FUJITSU

PRIMECLUSTER Wizard for Oracle (PRIMEQUEST) 4.3

Configuration and Administration Guide

Linux

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

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

Outline

The document consists of the following 6 chapters and 2 appendix:

- ・ Chapter 1 Feature

- ・ Chapter 2 Environment setup

- ・ Chapter 3 Operation

- ・ Chapter 4 Command

- ・ Chapter 5 Notice

- ・ Chapter 6 Message

- ・ Appendix A

- ・ Appendix B

- ・ Appendix C

Technical term

For technical words related to clusters in this document, refer to the manual. Unless otherwise specified, the following words are used for Oracle products. For details, refer to 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", or "Oracle RAC" in this document.
    For detail on the version and release of Oracle Real Application Clusters which is supported by the product (PRIMECLUSTER Wizard for Oracle), refer to the installation guide of this product.

- ・ **Oracle Clusterware:**

    Referred to as "Oracle Clusterware" in this document.

- ・ **Oracle user:**

    Referred to "Oracle user" or "DBA user" in this document.
    Operating system user account belonging to OSDBA to operate and manage Oracle system.

Notational convention

The document conforms to the following notational conventions:

Point

. . . .

Description (if necessary)

. . . .

Information

. . . .

Describes information a user can refer to.

. . . .

See

. . . .

Description (if necessary)

. . . .

Note

. . . .

Describes points to be taken notice of.

. . . .

Example

. . . .

Describes by using an example.

. . . .

Trademarks

Linux is a registered trademark of Linus~Torvalds in the United States and other countries.

Oracle is a registered trademark of Oracle Corporation and/or its affiliates.

Other product and brand names are trademarks or registered trademarks of their respective owners.

Requests

Contents

Chapter 1 Feature

1.1 Feature Outline

PRIMECLUSTER Wizard for Oracle is a software product that facilitates cluster operation management for Oracle database operating on a PRIMECLUSTER system.
The scalable operation with Oracle Real Application Clusters (Oracle RAC) and the standby operation with Oracle database are enabled.

This software provides the following features:

Feature	Description
Environment Setup	Environment setup tool to enable clustering of Oracle database
Monitoring	Daemon processes to monitor Oracle instance, Listener and detect their failures
Start and Stop Control	Scripts used for startup and stop of Oracle instances, Listeners
Setup and Operation Commands	Commands used for setup and operations

Environment Setup

To enable clustering of Oracle database, it is required that Oracle instances and Listeners are registered on userApplicatoin(cluster application) as a "resource". PRIMECLUSTER Wizard for Oracle enables it. For details, refer to "Chapter 2 Environment Setup".

Monitoring

PRIMECLUSTER Wizard for Oracle provides daemon processes to monitor Oracle instances and Listeners and detect their failures. For details, refer to "3.1 Oracle Control through PRIMECLUSTER Wizard for Oracle".

・ Oracle instance Monitoring

The daemon process connects to the Oracle instance as the SYSTEM user. It also cyclically monitors background processes ("Process Monitoring") and manipulates data with SQL statements ("Table Monitoring").
The daemon process monitors PMON, SMON, DBWn, LGWR and CKPT of the background processes in the process monitoring, and creates a table for monitoring in the SYSTEM schema, and manipulate data on the table with SQL statements (INSERT, UPDATE, DELETE and COMMIT) in the table monitoring. Therefore, it means that not only the background process failures but also logical failures can be detected.
If ORA-xxxxx error occurs and the daemon process detected it in monitoring, restart of the Oracle instance and failover are automatically performed according to the detected error. Moreover, if the Oracle instance hangs and the SQL statements are not returned within a specified time, it is notified as a time out error.

・ Listener Monitoring

The daemon process monitors a Listener process. In standby operation, it also monitors the Listener with "tnsping" command.

In scalable operation with Oracle RAC, the daemon process monitors Oracle instances and Listeners. However, if the Oracle instances and Listeners fail, they will be recovered by Oracle Clusterware.

Start and Stop Control

PRIMECLUSTER Wizard for Oracle provides scripts to start up and stop Oracle instances and Listeners automatically, according to the state transition of userApplication. For details, refer to "3.1 Oracle Control through PRIMECLUSTER Wizard for Oracle".

・ Oracle instance Start and Stop

In standby operation, the script starts up the Oracle instance, checking the state and recovering. For example, if the Oracle instance had failed during online backup, the scripts automatically execute "END BACKUP" during the startup.
When stopping, the scripts stop the instance in the IMMEDIATE mode. If it fails, the script immediately tries in the ABORT. It means that the failover of userApplication can be performed at high-speed.

In scalable operation with Oracle RAC, the script starts up and stops the Oracle instance with "srvctl start/stop instance" command.

・ Listener Start and Stop

In standby operation, the script starts up and stops the Listener with "lsnrctl start/stop" command, checking the state.

In scalable operation with Oracle RAC, the script starts up with "srvctl star listener" command.

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

Setup and Operation Commands

PRIMECLUSTER Wizard for Oracle provides auxiliary commands for setup and operation. For details, refer to "Chapter 4 Command".

1.2 Operating Environment

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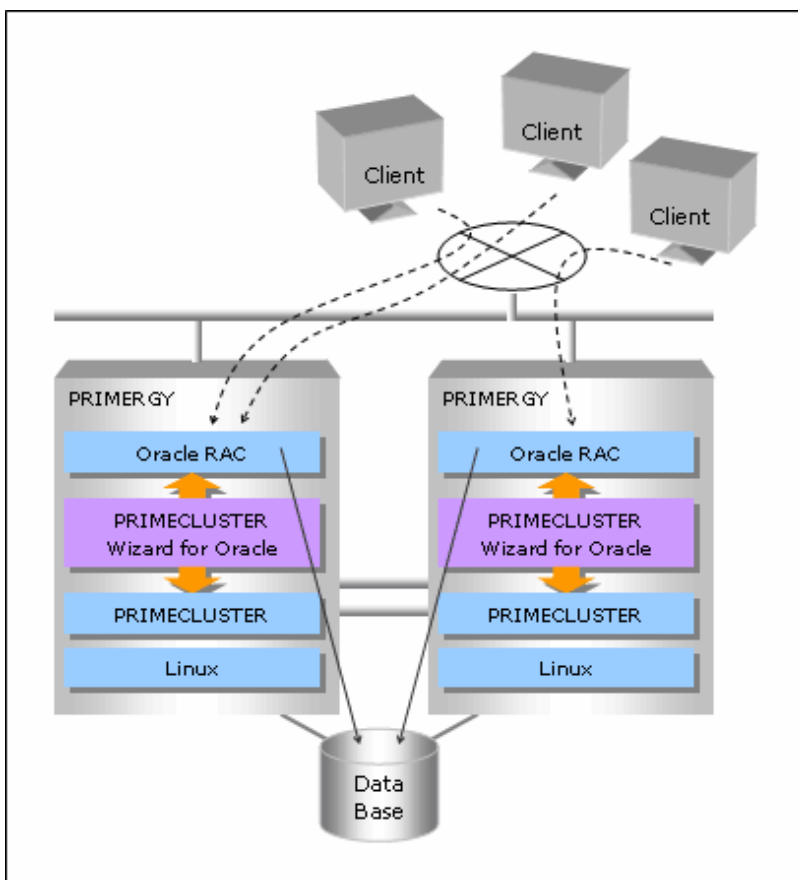
In scalable operation with Oracle RAC, Oracle is operated on all the nodes. The clients can access to the database regardless of which node they are connected to.

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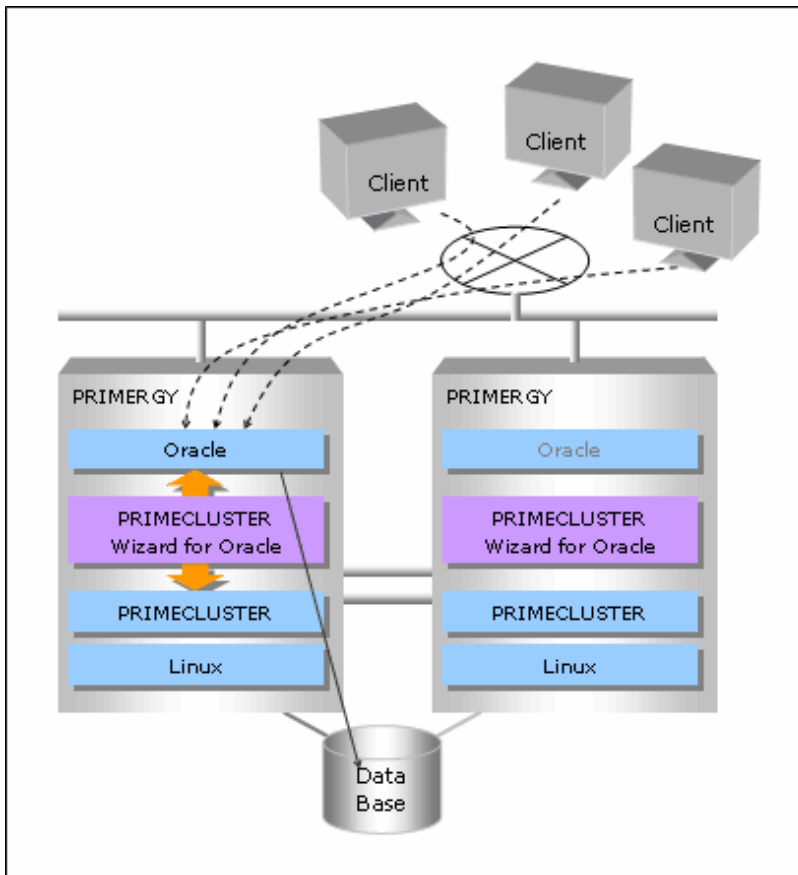
In standby operation, a cluster system consists of an operating node and standby nodes. On the operating node, the resources such as Oracle applications, a logical IP address and shared disks are active. On the standby node, these resources are inactive. In the event of a failure, userApplication is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

Chapter 2 Environment Setup

2.1 Oracle Environment Setting

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

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, refer to "2.2 Standby Operation".

Scalable operation (Oracle 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 and set up an Oracle database	-
5	Create and set up Oracle resources	-

For details, refer to "2.3 Oracle RAC Scalable Operation".

Note

The setup procedure explained in section "2.2 Standby Operation" and "2.3 Oracle RAC Scalable Operation" assumes that the userApplication will be created newly.
In the case of upgrading from previous version, refer to "Installation Guide for PRIMECLUSTER Wizard for Oracle".

2.2 Standby Operation

This section descries how to configure an environment for standby operation.

For the configuration procedure for Oracle RAC scalable operation, refer to "2.3 Oracle RAC 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 "Installation Guide" accompanying the software.
Standby operation requires the following editions:

- ・ PRIMECLUSTER Enterprise Edition

- ・ PRIMECLUSTER HA Server

Then, install PRIMECLUSTER Wizard for Oracle referring to "Installation Guide" accompanying the software.

Set up cluster system

Configure a cluster system according to "PRIMECLUSTER Installation and Administration Guide". Setup described in "6.6 Setting Up Online/Offline Scripts" in the manual should be completed.

How to create a userApplication(cluster application) with RMS Wizard("hvw" command) is explained in "6.7 Setting Up Cluster Applications" in the manual and the sections below.

2.2.2　Oracle Software Installation and Configuration

This section explains how to install and configure Oracle software.

Note

- ・ Install only Oracle software to all nodes. Do not create a database in this section (Database creation is performed in "2.2.6 Oracle Database Creation and Setting").

- ・ If multiple ORACLE_HOME are configured on one server, a different user name must be assigned respectively.

- ・ Confirm the contents of "Chapter 5 Notice" before Installing.

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 identical on all the nodes.

  The kernel parameters can be configured with the sysctl (8) utility when they are executed. The procedures for changing the kernel parameters and setting up the new kernel parameters are explained below.

Note

Before installing Oracle software, it is necessary to change the "/etc/sysctl.conf" file and reboot the node.
For semopm (the third value of "kernel.sem", specify a value of 4 or more.

Example

The following command enables the value of /etc/sysctl.conf for the kernel. You do not have to reconfigure the kernel.

To change the kernel parameter while the OS is running, use sysctl (8). For details about sysctl (8), refer to the manual pages.

```
sysctl -p <filename>
```

If <filename> is omitted, read from /etc/sysctl.conf.

- /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 <group ID> dba
# groupadd -g <group ID> oinstall
# useradd -g oinstall -G dba oracle
# passwd oracle
```

Normally, the group name should be "dba" and "oinstall".

Set up an environment variable of an Oracle user.

Example

(.bash_profile)

```
ORACLE_BASE=/u01/app/oracle;  export ORACLE_BASE
ORACLE_HOME=/u01/app/oracle/product/db;  export ORACLE_HOME
ORACLE_SID=ora  export ORACLE_SID
LD_LIBRARY_PATH=$ORACLE_HOME/lib;  export LD_LIBRARY_PATH
PATH=$ORACLE_HOME/bin:/usr/bin:/bin:/usr/bin/X11/:/usr/local/bin;  export PATH
```

Note

PRIMECLUSTER Wizard for Oracle controls Oracle as the Oracle user that belongs to OSDBA group.

- Be sure to include ORACLE_HOME/bin in the PATH environment variable of the Oracle 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 userApplicatoin startup or shutdown.

See

For further details, refer to the Oracle manual.

Installation

Install Oracle software 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 software is installed. The details will be described in "2.2.6 Oracle Database Creation and Setting".

![See] **See**

- -

For further details, refer to the Oracle manual.

- -

2.2.3   userApplication Configuration

Operating userApplication is configured as follows:
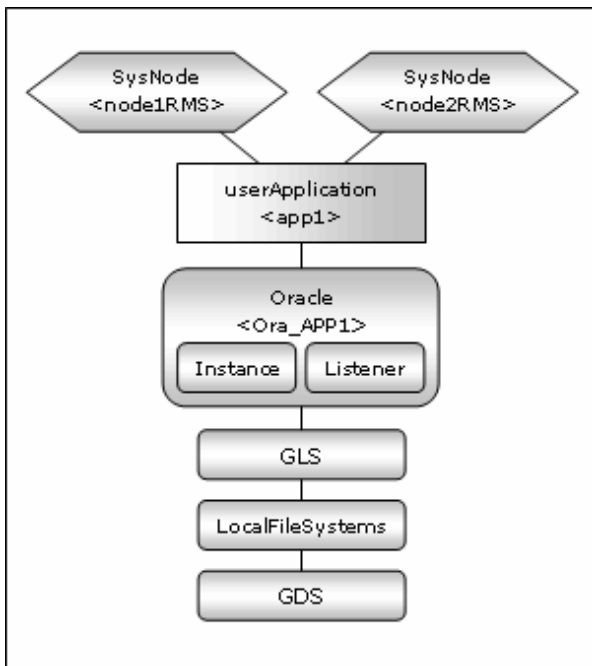
userApplication	Description	Resources
app1	userApplication on all operation nodes	Oracle resource (instance, listener) Gds resource LocalFileSystems resource Gls resource

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

Firstly, it is necessary to create userApplicatoin without Oracle resources, and add the resource after creating an Oracle database. The sections below explain how to do it.

![See] **See**

- -

For further details, refer to the PRIMECLUSTER manuals.

- -

2.2.4 userApplication Creation (without Oracle Resources)

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

Set up Oracle resources after creating a database.

Non-Oracle resources are configured first as follows:
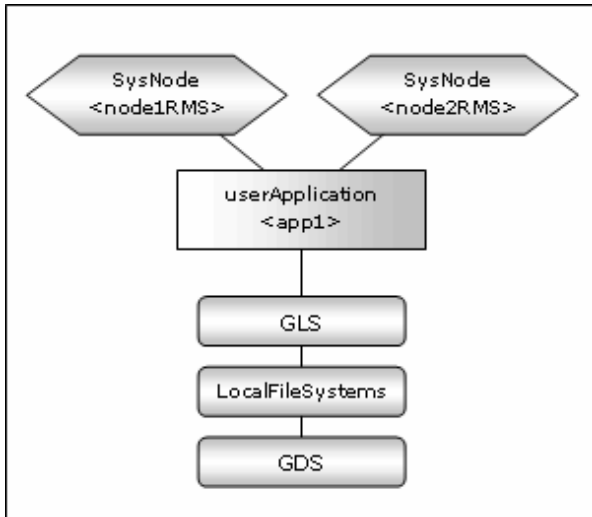
GDS setup

GDS is set as "shared disk for concurrent access" for scalable operation and "switching disk" for standby operation.

Information

It is possible to prepare the disk class for Oracle system table space and other Oracle data respectively, and the MONITORONLY attribute of the disk class is set to "NO" for the Oracle system table space and "YES" for the other Oracle data.

userApplication setup

Create userApplication according to "6.7 Setting Up Cluster Applications" of "PRIMECLUSTER Installation and Administration Guide".
Set up userApplication using the RMS Wizard. The RMS Wizard uses the format that allows you to select information in the menu.

2.2.4.1 userApplication creation

1. Executed the following command on any one of the cluster nodes.

```
# hvw -n <Configuration Name>
```

2. Select Application-Create in the "Main configuration menu" screen.

```
node1: Main configuration menu, current configuration: config_standby
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
```

3. Select WIZSTANDBY in the "Application type selection menu" screen.

```
Creation: Application type selection menu:
  1) HELP                            6) GENERIC
  2) QUIT                            7) ORACLE
  3) RETURN                          8) SCALABLE
  4) OPTIONS                         9) STANDBY
  5) DEMO                           10) WIZSTANDBY
Application Type: 10
```

📛 **Note**
. . . .
Do not select ORACLE (all caps) in this screen. This is for backward compatibility.
. . . .

4. In the case of editing the userApplication name, specify ApplicationName in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
  1) HELP                            4) REMOVE+EXIT
  2) NO-SAVE+EXIT                    5) ApplicationName=APP1
  3) SAVE+EXIT                       6) Machines+Basics(-)
Choose the setting to process: 5
```

5. Select Machines+Basics to set up nodes and basic setting of userApplication.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
  1) HELP                            4) REMOVE+EXIT
  2) NO-SAVE+EXIT                    5) ApplicationName=APP1
  3) SAVE+EXIT                       6) Machines+Basics(-)
Choose the setting to process: 6
```

For details, refer to HELP or "PRIMECLUSTER Installation and Administration Guide".

📖 **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

```
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:
```

6. Select SAVE+EXIT after setting Machines+Basics.

7. Set up a resource required for the shared disk (ex. GDS) in the "Setting of turnkey wizard "WIZSTANDBY"" screen.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
 1) HELP                            9) Procedure:BasicApplication(-)
 2) -                              10) Oracle(-)
 3) SAVE+EXIT                      11) Symfoware(-)
 4) -                             12) Procedure:SystemState3(-)
 5) ApplicationName=APP1          13) Procedure:SystemState2(-)
 6) Machines+Basics(app1)         14) Gls:Global-Link-Services(Gls_APP1)
 7) CommandLines(-)               15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)      16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process:
```

8. Return to the Main configuration menu by executing SAVE+EXIT. (Any settings related to Oracle should not be done here).

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
 1) HELP                            9) Procedure:BasicApplication(-)
 2) -                              10) Oracle(-)
 3) SAVE+EXIT                      11) Symfoware(-)
 4) -                             12) Procedure:SystemState3(-)
 5) ApplicationName=APP1          13) Procedure:SystemState2(-)
 6) Machines+Basics(app1)         14) Gls:Global-Link-Services(Gls_APP1)
 7) CommandLines(-)               15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)      16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 3
```

2.2.4.2 Configuration-Generate and Configuration-Activate

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

```
node1: Main configuration menu, current configuration: config_standby
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:
```

2. Select QUIT and terminate RMS Wizard.

```
node1: Main configuration menu, current configuration: config_standby
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: 2
```

2.2.5 userApplication Operation Check

Start userApplication by executing "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.

See
....
For the RMS command, refer to the "PRIMECLUSTER Installation and Administration Guide".
....

2.2.6 Oracle Database Creation and Setting

It is necessary to create a database on the shared disk. The creation should be performed on an operation node. After that, setup on standby nodes in the same configuration to be accessible to the database from the standby nodes.

Example

・ Mutual standby
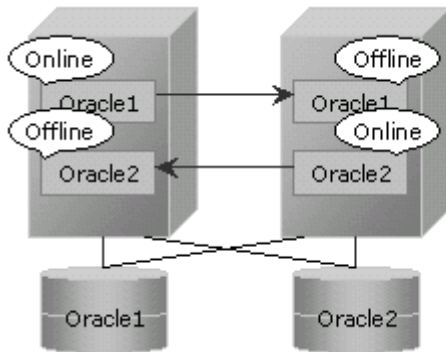
・ 2:1 Standby
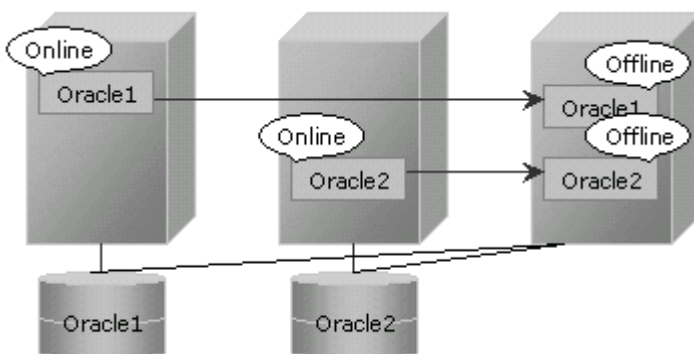
1. Startup of userApplication.

   Start up userApplication on an operation node where a database is created.

2. Creation of database

   Create a database on a shared disk mounted to the operation node.

Information

   - Refer to the Oracle manual.

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

   - Confirm the contents of "Chapter 5 Notice" before creating.

   - Destination of database files

Files	Locations	Note
Initialization Parameter File (PFILE)	Local	Allocate on a local disk of each node
Server Parameter File (SPFILE)	Share	-
Control Files	Share	-
Data Files	Share	-
Redo Log Files	Share	-

Archived Redo Log Files	Arbitrary	Recommend to be multiplexed, allocating on a shared disk and a local disk.
Flash Recovery Area	Share	-
Alert log, other log files	Local	Allocate on a local disk of each node

- Initialization Parameter File (PFILE)

    The initial parameter setting of LOCAL_LISTENER must be compatible with that of listener.ora and tnsnames.ora. You should also pay close attention to set up Oracle network.

- Server Parameter File (SPFILE)

    If you use the server parameter file, store it on a shared disk. If it is not stored on the shared disk, the settings will be inconsistent between operating and standby nodes. To prevent it, specify the path in the initial parameter file to allocate the server parameter file.

Example

How to set the initialized parameter file (<$ORACLE_HOME>/dbs/init<$ORACLE_SID>.ora):

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

Note

If you create a database using DBCA (Database Configuration Assistant), 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 Configuration".

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 "cloracpy" command to execute it on the standby nodes after the operating node.

Other notices for database creation are below.

Note

- If you use ASM (Automatic Storage Management), it is necessary to register the ASM as an RMS resource. Refer to "2.4.2 ASM (Automatic Storage Management)".

- 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.

3. Configuration of Oracle Net Services

    Configure Oracle Net Services such as Listener and net service name on operation node.

    - Oracle listener

        Create a Listener by editing listener.ora file,

```
$ORACLE_HOME/network/admin/listener.ora
```

or using netca (Oracle Net Configuration Assistant).

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 = ora)
      (ORACLE_HOME = /u01/app/oracle/product/db)
      (SID_NAME = ora)
    )
  )
```

- Net Service Name

  If the Oracle listener is monitored through "tnsping" command, set up the tnsnames.ora file,

```
$ORACLE_HOME/network/admin/tnsnames.ora
```

  or using netca (Oracle Net Configuration Assistant).

  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 = ora))
  )
```

Notices for Configuring Oracle Net Services are below.

📒 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 at the connecting.

- OS authentication of Listener must be enabled.

  In Oracle 10g or later environment, operating system authentication of Listener must be enabled. There are two methods to enable it:

- Define a parameter in sqlnet.ora file as below.

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

- Not define the "LOCAL_OS_AUTHENTICATION_<LISTENER_NAME>" parameter in sqlnet.ora file. (default)

4. Site preparation for standby nodes

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

- Agreement of configuration

All configurations of the database and Oracle Net Services on standby nodes must match that of the operating node.

- Under <$ORACLE_HOME>/dbs

- Under <$ORACLE_BASE>/admin/<$ORACLE_SID>

- Under <$ORACLE_BASE>/diag

- Under <$ORACLE_HOME>/network/admin

The access privilege to the directories and files above 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.

Information

The required files on the operating node can be backed up in the tar format with the "cloracpy" command. Refer to "4.4 cloracpy - Create Backup File for Oracle Database Setup".

- 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. Refer to "4.3 clorapass - Register Password for Monitoring" to register the password.

5. Check Oracle operation

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

Note

Before switching userApplication from the operating node to standby nodes, shut down all databases and Listeners on the operating node. If not, all processes associated with Oracle would be forcibly killed.

After the check completed, shut down all databases and Listeners, and stop RMS on all nodes.

2.2.7 userApplication Edit

Register Oracle resources in userApplication that was created at "2.2.4 userApplication Creation (without Oracle Resources)".

In standby operation, userApplication is configured as follows.

Note that userApplication resource (Ora_App1) is being created and added in this section.
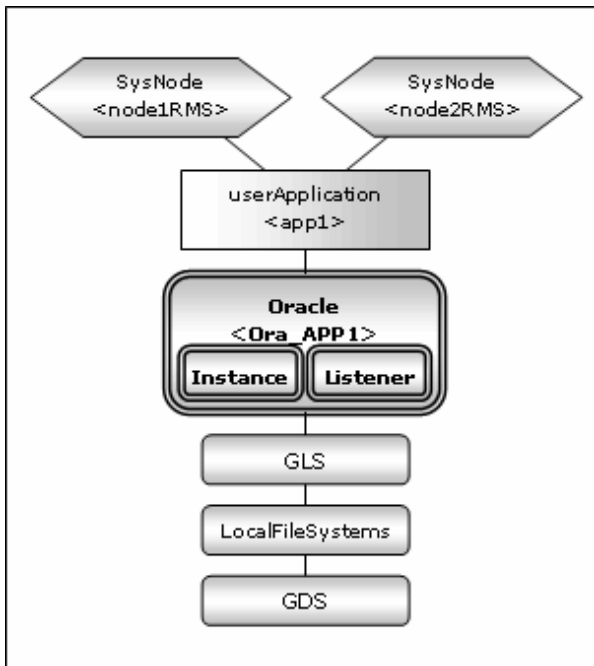
🛑 Note

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

- ・ Stop the Oracle instance, Oracle listener, and RMS on all the nodes in a cluster system before starting next section.

- ・ Do not create multiple resources for the same an Oracle instance or a Listener.

📖 See

For further details, refer to the "PRIMECLUSTER Installation and Administration Guide".

2.2.7.1 Oracle Resource Creation and Registration

The following example shows how to configure the Oracle environment.

1. Executed the following command on any one of the cluster nodes.
   (Configuration name specified at "2.2.4 userApplication Creation (without Oracle Resources)" also should be specified as <Configuration Name>.)

```
# hvw -n <Configuration Name>
```

2. Select Application-Edit in the "Main configuration menu" screen.

```
node1: Main configuration menu, current configuration: config_standby
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: 4
```

3. Select userApplication created at "2.2.4 userApplication Creation (without Oracle Resources)".

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

4. Select Oracle(-) in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
  1) HELP                          9) Procedure:BasicApplication(-)
  2) -                            10) Oracle(-)
  3) SAVE+EXIT                     11) Symfoware(-)
  4) -                            12) Procedure:SystemState3(-)
  5) ApplicationName=APP1         13) Procedure:SystemState2(-)
  6) Machines+Basics(app1)        14) Gls:Global-Link-Services(Gls_APP1)
  7) CommandLines(-)              15) LocalFileSystems(Lfs_APP1)
  8) Procedure:Application(-)     16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 10
```

5. Add Oracle instances and Oracle listeners in the Oracle setup screen.

```
Oracle (Ora_APP1:not yet consistent)
1) HELP                          6) AdditionalListener
2) -                            7) AdditionalRACInstance/Listener
3) SAVE+EXIT                     8) AdditionalOracleClusterware
4) REMOVE+EXIT                   9) StartPriority=Same
5) AdditionalInstance
Choose the setting to process:
```

Attributes	Description
AdditionalInstance	Add an Oracle instance resource.
AdditionalListener	Add an Oracle listener resource.
AdditionalRACInstance/Listener	Not used.
AdditionalOracleClusterware	Not used.
StartPriority	Set up the startup order of the Oracle instance and Oracle listener. The default is "Simultaneous startup".

Example

··

If a shared server configuration or a dynamic service information is used, specify "Listener" for the StartPriority attribute.

··

6. Add Oracle instance resource.
   Select AdditionalInstance, FREECHOICE and enter ORACLE_SID.

```
Oracle (Ora_APP1:not yet consistent)
1) HELP                          6) AdditionalListener
2) -                             7) AdditionalRACInstance/Listener
3) SAVE+EXIT                     8) AdditionalOracleClusterware
4) REMOVE+EXIT                   9) StartPriority=Same
5) AdditionalInstance
Choose the setting to process: 5
```

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

Example

··

In the case of ASM instance, enter SID which starts with "+" (ex. +ASM).

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

··

Information

··

An Oracle instance resource name on RMS is based on the ORACLE_SID <OracleSID> entered on this step.

```
ORACLE_Ora_<ApplicationName>_<OracleSID>
```

This resource name has the following convention and rules.

  - The resource name must be up to 39 characters.

  - "ORACLE_Ora_" is a fixed word.

  - For information on how to set up <ApplicationName>, refer to the step "4" of "2.2.4.1 userApplication creation".

··

7. Edit advanced settings of Oracle instance resource.

```
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:
```

Point

Advanced settings of Oracle instance resource

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 *Script, refer to "2.4.1 Oracle Online/Offline Script".

- For details about Flags, refer to "11 Appendix−Attributes" of "PRIMECLUSTER RMS with Wizard Tools 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=<*Abbreviation*> indicates that the flag attribute is enabled.

- Oracle user specified for the OracleUser attribute should belong to OSDBA group.

8. Select SAVE+RETURN to quit advanced settings.

```
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
```

9. Add Oracle listener resource.
   Select AdditionalListener, FREECHOICE and enter Listener name.

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

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

10. Edit advanced settings of Oracle listener resource.

```
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:
```

🅿 **Point**

....

Advanced settings of Oracle listener resource

Attributes	Description
ListenerName	Listener name.
OracleUser	DBA user for Oracle control.
TNSName	Network service for Listener monitoring Execute "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 *Script, refer to "2.4.1 Oracle Online/Offline Script".

- For details about Flags, refer to "11 Appendix－Attributes" of "PRIMECLUSTER RMS with Wizard Tools 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=<*Abbreviation*> indicates that the flag attribute is enabled.

11. Select SAVE+RETURN to quit advanced settings.

```
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
```

12. Confirm that Oracle instance and listener resources have been set, and then select SAVE+EXIT.
    In the next screen, confirm that Oracle(Ora_*xxx*) have been set.

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

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
 1) HELP                        9) Procedure:BasicApplication(-)
 2) -                          10) Oracle(Ora_APP1)
 3) SAVE+EXIT                  11) Symfoware(-)
 4) -                          12) Procedure:SystemState3(-)
 5) ApplicationName=APP1       13) Procedure:SystemState2(-)
 6) Machines+Basics(app1)      14) Gls:Global-Link-Services(Gls_APP1)
 7) CommandLines(-)            15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)   16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process:
```

2.2.7.2   Other Resource Creation and Registration

1. If you have any other required resources, register and create them in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

📖Information
. . . .
Other resources (ex. Procedure resource, resource concerning backup software) should be registered here.
For details of them, refer to the each manual. (For Procedure resource, refer to "PRIMECLUSTER Installation and Administration Guide".)
. . . .

2. Select SAVE+EXIT to return Main configuration menu.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
 1) HELP                        9) Procedure:BasicApplication(-)
 2) -                          10) Oracle(Ora_APP1)
 3) SAVE+EXIT                  11) Symfoware(-)
 4) -                          12) Procedure:SystemState3(-)
 5) ApplicationName=APP1       13) Procedure:SystemState2(-)
 6) Machines+Basics(app1)      14) Gls:Global-Link-Services(Gls_APP1)
 7) CommandLines(-)            15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)   16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 3
```

3. If you have any other required userApplications, create them in Main configuration menu screen.

2.2.7.3 Configuration-Generate and Configuration-Activate

1. Execute Configuration-Generate and Configuration-Activate.

```
node1: Main configuration menu, current configuration: config_standby
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:
```

2. Select QUIT and terminate RMS Wizard.

```
node1: Main configuration menu, current configuration: config_standby
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: 2
```

Information

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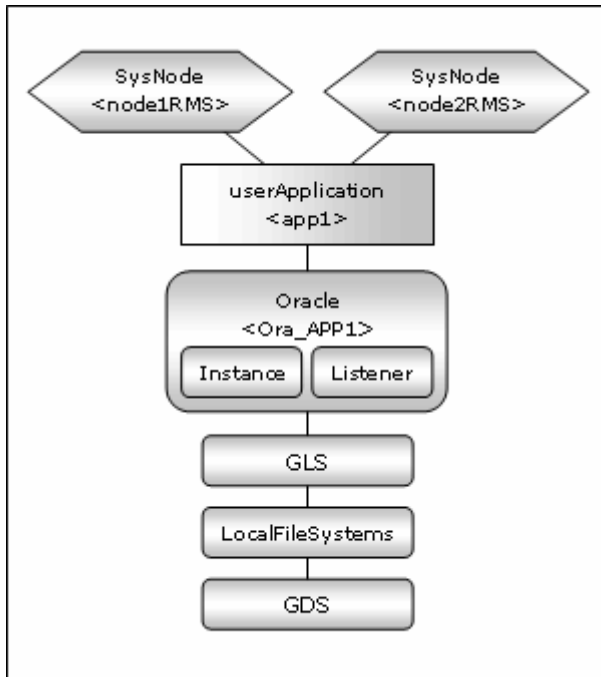
2.2.8 userApplication Operation Check

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

See

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

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

- 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 adders.

Information
. . . .
If Oracle instance resource becomes Warning state, it might have been caused by wrong registration of SYSTEM user password. Register the correct password using "clorapass" command to prevent it. For details, refer to "4.6 clorainfo - Display Resource Configuration and Monitoring Status".
. . . .

2.3 Oracle RAC 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 first, referring to "Installation Guide" accompanying the software.

Then, install PRIMECLUSTER Wizard for Oracle referring to "Installation Guide" accompanying the software.

Cluster configuration

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

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 (the third value of "kernel.sem", 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.

See the following setup example:

```
ORA_CRS_HOME=/u01/app/oracle/product/crs;  export ORA_CRS_HOME
```

. . . .

Oracle Database installation

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

🛈 Note

. . . .

・ 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 userApplicatoin startup or shutdown.

・ PRIMECLUSTER Wizard for Oracle controls Oracle as the Oracle DBA user.
The DBA user should belong to OSDBA group. Also, be sure to include ORACLE_HOME/bin and $ORA_CRS_HOME/bin in the PATH environment variable of the DBA user.
See the following setup example:

```
ORACLE_HOME= /u01/app/oracle/product/db;  export ORACLE_HOME
ORA_CRS_HOME= /u01/app/oracle/product/crs;  export ORA_CRS_HOME
PATH= $ORACLE_HOME/bin: $ORA_CRS_HOME/bin;  export PATH
```

・ In Oracle RAC scalable operation, the RMS resource name is generated based on the CRS resource name that is displayed with "crs_stat" command. If the RMS resource name is too long(more than 39 characters), it is failed to start up userApplication. For details of the RMS resource name, refer to the step "4" of "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration".

. . . .

Database creating and settings

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

Change settings

- 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
```

- Disabling automatic startup of CRS resource
Disable automatic startup of Oracle RAC instance (inst) by setting "never" to AUTO_START attribute.

> 📑 **See**

> For detail of editing AUTO_START, refer to Oracle manuals.

- Owner and permission of raw device files at system boot
Owner and permission of raw device files may be changed to enable for Oracle user to access them. However, the changes might become invalid at system reboot.

In this case, work around to prevent it referring to Oracle manuals.

Operation check

Check if Oracle instances and listeners are properly operating. Also, check if "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....1.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....2.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....rac.db   application    ONLINE    ONLINE    node1
ora....1.inst   application    ONLINE    ONLINE    node1
ora....2.inst   application    ONLINE    ONLINE    node2
$
```

2.3.3 userApplication Configuration

In Oracle RAC, 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.
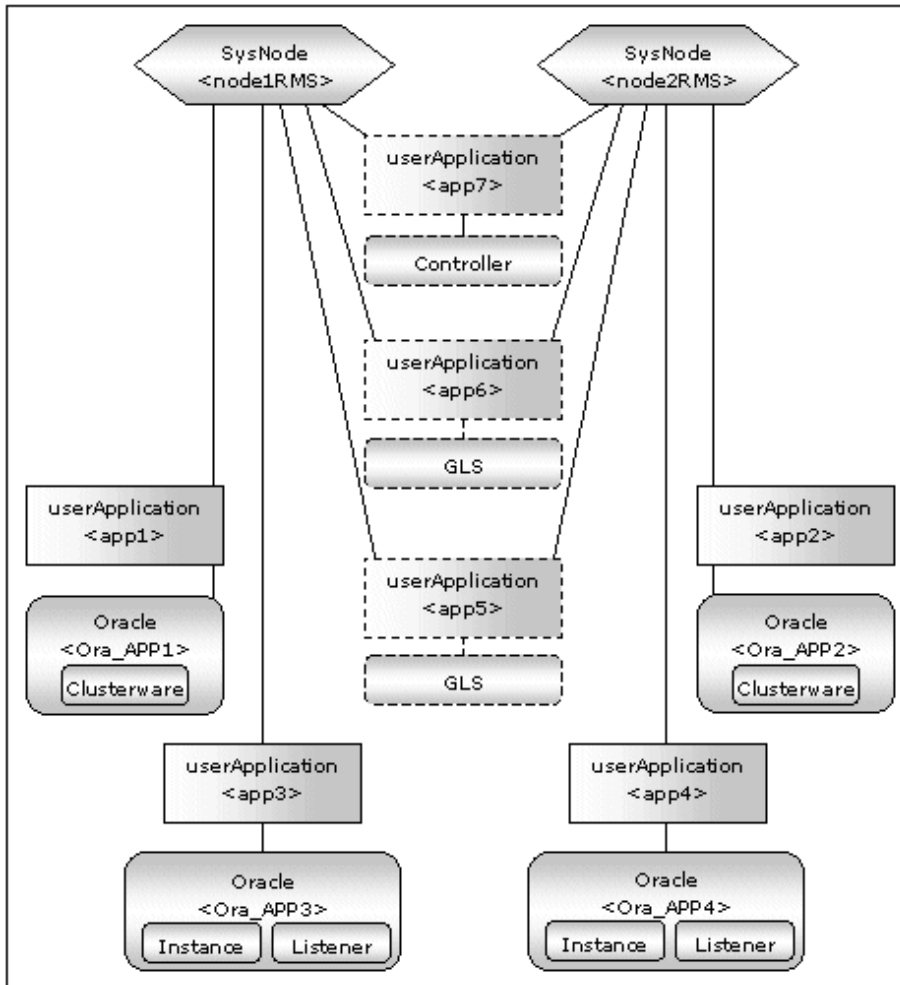
userApplication	Description	Resources
app1, app2	Controls Oracle Clusterware. It is created on each node.	Oracle resource (Clusterware)
app3, app4	Controls Oracle instances and listeners. It is created on each node.	Oracle resource (instances, listeners)
app5, app6	Used as standby for Gls or takeover 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

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.)

Set the procedure to do them automatically by using PreOfflineScript of Oracle Clusterware resource. For details, refer to step "4" of "2.3.4.2 Oracle Clusterware Resource Creation and Registration".

See

For further details of the "KeepOnline" flag, refer to the step "4" of "2.3.4.2 Oracle Clusterware Resource Creation and Registration".

Configuration B

The Oracle Clusterware and Oracle RAC instance are registered in the same userApplication.
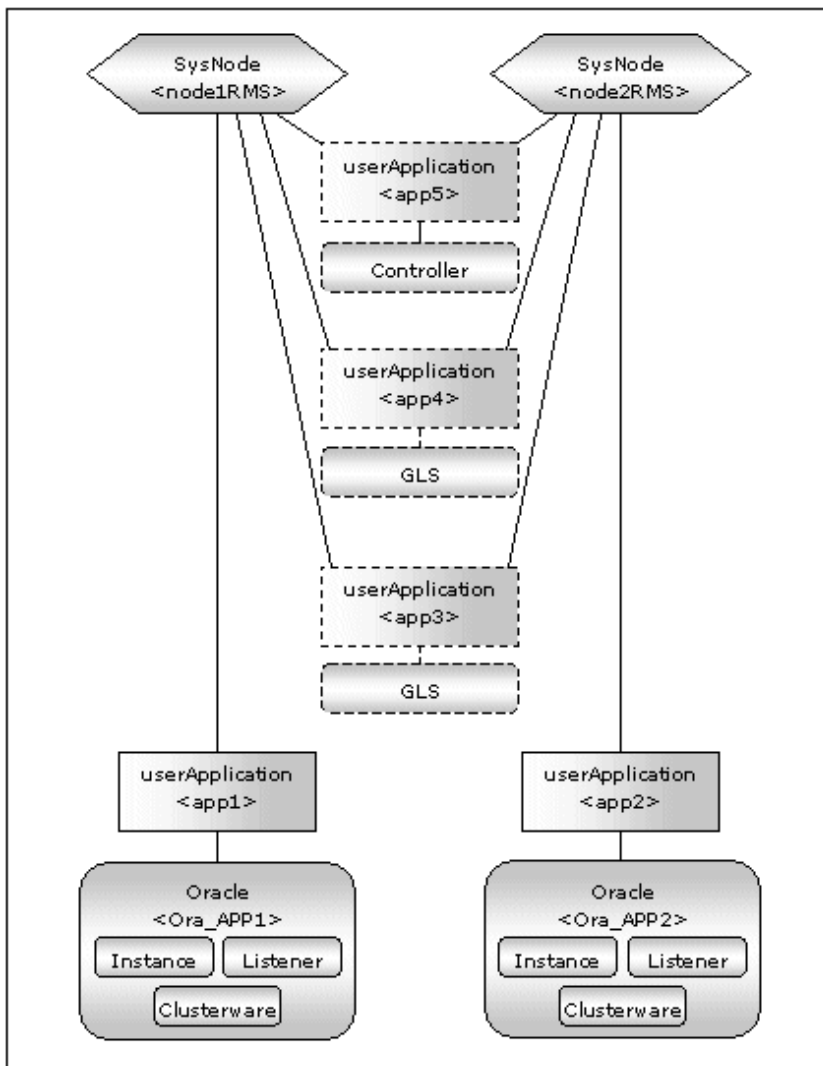
userApplication	Description	Resources
app1, app2	Controls Oracle Clusterware. It is created on each node.	Oracle resource (Clusterware, instances, listeners)
app3, app4	Used as standby for Gls or takeover network.(Option) Create them according to operating conditions.	Gls resource, Cmdline resource, 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.

2.3.4 userApplication Creation

This section describes how to create userApplicatoin including Oracle Clusterware resource or Oracle RAC instance resource using by RMS Wizard.

1	2.3.4.1 userApplication Basic Settings
2	2.3.4.2 Oracle Clusterware Resource Creation and Registration
3	2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration
4	2.3.4.4 Other Resource Creation and Registration
5	2.3.4.5 Other userApplication Creation
6	2.3.4.6 Configuration-Generate and Configuration-Activate

- Configuration A
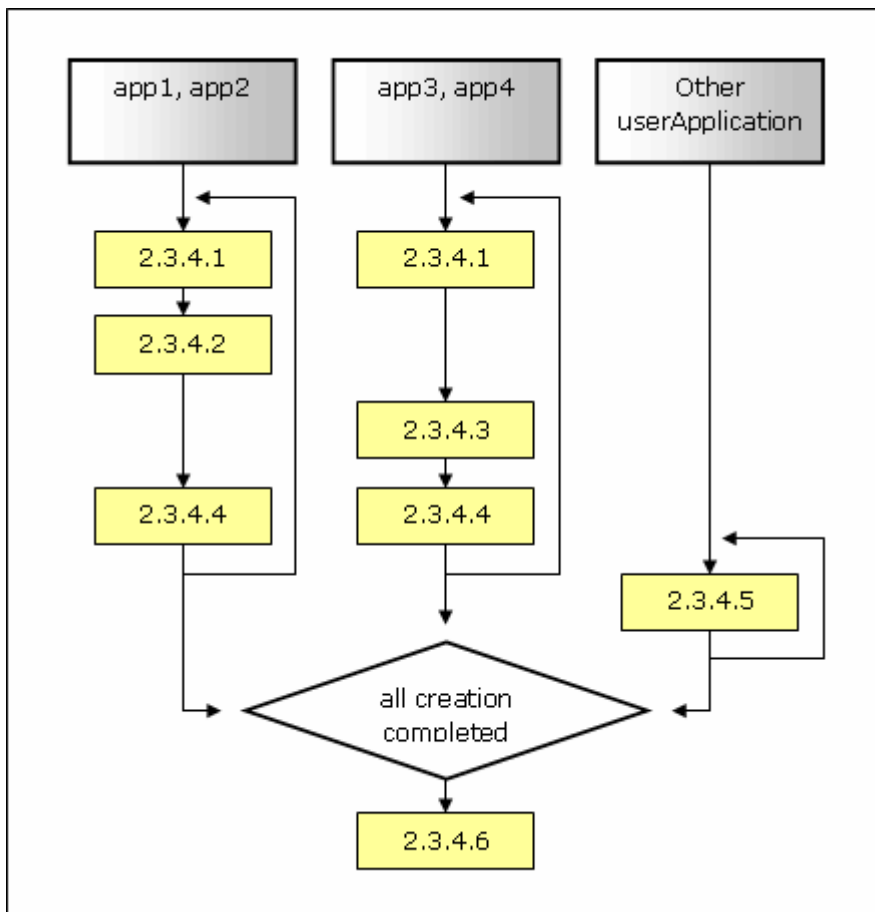
- app1 and app2 (including Oracle Clusterware resource)

    Create userApplicatoin in this order :

    1. "2.3.4.1 userApplication Basic Settings"

    2. "2.3.4.2 Oracle Clusterware Resource Creation and Registration"

    3. "2.3.4.4 Other Resource Creation and Registration"

- app3 and app4 (including Oracle RAC instance or Listener resource)

    Create userApplicatoin in this order :

    1. "2.3.4.1 userApplication Basic Settings"

    2. "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration"

    3. "2.3.4.4 Other Resource Creation and Registration"

- app5, app6 and app7 (Optional)

    If necessary, create in "2.3.4.5 Other userApplication Creation".

- After creation of all userApplications is completed, perform procedure of "2.3.4.6 Configuration-Generate and Configuration-Activate".

- Configuration B
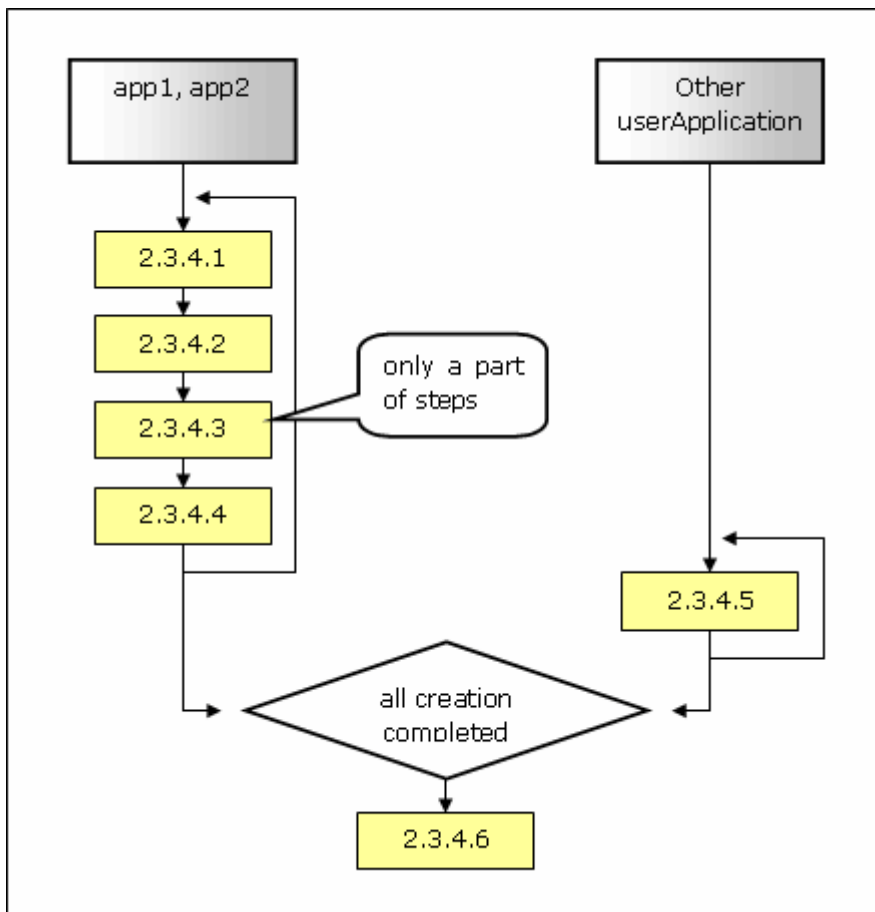
- app1 and app2 (including Oracle Clusterware, Oracle RAC instance and Listener resource)

Create userApplicatoin in this order :

1. "2.3.4.1 userApplication Basic Settings"

2. "2.3.4.2 Oracle Clusterware Resource Creation and Registration"

3. part of "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration"

4. "2.3.4.4 Other Resource Creation and Registration"

- app5, app6 and app7 (Optional)

If necessary, create in "2.3.4.5 Other userApplication Creation".

- After creation of all userApplications is completed, perform procedure of "2.3.4.6 Configuration-Generate and Configuration-Activate".

See
• •
For details, refer to the PRIMECLUSTER manual.
• •

2.3.4.1   userApplication Basic Settings

This section describes how to create userApplication and set basic settings. The following userApplications are related to this section.

- app1, app2, app3 and app4 in Configuration A

- app1 and app2 in Configuration B

1. Executed the following command on any one of the cluster nodes.

```
# hvw -n <Configuration Name>
```

2. Select Application-Create in the "Main configuration menu" screen.

```
node1: Main configuration menu, current configuration: config_RAC
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
```

3. Select WIZSTANDBY in the "Application type selection menu" screen.

```
Creation: Application type selection menu:
 1) HELP                           6) GENERIC
 2) QUIT                           7) ORACLE
 3) RETURN                         8) SCALABLE
 4) OPTIONS                        9) STANDBY
 5) DEMO                          10) WIZSTANDBY
Application Type: 10
```

📖 **Note**

. . . .

Do not select ORACLE (all caps) in this screen. This is for backward compatibility.

. . . .

4. In the case of editing the userApplication name, specify ApplicationName in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
 1) HELP                           4) REMOVE+EXIT
 2) NO-SAVE+EXIT                   5) ApplicationName=APP1
 3) SAVE+EXIT                      6) Machines+Basics(-)
Choose the setting to process: 5
```

5. Select Machines+Basics to set up nodes and basic setting of userApplication.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
 1) HELP                           4) REMOVE+EXIT
 2) NO-SAVE+EXIT                   5) ApplicationName=APP1
 3) SAVE+EXIT                      6) Machines+Basics(-)
Choose the setting to process: 6
```

For details, refer to HELP or "PRIMECLUSTER Installation and Administration Guide".

Information

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

- userApplication including Oracle Clusterware resource but not Oracle RAC instance resource (ex. app1 and app2 in Configuration A)

Attributes	Values
AutoSwitchOver	No
PersistentFault	1

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

- userApplication including Oracle RAC instance resource but not Oracle Clusterware resource (ex. app3 and app4 in Configuration A), and
  userApplication including Oracle RAC instance resource and Oracle Clusterware resource (ex. app1 and app2 in Configuration B)

Attributes	Values
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

```
Machines+Basics (app3:consistent)
 1) HELP                       14) (AutoStartUp=no)
 2) -                          15) (AutoSwitchOver=No)
 3) SAVE+EXIT                  16) (PreserveState=no)
 4) REMOVE+EXIT                17) (PersistentFault=1)
 5) AdditionalMachine          18) (ShutdownPriority=)
 6) AdditionalConsole          19) (OnlinePriority=)
 7) Machines[1]=node1RMS       20) (StandbyTransitions=)
 8) (PreCheckScript=)          21) (LicenseToKill=no)
 9) (PreOnlineScript=)         22) (AutoBreak=yes)
10) (PostOnlineScript=)        23) (HaltFlag=no)
11) (PreOfflineScript=)        24) (PartialCluster=0)
12) (OfflineDoneScript=)       25) (ScriptTimeout=)
13) (FaultScript=)
Choose the setting to process:
```

PersistentFault setup

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.

. . . .

6. Select SAVE+EXIT to return "Settings of turnkey wizard "WIZSTANDBY"" screen.
   After that, jump to the screen suitable for userApplication.

   - Configuration A

     app1 or app2 in process of creation in this section : jump to "2.3.4.2 Oracle Clusterware Resource Creation and Registration".

     app3 or app4 in process of creation in this section : jump to "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration".

   - Configuration B

     app1 or app2 in process of creation in this section : jump to "2.3.4.2 Oracle Clusterware Resource Creation and Registration".

2.3.4.2 Oracle Clusterware Resource Creation and Registration

This section describes how to create and register Oracle Clusterware resource. It is necessary to perform steps in this section for the creation of the following userApplication:

- app1 and app2 in Configuration A

- app1 and app2 in Configuration B

Do not create more than one Oracle Clusterware resource per node.

. . . .

1. Select Oracle in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
 1) HELP                          9) Procedure:BasicApplication(-)
 2) -                            10) Oracle(-)
 3) SAVE+EXIT                    11) Symfoware(-)
 4) -                            12) Procedure:SystemState3(-)
 5) ApplicationName=APP1         13) Procedure:SystemState2(-)
 6) Machines+Basics(app1)        14) Gls:Global-Link-Services(-)
 7) CommandLines(-)              15) LocalFileSystems(-)
 8) Procedure:Application(-)     16) Gds:Global-Disk-Services(-)
Choose the setting to process:  10
```

2. Select AdditionalOracleClusterware.

```
Oracle (Ora_APP1:not yet consistent)
 1) HELP                          6) AdditionalListener
 2) -                             7) AdditionalRACInstance/Listener
 3) SAVE+EXIT                     8) AdditionalOracleClusterware
 4) REMOVE+EXIT                   9) StartPriority=Same
 5) AdditionalInstance
Choose the setting to process:  8
```

· ·

Oracle Clusterware resource name in RMS is generated as follows:

```
Ora_<ApplicationName>_Clusterware
```

This resource name has the following convention and rules.

- The resource name must be up to 39 characters.

- For information on how to set up <ApplicationName>, refer to the step "4" of "2.3.4.1 userApplication Basic Settings".

· ·

3. Select OracleUser, FREECHOICE and enter Oracle user name.

```
Setting menu : Detail setting for Oracle Clusterware resource
 1) HELP                      5) ScriptTimeout=600       9) (PostOfflineScript=)
 2) NO-SAVE+RETURN            6) (PreOnlineScript=)      10) (FaultScript=)
 3) -                         7) (PostOnlineScript=)     11) (Flags=K)
 4) OracleUser=               8) (PreOfflineScript=)
Choose the setting to process: 4
```

```
Setting menu : OracleUser for Oracle Clusterware resource
 1) HELP
 2) RETURN
 3) FREECHOICE
Enter the name of OracleUser: 3
        >> racuser
```

4. Edit advanced settings of Oracle Clusterware resource.

```
Setting menu : Detail setting for Oracle Clusterware resource
 1) HELP                      5) ScriptTimeout=600       9) (PostOfflineScript=)
 2) NO-SAVE+RETURN            6) (PreOnlineScript=)      10) (FaultScript=)
 3) SAVE+RETURN               7) (PostOnlineScript=)     11) (Flags=K)
 4) OracleUser=racuser        8) (PreOfflineScript=)
Choose the setting to process:
```

![Point icon] **Point**

· ·

Advanced settings of Oracle Clusterware resource

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 enabled, Oracle Clusterware is actually running after userApplication has been stopped.

		If disabled, it is also stopped with userApplication stop. Default : KeepOnline is enabled.

Note

- Flags=<*Abbreviation*> 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(running).

- Stop of userApplication including Oracle RAC instance resource through PreOfflineScript
  When Oracle Clusterware and Oracle RAC instance are registered in different userApplication (Configuration A) and the "KeepOnline" flag is disabled, it is necessary to set the following script for PreOfflineScript of Oracle Clusterware resource;

```
/opt/FJSVclora/sbin/clorastopwait <userApplication>
```

<*userApplication*> : userApplication including Oracle RAC instance resource>

userApplication name specifiable for <*userApplication*> are as follows:

  - app1 in process of creation in this section : specify app3

  - app2 in process of creation in this section : specify app4

If there are multiple userApplications that include Oracle RAC instance resource, specify all of them space-delimited for <*userApplication*>.

5. Check the above settings then select SAVE+RETURN.

```
Setting menu : Detail setting for Oracle Clusterware resource
 1) HELP                      5) ScriptTimeout=600       9) (PostOfflineScript=)
 2) NO-SAVE+RETURN            6) (PreOnlineScript=)      10) (FaultScript=)
 3) SAVE+RETURN               7) (PostOnlineScript=)     11) (Flags=K)
 4) OracleUser=racuser        8) (PreOfflineScript=)
Choose the setting to process: 3
```

6. In the case of Configuraiton B, select AdditionalRACInstance/Listener here and jump to step "3" of "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration".

```
Oracle (Ora_APP1:consistent)
1) HELP                        4) REMOVE+EXIT
2) -                           5) AdditionalRACInstance/Listener
3) SAVE+EXIT                   6) OracleClusterware[0]=Clusterware
Choose the setting to process: 5
```

Step "7" or later are only for Configuration A.

7. Select SAVE+EXIT for registration.

   After that, confirm that Oracle(Ora_*xxx*) have been set in Settings of turnkey wizard WIZSTANDBY.

```
Oracle (Ora_APP1:consistent)
1) HELP                          4) REMOVE+EXIT
2) -                             5) AdditionalRACInstance/Listener
3) SAVE+EXIT                     6) OracleClusterware[0]=Clusterware
Choose the setting to process: 3
```

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
1) HELP                          9) Procedure:BasicApplication(-)
2) -                            10) Oracle(Ora_APP1)
3) SAVE+EXIT                    11) Symfoware(-)
4) -                            12) Procedure:SystemState3(-)
5) ApplicationName=APP1         13) Procedure:SystemState2(-)
6) Machines+Basics(app1)        14) Gls:Global-Link-Services(-)
7) CommandLines(-)              15) LocalFileSystems(-)
8) Procedure:Application(-)     16) Gds:Global-Disk-Services(-)
Choose the setting to process:
```

8. Select SAVE+EXIT and return to Main configuration menu screen.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
1) HELP                          9) Procedure:BasicApplication(-)
2) -                            10) Oracle(Ora_APP1)
3) SAVE+EXIT                    11) Symfoware(-)
4) -                            12) Procedure:SystemState3(-)
5) ApplicationName=APP1         13) Procedure:SystemState2(-)
6) Machines+Basics(app1)        14) Gls:Global-Link-Services(-)
7) CommandLines(-)              15) LocalFileSystems(-)
8) Procedure:Application(-)     16) Gds:Global-Disk-Services(-)
Choose the setting to process: 3
```

9. Jump to "2.3.4.4 Other Resource Creation and Registration" to continue creation of app1 or app2 in for Configuration A.

2.3.4.3   Oracle RAC Instance and Listener Resource Creation and Registration

This section describes how to create and register Oracle RAC instance resource and Listener resource. It is necessary to perform steps in this section for the creation of the following userApplication:

- app3 and app4 in Configuration A

- app1 and app2 in Configuraiton B (start from step "3")

CRS resource ora.*inst and ora.*lsnr are targeted for creation and registration. They are displayed by "crs_stat" command.

Example

....

See the following example:

```
$ crs_stat -t
Name            Type          Target    State     Host
------------------------------------------------------------
ora....1.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....2.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....rac.db  application    ONLINE    ONLINE    node1
ora....1.inst  application    ONLINE    ONLINE    node1
ora....2.inst  application    ONLINE    ONLINE    node2
$
```

In the above configuration, "ora....1.inst" included in node1, and "ora....2.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 Wizard is running, so "crs_stat" command can be executed correctly with Oracle DBA user.
However, it is not necessary that CRS resources are ONLINE state.

・ 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 "crs_stat" command can be executed correctly.

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

. . . .

1. Select Oracle in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

```
Settings of turnkey wizard "WIZSTANDBY" (APP3:not yet consistent)
 1) HELP                          9) Procedure:BasicApplication(-)
 2) -                            10) Oracle(-)
 3) SAVE+EXIT                    11) Symfoware(-)
 4) -                            12) Procedure:SystemState3(-)
 5) ApplicationName=APP3         13) Procedure:SystemState2(-)
 6) Machines+Basics(app3)        14) Gls:Global-Link-Services(-)
 7) CommandLines(-)              15) LocalFileSystems(-)
 8) Procedure:Application(-)     16) Gds:Global-Disk-Services(-)
Choose the setting to process: 10
```

2. Select AdditionalRACInstance/Listener.

```
Oracle (Ora_APP3:not yet consistent)
 1) HELP                          6) AdditionalListener
 2) -                             7) AdditionalRACInstance/Listener
 3) SAVE+EXIT                     8) AdditionalOracleClusterware
 4) REMOVE+EXIT                   9) StartPriority=Same
 5) AdditionalInstance
Choose the setting to process: 7
```

3. Select FREECHOICE and enter Oracle user name.
   (In the case of Configuraiton B, start from this step after the step "6" of "2.3.4.2 Oracle Clusterware Resource Creation and Registration".)

```
Setting menu : OracleUser for Oracle RAC Instance/Listener resource
 1) HELP
 2) RETURN
 3) FREECHOICE
Enter the name of OracleUser: 3
       >> racuser
```

4. Select CRS resource registered as RMS resource from the list.
   The selected CRS resources here should exist on the node that has set on the step "5" "Machines+Basics" of "2.3.4.1 userApplication Basic Settings".

```
Set Resource:Currently set:
1) HELP                          6) ora.rac.rac1.inst
2) NO-SAVE+RETURN                7) ora.rac.rac2.inst
3) SAVE+RETURN                   8) ora.node1.LISTENER_NODE1.lsnr
4) FREECHOICE                    9) ora.node2.LISTENER_NODE2.lsnr
5) (ScopeFilter=node1:node2)
Choose one of the resources:  6
```

```
Set Resource:Currently set:
1) HELP                          6) ora.rac.rac1.inst
2) NO-SAVE+RETURN                7) ora.rac.rac2.inst
3) SAVE+RETURN                   8) ora.node1.LISTENER_NODE1.lsnr
4) FREECHOICE                    9) ora.node2.LISTENER_NODE2.lsnr
5) (ScopeFilter=node1:node2)
Choose one of the resources:  5
```

```
Setting menu : ScopeFilter of Oracle RAC Instance/Listener resource
1) HELP
2) RETURN
3) NONE
4) FREECHOICE
Enter the word for filtering Scope:  4
        >> node1
```

```
Set Resource:Currently set:
1) HELP                          5) (ScopeFilter=node1)
2) NO-SAVE+RETURN                6) ora.rac.rac1.inst
3) SAVE+RETURN                   7) ora.node1.LISTENER_NODE1.lsnr
4) FREECHOICE
Choose one of the resources:
```

The RMS resource name is generated based on the CRS resource name as follows:

- Oracle RAC instance resource

```
Ora_<ApplicationName>_<inst_name>.i
```

- Listener resource

```
Ora_<ApplicationName>_<lsnr_name>.l
```

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

The resource name begins with "Ora_<ApplicationName>_" instead of "ora" of the resource name displayed with "crs_stat" command of Oracle RAC.

- The resource name must be up to 39 characters.

- For information on how to set up <ApplicationName>, refer to the step "4" of "2.3.4.1 userApplication Basic Settings".

- <inst_name> indicated by bold type is part of CRS resource name.

```
ora.rac.rac1.inst
```

- <lsnr_name> indicated by bold type is part of CRS resource name.

```
ora.node1.LISTENER_NODE1.lsnr
```

5. Confirm that CRS resources selected at previous screen appear after "Currently set".
   After that, select SAVE+RETURN.

```
Set Resource:Currently set: ora.rac.rac1.inst ora.node1.LISTENER_NODE1.lsnr
1) HELP                          6) NOT:ora.rac.rac1.inst
2) NO-SAVE+RETURN                7) ora.rac.rac2.inst
3) SAVE+RETURN                   8) NOT:ora.node1.LISTENER_NODE1.lsnr
4) FREECHOICE                    9) ora.node2.LISTENER_NODE2.lsnr
5) (ScopeFilter=node1:node2)
Choose one of the resources: 3
```

6. Edit advanced settings of Oracle RAC instance, Listener resource.

```
Oracle (Ora_APP3:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) AdditionalRACInstance/Listener
6) AdditionalOracleClusterware
7) RACInstance/Listener[0]=ora.rac.rac1.inst
8) RACInstance/Listener[1]=ora.node1.LISTENER_NODE1.lsnr
Choose the setting to process: 7
```

```
Setting menu : Oracle RAC Instance/Listener resource
1) HELP
2) RETURN
3) NONE
4) FREECHOICE
5) SELECTED:ora.rac.rac1.inst
Choose an Oracle RAC Instance/Listener: 5
```

```
Setting menu : Detail setting for RACInstance[0]=ora.rac.rac1.inst
 1) HELP                  6) WFTime=900           11) (PreOfflineScript=)
 2) NO-SAVE+RETURN        7) (Interval=60)        12) (PostOfflineScript=)
 3) SAVE+RETURN           8) (WatchTimeout=300)   13) (FaultScript=)
 4) OracleUser=racuser    9) (PreOnlineScript=)   14) (Flags=)
 5) ScriptTimeout=900    10) (PostOnlineScript=)
Choose the setting to process:
```

Point

Advanced settings of Oracle RAC instance and Listener resource

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
Interval		Monitoring interval of Oracle instance. Default: 60s (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 a resource should be monitored. If it is enabled, the resource will be monitored. Resource monitoring is disabled as default.

Information

- For details about *Script, refer to "2.4.1 Oracle Online/Offline Script".

- For details about Flags, refer to "11 Appendix－Attributes" of "PRIMECLUSTER RMS with Wizard Tools Configuration and Administration Guide".

Note

- **Startup of userApplication including Oracle Clusterware resource 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>
```

<userApplication> : userApplication including Oracle Clusterware resource

userApplication name specifiable for *<userApplication>* are as follows:

- app3 in process of creation in this section : specify app1

- app4 in process of creation in this section : specify app2

- **WFTime**
  In Oracle RAC, Oracle Clusterware will recover a failure of an RAC instance and a Listener. PRIMECLUSTER Wizard for Oracle, the wait time for the failure recovery can be set for WFTime

  - WFTime=PersistentWarning
    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.

  - WFTime=ImmediateFault
    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>
    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=<*Abbreviation*> indicates that the flag attribute is enabled.
- -

7. Select SAVE+RETURN to quit advanced settings.

```
Setting menu : Detail setting for RACInstance[0]=ora.rac.rac1.inst
 1) HELP                    6) WFTime=900              11) (PreOfflineScript=)
 2) NO-SAVE+RETURN          7) (Interval=60)           12) (PostOfflineScript=)
 3) SAVE+RETURN             8) (WatchTimeout=300)      13) (FaultScript=)
 4) OracleUser=racuser      9) (PreOnlineScript=)      14) (Flags=)
 5) ScriptTimeout=900      10) (PostOnlineScript=)
Choose the setting to process: 3
```

8. Repeat the procedure from step "6" and "7" as necessary.

9. Select SAVE+EXIT to register Oracle RAC instance or Listener resource.

```
Oracle (Ora_APP3:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) AdditionalRACInstance/Listener
6) AdditionalOracleClusterware
7) RACInstance/Listener[0]=ora.rac.rac1.inst
8) RACInstance/Listener[1]=ora.node1.LISTENER_NODE1.lsnr
Choose the setting to process: 3
```

📘Information
- -

In the case of Configuration B

In the case of Configuraiton B, the RMS Wizard screen in this step is displayed like the following;

```
Oracle (Ora_APP1:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) AdditionalRACInstance/Listener
6) RACInstance/Listener[0]=ora.rac.rac1.inst
7) RACInstance/Listener[1]=ora.node1.LISTENER_NODE1.lsnr
8) OracleClusterware[0]=Clusterware
Choose the setting to process:
```

10. Confirm that Oracle(Ora_*xxx*) have been set.

```
Settings of turnkey wizard "WIZSTANDBY" (APP3:not yet consistent)
 1) HELP                         9) Procedure:BasicApplication(-)
 2) -                           10) Oracle(Ora_APP3)
 3) SAVE+EXIT                    11) Symfoware(-)
 4) -                           12) Procedure:SystemState3(-)
 5) ApplicationName=APP3         13) Procedure:SystemState2(-)
 6) Machines+Basics(app3)        14) Gls:Global-Link-Services(-)
 7) CommandLines(-)              15) LocalFileSystems(-)
 8) Procedure:Application(-)     16) Gds:Global-Disk-Services(-)
Choose the setting to process:
```

11. Jump to "2.3.4.4 Other Resource Creation and Registration". This is applicable to all configuration patterns and all userApplications.

2.3.4.4   Other Resource Creation and Registration

This section describes how to create and register other resource. It is necessary to perform steps in this section for the creation of the following userApplication:

- ・ app1, app2, app3 and app4 in Configuration A

- ・ app1 and app2 in Configuraiton B

  1. If there are other necessary resources, create and register them in "Settings of turnkey wizard "WIZSTANDBY"" screen.

Information

Other resources (ex. Procedure resource, resource concerning backup software) should be registered here.
For details of them, refer to the each manual. (For Procedure resource, refer to "PRIMECLUSTER Installation and Administration Guide".)

  2. Select SAVE+EXIT to return Main configuration menu.

```
Settings of turnkey wizard "WIZSTANDBY" (APP1:not yet consistent)
 1) HELP                         9) Procedure:BasicApplication(-)
 2) -                           10) Oracle(Ora_APP1)
 3) SAVE+EXIT                    11) Symfoware(-)
 4) -                           12) Procedure:SystemState3(-)
 5) ApplicationName=APP1         13) Procedure:SystemState2(-)
 6) Machines+Basics(app1)        14) Gls:Global-Link-Services(-)
 7) CommandLines(-)              15) LocalFileSystems(-)
 8) Procedure:Application(-)     16) Gds:Global-Disk-Services(-)
Choose the setting to process: 3
```

3. This concludes creation of userApplication.

    After that, jump to the screen suitable for userApplication.

    - Configuration A

      If all userApplications (app1, app2, app3 and app4) have been created, jump to "2.3.4.5 Other userApplication Creation". If not, start from "2.3.4.1 userApplication Basic Settings".

    - Configuration B

      If all userApplications (app1 and app2) have been created, jump to "2.3.4.5 Other userApplication Creation". If not, start from "2.3.4.1 userApplication Basic Settings".

2.3.4.5 Other userApplication Creation

This section describes how to create other userApplication. (ex. app5, app6, and app7)

1. If there are other necessary userApplications, create them in "Main configuration menu" screen.

2. Return "Main configuration menu" screen after the creation.

2.3.4.6 Configuration-Generate and Configuration-Activate

This section describes how to generate and activate RMS configuration. It is necessary to perform steps in this section after creation of all userApplications is completed.

1. Execute Configuration-Generate and Configuration-Activate.

```
node1: Main configuration menu, current configuration: config_standby
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:
```

📝 Note

. . . .

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

However, it is not necessary that CRS resources are ONLINE state.

- 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 "crs_stat" command can be executed correctly.

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

. . . .

2. Select QUIT and terminate RMS Wizard.

```
node1: Main configuration menu, current configuration: config_standby
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: 2
```

Information
. . . .
You can check userApplication setup using "clorainfo -c" command. For details, refer to "4.6 clorainfo - Display Resource Configuration and Monitoring Status".
. . . .

2.3.5   userApplication Operation Check

Start userApplication by executing "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.

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

See
. . . .
For the RMS command, refer to "PRIMECLUSTER Installation and Administration Guide".
. . . .

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.

Script Type

Script		Description
startup	PreOnlineScript	Executed before OnlineScript. Set up in RMS Wizard ("hvw" command).
	OnlineScript	Starts resource up during userApplicatoin Online processing. It is impossible to setup by user.

		prestartup*	It is usable only for the Oracle instance resource in standby operation. Executed before Oracle instance startup. If the Oracle state (STATUS of the V$INSTANCE view) has to be checked Put the executable file that begins with "prestartup" in the "/opt/FJSVclora/usr" directory.
		nomount*	It is usable only for the Oracle instance resource in standby operation. Executed when the Oracle status (STATUS column in V$INSTANCE view) is "STARTED" during Oracle startup. Put the executable file that begins with "nomount" in the "/opt/FJSVclora/usr" directory.
		mount*	It is usable only for the Oracle instance resource in standby operation. Executed 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.
	PostOnlineScript		Executed after OnlineScript. Set up in RMS Wizard ("hvw" command).
Stop	PreOfflineScript		Executed before OfflineScript. Set up in RMS Wizard ("hvw" command).
	OfflineScript		Stops resource down during userApplicatoin Offline processing. It is impossible to setup by user.
	PostOfflineScript		Executed after OfflineScript. Set up in RMS Wizard ("hvw" command).
other	FaultScript		Executed when failures occur. Set up in RMS Wizard ("hvw" command).

🖼 See

For information on how to set up these scripts, refer to "2.2.7.1 Oracle Resource Creation and Registration", "2.3.4.2 Oracle Clusterware Resource Creation and Registration" or "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration".

- ・ PreOnlineScript

- ・ PostOnlineScript

- ・ PreOfflineScript

- ・ PostOfflineScript

- ・ FaultScript

For detail of these scripts, refer to "3.1 Oracle Control through PRIMECLUSTER Wizard for Oracle".

- ・ OnlineScript

- ・ OfflineScript

Execution sequence

Script			userApplication startup	resource AutoRecover	userApplication stop (normal)	userApplication stop (resource failure)
startup	PreOnlineScript		**1**	----	----	----
	OnlineScript		**2**	**1**	----	----
		prestartup*	**3**	**2**	----	----
		nomount*	**4**	**3**	----	----

	mount*	**5**	**4**	----	----
	PostOnlineScript	**6**	**5**	----	----
stop	PreOfflineScript	----	----	**1**	**2**
	OfflineScript	----	----	**2**	**3**
	PostOfflineScript	----	----	**3**	**4**
other	FaultScript	----	----	----	**1**

📝 Example

....

The execution sequence of scripts is described below when StartPriority set as "Listener";

- userApplication startup

  Note that all PreOnlineScript are executed firstly.

  1. PreOnlineScript of Listener resource
  2. PreOnlineScript of Oracle instance resource
  3. OnlineScript of Listener resource
  4. PostOnlineScript of Listener resource
  5. OnlineScript (including startup*, nomount*, mount*) of Oracle instance resource
  6. PostOnlineScript of Oracle instance resource

- Listener resource AutoRecover

  Note that PreOnlineScript of Listener resource is not executed.

  1. OnlineScript of Listener resource
  2. PostOnlineScript of Listener resource

- normal userApplication stop (user operation)

  Note that all PreOfflineScript are executed firstly.

  1. PreOfflineScript of Oracle instance resource
  2. PreOfflineScript of Listener resource
  3. OfflineScript of Oracle instance resource
  4. PostOfflineScript of Oracle instance resource
  5. OfflineScript of Listener resource
  6. PostOfflineScript of Listener resource

- userApplication stop caused by Listener resource failure

  Note that not only FaultScript of Listener resource but also FaultScript of Oracle instance resource are executed.

  1. FaultScript of Listener resource
  2. FaultScript of Oracle instance resource
  3. PreOfflineScript of Oracle instance resource
  4. PreOfflineScript of Listener resource
  5. OfflineScript of Oracle instance resource
  6. PostOfflineScript of Oracle instance resource
  7. OfflineScript of Listener resource

8. PostOfflineScript of Listener resource

- -

Notice (PreOnlineScript, PostOnlineScript, PreOfflineScript, PostOfflineScript, FaultScript)

- ・ Execute the scripts using root privileges.

- ・ The exit code 0 indicates normal termination. The value other than 0 indicates abnormal termination or switching process failures.

- ・ 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, refer to "2.6.3 Scripts" of the "PRIMECLUSTER RMS with Wizard Tools Configuration and Administration Guide".

- -

Notice (prestartup*, nomount*, mount*)

- ・ 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. Refer to step "7" of "2.2.7.1 Oracle Resource Creation and Registration".

Note

- -

The user scripts above are enabled in standby operation.
Note that they cannot be used in Oracle RAC scalable operation.

- -

2.4.2 ASM (Automatic Storage Management)

Automatic Storage Management (hereafter ASM) 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. 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.

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

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 where the AMS instance and database are created.

- Under $ORACLE_HOME/dbs

- Under $ORACLE_BASE/admin/$ORACLE_SID

- $ORACLE_BASE/admin/<ASM instance name>

- $ORACLE_BASE/diag/asm (Oracle 11g)

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.

Note
....
If required files on the operating node is backed up in the tar format with "cloracpy"(refer to "4.4 cloracpy - Create Backup File for Oracle Database Setup") 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".

See
....
For the initialized parameter of the ASM instance, refer to the Oracle manual.
....

userApplication creation

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

Information
....
・For information on how to create ASM instance resource, refer to "2.2.7.1 Oracle Resource Creation and Registration".

・ 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. F 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

This section discusses how PRIMECLUSTER Wizard for Oracle controls Oracle in standby operation.

Oracle instance Startup

Startup procedure of an Oracle instance 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. Refer to "2.2.6 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:

- When there is ACTIVE table space in the V$BACKUP view.

- When there are files required to be recovered in the V$RECOVER_FILE view.

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

・ DBA authentication

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.

Oracle instance Shutdown

・ Shutdown procedure of an Oracle instance by user operation 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 "5", shut it down forcibly by sending SIGKILL to the background processes.

・ Shutdown procedure of an Oracle instance by resource failure or failover 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" or "5", shut it down forcibly by sending SIGKILL to the background processes.

Oracle instance Monitoring

Monitoring procedure of an Oracle instance 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 the SYSTEM user

4. Check if Oracle status is OPEN

5. Check if the background processes (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" and after are 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. Note that "6" is executed at a 60-second interval at least.

・ SYSTEM user password

PRIMECLUSTER Wizard for Oracle monitors Oracle as the SYSTEM user. Set the SYSTEM user's password. Refer to "4.3 clorapass - Register Password for Monitoring".

・ 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 bites, 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 account is locked, so Oracle connection is not allowed (ORA-28000 detected)

- 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.

- Since the SYSTEM user's password has expired, so Oracle connection is not allowed (ORA-28001 detected)

- Monitoring timeout

    If SQL statement(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

Startup procedure of a Listener is as follows:

1. su - <Oracle user>

2. lsnrctl start <ListenerName>

3. Makes sure that a Listener process does exist.

Listener Shutdown

Shutdown procedure of a Listener is as follows:

1. su - <Oracle user>

2. lsnrctl stop <ListenerName>

3. Makes 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

Monitoring procedure of a Listener is as follows:

1. Makes sure that a Listener process does not exist.

2. Makes 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.

ASM instance Startup

Startup procedure of an ASM instance is as follows

1. su - <Oracle DBA user>

2. sqlplus / nolog

3. connect / as sysdba ("connect / as sysasm" in the case of Oracle 11g or later)

4. startup mount (if "STARTED" already, "alter diskgroup all mount" is executed.)

ASM instance Shutdown

- Shutdown procedure of an ASM instance by user operation is as follows:

    1. su - <Oracle DBA user>

    2. sqlplus / nolog

    3. connect / as sysdba ("connect / as sysasm" in the case of Oracle 11g or later)

    4. shutdown <immediate / abort / transactional> (Setup with StopModeStop)
       Default : immediate

    5. If ASM is not stopped at step "4" (except for abort), use shutdown abort.

    6. If ASM is not stopped at step "4" or "5", shut it down forcibly by sending SIGKILL to the background processes.

- Shutdown procedure of an ASM instance by resource failure or failover is as follows:

    1. su - <Oracle DBA user>

    2. sqlplus / nolog

    3. connect / as sysdba ("connect / as sysasm" in the case of Oracle 11g or later)

    4. shutdown <immediate / abort / transactional> (Setup with StopModeFail)
       Default : abort

    5. If ASM is not stopped at step "4" (except for abort), use shutdown abort.

    6. If ASM is not stopped at step "4" or "5", shut it down forcibly by sending SIGKILL to the background processes.

ASM instance Monitoring

ASM is not monitored. NullDetector flag is automatically enabled.

3.1.2 Oracle RAC Scalable Operation

In Oracle RAC, 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

Startup procedure of an Oracle RAC instance is as follows:

    1. su - <Oracle user>

    2. srvctl start instance -d $DB_NAME -i $ORACLE_SID

Oracle RAC instance Stop

Shutdown procedure of an Oracle RAC instance is as follows:

    1. su - <Oracle user>

    2. srvctl stop instance -d $DB_NAME -i $ORACLE_SID

Oracle RAC instance Monitoring

Monitoring procedure of an Oracle RAC instance is the same as standby operation. However, the monitoring interval's default value is 60 seconds.

For details, refer to "Oracle instance Monitoring" of "3.1.1 Standby Operation".

Listener Startup

Startup procedure of a Listener is as follows:

    1. su - <Oracle user>

    2. srvctl start listener -n $NODE_NAME -l $LSNR_NAME

Listener Shutdown

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

Listener Monitoring

Monitoring procedure of a Listener is the same as standby operation. However, the monitoring interval's default value is 60 seconds.

For details, refer to "Oracle instance Monitoring" of "3.1.1 Standby Operation".

Oracle Clusterware Startup

Startup procedure of an Oracle Clusterware is as follows:

1. /etc/init.d/init.crs start

2. Checks if Oracle Clusterware is activated using crs_stat -t.

Oracle Clusterware Stop

Shutdown procedure of an Oracle Clusterware is as follows:

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

Oracle Clusterware Monitoring

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

Note

If you want to startup, stop, or switch Oracle instances, execute "hvswitch" and "hvutil" on RMS userApplication. If you execute the Oracle Clusterware "srvctl" command or shutdown command to the Oracle instance directly, PRIMECLUSETR 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, 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. Stop monitoring

   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 resource monitoring is disrupted.

3. Stop Oracle-dependent resources

   Before stopping Oracle, stop Oracle-dependent resources manually if there are any. 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 instance to "OPEN" status. Start 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 resource monitoring is disrupted with "hvoradisable" command, start monitoring the Oracle-dependent resources again using the RMS command hvdisable, then start them manually.

8. Restart resource monitoring

   Start monitoring the Oracle instance and Listener resources again using "hvoraenable" command.

Information

・ Maintenance mode and resource monitoring

   To stop Oracle with userApplication active, use the "monitoring disruption" function of PRIMECLUSTER Wizard for Oracle. "Monitoring disruption" - Stop the Oracle resource monitoring only. If non-Oracle resource fails, a failover will be generated.

・ Oracle RAC

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

・ Oracle instance and Listener monitoring

   For information on how to cancel or restart monitoring the Oracle instance and Listener resource, refer to "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 then 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.

Note

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

3.2.1.1　Oracle must be stopped

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

1. Monitoring disruption

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

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 user>
$ sqlplus /nolog
SQL> connect / as sysdba
SQL> startup
```

5. Monitoring restart

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

📖Information

. . . .

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. Monitoring disruption

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

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

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

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. Monitoring disruption

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

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

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

 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. Monitoring disruption

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

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

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

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
. . . .

See
. . . .
For details, refer to the Oracle manual
. . . .

3.2.4.1   Oracle must be stopped

If Oracle must be stopped, recovery 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

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

3. userApplication startup

```
# hvswitch <userApplication>
```

4. Recovery

   Recover the database.

5. Oracle instance and Listener startup

```
# su - <Oracle user>
$ lsnrctl start <Listener>
$ 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. Monitoring disruption

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

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

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

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 disabled
```

2. Change the Oracle SYSTEM user password

    Change the Oracle SYSTEM user password, or unlock SYSTEM user account.

    - Change the Oracle SYSTEM user password
      In standby operation, change the password on the operating node. In scalable operation with Oracle RAC, 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
```
    ....

    - Unlock SYSTEM user account
      Refer to [Case 2] of "A.1.3 Warning State".

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

    Register the Oracle SYSTEM user password to Wizard for Oracle using "clorapass" command.
    In standby operation, register the password on the operating node. In scalable operation with Oracle RAC, 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 enabled
```

Information

・ For the "hvoradisable" command, refer to "4.1 hvoradisable - Discontinue Monitoring Resources".

・ For information on how to change the Oracle SYSTEM user password, refer to the Oracle manual.

・ For "clorapass" command, refer to "4.3 clorapass - Register Password for Monitoring".

・ For "hvoradisable" command, refer to "4.2 hvoraenable - Restart Monitoring Resources".

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 log files.

Log of PRIMECLUSTER Wizard for Oracle

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

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

The format of log files is 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

    - initialization parameter file

        $ORACLE_HOME/dbs/*.ora

        $ORACLE_BASE/admin/$ORACLE_SID/pfile/*.ora

    - Oracle Net Services file

        $ORACLE_HOME/network/admin/*.ora

- ・Log files

    - Oracle alert log

        $ORACLE_HOME/rdbms/log/alert_$ORACLE_SID.log

        $ORACLE_BASE/admin/$ORACLE_SID/bdump/alert_$ORACLE_SID.log

        $ORACLE_BASE/diag/* (Oracle 11g or later)

    - listener log

        $ORACLE_HOME/network/log/<ListenerName>.log

        $ORACLE_BASE/diag/* (Oracle 11g or later)

    - Oracle Clusterware log

        $ORA_CRS_HOME/crs/log/<nodename>.log

PRIMECLUSTER information

You can collect troubleshooting information by executing "fjsnap" command of PRIMECLUSTER. Refer to "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/*

3.6 Log Files

PRIMECLUSTER Wizard for Oracle generates log files under the following directory.

- ・ /var/opt/reliant/log

    Log files having information about startup/stop are stored in this directory.

    Disk space for the directory is managed by PRIMECLUSTER.

See

- -

Refer to "PRIMECLUSTER Installation and Administration Guide".

- -

- ・ /var/opt/FJSVclora

    Log files having information about monitoring are stored in this directory.

    Required disk space for the directory is described below;

    - - Oracle instance resource

        5.5 MB per resource

    - - Listener resource

        4.5 MB per resource

    - - ASM instance resource

        0.0 MB per resource (no output)

    - - Oracle Clusterware resource

        0.0 MB per resource (no output)

Note

- -

Do not remove these log files.

- -

Chapter 4 Command

4.1 hvoradisable - Discontinue Monitoring Resources

User

Super user

Format

/opt/FJSVclora/sbin/hvoradisable *userApplication Resource*

/opt/FJSVclora/sbin/hvoradisable -a [*userApplication*]

Function

hvoradisable 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.

📖Information
. . . .

- The ASM instance resource and Oracle Clusterware resource are not monitored, so it is not necessary to discontinue monitoring the resource with the command.

- For further details about ASM instance resources, refer to "2.4.2 ASM (Automatic Storage Management)".

. . . .

Parameter

userApplication Resource

Specify userApplication including Oracle resources that will be disrupted monitoring.

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

Specify them on the local node.

-a [*userApplication*]

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 *userApplication*.

If *userApplication* 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
. . . .

Note that execution timing. Unexpected resource failure or userApplication failover might be caused.

・ Do not execute the command while state transition of userApplication is in progress.

・ Do not execute the command while RMS is not running.

・ Do not right after execution of the command.
. . . .

4.2 hvoraenable - Restart Monitoring Resources

User

Super user

Format

/opt/FJSVclora/sbin/hvoraenable *userApplication Resource*

/opt/FJSVclora/sbin/hvoraenable -a [*userApplication*]

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.

Information
. . . .

- The ASM instance resource and Oracle Clusterware resource are not monitored, so it is not necessary to cancel monitoring for them with the command.

- For further details about ASM instance resources, refer to "2.4.2 ASM (Automatic Storage Management)".
. . . .

Parameter

userApplication Resource

Specify userApplication including Oracle resources that will be disrupted monitoring.

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

Specify them on the local node.

-a [*userApplication*]

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 *userApplication*.

If *userApplication* 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
. . . .

Note that execution timing. Unexpected resource failure or userApplication failover might be caused.

・ Do not execute the command while state transition of userApplication is in progress.

・ Do not right after execution of the command.

....

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 register the Oracle SYSTEM user password.

Parameter

None.

Exit status

0: Normal termination

Non-0: Abnormal termination

Information

....

For information on how to change the Oracle SYSTEM user's password while the cluster system is running, refer to "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/

- All files under $ORACLE_HOME/network/admin/

- All files under $ORACLE_BASE/diag/

The files on the operating node will be stored in the "/tmp/oracle.$ORACLE_SID.tar" file. Then, they will be deployed on the standby node with "tar xvfP /tmp/oracle.$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. "clgetoralog" command collects Oracle setup information and log files on a PRIMECLUSTER system. The information will be collected in the "<hostname>_<yymmddHHMMSS>_clgetoralog.tar.Z" (or tar.gz) file.

The "clgetoralog" command collects

- Initialized 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

Some files under $ORACLE_BASE/diag/

- 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)

  cat /proc/cpuinfo (CPU information)

  cat /proc/version (Linux version)

  sysctl -a (kernel parameter)

  ipcs (shared resources)

  cat /proc/swaps (swap information)

  ptree -pal, ps -efw (process information)

  ntpq -p (NTP information)

  /var/log/messages file

Information

・・

"pclsnap" command can also be used to collect troubleshooting information.

・・

Parameter

[-n *RMSconfiguration*]

Specify the RMS configuration name for *RMSconfiguration*.
If this option is specified, "clgetoralog" command will collect RMS configuration information in addition to the information described in "Function". You can check the RMS configuration name using the following command if RMS is running.

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

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

[-d *output_directory*]

Specify the directory where information is collected. Then, the command will store the "<hostname>_<yymmddHHMMSS>_clgetoralog.tar.Z" (or tar.gz) 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 Z" (or tar.gz) 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)

- MS log files (/var/opt/reliant/log/*)

- RMS environment variable configuration file (/usr/opt/reliant/bin/hvenv.local)

- /var/log/messages (all generations)

- /etc/hosts

- /etc/passwd

- /etc/services

- /etc/fstab

- /etc/fstab.pcl

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

Exit status

0: Normal termination

Non-0: Abnormal termination

🔰 Note

This command gets the value of background_dump_dest or diagnostic_dest parameter from the initialized parameter file or the server parameter file, and searches the Oracle alert log. However, if these parameter files can not be read(e.g. the server parameter file exists on a shared disk that is not mounted), the alert log is not also collected.
To prevent it, 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/diagnostic_dest parameter can be found in the initialized parameter file or the server parameter file. It can be also displayed by SQL "show parameter dest".)

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

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

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* s 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.

Information

When a Listener resource created in Oracle RAC scalable operation, it is impossible to set TNSName attribute of the resource even if "TNS name registered in RMS" item is displayed by "clorainfo -e" command.

```
# /opt/FJSVclora/bin/clorainfo -e
    :
  node1 : Ora_APP1_LISTENER_NODE1.l
------------------------------------------------------------
  User registered in RMS (uid)  : oracle (504)
  User Group (gid)              : oinstall (504)
                                : dba (505)
  ORACLE_HOME                   : /u01/app/oracle/product/db
  Listener registered in RMS    : LISTENER_NODE1
  Protocol Addresses            : (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)...
                                : (DESCRIPTION=(ADDRESS=(PROTOCOL=TCP)...
  TNS name registered in RMS    : ----
    :
```

-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

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.

- Operating several different versions of Oracle products on a PRIMECLUSTER system is not supported. For the Oracle products supported, refer to "Readme" 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, refer to "2.2.6 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, refer to "2.2.6 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 "2.2.7.1 Oracle Resource Creation and Registration" or "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration" should belong to OSDBA group.

  - SQLNET.AUTHENTICATION_SERVICES parameter should not defined in sqlnet.ora file.

  The other connections (ex. 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 userApplicatoin startup or shutdown.
  For details, refer to "2.2.2 Oracle Software Installation and Configuration" or "2.3.2 Oracle Software Installation and Configuration".

- In Oracle 10g or later environment, operating system authentication of Listener should be enabled. For details, refer to "2.2.6 Oracle Database Creation and Setting".

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.

- In standby operation, if a database failure is detected during Oracle instance startup, the database will automatically be recovered (END BACKUP, MEDIA RECOVERY).
  In scalable operation with Oracle RAC, it is not performed.

📑 See
・・・
For details, refer to "2.4.1 Oracle Online/Offline Script".
・・・

- In Oracle RAC scalable operation, an RMS resource is created based on the resource name of Oracle RAC. For details, refer to "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration".

- If "Instance" or "Listener" is specified for StartPriority, MonitorOnly cannot be enabled. To enable it, specify "Same". For details, refer to "2.2.7.1 Oracle Resource Creation and Registration".

- Do not execute "srvctl" or "sqlplus" commands to shut down Oracle instance. It might cause mismatched status between RMS and Oracle RAC.

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, refer to "2.4.1 Oracle Online/Offline Script".

- Do not create multiple resources for the same an Oracle instance, an ASM instance, a Listener or Oracle Clusterware.

- In Oracle RAC scalable operation, an Oracle Clusterware is controlled as a resource. Even if you have controlled it by PreOnlineScript of an Oracle RAC instance resource in previous version of PRIMECLUSTER Wizard for Oracle, it is not allowed to use the same method in this version.

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, refer to "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 "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 disabled

[Content]

Monitoring resource was discontinued after the hvoradisable was executed.

[Corrective action]

None. Execute "hvoraenable" command to restart resource monitoring.

Information

For details, refer to "4.1 hvoradisable - Discontinue Monitoring Resources".

INFO: 0102: Fault Watching is enabled

[Content]

Resource monitoring was restarted after "hvoraenable" command was executed.

[Corrective action]

None.

Information

For details, refer to "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 occurred (*count*)

[Content]

Since there is 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.

clgetoralog [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.

clgetoralog [ERROR] No space in path_name (details)!

[Content]

Not enough disk space in path_name.

[Corrective action]

Check the system environment.

clgetoralog [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.

clgetoralog [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.

clgetoralog [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.

clgetoralog [WARN] Obtaining local SysNode Name failed!

[Content]

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

[Corrective action]

　　None.

clgetoralog [WARN] Execution of hvw failed!

[Content]

　　Cannot execute an RMS command hvw(1M) correctly, but clgetoralog 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 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	A.1.1
	Failover	A.1.2
	Warning status	A.1.3
Oracle listeners	Startup/stop failure	A.2.1
	Failover	A.2.2

A.1 Oracle Instances

A.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 "clorainfo -c" command. Refer to "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. Refer to "Chapter 2 Environment Setup".

[Case 2]

Oracle instance startup or stop fails when user script settings in /opt/FJSVclora/usr are incorrect (standby 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. Refer to "3.2.4.1 Oracle must be stopped".

A.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 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.

A.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

- ・ 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. Refer to "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 statement.
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. Refer to "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 "clorainfo -m" command. Refer to "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. Refer to "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 statement(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 and the following error message will also be output to syslog:

```
ERROR: 0226: Watch Timeout occurred
```

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.

[Case 6]

An Oracle instance resource enters Warning when the SYSTEM user's password has expired, so Oracle connection is not allowed.

If ORA-28001 is output to syslog, you can determine the cause of this problem.
You can also check it by referring to the following SQL statement
If the ORA-28001 error message appears, you can determine the cause of this problem.

```
# su - <Oracle user>
$ sqlplus /nolog
SQL> connect system/password
ERROR:
ORA-28001: the password has expired

Changing password for system
New password:
```

If this is the case, change the SYSTEM user's password. After that, register the password with "clorapass" command. Refer to "3.3 Oracle SYSTEM user Password Change ".

See
....
For details refer to the Oracle manual.
....

A.2   Oracle Listeners

A.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 "clorainfo -c" command. Refer to "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. Refer to "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. Refer to "3.2.4.1 Oracle must be stopped".

A.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 "clorainfo -c" command. Refer to "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. Refer to "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 B Change Oracle Resource Settings

This section explains how to change the Oracle resource settings.

📒 Note

If you perform the procedure in the environment updated from previous version, it is necessary to replace prompt characters in screens with another.

- Settings of turnkey wizard "WIZSTANDBY"

  Replace "Settings of turnkey wizard "ORACLE""

This replacement is not necessary if your userApplication has been created newly in 4.3A00.

B.1 Resource Additional Creation

B.1.1 Respectively

This section explains how to create an Oracle resource newly and register it to an existing userApplication that includes an Oracle resource already.

📘 Example

To create a Listener "LISTENER_2" newly and register it to an existing userApplication including an Oracle instance resource and a Listener resource "LISTENER" already.

1. Stop RMS on all nodes.

2. Start up RMS Wizard by executing "hvw -n <Configuration Name>" command on any node.

3. Select Application-Edit in the "Main configuration menu" screen.

4. Select userApplication name where resources are registered in the "Application selection menu" screen.

5. Select Oracle(Ora_*xxx*) in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

6. Select Additional*xxx* in the "Oracle (Ora_*xxx*:consistent)" screen.

   ## 📘 Example

   - In the Standby Operation

     If you create and register an Oracle instance resource or an ASM instance resource, select AdditionalInstance here, and edit advanced settings of the resource according to the step "7" and "8" of "2.2.7.1 Oracle Resource Creation and Registration".

     If you create and register a Listener resource, select AdditionalListener here, and edit advanced settings of the resource according to the step "10" and "11" of "2.2.7.1 Oracle Resource Creation and Registration".

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

- In the Oracle RAC Scalable Operation

    If you create and register an Oracle Clusterware resource, select AdditionalOracleClusterware here, and edit advanced settings of the resource according to the step "3" - "5" of "2.3.4.2 Oracle Clusterware Resource Creation and Registration".

    If you create and register an Oracle RAC instance resource or a Listener resource, select AdditionalRACInstance/Listener here, and edit advanced settings of the resource according to the step "3" - "7" of "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration".

```
Oracle (Ora_APP3:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) AdditionalRACInstance/Listener
6) AdditionalOracleClusterware
7) RACInstance/Listener[0]=ora.rac.rac1.inst
8) RACInstance/Listener[1]=ora.node1.LISTENER_NODE1.lsnr
Choose the setting to process:
```

7. Repeat the step "6" if need to create and register resources else.

8. Select SAVE+EXIT in the "Oracle (Ora_*xxx*:consistent)" screen after completed.

9. Select SAVE+EXIT in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

10. Select RETURN in the "Application selection menu" screen.

11. Execute Configuration-Generate and Configuration-Activate in the "Main configuration menu" screen.

12. Select QUIT in the "Main configuration menu" screen and terminate RMS Wizard.

B.1.2   In a Group

This section explains how to create an Oracle resource newly and register it to an existing userApplication that does not include any Oracle instance resource and Listener resource.

📘 Example

To create an Oracle instance resource and(or) a Listener resource newly and register them(it) to an existing userApplication including GDS, LFS and GLS resources already.

In the standby operation, it is the same as the procedure in "2.2.7 userApplication Edit.

1. Stop RMS on all nodes.

2. Start up RMS Wizard by executing "hvw -n <Configuration Name>" command on any node.

3. Select Application-Edit in the "Main configuration menu" screen.

4. Select userApplication name where resources are registered in the "Application selection menu" screen.

5. Select Oracle(-) in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

6. Select Additional*xxx* in the "Oracle (Ora_*xxx*:not yet consistent)" screen.

Example

```
Oracle (Ora_APP1:not yet consistent)
1) HELP                          6) AdditionalListener
2) -                             7) AdditionalRACInstance/Listener
3) SAVE+EXIT                     8) AdditionalOracleClusterware
4) REMOVE+EXIT                   9) StartPriority=Same
5) AdditionalInstance
Choose the setting to process:
```

- In the Standby Operation

  If you create and register an Oracle instance resource or an ASM instance resource, select AdditionalInstance here, and edit advanced settings of the resource according to the step "7" and "8" of "2.2.7.1 Oracle Resource Creation and Registration".

  If you create and register a Listener resource, select AdditionalListener here, and edit advanced settings of the resource according to the step "10" and "11" of "2.2.7.1 Oracle Resource Creation and Registration".

- In the Oracle RAC Scalable Operation

  If you create and register an Oracle Clusterware resource, select AdditionalOracleClusterware here, and edit advanced settings of the resource according to the step "3" - "5" of "2.3.4.2 Oracle Clusterware Resource Creation and Registration".

  If you create and register an Oracle RAC instance resource or a Listener resource, select AdditionalRACInstance/Listener here, and edit advanced settings of the resource according to the step "3" - "7" of "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration".

7. Select SAVE+EXIT in the "Oracle (Ora_*xxx*:consistent)" screen after completed.

8. Select SAVE+EXIT in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

9. Select RETURN in the "Application selection menu" screen.

10. Execute Configuration-Generate and Configuration-Activate in the "Main configuration menu" screen.

11. Select QUIT in the "Main configuration menu" screen and terminate RMS Wizard.

B.2   Change Resource Settings

This section explains how to change settings of an existing resource.

Example

To change "Interval" attribute of an existing Oracle instance resource(e.g. changes it from 30 to 60).

1. Stop RMS on all nodes.

2. Start up RMS Wizard by executing "hvw -n <Configuration Name>" command on any node.

3. Select Application-Edit in the "Main configuration menu" screen.

4. Select userApplication name including target resources in the "Application selection menu" screen.

5. Select Oracle(Ora_*xxx*) in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

6. Select the target resource name in the "Oracle (Ora_*xxx*:consistent)" screen.

💽 Example

··

   - In the Standby Operation

     If an Oracle instance resource, select OracleInstanceName[0]='*OracleSID*'.
     If a Listener resource, select OracleListenerName[0]=*LISTENER*.

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

     Select a registered OracleSID or a registered Listener name in the next screen.
     The following screen shot indicates the case of an Oracle instance.

```
Setting menu : OracleSID for Oracle instance
1) HELP                          4) FREECHOICE
2) RETURN                        5) SELECTED:'ora'
3) NONE
Choose an Instance Name for Oracle: 5
```

   - In the Oracle RAC Scalable Operation

     Select RACInstance/Listener[*n*]=<target resource name>.

```
Oracle (Ora_APP3:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) AdditionalRACInstance/Listener
6) AdditionalOracleClusterware
7) RACInstance/Listener[0]=ora.rac.rac1.inst
8) RACInstance/Listener[1]=ora.node1.LISTENER_NODE1.lsnr
Choose the setting to process:
```

     Select the registered CRS resource name in the next screen.
     The following screen shot indicates the case of an Oracle RAC instance.

```
Setting menu : Oracle RAC Instance/Listener resource
1) HELP                          4) FREECHOICE
2) RETURN                        5) SELECTED:ora.rac.rac1.inst
3) NONE
Choose an Oracle RAC Instance/Listener: 5
```

··

7. Change settings in the "Detail setting for *xxx*" screen.

   - In the Standby Operation : Oracle instance resource or ASM instance resource

     Change advanced settings of the resource according to the step "7" of "2.2.7.1 Oracle Resource Creation and Registration".

   - In the Standby Operation : Listener resource

     Change advanced settings of the resource according to the step "10" of "2.2.7.1 Oracle Resource Creation and Registration".

   - In the Oracle RAC Scalable Operation : Oracle Clusterware resource

     Change advanced settings of the resource according to the step "4" of "2.3.4.2 Oracle Clusterware Resource Creation and Registration".

- In the Oracle RAC Scalable Operation : Oracle RAC instance resource or Listener resource

Change advanced settings of the resource according to the step "6" of "2.3.4.3 Oracle RAC Instance and Listener Resource Creation and Registration".

8. Select SAVE+RETURN in the "Detail setting for *xxx*" screen after completed.

9. Repeat the step "6" and "7" if need to change resources else.

10. Select SAVE+EXIT in the "Oracle (Ora_*xxx*:consistent)" screen after completed.

11. Select SAVE+EXIT in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

12. Select RETURN in the "Application selection menu" screen.

13. Execute Configuration-Generate and Configuration-Activate in the "Main configuration menu" screen.

14. Select QUIT in the "Main configuration menu" screen and terminate RMS Wizard.

B.3　Resource Deletion

B.3.1　Respectively

This section explains how to delete an Oracle instance or a Listener resource from an existing userApplication that includes an Oracle resource already.

 Example
. . . .
To delete only a Listener resource from an existing userApplication including an Oracle instance resource and a Listener resource already in standby operation.
. . . .

1. Stop RMS on all nodes.

2. Start up RMS Wizard by executing "hvw -n <Configuration Name>" command on any node.

3. Select Application-Edit in the "Main configuration menu" screen.

4. Select userApplication name including target resources in the "Application selection menu" screen.

5. Select Oracle(Ora_*xxx*) in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

6. Select the target resource in the "Oracle (Ora_*xxx*:consistent)" screen, and select NONE in the next screen.

📖 Example

┈┈┈

- Oracle instance resource deletion in standby operation

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

```
Setting menu : OracleSID for Oracle instance
1) HELP                              4) FREECHOICE
2) RETURN                            5) SELECTED:'ora'
3) NONE
Choose an Instance Name for Oracle: 3
```

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

- Listener resource deletion in Oracle RAC scalable operation

```
Oracle (Ora_APP3:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) AdditionalRACInstance/Listener
6) AdditionalOracleClusterware
7) RACInstance/Listener[0]=ora.rac.rac1.inst
8) RACInstance/Listener[1]=ora.node1.LISTENER_NODE1.lsnr
Choose the setting to process: 8
```

```
Setting menu : Oracle RAC Instance/Listener resource
1) HELP                              4) FREECHOICE
2) RETURN                            5) SELECTED:ora.node1.LISTENER_NODE1.lsnr
3) NONE
Choose an Oracle RAC Instance/Listener: 3
```

```
Oracle (Ora_APP3:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) AdditionalRACInstance/Listener
6) AdditionalOracleClusterware
7) RACInstance/Listener[0]=ora.rac.rac1.inst
Choose the setting to process:
```

┈┈┈

7. Repeat the step "6" if need to delete resources else.

8. Select SAVE+EXIT in the "Oracle (Ora_xxx:consistent)" screen after completed.

9. Select SAVE+EXIT in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

10. Select RETURN in the "Application selection menu" screen.

11. Execute Configuration-Generate and Configuration-Activate in the "Main configuration menu" screen.

12. Select QUIT in the "Main configuration menu" screen and terminate RMS Wizard.

B.3.2 In a Group

This section explains how to delete an Oracle resource and a Listener resource in a group from an existing userApplication including them already.

📝 Example
. . . .
To delete an Oracle resource and a Listener resources in a group from an existing userApplication including them already in standby operation.
. . . .

1. Stop RMS on all nodes.

2. Start up RMS Wizard by executing "hvw -n <Configuration Name>" command on any node.

3. Select Application-Edit in the "Main configuration menu" screen.

4. Select userApplication name including target resources in the "Application selection menu" screen.

5. Select Oracle(Ora_*xxx*) to be deleted in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

6. Select REMOVE+EXIT in the "Oracle (Ora_*xxx*:consistent)" screen, and reply "yes" for the reply message.

7. Select SAVE+EXIT in the "Settings of turnkey wizard "WIZSTANDBY"" screen.

8. Select RETURN in the "Application selection menu" screen.

9. Execute Configuration-Generate and Configuration-Activate in the "Main configuration menu" screen.

10. Select QUIT in the "Main configuration menu" screen and terminate RMS Wizard.

Appendix C (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's 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 statements while the corrective action is Np, the Rs processing will be performed.

- Message

   Message indicates text of the error code.

📖 Information

The errno that are not defined in the Action Definition File will be handled as Np.