled=no
Choose the setting to process: 5
```

4. Select Machines+Basics to set up a node and following menu items. Create the same number of userApplication as that of Oracle instances. One node is required for each userApplication. For other settings, see HELP or the "PRIMECLUSTER Installation and Administration Guide".

```
Settings of turnkey wizard "ORACLE"
 1) HELP                      4) REMOVE+EXIT          7) Machines+Basics(-)
 2) NO-SAVE+EXIT             5) ApplicationName=APP1
 3) SAVE+EXIT                6) BeingControlled=no
Choose the setting to process: 7
```

Information

The following setup values are recommended. The other attributes not described below are optional.

Attributes	Values
AutoStartUp	No If you control userApplication startup and stop on all nodes by using the controlling userApplication, be sure to specify No.
AutoSwitchOver	No

PersistentFault	1
-----------------	---

5. Save the above settings by selecting SAVE+EXIT.

```
Machines+Basics (app1:consistent)
1) HELP                10) (PostOnlineScript=)  19) (OnlinePriority=)
2) -                   11) (PreOfflineScript=) 20) (StandbyTransitions=)
3) SAVE+EXIT          12) (OfflineDoneScript=) 21) (LicenseToKill=no)
4) REMOVE+EXIT        13) (FaultScript=)      22) (AutoBreak=yes)
5) AdditionalMachine  14) (AutoStartUp=no)    23) (HaltFlag=no)
6) AdditionalConsole  15) (AutoSwitchOver=No) 24) (PartialCluster=0)
7) Machines[0]=node1RMS 16) (PreserveState=no) 25) (ScriptTimeout=)
8) (PreCheckScript=)  17) (PersistentFault=1)
9) (PreOnlineScript=) 18) (ShutdownPriority=)
Choose the setting to process: 3
```

6. Set up a resource required for the shared disk (ex. GDS) in the “Setting of turnkey wizard ORACLE” page.

```
Settings of turnkey wizard "ORACLE"
1) HELP                11) Oracle(-)
2) -                   12) Crm:SystemState3(-)
3) SAVE+EXIT          13) Crm:SystemState2(-)
4) -                   14) LocalFileSystems(-)
5) ApplicationName=APP1 15) RemoteFileSystems(-)
6) Machines+Basics(app1) 16) IpAddresses(-)
7) CommandLines(-)     17) RawDisks(-)
8) Controllers(-)      18) LVM-VolumeManagement(-)
9) Crm:Application(-)  19) Gds:Global-Disk-Services(-)
10) Crm:BasicApplication(-) 20) Gls:Global-Link-Services(-)
Choose the setting to process: 19
```

7. Return to the Main RMS management menu by executing SAVE+EXIT (Any settings related to Oracle should not be done here).
8. Node setup is completed.
For scalable operation, create the same number of userApplication as the nodes.
(Repeat the same procedure from 1 to 7 for the other nodes.)
9. Create userApplication (app3) for controlling Oracle the register the userApplications created up to step 8.



Create the controlling userApplication if you want to startup or stop userApplication (app1, app2) at the same time on all nodes.
For details of step 8 of the procedure, see “6.7.2.2 Creating Scalable Cluster Applications” of the “PRIMECLUSTER Installation and Administration Guide”.

A.1.2 Standby operation setup

1. Create userApplication by selecting Application-Create in the “Main RMS manage menu” page.

```

node1: Main configuration menu, current configuration: oraconf
No RMS active in the cluster
 1) HELP
 2) QUIT
 3) Application-Create
 4) Application-Edit
 5) Application-Remove
 6) Application-Clone
 7) Configuration-Generate
 8) Configuration-Activate
 9) Configuration-Copy
10) Configuration-Remove
11) Configuration-Freeze
12) Configuration-Thaw
13) Configuration-Edit-Global-Settings
14) Configuration-Consistency-Report
15) Configuration-ScriptExecution
16) RMS-CreateMachine
17) RMS-RemoveMachine
Choose an action: 3
  
```

2. Select ORACLE (in capitals) in the “Application type selection menu” page.

```

Creation: Application type selection menu:
 1) HELP
 2) QUIT
 3) RETURN
 4) OPTIONS
 5) DEMO
 6) GENERIC
 7) ORACLE
 8) SCALABLE
 9) STANDBY
Application Type: 7
  
```

3. Specify a userApplication name of ApplicationName in the “Settings of turnkey wizard ORACLE” page.

```

Settings of turnkey wizard "ORACLE"
 1) HELP
 2) NO-SAVE+EXIT
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) ApplicationName=APP1
 6) BeingControlled=no
 7) Machines+Basics(-)
Choose the setting to process: 5
  
```

4. Select Machines+Basics to set up nodes and following menu items.
Set an operating node to Machines [0], and standby nodes to Machines [n]. Select AdditionalMachines when adding a new node.
For other settings, see HELP or the PRIMECLUSTER Installation and Administration Guide.

```

Settings of turnkey wizard "ORACLE"
 1) HELP
 2) NO-SAVE+EXIT
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) ApplicationName=APP1
 6) BeingControlled=no
 7) Machines+Basics(-)
Choose the setting to process: 7
  
```

Information

The following setup values are recommended. The other attributes not described below are optional.

Attributes	Values
AutoSwitchOver	HostFailure ResourceFailure ShutDown
PersistentFault	1
HaltFlag	yes

5. Save the above settings by selecting SAVE+EXIT.

```
Machines+Basics (app1:consistent)
 1) HELP
 2) -
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) AdditionalMachine
 6) AdditionalConsole
 7) Machines[0]=node1RMS
 8) Machines[1]=node2RMS
 9) (PreCheckScript=)
10) (PreOnlineScript=)
11) (PostOnlineScript=)
12) (PreOfflineScript=)
13) (OfflineDoneScript=)
14) (FaultScript=)
15) (AutoStartUp=no)
16) (AutoSwitchOver=HostFailure|ResourceFailure|ShutDown)
17) (PreserveState=no)
18) (PersistentFault=1)
19) (ShutdownPriority=)
20) (OnlinePriority=)
21) (StandbyTransitions=)
22) (LicenseToKill=no)
23) (AutoBreak=yes)
24) (HaltFlag=yes)
25) (PartialCluster=0)
26) (ScriptTimeout=)
Choose the setting to process: 3
```

6. Set up resources required for shared disks (GDS), LocalFileSystems, and GIs in the “Settings of turnkey wizard ORACLE” page.

```
Settings of turnkey wizard "ORACLE"
 1) HELP
 2) -
 3) SAVE+EXIT
 4) -
 5) ApplicationName=APP1
 6) Machines+Basics(app1)
 7) CommandLines(-)
 8) Controllers(-)
 9) Crm:Application(-)
10) Crm:BasicApplication(-)
11) Oracle(-)
12) Crm:SystemState3(-)
13) Crm:SystemState2(-)
14) LocalFileSystems(Lfs_APP1)
15) RemoteFileSystems(-)
16) IpAddresses(-)
17) RawDisks(-)
18) LVM-VolumeManagement(-)
19) Gds:Global-Disk-Services(Gds_APP1)
20) Gls:Global-Link-Services(Gls_APP1)
Choose the setting to process: 3
```

7. Return to the Main RMS management menu by selecting SAVE+EXIT. (Any settings related to Oracle should not be done at this point.)

A.2 Configuration-Generate and Configuration-Activate

Execute Configuration-Generate and Configuration-Activate. Then the environment setup will successfully be completed.

```
node1: Main configuration menu, current configuration: oraconf
No RMS active in the cluster
 1) HELP
 2) QUIT
 3) Application-Create
 4) Application-Edit
 5) Application-Remove
 6) Application-Clone
 7) Configuration-Generate
 8) Configuration-Activate
 9) Configuration-Copy
10) Configuration-Remove
11) Configuration-Freeze
12) Configuration-Thaw
13) Configuration-Edit-Global-Settings
14) Configuration-Consistency-Report
15) Configuration-ScriptExecution
16) RMS-CreateMachine
17) RMS-RemoveMachine
Choose an action:
```

A.3 userApplication Operation Check

Start userApplication by executing the hvcm command then check if it is properly running on all the nodes.

- Check if you can access to the shared disk from the operating node. Also, check if a file can be created on the shared disk using Oracle user access privileges.
- Check if you can access the operating node from the client using the logical IP address.

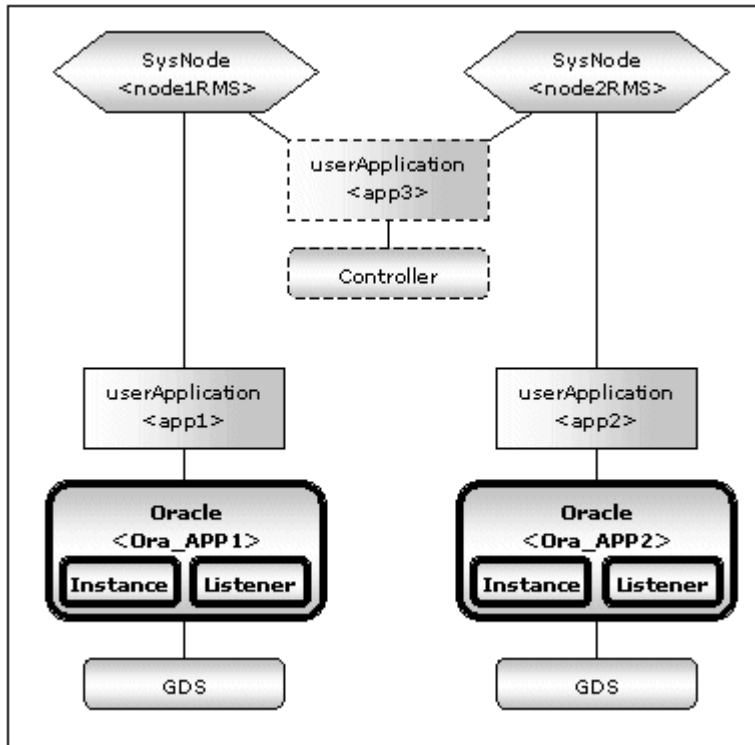


.....
For the RMS command, see the “PRIMECLUSTER Installation and Administration Guide.”
.....

A.4 Oracle Resource Creation and Setting

Register Oracle resources in userApplication that is created at “[A.1 userApplication with No Oracle Resources](#)”.

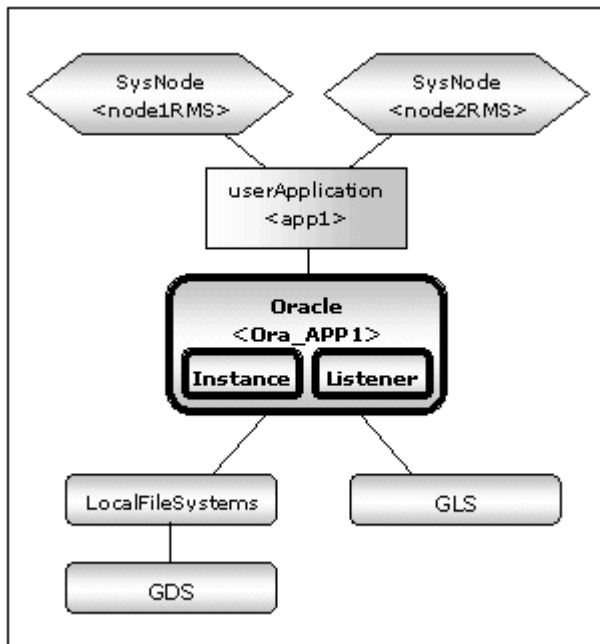
- Oracle9i RAC scalable operation
In Oracle9i RAC scalable operation, userApplication is configured as follows.
Note that userApplication resources (Ora_App1 and Ora_App2) are being created and added.



- Standby operation

In standby operation, userApplication is configured as follows.

Note that userApplication resource (Ora_App1) is being created and added.



Execute the following command on any one of the nodes. Note that <Definition name> must be the same as that specified at “[A.1 userApplication with No Oracle Resources](#)”.

```
# hww -n <Definition name>
```

RMS Configuration Wizard allows you to set up the environment by selecting numbers from the menu.

1. Application-Edit	Create userApplication.
2. Configuration-Generate	Generate userApplication.
3. Configuration-Activate	Activate userApplication.

Note

Check if Oracle is properly running by starting and stopping the Oracle instance and Oracle listener manually.

Also, stop the Oracle instance, Oracle listener, and RMS on all the nodes in a cluster system

See

For further details, see the “PRIMECLUSTER Installation and Administration Guide”.

A.5 userApplication with Oracle Resources

The following example shows how to configure the Oracle environment.

1. Select Application-Edit in the “Main RMS management menu” page.

```
node1: Main configuration menu, current configuration: oraconf
No RMS active in the cluster
 1) HELP
 2) QUIT
 3) Application-Create
 4) Application-Edit
 5) Application-Remove
 6) Application-Clone
 7) Configuration-Generate
 8) Configuration-Activate
 9) Configuration-Copy
10) Configuration-Remove
11) Configuration-Freeze
12) Configuration-Thaw
13) Configuration-Edit-Global-Settings
14) Configuration-Consistency-Report
15) Configuration-ScriptExecution
16) RMS-CreateMachine
17) RMS-RemoveMachine
Choose an action: 4
```

2. Select userApplication created at “[A.1 userApplication with No Oracle Resources](#)”. For scalable operation, select “app1” and “app2”.

```
Edit: Application selection menu (restricted):
 1) HELP
 2) QUIT
 3) RETURN
 4) OPTIONS
 5) APP1
Application Name: 5
```

3. Select ORACLE in the “Settings of turnkey wizard ORACLE” page.

```
Settings of turnkey wizard "ORACLE"
1) HELP
2) READONLY
3) SAVE+EXIT
4) -
5) ApplicationName=APP1
6) Machines+Basics(app1)
7) CommandLines(-)
8) Controllers(-)
9) Crm:Application(-)
10) Crm:BasicApplication(-)
11) Oracle(-)
12) Crm:SystemState3(-)
13) Crm:SystemState2(-)
14) LocalFileSystems(Lfs_APP1)
15) RemoteFileSystems(-)
16) IpAddresses(-)
17) RawDisks(-)
18) LVM-VolumeManagement(-)
19) Gds:Global-Disk-Services(Gds_APP1)
20) Gls:Global-Link-Services(Gls_APP1)
Choose the setting to process: 11
```

4. Add Oracle instances and Oracle listeners in the Oracle setup page.

Attributes	Description
AdditionalInstance	Add an Oracle instance resource.
AdditionalListener	Add an Oracle listener resource.
StartPriority	Set up the startup order of the Oracle instance and Oracle listener. The default is “Simultaneous startup”.

Example

If you use the Oracle multi-threaded server (MTS), the Oracle listener needs to be started first. For example, if an Oracle shared server is used, specify “Listener” for StartPriority to start up the Oracle listener first.

5. Add Oracle instances.

```
Oracle (Ora_APP1:not yet consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) Additional Instance
6) AdditionalListener
7) AdditionalOracle10gService
8) AdditionalOracle10gNodeapps
9) AdditionalOracle10gClusterware
10) StartPriority=Same
Choose the setting to process: 5
```

Enter ORACLE_SID.

```
Setting menu : OracleSID for Oracle instance
1) HELP
2) RETURN
3) FREECHOICE
Set additional instance OracleSID: 3
>> oracle
```

Information

A resource name on RMS is based on the ORACLE_SID on this step.

- Oracle instance resource/ASM instance resource
ORACLE_<SubApplicationName>_<OracleSID>

These resource names have the following convention and rules.

- Characters per resource name must be less than 40 characters.

- "ORACLE" are fixed words.

```

Setting menu : Detail setting for Oracle instance
1) HELP                                10) Interval=30
2) NO-SAVE+RETURN                      11) WatchTimeout=300
3) SAVE+RETURN                       12) (PreOnlineScript=)
4) OracleUser=oracle                  13) (PostOnlineScript=)
5) StartTimeout=600                   14) (PreOfflineScript=)
6) StopTimeout=180                    15) (PostOfflineScript=)
7) AbortTimeout=60                    16) (FaultScript=)
8) StopModeStop=immediate              17) (Flags=)
9) StopModeFail=abort
Choose the setting to process: 3

```

Oracle instance setup

Attributes		Description
OracleSID		ORACLE_SID
OracleUser		DBA user for Oracle control.
StartTimeout		Timeout duration of Oracle startup. Default: 600s (300s - 86400s)
StopTimeout		Timeout duration of Oracle stop. Default: 180s (60s - 86400s)
AbortTimeout		Timeout duration of forced termination in the event of an Oracle stop error. Default: 60s (60s - 86400s)
StopModeStop		Oracle stop mode in normal time. Default: Immediate mode (abort, immediate, transactional)
StopModeFail		Oracle stop mode in the event of a failure. Default: Abort mode (abort, immediate)
Interval		Monitoring interval of Oracle instance. Default: 30s (5s - 86400s)
WatchTimeout		No response time during monitoring Oracle. Default: 300s (30s - 3600s)
PreOnlineScript		Executed before online processing. No default
PostOnlineScript		Executed after online processing. No default
PreOfflineScript		Executed before offline processing. No default
PostOfflineScript		Executed after offline processing. No default
FaultScript		Executed when a fault occurs. No default
Flags	NullDetector (D)	Selects whether or not resource monitoring is enabled. If it is enabled, resource monitoring will not be performed. The resource monitoring is disabled as default.
	AutoRecover (A)	Selects whether or not resource restart is attempted before failover in the event of a resource failure. If it is enabled, the resource will be restarted. The resource is not restarted as default.

	MonitorOnly (M)	Selects whether or not a failover is generated in the event of a resource failure. If it is enabled, the resource will not be switched. The resource will be switched as default.
--	--------------------	---

 See

- For details about Scripts, see "2.4.1 Oracle Online/Offline Script".
- For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".

 Note

- If NullDetector is enabled, the AutoRecover and MonitorOnly attribute will automatically be disabled.
- If "Instance" or "Listener" is specified for StartPriority, MonitorOnly cannot be enabled. To enable it, specify "Same".
- Flags=<Initial letter> indicates that the flag attribute is enabled.

6. Add Oracle listeners.

```
Oracle (Ora_APP1:consistent)
1) HELP                      5) AdditionalInstance
2) -                          6) AdditionalListener
3) SAVE+EXIT                 7) StartPriority=Same
4) REMOVE+EXIT               8) OracleInstanceName[0]='oracle'
Choose the setting to process: 6
```

Enter the listener name.

```
Setting menu : ListenerName for Oracle listener
1) HELP
2) RETURN
3) FREECHOICE
Set additional Listener Name: 3
>> LISTENER
```

 Information

A resource name on RMS is based on the listener name on this step.

- Oracle listener resource
LISTENER_<SubApplicationName>_<ListenerName>

These resource names have the following convention and rules.

- Characters per resource name must be less than 40 characters.
- "LISTENER" are fixed words.

```
Setting menu : Detail setting for Oracle listener
1) HELP                      6) StartTimeout=180      11) (PostOnlineScript=)
2) NO-SAVE+RETURN           7) StopTimeout=60       12) (PreOfflineScript=)
3) SAVE+RETURN              8) Interval=30         13) (PostOfflineScript=)
4) OracleUser=oracle        9) WatchTimeout=300    14) (FaultScript=)
5) (TNSName=)              10) (PreOnlineScript=) 15) (Flags=A)
Choose the setting to process: 3
```

Oracle listener setup

Attributes		Description
ListenerName		Listener name.
OracleUser		DBA user for Oracle control.
TNSName		Network service for listener monitoring Execute the tnsping command to monitor the Oracle listener when TNSName is set (tnsnames.ora). If the TNSName is omitted, process monitoring of the Oracle listener will only be performed.
StartTimeout		Timeout during Oracle startup. Default: 180s (120s - 86400s)
StopTimeout		Timeout during Oracle stop. Default: 60s (60s - 86400s)
Interval		Monitoring interval of Oracle instance. Default: 30s (5s - 86400s)
WatchTimeout		No response time during monitoring Oracle. Default: 300s (30s - 3600s)
PreOnlineScript		Executed before online processing. No default
PostOnlineScript		Executed after online processing. No default
PreOfflineScript		Executed before offline processing. No default
PostOfflineScript		Executed after offline processing. No default
FaultScript		Executed when a fault occurs. No default
Flags	NullDetector (D)	Selects whether or not resource monitoring is enabled. If it is enabled, resource monitoring will not be performed. The resource monitoring is disabled as default.
	AutoRecover (A)	Selects whether or not resource restart is attempted before failover in the event of a resource failure. If it is enabled, the resource will be restarted. The resource is not restarted as default.
	MonitorOnly (M)	Selects whether or not a failover is generated in the event of a resource failure. If it is enabled, the resource will not be switched. The resource will be switched as default.



See

- For details about Scripts, see "2.4.1 Oracle Online/Offline Script".
- For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".

Note

- If NullDetector is enabled, the AutoRecover and MonitorOnly attribute will automatically be disabled.
- If "Instance" or "Listener" is specified for StartPriority, MonitorOnly cannot be enabled. To enable it, specify "Same".
- Flags=<Initial letter> indicates that the flag attribute is enabled.

7. Save the above settings by selecting SAVE+EXIT.

```
Oracle (Ora_APP1:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) AdditionalInstance
Choose the setting to process: 3
6) AdditionalListener
7) StartPriority=Same
8) OracleInstanceName[0]='oracle'
9) OracleListenerName[0]=LISTENER
```

```
Settings of turnkey wizard "ORACLE"
1) HELP
2) -
3) SAVE+EXIT
4) -
5) ApplicationName=APP1
6) Machines+Basics(app1)
7) CommandLines(-)
8) Controllers(-)
9) Crm:Application(-)
10) Crm:BasicApplication(-)
Choose the setting to process: 3
11) Oracle(Ora_APP1)
12) Crm:SystemState3(-)
13) Crm:SystemState2(-)
14) LocalFileSystems(Lfs_APP1)
15) RemoteFileSystems(-)
16) IpAddresses(-)
17) RawDisks(-)
18) LVM-VolumeManagement(-)
19) Gds:Global-Disk-Services(Gds_APP1)
20) Gls:Global-Link-Services(Gls_APP1)
```

A.6 Other Resource Registration

If you have any other required resources and userApplication, register and create them using the RMS Configuration Wizard.

A.7 Configuration-Generate and Configuration-Activate

Execute Configuration-Generate and Configuration-Activate. Then the environment setup will successfully be completed.

```
node1: Main configuration menu, current configuration: oraconf
No RMS active in the cluster
1) HELP
2) QUIT
3) Application-Create
4) Application-Edit
5) Application-Remove
6) Application-Clone
7) Configuration-Generate
8) Configuration-Activate
9) Configuration-Copy
10) Configuration-Remove
11) Configuration-Freeze
12) Configuration-Thaw
13) Configuration-Edit-Global-Settings
14) Configuration-Consistency-Report
15) Configuration-ScriptExecution
16) RMS-CreateMachine
17) RMS-RemoveMachine
Choose an action:
```



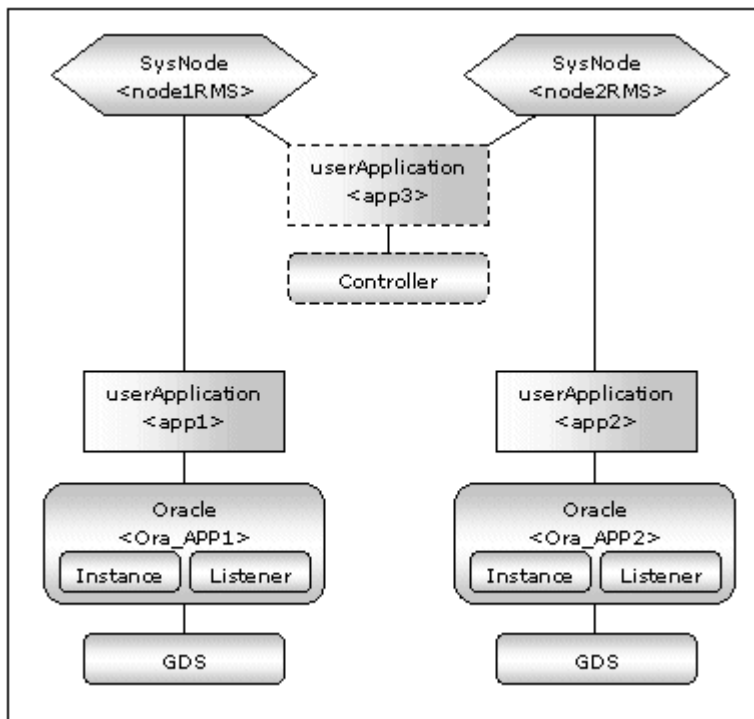
See

After set up userApplication, the settings in this section can be confirmed with clorainfo -c command. See "4.6 clorainfo - Display Resource Configuration and Monitoring Status" for details.

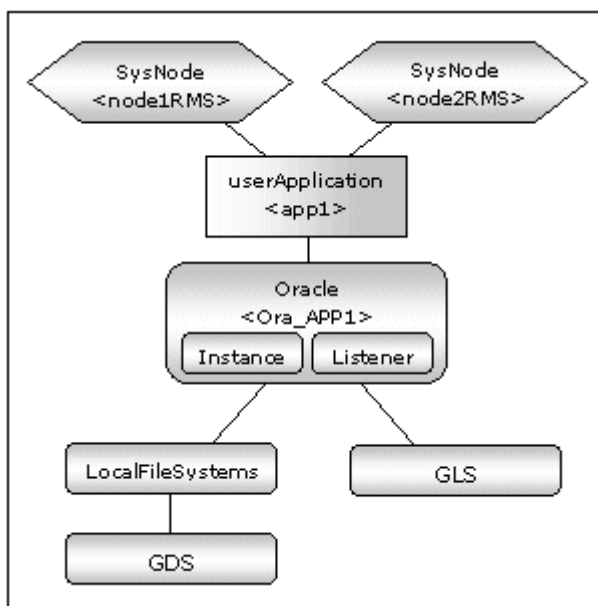
A.8 userApplication Operation Check

Start userApplication by executing the hvcm command then check if it is properly running on all the nodes.

- Check if the configuration is as follows in the Cluster Admin screen of Web-Based Admin View.
- Oracle9i RAC scalable operation



- Standby operation



- Check if you can access to the shared disk from the operating node. Also, check if a file can be created on the shared disk using Oracle user access privileges.
- Check if you can access the operating node from the client using the logical IP address.
- Check if you can access to Oracle running on the operating node from the client using the logical IP address.



See

.....
For the RMS command, refer to “PRIMECLUSTER Installation and Administration Guide.”
.....

Appendix B Failure case studies

Most of Oracle instance startup failures or cluster failover failures are due to Oracle instance down invents. Sometimes, the same or similar problems can occur due to setup or evaluation mistakes made by users.

This section discusses possible causes, corrective and preventive action of problems caused by improper settings or mistaken evaluations

Oracle instances	Startup/stop failure	B.1.1
	Failover	B.1.2
	Warning status	B.1.3
Oracle listeners	Startup/stop failure	B.2.1
	Failover	B.2.2

B.1 Oracle instances

B.1.1 Startup/stop failure

Oracle instance startup or stop failed.

[Case 1]

Oracle instance startup or stop fails when the PRIMECLUSTER RMS resource settings are invalid.

Check the resource setup information by executing the “clorainfo -c” command. See “[4.6 clorainfo - Display Resource Configuration and Monitoring Status](#)”.

- Oracle user
- OracleSID
- Scripts (e.g. PreOnlineScript)
 - A correct path must be set.
 - The script must have execution permission.
 - The script must behave correctly.

If your setup information is incorrect, set proper values again. See “[Chapter 2 Environment setup](#)”.

[Case 2]

Oracle instance startup or stop fails when user script settings in /opt/FJSVclora/usr are incorrect (standby operation or Oracle9i RAC scalable operation only).

Check if the user scripts behave correctly.

[Case 3]

Oracle instance startup or stop fails when Oracle settings are invalid.

Check the Oracle alertlog, so you might be able to detect the cause of the failure.

Also, check if Oracle can be started or stopped properly. If you discontinue Oracle instance resource monitoring, you can operate Oracle manually. See “[3.2.4.1 Oracle must be stopped](#)”.

B.1.2 Failover

A userApplication failover or degeneration occurred because of an Oracle instance resource failure.

[Case 1]

If there is insufficient space to archive, and data updating processing through monitoring SQL hangs, an oracle resource might fail.

Check the Oracle alertlog, so you might be able to detect the cause of the failure.

Also, back up archive logs then reserve enough disk space.

[Case 2]

If monitoring timeout occurs twice in a row, a resource failure will occur. If the following error message is output to syslog, you can determine the cause of this problem:

“ERROR: 0226: Watch Timeout error occurred”

Take corrective action on Oracle.

In Oracle instance monitoring of PRIMECLUSTER Wizard for Oracle, if there is no reply from Oracle within a specified time, monitoring timeout will be considered. At the first monitoring timeout, the resource will only enter Warning, however, if it occurs twice in a row, a resource failure will be determined.

B.1.3 Warning state

Oracle has been activated, but an Oracle instance resource has entered Warning.

[Case 1]

An Oracle instance resource enters Warning when

- The Oracle SYSTEM user password is not registered in PRIMECLUSTER Wizard for Oracle,
- The Oracle SYSTEM user password is registered in PRIMECLUSTER Wizard for Oracle, but it is incorrect, or
- The correct Oracle SYSTEM user password is registered in PRIMECLUSTER Wizard for Oracle, but it is disabled.

If ORA-01017 is output to syslog, you can determine the cause of this problem.

Register the correct SYSTEM user password again. See “[3.3 Oracle SYSTEM User Password Change](#)”.

[Case 2]

An Oracle instance resource enters Warning when the Oracle SYSTEM user account is locked, so you are not allowed to connect to Oracle.

If ORA-28000 is output to syslog, you can determine the cause of this problem.

You can also check the SYSTEM user account by referring to the following SQL.

If the “account_status” column indicates “LOCKED(TIMED)” or “LOCKED”, you can determine the cause of this problem.

```
# su - <Oracle user>
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> select username, account_status from dba_users;
```

Access Oracle using sysdba privileges then release account locking of the SYSTEM user.

```
# su - < Oracle user >
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> alter user system account unlock;
```

If ORA-01017 is output to syslog as well as ORA-28000, an incorrect password might have been registered. If this is the case, correct the SYSTEM user password. See “[3.3 Oracle SYSTEM User Password Change](#)”. Then, release account locking using the procedure above.

[Case 3]

An Oracle instance resource enters Warning when instance monitoring is discontinued.

Check the monitoring status by executing the “clorainfo -m” command. See “[4.6 clorainfo - Display Resource Configuration and Monitoring Status](#)”.

If instance monitoring has been discontinued, check if the Oracle instance has been activated with the OPEN status then restart monitoring. See “[4.2 hvoraenable - Restart Monitoring Resources](#)”.

[Case 4]

In Oracle instance monitoring, an Oracle instance resource enters Warning if there is no reply from SQL (e.g. insert, update, etc.) within a specified time, but you can access Oracle, and the instance indicates OPEN.

Take corrective action on Oracle.

In Oracle instance monitoring of PRIMECLUSTER Wizard for Oracle, if there is no reply from Oracle within a specified time, monitoring timeout will be considered. At the first monitoring timeout, the resource will only enter Warning, however, if it occurs twice in a row, a resource failure will be determined.

[Case 5]

In Oracle instance monitoring, an Oracle instance resource enters Warning if you cannot access Oracle because of a max session error or max process error.

If ORA-00018 or ORA-00020 is output to syslog, you can determine the cause of this problem.

For the maximum number of sessions that are set in the Oracle SESSIONS parameter, or the maximum number of processes that are set in the PROCESSES parameter, estimate enough values considering monitoring sessions for PRIMECLUSTER Wizard for Oracle.

For details see the Oracle manual.

B.2 Oracle listeners

B.2.1 Startup/stop failure

Oracle listener startup or stop failed.

[Case 1]

Oracle listener startup or stop fails when the PRIMECLUSTER RMS resource settings are invalid.

Check the following resource setup information by executing the “clorainfo -c” command. See “[4.6 clorainfo - Display Resource Configuration and Monitoring Status](#)”.

- Oracle user name
- Listener name
- TNSName (net service name)
- Scripts (e.g. PreOnlineScript)
 - A correct path must be set.
 - The script must have execution permission.
 - The script must behave correctly.

If your setup information is incorrect, set proper values again. See “[Chapter 2 Environment setup](#)”.

[Case 2]

Oracle listener startup or stop fails when the listener settings such as IP address and port number are incorrect.

Check listener logs, so you might be able to detect the cause of the failure.

Also, check if the listener can be started or stopped properly. If you discontinue Oracle instance resource monitoring, you can operate Oracle manually. See “[3.2.4.1 Oracle must be stopped](#)”.

B.2.2 Failover

A userApplication failover or degeneration occurred because of Oracle listener resource failure.

[Case 1]

A userApplication failover or degeneration occurs when the PRIMECLUSTER RMS resource settings (especially TNSName) are invalid.

Check the following resource setup information by executing the “clorainfo -c” command. See “[4.6 clorainfo - Display Resource Configuration and Monitoring Status](#)”.

- Oracle user name
- Listener name
- TNSName (net service name)

If your setup information is incorrect, set proper values again. See “[Chapter 2 Environment setup](#)”.

[Case 2]

A userApplication failover or cluster degeneration occurs when the net service name of tnsnames.ora is incorrect.

Check the net service name in tnsnames.ora file.

Appendix C Using PRIMECLUSTER Wizard for Oracle in Oracle Solaris Zones Environments

This section explains notices, construction procedures, and maintenance procedures in the case of using PRIMECLUSTER Wizard for Oracle with an Oracle Solaris Zones environment.

Information

About the method of installing PRIMECLUSTER in Oracle Solaris Zones environment, refer to "Chapter 13 Using PRIMECLUSTER in Oracle Solaris Zones Environments" of the "PRIMECLUSTER Installation and Administration Guide".

C.1 Notice of System Configuration

- Oracle RAC cannot be made a cluster in non-global zone.
- When you allocate the image of non-global zone on shared disks, create the volume for Oracle Database allocated on the shared disk class for non-global zone where Oracle is installed.
When you allocate the image of non-global zone on a local disk, create the volume for Oracle Database allocated on shared disk class, and enable it to access from non-global zone.
- The configurations which support PRIMECLUSTER Wizard for Oracle 4.2A00 operating on an Oracle Solaris Zones environment are as follows.

global zone OS(*1)	Non-global zone type(*2)	Oracle Database Edition	Version and/or level
Oracle Solaris 10	Oracle Solaris 9 Containers (OSLC)	Enterprise Edition	R9.2.0(32bit/64bit)
		Standard Edition	R10.1.0 (64bit)
			R10.2.0 (64bit)

- (*1) You need PRIMECLUSTER 4.3A20.
- (*2) You need PRIMECLUSTER 4.2A00.

C.2 Construction Procedure

This section explains construction procedure of Oracle and PRIMECLUSTER Wizard for Oracle in non-global zone. It needs to be beforehand completed to the setup of PRIMECLUSTER in non-global zone. (Before "13.3.4.10 Installing Middleware Products to Non-Global Zones" of "13.3.4 Creating Non-Global Zones" of "PRIMECLUSTER Installation and Administration Guide")

C.2.1 PRIMECLUSTER Wizard for Oracle Installation

Mount the media of PRIMECLUSTER Wizard for Oracle on non-global zone, or copy to non-global zone, and install PRIMECLUSTER Wizard for Oracle. About the installation procedure of PRIMECLUSTER Wizard for Oracle, refer to the PRIMECLUSTER Wizard for Oracle Installation Guide.

Note

When the global zone is Solaris 10, the existing systems running on Solaris 9 can also be run on Solaris 10 by migrating them to the non-global zone with Oracle Solaris Legacy Containers (OSLC).

If PRIMECLUSTER Wizard for Oracle 4.2A00 is used with the cluster system on Solaris 9 on migration source node, it is necessary to uninstall the PRIMECLUSTER Wizard for Oracle 4.2A00 before uninstall the PRIMECLUSTER on the Oracle Solaris zones environments.

Refer to the "PRIMECLUSTER Wizard for Oracle Installation Guide", and uninstall it.
Install PRIMECLUSTER Wizard for Oracle after it completes before "13.3.4.10 Installing Middleware Products to Non-Global Zones" of "13.3.4 Creating Non-Global Zones" of "PRIMECLUSTER Installation and Administration Guide".

After installing the packages, apply the newest patch of PRIMECLUSTER Wizard for Oracle. Procedure for applying the patch refer to the README provided with the patch. The versions necessary for applying the patch to the non-global zone is as follows.

Solaris 9 Containers
914425-04 or later

C.2.2 Oracle Installation and Oracle Database Creation

Install Oracle software and create Oracle Database. Refer to the following chapters.

- [2.2.2 Oracle Installation and Configuration](#)
- [2.2.7 Oracle Database Creation and Setting](#)



Be careful of the following points at the time of Oracle installation, and database creation.

- About the allocation of Oracle software and a database, read description of the above-mentioned chapter as follows.
 - It is necessary to replace "local disk" with "Volume for root file system of non-global zone".
 - It is necessary to replace "shared disk" with "Volume for Oracle data allocation".
- When non-global zone image is shared, because the operation node and standby node shares the root file system of non-global zone, installation/setup of Oracle software, and creation/setup of a database are only once carried out by operation node. When non-global zone image is not shared, installation/setup of Oracle software are carried out by all the nodes. creation/setup of database are only once carried out by operation node, and database setup of operation node is copied to standby node using the cloracpy command.
- Carry out registration of the SYSTEM user's password by the clorapass command in every non-global zone.
- Oracle listeners' IP address is set up according to the use existence or nonexistence of the GIs resource on non-global zone. When you don't use GIs resource, specify the IP address of non-global zone. When you use a GIs resource, specify the virtual IP (taking over IP).
- In order to use ASM in Oracle Solaris Zones environment, for the specification of Oracle Database, it is necessary to add a proc_prioctl privilege toward non-global zone in advance.
Execute the following commands.

```
# zonecfg -z <zone name> set limitpriv=default,proc_prioctl
```

C.3 Maintenance Procedure

This section explains maintenance procedure of Oracle and Wizard for Oracle in non-global zone.

C.3.1 Oracle Maintenance

To stop Oracle of non-global zone for maintenance work, such as cold backup, it is necessary to interrupt Oracle monitoring temporarily. Refer to the following chapter.

- [3.2 Oracle Maintenance](#)



Note

Note at the time of the Oracle maintenance work in non-global zone.

- In the above-mentioned chapter, although it is indicated that both the maintenance mode of PRIMECLUSTER and stop monitoring / restart monitoring command of Wizard for Oracle(hvoradisable, hvoraenable) are used, use only command of Wizard for Oracle(hvoradisable, hvoraenable) in non-global zone.

C.3.2 Patch Application to Wizard for Oracle

When applying a patch to PRIMECLUSTER Wizard for Oracle in non-global zone, set non-global zone as single user mode.

At this time, use maintenance mode in global zone. Refer to "13.5.1 Maintenance Operations on the Non-Global Zone" of "PRIMECLUSTER Installation and Administration Guide".

C.3.3 Troubleshooting Information

If the failure about Oracle and Wizard for Oracle that are operated in non-global zone occur, login the non-global zone by zlogin from a global zone, and collect troubleshooting Information using the clgetoralog command. Refer to the following chapters.

- [4.5 clgetoralog - Collect Troubleshooting Information](#)

C.4 Uninstallation Procedure

About the uninstallation procedure of PRIMECLUSTER Wizard for Oracle, refer to the "PRIMECLUSTER Wizard for Oracle Installation Guide". About the back out procedure of patch, refer to the README provided with the patch.

Appendix D (Information) Action Definition File

The Oracle instance-monitoring detector of RIMECLUSTER Wizard for Oracle determines what corrective action should be taken from the error code. The action definition file provides Oracle error numbers, corrective actions, and error descriptions.

- Action definition file name and path

```
/opt/FJSVclora/etc/FJSVclorafm.actionlist
```

- File format

```
errno/Status/Action/Message
 18   Cn   Wa  "maximum number of sessions exceeded"
 20   Cn   Wa  "maximum number of processes (%s) exceeded"
470  All  Of  "LGWR process terminated with error"
471  All  Of  "DBWR process terminated with error"
472  All  Of  "PMON process terminated with error"
 942  Ol   Np  "table or view does not exist"
1012 All  Rs  "not logged on"
1034 All  Of  "ORACLE not available"
```

- errno
Indicates the Oracle error number (ORA-xxxxx).
- Status
Indicates the detector state
Cn When connecting to an Oracle instance.
Ol Under connection with an Oracle instance.
Dc When disconnecting to an Oracle instance.
All Any status of above.
- Action
Indicates detector operation
Np : Ignores any detected errors.
Of : Notifies Offline.
Wa : Notifies Warning.
Rs : Restarts detector.
Fa : Notifies Faulted.

Note

NOP error

If subsequent processing is not allowed with the SQL command while the corrective action is Np, the Rs processing will be performed.

- Message
indicates text of the error code

Information

The errno that are not defined in the Action Definition File will be handled as Np.