

PRIMECLUSTER Wizard for NetWorker 4.2



Configuration and Administration Guide

Solaris

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Preface

Purpose

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

Readers

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

Outline

The document consists of the following six chapters and one appendix:

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

Notational convention

The document conforms to the following notational conventions:



Information

.....
Describes information a user can refer to.
.....



Note

.....
Describes points where a user should take notice.
.....



Example

.....
Describes settings using an example.
.....

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Contents

Chapter 1 Feature.....	1
1.1 Feature Outline.....	1
1.1.1 Server Cluster Operation.....	2
1.1.2 Storage Node Cluster Operation.....	3
1.1.3 Client Cluster Operation.....	5
1.1.4 Discontinue Monitoring NetWorker Resources.....	6
1.1.5 Client Operation of STANDBY Node.....	6
1.2 Operating Environment.....	6
1.2.1 Available Operation Modes on PRIMECLUSTER.....	6
1.2.2 System Configuration.....	7
1.2.2.1 Server cluster operation.....	7
1.2.2.2 Storage node cluster operation.....	8
1.2.2.3 Client cluster operation.....	8
Chapter 2 Setting and Installation.....	12
2.1 Environment Setup.....	12
2.2 PRIMECLUSTER Installation and Configuration.....	13
2.3 userApplication Creation.....	14
2.3.1 Configuration-Generate and Configuration-Activate.....	15
2.3.2 userApplication Operation Check.....	16
2.4 NetWorker Installation.....	16
2.4.1 NetWorker Installation.....	16
2.4.1.1 Server cluster operation.....	17
2.4.1.2 Storage node cluster operation.....	17
2.4.1.3 Client cluster operation.....	18
2.4.2 Setup NetWorker Directory (/nsr).....	18
2.4.2.1 Setup Shared NetWorker Directory.....	18
2.5 Defining Logical Node Name.....	19
2.5.1 Logical Node Name Management File.....	19
2.5.2 Cluster Mount Information File.....	21
2.5.3 Raw Device Path List File.....	21
2.6 NetWorker Resource Creation and Setting.....	22
2.6.1 userApplication with NetWorker Resources.....	24
2.6.1.1 userApplication Removing.....	25
2.6.1.2 Server cluster operation.....	26
2.6.1.3 Storage node cluster operation.....	29
2.6.1.4 Client cluster operation.....	32
2.6.1.5 userApplication creation.....	35
2.6.2 Configuration-Generate and Configuration-Activate.....	36
2.6.3 userApplication Operation Check.....	36
2.7 NetWorker Configuration.....	36
2.7.1 Server Cluster Operation.....	37
2.7.2 Storage Node Cluster Operation.....	38
2.7.3 Client Cluster Operation.....	39
2.8 Registering NetWorker License.....	39
2.9 Information.....	41
2.9.1 Definition of Operation Environment at NetWorker Startup.....	41
2.9.2 NetWorker Online/Offline Script.....	42
2.9.3 Notes for Constructing Tape Device Shared System.....	43
2.9.4 NetWorker Management Console Setting.....	44
Chapter 3 Operation.....	46
3.1 Auto Re-execution of Backup.....	46
3.1.1 What is Autorestart Function?.....	46
3.1.2 Procedure for Autorestart Setup.....	46

3.1.3 Notes to Use Autorestart Function.....	47
3.2 NetWorker Maintenance.....	47
3.2.1 Patch Application and Update.....	48
3.2.2 Uninstallation.....	49
3.3 Troubleshooting.....	49
3.3.1 Corrective Action against Failover.....	49
3.3.2 Backup and Recovery after Failover.....	50
3.3.3 Bringing Warning NetWorker Resource to Online State.....	50
3.3.4 Troubleshooting Information.....	51
Chapter 4 Command.....	52
4.1 clntwlog - Achieve Confidential.....	52
4.2 hvnwdisable - Discontinue Monitoring Resources.....	53
4.3 hvnwenable - Restart Monitoring Resources.....	54
4.4 nwcIntwadd - Copy of NetWorker Directory.....	55
4.5 clntwbr - Collective Backup and Restoration of Environmental Files.....	56
Chapter 5 Notice.....	58
Chapter 6 Message.....	60
6.1 Scripts Messages.....	60
6.2 NetWorker Startup Scripts Messages.....	60
6.2.1 NetWorker Start Messages.....	60
6.2.2 Error Messages.....	60
6.3 Error Messages of the SCSI reset.....	61
6.4 Error Messages of Commands.....	62
6.4.1 clntwlog messages.....	62
6.4.2 hvnwdisable/hvnwenable messages.....	63
6.4.3 nwcIntwadd messages.....	65
6.4.4 clntwbr messages.....	66
Appendix A Setup Method with CUI.....	68
A.1 userApplication Creation(CUI).....	68
A.1.1 Application-Create.....	69
A.1.2 Configuration-Generate and Configuration-Activate.....	71
A.2 NetWorker Resource Creation and Setting.....	72
A.2.1 Application-Edit.....	75
A.2.2 Configuration-Generate and Configuration-Activate.....	79
A.2.3 userApplication operation check.....	80

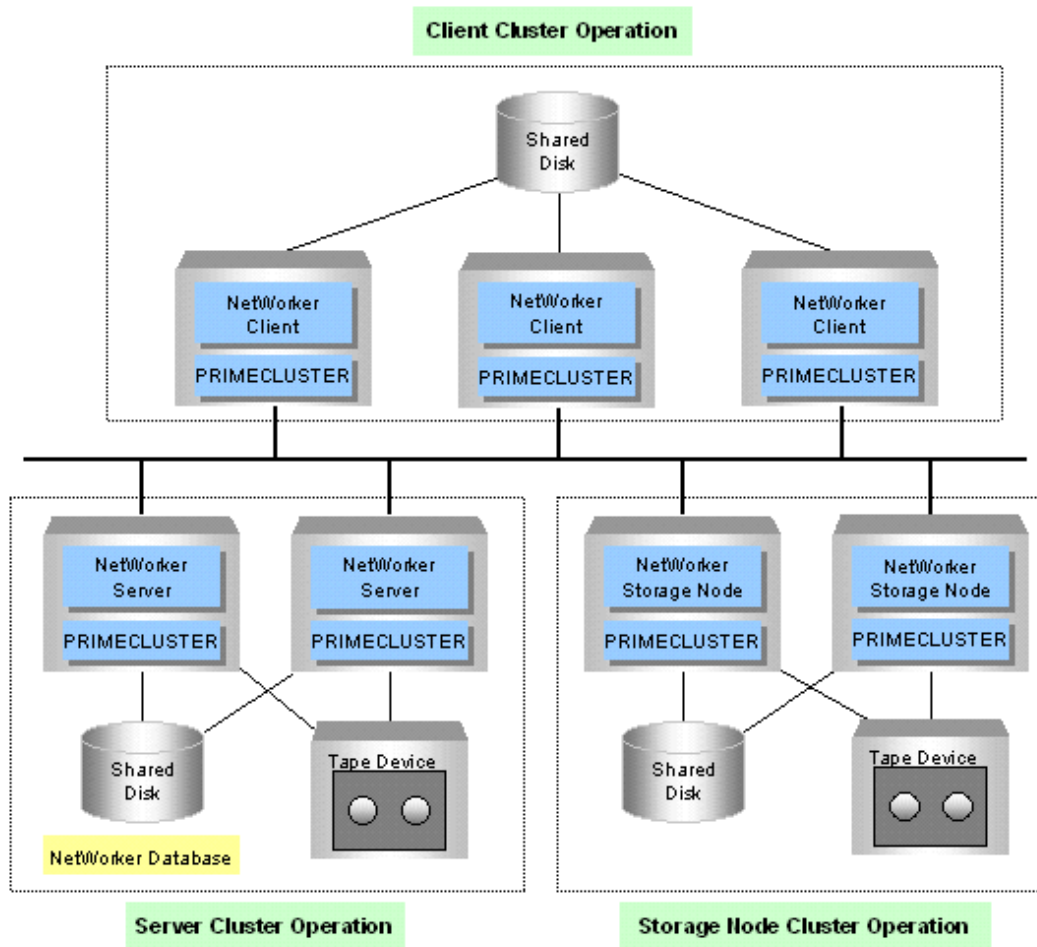
Chapter 1 Feature

1.1 Feature Outline

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

The standby operation requires NetWorker.

PRIMECLUSTER Wizard for NetWorker enables backing up and recovering integrated data on a shared disk on cluster system that is constructed on PRIMECLUSTER with clustering environment.



Operation that the NetWorker server cooperates with the cluster system is called "Server cluster operation". Operation that the NetWorker storage node cooperates with the cluster system is called "Storage node cluster operation". Operation that the NetWorker client cooperates with the cluster system is called "Client cluster operation".

Note

NetWorker 7.4/7.5/7.6 does not support the high available storage node in any cluster systems. Therefore, the storage node cluster operation is not supported for NetWorker 7.4/7.5/7.6.

Module structure

The modules for operating NetWorker on PRIMECLUSTER are as follows:

Environment setup Wizard	Environment setup tool to enable NetWorker operation on PRIMECLUSTER
Detector	Module to monitor NetWorker
Scripts	Control starting and stopping the NetWorker daemons
Setup/operation command	Commands used to set up and operate

Environment setup

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

Monitoring

The detector monitors NetWorker.

Startup and stop control

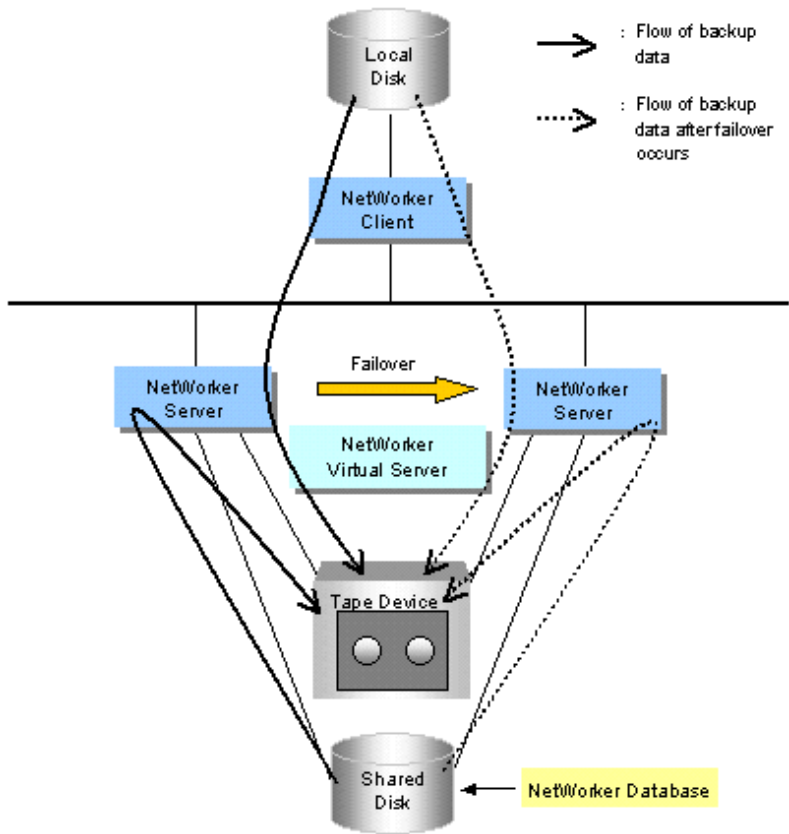
Along with the state transition of a cluster system, scripts automatically start or stop NetWorker.

Setup/operation command

Provides the commands to collect troubleshooting information and Discontinue Monitoring Resources of NetWorker.

1.1.1 Server Cluster Operation

Clustering NetWorker and monitoring system by NetWorker daemon-specific monitor improves availability of backup operation system on which NetWorker is used.



Clustering NetWorker server, sharing tape device and NetWorker management database (stores information such as when and what data is backed up and NetWorker setting) improves backup availability. Even failure occurs during backup and failover occurs in cluster system, backup can be continued on standby node.

Auto Detection and Recovery of NetWorker Failure

RMS configuration script and NetWorker server daemon detector automatically detects and recover failure on NetWorker and this minimizes time to stop backup service.

The Detector constantly monitors NetWorker, and if it detects a failure, it will notify RMS (Reliant Monitor Services). If the AUTORECOVER attribute is enabled, RMS will start script then perform automatic recovery for the failed NetWorker.

Taking over Backup Service

NetWorker-specific RMS configuration script and detector which monitors NetWorker server daemon cooperate with PRIMECLUSTER and it enables to takeover backup service.

If backup on the OPERATING node cannot be continued, backup operation is auto-switched from the OPERATING node to the STANDBY node. Then, the NetWorker server is automatically started on the STANDBY node (the new OPERATING node) and resumes backup service.

The new OPERATING node enables backup operation without changing NetWorker definition. Also, data that is backed up on the previous OPERATING node can be recovered on the new OPERATING node.

Virtual Client Backup

Data on the shared disk that PRIMECLUSTER manages can be backed up by using a virtual server name (logical node name).

The logical node name is a virtual name related to virtual IP address defined by takeover IP address of PRIMECLUSTER. Moreover, it is a name managed to support virtual NetWorker client, server, and storage node PRIMECLUSTER Wizard for NetWorker.

It is possible to treat NetWorker on the cluster system as a single similar system by using the logical node name. Therefore, it is possible to back up data on a shared disk from the standby node (new operation node) without the definition change of NetWorker even if failover is generated, and the backup data can be recovered from each node.

The logical node name can be specified each user application of the cluster. Therefore, data on a shared each disk can be backed up and recovered by logical node name treating each application as a single system even if in N:1 operation standby form or mutual standby form.

Local Backup of nodes within cluster

Data on a local disk of each node within the cluster can be backed up by using a physical node name of the node within the cluster.

A local disk of the STANDBY node can be backed up because the NetWorker client is operated on all nodes within the cluster. Moreover, the backup operation can be continued without the definition change of NetWorker even if failover is occurred.

Standby operation making about NetWorker client

The standby operation of the NetWorker client is achieved by running a necessary NetWorker client in operation/standby system when the cluster does failover in cooperation with PRIMECLUSTER.

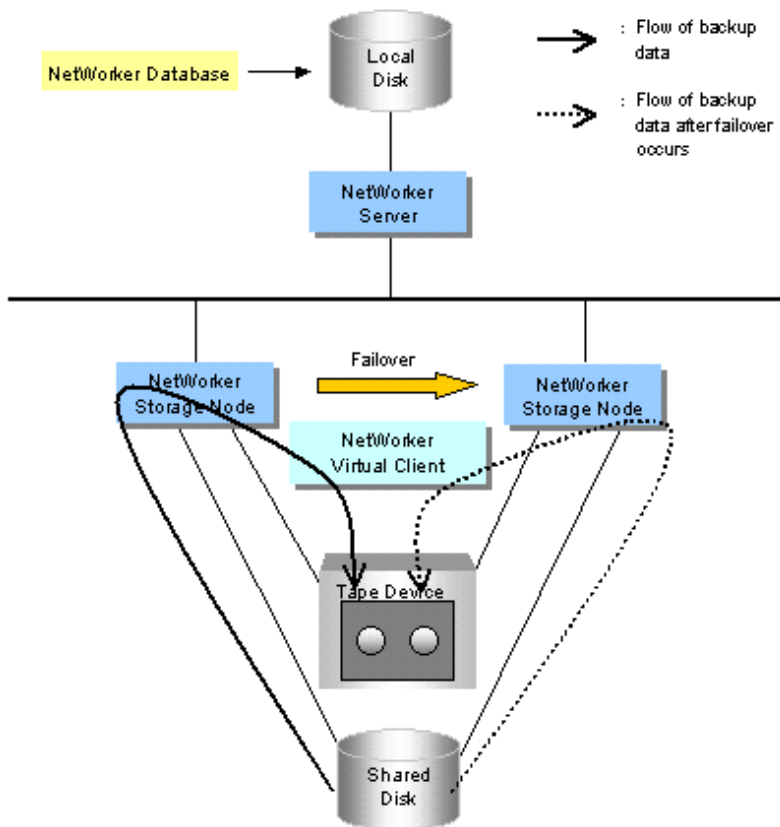


Note

NetWorker Server is a NetWorker Storage Node or NetWorker Client. Therefore NetWorker server includes function of storage node cluster or client cluster.

1.1.2 Storage Node Cluster Operation

Sharing tape library by clustering NetWorker Storage Node and NetWorker daemon-specific monitor improves availability of backup system on which NetWorker is used.



Clustering Storage Node improve backup availability on LAN-free with SAN environment.

To make NetWorker Storage Node a standby operation can take over functions that are provided by NetWorker Storage Node using by failover of PRIMECLUSTER without changing of NetWorker configurations.

Data can be backed up on logical node name likewise client cluster operation. Client daemon can also be monitored. Also, monitoring NetWorker daemon improves availability and reliability of data backup system.

Tape device can be shared between nodes that consist cluster system. NetWorker Dynamic Device Sharing Module is needed to share one tape device between nodes.

Note

NetWorker 7.4/7.5/7.6 does not support the high available storage node in any cluster systems. Therefore, the storage node cluster operation is not supported for NetWorker 7.4/7.5/7.6.

Virtual Client Backup

It can be backed up by a virtual client name (logical node name) like a server cluster operation.

Local Backup of nodes within cluster

It can be backed up by a physical client name like a server cluster operation.

Standby operation making about NetWorker client

The standby operation of the NetWorker client is achieved by running a necessary NetWorker client in operation/standby system when the cluster does failover in cooperation with PRIMECLUSTER.

Note

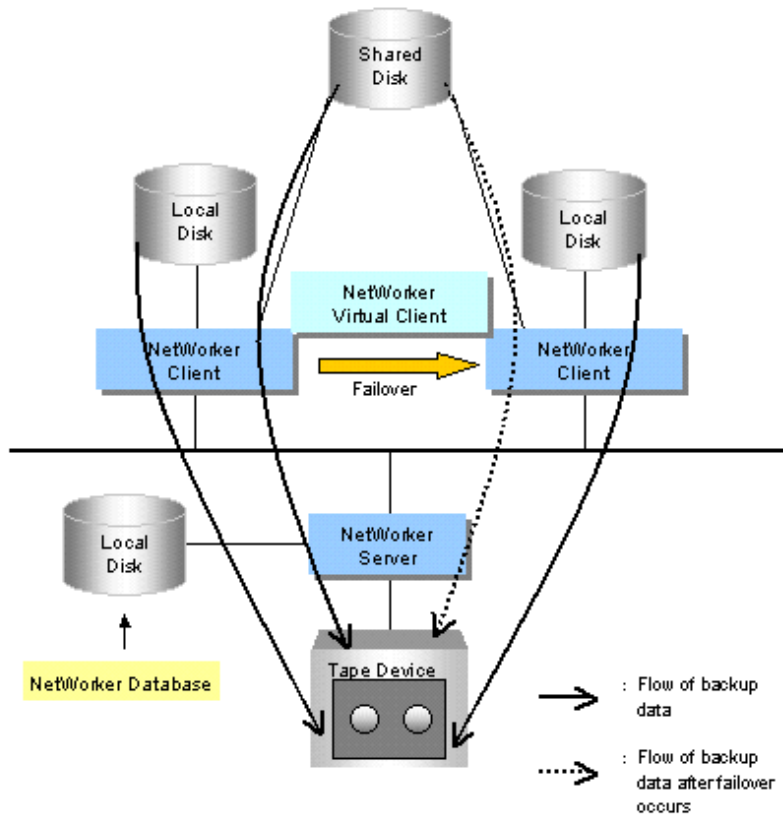
NetWorker Storage Node is a NetWorker Client. Therefore NetWorker server includes function of client cluster.

Information

For Server Cluster Operation, see “1.1.1 Server Cluster Operation”.

1.1.3 Client Cluster Operation

Client cluster operation enables backup user resource that is constructed on PRIMECLUSTER consistently in clustering environment. Using logical node name (virtual NetWorker client and server) enables backup after failover occurs without changing NetWorker definition.



Virtual Client Backup

It can be backed up by a virtual client name (logical node name) like a server cluster operation.

Local Backup of nodes within cluster

It can be backed up by a physical client name like a server cluster operation.

Standby operation making about NetWorker client

It can be standby operation making about NetWorker client like a storage node cluster.

Scalable operation making about NetWorker client

The scalable operation of the NetWorker client is achieved by running NetWorker client on every node within a cluster in cooperation with PRIMECLUSTER.

Moreover, the detector monitors the process of the NetWorker client, and notifies PRIMECLUSTER when fault occurs. Because the recovery feature of PRIMECLUSTER can be used, the availability of the backup operation system which uses NetWorker is improved.

Information

For Server Cluster Operation, see “[1.1.1 Server Cluster Operation](#)”.

For Storage Node Cluster Operation, see “[1.1.2 Storage Node Cluster Operation](#)”.

1.1.4 Discontinue Monitoring NetWorker Resources

The monitoring of NetWorker can be canceled by using the hynwdisable command.

When monitoring of the NetWorker resource is canceled, shutting down NetWorker without stopping the cluster application becomes possible. In this case, the state of the resource of NetWorker is Online. When monitoring NetWorker again, the hynwenable command is used.

Information

For detail of the NetWorker maintenance, see “[3.2 NetWorker Maintenance](#)”.

1.1.5 Client Operation of STANDBY Node

The NetWorker cluster application is Standby state in the STANDBY node within the cluster, and the NetWorker client runs there.

The detector monitors the NetWorker client in the STANDBY node. When the NetWorker client daemon stops abnormally in the STANDBY node, the NetWorker cluster application becomes Faulted state. Clearing Faulted state of the NetWorker cluster application makes the NetWorker client restart in the STANDBY node.

Moreover, if the NetWorker server starts by mistake in the STANDBY node, the detector regards the state as abnormal and reports that to RMS, and the NetWorker cluster application becomes Faulted state in that node.

1.2 Operating Environment

This section discusses the following PRIMECLUSTER operation modes in which NetWorker is operated.

1.2.1 Available Operation Modes on PRIMECLUSTER

The following tables show available operation modes on PRIMECLUSTER.

System Configuration	Standby operation				Scalable operation
	1:1 standby	N:1 standby	Mutual standby	Cascade	Scalable
Server Cluster Operation	runs	runs with condition (Note 1)	runs with condition (Note 1)	runs	not run
Storage Node Cluster Operation (Note 2)	runs	runs with condition (Note 1)	runs with condition (Note 1)	runs	not run
Client Cluster Operation	runs	runs with conditions	runs with conditions	runs	runs

System Configuration	Standby operation				Scalable operation
	1:1 standby	N:1 standby	Mutual standby	Cascade	Scalable
		(Note 1) (Note 3)	(Note 1) (Note 3)		

(Note 1) NetWorker cluster applications can not be operated simultaneously. However, standby operation between a NetWorker cluster application and other cluster applications can be run.

(Note 2) This operation is not supported for NetWorker 7.4/7.5/7.6.

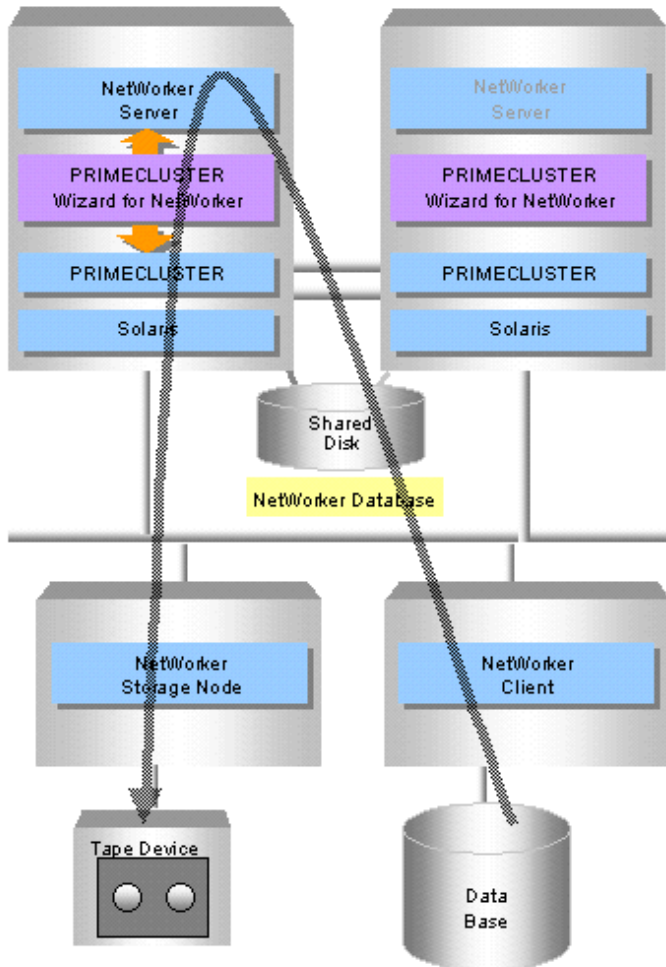
(Note 3) N:1 standby and mutual standby can be achieved by combining with the scalable operation of the NetWorker client. For details, see "1.2.2.3 Client cluster operation".

1.2.2 System Configuration

The following example shows the system configuration of the Server cluster operation, the Storage node cluster operation, and the Client cluster operation.

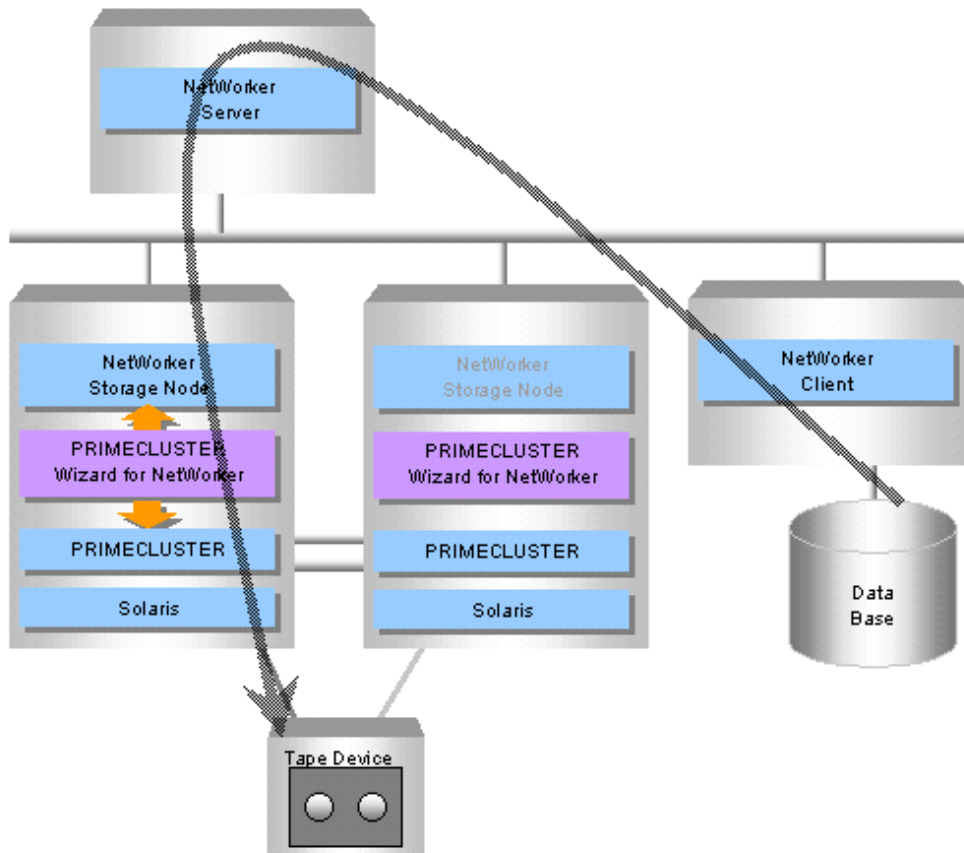
1.2.2.1 Server cluster operation

The following example shows the system configuration of the Server cluster operation.



1.2.2.2 Storage node cluster operation

The following example shows the system configuration of the Storage node cluster operation.



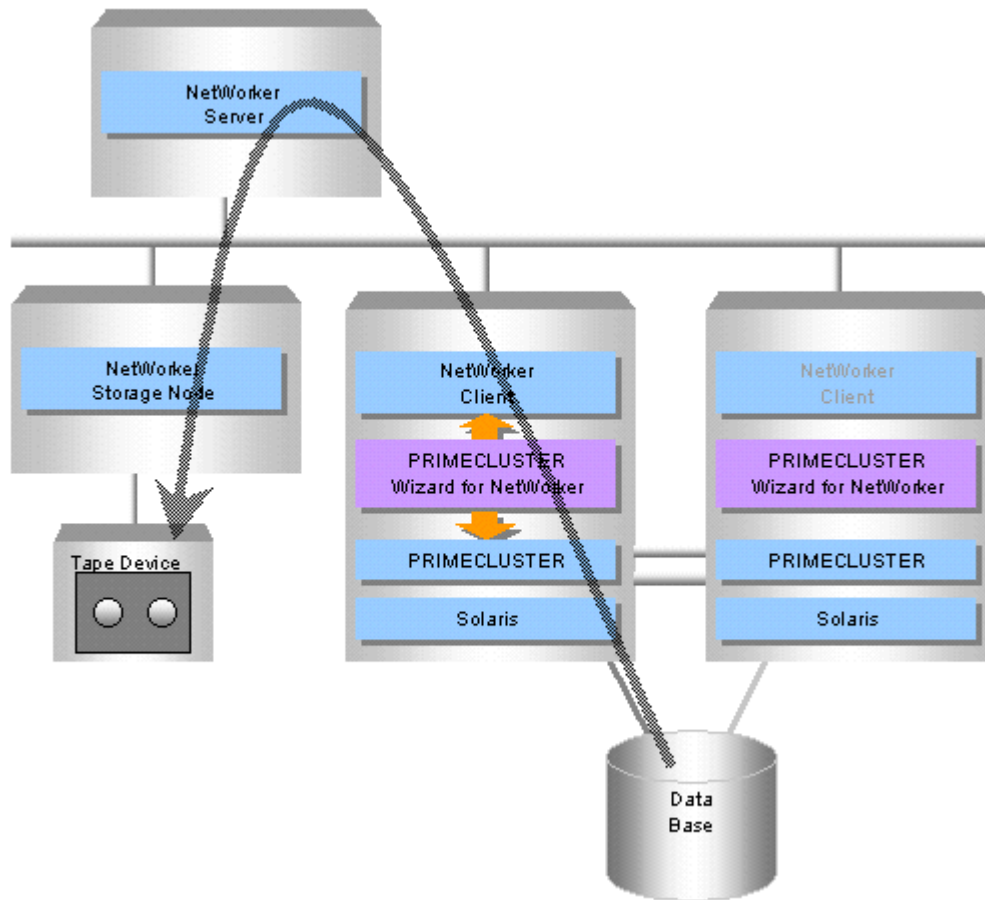
Note

NetWorker 7.4/7.5/7.6 does not support the high available storage node in any cluster systems. Therefore, the storage node cluster operation is not supported for NetWorker 7.4/7.5/7.6.

1.2.2.3 Client cluster operation

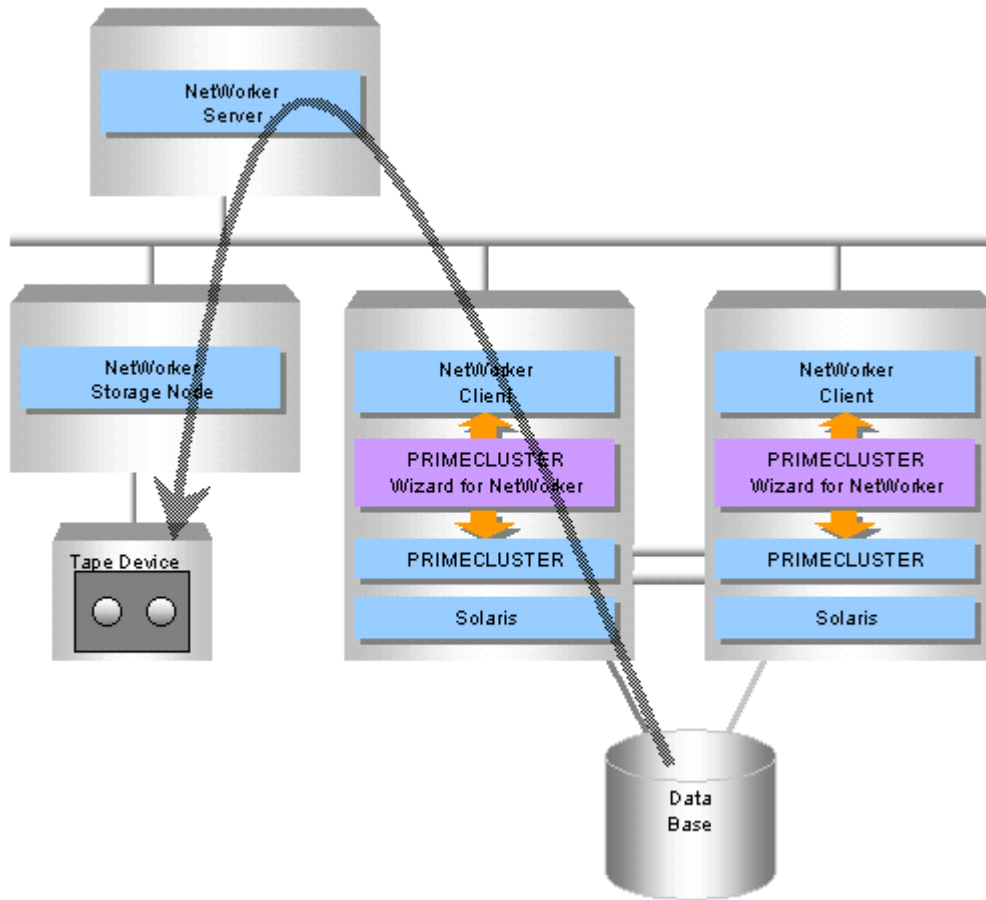
The following example shows the system configuration of the standby operation of the Client cluster operation.

- Standby operation(1:1 standby)



The following example shows the system configuration of the scalable operation of the Client cluster operation.

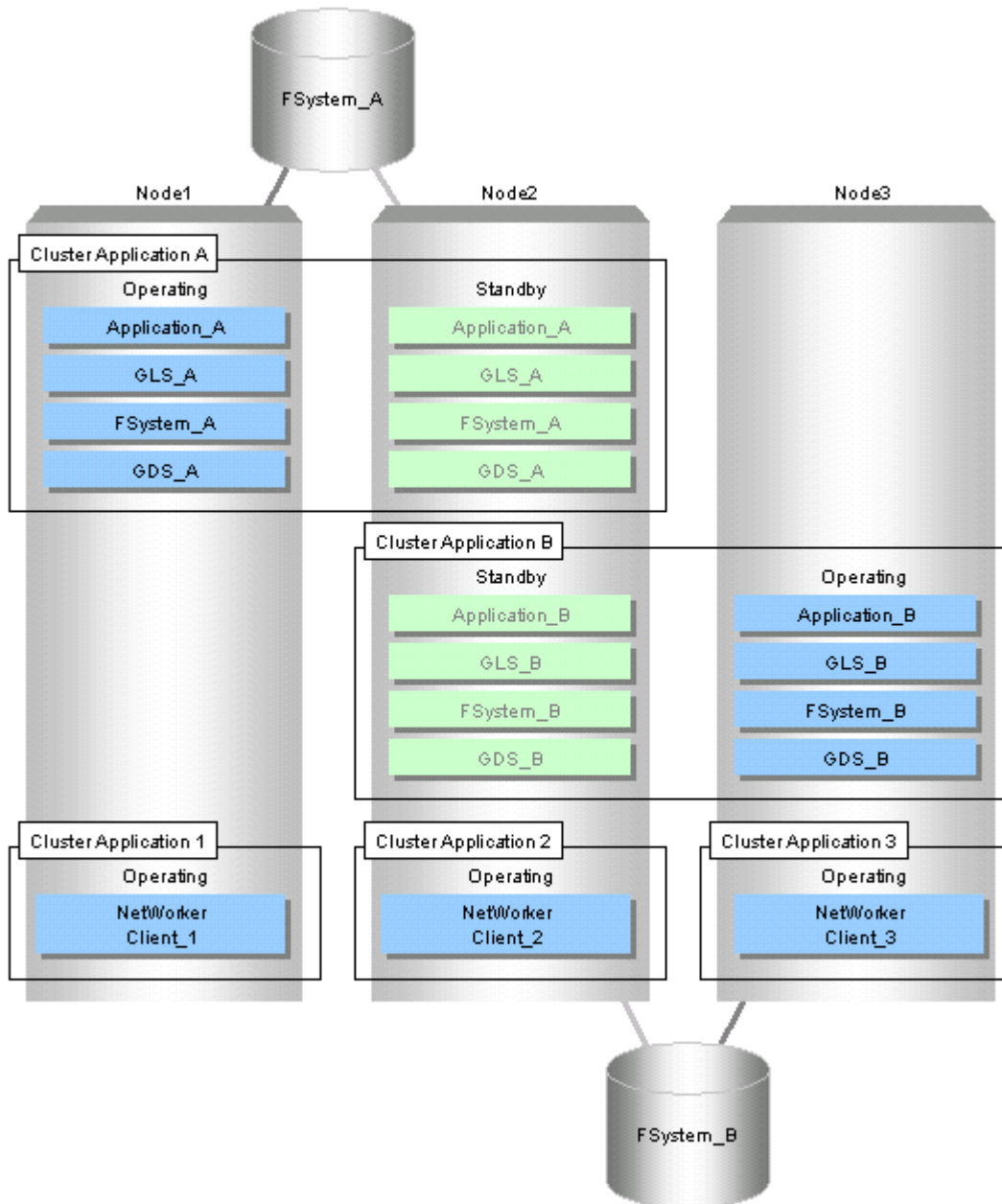
- Scalable operation



Data on the shared disk can be backed up on the node that the virtual client (logical node) is activated.

When you combine N:1 standby or mutual standby with the client cluster operation of NetWorker, configure the cluster applications which include no NetWorker resource of N:1 standby or mutual standby, and configure the cluster applications which include NetWorker resources of scalable operation besides them.

The following example shows the cluster applications of combining N:1 standby with the scalable operation of the NetWorker client.



Data of every node is able to be backed up whichever node the cluster applications except NetWorker are operated on because the NetWorker client is running on every node.

Chapter 2 Setting and Installation

2.1 Environment Setup

This section explains a general setup procedure of Server cluster operation or Storage node cluster operation or Client cluster operation on a PRIMECLUSTER system.

Server cluster operation

No	Procedure		Refer to
	One Arbitrary Node	Other Nodes	
1	Install and configure PRIMECLUSTER	Install and configure PRIMECLUSTER	2.2
2	Install PRIMECLUSTER Wizard for NetWorker	Install PRIMECLUSTER Wizard for NetWorker	2.2
3	Create userApplication	-	2.3
4	Install NetWorker	Install NetWorker	2.4
5	Define Logical Node Name	Define Logical Node Name	2.5
6	Create and set up NetWorker resources	-	2.6
7	Configure NetWorker	-	2.7
8	Register NetWorker License	-	2.8

Storage node cluster operation(NetWorker 7.2)

No	Procedure		Refer to
	One Arbitrary Node	Other Nodes	
1	Install and configure PRIMECLUSTER	Install and configure PRIMECLUSTER	2.2
2	Install PRIMECLUSTER Wizard for NetWorker	Install PRIMECLUSTER Wizard for NetWorker	2.2
3	Create userApplication	-	2.3
4	Install NetWorker	Install NetWorker	2.4
5	Define Logical Node Name	Define Logical Node Name	2.5
6	Create and set up NetWorker resources	-	2.6
7	Configure NetWorker	-	2.7



Note

NetWorker 7.4/7.5/7.6 does not support the high available storage node in any cluster systems. Therefore, the storage node cluster operation is not supported for NetWorker 7.4/7.5/7.6.

Client cluster operation

No	Procedure		Refer to
	One Arbitrary Node	Other Nodes	
1	Install and configure PRIMECLUSTER	Install and configure PRIMECLUSTER	2.2

No	Procedure		Refer to
	One Arbitrary Node	Other Nodes	
2	Install PRIMECLUSTER Wizard for NetWorker	Install PRIMECLUSTER Wizard for NetWorker	2.2
3	Create userApplication	-	2.3
4	Install NetWorker	Install NetWorker	2.4
5	Define Logical Node Name	Define Logical Node Name	2.5
6	Create and set up NetWorker resources	-	2.6
7	Configure NetWorker	-	2.7

2.2 PRIMECLUSTER Installation and Configuration

Set up hardware

Set up hardware required for PRIMECLUSTER.

Install software

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

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

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

Configure a cluster system

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

Setting Shared Disk Device

A shared disk that is shared between cluster nodes must be defined to construct NetWorker cluster environment.



Information

How to set up shared disk, see “PRIMECLUSTER Installation and Administration Guide”.



Note

Do not specify “/nsr” for a mount point of a shared disk.

/etc/vfstab file

Define disk mount information that is shared by cluster application.

Setting network

To setup cluster environment on NetWorker, use takeover IP address as takeover network.



Information

How to set up network, see “PRIMECLUSTER Installation and Administration Guide”.

/etc/hosts file

Define the logical node name that corresponds to the takeover IP address.

2.3 userApplication Creation

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

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

The term "userApplication" means "cluster application".

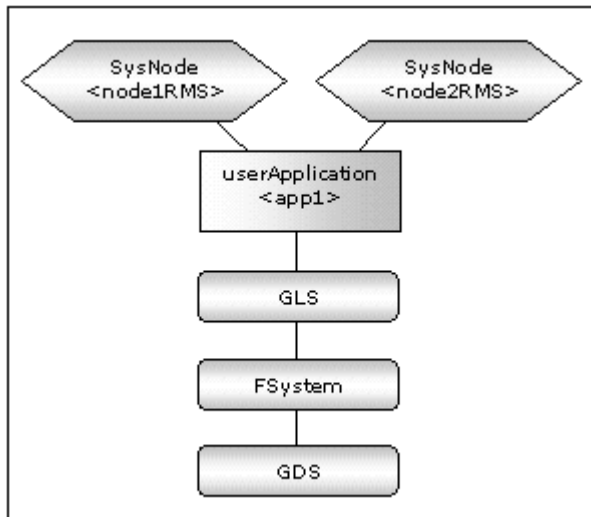
Information

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

- Standby operation

A userApplication is configured as follows.

Create a NetWorker resource after NetWorker is installed.



Information

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

Attributes	Values
AutoStartUp	Yes
AutoSwitchOver	HostFailure ResourceFailure ShutDown
PersistentFault	1
StandbyTransitions	ClearFaultRequest StartUp SwitchRequest
HaltFlag	Yes

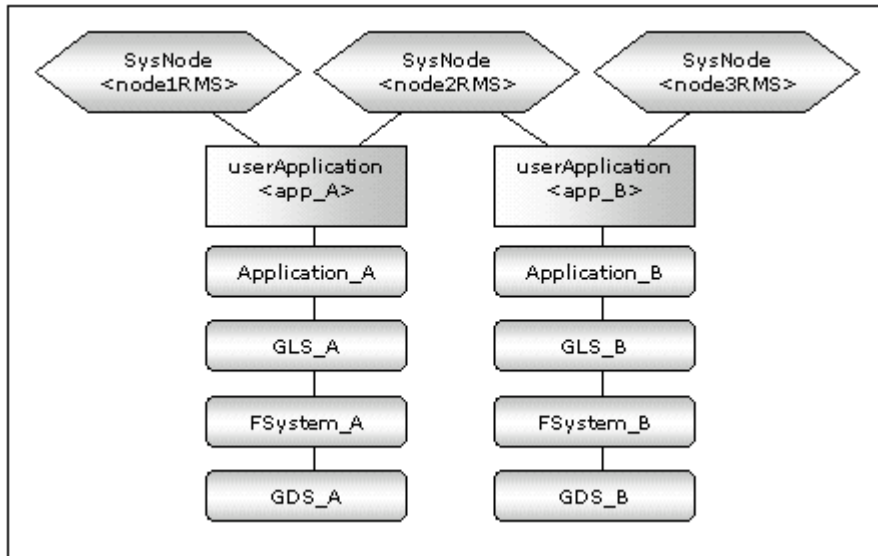
Note

“StandbyTransitions“ must be configured as above so that the NetWorker client daemons run on the STANDBY node.

- Scalable operation(Only client cluster operation)

When you combine N:1 standby or mutual standby with the scalable operation of NetWorker client shown by "1.2.2.3 Client cluster operation ", create the resources except NetWorker and userApplications which include them.

Create NetWorker resources and the userApplications which include them after NetWorker is installed.

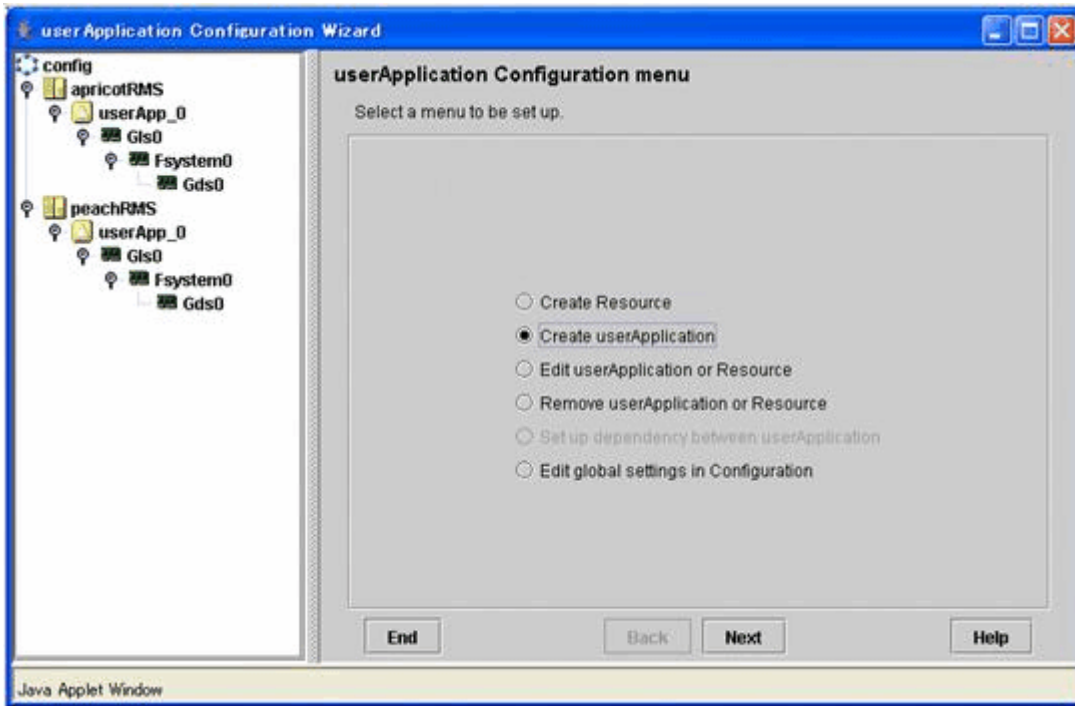


Information

Setup attributes of the userApplications which include no NetWorker resource according to the requirement of each application.

2.3.1 Configuration-Generate and Configuration-Activate

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



2.3.2 userApplication Operation Check

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

- Shared disk
Check if you can access to the shared disk from the OPERATING node.
- Takeover network
Check if you can access the OPERATING node from the client by the logical node name related to the takeover IP address.

Information

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

2.4 NetWorker Installation

2.4.1 NetWorker Installation

Install the NetWorker software. The packages installed for the server cluster operation, the storage node cluster operation, and the client cluster operation is different.

Note

- Don't input anything to the following input requirements when you install NetWorker.
“Enter the first NetWorker server's name [no more]”
- Specify "no" for the following input requirements when you install NetWorker.
“Start NetWorker daemons at end of install [yes]”
- Change the file name of the rc script of NetWorker as follows after installing NetWorker 7.4/7.5/7.6.

```
# mv /etc/rc3.d/S95networker /etc/rc3.d/FJ5Vclntw.S95networker
```

Information

- For detail of the NetWorker Installation, see the NetWorker manuals.
- The system configurations applied when NetWorker starts can be defined. See "[2.9.1 Definition of Operation Environment at NetWorker Startup](#)".

2.4.1.1 Server cluster operation

Install the following NetWorker softwares in each node. If necessary, install other packages (online manual etc.).

Package	NetWorker Software
LGTOclnt	Client
LGTOdrv*	Driver
LGTONode	Storage Node
LGTOserv	Server

* NetWorker 7.4/7.5/7.6 has no driver.

Install the NetWorker software in the local disk of each node. Make the NetWorker directory that is not /nsr (where administrative information of NetWorker and the online indexes are stored) on the local disk of each node.

Note

- It is necessary to recognize the NetWorker server as one of the NetWorker clients. Therefore, it is necessary to install LGTOclnt.
- It is necessary to install LGTOclnt earlier than LGTOserv.
- In case you use the NetWorker Console server on a node of the cluster, create the NetWorker Console database in the disk that NetWorker can always access to (a local disk, and so on).

2.4.1.2 Storage node cluster operation

Install the following NetWorker softwares in each node. If necessary, install other packages (online manual etc.).

Package	NetWorker Software
LGTOclnt	Client
LGTOdrv	Driver
LGTONode	Storage Node

Install NetWorker in the local disk of each node. Make the NetWorker directory for an arbitrary directory on the local disk of each node.

Note

- Do not install LGTOserv (NetWorker server).
- It is necessary to recognize the NetWorker storage node as one of the NetWorker clients. Therefore, it is necessary to install LGTOclnt.
- It is necessary to install LGTOclnt earlier than LGTONode.
- NetWorker 7.4/7.5/7.6 does not support the high available storage node in any cluster systems. Therefore, the storage node cluster operation is not supported for NetWorker 7.4/7.5/7.6.

2.4.1.3 Client cluster operation

Install the following NetWorker software in all nodes to be backed up. If necessary, install other packages (online manual etc.).

Package	NetWorker Software
LGTOclnt	Client

Install NetWorker in the local disk of each node. Make the NetWorker directory for an arbitrary directory on the local disk of each node.

Note

- Do not install LGTOserv (NetWorker server).
- In case you use the NetWorker Console server on a node of the cluster, create the NetWorker Console database in the disk that NetWorker can always access to (a local disk, and so on).

2.4.2 Setup NetWorker Directory (/nsr)

In the case of the server cluster operation, the NetWorker directory (where administrative information and the online indexes of NetWorker are stored) is as follows and /nsr becomes a symbolic link that points the NetWorker directory.

- OPERATING node

The NetWorker daemons start using the NetWorker directory on the shared disk. In this case, /nsr becomes a symbolic link that points the NetWorker directory.

- STANDBY node

The NetWorker client daemon starts using the NetWorker directory on the local disk. In this case, /nsr becomes a symbolic link that points the NetWorker directory.

Note

/nsr can not be used as the NetWorker directory because /nsr needs to be a symbolic link as above.

For the procedure for copying the NetWorker directory from the local disk to the shared disk, see “[2.4.2.1 Setup Shared NetWorker Directory](#)”.

Note

This setting is necessary only for server cluster operation.

2.4.2.1 Setup Shared NetWorker Directory

Copy the NetWorker directory from the local disk to the shared disk.

Example

1. Start the userApplication up for mount the shared disk.
2. Copy the NetWorker directory from the local disk to the shared disk.

```
# cp -Rp /var/nsr /mnt
```

3. Stop the userApplication to unmount the shared disk.

Information

You can use `/etc/opt/FJSSVclntw/bin/nwclntwadd` command to copy the NetWorker directory. For detail of `nwclntwadd` command, see ["4.4 nwclntwadd - Copy of NetWorker Directory"](#).

2.5 Defining Logical Node Name

Define the logical node name of the NetWorker clients to be backed up.

The logical node name is defined in the logical node name management file of PRIMECLUSTER Wizard for NetWorker.

```
/etc/opt/FJSSVclntw/etc/clnwc.env
```

Information

The node that is the NetWorker server is also the node that is the NetWorker client. Therefore, resources on the shared disk that is shared on the NetWorker servers are backed up for the virtual client (the virtual server).

To backup resource on the shared disk which is shared on the NetWorker server, the logical node name for client cluster operation (the virtual client) must be defined.

Note

- Define the logical node name in the all nodes where PRIMECLUSTER Wizard for NetWorker is installed.
- The logical node name related to the takeover IP address must be set in `/etc/hosts` file.
- When the backup is operated, a part of the NetWorker directory on the shared disk that the NetWorker server daemon uses is backed up automatically. Therefore, the definition of the logical node name for the userApplication that the NetWorker resource belongs is needed.
- When the logical node name is not defined, all the data on the shared disk and on the local disk is backed up to the indexes of the physical node name.
- When the logical node name is not defined, the server cluster cannot be operated.
- Do not define the logical node name of PRIMECLUSTER Wizard for NetWorker when you use node name takeover of takeover network resource of PRIMECLUSTER.

2.5.1 Logical Node Name Management File

Logical node name management file is used to define the logical node name of the NetWorker Client.

Description style

ApplicationName, LogicalNodeName, ClusterMntFileName, RawDeviceListFileName

Description

Enter ‘,’ between each file name and enter all the file name within one line. ApplicationName, LogicalNodeName, ClusterMntFileName, RawDeviceListFileName.

RawDeviceListFileName can be omitted.

Define the logical node name for each cluster application. If there is more than one logical node name, enter them by multiple lines for each cluster application.

Space and characters between ”#” to the end of a line are ignored.

Parameter

- ApplicationName:

Enter the name of the NetWorker client application.
This cannot be omitted.

- LogicalNodeName:

Specify the logical node name (hostname) that is related to the takeover IP address created on IP application (defined on /etc/hosts file).
This cannot to be omitted.
Specify the logical node name that is defined as the virtual client name at the definition of the NetWorker client to backup the shared disk.

- ClusterMntFileName:

Specify the pathname for the cluster mount information file.
This cannot be omitted.

Information

How to create cluster mount information file, see "[2.5.2 Cluster Mount Information File](#)".

- RawDeviceListFileName:

Specify the pathname for the raw device path list file.
Write to this file for backup the shared disk as raw device.
If the shared disk is backed up as file system, pathname is not required to be written.

Information

For detail of the raw device path list file, see "[2.5.3 Raw Device Path List File](#)".

Example

The following example shows the definition for the standby operation(1:1 standby).

Define the logical node name on both nodes.

```
# Logical Node Name Management File
# All Rights Reserved, Copyright Fujitsu 2003-2006
# ApplicationName, LogicalNodeName, ClusterMntFileName, RawDeviceListFileName
# userApp_0, v_hostname, /etc/opt/FJSPVclntw/etc/vfstab_userApp_0, /etc/opt/FJSPVclntw/etc/
raw_list_userApp_0
userApp_0, v_hostname1, /home/vfstab_userApp_0, /home/raw_list_userApp_0
```

Example

The following example shows the definition for combining N:1 standby with scalable operation.

Define the logical node name on each node that the logical node is activated.

Node1(node1RMS)

```
# Logical Node Name Management File
# All Rights Reserved, Copyright Fujitsu 2003-2006
# ApplicationName, LogicalNodeName, ClusterMntFileName, RawDeviceListFileName
# userApp_0, v_hostname, /etc/opt/FJSPVclntw/etc/vfstab_userApp_0, /etc/opt/FJSPVclntw/etc/
```

```
raw_list_userApp_0
userApp_A , v_hostnameA , /home/vfstab_userApp_A , /home/raw_list_userApp_A
```

Node2(node2RMS)

```
# Logical Node Name Management File
# All Rights Reserved, Copyright Fujitsu 2003-2006
# ApplicationName, LogicalNodeName, ClusterMntFileName, RawDeviceListFileName
# userApp_0, v_hostname, /etc/opt/FJSVclntw/etc/vfstab_userApp_0, /etc/opt/FJSVclntw/etc/
raw_list_userApp_0
userApp_A , v_hostnameA , /home/vfstab_userApp_A , /home/raw_list_userApp_A
userApp_B , v_hostnameB , /home/vfstab_userApp_B , /home/raw_list_userApp_B
```

Node3(node3RMS)

```
# Logical Node Name Management File
# All Rights Reserved, Copyright Fujitsu 2003-2006
# ApplicationName, LogicalNodeName, ClusterMntFileName, RawDeviceListFileName
# userApp_0, v_hostname, /etc/opt/FJSVclntw/etc/vfstab_userApp_0, /etc/opt/FJSVclntw/etc/
raw_list_userApp_0
userApp_B , v_hostnameB , /home/vfstab_userApp_B , /home/raw_list_userApp_B
```

2.5.2 Cluster Mount Information File

Cluster mount information file is used to define file system on the shared disk that is backed up on logical node.

Format of this file must be followed to /etc/vfstab file.

Create cluster mount information file by the following procedure.

1. Copy template file of cluster mount information file (/etc/opt/FJSVclntw/etc/vfstab.draft file) on cp (1).

```
# cp -p /etc/opt/FJSVclntw/etc/vfstab_draft /home/vfstab_userApp_0
```

If there is no file system on the shared disk on which data is backed up, procedure for creating a file is complete.

If file system is on the shared disk on which data is backed up, execute procedure 2.

2. Edit a file by using vi(1).

```
# vi /home/vfstab_userApp_0
```

Example

```
# Cluster mount information file
# All Rights Reserved, Copyright Fujitsu 2003-2006
#
# device device mount FS fsck mount mount
# to mount to fsck point type pass at boot options
# /dev/dsk/c0t0d0s5 /dev/rdisk/c0t0d0s5 /vol1 ufs - no -
/dev/sfdsk/class0001/dsk/volume0001 /dev/sfdsk/class0001/rdisk/volume0001 /mnt ufs - no
-
```

2.5.3 Raw Device Path List File

raw device path list file is used to define raw device to be backed up.

This file is required for backup shared disk as raw device.

This file must be created on each logical node.

To edit this file, copy template of raw device path list

File (/etc/opt/FJSVclntw/etc/raw_list) on cp(1) and use vi(1).

Description style

raw device path

Description

Write down raw device path in one line.

If there is more than one raw device path, write them in multiple lines.

Characters in between ”#” to enter and spaces are ignored.

Parameter

- raw device path:

Specify path name of raw device on which data is backed up if shared disk is backed up as raw device.



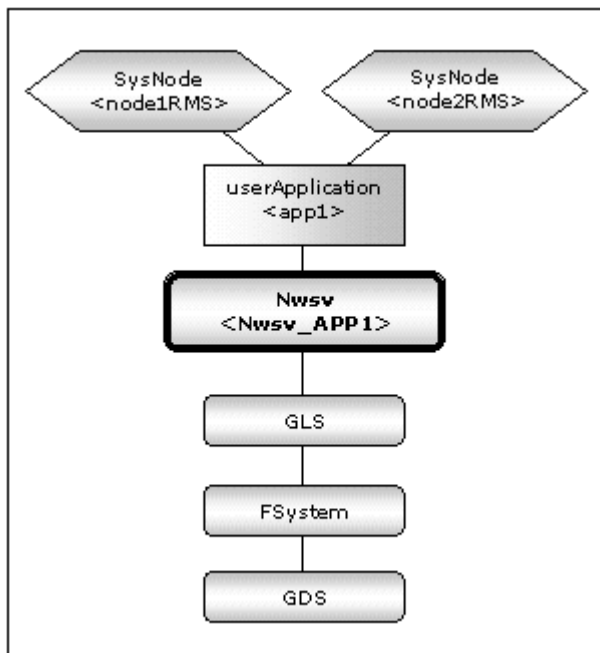
Example

```
# Raw Device Path List File
# All Rights Reserved, Copyright Fujitsu 2003
# RawDevicePath
# /dev/rdisk/c1t0d0s5
/dev/rdsk/c2t1d0s0
/dev/rdsk/c2t1d0s1
```

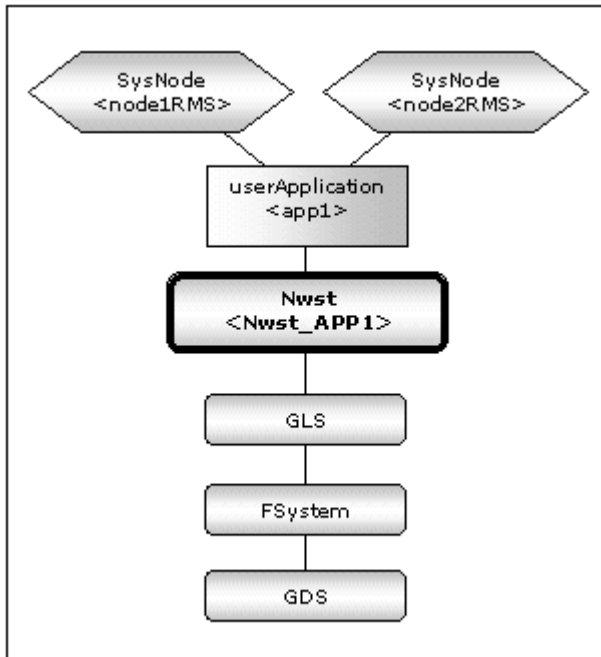
2.6 NetWorker Resource Creation and Setting

Register NetWorker resources in userApplication that is created at “2.3 userApplication Creation”.

- Server cluster operation



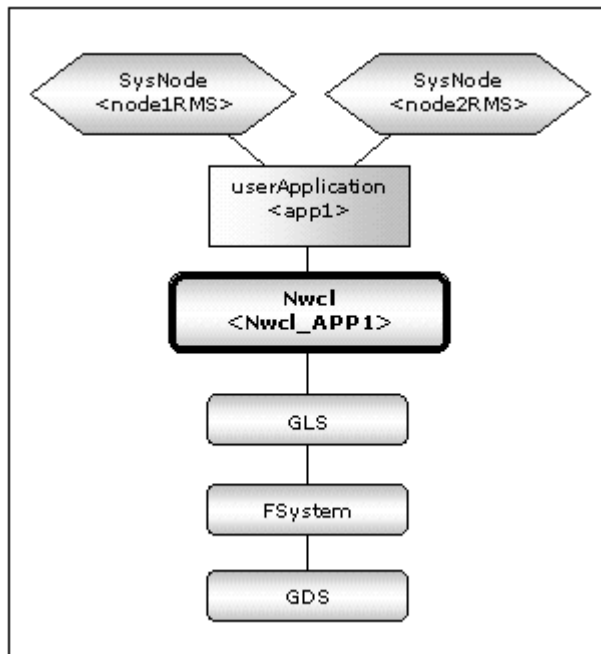
- Storage node cluster operation



 Note

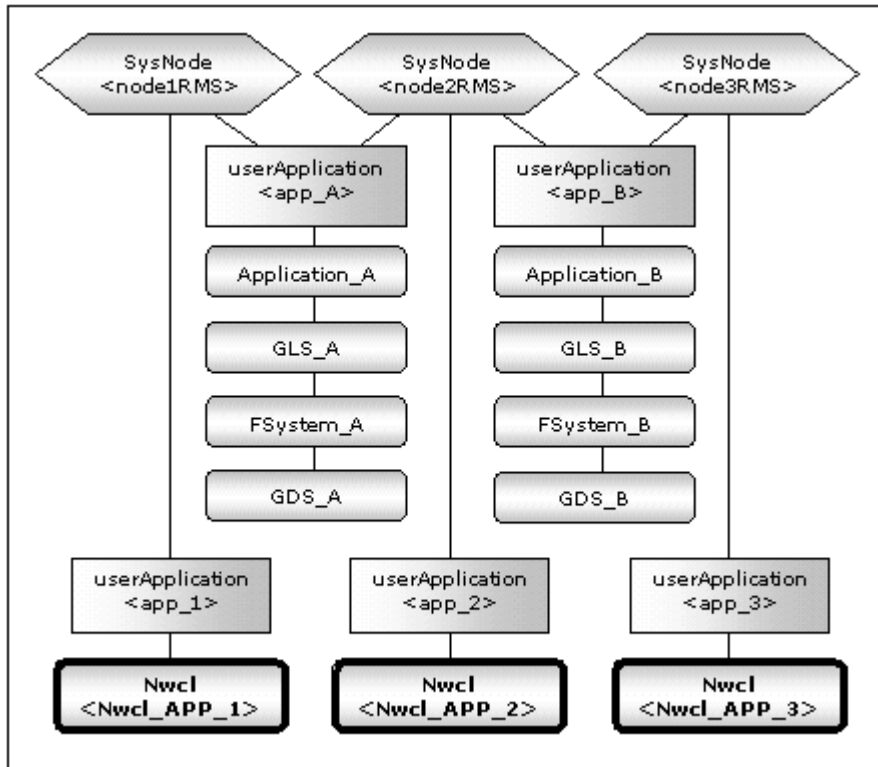
NetWorker 7.4/7.5/7.6 does not support the high available storage node in any cluster systems. Therefore, the storage node cluster operation is not supported for NetWorker 7.4/7.5/7.6.

- Client cluster operation(Standby operation)



- Client cluster operation(Scalable operation)

When you combine N:1 standby or mutual standby with the scalable operation of NetWorker client shown by "[1.2.2.3 Client cluster operation](#)", create NetWorker resources and the userApplications which include them.



Information

At scalable operation, the following setup values are recommended for the userApplications which include NetWorker resources. The other attributes not described below are optional.

Attributes	Values
AutoSwitchOver	No
PersistentFault	1
StandbyTransitions	No
HaltFlag	No

Note

Before starting this procedure, RMS on all the cluster nodes should stop.

Information

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

2.6.1 userApplication with NetWorker Resources

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

- Standby operation

The flow of userApplication creation is as follows:

1	userApplication delete
2	Resources creation
3	userApplication creation

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

Information

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

- Scalable operation(Only client cluster operation)

Create NetWorker resources and userApplications which include them.
The flow of userApplication creation is as follows:

1	Resources creation
2	userApplication creation

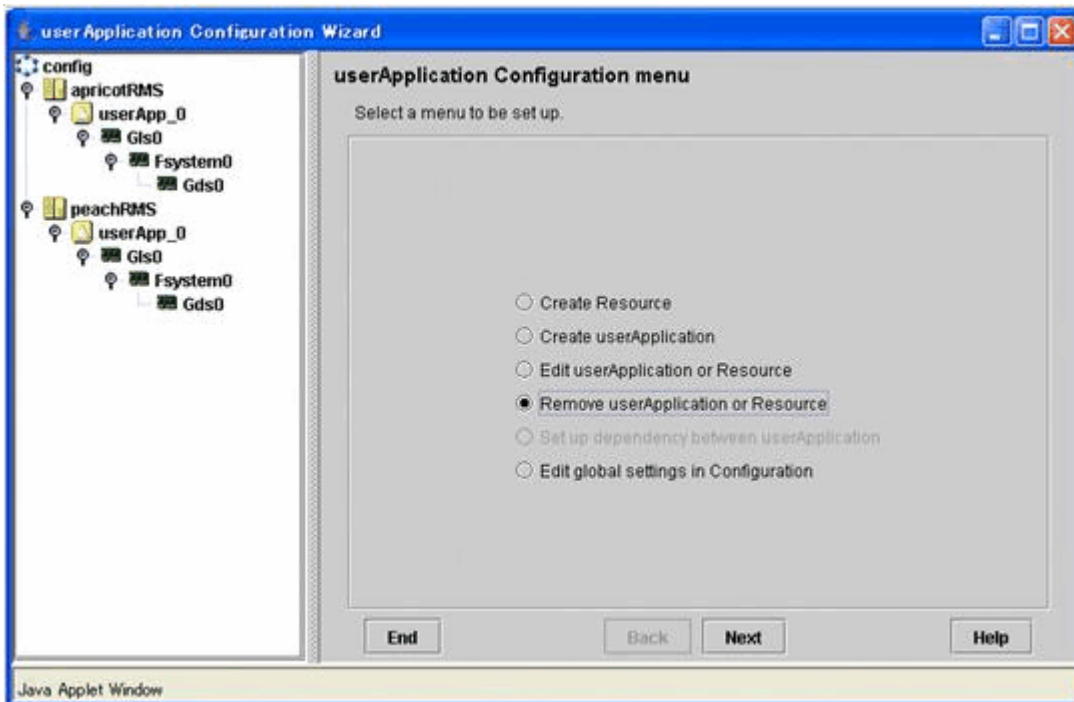
The userApplications which include no NetWorker resource do not need to be deleted.
This section explains only about “1. Resources creation”.

Information

For further details of “2. userApplication creation”, see “6.6 Setting Up Cluster Applications” of the “PRIMECLUSTER Installation and Administration Guide”.

2.6.1.1 userApplication Removing

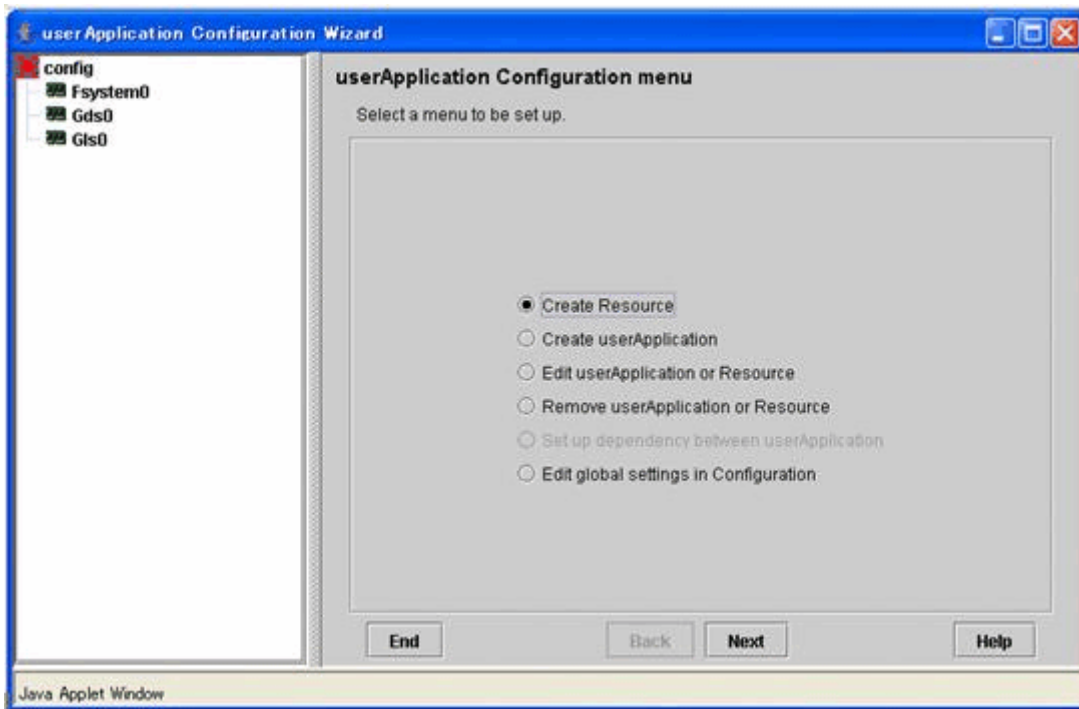
Select “Remove userApplication or Resource” in the “userApplication Configuration menu”, delete an userApplication only.



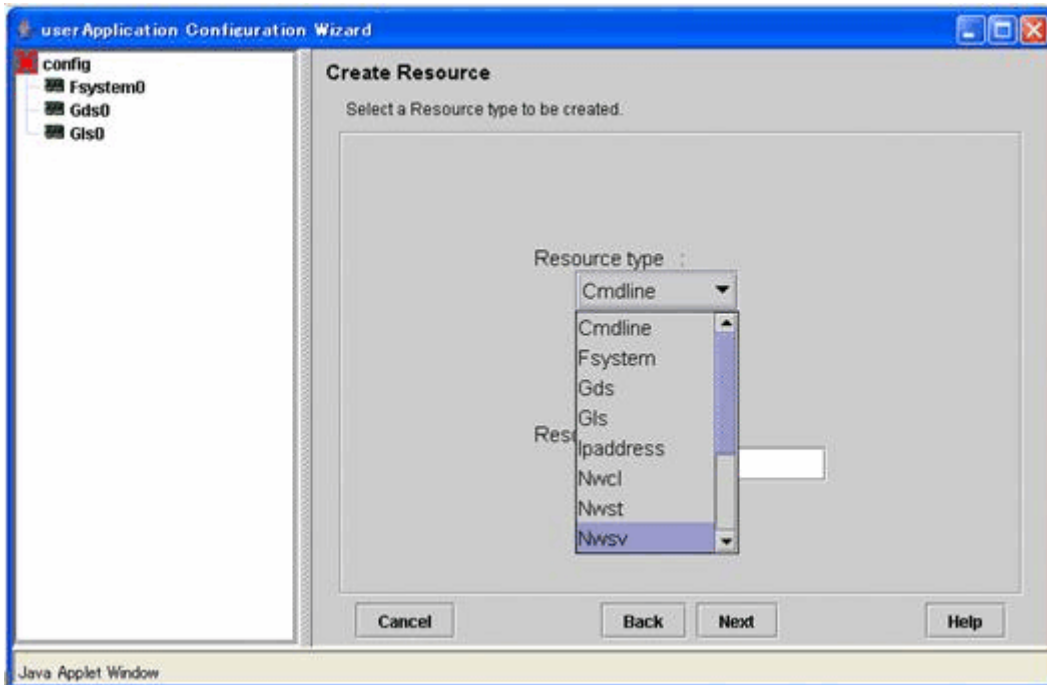
2.6.1.2 Server cluster operation

This section explains a setup procedure of NetWorker Server cluster operation.

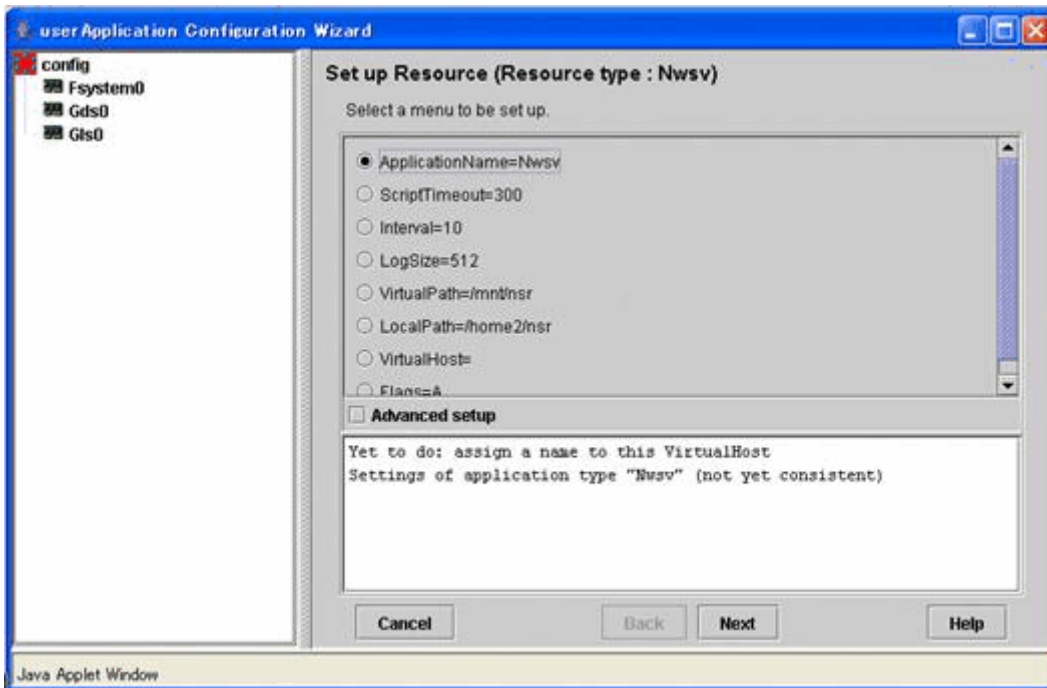
1. Select “Create Resource” in the “userApplication Configuration” menu.



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



3. Set attributes in the “Nwsv” setup screen.



Attributes	Description
ScriptTimeout	default_value[:[offline_value][:online_value]] Default 300 (60 - 86400) Specify timeout period for launching of Online/Offline processing. When the timeout time passes, RMS transmits the stop signal to the script. Timeout value of OfflineScript (offline_value) and OnlineScript (online_value) can be separately set.
Interval	Default 10 (5 - 60) Specify interval time for monitoring NetWorker.
LogSize	Default 512 (10 - 4096) Specify the size of the log files for the script and the detector. If size is over the range of specified size, change the name to *.old and create a new file.
VirtualPath	Specify the pathname of the NetWorker directory on the shared disk. /nsr cannot be specified for VirtualPath because /nsr needs to be a symbolic link that points the NetWorker directory.
LocalPath	Specify the pathname of the NetWorker directory on the local disk. The initial value is the directory pointed by the symbolic link /nsr, and it does not usually need to be changed. /nsr cannot be specified for VirtualPath because /nsr needs to be a symbolic link that points the NetWorker directory.
VirtualHost	The logical node name that the NetWorker server uses is set. As for the initial value, the logical node name defined by " 2.5 Defining Logical Node Name " is displayed. Make a set content a blank when you use node name takeover of takeover network resource of PRIMECLUSTER.

Attributes		Description
Flags	NullDetector(D)	Select whether or not the NetWorker resource is monitored. If it is enabled, the resource is not monitored. In that case, Standby processing is not performed and the NetWorker resource is Offline state in the STANDBY node. Therefore, the NetWorker client does not run in the STANDBY node. As default, the setting is disabled and the NetWorker resource is monitored.
	WarningOnly(W)	Select whether or not failover is performed. If it is enabled, when the NetWorker resource failure occurs, the NetWorker resource which is Online state becomes Warning state, and the NetWorker resource which is Standby state becomes Faulted state. In any case, failover is not performed. As default, the setting is disabled and failover is performed.
	AutoRecover(A)	Select whether or not recovering the NetWorker resource is attempted before failover in the event of NetWorker resource failure. If it is enabled, the NetWorker resource is recovered and NetWorker is restarted. As default, the setting is enabled and the NetWorker resource is recovered.
DeviceName		Specify device pathname of tape devices. If this is specified, SCSI reset is performed to specified devices just before NetWorker starts. The setting must be specified to share tape devices on SCSI multi-initiate connection. If more than one tape device exist, specify by entering ":" between device pathname.
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

Point

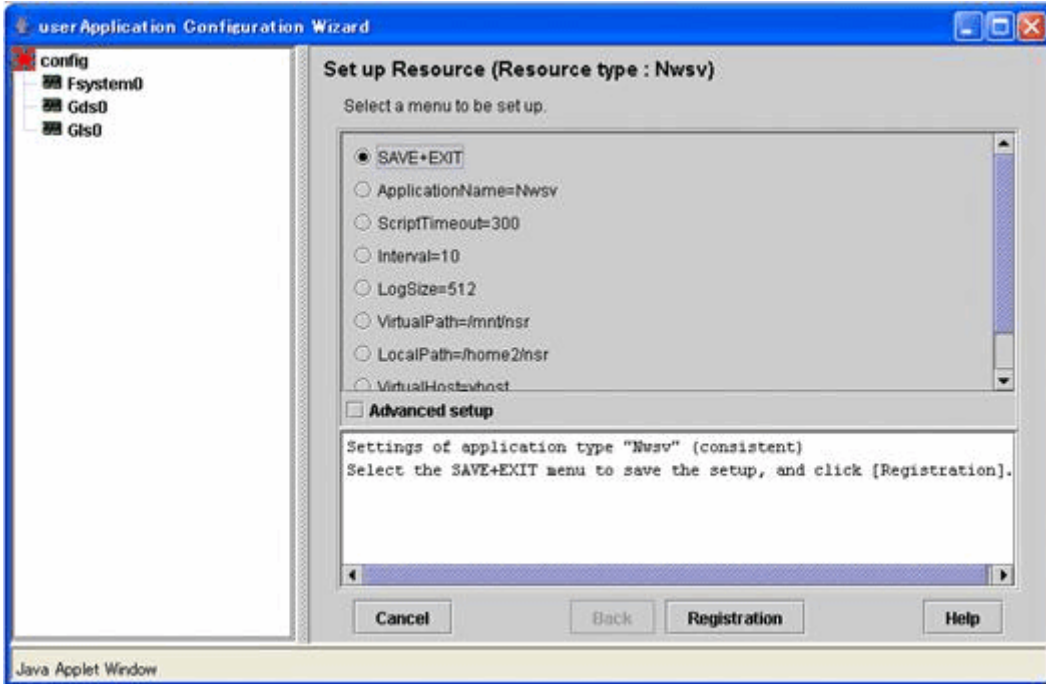
- For details about PreOnlineScript, PostOnlineScript, PreOfflineScript, PostOfflineScript, FaultScript, see "2.9.2 NetWorker Online/Offline Script".
- For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".

Note

- If NullDetector is enabled, the WarningOnly and AutoRecover attribute is automatically disabled.

- Flags=<Abbreviation> indicates that the flag attribute is enabled.

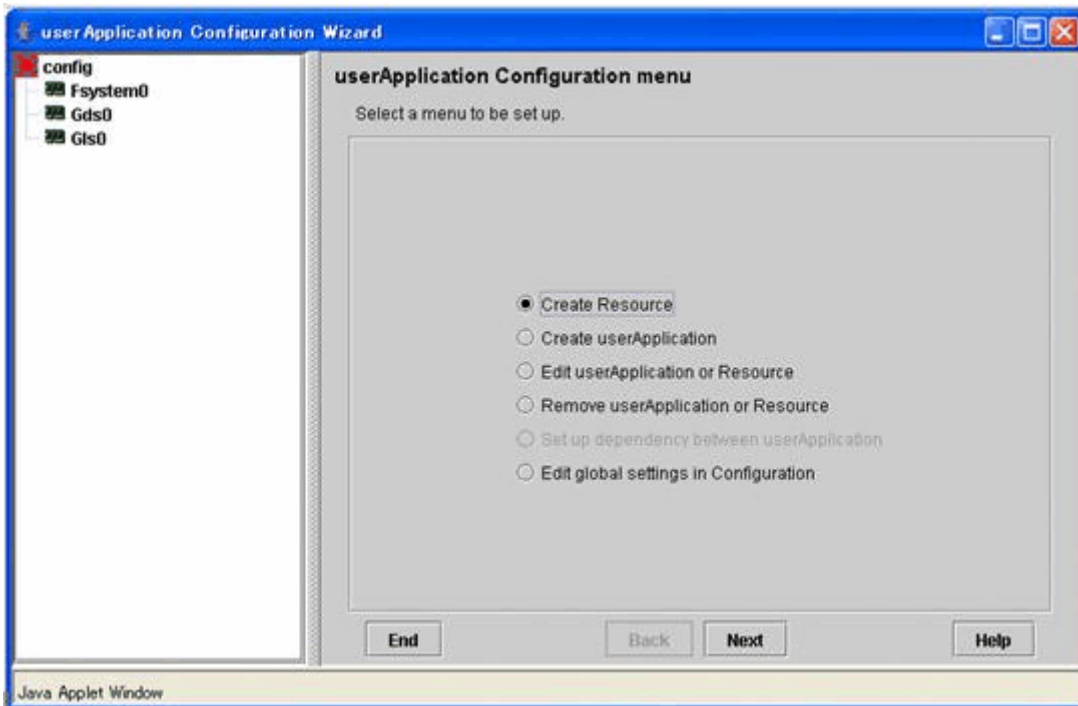
4. Save the settings by selecting "SAVE+EXIT".



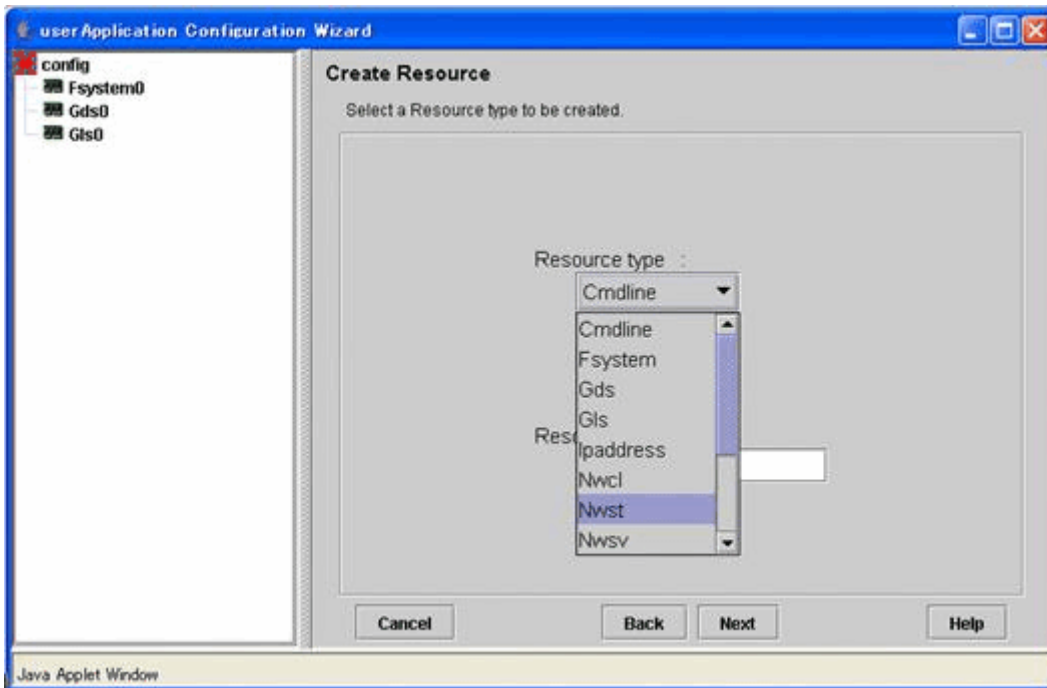
2.6.1.3 Storage node cluster operation

This section explains a setup procedure of NetWorker Storage node cluster operation.

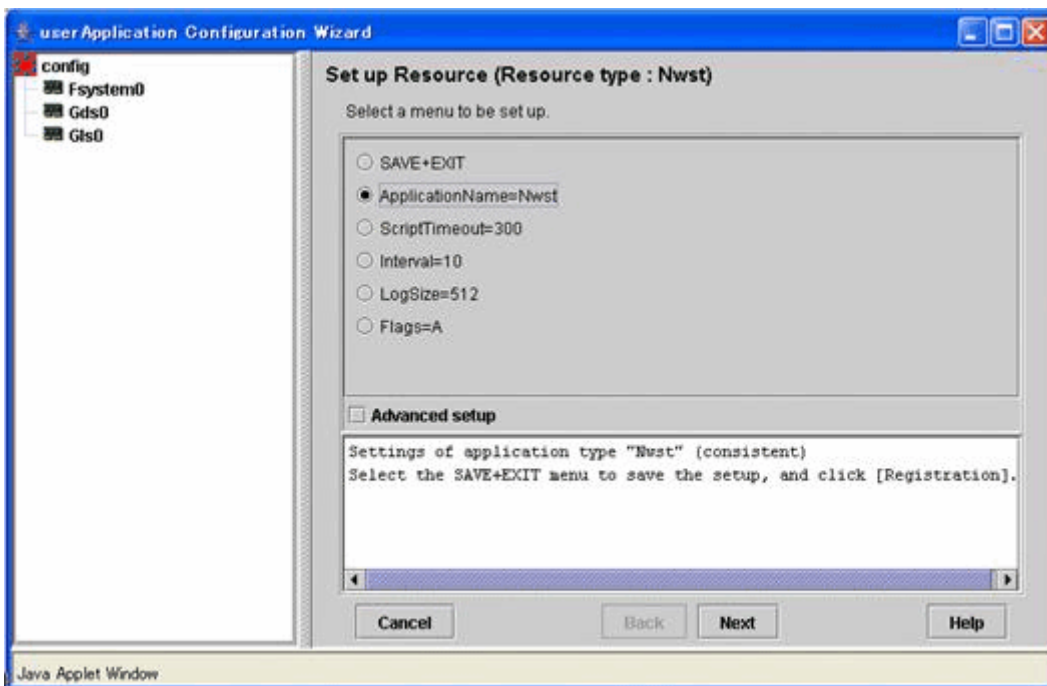
1. Select "Create Resource" in the "userApplication Configuration" menu.



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



3. Set attributes in the “Nwst” setup screen.



Attributes	Description
ScriptTimeout	default_value[:[offline_value][:online_value]] Default 300 (60 - 86400) Specify timeout period for launching of Online/Offline processing. When the timeout time passes, RMS transmits the stop signal to the script. Timeout value of OfflineScript (offline_value) and OnlineScript (online_value) can be separately set.

Attributes		Description
Interval		Default 10 (5 - 60) Specify interval time for monitoring NetWorker.
LogSize		Default 512 (10 - 4096) Specify the size of the log files for the script and the detector. If size is over the range of specified size, change the name to *.old and create a new file.
Flags	NullDetector(D)	Select whether or not the NetWorker resource is monitored. If it is enabled, the resource is not monitored. In that case, Standby processing is not performed and the NetWorker resource is Offline state in the STANDBY node. Therefore, the NetWorker client does not run in the STANDBY node. As default, the setting is disabled and the NetWorker resource is monitored.
	WarningOnly(W)	Select whether or not failover is performed. If it is enabled, when the NetWorker resource failure occurs, the NetWorker resource which is Online state becomes Warning state, and the NetWorker resource which is Standby state becomes Faulted state. In any case, failover is not performed. As default, the setting is disabled and failover is performed.
	AutoRecover(A)	Select whether or not recovering the NetWorker resource is attempted before failover in the event of NetWorker resource failure. If it is enabled, the NetWorker resource is recovered and NetWorker is restarted. As default, the setting is enabled and the NetWorker resource is recovered.
DeviceName		Specify device pathname of tape devices. If this is specified, SCSI reset is performed to specified devices just before NetWorker starts. The setting must be specified to share tape devices on SCSI multi-initiate connection. If more than one tape device exist, specify by entering ":" between device pathname.
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

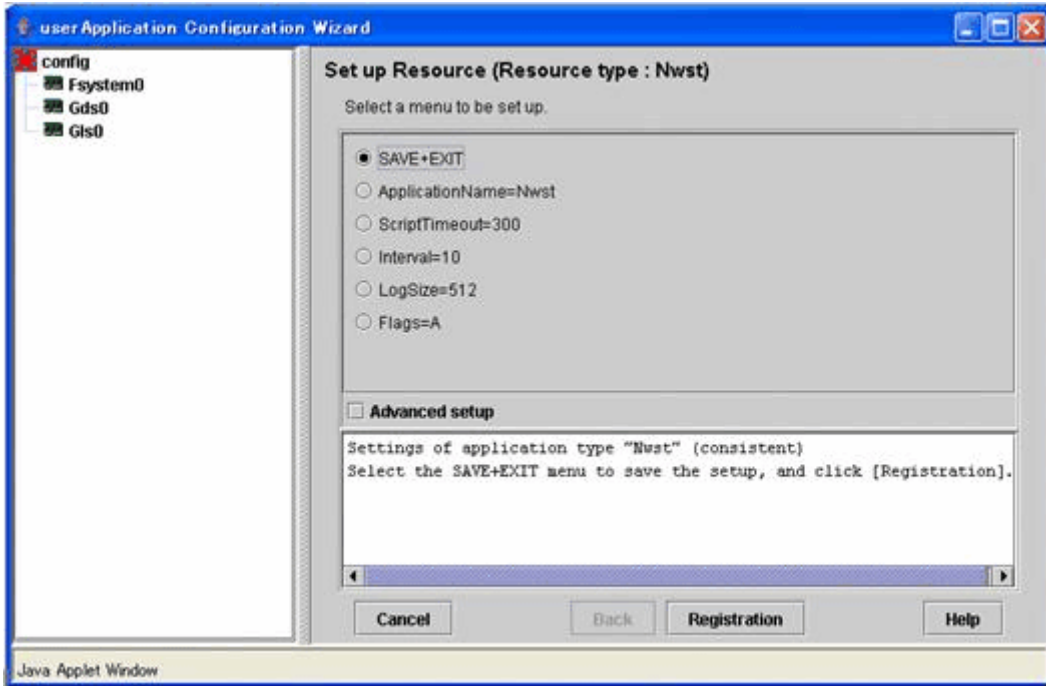
Information

- For details about PreOnlineScript, PostOnlineScript, PreOfflineScript, PostOfflineScript, FaultScript, see ["2.9.2 NetWorker Online/Offline Script"](#).
- For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".

Note

- If NullDetector is enabled, the WarningOnly and AutoRecover attribute is automatically disabled.
- Flags=<Abbreviation> indicates that the flag attribute is enabled.

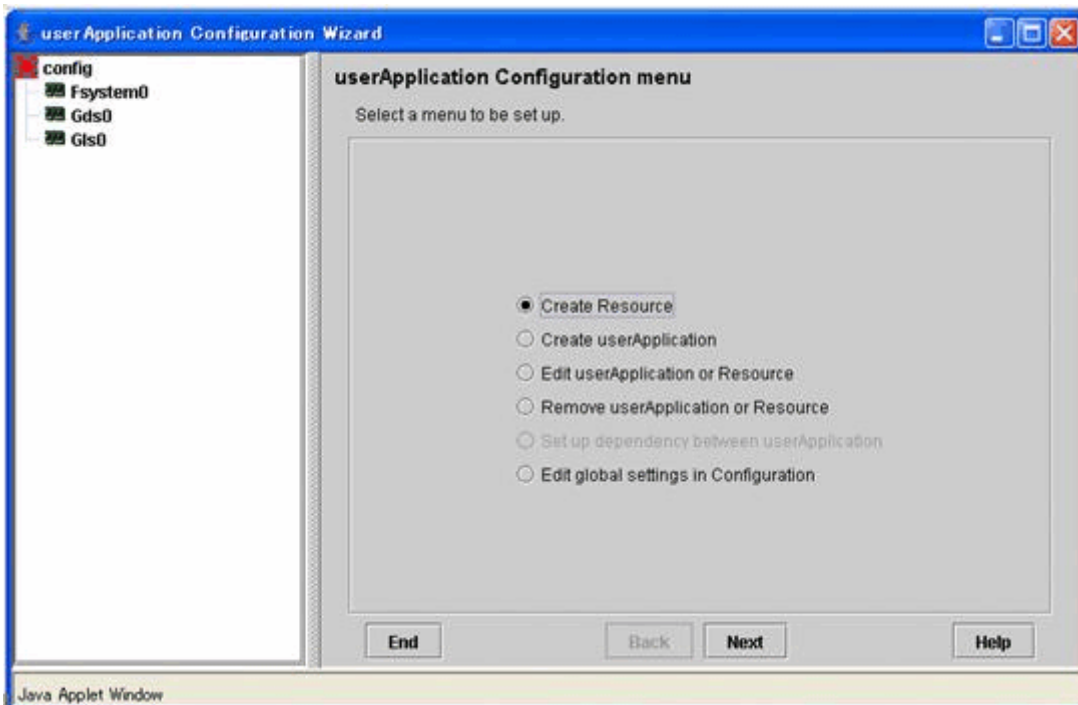
4. Save the settings by selecting “SAVE+EXIT”.



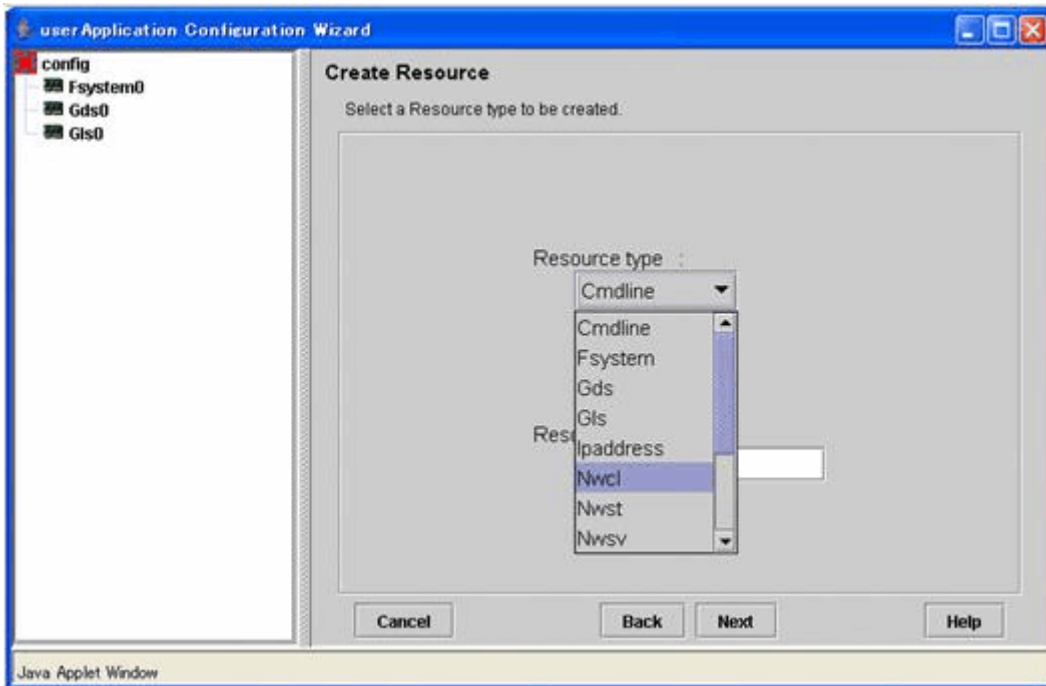
2.6.1.4 Client cluster operation

This section explains a setup procedure of NetWorker Client cluster operation.

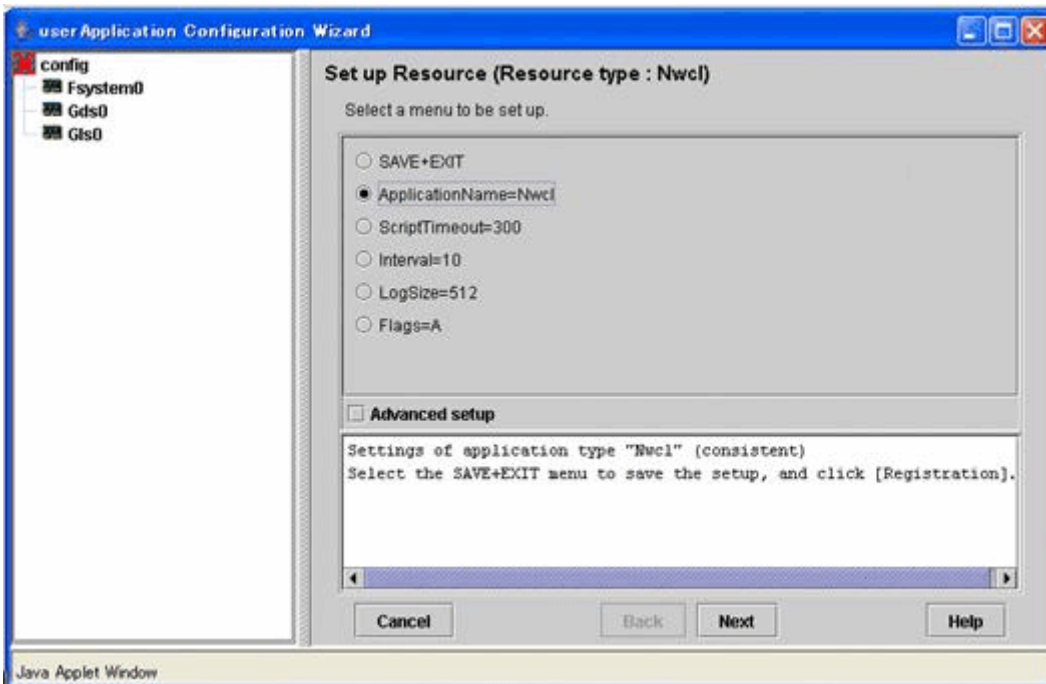
1. Select “Create Resource” in the “userApplication Configuration” menu.



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



3. Set attributes in the “Nwcl” setup screen.



Attributes	Description
ScriptTimeout	default_value[:[offline_value][:online_value]] Default 300 (60 - 86400) Specify timeout period for launching of Online/Offline processing. When the timeout time passes, RMS transmits the stop signal to the script. Timeout value of OfflineScript (offline_value) and OnlineScript (online_value) can be separately set.

Attributes		Description
Interval		Default 10 (5 - 60) Specify interval time for monitoring NetWorker.
LogSize		Default 512 (10 - 4096) Specify the size of the log files for the script and the detector. If size is over the range of specified size, change the name to *.old and create a new file.
Flags	NullDetector(D)	Select whether or not the NetWorker resource is monitored. If it is enabled, the resource is not monitored. In that case, Standby processing is not performed and the NetWorker resource is Offline state in the STANDBY node. Therefore, the NetWorker client does not run in the STANDBY node. As default, the setting is disabled and the NetWorker resource is monitored.
	WarningOnly(W)	Select whether or not failover is performed. If it is enabled, when the NetWorker resource failure occurs, the NetWorker resource which is Online state becomes Warning state, and the NetWorker resource which is Standby state becomes Faulted state. In any case, failover is not performed. At scalable operation, disable this flag. As default, the setting is disabled and failover is performed.
	AutoRecover(A)	Select whether or not recovering the NetWorker resource is attempted before failover in the event of NetWorker resource failure. If it is enabled, the NetWorker resource is recovered and NetWorker is restarted. As default, the setting is enabled and the NetWorker resource is recovered.
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

Information

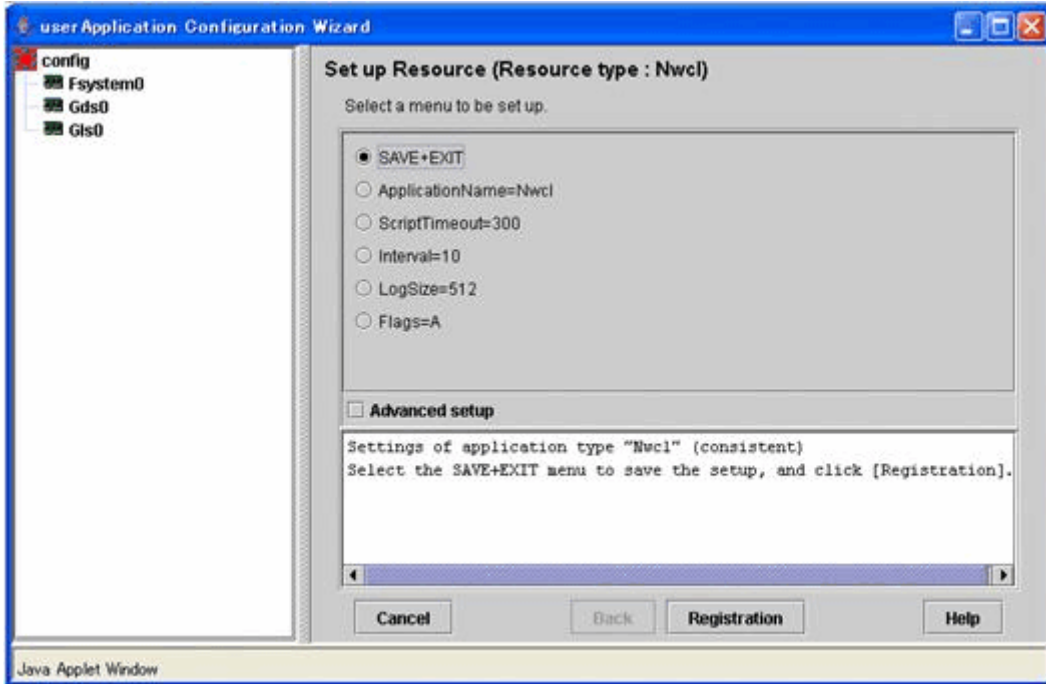
- For details about PreOnlineScript, PostOnlineScript, PreOfflineScript, PostOfflineScript, FaultScript, see "2.9.2 NetWorker Online/Offline Script".
- For details about Flags, see "9 Appendix - Attributes" of the "PRIMECLUSTER RMS Configuration and Administration Guide".

Note

- If NullDetector is enabled, the WarningOnly and AutoRecover attribute is automatically disabled.

- Flags=<Abbreviation> indicates that the flag attribute is enabled.

4. Save the settings by selecting “SAVE+EXIT”.



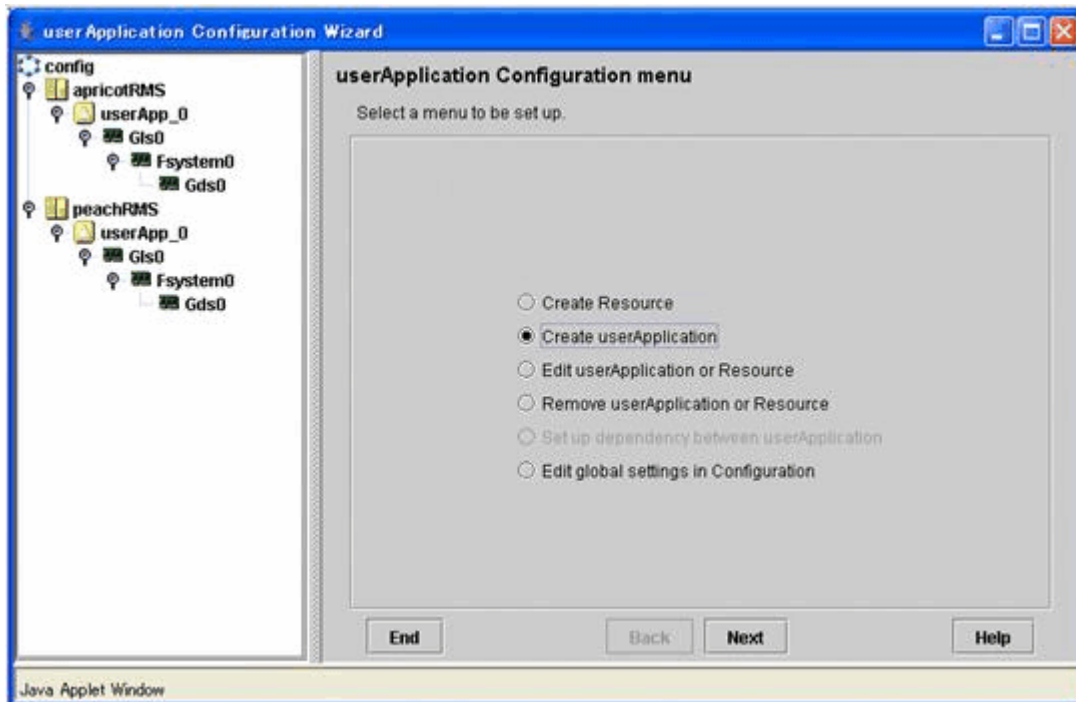
2.6.1.5 userApplication creation

Select “Create userApplication”, Create userApplication including NetWorker resources.
The attribute of userApplication, see “2.3 userApplication Creation”.



2.6.2 Configuration-Generate and Configuration-Activate

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



2.6.3 userApplication Operation Check

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

- Shared disk
Check if you can access to the shared disk from the OPERATING node.
- Takeover network
Check if you can access the OPERATING node from the client by the logical node name related to the takeover IP address.
- NetWorker
Check if the NetWorker daemons are running on the OPERATING node.

Information

- For the RMS command, see the “PRIMECLUSTER Installation and Administration Guide.”
- How to verify the NetWorker processes are running, see the NetWorker manuals.

2.7 NetWorker Configuration

Configure NetWorker.

Information

For configuration of NetWorker, see the NetWorker manuals.

Note

- In case of NetWorker 7.2, you can use the NetWorker Administrator program (nwadmin) to configure NetWorker. For the nwadmin command, see the NetWorker manuals.
- In case of NetWorker 7.4/7.5/7.6, you can use the NetWorker Management Console to configure NetWorker. For the NetWorker Management Console, see the NetWorker manuals.
- Execute the NetWorker Administrator program (nwadmin) or the NetWorker Management Console with the NetWorker server daemon running.
- Client configuration of NetWorker needs to be done only on the OPERATING node. After the configuration switch the cluster system, and confirm that the configuration is effective on the STANDBY node. After the confirmation, switch the cluster system again.

2.7.1 Server Cluster Operation

Pay attention to configure the following NetWorker settings.

Server Configuration

The following items must be defined for server that is specified as VirtualHost.

Follow the procedure below if you use the NetWorker Administrator program (nwadmin).

1. Start nwadmin GUI, and select [Server] -> [Server Setup].
2. Specify name of administrator of physical node that consists of cluster on [Administrator] field.

Follow the procedure below if you use the NetWorker Management Console.

1. Start NetWorker Management Console, and select [Configuration] on [NetWorker Administration] screen.
2. Select [File] -> [Properties].
3. Specify name of administrator of physical node that consists of cluster on [Administrator] field.

Example

```
user=root,host=clus_phys1
user=root,host=clus_phys2
```

Note

- NetWorker server name is the logical node name set in the userApplication configuration.
- If node name takeover of takeover network resource of PRIMECLUSTER is used, above setting isn't necessary.

Client Configuration

Configure each physical node within the cluster as a NetWorker client.

Follow the procedure below if you use the NetWorker Administrator program (nwadmin).

1. Start nwadmin GUI, and select [Client] -> [Client Setup].

2. Confirm that the physical node name has been set in the [name] field. If it has not been set, click [create], and enter the physical node name for the [name] field.

Follow the procedure below if you use the NetWorker Management Console.

1. Start NetWorker Management Console, and select [Configuration] on [NetWorker Administration] screen.
2. When the client of the physical node name does not exist, create the new client.
3. Enter the physical node name for the [name] field.

Configure each logical node within the cluster as a NetWorker client.

Follow the procedure below if you use the NetWorker Administrator program (nwadmin).

1. Start nwadmin GUI, and select [Client] -> [Client Setup].
2. Confirm that logical node name has been set in the [name] field. If it has not, click [create], and enter the logical node name for the [name] field.
3. Enter the name of the administrator of each physical node that the logical node is activated in the [remote access] field.

Follow the procedure below if you use the NetWorker Management Console.

1. Start NetWorker Management Console, and select [Configuration] on [NetWorker Administration] screen.
2. When the client of the logical node name does not exist, create the new client.
3. Enter the logical node name for the [name] field.
4. Enter the name of the administrator of each physical node that the logical node is activated in the [Remote access] field on [Globals (2 of 2)] tab.



Example

```
user=root,host=clus_phys1  
user=root,host=clus_phys2
```



Note

- It is necessary to create the clients with the name of each physical node within the cluster to be backed up even if backing up by the physical node name is not done.
- Do not register the physical node name in the "alias" attribute if backing up by the logical node name is done.
- Client configuration of NetWorker needs to be done only to NetWorker server on the OPERATING node. After the configuration, switch the cluster system, and confirm that the configuration is effective on the STANDBY node. After the confirmation, switch the cluster system again.

2.7.2 Storage Node Cluster Operation

Pay attention to configure the following NetWorker settings:

Executing jbcnfig command

The procedure for setting a storage node by using the jbcnfig command is the same as the procedure for setting an usual one. Define the logical node name for the storage node name.

Information

For the jbsconfig command, see the NetWorker manuals.

Client Configuration

For details, see “Client Configuration” of the “[2.7.1 Server Cluster Operation](#)”.

About License

The number of shared tape library must be prepared with the module of NetWorker Storage Node. The number of NetWorker Cluster Connections license in cluster system must be prepared.

2.7.3 Client Cluster Operation

Pay attention to configure the following NetWorker settings:

Client Configuration

For details, see “Client Configuration” of the “[2.7.1 Server Cluster Operation](#)”.

2.8 Registering NetWorker License

Different type of NetWorker license is required for server cluster operation.

Follow the procedure below for entering and applying NetWorker enabler codes and authorization codes.

Note

- In case of NetWorker 7.2, you can use the NetWorker Administrator program (nwadmin) to configure NetWorker. For the nwadmin command, see the NetWorker manuals.
- In case of NetWorker 7.4/7.5/7.6, you can use the NetWorker Management Console to configure NetWorker. For the NetWorker Management Console, see the NetWorker manuals.

Procedure

Follow the procedure below if you use the NetWorker Administrator program (nwadmin).

1. Ensure that the NetWorker server is running normally on the OPERATING node.
When the NetWorker server is running on the OPERATING node, enter NetWorker licenses after PRIMECLUSTER, NetWorker, and PRIMECLUSTER Wizard for NetWorker are installed.
2. Login to the OPERATING node as superuser.
3. Start the NetWorker Administrator program (nwadmin).
4. Open [register] window on [Server] on menu bar.
5. Select [Create].
6. Enter the enabler code on [Enabler code] field.
7. Open [Server] window on [Server Setup] on [Server] on menu bar and enter name, address, telephone number, and email address.
8. Create the following file.
/nsr/res/hostids

- Write the hostid of the OPERATING node and the STANDBY node by the following format to /nsr/res/hostids file created in procedure 8.

format

```
hostid of the OPERATING node: hostid of the STANDBY node (: hostid of the STANDBY node *)
```

* Written for server cluster operation at more than three nodes within the cluster

To find each hostid, execute hostid command on each node.

Example

Cluster Node	hostid of Each Node		Example
2 nodes	OPERATING node	12345678	12345678:87654321
	STANDBY node	87654321	
3 nodes	OPERATING node	12345678	12345678:87654321:98765432
	STANDBY node	87654321	
	STANDBY node	98765432	

- Switch cluster server and reboot all the nodes, and restart the NetWorker server. After that, restart the NetWorker Administrator program (nwadmin).
- Change displaying style of server window to chart style and output content of the server resource.
- Follow the procedure for applying a NetWorker license.
Fill out password application form based on the output result on procedure 11 and send application form to password issuing office. When you receive "authorization code", enter the authorization code on the [Auth Code] field on [Register] window and apply that code. If the authorization code is entered, you are allowed to operate NetWorker permanently.

Follow the procedure below if you use the NetWorker Management Console.

- Ensure that the NetWorker server is running normally on the OPERATING node.
- Start NetWorker Management Console, and select [Configuration] on [NetWorker Administration] screen.
- Select [Registrations] from left pane, then [Registrations] list is displayed.
- Right-click and select [New], then [Create Registrations] screen is displayed.
- Enter the enabler code on [Enabler code] field on [Configuration], and click [OK].
- Create the following file.
/nsr/res/hostids
- Write the hostid of the OPERATING node and the STANDBY node by the following format to /nsr/res/hostids file created in procedure 6.

format

```
hostid of the OPERATING node: hostid of the STANDBY node (: hostid of the STANDBY node *)
```

* Written for server cluster operation at more than three nodes within the cluster

To find each hostid, execute hostid command on each node.

Example

Cluster Node	hostid of Each Node		Example
2 nodes	OPERATING node	12345678	12345678:87654321
	STANDBY node	87654321	
3 nodes	OPERATING node	12345678	12345678:87654321:98765432
	STANDBY node	87654321	
	STANDBY node	98765432	

8. Stop the cluster application and start again to restart the NetWorker server.
9. Select [Registrations] created in procedure 5 on [NetWorker Administration] screen of NetWorker Management Console, then [Expiration date] and [Host id] are displayed.
10. Fill in displayed [expiration date] and [host id] on "NetWorker license password application form", and fax it to the Fujitsu license password issuing office. The "authorization code" is sent back.
11. Select [Registrations] created in procedure 5 on [NetWorker Administration] screen of NetWorker Management Console.
12. Enter the authorization code on the [Auth code] field, and click [OK]. You are allowed to operate NetWorker permanently.

Information

For the detail of NetWorker enabler codes and authorization codes, see the NetWorker manuals.

Note

Enter the NetWorker licenses on the OPERATING node that the NetWorker server is running after PRIMECLUSTER, NetWorker, and PRIMECLUSTER Wizard for NetWorker are installed; not required on the STANDBY node.

2.9 Information

2.9.1 Definition of Operation Environment at NetWorker Startup

Definition of operation environment is available when the NetWorker starts.

PRIMECLUSTER Wizard for NetWorker executes the following NetWorker startup scripts to start NetWorker.

Server Cluster Operation

`/etc/opt/FJSVclntw/sys/v_nsrld_start`

Storage Node Cluster Operation

Client Cluster Operation

`/etc/opt/FJSVclntw/sys/networker_start`

If you want NetWorker to execute some commands and setting of environmental variables just before NetWorker starts, you can define them in the definition file PRIMECLUSTER Wizard for NetWorker provides.

Example

1. Copy `/etc/opt/FJSVclntw/etc/networker.env_draft` file to `/etc/opt/FJSVclntw/etc/networker.env`.

```
# cp -p /etc/opt/FJSVclntw/etc/networker.env_draft /etc/opt/FJSVclntw/etc/networker.env
```

2. Edit networker.env file with vi(1).

```
# vi /etc/opt/FJSVclntw/etc/networker.env
```

Example

```
# networker.env executed as a part of the NetWorker startup script
# All Rights Reserved, Copyright Fujitsu 2006
#
# Users can write commands and the setting of environmental variables
# executed just before starting NetWorker.
#
# Examples:
# NSR_DEV_BLOCK_SIZE_4MM_20GB=64
# export NSR_DEV_BLOCK_SIZE_4MM_20GB
# LANG=C
# export LANG
# LC_ALL=$LANG
# export LC_ALL
# ulimit -n 1024
#
NSR_DEV_BLOCK_SIZE_4MM_20GB=128
export NSR_DEV_BLOCK_SIZE_4MM_20GB
```

Note

- Define in the all nodes installed PRIMECLUSTER Wizard for NetWorker to.
- Define environmental variables LANG and LC_ALL if you change the language that NetWorker operates.

2.9.2 NetWorker Online/Offline Script

PRIMECLUSTER Wizard for NetWorker starts and stops NetWorker by the script. PRIMECLUSTER Wizard for NetWorker provides user interfaces that allow users to perform unique operation during NetWorker start/stop.

For example, application startup/stop and batch processing can be executed along with startup or stop of NetWorker.

Script

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

Notice

Execute the scripts using root privileges.

The exit code 0 indicates normal termination. The value other than 0 indicates abnormal termination or Online processing and Offline processing of userApplication failure.

If the script exceeds the maximum execution time (ScriptTimeout), switching process will fail.

Each script has the environment variable defined in RMS.

Information

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

2.9.3 Notes for Constructing Tape Device Shared System

Setting Operating Environment

If tape device is shared on cluster system on NetWorker Server, NetWorker Storage Node, device pathname of shared tape device must be specified with operating environment setting.

For the detail of NetWorker Configuration, see “2.6 NetWorker Resource Creation and Setting”.

Note

After installing PRIMECLUSTER Wizard for NetWorker, change operating environment before stating the cluster application. If the cluster application is started without specifying device pathname of shared tape device, tape may not be able to be mounted to jukebox.

Device and SCSI port that the specified device uses must be correspond in the cluster system. If specified value is not correspondent in each cluster node, tape library may not be able to use.

Setting /kernel/drv/st.conf

If tape library is shared on cluster system, the below setting is needed.

1. Edit /kernel/drv/st.conf using by vi(1) command according to manual that appends in hardware.

Edit st.conf as follows, in case description of st.conf doesn't exist in the manual of the hardware.

1. Execute the mt(config) command.

```
# mt -f <Device path name of tape device> config
```

Example

```
# mt -f /dev/rmt/lcbln config
tape-config-list=
"HP      Ultrium 4", "HP Ultrium LTO 4", "CFGHPULTRIUMLTO4";
CFGHPULTRIUMLTO4 = 2,0x3B,
0,0x18619,4,0x44,0x44,0x46,0x46,3,60,1200,600,1200,600,600,18000;
```

2. Add the output of the mt command to st.conf.

Example

```
tape-config-list=
"HP      Ultrium 4", "HP Ultrium LTO 4", "CFGHPULTRIUMLTO4";
CFGHPULTRIUMLTO4 = 2,0x3B,0,0x18619,4,0x44,0x44,0x46,0x46,3,60,1200,600,1200,600,600,18000;
```


2. After above setting, add "ST_NO_RESERVE_RELEASE 0x20000" to the fourth parameter of drive information in st.conf. The following is an example in case of the tape device which uses Ultrium-4.

Example

Before changing	tape-config-list= "HP Ultrium 4", "HP Ultrium LTO 4", "CFGHPULTRIUMLTO4"; CFGHPULTRIUMLTO4 = 2,0x3B, 0,0x18619,4,0x44,0x44,0x46,0x46,3,60,1200,600,1200,600,600,18000;
After changing	tape-config-list= "HP Ultrium 4", "HP Ultrium LTO 4", "CFGHPULTRIUMLTO4"; CFGHPULTRIUMLTO4 = 2,0x3B, 0,0x38619,4,0x44,0x44,0x46,0x46,3,60,1200,600,1200,600,600,18000;

3. Reboot this server.

Note

Do not use the tape library that sets above settings except NetWorker. And the tape library can not be shared between two or more NetWorker Servers. Data may be vanished if the tape library is shared by two or more NetWorker Servers.

2.9.4 NetWorker Management Console Setting

Implement either of Procedure 1, Procedure 2 or Procedure 3 when you use NetWorker Management Console(NMC) in the cluster environment using PRIMECLUSTER Wizard for NetWorker.

[Procedure 1] Install NMC server besides the cluster environment

Install NMC server in the machine besides the cluster environment.It is necessary to install the NetWorker client package to install NMC.

[Procedure 2] Register NMC as a resource of PRIMECLUSTER

Control NMC by registering in the Cmdline resource of PRIMECLUSTER. When you implement this procedure, contact Fujitsu engineer.

[Procedure 3] Incorporate NMC in PRIMECLUSTER Wizard for NetWorker

Install NMC in one node of the cluster, and incorporate the NMC start procedure in PRIMECLUSTER Wizard for NetWorker.

1. Edit "/etc/opt/FJSVclntw/sys/v_nsr_d_start" file as follows. Add "/etc/init.d/gst start &" (NMC start command) before the last "exit 0" in the file. The following example shows the edited file.

Example

```

else
  (/usr/sbin/nsrd -k $1) >${MSG_FILE} 2>&1
  if [ $? -ne 0 ]; then
    ${CMD_LOGGER} -p daemon.err <${MSG_FILE}
    [ -f "${MSG_FILE}" ] && ${CMD_RM} -f ${MSG_FILE}
    exit 1
  else
    ${CMD_LOGGER} -p daemon.notice <${MSG_FILE}
  fi
  ${CMD_LOGGER} -p daemon.notice ' nsrd'
# (echo ' nsrd') > /dev/console
# (echo '') > /dev/console
fi

```

```
{CMD_RM} -f {MSG_FILE}

/etc/init.d/gst start &

exit 0
```

2. Edit "/etc/opt/FJSVclntw/sys/networker_start" file as follows. Add "/etc/init.d/gst start &" (NMC start command) before the last "exit 0" in the file. The following example shows the edited file..

Example

```
fi
    ;;
*)
# ${CMD_LOGGER} -p daemon.err "usage: `basename $0` {start|stop}"
echo "usage: `basename $0` {start|stop}"
[ -f "${MSG_FILE}" ] && {CMD_RM} -f {MSG_FILE}
exit 1
    ;;
esac

[ -f "${MSG_FILE}" ] && {CMD_RM} -f {MSG_FILE}

/etc/init.d/gst start &

exit 0
```

3. Change the file name of the NMC start script.

```
# mv /etc/rc3.d/S97gst /etc/rc3.d/FJSVclntw.S97gst
```

Note

When you connect to the NMC after the procedure above, connect to the IP address of physical node which the NMC is installed.

Chapter 3 Operation

3.1 Auto Re-execution of Backup

By using NetWorker Autorestart function, if failure occurs on the NetWorker server or the OPERATING node and failover occurs during backup, backup is resumed automatically on the new OPERATING node in server cluster operation. Detail of backup operation using Autorestart function is explained below.

Information

For detail, see the NetWorker manuals.

3.1.1 What is Autorestart Function?

If backup is not ended normally due to node shutdown, backup operation is re-executed when the NetWorker server starts next time. When NetWorker restarts, it writes EOF to the tape that writing is interrupted and backup data from interrupted save set.

For detail of function, see the NetWorker manuals.

Enabling Autorestart function allows re-execute backup automatically on the new OPERATING node if failover occurs during backup.

3.1.2 Procedure for Autorestart Setup

Enable Autorestart function by the procedure below.

Note

- In case of NetWorker 7.2, you can use the NetWorker Administrator program (nwadmin) to enable the Autorestart function. For the nwadmin command, see the NetWorker manuals.
- In case of NetWorker 7.4/7.5/7.6, you can use the NetWorker Management Console to enable Autorestart function. For the NetWorker Management Console, see the NetWorker manuals.

Procedure

Follow the procedure below if you use the NetWorker Administrator program (nwadmin).

1. Ensure that the NetWorker server is running normally on the OPERATING node.
2. Login to the OPERATING node as superuser.
3. Start the NetWorker Administrator program (nwadmin):
4. Open [Group] window on [Customize] on menu bar.
5. Select [View] -> [Details] on [Group] window.
6. Change [Autorestart] to [Enabled].

Follow the procedure below if you use the NetWorker Management Console.

1. Ensure that the NetWorker server is running normally on the OPERATING node.
2. Select [Configuration] on [NetWorker Administration] screen of NetWorker Management Console.
3. Select [Groups] from left pane, then [Groups] list is displayed.
4. Right-clicks the group which enables Autorestart function and select [Properties], then properties are displayed.
5. Change [Autorestart] to [Enabled] on [Advanced] tab.



Note

- To enable Autorestart function, [Autostart] must be changed to [Enabled].
- If [Manual restart] is specified on [Options], [Autorestart] is not enabled.
- Note that if backup is interrupted, [Manual restart] on [Options] is automatically selected.

3.1.3 Notes to Use Autorestart Function

Depends on timing of failover, data is not backed up automatically because error occurs on NetWorker before Autorestart is enabled. If such a case occurs, cause of error on NetWorker must be resolved before backup manually.

Autorestart function is available only with server cluster operation on NetWorker.

Data must be re-backed up manually with other operation such as client cluster operation, storage node cluster operation.

3.2 NetWorker Maintenance

PRIMECLUSTER Wizard for NetWorker monitors a NetWorker process while PRIMECLUSTER is running. If the NetWorker daemons stop, this PRIMECLUSTER Wizard considers that a failure occurs in the system. Then, the NetWorker daemons are restarted or switched to the STANDBY node. If maintenance work is required, discontinue monitoring the NetWorker resource or use the maintenance mode of PRIMECLUSTER.

Discontinue monitoring the NetWorker resource

Execute the following commands to discontinue monitoring the NetWorker resource on the OPERATING node.

- Discontinuing monitoring the resource

```
# /etc/opt/FJSVclntw/sbin/hvnwdisable application_name resource_name
```

- Restarting monitoring the resource

```
# /etc/opt/FJSVclntw/sbin/hvnwenable application_name resource_name
```

The userApplication name is specified for application_name. The NetWorker resource name is specified for resource_name. Confirm the userApplication name and the resource name by using the hvdisp command of PRIMECLUSTER.



Note

Use the maintenance mode of PRIMECLUSTER when you discontinue monitoring the NetWorker resource on the STANDBY node.



Information

- For information on how to discontinue or restart monitoring the NetWorker resource, see "[4.2 hvnwdisable - Discontinue Monitoring Resources](#)" and "[4.3 hvnwenable - Restart Monitoring Resources](#)".
- For detail of the hvdisp command, see "PRIMECLUSTER Installation and Administration guide".

When monitoring the NetWorker resource is discontinued, shutting down NetWorker without stopping the cluster application is possible. In this case, the state of the NetWorker resource is Online.

Use the maintenance mode of PRIMECLUSTER.

Use the maintenance mode of PRIMECLUSTER to discontinue monitoring the NetWorker resource on the OPERATING node and the STANDBY node.

Information

- For detail of the maintenance mode of PRIMECLUSTER, see "5.4.11 Using maintenance mode" of "PRIMECLUSTER Reliant Monitor Services (RMS) with Wizard Tools Configuration and Administration Guide".

The maintenance mode of PRIMECLUSTER enables you to shut down NetWorker without stopping the cluster application.

Starting and stopping NetWorker.

To start or to stop NetWorker, use the following commands when monitoring the NetWorker resource is discontinued or maintenance mode of PRIMECLUSTER is used.

- Starting NetWorker

- Server Cluster Operation

```
# /etc/opt/FJSClntw/sys/v_nsr_start hostname
```

Specify the logical node name of the NetWorker server as VirtualHost for hostname.

- Storage Node Cluster Operation • Client Cluster Operation

```
# /etc/opt/FJSClntw/sys/networker_start start
```

- Stopping NetWorker

```
# /usr/sbin/nsr_shutdown
```

3.2.1 Patch Application and Update

Follow the procedure below to applying the NetWorker patch or update the NetWorker software.

Information

- For detail of applying the NetWorker patch or update the NetWorker software, see the NetWorker manuals.
- For detail of the maintenance mode of PRIMECLUSTER, see "5.4.11 Using maintenance mode" of "PRIMECLUSTER Reliant Monitor Services (RMS) with Wizard Tools Configuration and Administration Guide".

1. Start maintenance mode.

2. Stop NetWorker client on the STANDBY node.

```
# /usr/sbin/nsr_shutdown
```

3. Apply the NetWorker patch or update the NetWorker software on the STANDBY node.

4. If "S95networker" exists in "/etc/rc3.d" on the STANDBY node, change the file name to "FJSClntw.S95networker."

```
# mv /etc/rc3.d/S95networker /etc/rc3.d/FJSClntw.S95networker
```

5. Start NetWorker client on the STANDBY node.

```
# /etc/opt/FJSClntw/sys/networker_start start
```

6. Stop NetWorker on the OPERATING node.

```
# /usr/sbin/nsr_shutdown
```

7. Apply the NetWorker patch or update the NetWorker software on the OPERATING node.

8. If "S95networker" exists in "/etc/rc3.d" on the OPERATING node, change the file name to "FJSVclntw.S95networker".

```
# mv /etc/rc3.d/S95networker /etc/rc3.d/FJSVclntw.S95networker
```

9. Start NetWorker on the OPERATING node.

- Server Cluster Operation

```
# /etc/opt/FJSVclntw/sys/v_nsrld_start hostname
```

- Storage Node Cluster Operation • Client Cluster Operation

```
# /etc/opt/FJSVclntw/sys/networker_start start
```

10. Stop maintenance mode.

3.2.2 Uninstallation

Follow the procedure below to uninstall the NetWorker software and PRIMECLUSTER Wizard for NetWorker.

Note

- Uninstall PRIMECLUSTER Wizard for NetWorker before uninstalling NetWorker.
- Stop RMS on all nodes within the cluster before uninstalling NetWorker and PRIMECLUSTER Wizard for NetWorker.

Information

- For detail of procedure for uninstalling NetWorker, see the NetWorker manuals.
- For detail of procedure for uninstalling PRIMECLUSTER Wizard for NetWorker, see "Software Release Guide PRIMECLUSTER Wizard for NetWorker".
- For details of procedure for deleting NetWorker resources, see "8.8.2 Deleting a Resource" of "PRIMECLUSTER Installation and Administration guide".

1. Stop RMS on all nodes within the cluster.
2. Delete the NetWorker resource.
3. Uninstall PRIMECLUSTER Wizard for NetWorker on all nodes within the cluster.
4. If "FJSVclntw.S95networker" exists in "/etc/rc3.d" on all nodes within the cluster, change the file name to "S95networker".

```
# mv /etc/rc3.d/FJSVclntw.S95networker /etc/rc3.d/S95networker
```

5. Uninstall NetWorker on all nodes within the cluster.

Note

In the case of the server cluster operation, the NetWorker directory exists on the local disk of each node and the shared disk. If you delete the NetWorker directory after NetWorker is uninstalled, delete the NetWorker directory on the local disk of each node and the shared disk.

3.3 Troubleshooting

3.3.1 Corrective Action against Failover

NetWorker logging

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

PRIMECLUSTER Wizard for NetWorker logging

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

```
/var/opt/FJsvclntw/logs/FJsvclntw_HV_NODENAME*.log
```

*HV_NODENAME is the name of the NetWorker resource.

The log file formats are as follows:

```
Date/type/ID/text
2006/03/24 14:46:15 INFO: GdCheck: Beginning of process watch.
2006/03/24 16:17:24 ERROR: GdCheck: End process watch. pid=5386
```

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



Note

The log files will be used for troubleshooting. Do not delete or edit the files.

3.3.2 Backup and Recovery after Failover

When the failover occurs while operating NetWorker on PRIMECLUSTER, the cluster application on the node where the resource failure occurred becomes the Faulted state. Under such a state, you are not able to back up or recover data because the NetWorker client daemon has stopped.

It is necessary to clear the Faulted state of the cluster application and bring it to the Standby state to back up or recover data on the node where the resource failure occurred.

1. Solve the problem of NetWorker by the method similar to "[3.3.1 Corrective Action against Failover](#)".
2. Clear the Faulted state of the cluster application to bring it to the Standby state on the node where the resource failure occurred.

```
# /opt/SMAW/SMAWRrms/bin/hvutil -c application_name
```

application_name is the cluster application name. Confirm the cluster application name by the hvdisp command of PRIMECLUSTER.

3.3.3 Bringing Warning NetWorker Resource to Online State

The procedure for solving the problem and bringing the Warning NetWorker resource to Online is described below.

1. The problem of NetWorker is solved by the method similar to "[3.3.1 Corrective Action against Failover](#)".
2. Confirm that the NetWorker daemons have stopped. If they are running, stop them.
Stopping the NetWorker daemons

```
# /usr/sbin/nsr_shutdown
```

3. Confirm that the resources except the NetWorker one are Online.

4. In the case of server cluster operation, confirm that /nsr is a symbolic link that points the NetWorker directory on the shared disk.
5. Start the NetWorker daemons.
 - Server Cluster Operation

```
# /etc/opt/FJSVclntw/sys/v_nsr_start hostname
```

Specify the logical node name of the NetWorker server as VirtualHost for hostname.

- Storage Node Cluster Operation • Client Cluster Operation

```
# /etc/opt/FJSVclntw/sys/networker_start start
```

6. The NetWorker resource becomes Online if NetWorker starts normally.

3.3.4 Troubleshooting Information

The following information is useful for troubleshooting.

System message

Message file

/var/adm/messages

NetWorker information

Log files

/nsr/logs/*

PRIMECLUSTER information

You can collect troubleshooting information by executing the “fjsnap” command of PRIMECLUSTER. See the “PRIMECLUSTER Installation and Administration Guide”.

PRIMECLUSTER Wizard for NetWorker information

Configuration files

/etc/opt/FJSVclntw/etc/*

/usr/opt/reliant/etc/hvgdconfig

/usr/opt/reliant/build/<configuration name>.usfiles/*

Log files

/var/opt/reliant/log/*

/var/opt/FJSVclntw/log/FJSVclntw_HV_NODENAME*.log

/var/opt/FJSVclntw/log/FJSVclntw_HV_NODENAME*.script.log

*HV_NODENAME is the NetWorker resource name.



Information

For information on how to collect troubleshooting information of PRIMECLUSTER Wizard for NetWorker only, see “[4.1 clntwlog - Achieve Confidential](#)”.

Chapter 4 Command

4.1 clntwlog - Achieve Confidential

User

Superuser

Format

/etc/opt/FJSVclntw/bin/clntwlog [-d output destination directory path]

Function

Achieve resource for trouble

The name of output file is clntwtrace.tar.Z .

Following data is collected.

- NetWorker setting information and log files
 - /usr/bin/pkginfo -l LGTOxxxx
 - /nsr/res
 - /nsr/logs
 - /usr/bin/ls -dlog /nsr
 - /usr/bin/ls -alR NetWorkerDirectory*
 - /etc/init.d/networker
 - /usr/sbin/mminfo -avV
 - /usr/sbin/nsrjb -v
 - /usr/sbin/nsrlic -v
- Wizard for NetWorker setting information and log files
 - /usr/bin/ pkginfo -l FJSVclntw
 - /etc/opt/FJSVclntw/etc
 - /etc/opt/FJSVclntw/sys/v_nsr_start
 - /etc/opt/FJSVclntw/sys/networker_start
 - /var/opt/FJSVclntw/logs
 - /etc/opt/FJSVclnw/sys/clgetnwc (lcmapi)
- PRIMECLUSTER setting information and log files
 - /usr/opt/reliant/build/wizard.d/ConfigurationName
 - /usr/opt/reliant/build/ConfigurationName.usfiles
 - /var/opt/reliant/log
- System information
 - /usr/bin/date
 - /usr/bin/uname -a
 - /usr/bin/df -k NetWorkerDirectory*
 - /usr/bin/df -k
 - /etc/release
 - /usr/bin/isainfo -v
 - /kernel/drv/st.conf
 - /usr/bin/ls -l /dev/rmt/ *
 - /etc/host*
 - /usr/sbin/ifconfig -a
 - /usr/bin/ps -ecfjl
 - /usr/bin/ls -al /etc/rc0.d
 - /usr/bin/ls -al /etc/rc2.d
 - /usr/bin/ls -al /usr/sbin

```
/usr/bin/showrev -p  
/var/adm/messages*
```

* NetWorkerDirectory is /nsr directory or the directory linked by /nsr.

Parameter

To specify destined output directory, specify “-d output destination directory path”. This directory is used for working directory. The default is /var/tmp.

Completion Status

0 : stopped normally
except for above : stopped abnormally



When this command executes in the state that the cluster application is Offline, the latest log of NetWorker cannot be gathered. After mounting only a shared disk using by /usr/sbin/mount command, the latest is gathered.

4.2 hvnwdisable - Discontinue Monitoring Resources

User

Superuser

Format

```
/etc/opt/FJSVclntw/sbin/hvnwdisable application_name resource_name  
/etc/opt/FJSVclntw/sbin/hvnwdisable -a [ application_name ]
```

Function

Stop monitoring application such as NetWorker on PRIMECLUSTER temporarily. Use this function for NetWorker maintenance.

Parameter

application_name resource_name

application_name specifies the user application of PRIMECLUSTER, and the resource name that stops resource_name. Please check by performing command “hvdisp” of PRIMECLUSTER about a resource name.

-a [application_name]

The option discontinues monitoring the NetWorker resource that belongs to userApplication that is running on a local node and is specified for application_name.

If application_name is omitted, the option will discontinue monitoring the NetWorker resource on the local node.



For detail of the hvdisp command, see “PRIMECLUSTER Installation and Administration Guide”.

Exit Status

0 : normally stopped
except for above : stopped abnormally

4.3 hvnwenable - Restart Monitoring Resources

User

Superuser

Format

```
/etc/opt/FJSCvclntw/sbin/hvnwenable application_name resource_name  
/etc/opt/FJSCvclntw/sbin/hvnwenable -a [ application_name ]
```

Function

Resume monitoring on application that is stopped by hvdisable command. Use this function for NetWorker maintenance.

Parameter

application_name resource_name

application_name and resource_name specify the user application name and resource name that were specified to be the "hvnwdisable" command.

-a [application_name]

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

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



Example

It is an example of the procedure after hvnwdisable is executed.

<pre># nsr_shutdown nsr_shutdown will kill the following processes 6411 ? S 0:00 /usr/sbin/nsrexecd 6421 ? S 0:00 /usr/sbin/nsrexecd 6444 ? S 0:02 /usr/sbin/nsrd -k hostname 6484 ? S 0:00 /usr/sbin/nsrmmdbd 6491 ? S 0:00 /usr/sbin/nsrindexd 6513 ? S 0:00 /usr/sbin/nsrmmd -n 1 6523 ? S 0:00 /usr/sbin/nsrmmd -n 2 Do you want to continue? [Yes]? * * Killing NetWorker daemons ** Maintenance ** # /etc/opt/FJSCvclntw/sys/v_nsr_start hostname # /etc/opt/FJSCvclntw/sbin/hvnwenable app1 ManageProgram001_Nwsv hvnwenable: INFO: The monitoring of "ManageProgram000_Nwsv_APP1" is enabled successfully. #</pre>	<pre><- NetWorker shutdown command <-Logical node name <- Startup NetWorker server with logical node name</pre>
--	--

Exit Status

0 : stopped normally

except for above : stopped abnormally



Use this command as a pair of a hvnwdisable command.

4.4 nwcIntwadd - Copy of NetWorker Directory

User

Superuser

Format

/etc/opt/FJSVclntw/bin/nwcIntwadd

Function

Copy the NetWorker directory on the local disk to the shared disk in the cluster system. Execute this command from one node in the cluster node. When the shared disk is not mounted, mount/umount is done automatically before and after the copy.

Sharing NetWorker directory is set as a copy destination on a shared disk. When the NetWorker resource is made when sharing NetWorker directory is set according to this command, the setting of sharing NetWorker directory need not be changed.

Parameter

No parameters.

Example

It is an example when the substance of NetWorker database (/nsr) is on a shared disk (here, "/mnt/nsr" is specified in "Virtual_Path").

<pre># /etc/opt/FJSVclntw/bin/nwcIntwadd This command must be executed on server cluster mode. Are you sure? (default:n) [y,n] : y PRIMECLUSTER Wizard for NetWorker Setup tool 1 /mnt Select Mount-Point Number (quit:q) : 1 Complete the VirtualPath : >> /mnt/nsr The specified VirtualPath is /mnt/nsr. Are you sure? (default:n) [y,n,q] : y VirtualPath Mount NetWorker Database copy VirtualPath Unmount Setup succeeded. #</pre>	<pre><- Confirm server cluster mode <- Select mount point <- Input the shared NetWorker directory <- Confirm the setting of the shared NetWorker directory.</pre>
--	--

Exit Status

0 : stopped normally
except for above : stopped abnormally

Note

- Execute this command only in the case of server cluster operation.
- Execute this command on one node within the cluster.
- /nsr must be a symbolic link that points the NetWorker directory on the local disk by installing the NetWorker software according to "2.4.1.1 Server cluster operation".
- The shared disk must be ready to be mounted when this command is executed. Therefore, in the case of using GDS(Global Disk Services), the volume that is used for the shared disk must be made "active" state before the command is executed. How to operate GDS, see the "PRIMECLUSTER Installation and Administration Guide".
- When ZFS is used for the shared disk used as NetWorker directory, the nwcIntwadd command cannot be used. In this case, copy the NetWorker directory according to the example of "2.4.2.1 Setup Shared NetWorker Directory".

4.5 clntwbr - Collective Backup and Restoration of Environmental Files

User

Superuser

Format

```
/etc/opt/FJSVclntw/bin/clntwbr [ backup | restore ] [ -d backup_directory ]
```

Function

This command supports the collective backup and restoration of a variety of environmental files that constitute PRIMECLUSTER Wizard for NetWorker.

The collective backup and restoration of Wizard for NetWorker is also executed by the collective backup and restoration of the PRIMECLUSTER system (cfbackup/cfrestore).

Note

For the collective backup and restoration of the PRIMECLUSTER system, see "Chapter 11 Backing Up and Restoring a PRIMECLUSTER System" in "PRIMECLUSTER Installation and Administration Guide".

The following files can be backed up and restored with this command:

- /etc/opt/FJSVclntw/etc/*
- cluster mount information file and raw device list file
defined on /etc/opt/FJSVclntw/etc/clnwc.env

Parameter

backup

Collect backup of environmental files that constitute PRIMECLUSTER Wizard for NetWorker. The list of the files is displayed to standard output. The collected files are stored in <current directory>/FJSVclntw or <directory specified with -d option>/FJSVclntw.

restore

Restore environmental files that were collected with backup option before. The list of the files is displayed to standard output. Be sure to confirm whether <current directory>/FJSVclntw or <directory specified with -d option>/FJSVclntw exists.

[-d backup_directory]

It specifies the directory where environmental files are stored with backup or restore option. With backup option, FJSVclntw directory is made in the specified directory. With restore option, environmental files are restored from <the specified directory>/FJSVclntw. Without this option, environmental files are collected backup to or restored from <current directory>/FJSVclntw.

Exit Status

0 : stopped normally
except for above : stopped abnormally

Chapter 5 Notice

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

Features and functions

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

- For the node where NetWorker server is running

During server is running, NetWorker server is running on the OPERATING node. Therefore, the NetWorker server cannot be run and shared disk cannot be backed up on the STANDBY node.

- About the storage node cluster operation

NetWorker 7.4/7.5/7.6 does not support the high available storage node in any cluster systems. Therefore, the storage node cluster operation is not supported for NetWorker 7.4/7.5/7.6.

Configuration

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

- There is no problem in operation, though the default setting such as the label templates and managers becomes a physical node name when the server cluster operation is constructed. Change to an appropriate setting.

Operations

Below are guidelines and precautions to be taken in operating PRIMECLUSTER Wizard for NetWorker:

- Notes for shared operation of tape device

If failover occurs during robot is operated on library in transferring tape, backup may not be ended normally. In such a case, execute "nsrjb -H" and "nsrjb -I" command and backup manually.

- About the access to the tape device

It keeps waiting for the response from hardware when the cluster application is switched with NetWorker accessed the tape device. Therefore, the NetWorker process cannot stop and PRIMECLUSTER might have the node in the panic. Execute the switch of the cluster application with their no access to the tape device.

- file.xxxx File

If monitor is not stopped normally due to node failure, file.xxxx (xxxx is number) may be stored on /var/opt/FJSVclntw/logs. This file may be used for testing when failure occurs.

- About the message on syslog.

Although the following messages may be displayed on a console screen at the time of node starting and a node change, it does not have influence on operation.

```
syslogd: /nsr/logs/messages: Input-and-output error
syslogd: /nsr/logs/messages: There are a file and no directory.
syslogd: /nsr/logs/summary": There are a file and no directory.
```

The file in this message is a log file of a NetWorker server, and is performing the writing to these log files using syslogd. In case mount processing to a shared disk is performed at the time of node starting or a change and the message output from the application which is using other syslogd(s) in the state where it became impossible to refer to these files temporarily is performed, this message output generates a /nsr directory. The message file of the /var/adm subordinate who is using Syslogd etc. is normally outputted, while this message is displayed. Moreover, since it is in the state where NetWorker is not started, it is not used for these log files of a NetWorker server.

- About the Warning state when the NetWorker resource starts

There is no problem that a NetWorker resource may become the Warning state and the following message is output before it becomes the Online state, when the resource starts.

```
[ID 748625 daemon.warning] LOG3.011892417591080023 11 4 0 4.2 RMS
(DET, 29): WARNING: Resource <ManageProgram001_Nwsv> received detector report
DetReportsOnlineWarn" the WarningScript "/etc/opt/FJSVclntw/sys/clntwwarning" will be run."
```

If the NetWorker resource keeps the Warning state and it does not become the Online state, see ["3.3.3 Bringing Warning NetWorker Resource to Online State"](#) to solve the problem.

- About the NetWorker Console server

In case you start the NetWorker Console server of NetWorker 7.4/7.5/7.6 on a node of the cluster, make the NetWorker cluster application the Online or Standby state because the NetWorker client daemon needs to be running in that node.

Chapter 6 Message

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

6.1 Scripts Messages

It explains the error message output to console and /var/adm/messages file when starting the cluster application and stopping.

WARNING: The syslogd daemon may be forced to stop.

[Content]

There is a possibility that syslogd process is killed.

[Corrective action]

Start syslogd when syslogd is killed.

6.2 NetWorker Startup Scripts Messages

PRIMECLUSTER Wizard for NetWorker has following NetWorker startup scripts.

- /etc/opt/FJSVclntw/sys/networker_start
- /etc/opt/FJSVclntw/sys/v_nsrld_start

It explains the message that these scripts output to console and /var/adm/messages file.

6.2.1 NetWorker Start Messages

When the NetWorker start by PRIMECLUSTER Wizard for NetWorker is done, the following messages are output by NetWorker startup script. The message of NetWorker server demon nsrd start is output only at the server cluster operation.

```
Mar 23 09:28:40 tom logger: starting NetWorker daemons:
Mar 23 09:28:40 tom logger: nsrexecd
Mar 23 09:28:42 tom logger: nsrd
```

6.2.2 Error Messages

It explains the error message output when NetWorker startup script is executed. The error message of the NetWorker demon might be output besides the following.



Information

For the details about messages of NetWorker daemon, see the manual of NetWorker.

/usr/sbin/nsrexecd does not exist or is not a regular file.

[Content]

NetWorker client demon nsrexecd command doesn't exist or it is abnormal file.

[Corrective action]

Confirm NetWorker is correctly installed, and nsrexecd command exists.

/usr/sbin/nsrexecd does not exist or is not executable.

[Content]

NetWorker client demon nsrexecd command doesn't exist or it is not executable.

[Corrective action]

Confirm NetWorker is correctly installed, and nsrexecd command is executable.

/usr/sbin/nsrd does not exist or is not a regular file.

[Content]

NetWorker server daemon nsrd command doesn't exist or it is abnormal file.

[Corrective action]

Confirm NetWorker is correctly installed, and nsrd command exists.

/usr/sbin/nsrd does not exist or is not executable.

[Content]

NetWorker server demon nsrd command doesn't exist or it is not executable.

[Corrective action]

Confirm NetWorker is correctly installed, and nsrd command is executable.

6.3 Error Messages of the SCSI reset

It explains the error messages output to console and the /var/adm/messages file when the SCSI reset processing is executed before NetWorker starts.

Message is displayed by the format: "package name: level of message: message number: message". "FJSVclntw" is displayed as "package name". The following is described without the package name.

ERROR: 4401: Device-file-name (DEVICE) is a mode of the unsupport.

[Content]

The specified device file was not a character device.

[Corrective action]

Check the device name set to the NetWorker resource.
Check the device file of the tape device.

ERROR: 4402: Memory allocation failed. errno=X

[Content]

Allocating memory failed.

[Corrective action]

The problem may be due to insufficient system resource. Check the system environment.
"X" is value of errno when the malloc() function is executed.

ERROR: 4403: Device (DEVICE) open failed. errno=X

[Content]

Opening the specified device file failed.

[Corrective action]

Check the condition of the tape device and the device file of the tape device.
"X" is value of errno when the open() system call is executed.

ERROR: 4404: Device (DEVICE) reset failed. errno=X**[Content]**

Resetting the specified device failed.

[Corrective action]

Check the condition of the tape device, and the device file of the tape device.

"X" is value of errno when the ioctl() system call is executed.

6.4 Error Messages of Commands

It explains the error message output when the command is executed.
The message of PRIMECLUSTER might be output besides the following.



Information

For the detail about messages of PRIMECLUSTER, see "PRIMECLUSTER Installation and Administration Guide"

6.4.1 clntwlog messages

Message is displayed by the format: "package name : level of message : message number : message". "FJSVclntw" is displayed as "package name". The description of format below omits package name.

ERROR:4001:No system administrator authority.**[Content]**

Not root authority.

[Corrective action]

Re-execute by root authority.

ERROR:4021:The PATH directory does not exist.**[Content]**

Directory specified with -d option does not exist.

[Corrective action]

Specify the exist directory with -d option.

ERROR:4022:Abnormal end. Detail:X,X**[Content]**

Error occurs within command.

[Corrective action]

Contact your system administrator.

ERROR:4023:The "CMD" command terminated abnormally. Detail:X**[Content]**

"CMD" ended abnormally. Either /usr/bin/cp or /usr/bin/tar or /usr/bin/compress is in "CMD". Example of displayed error message for disk shortage is shown below.

(example)

Getting NetWorker log.

```
*** Internal log collection completion ***
```

```
tar: write error: Error is detected on EOF.
```

ERROR: The /usr/bin/tar command terminated abnormally. Processing is ended. code:2

[Corrective action]

The disk space can be short. Check disk space of /var/tmp or directory specified with -d option. Change the destined directory and re-execute.

6.4.2 hvnwdisable/hvnwenable messages

Message is displayed by the format: “command name : level of message : message“. “hvnwdisable” or “hvnwenable” is displayed as “command name“. The description of format below omits command name.

ERROR: Internal error! (details)

[Content]

An internal error occurred.

[Corrective action]

Contact your system administrator.

ERROR: Failed to disable/enable resource monitoring - resource_name

[Content]

Cannot disable or enable monitoring.

[Corrective action]

Contact your system administrator.

ERROR: hvgdconfig does not exist!

[Content]

hvgdconfig file does not exist.

[Corrective action]

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

ERROR: Obtaining local SysNode Name failed!

[Content]

Cannot get a local SysNode name.

[Corrective action]

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

ERROR: Obtaining RMS configuration Name failed!

[Content]

The RMS configuration name is not able to obtain.

[Corrective action]

Confirm the setting of userApplication (cluster application) is completed.

ERROR: Result of hww is invalid!

[Content]

RMS hww (1M) command is failed.

[Corrective action]

Confirm the setting of userApplication (cluster application) is completed.

ERROR: Failed to disable/enable resource monitoring! (details)

[Content]

Cannot disable or enable monitoring because of details.

[Corrective action]

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

ERROR: No Wizard for NetWorker resources belong to specified userApplication! - userApplication_name

[Content]

There is no PRIMECLUSTER Wizard for NetWorker resource in the specified userApplication userApplication_name.

[Corrective action]

Retry with a correct userApplication name.

ERROR: No Wizard for NetWorker resources are in the current RMS configuration!

[Content]

There is no PRIMECLUSTER Wizard for NetWorker resource in the current RMS configuration.

[Corrective action]

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

ERROR: No Wizard for NetWorker resources exist on this node! - SysNode_name

[Content]

There is no PRIMECLUSTER Wizard for NetWorker resource on a local node SysNode_name.

[Corrective action]

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

ERROR: Invalid userApplication or Resource!

[Content]

The specified userApplication name or resource name is invalid.

[Corrective action]

Retry with a correct userApplication name and resource name.

ERROR: The specified resource does not exist on SysNode_name! - resource_name

[Content]

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

[Corrective action]

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

6.4.3 nwcIntwadd messages

Message is displayed by the format: "package name : level of message : message number : message". "FJSVcIntw" is displayed as "package name". The description of format below omits package name.

ERROR : /nsr does not exist or is not a symbolic link.

[Content]

The directory "/nsr" does not exist or is not a symbolic link.

[Corrective action]

Make "/nsr" a symbolic link that indicates the NetWorker directory on a local disk.

ERROR : LocalPath does not exist or is not a directory.

[Content]

LocalPath (NetWorker directory on the local disk) does not exist or is not a directory.

[Corrective action]

Make "/nsr" a symbolic link that indicates the NetWorker directory on a local disk.

ERROR : /etc/vfstab does not exist or is not readable.

[Content]

/etc/vfstab file does not exist or is not readable.

[Corrective action]

Confirm the /etc/vfstab file.

ERROR : Shared-disk does not exist.

[Content]

The shared disk that can be used from PRIMECLUSTER does not exist.

[Corrective action]

Set the shared disk that can be used with PRIMECLUSTER.

ERROR : Device or Mountpoint is not set.

[Content]

Setting "Device" or "Mountpoint" of the shared disk is illegal.

[Corrective action]

Confirm the shared disk setting.

ERROR : Mounting the shared disk failed.

[Content]

The mounting of a shared disk failed.

[Corrective action]

Confirm setting a shared disk or whether a shared disk's being using.

ERROR : Unmounting the shared disk failed.**[Content]**

The unmounting of a shared disk failed.

[Corrective action]

Confirm whether there is the process where a shared disk is used.

ERROR : VirtualPath or LocalPath is not set.**[Content]**

Neither "Virtual_Path" nor "Local_Path" are set.

[Corrective action]

Confirm "Virtual_Path" and "Local_Path" of PRIMECLUSTER Wizard for NetWorker.

ERROR : Copying the NetWorker directory (/nsr) failed.**[Content]**

The copying of a shared data area of NetWorker failed.

[Corrective action]

Confirm whether there is existing/nsr area in a shared data area.

6.4.4 clntwbr messages

The messages are displayed with the format: "date_and_time command_name: message". "clntwbr" or "FJSVclntw.pi" is displayed as "command_name". The following is described without date and time.

clntwbr: No system administrator authority.**[Content]**

Not root authority.

[Corrective action]

Re-execute by root authority.

clntwbr: /usr/xpg4/bin/id cannot be executed.**[Content]**

/usr/xpg4/bin/id cannot be executed.

[Corrective action]

Confirm /usr/xpg4/bin/id exists and it is executable.

clntwbr: Failed in mkdir PATH**[Content]**

The directory specified with -d option cannot be created.

[Corrective action]

The disk space can be short. Check the disk space of the directory specified with -d option or the directory that this command is executed (the current directory). Change the target directory and execute again.

clntwbr: PATH/FJSVclntw does not exist. Restoration failed!

[Content]

FJSVclntw directory does not exist in the directory specified with -d option for restoration.

[Corrective action]

Confirm FJSVclntw directory (backup information) exists in the directory specified with -d option or the directory that this command is executed (the current directory).

FJSVclntw.pi: backup aborted (X-X)

[Content]

Error occurs within the command.

[Corrective action]

Contact your system administrator.

FJSVclntw.pi: restore aborted (X-X)

[Content]

Error occurs within the command.

[Corrective action]

Contact your system administrator.

Appendix A Setup Method with CUI

A.1 userApplication Creation(CUI)

This section explains how to setup RMS configurations using by CUI.

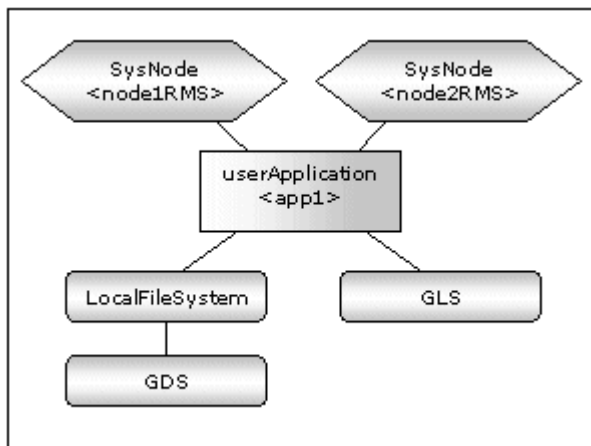
Note

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

- Standby operation

A userApplication is configured as follows.

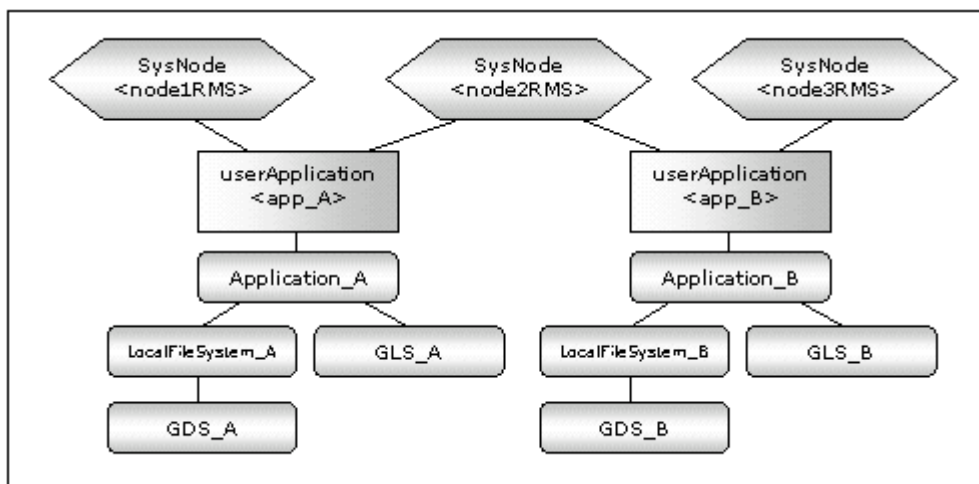
Create a NetWorker resource after NetWorker is installed.



- Scalable operation(Only client cluster operation)

When you combine N:1 standby or mutual standby with the scalable operation of NetWorker client shown by "[1.2.2.3 Client cluster operation](#)", create the resources except NetWorker and userApplications which include them.

Create NetWorker resources and the userApplications which include them after NetWorker is installed.



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

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

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

This section explains userApplication creation and non-NetWorker resource setup. userApplication is configured with the RMS Configuration Wizard. This RMS Configuration Wizard forms Wizard format.

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

On Application type selection menu, the menus in capital letters are the turnkey wizards (e. g. NETWORKER) that enables you to create userApplication easily.

The following pages describe procedure for creating the userApplication which includes a NetWorker resource with the turnkey wizard. Create the userApplications which include no NetWorker resource according to the creating procedure of each application.

Information

For further details, see the PRIMECLUSTER manuals.

A.1.1 Application-Create

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

```

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

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

```

Creation: Application type selection menu:
1) HELP
2) QUIT
3) RETURN
4) OPTIONS
5) CRM
6) DEMO
7) GENERIC
8) NETAPP
9) NETWORKER
10) ORACLE
11) SYMFOWARE
Application Type: 9
    
```

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

```

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

4. Select Machines+Basics to set up nodes and following menu items.

```

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

```

5. Set an operating node to Machines [0], and standby nodes to Machines [n]. Select AdditionalMachines when adding a new node. For other settings, see HELP or the PRIMECLUSTER Installation and Administration Guide.

 **Information**

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

Attributes	Values
AutoStartUp	Yes
AutoSwitchOver	HostFailure ResourceFailure ShutDown
PersistentFault	1
StandbyTransitions	ClearFaultRequest StartUp SwitchRequest
HaltFlag	Yes

 **Note**

“StandbyTransitions“ must be changed as above stated while NetWorker clients clustering system is standby.

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

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

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

```
Settings of turnkey wizard "NETWORKER"
 1) HELP
 2) -
 3) SAVE+EXIT
 4) -
 5) ApplicationName=APP1
 6) Machines+Basics(app1)
 7) CommandLines(-)
 8) Controllers(-)
 9) Nwcl(-)
10) Nwst(-)
11) Nwsv(-)
12) Crm:Application(-)
13) Crm:BasicApplication(-)
14) Oracle(-)
15) Crm:SystemState3(-)
16) Crm:SystemState2(-)
17) LocalFileSystems(Lfs_APP1)
18) RemoteFileSystems(-)
19) IpAddresses(-)
20) RawDisks(-)
21) RC-VolumeManagement(-)
22) VERITAS-VolumeManagement(-)
23) Netapp(-)
24) Gds:Global-Disk-Services(Gds_APP1)
25) Crm:MPNET(-)
26) GIs:Global-Link-Services(GIs_APP1)
Choose the setting to process: 3
```

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

A.1.2 Configuration-Generate and Configuration-Activate

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

```

node1: Main configuration menu, current configuration: test
No RMS active in the cluster

1) HELP
2) QUIT
3) Application-Create
4) Application-Edit
5) Application-Remove
6) Application-Clone
7) Configuration-Generate
8) Configuration-Activate
9) Configuration-Copy
10) Configuration-Remove
11) Configuration-Freeze
12) Configuration-Thaw
13) Configuration-Edit-Global-Settings
14) Configuration-Consistency-Report
15) Configuration-ScriptExecution
16) RMS-CreateMachine
17) RMS-RemoveMachine

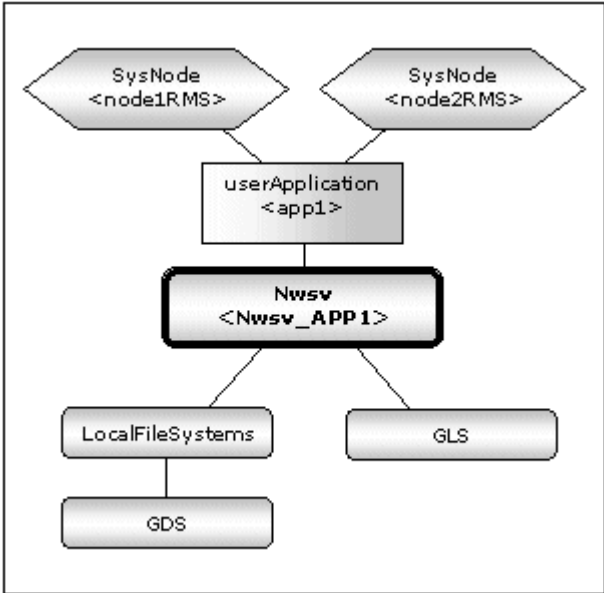
Choose an action: 8

```

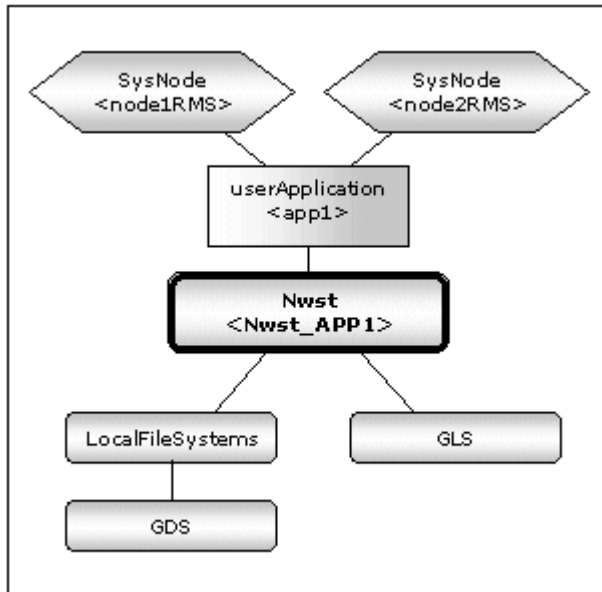
A.2 NetWorker Resource Creation and Setting

Register NetWorker resources in userApplication that is created at “A.1 userApplication Creation(CUI)”.

- Server cluster operation



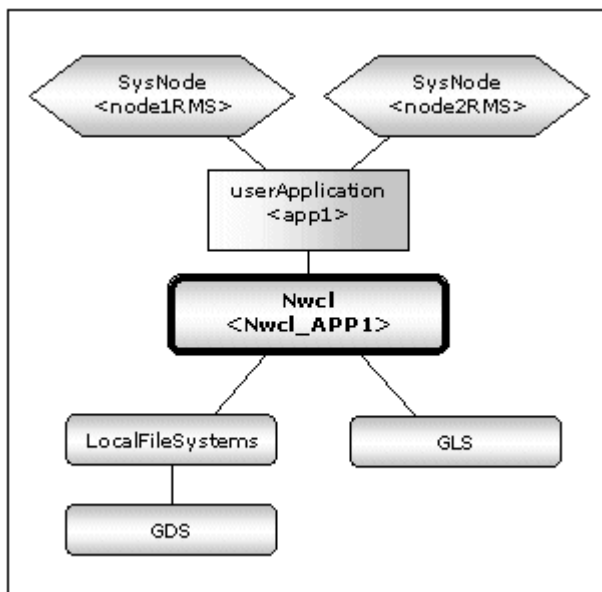
- Storage node cluster operation



 Note

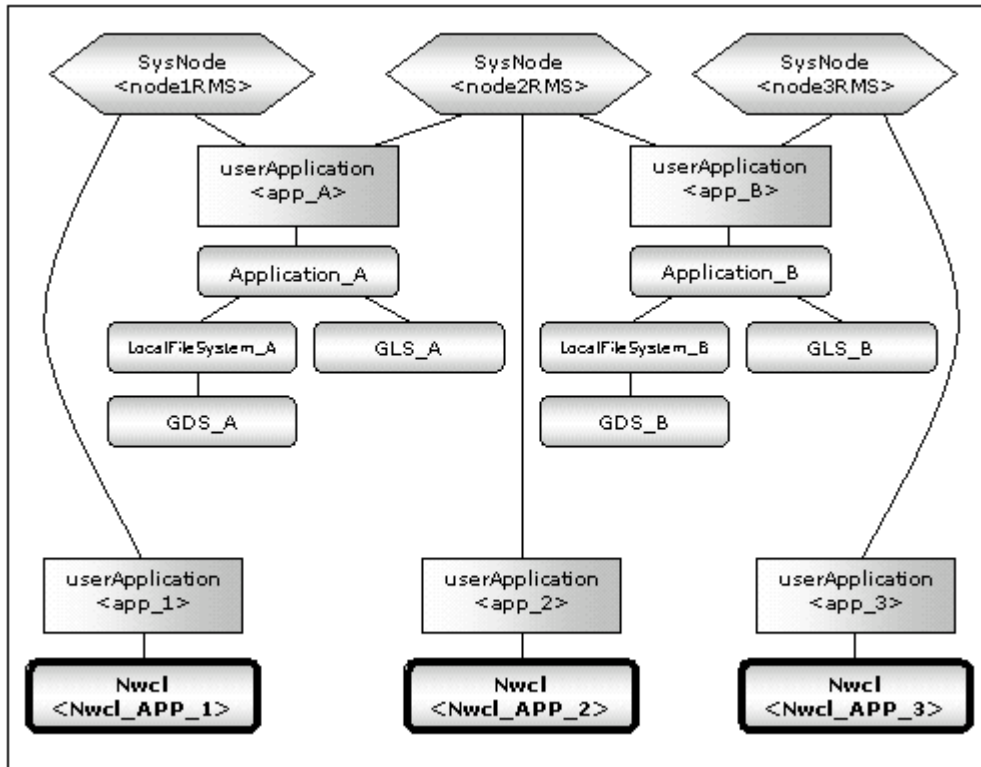
NetWorker 7.4/7.5/7.6 does not support the high available storage node in any cluster systems. Therefore, the storage node cluster operation is not supported for NetWorker 7.4/7.5/7.6.

- Client-cluster operation(Standby operation)



- Client-cluster operation(Scalable operation)

When you combine N:1 standby or mutual standby with the scalable operation of NetWorker client shown by "[1.2.2.3 Client cluster operation](#)", create NetWorker resources and the userApplications which includethem.



See

See "A.1.1 Application-Create" about the way of creating userApplication.

At scalable operation, the following setup values are recommended for the userApplications which include NetWorker resources. The other attributes not described below are optional.

Attributes	Values
AutoSwitchOver	No
PersistentFault	1
StandbyTransitions	No
HaltFlag	No

Execute the following command on any one of the nodes. Note that <Definition name> must be the same as that specified at "A.1 userApplication Creation(CUI)".

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

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

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



Note

Before starting this procedure, RMS on all the cluster nodes should stop.

Information

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

A.2.1 Application-Edit

Server cluster operation

The following example shows how to configure the NetWorker server cluster operation.

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

```
node1: Main configuration menu, current configuration: test
No RMS active in the cluster

1) HELP
2) QUIT
3) Application-Create
4) Application-Edit
5) Application-Remove
6) Application-Clone
7) Configuration-Generate
8) Configuration-Activate
9) Configuration-Copy
10) Configuration-Remove
11) Configuration-Freeze
12) Configuration-Thaw
13) Configuration-Edit-Global-Settings
14) Configuration-Consistency-Report
15) Configuration-ScriptExecution
16) RMS-CreateMachine
17) RMS-RemoveMachine

Choose an action: 4
```

2. Select userApplication in the “Application selection menu” created at “A.1 userApplication Creation(CUI)”.

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

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

```
Settings of turnkey wizard "NETWORKER"

1) HELP
2) READONLY
3) SAVE+EXIT
4) -
5) ApplicationName=APP1
6) Machines+Basics(app1)
7) CommandLines(-)
8) Controllers(-)
9) Nwcl(-)
10) Nwst(-)
11) Nwsv(-)
12) Crm:Application(-)
13) Crm:BasicApplication(-)
14) Oracle(-)
15) Crm:SystemState3(-)
16) Crm:SystemState2(-)
17) LocalFileSystems(Lfs_APP1)
18) RemoteFileSystems(-)
19) IpAddresses(-)
20) RawDisks(-)
21) RC-VolumeManagement(-)
22) VERITAS-VolumeManagement(-)
23) Netapp(-)
24) Gds:Global-Disk-Services(Gds_APP1)
25) Crm:MPNET(-)
26) Gls:Global-Link-Services(Gls_APP1)

Choose the setting to process: 11
```


4. Setup in the Nwsv setup page.

```
Nwsv (Nwsv_APP1:not yet consistent)
 1) HELP
 2) -
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) ScriptTimeout=300
 6) Interval=10
 7) LogSize=512
 8) VirtualPath='/mnt/nsr'
 9) LocalPath='/opt/nsr'
10) VirtualHost=
11) Flags=A
12) (DeviceName=)
13) (PreOnlineScript=)
14) (PostOnlineScript=)
15) (PreOfflineScript=)
16) (PostOfflineScript=)
17) (FaultScript=)
Choose the setting to process: 3
```

For details about setting, see "2.6.1.2 Server cluster operation".

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

```
Settings of turnkey wizard "NETWORKER"
 1) HELP
 2) -
 3) SAVE+EXIT
 4) -
 5) ApplicationName=APP1
 6) Machines+Basics(app1)
 7) CommandLines(-)
 8) Controllers(-)
 9) Nwcl(-)
10) Nwst(-)
11) Nwsv(Nwsv_APP1)
12) Crm:Application(-)
13) Crm:BasicApplication(-)
14) Oracle(-)
15) Crm:SystemState3(-)
16) Crm:SystemState2(-)
17) LocalFileSystems(Lfs_APP1)
18) RemoteFileSystems(-)
19) IpAddresses(-)
20) RawDisks(-)
21) RC-VolumeManagement(-)
22) VERITAS-VolumeManagement(-)
23) Netapp(-)
24) Gds:Global-Disk-Services(Gds_APP1)
25) Crm:MPNET(-)
26) Gls:Global-Link-Services(Gls_APP1)
Choose the setting to process: 3
```

Storage node cluster operation

The following example shows how to configure the NetWorker storage node cluster operation.

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

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

2. Select userApplication in the “Application selection menu” created at “[A.1 userApplication Creation\(CUI\)](#)”.

```

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

```

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

```

Settings of turnkey wizard "NETWORKER"
1) HELP
2) READONLY
3) SAVE+EXIT
4) -
5) ApplicationName=APP1
6) Machines+Basics(app1)
7) CommandLines(-)
8) Controllers(-)
9) Nwcl(-)
10) Nwst(-)
11) Nwsv(-)
12) Crm:Application(-)
13) Crm:BasicApplication(-)
14) Oracle(-)
15) Crm:SystemState3(-)
16) Crm:SystemState2(-)
17) LocalFileSystems(Lfs_APP1)
18) RemoteFileSystems(-)
19) IpAddresses(-)
20) RawDisks(-)
21) RC-VolumManagement(-)
22) VERITAS-VolumManagement(-)
23) Netapp(-)
24) Gds:Global-Disk-Services(Gds_APP1)
25) Crm:MPNET(-)
26) Gls:Global-Link-Services(Gls_APP1)
Choose the setting to process: 10

```

4. Setup in the Nwst setup page.

```

Nwst (Nwst_APP1:consistent)
1) HELP
2) -
3) SAVE+EXIT
4) REMOVE+EXIT
5) ScriptTimeout=300
6) Interval=10
7) LogSize=512
8) Flags=A
9) (DeviceName=)
10) (PreOnlineScript=)
11) (PostOnlineScript=)
12) (PreOfflineScript=)
13) (PostOfflineScript=)
14) (FaultScript=)
Choose the setting to process: 3

```

For details about setting, see “[2.6.1.3 Storage node cluster operation](#)”.

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

```

Settings of turnkey wizard "NETWORKER"
 1) HELP
 2) -
 3) SAVE+EXIT
 4) -
 5) ApplicationName=APP1
 6) Machines+Basics(app1)
 7) CommandLines(-)
 8) Controllers(-)
 9) Nwcl(-)
10) Nwst(Nwst_APP1)
11) Nwsv(-)
12) Crm:Application(-)
13) Crm:BasicApplication(-)
14) Oracle(-)
15) Crm:SystemState3(-)
16) Crm:SystemState2(-)
17) LocalFileSystems(Lfs_APP1)
18) RemoteFileSystems(-)
19) IpAddresses(-)
20) RawDisks(-)
21) RC-VolumeManagement(-)
22) VERITAS-VolumeManagement(-)
23) Netapp(-)
24) Gds:Global-Disk-Services(Gds_APP1)
25) Crm:MPNET(-)
26) Gls:Global-Link-Services(Gls_APP1)
Choose the setting to process: 3

```

Client-cluster operation

The following example shows how to configure the NetWorker client-cluster operation.

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

```

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

```

2. Select userApplication in the “Application selection menu” created at “[A.1 userApplication Creation\(CUI\)](#)”.

```

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

```

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

```

Settings of turnkey wizard "NETWORKER"
 1) HELP
 2) READONLY
 3) SAVE+EXIT
 4) -
 5) ApplicationName=APP1
 6) Machines+Basics(app1)
 7) CommandLines(-)
 8) Controllers(-)
 9) Nwcl(-)
10) Nwst(-)
11) Nwsv(-)
12) Crm:Application(-)
13) Crm:BasicApplication(-)
14) Oracle(-)
15) Crm:SystemState3(-)
16) Crm:SystemState2(-)
17) LocalFileSystems(Lfs_APP1)
18) RemoteFileSystems(-)
19) IpAddresses(-)
20) RawDisks(-)
21) RC-VolumeManagement(-)
22) VERITAS-VolumeManagement(-)
23) Netapp(-)
24) Gds:Global-Disk-Services(Gds_APP1)
25) Crm:MPNET(-)
26) Gls:Global-Link-Services(Gls_APP1)
Choose the setting to process: 9

```

4. Setup in the Nwcl setup page.

```

Nwcl (Nwcl_APP1:consistent)
 1) HELP
 2) -
 3) SAVE+EXIT
 4) REMOVE+EXIT
 5) ScriptTimeout=300
 6) Interval=10
 7) LogSize=512
 8) Flags=A
 9) (PreOnlineScript=)
10) (PostOnlineScript=)
11) (PreOfflineScript=)
12) (PostOfflineScript=)
13) (FaultScript=)
Choose the setting to process: 3

```

For details about setting, see ["2.6.1.4 Client cluster operation"](#).

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

```

Settings of turnkey wizard "NETWORKER"
 1) HELP
 2) -
 3) SAVE+EXIT
 4) -
 5) ApplicationName=APP1
 6) Machines+Basics(app1)
 7) CommandLines(-)
 8) Controllers(-)
 9) Nwcl(Nwcl_APP1)
10) Nwst(-)
11) Nwsv(-)
12) Crm:Application(-)
13) Crm:BasicApplication(-)
14) Oracle(-)
15) Crm:SystemState3(-)
16) Crm:SystemState2(-)
17) LocalFileSystems(Lfs_APP1)
18) RemoteFileSystems(-)
19) IpAddresses(-)
20) RawDisks(-)
21) RC-VolumeManagement(-)
22) VERITAS-VolumeManagement(-)
23) Netapp(-)
24) Gds:Global-Disk-Services(Gds_APP1)
25) Crm:MPNET(-)
26) Gls:Global-Link-Services(Gls_APP1)
Choose the setting to process: 3

```

A.2.2 Configuration-Generate and Configuration-Activate

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

```
node1: Main configuration menu, current configuration: test
No RMS active in the cluster

1) HELP
2) QUIT
3) Application-Create
4) Application-Edit
5) Application-Remove
6) Application-Clone
7) Configuration-Generate
8) Configuration-Activate
9) Configuration-Copy
10) Configuration-Remove
11) Configuration-Freeze
12) Configuration-Thaw
13) Configuration-Edit-Global-Settings
14) Configuration-Consistency-Report
15) Configuration-ScriptExecution
16) RMS-CreateMachine
17) RMS-RemoveMachine

Choose an action: 8
```

A.2.3 userApplication operation check

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

- Check if you can access to the shared disk from the operating node.
- Check if you can access the operating node from the client using the logical IP address.
- Check if NetWorker process can be running on the operating node.

 **Information**

- For the RMS command, see “PRIMECLUSTER Installation and Administration Guide.”
- For the NetWorker process, see the manual of NetWorker.