PRIMECLUSTER™ Wizard for Oracle Configuration and Administration Guide 4.1

for Solaris™ Operating Environment

Edition April 2003

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 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 1 appendix:

- Chapter 1 Feature
- Chapter 2 Environment setup
- Chapter 3 Operation
- Chapter 4 Command
- Chapter 5 Notice
- Chapter 6 Message
- Appendix A

Notational convention

The document conforms to the following notational conventions:

- 

Describes points to be taken notice of.

- 

Describes information a user can refer to.

- 

Describes by using an example.

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Requests

Contents

Chapter 1 Feature

1.1 Feature outline

PRIMECLUSTER Wizard for Oracle is a software product that facilitates cluster operation management for Oracle operating on a PRIMECLUSTER system.
This is required for scalable operation and standby operation for a cold standby Oracle instance. The scalable operation requires Oracle9i Real Application Clusters (Oracle9i RAC). The standby operation does not require Oracle9i RAC, but requires Oracle cold standby instead.

Module structure

For Oracle operation on PRIMECLUSTER, the module consists of the followings:

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

Environment setup

The environment setup tool provides “ORACLE” Wizard that creates userApplication in the environment configuration of PRIMECLUSTER RMS.

Monitoring

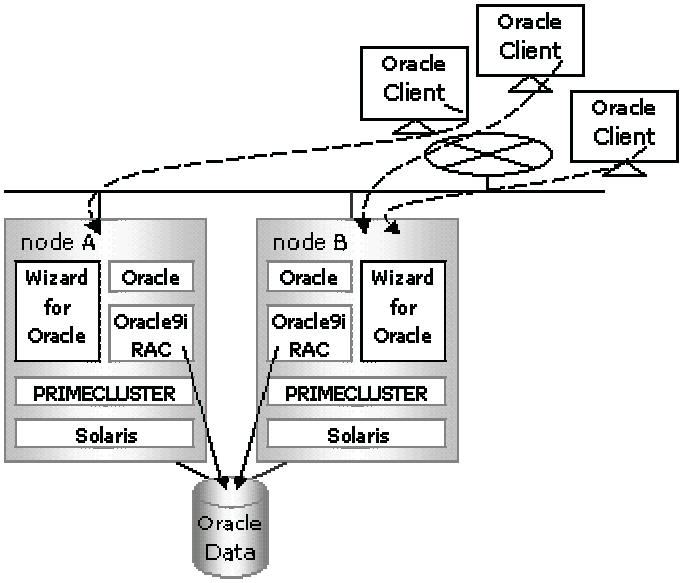
A detector monitors Oracle instances and Oracle listeners. The detector is connected to Oracle using system user to monitor the Oracle instance. Then, it periodically creates, updates, and deletes dummy table, which is created in the system user’s default tablespace by executing the SQL command. This enables the detector to detect a logical failure as well as the process state of the Oracle instance. When the Oracle instance hangs, and if the SQL command is not returned within a specified time, the detector times out to notify a user of the failure. The two types of monitoring of the Oracle listener are process detection and the “tnsping” command.

Startup and stop control

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

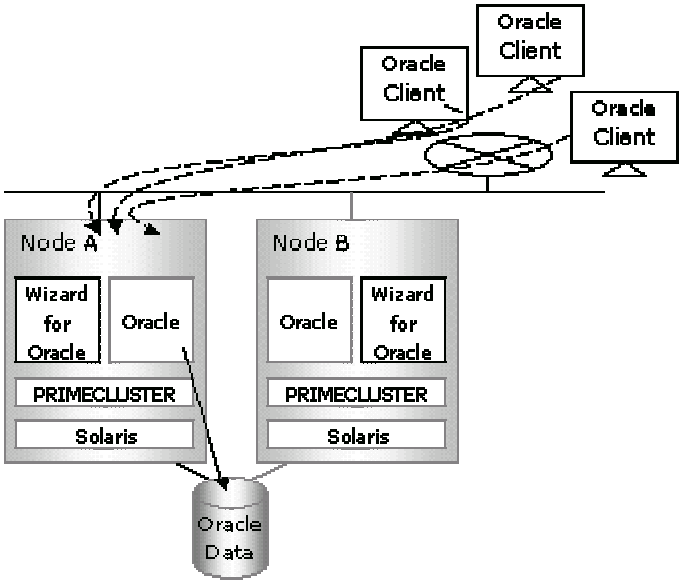
1.2 Operating Environment

Scalable operation



In scalable operation with Oracle9i RAC, Oracle is operated on all nodes. Regardless of which node a client is connected to, the client is able to use the database.

Standby operation



In standby operation, a cluster system consists of an operational node and standby nodes. On the operational node, Oracle applications, a logical IP address and shared disks are active. On the standby nodes, these resources are inactive. In the event of a failure, business operation is switched to one of the standby nodes, and the resources in this standby node are activated. Then, the client can be connected to the running node using the logical IP address without modifying any settings.

Chapter 2 Environment setup

2.1 Set up environment

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

Scalable operation (Oracle9i RAC)

No	Outline	
	One arbitrary node	Other nodes
1	Install and set up PRIMECLUSTER	Install and set up PRIMECLUSTER
2	Install PRIMECLUSTER Wizard for Oracle	Install PRIMECLUSTER Wizard for Oracle
3	Install and set up Oracle software	Install and set up 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	

Standby operation

No	Outline	
	Operational node	Standby nodes
1	Install and set up PRIMECLUSTER	Install and set up PRIMECLUSTER
2	Install PRIMECLUSTER Wizard for Oracle	Install PRIMECLUSTER Wizard for Oracle
3	Install and set up Oracle software	Install and set up 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	

Further details of each step are described below.

2.2 Install and set up PRIMECLUSTER software

This section explains how to install and set up PRIMECLUSTER.

Set up hardware

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

Install software

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

Scalable operation requires PRIMECLUSTER Enterprise Edition.
Standby operation requires PRIMECLUSTER Enterprise Edition or PRIMECLUSTER HA Server.

Set up cluster system

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

2.3 Install and set up Oracle software

This section explains how to install and set up Oracle.

Initial setup

- /etc/system

  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 nodes.


Note

Before installing Oracle, you need to change the “/etc/system” file and reboot the node.


Example The setup examples are shown below:

```
set shmsys:shminfo_shmmax=4294967295
set shmsys:shminfo_shmmin=1
set shmsys:shminfo_shmmni=100
set shmsys:shminfo_shmseg=10
set semsys:seminfo_semmni=100
set semsys:seminfo_semmsl=200
set semsys:seminfo_semmns=400
set semsys:seminfo_semopm=100
set semsys:seminfo_semvmx=32767
```

- /etc/services

  Set up a port number for the Oracle listener.


Example

```
listener    1521/tcp    oracle
```

- Oracle User

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


Example

```
# groupadd –g <group ID> dba
# useradd –u <user ID> –g dba –d /export/home/oracle –s /bin/sh –m oracle
# passwd oracle
```

Normally, the group name should be “dba”.

Set up environment variables of Oracle user.

Example （.profile ）

```
ORACLE_BASE=/opt/oracle; export ORACLE_BASE
ORACLE_HOME=/opt/oracle/product/8.1.7; export ORACLE_HOME
ORACLE_TERM=sun-cmd; export ORACLE_TERM
ORA_NLS33=$ORACLE_HOME/ocommon/nls/admin/data; export ORA_NLS33
LD_LIBRARY_PATH=$ORACLE_HOME/lib; export LD_LIBRARY_PATH
PATH=$ORACLE_HOME/bin:/usr/bin:/usr/ccs/bin:/usr/ucb; export PATH
```

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

Information

For further details, refer to the Oracle manual.

Installation

- Oracle

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

- Oracle9i RAC

  Install Oracle9i RAC using root user. Refer to the Oracle9i RAC manual.

Information

For further details, refer to the Oracle manual.

2.4 Create userApplication

This section explains how to set up userApplication creation and Non-Oracle resource setup. Set up the Oracle resource after configuring the database. Then, set up userApplication using “userApplication Configuration Wizard”. This “userApplication Configuration Wizard” follows the Wizard format in which you can select the item from the menu and click a “Next” button.

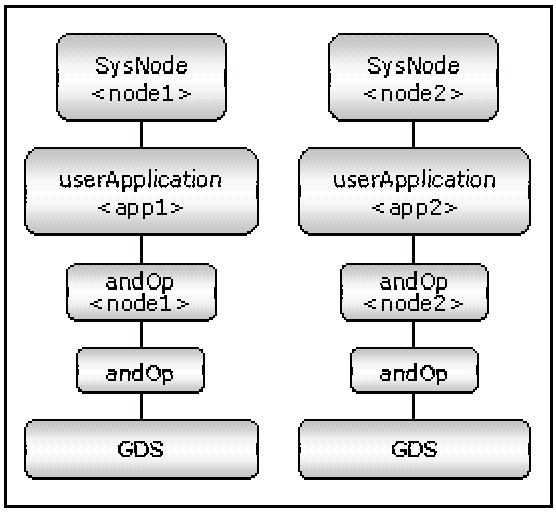
Information

See “Chapter 6 Cluster application configuration” of “PRIMECLUSTER Installation/Administration Guide” for the userApplication Configuration Wizard setup.

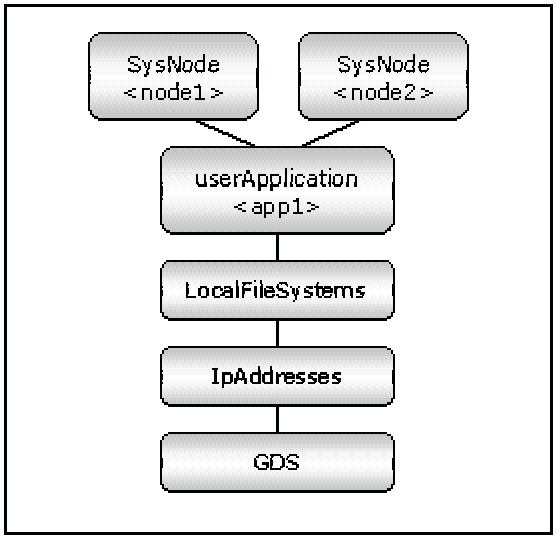
2.4.1 Application-Create

The Oracle environment setup is described with the following illustrations:

- Scalable operation (Oracle9i RAC)
  userApplication is configured as shown in the illustration.



- Standby operation
  userApplication is configured as shown in the illustration.



GDS setup

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

userApplication setup

Create userApplication using userApplication Configuration Wizard. See “Chapter 6 Cluster application configuration” of “PRIMECLUSTER Installation/Administration Guide”. In scalable operation, userApplication should be created for each node. In standby operation, one userApplication should be created for all operational nodes. The recommended values are as follows:

- Scalable operation (Oracle9i RAC)
  Operation=Standby
  AutoSwitchOver = no
  PersistentFault = 1
  HaltFlag=Yes
  Additional resources =Gds resource

- Standby operation
  Operation =Standby
  AutoSwitchOver = HostFailure|ResourceFailure|ShutDown
  PersistentFault = 1
  HaltFlag=Yes
  Additional resources = Gds resource, Fsystem resource, Network resource

2.4.2 Check userApplication

Execute the “hvcm” command of RMS to start up userApplication and check if it is normally running on all nodes.

- Shared disk – Check access to the shared disk on an operational node.
- Logical IP address – Check access to an operational node.

2.5 Create and set up Oracle database

- Allocate database

  Create a database on the shared disk. The shared disk should be active.
  Each file is allocated as follows:

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

- Create database (Scalable operation with Oracle9i RAC)

  Create a database on an arbitrary node. This database should be accessible from other nodes.

Information

Refer to the Oracle9i RAC manual.

- Create database (Standby operation)

  Operational node

  Create a database on an operational node. Standby nodes have to access this database.

Information

Refer to the Oracle manual.

Standby node

Set up directory generation, file copy, and link. The configuration should be the same as that of the operational node where the database is generated.
Under $ORACLE_HOME/dbs
Under $ORACLE_BASE/admin/$ORACLE_SID

The access privilege to the generated directory and file should be the same as that of the operational node.

Set up an output location on the standby nodes if you use archive log operation.

Information

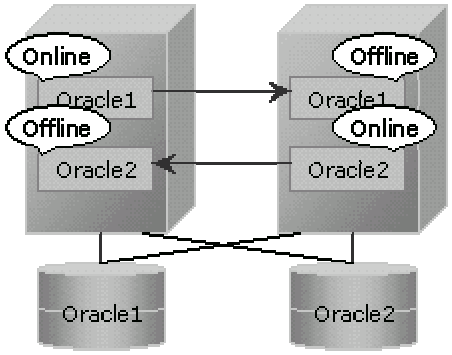
The required files in the operational node can be backed up in a tar format by executing the “cloracpy” command. Refer to “Chapter 4.4”.

Mutual standby / N:1 Standby operation

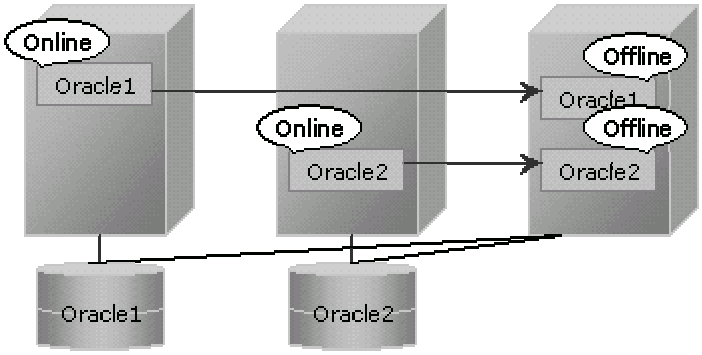
Create a database on an operational node.

On the standby nodes, the database on the shared disk created from the operational node should be enabled. This is the same as other operation methods.

Example Mutual standby



Example 2:1 Standby



- Oracle9i

  Allocate a server parameter file on the shared disk when using the Oracle9i server parameter file. If this process is omitted or failed, the operational and standby nodes do not work properly.

  Example

  You can set the initialized parameter file as follows:
  ($ORACLE_HOME/dbs/init<ORACLE_SID>.ora

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

- Network setup

  Set up the Oracle network.

  $ORACLE_HOME/network/admin/listener.ora, tnsnames.ora

  — listener.ora

  Set up a logical IP address for a listener IP address to switch listeners.

  Example

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

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

— tnsnames.ora

Set up the “tnsnames.ora” file to monitor listener operation by executing the “tnsping” command. Also, set up a network service name in the ”tnsnames.ora” file and in the Oracle listener environment of Oracle Wizard. The ORACLE_SID, a host (logical IP address) and a port number, which are all set up in this file, should be the same as those of the listener of the ”listener.ora” file.


Example

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

● Check Oracle operation

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

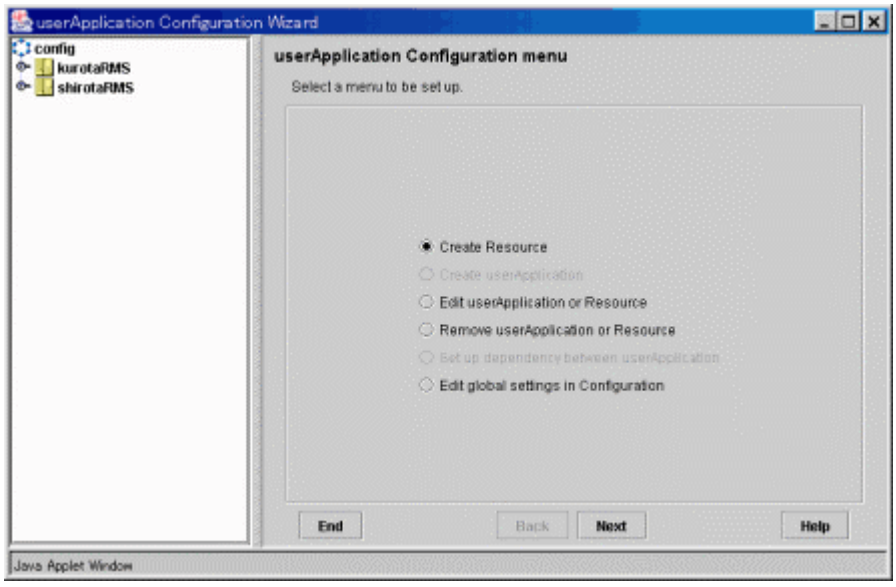
2. 6 Create and set up Oracle resource

This section explains how to register the Oracle-related resource in userApplication.

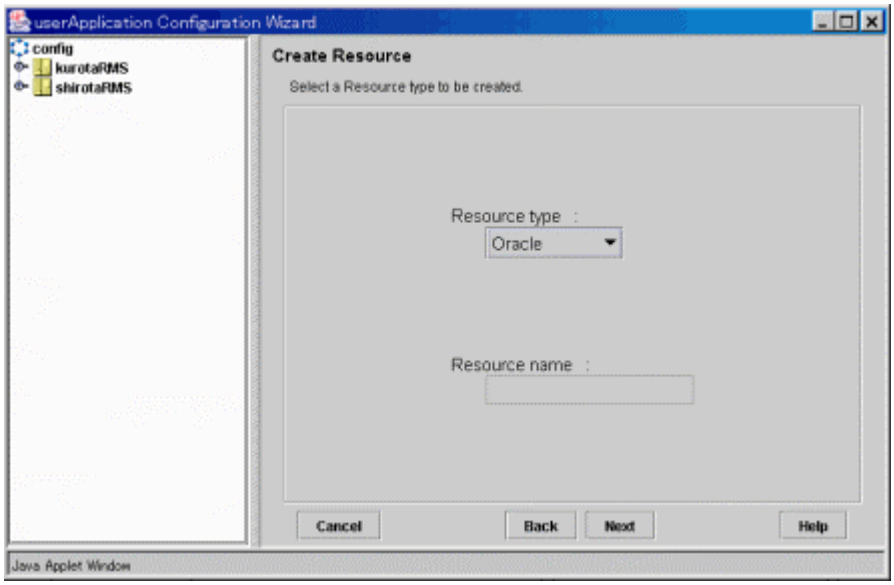
2. 6. 1 Create Oracle resource

This section explains how to create the Oracle resource using userApplication Configuration Wizard.

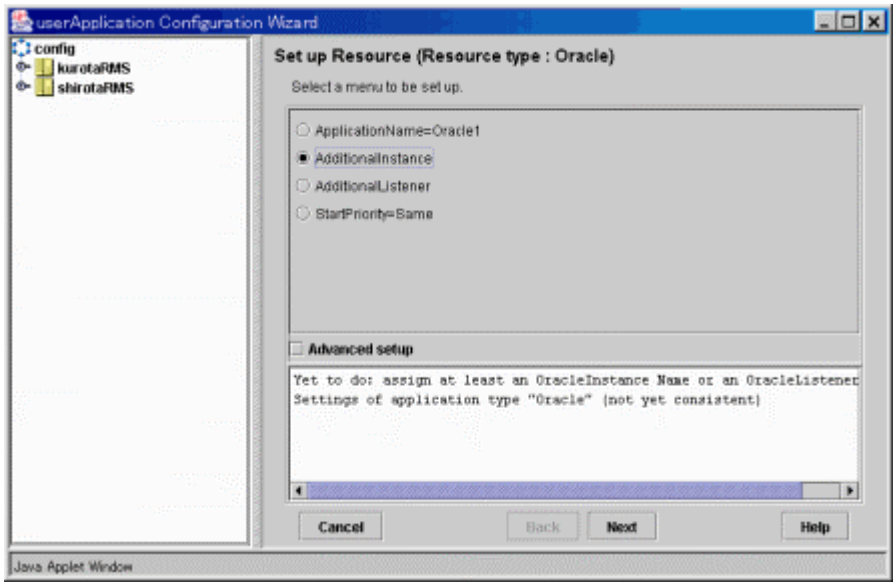
1. Select “Create ResourceResource” in the “userApplication Configuration” menu.



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



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

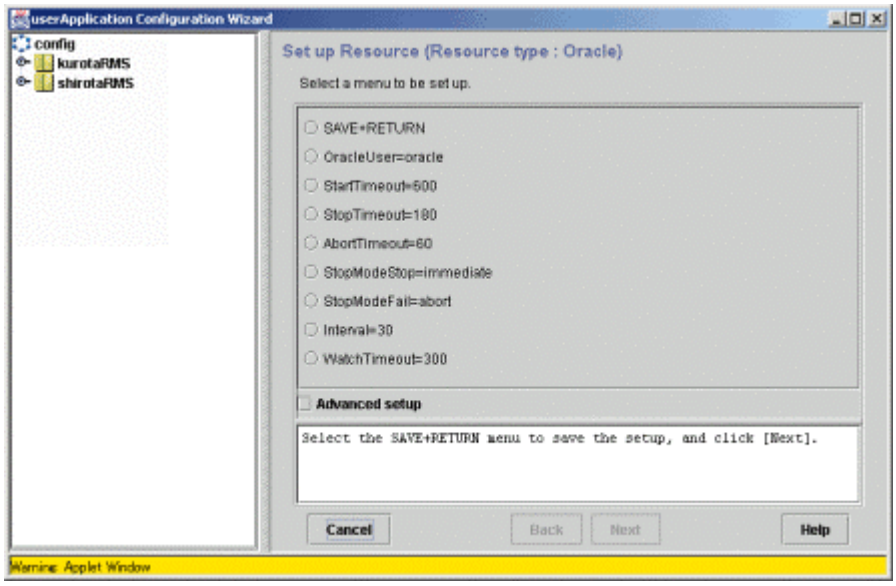


ApplilcationName Change the application name.
AdditionalInstance Add the Oracle instance resource.
AdditionalListener Add the Oracle listener resource.
StartPriority Set up a startup order of the Oracle instance and Oracle listener.

Example

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

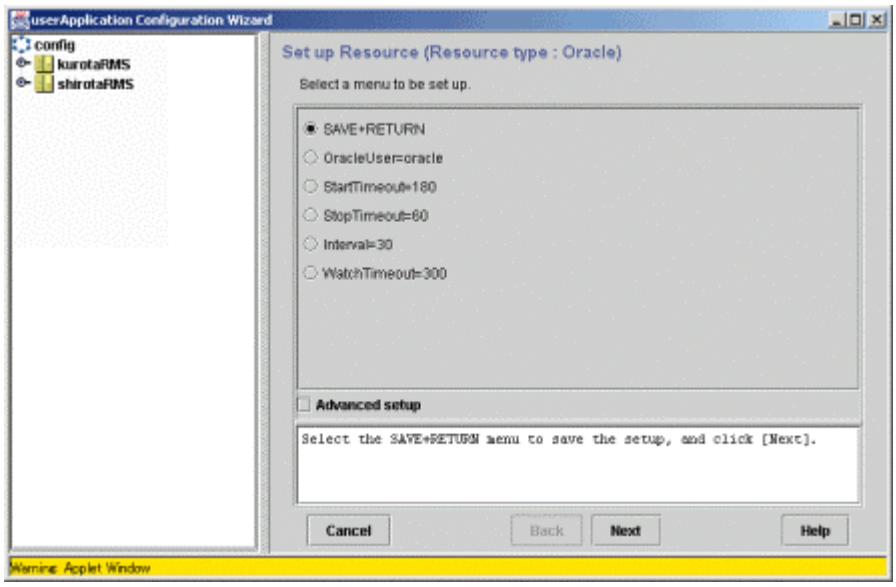
4. Set up the Oracle instance as follows:



OracleSID
ORACLE_SID
OracleUser
Oracle Installation user
StartTimeout
Timeout duration of Oracle startup. Default: 600s (300s - 86400s)

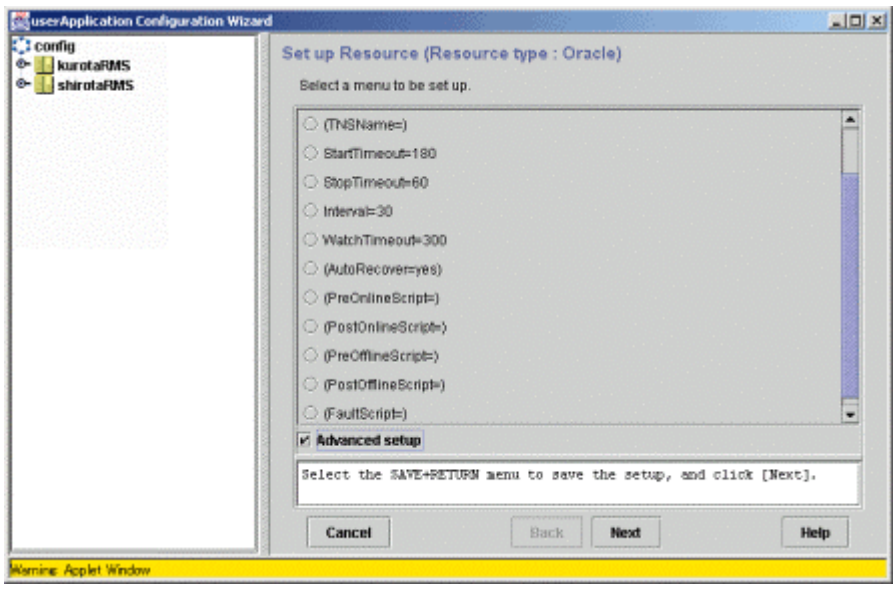
StopTimeout
Timeout duration of Oracle stop. Default: 180s (60s - 86400s)
AbortTimeout
Timeout duration of forced termination in the event of an Oracle stop error.
Default: 60s (60s - 86400s)
StopModeStop
Oracle stop mode in normal time.
Default: Immediate mode (abort, immediate, transactional)
StopModeFail
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)

5. Set up the Oracle listener as follows:



ListenerName
Listener name
OracleUser
Oracle installation user
StartTimeout
Timeout duration of Oracle startup Default: 180s (120s - 86400s)
StopTimeout
Timeout duration of 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)

6. Advanced setup



TNSName

Network service name used to monitor the Oracle listener

Note: The “tnsping” command is used to monitor the Oracle listener if TNSName is set. This TNSName is set in tnsnames.ora. When TNSName is omitted, the feature to monitor only the listener process is enabled (arbitrary).

AutoRecover

Feature to recover resources.

Note: Select yes to enable this feature. RMS attempts to recover the failed resources to prevent userApplication from switching to other host.

PreOnlineScript

Executed before Online processing No default

PostOnlineScript

Executed after Online processing No default

PreOfflineScript

Executed before Offline processing No default

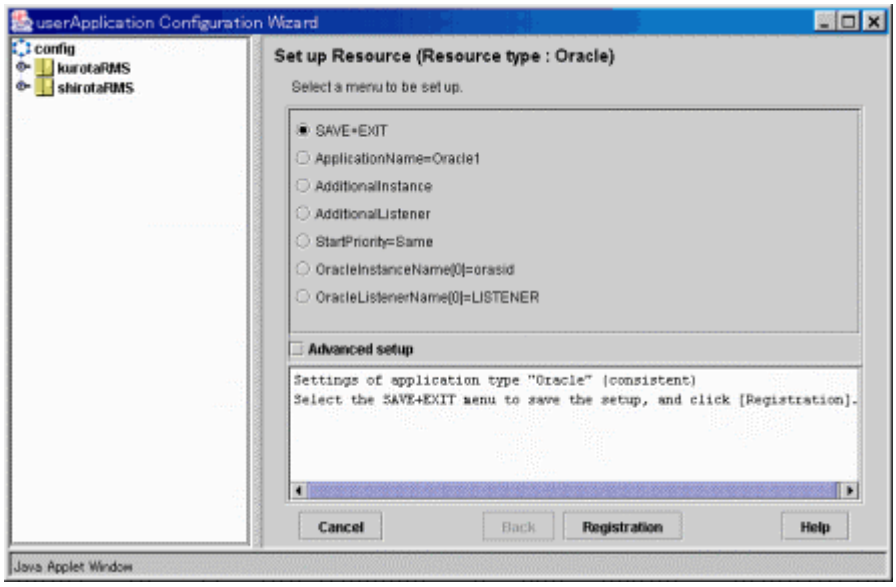
PostOfflineScript

Executed after Offline processing No default

FaultScript

Executed when a fault occurs No default

7. Save by selecting SAVE+EXIT.

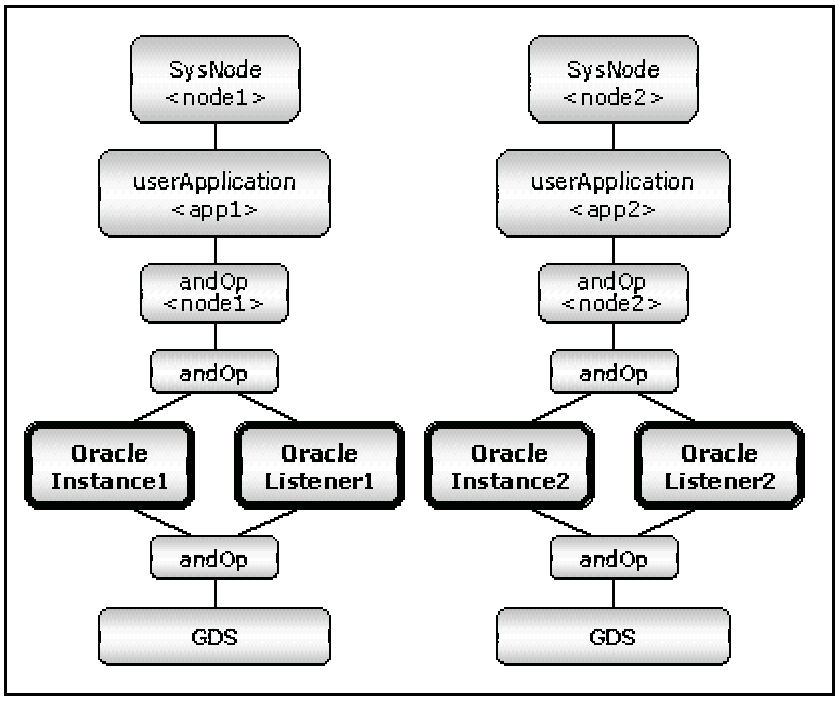


When using Oracle9i RAC, follow the setup procedure from 1. to 6. for the number of other userApplication.

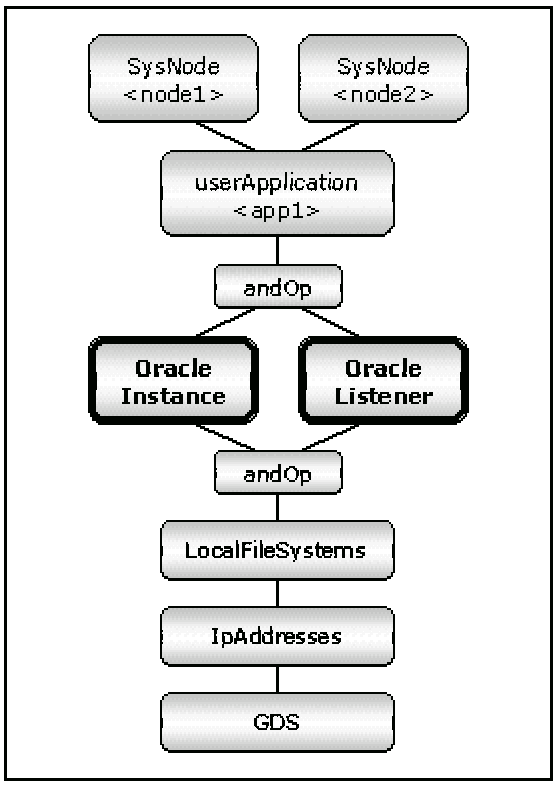
2.6.2 Set up userApplication

This section explains how to create the userApplication and Oracle resource, referring to “8.1.1 Modify cluster application configuration” of “PRIMECLUSTER Installation/Administration Guide”.

In scalable operation, userApplication is configured as follows:



In standby operation, userApplication is configured as follows:



2.6.3 Check userApplication

Execute the “hvcm” command of RMS to start up userApplication and check if it is normally running on all nodes.

Information

See “PRIMECLUSTER RMS Configuration and Administration” for the RMS command.

Chapter 3 Operation

3.1 Set up Oracle-related script

Script files on a PRIMECLUSTER system control each resource startup and stop. Script files in PRIMECLUSTER Wizard also start and stop of the Oracle instance and Oracle listener. Along with this Oracle startup and stop, the scripts can execute user programs and batch process.

PreOnlineScript
Executed before Online processing

PostOnlineScript
Executed after Online processing

PreOfflineScript
Executed before Offline processing

PostOfflineScript
Executed after Offline processing

FaultScript
Executed when a fault occurs

Notice

- System administrator access privileges are used for execution.
- The exit code 0 indicates normal termination. The value other than 0 indicates abnormal termination or switching process failure.
- The script is abnormally terminated when the execution time exceeds the given timeout. This also causes a failure during switchover process.
- Each script has the environment variable defined in RMS.

See “PRIMECLUSTER RMS Configuration and Administration” for further details.

3.2 Oracle stop during cluster operation

PRIMECLUSTER Wizard for Oracle monitors an Oracle system while PRIMECLUSTER is running. If the Oracle system is stopped, this PRIMECLUSTER Wizard considers it as a failure. Then, the Oracle system is restarted or switched over to a standby node. If maintenance work such as Oracle cold backup is required, discontinue to monitor Oracle executing the following command:

- When discontinuing
  /opt/FJSVclora/sbin/hvoradisable *application_name resource_name*

- When restarting
  /opt/FJSVclora/sbin/hvoraenable *application_name resource_name*

These commands are executed for the Oracle instance and listener resource on the node where maintenance work is required.

See “Chapter 4 Command”.

Restart monitoring

When the Oracle instance and/or listener is stopped, and monitoring is discontinued, restart the Oracle instance and/or listener before monitoring is restarted.

State transition during maintenance

When the Oracle system is not monitored, the state transition does not occur even in the event of an Oracle failure. However, the state transition might occur because of other glitches like disk failures.

userApplication during maintenance

When the “hvoradisable” command properly stops monitoring the resource, this brings the resource Warning on Web-Based Admin View.

3.3 Action definition file

The instance-monitoring detector of Oracle Wizard determines what corrective action should be taken from an error code. The action definition file consists of Oracle error numbers, corrective actions, and error messages.

- Action definition file name and path

```
/etc/opt/FJSVclora/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 an Oracle error number (ORA-xxxxx).

— Status
Indicates the detector state
Cn : When connecting to the Oracle instance.
Ol : Under connection to the Oracle instance.
Dc : When disconnecting to the Oracle instance.
All : Any status of above.

— Action
Indicates detector's operation.
Np : Ignores any detected errors.
Of : Notifies Offline.
Wa : Notifies Warning.
Rs : Restarts detector.
Fa : Notifies Faulted.
When an error is detected by executing the "UPDATE" command of SQL, and if NP is shown as a corrective action, the subsequent process has to be discontinued. Take the Rs process.

— Message
Indicates text of an error code.

3.4 Solution at the time of switchover

Oracle logging

When switchover or degeneration occurs, solve the problem referring to Oracle alert logging or trace logging in the same way as the solution in single Oracle operation.

PRIMECLUSTER Wizard for Oracle logging

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 log file formats are as follows:

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

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

There is no restriction of space or memory for log files. RMS manages the log files.

The following trace logs are output as information for troubleshooting.

```
/var/opt/FJSVclora/FJSVclora_<OracleSID>_*.trclog
/var/opt/FJSVclora/FJSVclora_<ListenerName>_*.trclog
```

The log files and the trace files are important for troubleshooting. Do not delete or edit these files.

3.5 Collect information for troubleshooting

The following information is helpful in the event of a failure.

Oracle information

- Setup file

  $ORACLE_HOME/network/admin/*.ora
  $ORACLE_HOME/dbs/*.ora
  $ORACLE_BASE/admin/$ORACLE_SID/pfile/*.ora

- Logging file

  $ORACLE_HOME/rdbms/log/alert_$ORACLE_SID.log
  $ORACLE_BASE/admin/$ORACLE_SID/bdump/alert_$ORACLE_SID.log
  $ORACLE_HOME/network/log/<ListenerName>.log

PRIMECLUSTER information

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

PRIMECLUSTER Wizard for Oracle information

- Setup file

  /opt/FJSVclora/etc/*
  /usr/opt/reliant/etc/hvgdconfig
  /usr/opt/reliant/build/wizard.d/<configuration name>.usfiles/*

- Log file

  /var/opt/reliant/log/*
  /var/opt/FJSVclora/*

Chapter 4 Command

4.1 hvoradisable - Discontinue monitoring resource

User

Super user

Format

/opt/FJSVclora/sbin/hvoradisable *application_name resource_name*

Function

It is a feature to discontinue monitoring the specified Oracle instance or Oracle listener resource. This function is used to stop the Oracle instance or Oracle listener for maintenance. It is disenabled while userApplication is stopped. It is enabled when userApplication is activated next time. Then, the resource goes into the Warning state without starting the Oracle instance or Oracle listener.

If the “/opt/FJSVclora/sbin/hvoradisable “ command is executed while userApplication is running, this disenables the feature to monitor the Oracle system immediately, and the resource state goes into the Warning state. You need to confirm if the resource state is Warning, and then stop the Oracle instance or Oracle listener.
Even though the Oracle instance or Oracle listener is stopped, the resource remains Warning.
Along with userApplication stop, this feature is automatically cancelled.

Parameter

application_name
It specifies the userApplication name including the resource that is discontinued monitoring.

resource_name
It specifies the resource name of the Oracle instance or listener resource that is discontinued monitoring.

Exit status

0 : Normal termination
Other than 0 : Abnormal termination

4.2 hvoraenable - Restart monitoring resource

User

Super user

Format

/opt/FJSVclora/sbin/hvoraenable *application_name resource_name*

Function

It is a feature to restart monitoring the Oracle instance or Oracle resource.
This function is disenabled while userApplication is stopped. It is enabled when userApplication is activated next time. Execute the “hvoraenable” command while the Oracle instance or Oracle listener is running.
Confirm if the resource state is changed from Warning to Online.

Parameter

application_name
It specifies the userApplication name including the resource that is discontinued monitoring.

resource_name
It specifies the resource name of the Oracle instance or listener that is restarted monitoring.

Exit status

0 : Normal termination
Other than 0 : Abnormal termination

4.3 clorapass - Set up password for monitoring

User

Super user

Format

/opt/FJSVclora/sbin/clorapass

Function

It is a feature to specify a password of Oracle system user in PRIMECLUSTER Wizard for Oracle by executing the “clorapass” command. The detector monitoring the Oracle instance is connected to Oracle using system user. For that purpose, this detector requires the password of Oracle system user. If the password is not set up in this Wizard for Oracle, the detector uses “manager” as a system user password.

Parameter

None.

Exit status

0 : Normal termination
Other than 0 : Abnormal termination

4.4 cloracpy - Oracle environment setup tool for standby node

User

Oracle DBA user

Format

/opt/FJSVclora/sbin/cloracpy

Function

The required files in the operational node can be backed up in a tar format by executing the “cloracpy” command. By deploying this backup data on the standby nodes, the file copy and link settings are enabled.

Execute the “cloracpy” command
・$ORACLE_HOME and $ORACLE_BASE should be identical between the operational node and the standby nodes.
・Oracle configuration should be the same between the operational node and the standby nodes.
・Database should be created and set up on the operational node.
・The command should be executed using Oracle user.
・$ORACLE_BASE, $ORACLE_HOME, and $ORACLE_SID should be set in the Oracle user environment variables.

The following backup files are stored in the tar file by executing the “cloracpy” command:
・All resources under $ORACLE_HOME/dbs/
・All resources under $ORACLE_BASE/admin/$ORACLE_SID/
・$ORACLE_HOME/network/admin/*.ora

These files should be contained in the “/tmp/oracle.$ORACLE_SID.tar” file. Copy this file to the standby nodes. Then, the files in the operational node are deployed on the standby nodes by executing the “tar xvf /tmp/oracle.$ORACLE_SID.tar” command. This command stores the files in the tar file, and deploys by full path. The command should not be executed if the $ORACLE_BASE or $ORACLE_HOME setup differs between the operational node and the standby nodes. Also, if the operational method is different between the operational node and the standby nodes, this command is not enabled. The file that has a name same as other file will be overridden.

Parameter

None.

Exit status

0 : Normal termination
Other than 0 : Abnormal termination

4.5 clgetoralog - Collect Oracle information for troubleshooting

User

Super user

Format

/opt/FJSVclora/bin/clgetoralog *[-n configure_name]* *[-d output_directory]*

Function

It is a feature to collect Oracle information for troubleshooting. The “clgetoralog” command collects Oracle information and log files on a PRIMECLUSTER system.

The “clgetoralog” command collects

- $ORACLE_HOME/dbs/*.log
- $ORACLE_HOME/rdbms/log/
- $ORACLE_HOME/../../admin/$ORACLE_SID/pfile/*.ora
- $ORACLE_HOME/../../admin/$ORACLE_SID/bdump/*.log
- $ORACLE_HOME/network/admin/*.ora
- $ORACLE_HOME/network/log/*.log

If –n option is specified, the “clgetoralog” command collects configuration information of PRIMECLUSTER Wizard for Oracle and log files.

Parameter

[-n configure_name]

It specifies the RMS definition name including the PRIMECLUSTER Wizard for Oracle information that you need in addition to Oracle information. Without this option, the “clgetoralog” command collects Oracle information using current active RMS definition name.

[-d output_directory]

It specifies the directory where collected Oracle information is stored. Without this option, collected Oracle information is stored in the following directory.
/opt/FJSVclora/bin/snap

Exit status

0 : Normal termination
Other than 0 : Abnormal termination

Chapter 5 Notice

This section explains the points you need to pay close attention to.

- The Oracle database needs to be allocated to the shared disk.

- PRIMECLUSTER operated with Oracle products of different versions is not supported. For the supported Oracle products, refer to the installation guide or handbook.

- A user name, user ID, group name, and group ID should be identical on all nodes to install Oracle.

- A different user name should be assigned respectively to create multiple ORACLE_HOME in one server.

- To monitor the Oracle instance, the detector is connected to the database by using system user. The detector also checks Oracle operation by using the system user's default tablespace.

- The Oracle instance fails to stop in the "immediate" mode in the following situations:

  1. DBA user is connected to the Oracle instance, or
  2. The Oracle instance backup is in progress

- If the Oracle instance is stopped in the "abort" mode, automatic recovery runs when the Oracle instance is restarted next time.

- The Oracle resource needs to be allocated to the shared disk as prerequisite. The Oracle archive log files might be stored on the local disks. In such a case, if recovery is required, the files from all nodes should be put together on the node where Oracle is recovered.

- Startup and stop time of the Oracle instance varies depending on the database size. The default timeout duration of the Oracle instance startup is 10 minutes. The default timeout duration of the Oracle instance stop is 5 minutes.

- Be aware of the exit code and timeout duration when the following scripts are set up: PreOnlineScript, PostOnlineScript, PreOfflineScript, PostOfflineScript, FaultScript

- When a database failure is detected during Oracle instance startup, recovery operation is automatically run. This is not applicable to Oracle9iRAC. If recovery is required, the file names in the "/opt/FJSVclora/usr" directory should be replaced as follows:

  mount10EndBackup.sh <--> _mount10EndBackup.sh
  mount20MediaRecover.sh <--> _mount20MediaRecover.sh

Chapter 6 Message

This section lists console messages that are output while PRIMECLUSTER Wizard for Oracle is running. The messages are indicated in the “syslog(3C)” format.

Oracle instance detector messages

- [Error] [1202] Cannot map shared memory or get semaphore
  Cannot map shared memory or get semaphore. Check the system environment..
- [Error] [1203] Cannot open actionlist
  Cannot open the action definition file. Check this file.
- [Error] [1204] Corrupted actionlist: Invalid errno, line=xx
  There is an incorrect setup in the action definition file. Check errno of the message line number xx.
- [Error] [1205] Corrupted actionlist: Invalid status, line=xx
  There is an incorrect setup in the action definition file. Check status of the message line number xx.
- [Error] [1206] Corrupted actionlist: Invalid action, line=xx
  There is an incorrect setup in the action definition file. Check action of the message line number xx.
- [Error] [1207] Cannot receive watched status
  Cannot receive the monitored status. Contact your system administrator.
- [Error] [1208] <Oracle process> process error
  An Oracle process error was detected.
- [Error] [1209] Cannot send Oracle status (Online)
  Online notification failed. Contact your system administrator.
- [Error] [1210] Cannot send Oracle status (Offline)
  Offline notification failed. Contact your system administrator.
- [Error] [1211] Cannot send Oracle status (Warning)
  Warning notification failed. Contact your system administrator.
- [Error] [1212] Cannot send Oracle status (Faulted)
  Fault notification failed. Contact your system administrator.
- [Error] [1213] Action error detected: Offline
  Offline was detected.
- [Error] [1214] Action error detected: Faulted
  Faulted was detected.
- [Error] [1215] Action error detected: Restart
  Restarts the detector.
- [Error] [1216] Cannot get watching phase.
  Cannot receive the monitoring state. Contact your system administrator.
- [Error] [1217] Cannot get detector status.
  Cannot receive the detector status. Contact your system administrator.

- [Error] [1219] Cannot read hvgdconfig
  Cannot read the “hvgdconfig” file. Check this file.
- [Error] [1220] Not Found xx setting in hvgdconfig
  There is an incorrect setup of resource xx in “hvgdconfig” file. Check this file.
- [Error] [1223] Not found ORACLE_SID in hvgdconfig
  ORACLE_SID is not found in the “hvgdconfig“ file. Check this file.
- [Error] [1299] ORA-xxxxx
  An Oracle error was detected. Check Oracle and Oracle Alertlog files.
- [Warn] [1302] Action error detected: Warning
  Warning was detected. Check Oracle and Oracle Alertlog files.

Oracle listener detector messages

- [Error] [2202] Cannot map shared memory or get semaphore
  Failed to acquire shared memory or semaphoe. Check the system environment..
- [Error] [2203] Cannot get ORACLE_HOME
  Failed to acquire ORACLE_HOME. Check “ORACLE_HOME” environment variable.
- [Error] [2204] Cannot read hvgdconfig
  Cannot read the “hvgdconfig” file. Check this file.
- [Error] [2205] Not Found xx setting in hvgdconfig
  There is an incorrect setup of resource xx in “hvgdconfig” file. Check this file.
- [Error] [2206] Not Found Listener in hvgdconfig
  The listener setup failed in the “hvgdconfig” file. Check this file.
- [Error] [2207] Cannot send Listener status (Online)
  Online notification failed. Contact your system administrator.
- [Error] [2208] Cannot send Listener status (Offline)
  Offline notification failed. Contact your system administrator.
- [Error] [2209] The system error occurred (fork error)
  The system error occurred in the process generation. Check the system environment..
- [Error] [2210] Tnsping detected the error (xx)
  There was an error in “tnsping”.
- [Error] [2211] The listener name is invalid
  The Oracle listener name is incorrect.
- [Error] [2212] The system error occurred (process open error)
  The system error occurred in the process open. Check the system environment..
- [Error] [2214] The process of the listener does not exist
  An Oracle listener process failure was detected.
- [Error] [2216] Cannot receive watch message
  Cannot receive the monitored message. Contact your system administrator.
- [Error] [2217] Cannot get watching phase
  Cannot get the watching message. Contact your system administrator.
- [Error] [2218] Cannot get detector status
  Cannot receive the detector status. Contact your system administrator.

Common messages

- [Info] [0101] Fault Watching is disable
  Monitoring resource was discontinued. To restart monitoring, execute "hvoraenable".
- [Info] [0102] Fault Watching is enable
  Monitoring resource was restarted.
- [Error] [0202] hvgdconfig <Interval> Error
  There is an incorrect setup "Interval" in the hvgdconfig. Check this file.
- [Error] [0203] hvgdconfig <Timeout> Error

There is an incorrect setup "Timeout" in the hvgdconfig. Check this file.

- [Error] [0207] Cannot allocate memory hvgdconfig
  The system error occurred in the mapping memory. There are probably insufficient system resources. Check the system environment..
- [Error] [0208] Data init error
  The system error occurred in the getting semaphore. There are probably insufficient system resources. Check the system environment..
- [Error] [0209] Fork error
  The system error occurred in the process generation. There are probably insufficient system resources. Check the system environment..
- [Error] [0210] Watcher exec error
  The system error occurred in the starting process up. There are probably insufficient system resources. Check the system environment..
- [Error] [0211] User xx not found.
  There is an incorrect setup of Oracle user. Check it.
- [Error] [0212] Cannot create log xx
  Cannot create log files. There are probably insufficient system resources(disk space). Check the system environment..
- [Error] [0213] Library init error
  The system error occurred in the initialization. There are probably insufficient system resources. Check the system environment..
- [Error] [0214] Cannot get watching status
  Cannot get watching status. Contact your system administrator.
- [Error] [0215] Cannot get monitor status
  Cannot get monitor status. Contact your system administrator.
- [Error] [0216] Send watch message error
  Cannot send watch message. Contact your system administrator.
- [Error] [0217] Receive result error
  Cannot receive watch result. Contact your system administrator.
- [Error] [0218] Timeout occurred
  There is no response from Oracle or Listener. Check Oracle Alertlog files or Listner log files to confirm if Oracle or Listener is normal.
- [Error] [0219] Detector aborted
  The system error occurred and detector terminated. There are probably insufficient system resources. Check the system environment..

Appendix A　Setup method using CUI

This appendix explains how to create the environment configuration using CUI.
A.1 Create userApplication following the procedure of Chapter 2.4
A.2 Create the Oracle resource following the procedure of Chapter 2.6

A.1　Create userApplication

This section explains userApplication generation and non-Oracle resource setup.　Set up the Oracle resource after configuring the database, and then userApplication using RMS Configuration Wizard. This RMS Configuration Wizard adopts the format that allows a user to refer to and select information in the menu.

The following command is executed on an arbitrary node.

```
# hvw　–n　<Definition name>
```

The method of setting the environment is outlined below.
Select a number from the following menu to create an environment using RMS Configuration Wizard.
The environment settings using “ORACLE” wizard are described below.

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

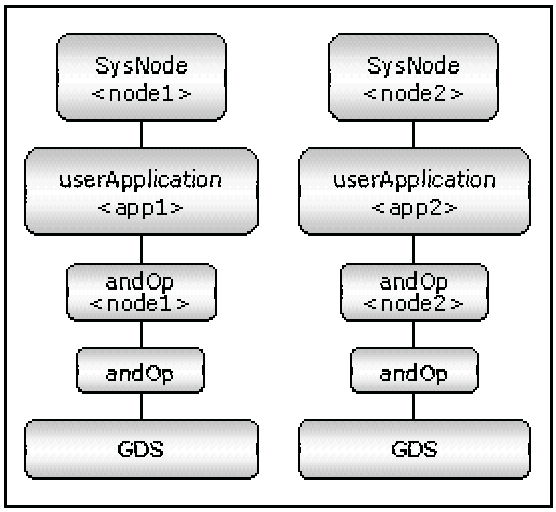
The menu written in capitals is a turnkey wizard that facilitates creation of userApplication.

For further details, refer to the PRIMECLUSTER manuals.

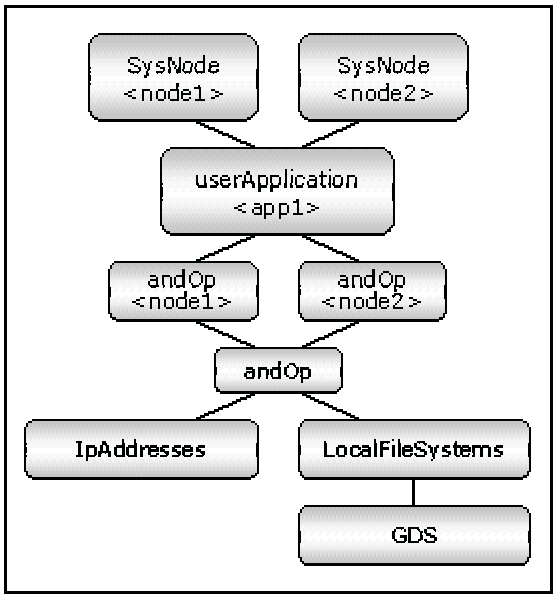
A.1.1　Application-Create

The examples of Oracle environment setup are provided as follows:

- Scalable operation (Oracle9i RAC)
  In scalable operation, userApplication is configured as shown in the illustration.



- Standby operation
  In standby operation, userApplication is configured as shown in the illustration.



A.1.2 Set up scalable operation (Oracle 9i RAC)

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

```
host1: Main RMS management menu, current configuration: oracle1
 1) HELP
 2) QUIT
 3) Application-Create
 4) Application-Edit
 5) Application-Remove
 6) Application-Clone
 7) Configuration-Generate
 8) Configuration-Activate
. . .
```

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

```
Creation: Application type selection menu:
1) HELP
2) QUIT
3) RETURN
4) OPTIONS
5) GENERIC
6) ORACLE
Application Type: 6
```

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

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

4) Select Machines+Basics to set up a node and following menu items. Create the same number of userApplication as that of Oracle instances. Set up a node for each userApplication. For other settings, refer to HELP or PRIMECLUSTER RMS Configuration and Administration.

Information

Recommended setting
AutoSwitchOver = no
PersistentFault = 1

Select SAVE+EXIT to save the above setup.

```
Machines+Basics (app1:consistent)
 1) HELP                          12) (OfflineDoneScript=)
 2) -                             13) (FaultScript=)
 3) SAVE+EXIT                     14) (AutoStartUp=no)
 4) REMOVE+EXIT                   15) (AutoSwitchOver=No)
 5) AdditionalMachine             16) (PreserveState=no)
 6) AdditionalConsole             17) (PersistentFault=1)
 7) Machines[0]=host1RMS          18) (ShutdownPriority=)
 8) (PreCheckScript=)             19) (OnlinePriority=)
 9) (PreOnlineScript=)            20) (StandbyTransitions=)
10) (PostOnlineScript=)           21) (LicenseToKill=no)
11) (PreOfflineScript=)           22) (AutoBreak=yes)
Choose the setting to process: 7
```

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

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

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

7) With the procedure from 1) to 6), the node setup is done. For scalable operation, create the same number of userApplication as that of all nodes. This setup procedure should be done on all nodes.

A.1.3 Set up standby operation

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

```
host1: Main RMS management menu, current configuration: oracle1
 1) HELP
 2) QUIT
 3) Application-Create
 4) Application-Edit
 5) Application-Remove
 6) Application-Clone
 7) Configuration-Generate
 8) Configuration-Activate
. . .
```

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

```
Creation: Application type selection menu:
1) HELP
2) QUIT
3) RETURN
4) OPTIONS
5) GENERIC
6) ORACLE
Application Type: 6
```

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

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

4) Select Machines+Basics to set up nodes and following menu items.
Set an operational node to Machines[0], and standby nodes to Machines[n].
Select AdditionalMachines to add a node. For other settings, refer to HELP or “PRIMECLUSTER RMS Configuration and Administration”.

Information Recommended setting

AutoSwitchOver = HostFailure|ResourceFailure|ShutDown
PersistentFault = 1

Select SAVE+EXIT to save the above setup.

```
Machines+Basics (app1:consistent)
 1) HELP                          12) (OfflineDoneScript=)
 2) -                             13) (FaultScript=)
 3) SAVE+EXIT                     14) (AutoStartUp=no)
 4) REMOVE+EXIT                   15) (AutoSwitchOver=No)
 5) AdditionalMachine             16) (PreserveState=no)
 6) AdditionalConsole             17) (PersistentFault=1)
 7) Machines[0]=host1RMS          18) (ShutdownPriority=)
 8) (PreCheckScript=)             19) (OnlinePriority=)
 9) (PreOnlineScript=)            20) (StandbyTransitions=)
10) (PostOnlineScript=)           21) (LicenseToKill=no)
11) (PreOfflineScript=)           22) (AutoBreak=yes)
Choose the setting to process: 7
```

5) Set up a resource required for the shared disk (ex. GDS), LocalFileSystems, and IpAddress in the “Settings of turnkey wizard ORACLE” page.

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

6) Return to the Main RMS management menu by selecting SAVE+EXIT. (Any settings related to Oracle should not be done here.)

A.1.4 Configuration-Generate and Configuration-Activate

Select Configuration-Generate to set up userApplication.
Select Configuration-Activate to enable the userApplication setup.

Main RMS management menu

```
host1: Main RMS management menu, current configuration: oracle1
 1) HELP
 2) QUIT
 3) Application-Create
 4) Application-Edit
 5) Application-Remove
 6) Application-Clone
 7) Configuration-Generate
 8) Configuration-Activate
. . .
```

A.1.5 Check userApplication

Execute the “hvcm” command of RMS to start up userApplication and check if it is normally running on all nodes.

- Shared disk – Check access to the shared disk on an operational node.
- Logical IP address – Check access to an operational node.

See “PRIMECLUSTER RMS Configuration and Administration” for the RMS command.

A.2 Create and set up Oracle resource

The Oracle-related resource is registered in userApplication that is created in Chapter 2.4.

Execute the following command on an arbitrary node.

```
# hvw  –n  <Definition name>
```

For further details, refer to PRIMECLUSTER RMS Configuration and Administration.

A.2.1 Application-Edit

The examples of Oracle environment setup are provided as follows:

1) Select Application-Edit in the “Main RMS management menu” page to edit userApplication.

```
host1: Main RMS management menu, current configuration: oracle1
 1) HELP
 2) QUIT
 3) Application-Create
 4) Application-Edit
 5) Application-Remove
 6) Application-Clone
 7) Configuration-Generate
 8) Configuration-Activate
. . .
```

2) Select userApplication created in the “Application selection menu” page of Chapter 2.4.

```
Edit: Application selection menu (restricted):
1) HELP
2) QUIT
3) RETURN
4) OPTIONS
5) APP1
6) APP2
Application Name: 5
```

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

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

4) Add the Oracle instance and Oracle listener in the Oracle setup page.

AdditionalInstance Add the Oracle instance resource
AdditionalListener Add the Oracle listener resource
StartPriority Set up a startup order of the Oracle instance and Oracle listener


Example

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

5) Set up the Oracle instance.
See 4 of “2.6.1 Create Oracle resource” for details.

Set up the Oracle listener.
See 5 and 6 of “2.6.1 Create Oracle resource” for details.

6) Select SAVE+EXIT to save. When using Oracle9i RAC, follow the setup procedure from 1) to 6) for the number of other userApplication.

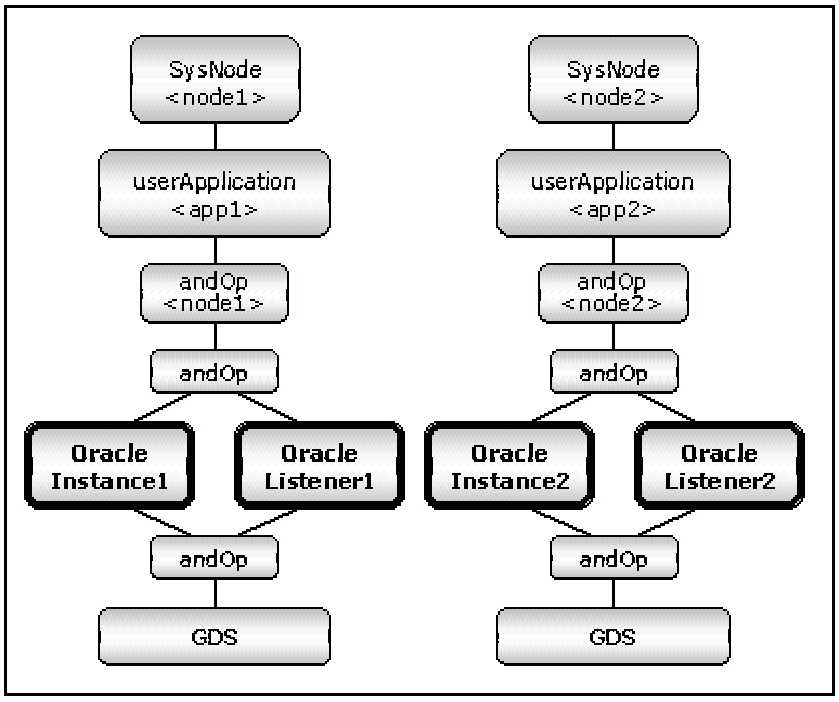
A.2.2 Configuration-Generate and Configuration-Activate

Select Configuration-Generate to set up userApplication.
Then, select Configuration-Activate to enable the userApplication setup.

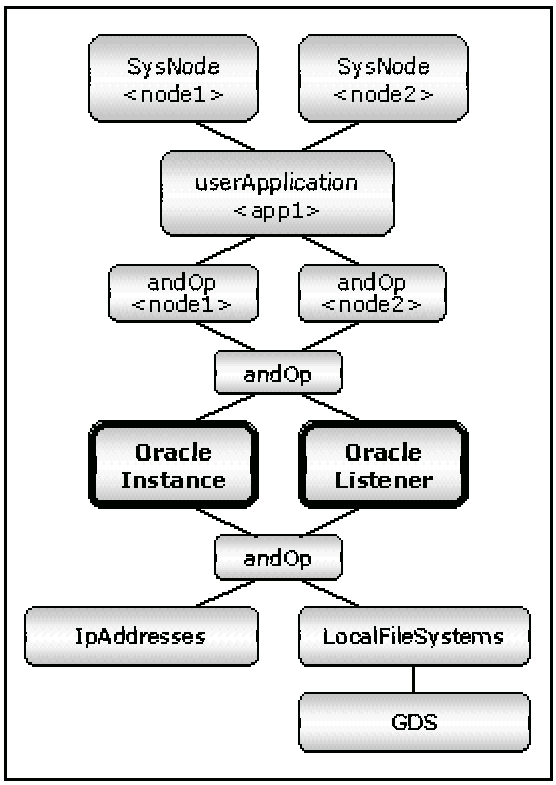
Main RMS management menu

```
host1: Main RMS management menu, current configuration: oracle1
 1) HELP
 2) QUIT
 3) Application-Create
 4) Application-Edit
 5) Application-Remove
 6) Application-Clone
 7) Configuration-Generate
 8) Configuration-Activate
. . .
```

In scalable operation, userApplication is configured as follows:



In standby operation, userApplication is configured as follows:



A.2.3 Check userApplication operation

Execute the “hvcm” command of RMS to start up userApplication and check if it is normally running on all nodes.

Information

See “PRIMECLUSTER RMS Configuration and Administration” for the RMS command.