FUJITSU Software
Symfoware Server V12.0.0

Cluster Operation Guide

Linux

Preface

Purpose of This Document

This document explains the items required to operate Symfoware Server on a cluster system.

Intended Readers

This document is aimed at people who install and operate Symfoware Server on a cluster system. Readers of this document are also assumed to have general knowledge of:

- PRIMECLUSTER

- PostgreSQL

- SQL

- Linux

Structure of This Document

This document is structured as follows:

```
First edition: November 2013
```

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Contents

Chapter 1 Definition of Cluster Operation

This chapter explains the features of a cluster system, the types of cluster operations, and the operation mode.

1.1 What Is a Cluster System?

A cluster system is a system that joins multiple systems (hereafter referred to as nodes) to achieve high availability and to expand throughput. When a cluster system is constructed, multiple nodes can operate as one system that can process a vast amount of data and multiple jobs simultaneously.

A cluster system has the following objectives:

- High availability

- Expandability

- High performance

High availability

If one of the nodes in a cluster system fails for any reason, any jobs operating on the node can be taken over by another node, keeping at a minimum the time that a system must be stopped. Because a normally functioning node takes over a job while the failed node is being repaired, recovery can be performed without any interruption to the job.

Expandability

A cluster system corresponds to any system expansion associated with processing task expansion.

High performance

For an application program for parallel processing is possible, one job can be distributed to more than one node to distribute the processing load, improving system performance.

Symfoware Server provides failover and load sharing to help achieve these aims.

Failover operation and load sharing operation are used to meet these objectives.

 Information
....
Definition of load sharing operation

Load sharing is a feature for processing transactions in parallel on multiple nodes in a cluster system.
The operation for performing load sharing is referred to as load sharing operation.
....

1.2 Cluster Operation Provided by Symfoware Server

The Symfoware Server Lite Edition and Symfoware Server Standard Edition provide the standby feature of failover operation. The operation mode they support is 1:1 standby.

An overview of failover operation follows.

Definition of failover operation in Symfoware Server

Failover is a feature in cluster systems to transfer a job operating on a node to another one when an abnormality occurs on the node.

The operation for performing failover is referred to as failover operation.

The presence of failover operation in Symfoware Server allows highly available systems to be constructed.

Feature of failover operation

Failover operation in Symfoware Server supports the standby feature.

When an abnormality occurs on a node, the standby feature activates the instance that is the standby system at the time of the switch, and transfers the job to it.

Operation mode of failover operation

The operation mode supported in failover operation in Symfoware Server is 1:1 standby.

1:1 standby is a mode in which one active system or standby system operates on one node. Because failover allows jobs to continue when an abnormality occurs in the active system, this mode allows highly reliable systems to be constructed.
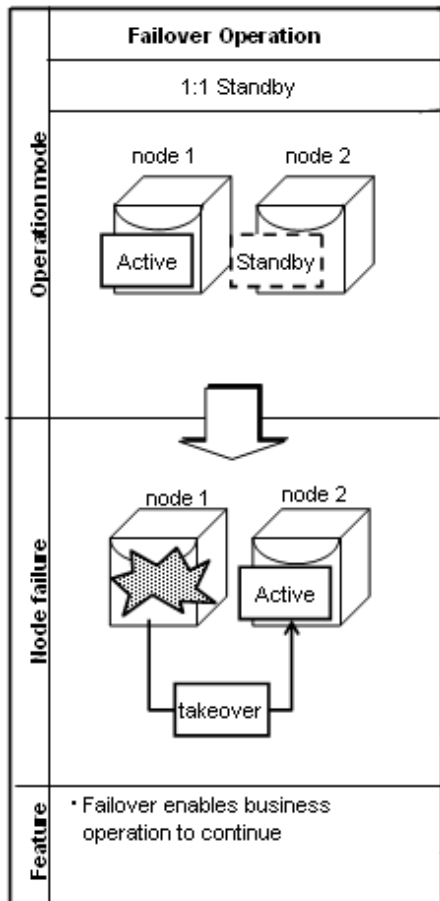
Chapter 2 Overview of Failover Operation

This chapter provides an overview of failover operation in Symfoware Server.

2.1 Definition of Failover Operation

When an abnormality occurs on any of the multiple server devices that make up the cluster system (hereafter referred to as "nodes"), the failover feature transfers a job operating on such a node to another one. Failover can reduce the time for which jobs are stopped when an abnormality occurs, and allows jobs to continue while the node on which the abnormality occurred is recovered.

Figure 2.1 Concept of failover
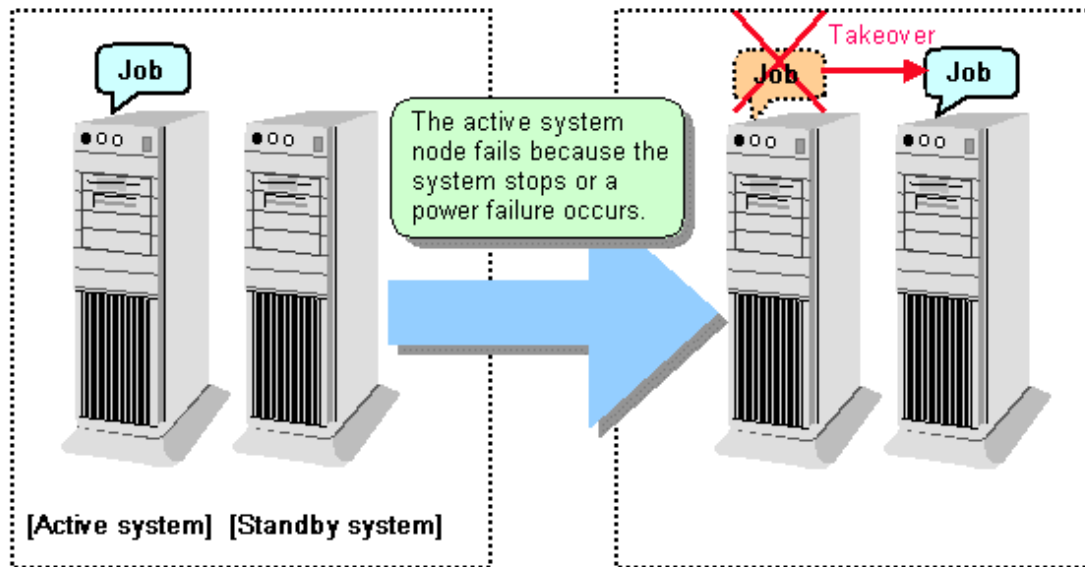
2.2 System Configuration of Failover Operation

In the illustration below, the file system is on a GDS volume (shared disk), mounted on node 1 only.

The following Symfoware resources are located in this file system:

- Data directories

- Tablespaces

- Backup directories

A Symfoware process is waiting for the connection of a user application to access the database, on a logical IP address activated on node 1 only.
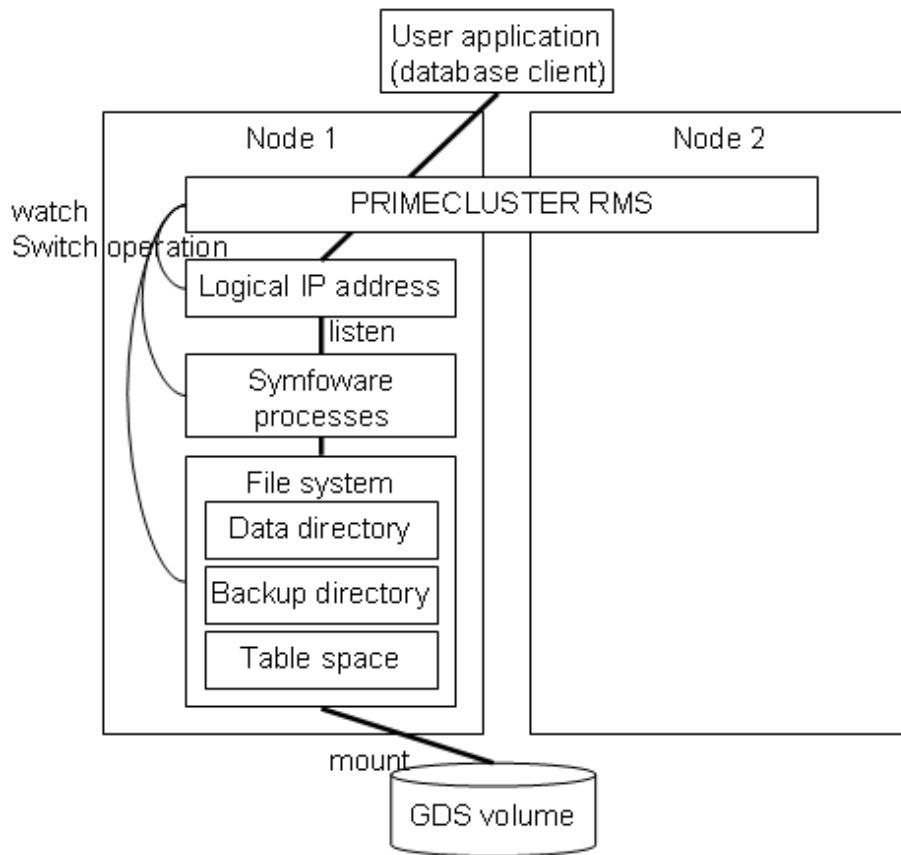
When any kind of abnormality is detected on node 1, PRIMECLUSTER mounts the file system on node 2 and activates the logical IP address on it. The Symfoware process is also started on node 2. The logical IP address does not change, so the user application can access Symfoware on node 2 simply by re-establishing the database connection.
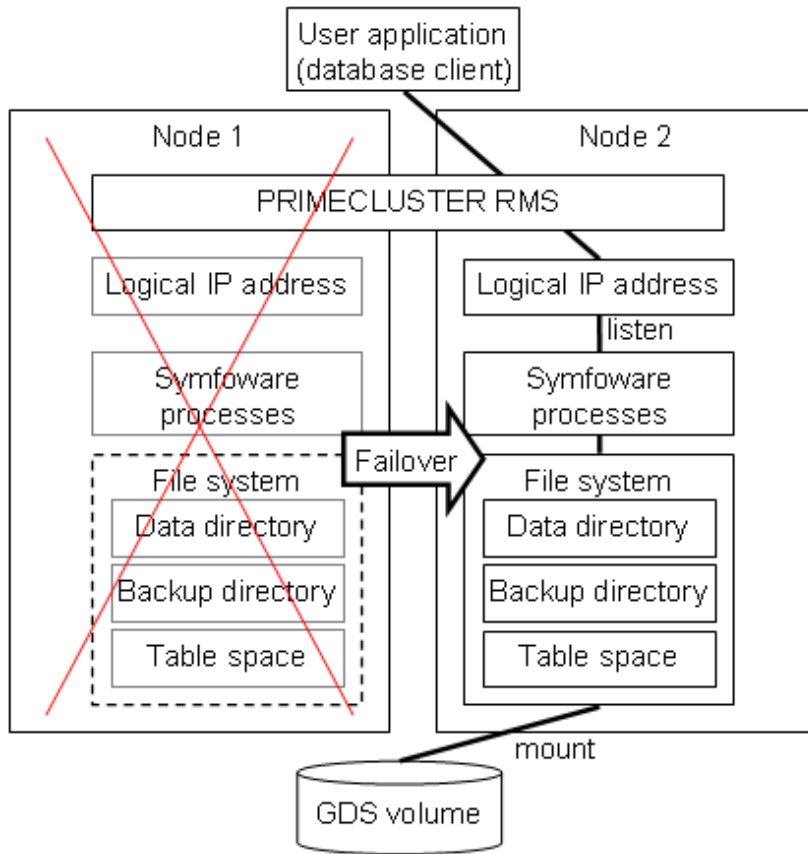
2.3 Setup of Failover Operation

Use the procedure in the table below to perform setup:

Step	Work item		See section
	Active system	Standby system	
1	Installing PRIMECLUSTER and Symfoware Server		2.3.1
2	Configuring PRIMECLUSTER		2.3.2
3	Creating a GDS volume		2.3.3
4	Creating a file system		2.3.4
5	Creating a user for the operating system to start Symfoware		2.3.5
6	Mounting the file system		2.3.6
7	Creating, configuring, and registering a Symfoware database cluster		2.3.7
8	Unmounting the file system		2.3.8
9	Creating a cluster application		2.3.9
10	Checking operation		2.3.10

The sections that follow explain each step.

2.3.1 Installing PRIMECLUSTER and Symfoware Server

Refer to the manual for each product, and then install each product.

📔 Note

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When installing Symfoware Server, do not create an instance.

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📖 See

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- Refer to the PRIMECLUSTER Installation and Administration Guide for information on how to install PRIMECLUSTER.

- Refer to the "Installation and Setup Guide for Server" for information on how to install Symfoware Server.

- -

2.3.2 Configuring PRIMECLUSTER

Perform the tasks from installing cluster control to configuring the initial configuration and the network.

📖 See

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Refer to the PRIMECLUSTER Installation and Administration Guide for information on steps required before setup.

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2.3.3 Creating a GDS Volume

Each of the following Symfoware resources must be located in a file system on a shared disk:

- Data directories

- Tablespaces

- Backup directories

📔 Note

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Store data directories, tablespaces, and their respective backup directories in different GDS disk groups, in case the file system becomes corrupted.

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2.3.4 Creating a File System

Create a file system.

📖 See

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- Refer to the PRIMECLUSTER Installation and Administration Guide for information on how to create a file system on a GDS volume.

- -

2.3.4.1 Creating a File System

Select a file system configuration from the configuration menu in the [Global Disk Services] window in the PRIMECLUSTER Web-Based Admin View, and then create a file system.

2.3.4.2 Editing Configuration Files

Edit /etc/fstab and /etc/fstab.pcl on each node, as follows:

- /etc/fstab
  Add the "ro" attribute to the entries for the file system for monitoring, as follows:

```
# cat /etc/fstab
/dev/sfdsk/class0001/dsk/volume0001 /mnt/swdsk1 ext3 noauto 0 0
```

```
/dev/sfdsk/class0001/dsk/volume0002 /mnt/monitor1 ext3 noauto,ro 0 0
/dev/sfdsk/class0001/dsk/volume0003 /mnt/swdsk2 ext3 noauto 0 0
/dev/sfdsk/class0001/dsk/volume0004 /mnt/monitor2 ext3 noauto,ro 0 0
```

- /etc/fstab.pcl

   Copy the entries shown above, and then prefix each line with #RMS#, as follows:

```
# cat /etc/fstab.pcl
#RMS#/dev/sfdsk/class0001/dsk/volume0001 /mnt/swdsk1 ext3 noauto 0 0
#RMS#/dev/sfdsk/class0001/dsk/volume0002 /mnt/monitor1 ext3 noauto,ro 0 0
#RMS#/dev/sfdsk/class0001/dsk/volume0003 /mnt/swdsk2 ext3 noauto 0 0
#RMS#/dev/sfdsk/class0001/dsk/volume0004 /mnt/monitor2 ext3 noauto,ro 0 0
```

2.3.4.3 Checking

Ensure that each file system can be mounted.

```
# mount -t ext3 /dev/sfdsk/class0001/dsk/volume0001 /mnt/swdsk1
# mount -t ext3 /dev/sfdsk/class0001/dsk/volume0002 /mnt/monitor1
# mount -t ext3 /dev/sfdsk/class0001/dsk/volume0003 /mnt/swdsk2
# mount -t ext3 /dev/sfdsk/class0001/dsk/volume0004 /mnt/monitor2
# umount /mnt/swdsk1
# umount /mnt/monitor1
# umount /mnt/swdsk2
# umount /mnt/monitor2
```

2.3.5 Creating an Operating System User to Start Symfoware

Create an operating system user who is to start Symfoware.

Note

Ensure that the name, UID, and GID of the operating system user who is to start Symfoware match on all nodes that make up the cluster system.

2.3.6 Mounting the File System

1. Start the GDS volume.

2. Mount the file system where the data directory was stored:

```
# mount -t ext3 /dev/sfdsk/class0001/dsk/volume0001 /mnt/swdsk1
```

2.3.7 Creating, Configuring, and Registering a Symfoware Database Cluster

1. Ensure that the operating system user who is to start Symfoware has been granted write privileges for the path specified in the PGDATA environment variable.

2. Either login again as the operating system user who is to start Symfoware, or use the su command to login as the operating system user who is to start Symfoware.

```
# su - postgres
```

3. Create the database cluster manually.

Note

If the configuration requires password authentication, create a .pgpass file in the home directory of the operating system user who is to start Symfoware, and then specify a password. This will be used when PRIMECLUSTER checks the operation of the Symfoware database server. If authentication fails, a fault will be assumed to have occurred in the database server.

4. Check starting, connecting, and stopping. In particular, check that authentication is performed correctly.

5. Use the pgx_pclrsc command to register the database cluster in PRIMECLUSTER - the following is the simplest execution example:

```
# pgx_pclrsc -a -c databaseClusterName -u osUser -D pgData -w workDir -n memberNodes
```

Item	Explanation
databaseClusterName	Specify the Symfoware database cluster name. The database cluster name is case-sensitive. The database cluster name must be as follows: - Up to 16 bytes, and - The first byte must be an ASCII letter, and - The other bytes must be ASCII alphanumeric characters, or underscores (_).
osUser	Specify the operating system user who can start the Symfoware database server.
pgData	Specify the path of the data directory specified during database cluster creation.
workDir	Specify the directory for storing the temporary files required for Symfoware resource monitoring and state transition, and for storing the trace logs required in case of problems.
memberNodes	Specify the names of all nodes that make up the cluster system. Use a comma (,) to separate each node name. Specification example: -n node1RMS,node2RMS

See

- Refer to the " Installation and Setup Guide for Server" for information on how to create a database cluster manually.

- Refer to the "Reference" for information on the pgx_pclrsc command.

2.3.8 Unmounting the File System

Unmount the file system:

```
# umount /mnt/swdsk1
```

2.3.9 Creating a Cluster Application

Refer to "Appendix A Creating Resources and Creating/Modifying Cluster Applications".

2.3.10 Checking Operation

Check if the environment has been configured correctly, by starting the cluster application and then checking operation by performing a switch and a restoration.

Chapter 3 Failover Operation

This chapter explains the procedures involved in failover operation.

3.1 Adding Tablespaces

This section explains how to add tablespaces to a new file system.

This procedure is not required when you are adding tablespaces to an existing file system.

Perform the following steps when using a new shared disk class:

- Stop RMS on all nodes.

- Perform setup as described from "2.3.3 Creating a GDS Volume" to "2.3.4 Creating a File System".

- Modify the cluster application (refer to "A.2 Modifying Cluster Applications" for details).

Perform the following steps when not using a new shared disk class:

- Stop RMS on all nodes.

- Perform the setup as described in "2.3.4 Creating a File System".

- Modify the cluster application (refer to "A.2 Modifying Cluster Applications " for details).

3.2 Modifying Database Cluster Attributes

This section explains the following operations:

- Displaying database instance information

- Modifying database instance content

- Deleting a database instance

Displaying database cluster information

Execute the pgx_pclrsc command as shown below (note that if -c is not specified, the command lists all registered database cluster names):

```
# pgx_pclrsc -p -c databaseClusterName
```

Modifying database instance content

1. Stop RMS.

2. Execute the pgx_pclrsc command as shown below (this is the simplest example):

```
# pgx_pclrsc -d -c databaseClusterName
# pgx_pclrsc -a -c databaseClusterName -u osUser -D pgData -w workDir -n memberNodes
```

🛑 Note

. . . .

If you are modifying attributes, first delete the database cluster from the cluster application, and then re-create it.

. . . .

📖 See

. . . .

Refer to "Reference" for information on the pgx_pclrsc command.

. . . .

Deleting a database instance

1. Stop RMS.

2. Delete the database cluster from the cluster application.

3. Execute the pgx_pclrsc command as shown below:

```
# pgx_pclrsc -d -c databaseClusterName
```

![Note icon] **Note**

. . . .

The directory specified in the -w option of the pgx_pclrsc command during registration will not be deleted. Use operating system commands to delete it if necessary.

. . . .

3.3 Operation at State Transition

The workflow for operation at state transition is shown below.

The activation operation during failover operation will be performed automatically by the Online script.
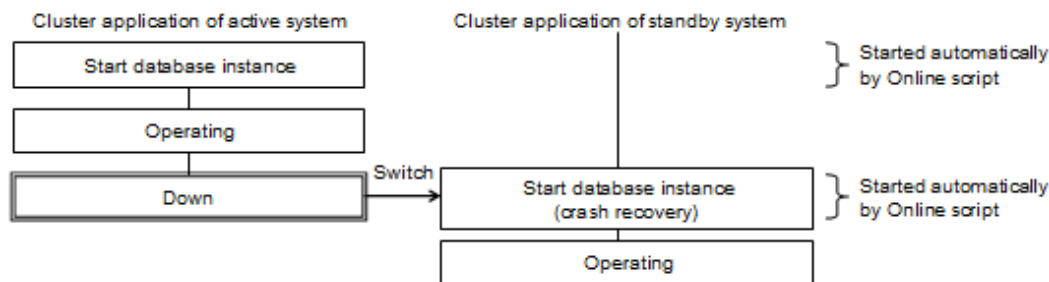
Non-transferrable feature

All transactions being processed by the cluster application on the active system will be rolled back.

Errors during state transition

If an error occurs in a Symfoware script during cluster application state transition, the following message will be displayed in the switchlog of Cluster Admin (the registered database cluster name will be displayed in the pgxtest part shown below):

```
2012-05-14 11:08:22.060:(DET, 3): ERROR: FAULT REASON: Resource <Symfoware_pgxtest> transitioned to
a Faulted state due to a script failure.
```

To display the switchlog, select [Tools] >> [View switchlog] in the [Cluster Admin] window.

If the resource displayed in the error message is a Symfoware resource name, a message indicating the cause will be output either before the message above or to the system log.

Chapter 4 Procedures Required after Failover Abnormality

This chapter explains how to perform recovery when an abnormality occurs during failover operation.

4.1 Stopping for Cluster Application Maintenance

This section describes 2 different procedures to stop for cluster application maintenance - each must be executed in maintenance state:

- Stop in maintenance state the active system and standby system cluster applications

- Stop in maintenance state only the standby system cluster application

    This means to stop in maintenance state only the standby system cluster application, while the active system cluster application remains active.

Stop in maintenance state the active system and standby system cluster applications

1. Open the [Cluster Admin] window.

2. Stop the cluster application.

    In the "rms tree view" in the [Cluster Admin] window, right-click the standby system cluster application to be stopped in maintenance state, and then select [Offline] - this stops both the active system and standby system.

3. Stop RMS.

    In the "rms tree view" in the [Cluster Admin] window, right-click the SysNode where the cluster application to be stopped in maintenance state can be found, and then select [Shutdown RMS]. Note that if you want to perform maintenance without stopping RMS, use the hvutil -d command to place the cluster application in a "Deact" state.

Note

- You must stop RMS if you are applying a Symfoware Server fix patch.

- Stopping RMS also stops all cluster applications on the SysNode of the stopped RMS.

Stop in maintenance state only the standby system cluster application

In /opt/SMAW/SMAWRrms/bin/hvenv.local, add the line "export HV_RCSTART=0" (create the file if it does not yet exist).

```
# vi /opt/SMAW/SMAWRrms/bin/hvenv.local
Add "export HV_RCSTART=0".
```

1. In the "rms tree view" in the [Cluster Admin] window, right-click the standby system cluster application to be stopped in maintenance state, and then select [Offline].

2. In the "rms tree view" in the [Cluster Admin] window, right-click the SysNode where the standby system cluster application stopped in maintenance state can be found, select [Shutdown RMS], and then select [Keep local Apps] to stop RMS.

Note

- If the active system cluster application goes down between stopping the standby system cluster application (step 2) and stopping RMS (step 3), the stopped standby system cluster application may be used as the destination of the switch.

- You must stop RMS if you are applying a Symfoware Server fix patch.

- Stopping RMS also stops all cluster applications on the SysNode of the stopped RMS.

4.2 Releasing Cluster Application Stop in Maintenance State

This section describes 2 different procedures to release a cluster application stop in maintenance state - each must be executed in maintenance state:

- Release the stop in maintenance state of active system and standby system cluster applications

- Release the stop in maintenance state of the standby system cluster application only

Release the stop in maintenance state of active system and standby system cluster applications

1. Open the [Cluster Admin] window.

2. If RMS is not activated, in the [Cluster Admin] window, select [Tools] >> [Start RMS], then select the node to be activated, and then click [OK].

   Note that if you have stopped in maintenance state by using the hvutil -d command, you must execute the hvutil -a command before activating RMS.

3. Activate the cluster application.

   In the "rms tree view" in the [Cluster Admin] window, right-click the standby system cluster application, and then select [Online] to activate it as the active system or [Standby] to activate it as the standby system. If its state is [Fault], select [Clear Fault].

Release the stop in maintenance state of the standby system cluster application only

1. In /opt/SMAW/SMAWRrms/bin/hvenv.local, delete the line "export HV_RCSTART=0".

```
# vi /opt/SMAW/SMAWRrms/bin/hvenv.local
Delete "export HV_RCSTART=0".
```
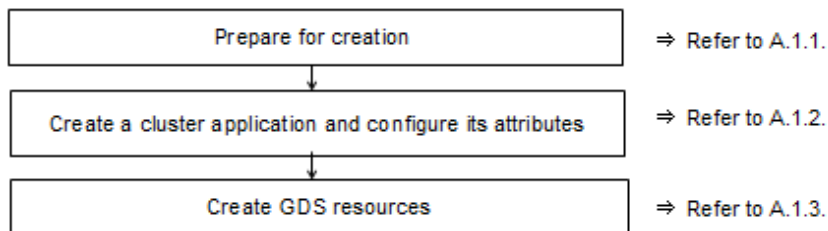
2. In the [Cluster Admin] window, select [Tools] >> [Start RMS], then select the node to be activated, and then click [OK].

3. In the "rms tree view" in the [Cluster Admin] window, right-click the cluster application to be activated as the standby system, and then select [Standby] to activate it. If its state is [Fault], select [Clear Fault].

Appendix A Creating Resources and Creating/Modifying Cluster Applications

This appendix explains how to create and modify cluster applications that include Symfoware resources in PRIMECLUSTER.

A.1 Creating Resources and Cluster Applications

Use the following procedure to create resources and set the attributes of a cluster application:

Prepare for creation	⇒ Refer to A.1.1.
Create a cluster application and configure its attributes	⇒ Refer to A.1.2.
Create GDS resources	⇒ Refer to A.1.3.

A.1.1 Preparing for Creation

1. Execute the hvgdsetup command for all shared disk classes to be used by all file systems to be registered in the cluster application.

```
# /usr/opt/reliant/bin/hvgdsetup -a class0001
```

2. From the Web-Based Admin View, stop RMS on all nodes.

3. Execute the hvw command.

```
# /opt/SMAW/SMAWRrms/bin/hvw
```

See
....
Refer to the PRIMECLUSTER Installation and Administration Guide for information on the hvgdsetup command.
....

A.1.2 Creating a Cluster Application and Configuring Its Attributes

1. Select [Application-Create].

```
pcl-vm13: Main configuration menu, current configuration: config
No RMS active in the cluster
 1) HELP                            10) Configuration-Remove
 2) QUIT                            11) Configuration-Freeze
 3) Application-Create              12) Configuration-Thaw
 4) Application-Edit                13) Configuration-Edit-Global-Settings
 5) Application-Remove              14) Configuration-Consistency-Report
 6) Application-Clone               15) Configuration-ScriptExecution
 7) Configuration-Generate          16) RMS-CreateMachine
 8) Configuration-Activate          17) RMS-RemoveMachine
 9) Configuration-Copy
Choose an action: 3
```

2. Select [STANDBY].

```
Creation: Application type selection menu:
1) HELP                              7) SCALABLE
2) QUIT                              8) STANDBY
3) RETURN
4) OPTIONS
```

```
5) DEMO
6) GENERIC
Application Type: 8
```

3. Select [Machines+Basics].

Specify any application name that is within the scope of the PRIMECLUSTER constraints.

```
Settings of turnkey wizard "STANDBY" (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
```

4. Select [AdditionalMachine].

```
Machines+Basics (app1:consistent)
 1) HELP                         14) (AutoStartUp=no)
 2) -                            15) (AutoSwitchOver=No)
 3) SAVE+EXIT                    16) (PreserveState=no)
 4) REMOVE+EXIT                  17) (PersistentFault=0)
 5) AdditionalMachine            18) (ShutdownPriority=)
 6) AdditionalConsole            19) (OnlinePriority=)
 7) Machines[0]=pcl-vm13RMS      20) (StandbyTransitions=)
 8) (PreCheckScript=)            21) (LicenseToKill=no)
 9) (PreOnlineScript=)           22) (AutoBreak=yes)
10) (PostOnlineScript=)          23) (AutoBreakMaintMode=no)
11) (PreOfflineScript=)          24) (HaltFlag=no)
12) (OfflineDoneScript=)         25) (PartialCluster=0)
13) (FaultScript=)               26) (ScriptTimeout=)
Choose the setting to process: 5
```

5. Select a standby node.

```
1) HELP
2) RETURN
3) pcl-vm13RMS
4) pcl-vm14RMS
Choose a machine for this application: 4
```

6. Ensure that all nodes that make up the cluster application are displayed in [Machines].

```
Machines+Basics (app1:consistent)
 1) HELP                         15) (AutoStartUp=no)
 2) -                            16) (AutoSwitchOver=No)
 3) SAVE+EXIT                    17) (PreserveState=no)
 4) REMOVE+EXIT                  18) (PersistentFault=0)
 5) AdditionalMachine            19) (ShutdownPriority=)
 6) AdditionalConsole            20) (OnlinePriority=)
 7) Machines[0]=pcl-vm13RMS      21) (StandbyTransitions=)
 8) Machines[1]=pcl-vm14RMS      22) (LicenseToKill=no)
 9) (PreCheckScript=)            23) (AutoBreak=yes)
10) (PreOnlineScript=)           24) (AutoBreakMaintMode=no)
11) (PostOnlineScript=)          25) (HaltFlag=no)
12) (PreOfflineScript=)          26) (PartialCluster=0)
13) (OfflineDoneScript=)         27) (ScriptTimeout=)
14) (FaultScript=)
Choose the setting to process:
```

7. Select [AutoStartUp].

```
Machines+Basics (app1:consistent)
 1) HELP                         15) (AutoStartUp=no)
 2) -                            16) (AutoSwitchOver=No)
```

```
 3) SAVE+EXIT                      17) (PreserveState=no)
 4) REMOVE+EXIT                    18) (PersistentFault=0)
 5) AdditionalMachine             19) (ShutdownPriority=)
 6) AdditionalConsole             20) (OnlinePriority=)
 7) Machines[0]=pcl-vm13RMS       21) (StandbyTransitions=)
 8) Machines[1]=pcl-vm14RMS       22) (LicenseToKill=no)
 9) (PreCheckScript=)             23) (AutoBreak=yes)
10) (PreOnlineScript=)            24) (AutoBreakMaintMode=no)
11) (PostOnlineScript=)           25) (HaltFlag=no)
12) (PreOfflineScript=)           26) (PartialCluster=0)
13) (OfflineDoneScript=)          27) (ScriptTimeout=)
14) (FaultScript=)
Choose the setting to process: 15
```

8. Select [yes].

```
1) HELP
2) RETURN
3) yes
4) no
Set the AutoStartUp mode: 3
```

9. Select [AutoSwitchOver=No].

```
Machines+Basics (app1:consistent)
 1) HELP                          15) (AutoStartUp=yes)
 2) -                             16) (AutoSwitchOver=No)
 3) SAVE+EXIT                     17) (PreserveState=no)
 4) REMOVE+EXIT                   18) (PersistentFault=0)
 5) AdditionalMachine            19) (ShutdownPriority=)
 6) AdditionalConsole            20) (OnlinePriority=)
 7) Machines[0]=pcl-vm13RMS      21) (StandbyTransitions=)
 8) Machines[1]=pcl-vm14RMS      22) (LicenseToKill=no)
 9) (PreCheckScript=)            23) (AutoBreak=yes)
10) (PreOnlineScript=)           24) (AutoBreakMaintMode=no)
11) (PostOnlineScript=)          25) (HaltFlag=no)
12) (PreOfflineScript=)          26) (PartialCluster=0)
13) (OfflineDoneScript=)         27) (ScriptTimeout=)
14) (FaultScript=)
Choose the setting to process: 16
```

10. Select [HOSTFAILURE], then [RESOURCEFAILURE], then [SHUTDOWN], and then select [SAVE+RETURN] when the following window is displayed:

```
Set flags for AutoSwitchOver:  Currently set: HOSTFAILURE,RESOURCEFAILURE,SHUTDOWN (HRS)
1) HELP                  4) DEFAULT                 7) NOT:RESOURCEFAILURE(R)
2) -                     5) NO(N)                   8) NOT:SHUTDOWN(S)
3) SAVE+RETURN           6) NOT:HOSTFAILURE(H)
Choose one of the flags: 3
```

11. Select [PersistentFault].

```
Machines+Basics (app1:consistent)
 1) HELP
 2) -
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) AdditionalMachine
 6) AdditionalConsole
 7) Machines[0]=pcl-vm13RMS
 8) Machines[1]=pcl-vm14RMS
 9) (PreCheckScript=)
10) (PreOnlineScript=)
11) (PostOnlineScript=)
```

```
12) (PreOfflineScript=)
13) (OfflineDoneScript=)
14) (FaultScript=)
15) (AutoStartUp=yes)
16) (AutoSwitchOver=HostFailure|ResourceFailure|ShutDown)
17) (PreserveState=no)
18) (PersistentFault=0)
19) (ShutdownPriority=)
20) (OnlinePriority=)
21) (StandbyTransitions=)
22) (LicenseToKill=no)
23) (AutoBreak=yes)
24) (AutoBreakMaintMode=no)
25) (HaltFlag=no)
26) (PartialCluster=0)
27) (ScriptTimeout=)
Choose the setting to process: 18
```

12. Select [0] or [1] (the example below selects [1]).

```
1) HELP
2) RETURN
3) 0
4) 1
Enable persistent fault feature for this application: 4
```

13. Select [OnlinePriority].

```
Machines+Basics (app1:consistent)
 1) HELP
 2) -
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) AdditionalMachine
 6) AdditionalConsole
 7) Machines[0]=pcl-vm13RMS
 8) Machines[1]=pcl-vm14RMS
 9) (PreCheckScript=)
10) (PreOnlineScript=)
11) (PostOnlineScript=)
12) (PreOfflineScript=)
13) (OfflineDoneScript=)
14) (FaultScript=)
15) (AutoStartUp=yes)
16) (AutoSwitchOver=HostFailure|ResourceFailure|ShutDown)
17) (PreserveState=no)
18) (PersistentFault=1)
19) (ShutdownPriority=)
20) (OnlinePriority=)
21) (StandbyTransitions=)
22) (LicenseToKill=no)
23) (AutoBreak=yes)
24) (AutoBreakMaintMode=no)
25) (HaltFlag=no)
26) (PartialCluster=0)
27) (ScriptTimeout=)
Choose the setting to process: 20
```

14. Select [0] or [1] (the example below selects [1]).

```
1) HELP
2) RETURN
3) 0
```

```
4) 1
Enable Online Priority (Active Standby) feature for this application: 4
```

15. Select [StandbyTransitions].

```
Machines+Basics (app1:consistent)
 1) HELP
 2) -
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) AdditionalMachine
 6) AdditionalConsole
 7) Machines[0]=pcl-vm13RMS
 8) Machines[1]=pcl-vm14RMS
 9) (PreCheckScript=)
10) (PreOnlineScript=)
11) (PostOnlineScript=)
12) (PreOfflineScript=)
13) (OfflineDoneScript=)
14) (FaultScript=)
15) (AutoStartUp=yes)
16) (AutoSwitchOver=HostFailure|ResourceFailure|ShutDown)
17) (PreserveState=no)
18) (PersistentFault=1)
19) (ShutdownPriority=)
20) (OnlinePriority=1)
21) (StandbyTransitions=)
22) (LicenseToKill=no)
23) (AutoBreak=yes)
24) (AutoBreakMaintMode=no)
25) (HaltFlag=no)
26) (PartialCluster=0)
27) (ScriptTimeout=)
Choose the setting to process: 21
```

16. Select [CLEARFAULTREQUEST], then [STARTUP], then [SWITCHREQUEST], and then select [SAVE+RETURN] when the following window is displayed:

```
Set flags for StandbyTransitions: Currently set: ClearFaultRequst,StartUp,SwitchRequest (CTW)
1) HELP                              5) NOT:CLEARFAULTREQUEST(C)
2) -                                 6) NOT:STARTUP(T)
3) SAVE+RETURN                       7) NOT:SWITCHREQUEST(W)
4) NO(N)
Choose one of the flags: 3
```

17. Select [HaltFlag].

```
Machines+Basics (app1:consistent)
 1) HELP
 2) -
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) AdditionalMachine
 6) AdditionalConsole
 7) Machines[0]=pcl-vm13RMS
 8) Machines[1]=pcl-vm14RMS
 9) (PreCheckScript=)
10) (PreOnlineScript=)
11) (PostOnlineScript=)
12) (PreOfflineScript=)
13) (OfflineDoneScript=)
14) (FaultScript=)
15) (AutoStartUp=yes)
16) (AutoSwitchOver=HostFailure|ResourceFailure|ShutDown)
```

```
17) (PreserveState=no)
18) (PersistentFault=1)
19) (ShutdownPriority=)
20) (OnlinePriority=1)
21) (StandbyTransitions=ClearFaultRequest|StartUp|SwitchRequest)
22) (LicenseToKill=no)
23) (AutoBreak=yes)
24) (AutoBreakMaintMode=no)
25) (HaltFlag=no)
26) (PartialCluster=0)
27) (ScriptTimeout=)
Choose the setting to process: 25
```

18. Select [yes].

```
1) HELP
2) RETURN
3) yes
4) no
Set the Halt mode: 3
```

19. Ensure that all attributes are displayed as set in the previous steps, and then select [SAVE+EXIT].

```
Machines+Basics (app1:consistent)
 1) HELP
 2) -
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) AdditionalMachine
 6) AdditionalConsole
 7) Machines[0]=pcl-vm13RMS
 8) Machines[1]=pcl-vm14RMS
 9) (PreCheckScript=)
10) (PreOnlineScript=)
11) (PostOnlineScript=)
12) (PreOfflineScript=)
13) (OfflineDoneScript=)
14) (FaultScript=)
15) (AutoStartUp=yes)
16) (AutoSwitchOver=HostFailure|ResourceFailure|ShutDown)
17) (PreserveState=no)
18) (PersistentFault=1)
19) (ShutdownPriority=)
20) (OnlinePriority=1)
21) (StandbyTransitions=ClearFaultRequest|StartUp|SwitchRequest)
22) (LicenseToKill=no)
23) (AutoBreak=yes)
24) (AutoBreakMaintMode=no)
25) (HaltFlag=yes)
26) (PartialCluster=0)
27) (ScriptTimeout=)
Choose the setting to process: 3
```

20. The following window will be displayed:

```
Settings of turnkey wizard "STANDBY" (APP1:not yet consistent)
 1) HELP                              9) Procedure:BasicApplication(-)
 2) -                               10) Symfoware(-)
 3) SAVE+EXIT                       11) Procedure:SystemState3(-)
 4) -                               12) Procedure:SystemState2(-)
 5) ApplicationName=APP1            13) Gls:Global-Link-Services(-)
 6) Machines+Basics(app1)          14) IpAddresses(-)
 7) CommandLines(-)                15) LocalFileSystems(-)
```

```
 8) Procedure:Application(-)              16) Gds:Global-Disk-Services(-)
Choose the setting to process:
```

A.1.3 Creating GDS Resources

1. Select [Gds:Global-Disk-Services].

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

2. Select [AdditionalDiskClass].

```
Volume management (Gds_APP1:not yet consistent)
1) HELP                    4) REMOVE+EXIT          7) (StandbySupport=no)
2) -                       5) AdditionalDiskClass  8) (AutoRecover=no)
3) SAVE+EXIT               6) (ClassNameFilter=)   9) (Timeout=1800)
Choose the setting to process: 5
```

3. Select a disk class.

```
1) HELP
2) RETURN
3) FREECHOICE
4) class0001
Choose the disk class: 4
```

4. Follow the steps above for all shared disk classes to be used by all file systems to be registered in the cluster application. When doing so, configure the MONITORONLY attribute as shown in the following table:

Purpose of file system	MONITORONLY attribute
Data directory	Do not configure.
Backup directory	Configure.
Table space	Do not configure.

5. Select [SAVE+EXIT].

```
Volume management (Gds_APP1:consistent)
 1) HELP                              6) DiskClasses[0]=class0001
 2) -                                 7) (ClassNameFilter=)
 3) SAVE+EXIT                         8) (StandbySupport=no)
 4) REMOVE+EXIT                       9) (AutoRecover=no)
 5) AdditionalDiskClass              10) (Timeout=1800)
Choose the setting to process: 3
```

6. Select [Symfoware].

```
Settings of turnkey wizard "STANDBY" (APP1:consistent)
 1) HELP                                   9) Procedure:BasicApplication(-)
 2) -                                      10) Symfoware(-)
 3) SAVE+EXIT                              11) Procedure:SystemState3(-)
 4) -                                      12) Procedure:SystemState2(-)
 5) ApplicationName=APP1                   13) Gls:Global-Link-Services(-)
 6) Machines+Basics(app1)                  14) IpAddresses(-)
```

```
 7) CommandLines(-)                    15) LocalFileSystems(-)
 8) Procedure:Application(-)           16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 10
```

7. Select [AdditionalResource].

```
Resource (Symfoware_APP1:not yet consistent)
1) HELP                                4) REMOVE+EXIT
2) -                                   5) AdditionalResource
3) SAVE+EXIT
Choose the setting to process: 5
```

8. Select the name of the database instance specified in the pgx_pclrsc command.

```
1) HELP
2) RETURN
3) FREECHOICE
4) pgxtest
Choose the resource: 4
```

9. Select [SAVE+EXIT].

```
Resource (Symfoware_APP1:consistent)
 1) HELP                               6) ResourceName[0]=pgxtest
 2) -                                  7) Flags[0]=T900
 3) SAVE+EXIT                          8) OnlineTimeout[0]=3600
 4) REMOVE+EXIT                        9) OfflineTimeout[0]=1800
 5) AdditionalResource               10) FaultScript[0]=''
Choose the setting to process: 3
```

10. Select [Gls:Global-Link-Services].

```
Settings of turnkey wizard "STANDBY" (APP1:consistent)
 1) HELP                               9) Procedure:BasicApplication(-)
 2) -                                 10) Symfoware(Symfoware_APP1)
 3) SAVE+EXIT                         11) Procedure:SystemState3(-)
 4) -                                 12) Procedure:SystemState2(-)
 5) ApplicationName=APP1              13) Gls:Global-Link-Services(-)
 6) Machines+Basics(app1)            14) IpAddresses(-)
 7) CommandLines(-)                   15) LocalFileSystems(-)
 8) Procedure:Application(-)          16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 13
```

11. Select [AdditionalTakeoverIpaddress].

```
Gls (Gls_APP1:not yet consistent)
1) HELP                                4) REMOVE+EXIT
2) -                                   5) AdditionalTakeoverIpaddress
3) SAVE+EXIT                           6) (Timeout=60)
Choose the setting to process: 5
```

12. Select a takeover IP.

```
1) HELP
2) RETURN
3) FREECHOICE
4) takeoverip
Choose a takeover IP address for Gls: 4
```

13. Select [SAVE+RETURN].

```
Set a flag for takeover IP address: takeoverip
Currently set:
1) HELP                                5) AUTORECOVER(A)
```

```
2) -
3) SAVE+RETURN
4) DEFAULT
Choose additionally one of the flags: 3
```

14. Select [SAVE+EXIT].

```
Gls (Gls_APP1:consistent)
1) HELP                          5) AdditionalTakeoverIpaddress
2) -                             6) TakeoverIpaddress[0]=N,takeoverip
3) SAVE+EXIT                     7) (Timeout=60)
4) REMOVE+EXIT
Choose the setting to process: 3
```

15. Select [LocalFileSystem].

```
Settings of turnkey wizard "STANDBY" (APP1:consistent)
 1) HELP                          9) Procedure:BasicApplication(-)
 2) -                            10) Symfoware(Symfoware_APP1)
 3) SAVE+EXIT                    11) Procedure:SystemState3(-)
 4) -                           12) Procedure:SystemState2(-)
 5) ApplicationName=APP1        13) Gls:Global-Link-Services(Gls_APP1)
 6) Machines+Basics(app1)       14) IpAddresses(-)
 7) CommandLines(-)             15) LocalFileSystems(-)
 8) Procedure:Application(-)    16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 15
```

16. Select [AdditionalMountPoint].

```
File systems (Lfs_APP1:not yet consistent)
1) HELP                 4) REMOVE+EXIT           7) (Timeout=180)
2) -                    5) AdditionalMountPoint
3) SAVE+EXIT            6) (Filter=)
Choose the setting to process: 5
```

17. Select a mount point allocated for the data directory, backup directory, and tablespace, and a mount point for the file system for monitoring these areas.

```
1) HELP                          5) /mnt/monitor1
2) RETURN                        6) /mnt/monitor2
3) FREECHOICE                    7) /mnt/swdsk1
4) ALL                           8) /mnt/swdsk2
Choose a mount point: 5
```

18. Select [SAVE+RETURN].

```
Set flags for mount point: /mnt/monitor1 Currently set: LOCAL,AUTORECOVER (LA)
1) HELP                 4) DEFAULT               7) SHARE(S)
2) -                    5) SYNC(Y)               8) MONITORONLY(M)
3) SAVE+RETURN          6) NOT:AUTORECOVER(A)
Choose one of the flags: 3
```

19. After configuring all mount points, select [SAVE+EXIT].

```
File systems (Lfs_APP1:consistent)
 1) HELP                          7) MountPoints[1]=LA:/mnt/monitor2
 2) -                             8) MountPoints[2]=LA:/mnt/swdsk1
 3) SAVE+EXIT                     9) MountPoints[3]=LA:/mnt/swdsk2
 4) REMOVE+EXIT                  10) (Filter=)
 5) AdditionalMountPoint         11) (Timeout=180)
 6) MountPoints[0]=LA:/mnt/monitor1
Choose the setting to process: 3
```

20. Select [SAVE+EXIT].

```
Settings of turnkey wizard "STANDBY" (APP1:consistent)
 1) HELP                             9) Procedure:BasicApplication(-)
 2) -                               10) Symfoware(Symfoware_APP1)
 3) SAVE+EXIT                       11) Procedure:SystemState3(-)
 4) -                               12) Procedure:SystemState2(-)
 5) ApplicationName=APP1            13) Gls:Global-Link-Services(Gls_APP1)
 6) Machines+Basics(app1)           14) IpAddresses(-)
 7) CommandLines(-)                 15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)        16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 3
```

21. Select [Configuration-Generate].
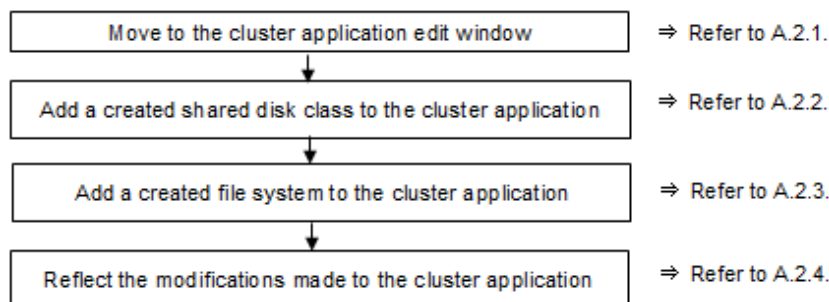
```
pcl-vm13: Main configuration menu, current configuration: config
No RMS active in the cluster
 1) HELP                            10) Configuration-Remove
 2) QUIT                            11) Configuration-Freeze
 3) Application-Create              12) Configuration-Thaw
 4) Application-Edit                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: 7
```

22. Select [Configuration-Activate].

```
pcl-vm13: Main configuration menu, current configuration: config
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: 8
```

23. Select [QUIT].

```
pcl-vm13: Main configuration menu, current configuration: config
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
```

A.2 Modifying Cluster Applications

Use the following procedure to modify a cluster application:

Move to the cluster application edit window	⇒ Refer to A.2.1.
Add a created shared disk class to the cluster application	⇒ Refer to A.2.2.
Add a created file system to the cluster application	⇒ Refer to A.2.3.
Reflect the modifications made to the cluster application	⇒ Refer to A.2.4.

A.2.1 Moving to the Cluster Application Edit Window

1. Execute the hvw command.

```
# hvw
```

2. Select [Application-Edit].

```
pcl-vm13: Main configuration menu, current configuration: config
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 the user application to be used.

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

A.2.2 Adding a Created Shared Disk Class to the Cluster Application

1. Select [Gds:Global-Disk-Services].

```
Settings of turnkey wizard "STANDBY" (APP1:consistent)
 1) HELP                               9) Procedure:BasicApplication(-)
 2) READONLY                          10) Symfoware(Symfoware_APP1)
 3) SAVE+EXIT                         11) Procedure:SystemState3(-)
 4) -                                 12) Procedure:SystemState2(-)
 5) ApplicationName=APP1              13) Gls:Global-Link-Services(Gls_APP1)
 6) Machines+Basics(app1)            14) IpAddresses(-)
 7) CommandLines(-)                   15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)          16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 16
```

2. Select [AdditionalDiskClass].

```
Volume management (Gds_APP1:consistent)
 1) HELP                               6) DiskClasses[0]=class0001
```

```
  2) NO-SAVE+EXIT                         7) (ClassNameFilter=)
  3) SAVE+EXIT                            8) (StandbySupport=no)
  4) REMOVE+EXIT                          9) (AutoRecover=no)
  5) AdditionalDiskClass                 10) (Timeout=1800)
Choose the setting to process: 5
```

3. Select the class of the created disk.

```
1) HELP
2) RETURN
3) FREECHOICE
4) class0001
5) class0002
Choose the disk class: 5
```

4. Select [SAVE+EXIT].

```
Volume management (Gds_APP1:consistent)
 1) HELP                                7) DiskClasses[1]=class0002
 2) NO-SAVE+EXIT                        8) (ClassNameFilter=)
 3) SAVE+EXIT                           9) (StandbySupport=no)
 4) REMOVE+EXIT                        10) (AutoRecover=no)
 5) AdditionalDiskClass               11) (Timeout=1800)
6) DiskClasses[0]=class0001
Choose the setting to process: 3
```

5. Select [SAVE+EXIT] to quit or [LocalFileSystems] to add local file systems.

```
Settings of turnkey wizard "STANDBY" (APP1:consistent)
 1) HELP                                9) Procedure:BasicApplication(-)
 2) -                                  10) Symfoware(Symfoware_APP1)
 3) SAVE+EXIT                          11) Procedure:SystemState3(-)
 4) -                                  12) Procedure:SystemState2(-)
 5) ApplicationName=APP1               13) Gls:Global-Link-Services(Gls_APP1)
 6) Machines+Basics(app1)             14) IpAddresses(-)
 7) CommandLines(-)                    15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)           16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process:
```

A.2.3 Adding a Created File System to the Cluster Application

1. Select [LocalFileSystems].

```
Settings of turnkey wizard "STANDBY" (APP1:consistent)
 1) HELP                                9) Procedure:BasicApplication(-)
 2) -                                  10) Symfoware(Symfoware_APP1)
 3) SAVE+EXIT                          11) Procedure:SystemState3(-)
 4) -                                  12) Procedure:SystemState2(-)
 5) ApplicationName=APP1               13) Gls:Global-Link-Services(Gls_APP1)
 6) Machines+Basics(app1)             14) IpAddresses(-)
 7) CommandLines(-)                    15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)           16) Gds:Global-Disk-Services(Gds_APP1)
Choose the setting to process: 15
```

2. Select [AdditionalMountPoint].

```
File systems (Lfs_APP1:consistent)
 1) HELP                                7) MountPoints[1]=LA:/mnt/monitor2
 2) NO-SAVE+EXIT                        8) MountPoints[2]=LA:/mnt/swdsk1
 3) SAVE+EXIT                           9) MountPoints[3]=LA:/mnt/swdsk2
 4) REMOVE+EXIT                        10) (Filter=)
 5) AdditionalMountPoint              11) (Timeout=180)
```

```
 6) MountPoints[0]=LA:/mnt/monitor1
Choose the setting to process: 5
```

3. After registering the file systems to be used and the file system for the areas for monitoring them, select [SAVE+EXIT].

```
File systems (Lfs_APP1:consistent)
 1) HELP                                8) MountPoints[2]=LA:/mnt/swdsk1
 2) NO-SAVE+EXIT                         9) MountPoints[3]=LA:/mnt/swdsk2
 3) SAVE+EXIT                           10) MountPoints[3]=LA:/mnt/monitor3
 4) REMOVE+EXIT                         10) MountPoints[3]=LA:/mnt/swdsk3
 5) AdditionalMountPoint                11) (Filter=)
 6) MountPoints[0]=LA:/mnt/monitor1     12) (Timeout=180)
 7) MountPoints[1]=LA:/mnt/monitor2
Choose the setting to process:
```

A.2.4 Reflecting Modifications Made to the Cluster Application

1. Select [SAVE+EXIT].

```
Settings of turnkey wizard "STANDBY" (APP1:consistent)
 1) HELP                                9) Procedure:BasicApplication(-)
 2) -                                   10) Symfoware(Symfoware_APP1)
 3) SAVE+EXIT                           11) Procedure:SystemState3(-)
 4) -                                   12) Procedure:SystemState2(-)
 5) ApplicationName=APP1                13) Gls:Global-Link-Services(Gls_APP1)
 6) Machines+Basics(app1)               14) IpAddresses(-)
 7) CommandLines(-)                     15) LocalFileSystems(Lfs_APP1)
 8) Procedure:Application(-)            16) Gds:Global-Disk-Services(Gds_APP1)
```

2. Select [RETURN].

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

3. Select [Configuration-Generate].

```
pcl-vm13: Main configuration menu, current configuration: config
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: 7
```

4. Select [Configuration-Activate].

```
pcl-vm13: Main configuration menu, current configuration: config
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: 8
```

5. Select [QUIT].

```
pcl-vm13: Main configuration menu, current configuration: config
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
```

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