



**EXPRESSCLUSTER X for Linux
Legacy Feature Guide**

Release 2

NEC Corporation

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PREFACE

1.1 Who Should Use This Guide

The *EXPRESSCLUSTER X Legacy Feature Guide* describes EXPRESSCLUSTER X 4.0 WebManager and Builder.

1.2 How This Guide is Organized

- "2. *Functions of the WebManager*": Provides information on function of the EXPRESSCLUSTER WebManager.
- "3. *Functions of the Builder*": Provides information on function of the EXPRESSCLUSTER Builder.
- "4. *Troubleshooting*"

1.3 EXPRESSCLUSTER X Documentation Set

The EXPRESSCLUSTER manuals consist of the following six guides. The title and purpose of each guide is described below.

EXPRESSCLUSTER X Getting Started Guide

This guide is intended for all users. The guide covers topics such as product overview, system requirements, and known problems.

EXPRESSCLUSTER X Installation and Configuration Guide

This guide is intended for system engineers and administrators who want to build, operate, and maintain a cluster system. Instructions for designing, installing, and configuring a cluster system with EXPRESSCLUSTER are covered in this guide.

EXPRESSCLUSTER X Reference Guide

This guide is intended for system administrators. The guide covers topics such as how to operate EXPRESSCLUSTER, function of each module and troubleshooting. The guide is supplement to the Installation and Configuration Guide.

EXPRESSCLUSTER X Maintenance Guide

This guide is intended for administrators and for system administrators who want to build, operate, and maintain EXPRESSCLUSTER-based cluster systems. The guide describes maintenance-related topics for EXPRESSCLUSTER.

EXPRESSCLUSTER X Hardware Feature Guide

This guide is intended for administrators and for system engineers who want to build EXPRESSCLUSTER-based cluster systems. The guide describes features to work with specific hardware, serving as a supplement to the Installation and Configuration Guide.

EXPRESSCLUSTER X Legacy Feature Guide

This guide is intended for administrators and for system engineers who want to build EXPRESSCLUSTER-based cluster systems. The guide describes EXPRESSCLUSTER X 4.0 WebManager and Builder.

1.4 Conventions

In this guide, **Note**, **Important**, **See also** are used as follows:

Note: Used when the information given is important, but not related to the data loss and damage to the system and machine.

Important: Used when the information given is necessary to avoid the data loss and damage to the system and machine.

See also:

Used to describe the location of the information given at the reference destination.

The following conventions are used in this guide.

Convention	Usage	Example
Bold	Indicates graphical objects, such as fields, list boxes, menu selections, buttons, labels, icons, etc.	In User Name , type your name. On the File menu, click Open Database .
Angled bracket within the command line	Indicates that the value specified inside of the angled bracket can be omitted.	clpstat -s[-h host_name]
#	Prompt to indicate that a Linux user has logged on as root user.	# clpcl -s -a
Monospace (courier)	Indicates path names, commands, system output (message, prompt, etc.), directory, file names, functions and parameters.	/Linux/4.0/en/server/
Monospace bold (courier)	Indicates the value that a user actually enters from a command line.	Enter the following: # clpcl -s -a
<i>Monospace italic</i> (courier)	Indicates that users should replace italicized part with values that they are actually working with.	rpm -i expresscls-<version_number>-<release_number>.x86_64.rpm

1.5 Contacting NEC

For the latest product information, visit our website below:

<https://www.nec.com/global/prod/expresscluster/>

FUNCTIONS OF THE WEBMANAGER

This chapter describes the functions of the WebManager.

This chapter covers:

- 2.1. *Starting up the WebManager*
- 2.2. *Window of the WebManager*
- 2.3. *Checking the status of each object in the tree view of WebManager*
- 2.4. *Checking the cluster status by the WebManager list view*
- 2.5. *Checking alerts using the WebManager*
- 2.6. *Mirror disk helper*
- 2.7. *Manually setting WebManager to stop and start*
- 2.8. *Changing the settings without using the WebManager*
- 2.9. *Setting usage limitations*
- 2.10. *Operating a cluster by using the WebManager*
- 2.11. *Limitations of the WebManager*
- 2.12. *Error messages on the WebManager*

2.1 Starting up the WebManager

Accessing to the WebManager is required to create cluster configuration data. This section describes the overview of the WebManager, the access to the WebManager, and how to create cluster configuration data.

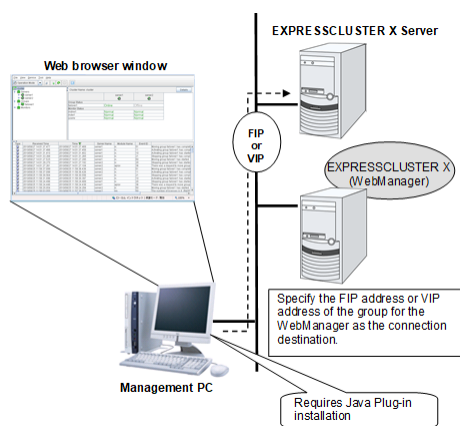
Note: You cannot configure or display functions that have been added to or changed in versions later than EXPRESSCLUSTER X 4.0.

See also:

For the system requirements of the WebManager, see the corresponding web page.

2.1.1 What is WebManager?

The WebManager is a function for setting up the cluster, monitoring its status, starting up or stopping servers and groups, and collecting cluster operation logs through a Web browser. The overview of the WebManager is shown in the following figures.



The WebManager in EXPRESSCLUSTER Server is configured to start up at the time when the operating system starts up.

2.1.2 Setting up Java runtime environment to a management PC

To access the Java applet version of WebManager, a Java Plug-in (Java[®] Runtime Environment Version 8.0 Update 162 (1.8.0_162) or later) must be installed in a browser on a management PC.

When the version of Java Plug-in is older than the version written above, the browser might prompt you to install Java. In this case, install the Java Plug-in of the version of which the operation is verified on EXPRESSCLUSTER WebManager.

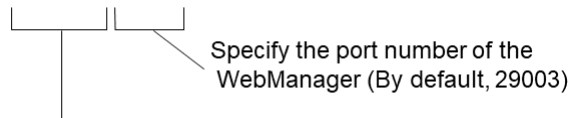
To install Java Plug-in on a browser, refer to the browser's help and the JavaVM installation guide.

You have to add the Exception Site for Java on the machine connected to the WebManager. From **Control Panel**, open **Java** and add "URLs used to connect to the WebManager."

2.1.3 Starting the WebManager

The following describes how to start the WebManager.

1. Start your Web browser.
2. Enter the actual IP address and port number of the server where the EXPRESSCLUSTER Server is installed in the Address bar of the browser.
`http://10.0.0.11:29003/main.htm`



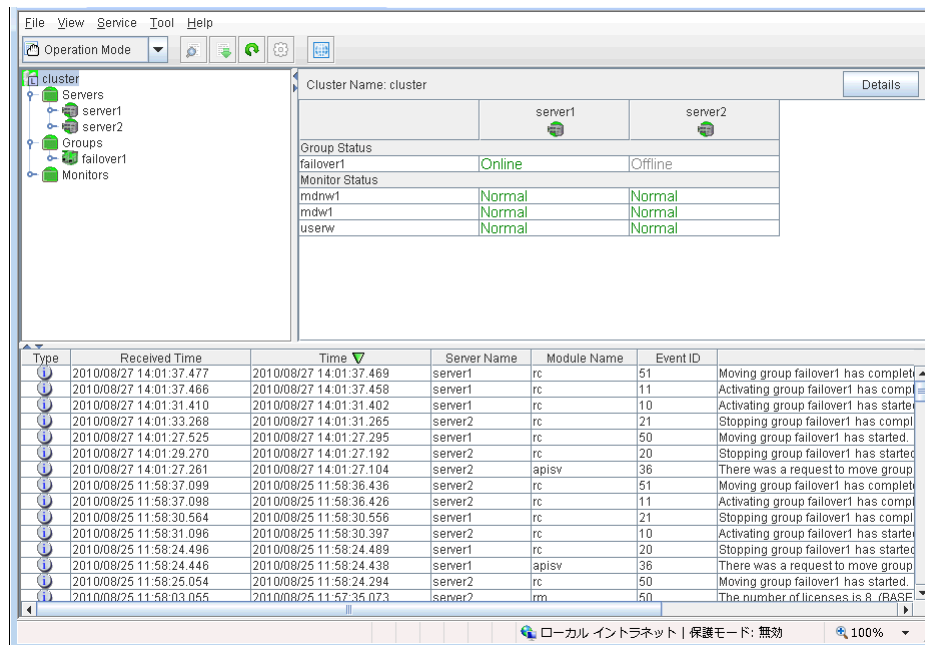
Specify the actual IP address of the server on which the EXPRESSCLUSTER Server is installed.

Note:

In Java Runtime Environment Version 9.0 or later, WebManager can be launched by using Java Web Start. When starting the Java WebManager, change "main.htm" of the URL above to "main.jnlp" and then enter the modified URL in the Address bar.

Example: `http://10.0.0.11:29003/main.jnlp`

3. The WebManager starts up.



See also:

The WebManager supports encrypted communication (by using HTTPS). For details of encrypted communication, see "3.11.11. *WebManager tab*" in "3.11. *Cluster properties*" in "3. *Functions of the Builder*" in this guide. Enter the following to perform encrypted communication.

`https://10.0.0.1:29003/main.htm`

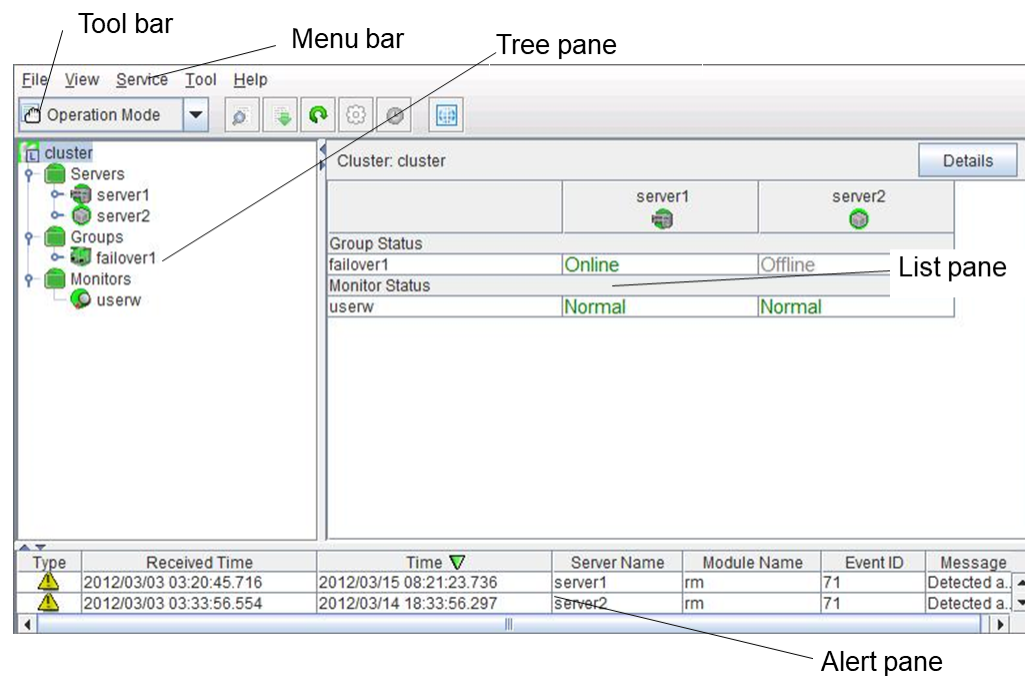
2.2 Window of the WebManager

This chapter provides information about the WebManager window.

Note: For the language used on the screen, see "3.11. Cluster properties 3.11.1. Info tab" in "3. Functions of the Builder" in this guide.

2.2.1 Main pane of the WebManager

The WebManager window consists of 2 bars and 3 panes.



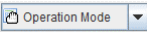
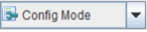
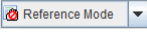
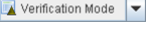






Menu bars

The following five menus can be selected.

- Files
- View
- Service
- Tool
- Help


Tool bars

If you click the combo box and icons on the toolbar, you can perform the same operations as some functions of the pull-down menu displayed on the top of the screen.

Icon	Function	Refer to:
	Switches to the WebManager operation mode. This is the same as clicking View on the menu bar and then selecting Operation Mode.	2.2.2. Switching the operation modes of the WebManager
	Switches to the WebManager config mode (Builder (online version)). This is the same as clicking View on the menu bar and then selecting Config Mode.	2.2.2. Switching the operation modes of the WebManager
	Switches to the WebManager reference mode. This is the same as clicking View on the menu bar and then selecting Reference Mode.	2.2.2. Switching the operation modes of the WebManager
	Switches to WebManager verification mode. This is the same as clicking View on the menu bar and then selecting Verification Mode.	2.2.2. Switching the operation modes of the WebManager
	Searches alerts. This is the same as clicking Tool on the menu bar and then selecting Filter Alerts.	2.2.3. Searching for an alert by using the WebManager
	Collect logs. This is the same as clicking Tool on the menu bar and then selecting Collect cluster logs	2.2.4. Collecting logs by using the WebManager
	Performs reloading. This is the same as clicking Tool on the menu bar and then selecting Reload.	2.2.5. Updating the WebManager information
	Displays the option. This is the same as clicking Tool on the menu bar and then selecting Option.	2.2.6. Changing the WebManager screen layout
 	Displays the time information. This is the same as clicking Tool on the menu bar and then selecting TimeInfo. When the time information has been updated, the icon changes accordingly. The icon reverts to its original form when the time information dialog is displayed.	2.2.7. Checking the time information from the WebManager

Continued on next page

Table 2.1 – continued from previous page

Icon	Function	Refer to:
	Displays Integrated WebManager. This is the same as clicking Tool on the menu bar and then selecting Integrated WebManager.	2.2.8. <i>Executing Integrated WebManager from the WebManager</i>

The current mode is displayed to the right of the icon.

Tree view

Allows you to see a status of each cluster's resources such as server and group resources. For more information, see "2.3. *Checking the status of each object in the tree view of WebManager*".

List view

Provides information on each cluster resource selected in the tree view in the top section and lists each server and group resource, whether each monitor resource is started or stopped, and comments in the bottom section. If you click the **Details** button located on the upper right of the view, further information will be displayed in a dialog. For more information, see "2.4. *Checking the cluster status by the WebManager list view*".

Alert view


Shows messages describing EXPRESSCLUSTER operating status. For further information, see "2.5. *Checking alerts using the WebManager*".

2.2.2 Switching the operation modes of the WebManager

The WebManager has the following four operation modes:


- Operation mode

This mode allows the user to see the status of and operate the cluster.

Select **Operation Mode** on the **View** menu or click the **Operation Mode** on the combo box ( Operation Mode) on the toolbar to switch to the operation mode. However, if you used the reference mode password for login when starting the WebManager or connected to the WebManager from a client that is not allowed to perform operations, it is not possible to switch to the operation mode.

- Config mode

This mode allows the user to set up the cluster and change the settings. The WebManager in the config mode is called *Builder (online version)*. For details about operations in the config mode, see the next chapter.

Select **Config Mode** on the **View** menu or click the **Config Mode** on the combo box ( Config Mode) on the toolbar to switch to the config mode. However, if you connected to the WebManager from a client that is not allowed to perform operations, it is not possible to switch to the config mode.


- Reference mode

This mode allows the user to see the cluster status, but not to operate the cluster.

Select **Reference Mode** on the **View** menu or click the **Reference Mode** on the combo box ( Reference Mode) on the toolbar to switch to the reference mode.

- Verification mode

This mode allows the user to enable or disable dummy failure of monitor resource.

Select **Verification Mode** on the **View** menu or click **Verification Mode** in the combo box () on the toolbar to switch to verification mode. However, if you connected to the WebManager from a client that is not allowed to perform operations, it is not possible to switch to verification mode.

If you switch from the verification mode to another mode, a dialog box asks if you want to cancel the enabled dummy failure of all the monitor resources. Select **Yes** to place all the monitor resources in the enabled dummy failure back in the normal monitored status. Select **No** to switch to another mode while keeping the monitor resources in the enabled dummy failure.

Note:


When the pop-up window is displayed for **Operation Mode**, **Reference Mode**, or **Verification Mode** in the WebManager, and if switching to **Config Mode** is performed, the open pop-up window closes.

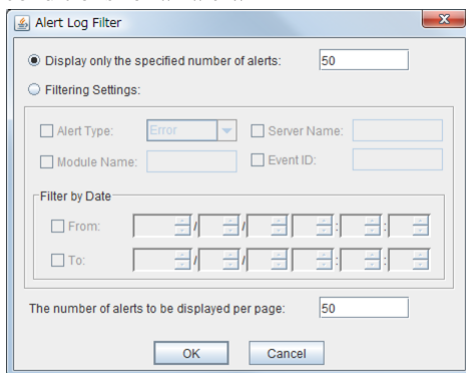
The operation performed on the pop-up window continues.

2.2.3 Searching for an alert by using the WebManager

You can search for an alert by using the WebManager. Searching in this method is useful to view only a specific type alert.

Note: For the information on alert logs, see "[2.5. Checking alerts using the WebManager](#)".

To search for an alert, click **Filter Alerts** on the Tool menu or click the filter alerts icon () on the toolbar. In the title view, click the **Filter Alerts** button to display the window for setting search conditions for an alert.



To search only the specified number of past alert logs:

1. Select **Display only the specified number of alerts**.
2. Enter the number of past alert logs to search, and then click **OK**. The specified number of past alerts are displayed.

Note: The maximum alert number to enter can be configured in **Max Number to Save Alert Records**. To configure **Max Number to Save Alert Records**, right-click the cluster icon in the **Builder** and click **Properties** on the shortcut menu. In the properties dialog box click the **Alert Log** tab.

To search by specifying search conditions:

1. Click Select the filter option.
2. Enter the search conditions in each field and start searching.
 - **Alert Type:** Select the type of alerts.
 - **Module Name:** Enter the module type. The values you can enter are as follows.


Module Type	Category
pm	Whole EXPRESSCLUSTER
monp	Whole EXPRESSCLUSTER
rc	Group/resource related
rm	Monitor resource related
nm	Heartbeat resource related
apisv	API related
lanhb	LAN heartbeat resource
lankhb	Kernel mode LAN heartbeat resource
diskhb	DISK heartbeat resource
comhb	COM heartbeat resource
bmchb	BMC heartbeat resource
disk	Disk resource
fip	Floating IP resource
vip	Virtual IP resource
vipw	VIP monitor resource
ddnsw	Dynamic DNS monitor resource
vmw	VM monitor resource
userw	User-mode monitor resource
trnsv	External monitoring coordination related
mm	External monitoring coordination related
md	Mirror disk resource
hd	Hybrid disk resource
mdagent	Mirror agent related
mdadmn	Mirror disk related
mdctrl	Mirror disk control command
mdinit	Mirror disk initialization command
hdctrl	Hybrid disk control command
hdinit	Hybrid disk initialization command
mdw	Mirror disk monitor resource
hdw	Hybrid disk monitor resource
cl	Cluster control command
cfmgr	Cluster configuration information operation library
logcmd	Message output command
mail	Mail report related
lamp	Network warning light report related
diskperf	Disk performance information management module
jra	JVM monitor resource
sra	System monitor resource

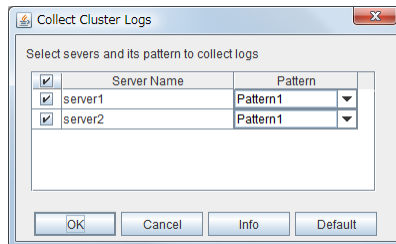
- Server Name : Type in the name of a server whose alerts you want to see.
- Event ID : Type in an event ID whose alerts you want to see.
- Start Time and Stop Time: Specify the **Start Time** and **Stop Time** to narrow down the search condition

using the time of the event occurrence.

3. Enter the number of alerts to display on one page in **The number of alerts to be displayed per page:** and click **OK**. Research results are displayed based on the time an alert occurred.
4. If the results of research are displayed on more than one page, move the page by clicking **Back**, **Next**, and **Jump**.

2.2.4 Collecting logs by using the WebManager

Clicking **Collect Cluster Logs** on the **Tool** menu or clicking the Collect Cluster logs icon () on the toolbar opens the log collection dialog box.



Check box

Select check boxes of the servers that have the logs you want to collect.

Pattern

Select the information to be collected. Specify one of Pattern 1 to Pattern 3 as the log collection pattern.

	Pattern1	Pattern2	Pattern3	Pattern4
(1) Default collect In-formation	✓	✓	✓	✓
(2) syslog	✓	✓	✓	n/a
(3) core	✓	✓	n/a	✓
(4) OS Infor-mation	✓	✓	✓	✓
(5) script	✓	✓	n/a	n/a
(6) ESMPRO/AC	✓	✓	n/a	n/a

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Table 2.3 – continued from previous page

	Pattern1	Pattern2	Pattern3	Pattern4
(7) HA Logs	n/a	✓	n/a	n/a

For (1) to (7) information , see "Collecting logs (clplogcc command)" in "EXPRESSCLUSTER command reference" in the Reference Guide.

OK

Starts collect cluster logs and displays the dialog box of log collection progress.

Cancel

Closes this dialog box.

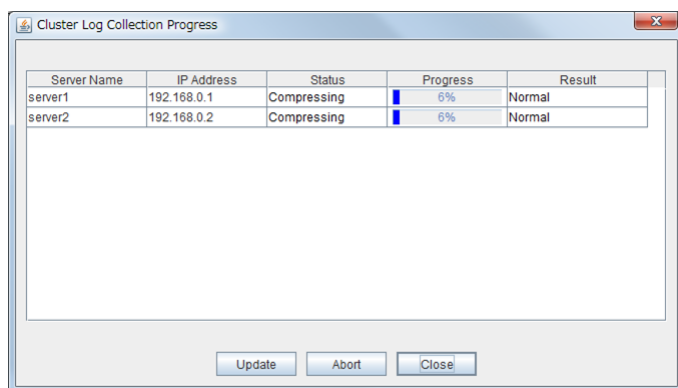
Info

Displays the information on each pattern.

Default

Resets the selections of servers and collect patterns to default values.

Cluster Log Collection Progress dialog box



Update

Updates the dialog box of the **Cluster** log collection progress.

Abort

Aborts the **Cluster** log collection.

Close

Closes the dialog box of the **Cluster** log collection progress. **Cluster** Log collection is continued.
At this time, the display of the **Collect Cluster Logs** button has changed to the **Progress** button. Click **Progress** to display the progress of log collection again.

Collect Cluster Logs Results

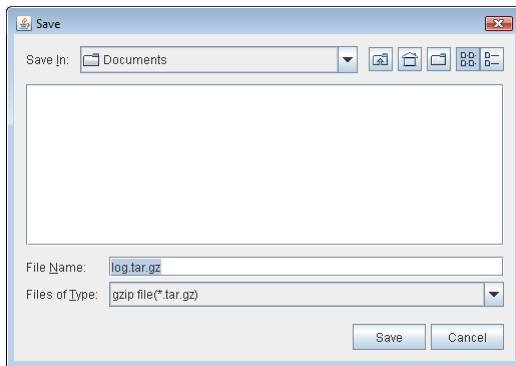
Result	Description
Normal	Cluster Log collection succeeded.
Abort	Cluster Log collection was canceled by user.
Invalid Parameters	Internal error may have occurred.

Continued on next page

Table 2.4 – continued from previous page

Result	Description
Communication Error	Connecting error occurred.
Timeout	Time-out occurred.
Busy	Server is busy.
Compression Error	Error occurred when compressing a file.
File I/O Error	File I/O failed.
Not Enough Free Space	There is not enough available space on the disk.
Unknown Error	File does not exist.

When the **Cluster** log collection completes, the browser displays a **Save** dialog box that asks where you want to save the logs. Download the logs to any location.



Note: Logs may not be downloaded properly if nothing is changed for more than 10 minutes.

When you collect logs, the following message may be displayed in the server console.

```
hda: bad special flag: 0x03
ip_tables: (C) 2000-2002 Netfilter core team
```

This will not affect log collection. Ignore this message.

Note: If other modal dialog is displayed while **Cluster** collecting logs, the file saving dialog for the **Cluster** log collection will not be displayed. To display the file saving dialog, close the modal dialog.

2.2.5 Updating the WebManager information

Update the information displayed in the WebManager by clicking the **Reload** button in the title view in the upper part of the WebManager.

Click **Reload** on the **Tool** menu or click the reload icon () on the toolbar.

Note:

When **RealTime** is set for the client data update method, what is displayed for the WebManager is updated automatically

When **Polling** is set for the client data update method, what is displayed for the WebManager is generally updated automatically, however, it does not always display the latest status because of the refresh interval configuration.

To display the latest information, click the reload icon or **Reload** on the **Tool** menu after performing an operation.

To configure the client data update method, from the shortcut menu, select **Properties**. In the properties dialog box, click the **WebManager** tab. Select the **Client Data Update Method** on **Tuning**.

To configure the automatic **reload interval of the WebManager**, from the shortcut menu, select **Properties**. In the properties dialog box, click the **WebManager** tab. Configure the **Reload Interval**.


Some objects may be displayed in gray when communications to the connecting destination is disabled or EXPRESSCLUSTER is not working at the access destination.

2.2.6 Changing the WebManager screen layout

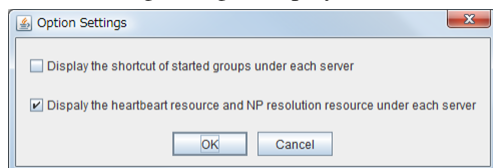
The WebManager screen layout can be changed by clicking the split bar buttons or dragging the bars. The split bars divide the views in the WebManager.




On the bar, click ▲ to maximize the view. Click ▼ to minimize it.

To change the display items on the tree view, click **Option** on the **Tool** menu or option icon () on the tool bar.

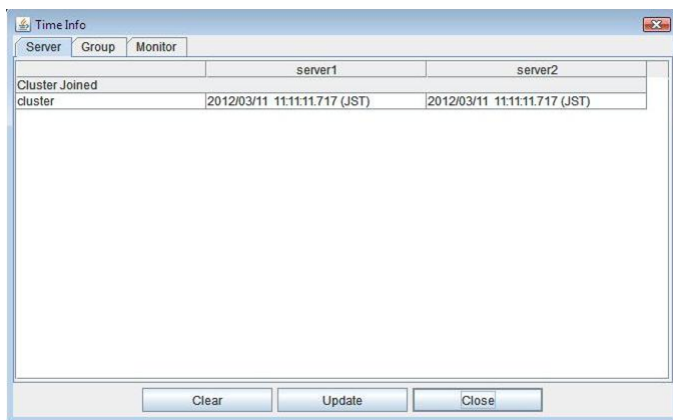
The following dialog is displayed. Check items you want to display.



2.2.7 Checking the time information from the WebManager

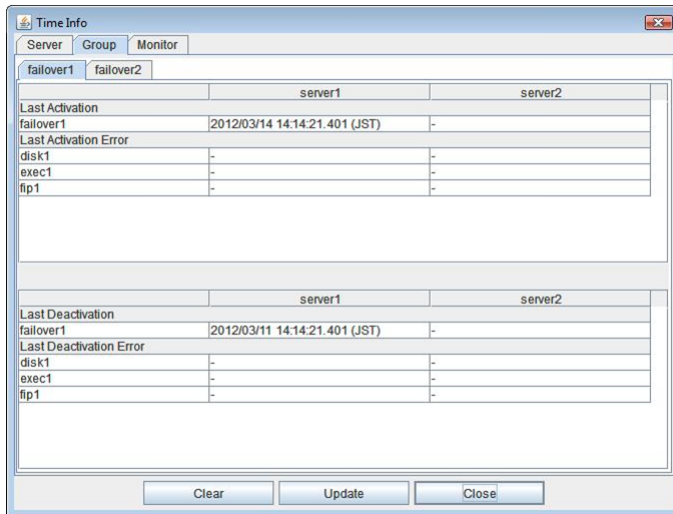
Check the time information from the WebManager by clicking **Time info** on the **Tool** menu or by clicking the time information icon () on the toolbar.

Time information displayed on the Server tab



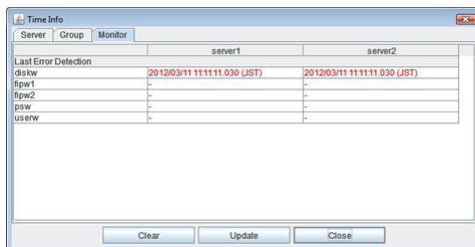
- Cluster joined
Displays the most recent time at which each server joined the cluster.

Time information displayed on the Group tab



- Last activation
Displays the time at which the failover group was last activated on each server.
- Last activation error
Displays the time at which an activation failure of a group resource was last detected on each server.
- Last deactivation
Displays the time at which the failover group was last deactivated on each server.
- Last deactivation error
Displays the time at which a deactivation failure of a group resource was last detected on each server.

Time information displayed on the Monitor tab



- Last error detection
Displays the time at which each monitor resource last transitioned from normal status to abnormal status on each server.

Clear

Deletes the time information displayed on the current tab.

Update

Acquires the time information for all the tabs.


Close

Closes the time information dialog box.

Note: When **Client Data Update Method** is set to **Polling**, the time information icon on the toolbar may

be blinked if you push **Clear** button. But it's not a problem.

2.2.8 Executing Integrated WebManager from the WebManager

To execute Integrated WebManager from the WebManager, click **Integrated WebManager** on the **Tool** menu or Integrated WebManager icon () on the tool bar.

2.2.9 Operating a cluster and cluster services on the WebManager

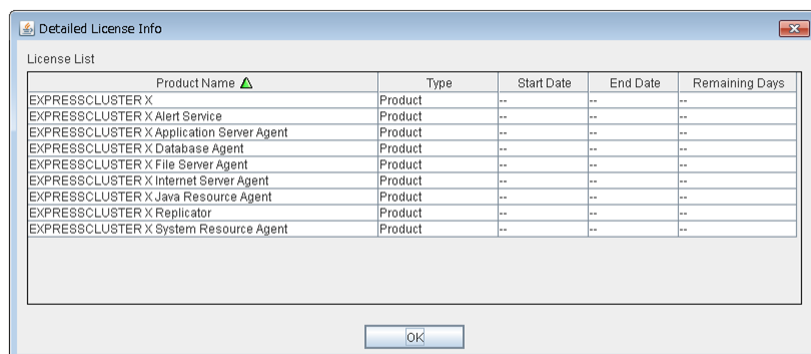
Operate cluster services on the WebManager by clicking each of the following items on the **Service** menu.

Suspend Cluster, Resume Cluster, Start Cluster, Stop Cluster, Restart Manager, Start Mirror Agent, Stop Mirror Agent are displayed. Clicking these items perform the following operations.

- **Suspend Cluster**
Suspends a cluster. This menu can be selected only when all the servers in a cluster are running.
- **Resume Cluster**
Resumes a suspended cluster. This menu can be selected only when all the servers in a cluster are suspended. The status of the group and the group resource of the resumed cluster when suspended is kept.
- **Start Cluster**
Starts a cluster. This menu can be selected only when a cluster is stopped.
- **Stop Cluster**
Stops a cluster. This menu can be selected only when a cluster is running.
- **Restart Manager**
Restarts a manager.
- **Start Mirror Agent**
Starts a mirror agent. This menu can be selected when the cluster is stopped regardless of the mirror agent status.
- **Stop Mirror Agent**
Stops a mirror agent. This menu can be selected when the cluster is stopped regardless of the mirror agent status.

2.2.10 Confirming the license from the WebManager

To confirm the license from the WebManager, click **License Info** on the **Help** menu.



Registered License List

Displays the licenses registered on the connection destination server.

You can rearrange each item by selecting the field name from the list.

By default, the items are arranged in descending order of **Product Name**.

Note: In case of license which includes multiple licenses, all included licenses information are displayed.

OK button

Closes the **License Info** dialog box.

2.3 Checking the status of each object in the tree view of WebManager

View the status of objects that configure the cluster on the WebManager.

1. Start the WebManager.
2. On the left pane of the window, a tree is displayed. Check the status by icon and object color.

Note: The configurations of the tree depend on the versions and option products of EXPRESSCLUSTER.

2.3.1 The colors of the icons displayed in the WebManager tree view

The following table shows icons and their meanings:

No.		Icon	Status	Description
1	Cluster		Normal	All servers, group resources, and monitor resources are in a normal status.
			Caution	One or more servers, or group resources, or monitor resource has an error or is in a warning status.
			Error	All servers are down or in the error status.
2	All servers		Normal	All servers have been started.
			Caution	One or more servers in the cluster are not working.
			-	-
			Unknown	No information is acquired.
3	Individual server		Online	The server is running normally.
			Caution	One or more servers in the cluster cannot be accessed.
			Offline or Unknown	The server is not working, or no information is acquired.



Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
4	Individual server (Virtual machine)		Online	The server is running normally.
			Caution	One or more servers in the cluster cannot be accessed.
			Offline or Unknown	The server is not working, or no information is acquired.
5	LAN heartbeat resource		Normal	The resource can communicate with all servers.
			Caution	One or more servers in the cluster cannot be accessed.
			Error	The resource is not working normally.
			Unknown	No status is acquired.
			Not Used	The heartbeat resource is not registered.
6	Kernel-mode LAN heartbeat resource		Normal	The resource can communicate with all servers.
			Caution	One or more servers in the cluster cannot be accessed.
			Error	The resource is not working normally.
			Unknown	No status is acquired.
			Not Used	The heartbeat resource is not registered.
7	Disk heartbeat resource		Normal	The resource can communicate with all servers.
			Caution	One or more servers in the cluster cannot be accessed.
			Error	The resource is not working normally.
			Unknown	No status is acquired.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Not Used	The heartbeat resource is not registered.
8	COM heartbeat resource		Normal	The resource can communicate with all servers.
			Caution	One or more servers in the cluster cannot be accessed.
			Error	The resource is not working normally.
			Unknown	No status is acquired.
			Not Used	The heartbeat resource is not registered.
9	BMC heartbeat resource		Normal	The resource can communicate with all servers.
			Caution	One or more servers in the cluster cannot be accessed.
			Error	The resource is not working normally.
			Unknown	No status is acquired.
			Not Used	The heartbeat resource is not registered.
10	PING network partition resolution resource		Normal	A response to ping command is sent from a ping target.
			Caution	-
			Error	A response to ping command is not sent from a ping target.
			Unknown	No information is acquired.
			Not Used	The ping network partition resolution resource is not registered.
11	All groups		Normal	All groups are running normally.
			Caution	One or more groups are not running normally.




Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	No groups are working normally.
			Unknown	No information is acquired.
12	Individual group		Online	The group has been started.
			Error	The group has an error.
			Offline or Unknown	The group is stopped, or no information is acquired.
13	Disk resource		Online	The disk resource has been started.
			Error	The disk resource has an error.
			Offline or Unknown	The disk resource is stopped, or no information is acquired.
14	EXEC resource		Online	The Exec resource has been started.
			Error	The Exec resource has an error.
			Offline or Unknown	The Exec resource is stopped, or no information is acquired.
15	Floating IP resource		Online	The floating IP resource has been started.
			Error	The floating IP resource has an error.
			Offline or Unknown	The floating IP resource is stopped/ no information is acquired.
16	Mirror disk resource		Online	The mirror disk resource has been started.
			Error	The mirror disk resource has an error.
			Offline or Unknown	The mirror disk resource is stopped, or no information is acquired.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
17	Hybrid disk resource		Online	The hybrid disk resource has been started.
			Error	The hybrid disk resource has an error.
			Offline or Unknown	The hybrid disk resource is stopped, or no information is acquired.
18	NAS resource		Online	The NAS resource has been started.
			Error	The NAS resource has an error.
			Offline or Unknown	The NAS resource is stopped, or no information is acquired.
19	Volume manager resource		Online	The volume manager resource has been started.
			Error	The volume manager resource has an error.
			Offline or Unknown	The volume manager resource is stopped, or no information has been acquired.
20	Virtual IP resource		Online	The Virtual IP resource has been started.
			Error	The Virtual IP resource has an error.
			Offline or Unknown	The Virtual IP resource is stopped, or no information is acquired.
21	Virtual machine resource		Online	The virtual machine resource has been started.
			Error	The virtual machine resource has an error.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Offline or Unknown	The virtual machine resource is stopped, or no information is acquired.
22	Dynamic DNS resource		Online	The Dynamic DNS resource has been started.
			Error	The Dynamic DNS resource has an error.
			Offline or Unknown	The Dynamic DNS resource is stopped, or no information has been acquired.
23	AWS Elastic IP resource		Normal	The AWS Elastic IP resource is running normally.
			Error	The AWS Elastic IP resource has an error.
			Offline or Unknown	The AWS Elastic IP resource is stopped, or no information is acquired.
24	AWS Virtual IP resource		Normal	The AWS Virtual IP resource is running normally.
			Error	The AWS Virtual IP resource has an error.
			Offline or Unknown	The AWS Virtual IP resource is stopped, or no information is acquired.
25	AWS DNS resource		Normal	The AWS DNS resource is running normally.
			Error	The AWS DNS resource has an error.
			Offline or Unknown	The AWS DNS resource is stopped, or no information is acquired.
26	Azure probe port resource		Normal	The Azure probe port resource is running normally.




Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The Azure probe port resource has an error.
			Offline or Unknown	The Azure probe port resource is stopped, or no information is acquired.
27	Azure DNS resource		Normal	The Azure DNS resource is running normally.
			Error	The Azure DNS resource has an error.
			Offline or Unknown	The Azure DNS resource is stopped, or no information is acquired.
28	All monitor resources ¹		Normal	All monitor resources are running normally.
			Caution	One or more monitor resources have an error, or monitoring is suspended on a server.
			Error	All monitor resources have errors.
			Normal (Dummy Failure)	In the normal status, dummy failure enabled.
			Caution (Dummy Failure)	In the warning status, dummy failure enabled.
			Error (Dummy Failure)	In the error status, dummy failure enabled.
			Normal (Recovery Action Disabled)	In the normal status, the recovery action disabled.
			Caution (Recovery Action Disabled)	In the warning status, the recovery action disabled.
			Error (Recovery Action Disabled)	In the error status, the recovery action disabled.














Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Normal (Dummy Failure and Recovery Action Disabled)	In the normal status, the recovery action disabled and dummy failure enabled.
			Caution (Dummy Failure and Recovery Action Disabled)	In the warning status, the recovery action disabled and dummy failure enabled.
			Error (Dummy Failure and Recovery Action Disabled)	In the error status, the recovery action disabled and dummy failure enabled.
			Unknown	No information is acquired.
29	Disk monitor resource ²		Normal	The disk is running normally.
			Caution	There are one or more servers with disk problems, or monitoring is suspended on a server.
			Error	All servers have disk errors.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
30	IP monitor resource ²		Normal	The IP address of a target has no error.
			Caution	One or more servers cannot communicate with the IP address of the target, or monitoring is suspended on a server.
			Error	No servers can communicate with the IP address of the target.
			Dummy Failure	Dummy failure is enabled.





Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Unknown	No information is acquired.
31	NIC Link Up/Down monitor resource ²		Normal	The NIC of a target has no error.
			Caution	One of servers has a problem with the NIC of the target, or monitoring is suspended on a server.
			Error	All servers have errors with the NIC of the target.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
32	Mirror disk connect monitor resource		Normal	The mirror disk connect is running normally.
			Caution	One of the servers has mirror disk connect problems, or monitoring is suspended on a server.
			Error	A mirror disk connect error has occurred on both servers.
			Unknown	No information is acquired.
33	Mirror disk monitor resource		Normal	The mirror disk is running normally.
			Caution	Mirroring is now being recovered, or monitoring is suspended on a server.
			Error	The mirror disk has an error. Mirror recovery is needed.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Unknown	No information is acquired.
34	Hybrid disk connect monitor resource		Normal	Hybrid disk connect is running normally.
			Caution	One of the servers has hybrid disk connect problems, or monitoring is suspended on a server.
			Error	Hybrid disk connect error has occurred on both servers.
			Unknown	No information is acquired.
35	Hybrid disk monitor resource		Normal	Hybrid disk is running normally.
			Caution	Mirroring for hybrid disk is now being recovered, or monitoring is suspended on a server.
			Error	Hybrid disk is not working normally. Mirror recovery must be performed.
			Unknown	No information is acquired.
36	PID monitor resource ²		Normal	AP is running normally.
			Caution	There are one or more servers on which monitoring is suspended.
			Error	AP is not working normally.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.





















Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
37	User-mode monitor resource		Normal	User space is running normally.
			Caution	User space is not working on one or more servers, or monitoring is suspended on a server.
			Error	User space is not working on all servers.
			Unknown	No information is acquired.
38	Multi target monitor resource ²		Normal	Multi target monitor resource is running normally.
			Caution	Monitoring is suspended on a server, or one or more monitor resources registered in the multi target monitor resource have errors.
			Error	Multi target has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
39	Virtual IP monitor resource		Normal	Virtual IP monitor resource is running normally.
			Caution	-
			Error	Virtual IP monitor resource has an error.
			Unknown	No information is acquired.
40	ARP monitor resource		Normal	ARP monitor resource is running
				normally.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Caution	-
			Error	ARP monitor resource has an error.
			Unknown	No information is acquired.
41	Custom monitor resource ²		Normal	Custom monitor resource is running normally.
			Caution	-
			Error	Custom monitor resource has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
42	VM monitor resource		Normal	VM is running normally.
			Caution	The Virtual machine is not working on one or more servers, or monitoring is suspended on a server.
			Error	VM has an error.
			Unknown	No information has been acquired.
43	Message receive monitor resource		Normal	No error message has been received.
			Caution	A server has received an error message, or monitoring is suspended on a server.
			Error	An error message has been received.
			Unknown	No information has been acquired.
44	Dynamic DNS monitor resource		Normal	Dynamic DNS is running normally.
			Caution	-
			Error	Dynamic DNS has an error.
			Unknown	No information has been acquired.





















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Table 2.5 – continued from previous page

No.		Icon	Status	Description
45	Process name monitor resource ²		Normal	Process is running normally.
			Caution	There are one or more servers on which monitoring is suspended.
			Error	Process is not working normally.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
46	Oracle monitor resource ²		Normal	Oracle is running normally.
			Caution	Oracle monitor resource is suspended.
			Error	Oracle has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
47	DB2 monitor resource ²		Normal	DB2 is running normally.
			Caution	DB2 monitor resource is suspended.
			Error	DB2 has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
48	PostgreSQL monitor resource ²		Normal	PostgreSQL is running normally.
			Caution	PostgreSQL monitor resource is suspended.
			Error	PostgreSQL has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
49	MySQL monitor resource ²		Normal	MySQL is running normally.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Caution	MySQL monitor resource is suspended.
			Error	MySQL has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
50	Sybase monitor resource ²		Normal	Sybase is running normally.
			Caution	Sybase monitor resource is suspended.
			Error	Sybase has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
51	Samba monitor resource ²		Normal	Samba is running normally.
			Caution	The Samba is not working in one or more servers, or monitoring is suspended on a server.
			Error	Samba has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
52	NFS monitor resource ²		Normal	NFS is running normally.
			Caution	The NFS is not working in one or more servers, or monitoring is suspended on a server.
			Error	NFS has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
53	HTTP monitor resource ²		Normal	HTTP is running normally.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Caution	The PostgreSQL is not working in one or more servers, or monitoring is suspended on a server.
			Error	HTTP has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
54	FTP monitor resource ²		Normal	FTP is running normally.
			Caution	FTP is not working in one or more servers, or monitoring is suspended on a server.
			Error	FTP has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
55	SMTP monitor resource ²		Normal	SMTP is running normally.
			Caution	The SMTP is not working in one or more servers, or monitoring is suspended on a server.
			Error	SMTP has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
56	POP3 monitor resource ²		Normal	POP3 is running normally.
			Caution	POP3 is not working in one or more servers, or monitoring is suspended on a server.
			Error	POP3 has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
57	IMAP4 monitor resource ²		Normal	IMAP4 is running normally.
			Caution	IMAP4 is not working in one or more servers, or monitoring is suspended on a server.
			Error	IMAP4 has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
58	Tuxedo monitor resource ²		Normal	Tuxedo is running normally.
			Caution	Tuxedo monitor resource is suspended.
			Error	Tuxedo has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
59	WebSphere monitor resource ²		Normal	WebSphere is running normally.
			Caution	WebSphere monitor resource is suspended.
			Error	WebSphere has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
60	WebLogic monitor resource ²		Normal	WebLogic is running normally.
			Caution	WebLogic monitor resource is suspended.
			Error	WebLogic has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
61	WebOTX monitor resource ²		Normal	WebOTX is running normally.
			Caution	WebOTX monitor resource is suspended.
			Error	WebOTX has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
62	JVM monitor resource ²		Normal	JAVA VM is running normally.
			Caution	The JVM monitor resource is suspended.
			Error	JAVA VM has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
63	System monitor resource ²		Normal	System Resource Agent is running normally.
			Caution	Monitoring is suspended on a server.
			Error	System Resource Agent has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
64	Floating IP monitor resource ²		Normal	Floating IP is running normally.
			Caution	Monitoring is suspended on a server.
			Error	Floating IP has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
65	BMC monitor resource ²		Normal	BMC is running normally.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Caution	Monitoring is suspended on a server.
			Error	BMC has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
66	Oracle Clusterware Synchronization Management monitor resource ²		Normal	Oracle Clusterware Synchronization Management process is running normally.
			Caution	Monitoring is suspended on a server.
			Error	Oracle Clusterware Synchronization Management process has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
67	AWS Elastic IP monitor resource ²		Normal	The AWS Elastic IP monitor resource is running normally.
			Caution	Acquiring the AWS CLI command response failed or monitoring is suspended on a server.
			Error	The AWS Elastic IP monitor resource has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
68	AWS Virtual IP monitor resource ²		Normal	The AWS Virtual IP monitor resource is running normally.
			Caution	Acquiring the AWS CLI command response failed or monitoring is suspended on a server.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The AWS Virtual IP monitor resource has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
69	AWS AZ monitor resource ²		Normal	The AWS AZ monitor resource is running normally.
			Caution	Acquiring the AWS CLI command response failed or monitoring is suspended on a server.
			Error	The AWS AZ monitor resource has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
70	AWS DNS monitor resource ²		Normal	The AWS DNS monitor resource is running normally.
			Caution	Acquiring the AWS CLI command response failed or monitoring is suspended on a server.
			Error	The AWS DNS monitor resource has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
71	Azure probe port monitor resource ²		Normal	The Azure probe port monitor resource is running normally.
			Caution	The Azure probe port monitor resource has a monitoring suspended on a server.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The Azure probe port monitor resource has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
72	Azure load balance monitor resource ²		Normal	The Azure load balance monitor resource is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The Azure load balance monitor resource has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.
73	Azure DNS monitor resource ²		Normal	The Azure DNS monitor resource is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The Azure DNS monitor resource has an error.
			Dummy Failure	Dummy failure is enabled.
			Unknown	No information is acquired.

2.3.2 Operations from the WebManager

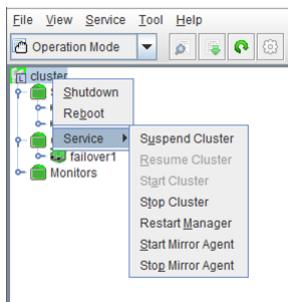
You can operate a cluster by right-clicking (1) Cluster, (3) Individual server, (12) Individual group, or (21) VM resource and choosing an operation.

Objects of the cluster

When you right-click the **cluster** object, the following shortcut menu is displayed.

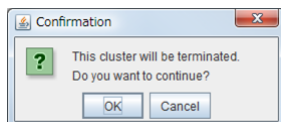
¹ When restraining recovery action at the time of monitor resource abnormality, "Recovery Action Disabled" is indicated next to monitor. When the monitor resource by which pseudo-failures occur exists, "Failure Verification" is indicated.

² When dummy failure, "Dummy Failure" is indicated.



- **Shut down**

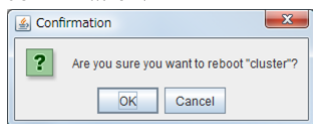
Shuts down all running servers. When you select **Shutdown**, the following dialog box is displayed for confirmation.



Note that servers that cannot be accessed from the server to which the WebManager is connected (for example, servers that all LAN heartbeat resources are stopped) will not be shut down.

- **Reboot**

Reboots all running servers. When you select **Reboot**, the following dialog box is displayed for confirmation.

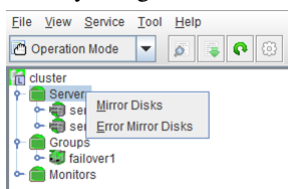


- **Service**

Clicking **Service** displays **Suspend Cluster**, **Resume Cluster**, **Start Cluster**, **Stop Cluster**, **Start Mirror Agent** and **Stop Mirror Agent**.

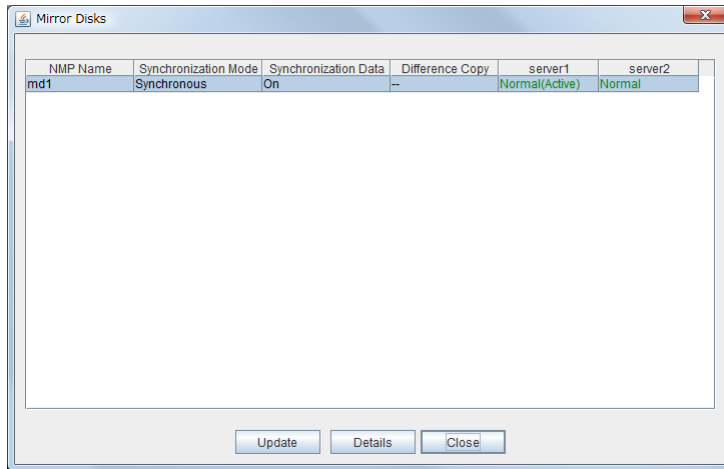
Servers object

When you right-click the **Servers** object, the following shortcut menu is displayed.



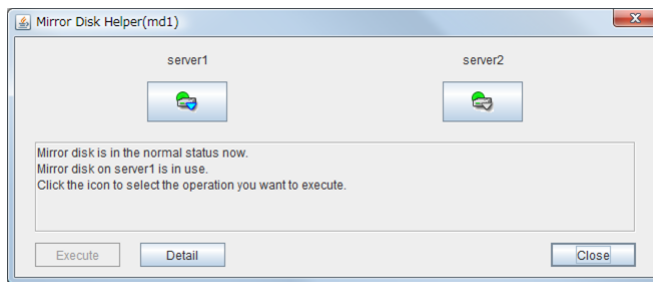
- **Mirror Disks**

If you select this menu, the following dialog box that all the mirror disk resources and hybrid disk resources are listed is displayed.



Details

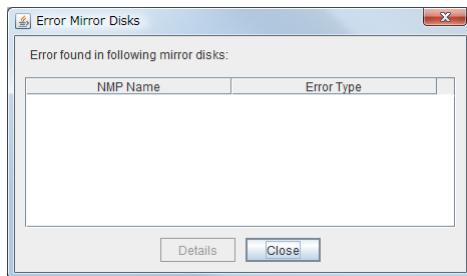
Starts the **Mirror Disk Helper** dialog box for the selected mirror disk resource or hybrid disk resource.



For information on using the Mirror Disk Helper, see "[2.6. Mirror disk helper](#)".

- **Error Mirror Disks**

Lists mirror disk resources and hybrid disk resources with an error in a dialog box.



If there is any mirror disk or hybrid disk with an error listed below in the cluster, the above dialog box will be displayed.

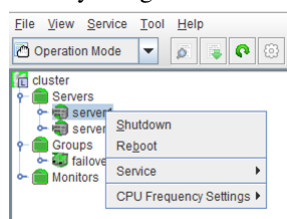
The description provides what you should do to correct an error on the mirror disk or hybrid disk.

Error type	Description
Mirror Error	Mirror recovery or forced mirror recovery is necessary. Run the Mirror Helper and perform mirror recovery. If a communication status error occurs during mirror disk connect, check the communication status.
Mirror Error (Single Server Run)	Only one server is running, and the latest data of a mirror disk/hybrid disk is not completed. To continue the operation, run the Mirror Helper and execute mirror recovery. Be careful since the server that is currently running will be the latest data when the mirror recovery is executed.

When you select **Details**, the Mirror Disk Helper is activated.

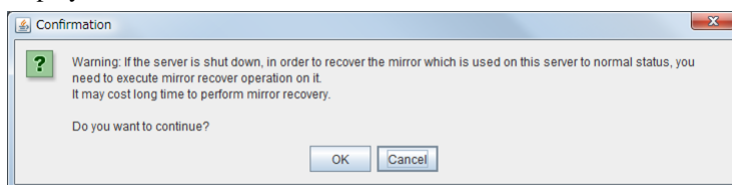
Individual server objects

When you right-click an individual server object, the following shortcut menu is displayed.



- **Shut down**

Shuts down the selected server. When you select this operation, the following dialog box is displayed for confirmation.



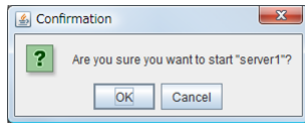
- **Reboot**

Reboots the selected server. When you select this operation, the following dialog box is displayed for confirmation.

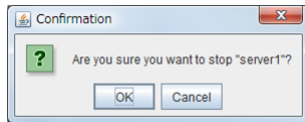


- **Service**

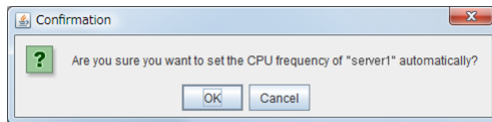
When you click **Start** on **Service**, the selected server is started. When you select this operation, the following dialog box is displayed for confirmation.



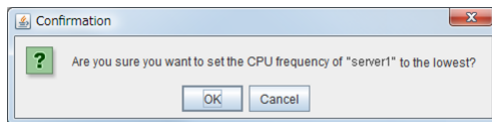
When you click **Stop** on **Service**, the selected server is stopped. When you select this operation, the following dialog box is displayed for confirmation.



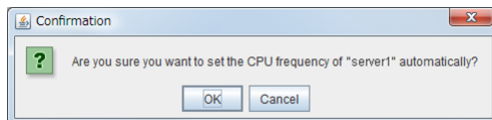
- CPU Frequency Settings
Configures the CPU frequency control function of the selected server.
- Highest Frequency
Sets the CPU frequency to high.



- Low Frequency
Lowers the frequency to turn it to power-saving mode.



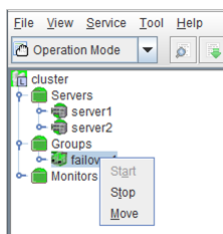
- Auto
Restores the CPU frequency control to the control by EXPRESSCLUSTER.



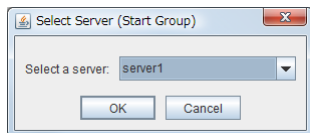
This function cannot be used when the checkbox of "Use CPU Frequency Control" is not selected in the **Extension** tab settings in cluster properties.

Individual failover group objects

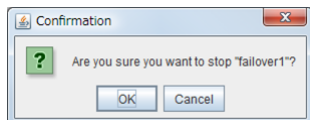
When you right-click an individual group object, the following shortcut menu is displayed.



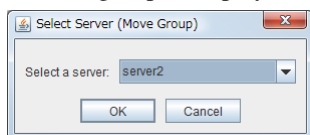
- Start (enabled only when the group is stopped)
Starts up the selected group. The dialog box for choosing a server that starts up the selected group is displayed.



- Stop (enabled only when the group has been started up or when it has an error)
Stops the selected group. When you select this operation, the following dialog box is displayed for confirmation.

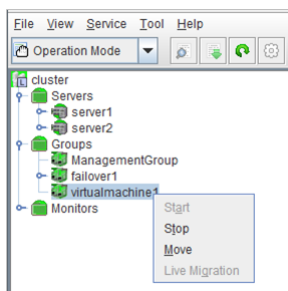


- Move (enabled only when the group has been started up)
Moves the selected group. The dialog box for choosing a server to which you want to move the selected group is displayed. The status of the group resource of moved group is kept.

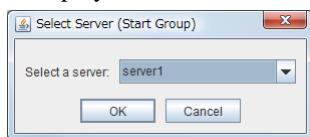


Objects of the individual VM group

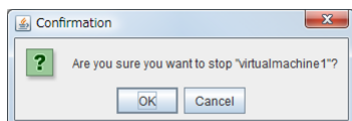
When you right-click a virtual machine group object, the following shortcut menu is displayed.



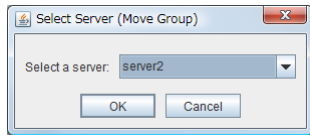
- Start (enabled only when the group is stopped)
Starts up the selected group. The dialog box for selecting the server that starts up the selected group is displayed.



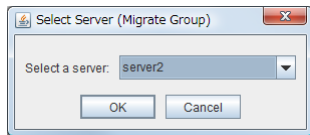
- Stop (enabled only when the group is running or has an error)
Stops the selected group. When you select this operation, the following confirmation dialog box is displayed.



- Move (enabled only when the group has been started up)
Moves the selected group. The dialog box for selecting the server to which to move the selected group is displayed.



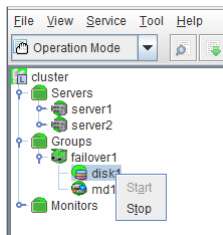
- Live Migration (enabled only when the group has been started up)
Migrates the selected group. The dialog box for selecting the server to which to migrate the selected group is displayed.



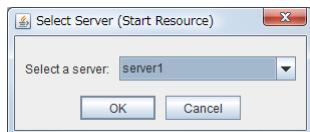
On the server selection screen, servers where groups can be started can be selected as the destination (except the active server and offline servers).

Individual group resource objects (except mirror disk resources, hybrid disk resources, and VM resources)

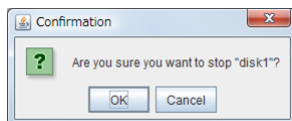
When you right-click an individual group resource object, the following shortcut menu is displayed.



- Start (enabled only when the group is stopped)
Starts up the selected group resource.
The dialog box for selecting the server that starts up the selected group is displayed.



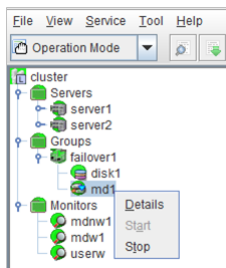
- Stop (enabled only when the group is running or it has an error)
Stops the selected group. When you select this operation, the following dialog box for confirmation is displayed.



Mirror disk resource object and hybrid disk resource object

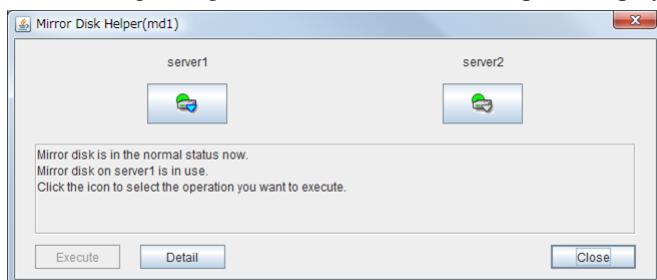
When you right-click a mirror disk resource object, the following shortcut menu is displayed.

For the start or stop methods, refer to "Individual group resource objects (except mirror disk resources, hybrid disk resources, and VM resources)".



- Details

Starts up the Mirror Disk Helper for the selected mirror disk resource or hybrid disk resource, and the following dialog box for the Mirror Disk Helper is displayed.

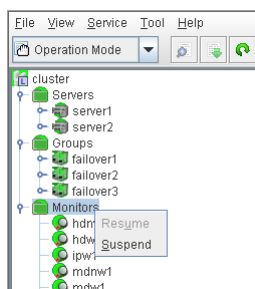


For information on using the Mirror Disk Helper, see "2.6. *Mirror disk helper*".

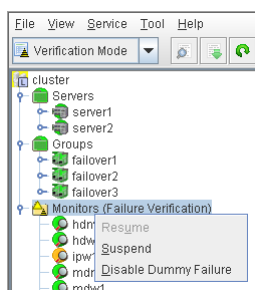
Monitors object

When you right-click the **Monitors** object, the following shortcut menu is displayed.

When operation mode is selected

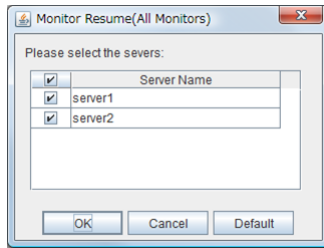


When verification mode is selected

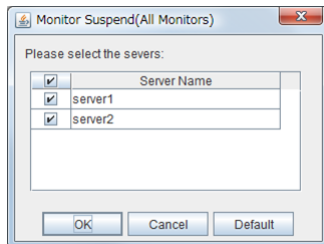


- Resume (enabled only when the monitor is suspended)

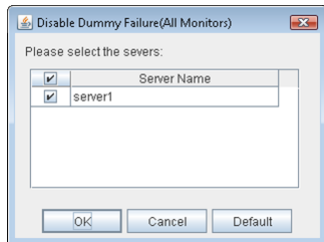
Resumes all the monitor resources that are configured. This operation is not performed on the monitor resources where suspending/resuming the monitoring is not possible. The following dialog box for selecting the server where monitor resources are resumed is displayed.



- Suspend (enabled only when the monitor is running)
Suspends all the monitor resources that are configured. This operation is not performed on the monitor resources where suspending/resuming the monitoring is not possible. The following dialog box for selecting the server where monitor resources are suspended is displayed.



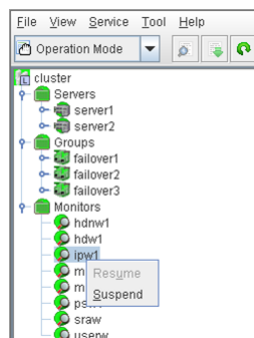
- Disable Dummy Failure (available only when dummy failure is enabled)
Disable dummy failure for all monitor resources. Select the server on which dummy failure for monitor resources is to be cleared from the dialog box shown below.



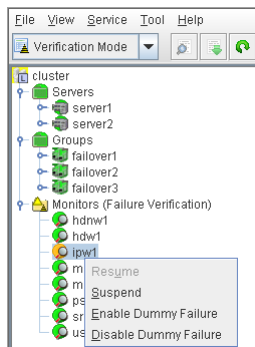
Individual monitor resource objects

When you right-click an individual monitor resource object, the following shortcut menu is displayed.

When operation mode is selected

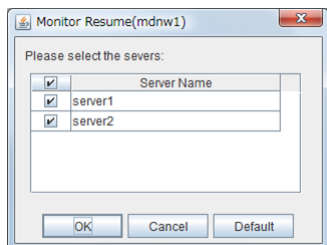


When verification mode is selected



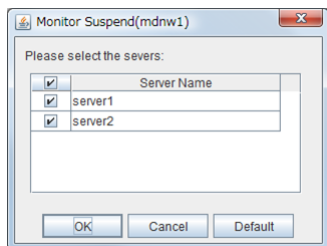
- Resume (enabled only when the monitor is suspended)

Resumes a selected monitor resource. This operation is not performed on the monitor resources where suspending/resuming the monitoring is not possible. The following dialog box for selecting the server where a selected monitor resource is resumed is displayed.



- Suspend (enabled only when the monitor is running)

Suspends a selected monitor resource. This operation is not performed on the monitor resources where suspending/resuming the monitoring is not possible. The following dialog box for selecting the server where a selected monitor resource is suspended is displayed.



- Enable Dummy Failure (available only in verification mode)

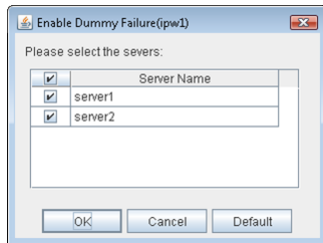
Enable dummy failure for a selected monitor resource. Dummy failure can be enabled only on a server on which **Resource Status on Each Server** of the relevant monitor resource indicates a status other than **Error** or Dummy Failure.

Note, however, that the following monitor resources cannot be selected:

- Mirror disk connect monitor resources
- Mirror disk monitor resources
- Hybrid disk connect monitor resources
- Hybrid disk monitor resources
- User-mode monitor resources
- Virtual IP monitor resources
- ARP monitor resources

- External coordination monitor resources
- Dynamic DNS monitor resources
- VM monitor resource

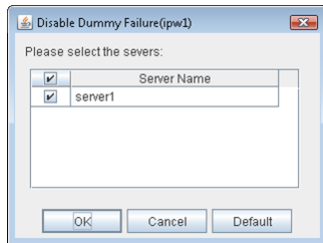
Select the server on which to enable dummy failure for the selected monitor resource from the following dialog box.



Note: When an attempt is made to enable dummy failure, and if one or more servers cannot be connected, an error is displayed. Dummy failure cannot be enabled on a server that cannot be connected.

- Disable Dummy Failure (available only in verification mode)


Dummy failure is disabled for the selected monitor resource. Select the server on which the dummy failure is to be disabled for the selected monitor resource from the dialog box shown below.

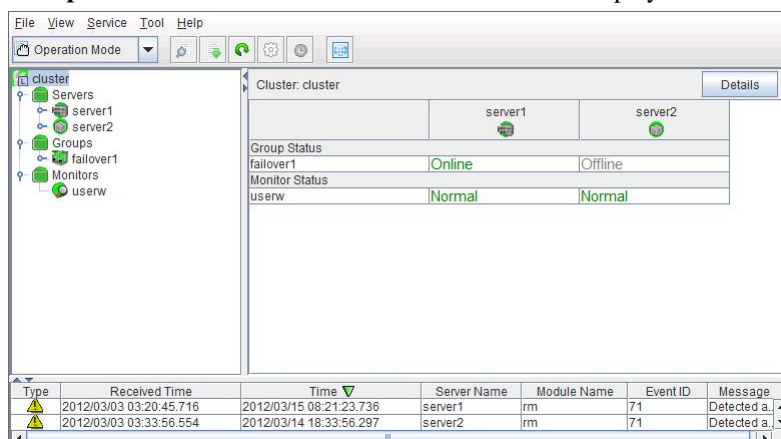


2.4 Checking the cluster status by the WebManager list view

The detailed information on the selected object in the tree view of WebManager can be displayed.

2.4.1 To display information on the whole cluster

1. Start the WebManager.
2. In this tree view, click the object icon  for the cluster. In the list view in the right pane of the window, the **Group Status** and **Monitor Status** of each server are displayed.



3. In the following dialog box, click **Details** to display the following information.

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	Port No. (Log)
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Name				cluster				
Comment								
Status				Normal				

Name: Cluster name

Comment: Comment for the cluster

Status: Status of the cluster

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	Port No. (Log)
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Server Down Notification				On				

Server Down Notification: Server down notification

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	Port No. (Log)
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Action at NP Occurrence				Stop the cluster service and shutdown OS				

Action at NP Occurrence: Action to be taken when a network partition occurs

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Server Sync Wait Time (sec)				300				
Heartbeat Timeout (msec)				90000				
Heartbeat Interval (msec)				3000				
Server Internal Timeout (sec)				180				
Timeout Ratio				1				

Server Sync Wait Time (sec): Time to wait for the other servers to start up (in seconds)

Heartbeat Timeout (msec): Heartbeat time-out (in milliseconds)

Heartbeat Interval (msec): The interval for sending heartbeats (in milliseconds)

Server Internal Timeout (sec): Internal communication time-out (in seconds)

Timeout Ratio: Current time-out ratio

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Server Internal Port Number				29001				
Data Transfer Port Number				29002				
Heartbeat Port Number				29002				
Kernel Mode Heartbeat Port Number				29006				
WebManager HTTP Port Number				29003				
Alert Sync Port Number				29003				

Server Internal Port Number: Port number for internal communication

Data Transfer Port Number: Port number for data transfer

Heartbeat Port Number: Port number for heartbeat

Kernel Mode Heartbeat Port Number: Port number for kernel-mode heartbeat

WebManager HTTP Port Number: Port number for WebManager

Alert Sync Port Number: Port number for alert synchronization

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Communication Method for Internal Logs				UNIX Domain				
Port Number				0				

Communication method for Internal Logs: Communication method used for logs

Port Number: Port number used for logs

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Shutdown Monitor				Always execute				
Shutdown Monitoring Method				softdog				
Action				RESET				
Enable SIGTERM Handler				Off				
Use HB Timeout				On				
Timeout (sec)				90				
Collect System Resource Information				Off				

Shutdown Monitor: Whether or not to monitor shutdown

Shutdown Monitoring Method: Method for monitoring shutdown

Action: Operation at time-out

Enable SIGTERM Handler: Whether or not to enable SIGTERM

Use HB Timeout: Whether or not to use HB time-out

Timeout (sec): Timeout (in seconds)

Collect System Resource Information: Whether or not to collect System Resource Information

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties							Value	
Action When the Cluster Service Process Is Failure							Shut down the OS	
Recovery Action for HA Agents: Max Restart Count							3	
Recovery Action for HA Agents: Recovery Action over Max Restart Count							No operation	
Disable Recovery Action Caused by Monitor Resource Failure							Off	
Action at Group Resource Activation or Deactivation Stall							Stop the cluster service and shutdown OS	
Restrain the shutdown action if only one server is alive (when active group resource abnormality detected)							Off	
Restrain the shutdown action if only one server is alive (when deactive group resource abnormality detected)							Off	
Restrain the shutdown action if only one server is alive (when monitoring resource abnormality detected)							Off	

Action When the Cluster Service Process Is Failure: Action to be taken when a cluster service process fails

Recovery Action for HA Agents: Max Restart Count Maximum count to restart an HA process if the process fails

Recovery Action for HA Agents: Recovery Action over Max Restart Count Action to be taken when the HA process fails and the process cannot be restarted even after retrying restart of the process for the maximum number of retries

Disable Recovery Action Caused by Monitor Resource Failure Whether or not to disable the recovery action when the monitor resource fails

Action at Group Resource Activation or Deactivation Stall Action to be taken when group resource activation/deactivation is stalled

When active group resource abnormality detected: Whether or not to disable shutdown at activation failure in the case of the last one server

When non active group resource abnormality detected: Whether or not to disable shutdown at deactivation failure in the case of the last one server

When monitoring resource abnormality detected: Whether or not to disable shutdown at monitoring error in the case of the last one server

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties							Value	
E-mail Address								
Use Network Warning Light							Off	
Use Chassis Identify							Off	
Enable Alert Setting							Off	

E-mail Address: Destination e-mail address for sending alerts

Use Network Warning Light: Whether or not to use a network warning light

Use Chassis Identify: Whether or not to use a chassis identify function

Enable Alert Setting: Whether or not to use the alert setting

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties							Value	
Heartbeat Delay Warning							80	
Monitor Delay Warning							80	

Heartbeat Delay Warning: Heartbeat delay warning (%)

Monitor Delay Warning: Monitor delay warning (%)

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No.(Mirror)	Port No.(Log)		
Properties				Value				
Java Install Path				Jusr				
Maximum Java Heap Size (MB)				16				
Load Balancer Connection Setting				Off				
Log Level				INFO				
Generation Count for Stored Log Files				10				
Log Rotation Type				File Size				
Log File Maximum Size (KB)				3072				
Time of First Log Rotation				00:00				
Log Rotation Interval (Hours)				24				
Resource Measurement: Retry Count				10				
Resource Measurement: Threshold for Abnormal Judgment				5				
Resource Measurement: Default Interval				60				
Resource Measurement: Interval for Full GC				120				
WebLogic Monitoring: Retry Count				3				
WebLogic Monitoring: Threshold for Abnormal Judgment				5				
WebLogic Monitoring: Request Count Measurement Interval				60				
WebLogic Monitoring: Interval for Average measurement				300				
Management Port				25500				
Connection Retry Count				3				
Time until Reconnect				60				
Management Port for Load Balancer Linkage				25550				
Health Check Linkage Function				Off				
Directory containing HTML files								
HTML File Name								
HTML Renamed File Name								
Retry count for renaming				3				
Wait time for retry				3				
Management IP Address								
Connection Port				443				

Java Install Path: Java installation path

Maximum Java Heap Size (MB): Maximum Java heap size (MB)

Load Balancer Linkage Settings Load balancer linkage settings

Log Level: Log level

Generation Count for Stored Log Files: Number of generations of log files to be stored

Log Rotation Type: Log rotation type

Log File Maximum Size (KB): Maximum log file size (KB)

Time of First Log Rotation: Time of the first log rotation

Log Rotation Interval (Hours): Log rotation interval (hours)

Resource Measurement: Retry Count: Measurement retry count

Resource Measurement: Threshold for Abnormal Judgment: Threshold for abnormal judgment

Resource Measurement: Default Interval: Interval for memory and thread measurement (sec)

Resource Measurement: The time and count in Full GC: Interval for Full GC measurement (sec)

WebLogic Monitoring: Retry Count: Measurement retry count

WebLogic Monitoring: Threshold for Abnormal Judgment: Threshold for abnormal judgment

WebLogic Monitoring: Request Count Measurement Interval: Interval for measuring the number of requests (sec)

WebLogic Monitoring: Interval for Average measurement: Interval for measuring the average (sec)

Management Port: Management port number

Connection Retry Count: Connection retry count

Time until Reconnect: Time to wait for reconnection (sec)

Management Port for Load Balancer Linkage: Management port number for load balancer linkage

Health Check Linkage Function: Whether or not to use the health check linkage function

HTML Path: HTML storage directory

HTML File Name: HTML file name

HTML Renamed File Name: Renamed HTML file name

Retry Count: Retry count if renaming fails

Retry Interval: Time to wait for a renaming retry (sec)

Management IP address: BIG-IP LTM management IP address

Connection Port: Communication port number for BIG-IP LTM

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No.(Mirror)	Port No.(Log)		
Properties					Value			
Max Reboot Count					0			
Max Reboot Count Reset Time (min)					0			
Use Forced Stop					Off			
Forced Stop Action					BMC Reset			
Forced Stop Timeout (sec)					3			
Execute Script for Forced Stop					Off			
Use CPU Frequency Control					Off			
Start Automatically After System Down					On			
Exclude Mount/Unmount Commands					On			

Max Reboot Count: Maximum reboot count

Max Reboot Count Reset Time (min): Maximum reboot count reset time (in minutes)

Use Forced Stop: Whether or not to use a forced stop function

Forced Stop Action: Action of forced stop function

Forced stop Timeout (sec): Wait time till the activation of failover group is started after a forced stop function is performed (in seconds)

Execute Script for Forced Stop: Whether to execute a script for forced stop

Use CPU Frequency Control: Whether or not to use CPU frequency control

Start Automatically After System Down: Whether or not to prohibit automatic startup of the cluster service when it is stopped abnormally

Exclude Mount/Unmount Commands: Whether or not to exclude a mount or unmount command

When Replicator and/or Replicator DR are used:

Only the information which is different from that of EXPRESSCLUSTER X (above) is described below.

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No.(Mirror)	Port No.(Log)		
Properties					Value			
Mirror Agent Port Number					29004			

Mirror Agent Port Number: Port number used by a mirror agent

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Auto Mirror Recovery				On				
Collect Mirror Statistics				On				
Receive Timeout (sec)				10				
Send Timeout (sec)				120				
Recovery Data Size (kbyte)				4096				
Recovery Retry Count				0				
Start Wait Time (sec)				10				
Cluster Partition I/O Timeout (sec)				30				

Auto Mirror Recovery: Whether or not to perform auto mirror recovery

Collect Mirror Statistics: Whether or not to collect mirror statistics

Receive Timeout (sec): Receive time-out (in seconds)

Send Timeout (sec): Send time-out (in seconds)

Recovery Data Size (kbyte): Recovery data size (in kilobytes)

Recovery Retry Count: Recovery retry count

Start Wait Time (sec): Wait time for starts of servers in a server group. (sec)

Cluster Partition I/O Timeout (sec) : I/O timeout (sec) of the cluster partition

Monitor	Recovery	Alert Service	Delay Warning	Mirror Agent	Mirror Driver	JVM Monitor	Extension	
Info	Heartbeat I/F	NP Resolution	Timeout	Port No.	Port No. (Mirror)	Port No. (Log)		
Properties				Value				
Request Queue Maximum Number				2048				
Difference Bitmap Size (MB)				1				
Difference Bitmap Update Interval (sec)				100				
Cluster Partition				RESET				
Data Partition				RESET				

Request Queue Maximum Number: Maximum number of request queues

Difference Bitmap Size (MB): Difference Bitmap Size (MB)

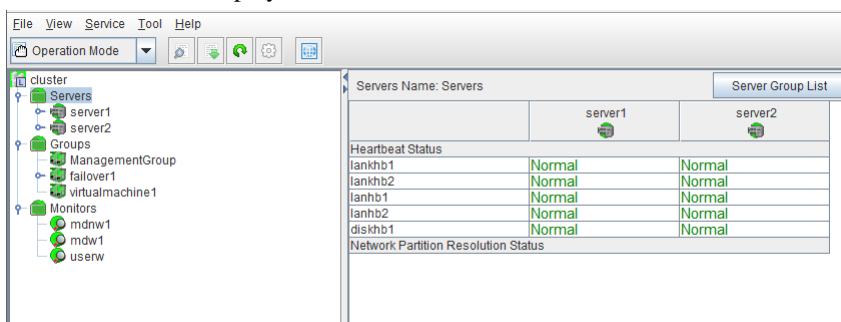
Difference Bitmap Update Interval (sec): Difference Bitmap Update Interval (in seconds)

Cluster Partition: Action to be taken when an I/O error occurs in a cluster partition.

Data Partition: Action to be taken when an I/O error occurs in a data partition.

2.4.2 Checking the whole status of the server in the WebManager list view


1. Start the WebManager.
2. In the top section of the right window pane, the heartbeat status and the network partition resolution status list on each server are displayed.



Additionally, click **Server Group List** to display the information of the server group on the pop up dialog.

ServerGroup Name	Server Name
servergroup1	server1
servergroup2	server2

2.4.3 Checking the status of individual server in the WebManager list view

1. Start the WebManager.
2. In the tree view, select the object of an individual server . The **Server Comment**, **Product**, **Version**, **Platform**, **Status** of the server are displayed.

Server Name: server1		Details
Properties	Value	
Comment		
Virtual Infrastructure		
Product	EXPRESSCLUSTER X 4.0 for Linux	
Version	4.0.0-1	
Platform	Red Hat Enterprise Linux Server release 6.8 (Santiago)	
Status	Online	
Heartbeat Status		
lanhb1	Normal	
lanhkb1	Normal	
lanhkb2	Normal	
diskhb1	Normal	
Network Partition Resolution Status		

Comment: Comment for the server

Virtual Infrastructure: Virtual infrastructure name

Product: Product name

Version: Version (identical to the RPM version value)

Platform: Platform

Status: Status of the server

When you click **Details**, the following information is displayed.

Properties	Value
Name	server1
Edition	X
Mirror Disk Connect IP Address mdc[1]	192.168.0.1
Network Warning Light IP Address(Type)	
Disk I/O Lockout Device	
BMC IP Address	
CPU Frequency Status	-
No shutdown when double activation detected	Off

Name: Server name

Edition: Edition

Mirror Disk Connect IP Address mdc[1]³ IP address of mirror disk connect

Network Warning Light IP Address: IP address of network warning light

Disk I/O Lockout Device: Name of disk device which locks disk IO

BMC IP Address: IP address of BMC

CPU Frequency Status: Current setting status of CPU frequency control

No shutdown when double activation detected: Whether or not to disable shutdown when activation of both disks is detected

³ The number in brackets represents the mirror disk connect I/F number.

2.4.4 Checking the status of the whole monitor in the WebManager list view

1. Start the WebManager.
2. In the tree view, select the object icon  . The **Monitor Name** and the list of statuses on each server are displayed in the list view.

2.5 Checking alerts using the WebManager

You can view alerts in the bottom part of the WebManager.
Each field of the alert view is configured as follows.

Type	Received Time	Time	Server Name	Module Name	Event ID	
	2018/02/08 18:03:42.543	2018/02/08 18:02:53.870	server2	rm	1	Monitoring psw1 has started.
	2018/02/08 18:03:42.542	2018/02/08 18:02:49.844	server2	rm	1	Monitoring hdnw1 has started.
	2018/02/08 18:03:42.542	2018/02/08 18:02:49.834	server2	rm	1	Monitoring hdnw1 has started.
	2018/02/08 18:03:42.541	2018/02/08 18:02:49.824	server2	rm	1	Monitoring mdnw1 has started.
	2018/02/08 18:03:42.540	2018/02/08 18:02:49.814	server2	rm	1	Monitoring mdnw1 has started.
	2018/02/08 18:03:42.540	2018/02/08 18:02:49.793	server2	rm	1	Monitoring userw has started.
	2018/02/08 18:03:42.539	2018/02/08 18:02:49.793	server2	lcns	1	The number of license is 1. (Product name: EXPRESSCLUSTER X)
	2018/02/08 18:03:42.538	2018/02/08 18:02:47.789	server2	nm	3	Resource lanhb1 of server server2 has started.
	2018/02/08 18:02:28.003	2018/02/08 18:02:46.789	server2	nm	3	Resource lanhb1 of server server1 has started.
	2018/02/08 18:02:28.002	2018/02/08 18:02:45.789	server2	nm	1	Server server2 has started.
	2018/02/08 18:02:28.002	2018/02/08 18:02:45.788	server2	nm	1	Server server1 has started.
	2018/02/08 18:02:28.001	2018/02/08 18:02:45.468	server2	pm	34	Received a request to resume the cluster daemon from command.
	2018/02/08 18:02:28.000	2018/02/08 18:02:45.461	server2	pm	1	Starting the cluster daemon...
	2018/02/08 18:02:39.922	2018/02/08 18:02:39.912	server1	cl	1	There was a request to start Alert Sync from the Web Manager.
	2018/02/08 18:02:39.348	2018/02/08 18:02:39.339	server1	cl	1	There was a request to start Web Manager Server from the Web Manager.

For meanings of alert messages, see "Error messages" in the Reference Guide. For information about searching for alert messages, see ["2.2.3. Searching for an alert by using the WebManager"](#).

2.5.1 Alert view fields

The meaning of each of the fields in the alert view of the WebManager are the following.

- (1) Alert type icon

Alert type	Description
	Informational message
	Warning message
	Error message

- (2) Alert received time

The time the alert was received. The time in the server to which the WebManager connects is applied.

- (3) Alert sent time

The time the alert was sent from a server. The time in the alert sender server is used.

- (4) Alert sender server

The name of a server that sent the alert.

- (5) Alert sender module

The type of a module that sent the alert.

For a list of module name types, see ["2.2.3. Searching for an alert by using the WebManager"](#) in this chapter.

- (6) Event ID

The event ID number set to each alert.

- (7) Alert message

The alert messages.

2.5.2 Alert view operation

By clicking an item on the bar showing name of each field, you can change the alert order.



Whenever you select an item, the ▲ or ▼ mark is displayed in each field.

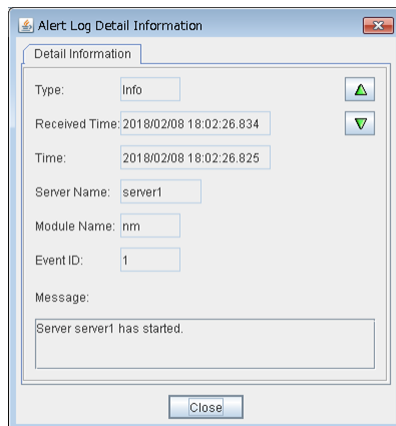
Mark	Purpose
▲	Sorts alerts in the ascending order of the selected field.
▼	Sorts alerts in the descending order of the selected field.

By default, alerts are displayed in the **Time** descending order.

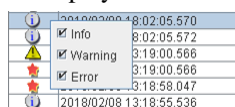
When you right-click this bar, the following pop-up window is displayed so that you can select the items to be displayed. All items are selected by default.

Type	Received Time	Time ▼	Server Name
Info	2018/02/08 18:02:28.002	245.789	server2
Info	2018/02/08 18:02:28.002	245.788	server2
Info	2018/02/08 18:02:28.001	245.468	server2
Info	2018/02/08 18:02:28.000	245.461	server2
Info	2018/02/08 18:02:39.922	239.912	server1
Info	2018/02/08 18:02:39.348	239.339	server1
Warning	2018/02/08 18:02:38.071	238.056	server1
Error	2018/02/08 18:02:36.571	236.556	server1
Info	2018/02/08 18:02:15.979	234.065	server2
Info	2018/02/08 18:02:33.849	2018/02/08 18:02:33.837	server1

When you double-click the displayed alert, the following window is displayed where you can check the detail of the alert.



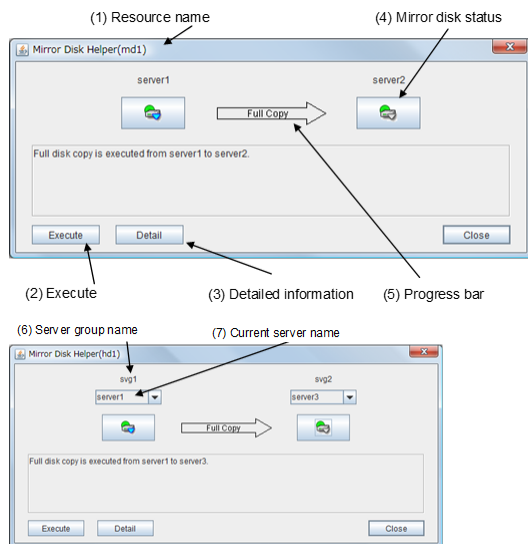
When you right-click the alert, the following pop-up window is displayed where you can select the type of the alert to be displayed. All items are selected by default.



2.6 Mirror disk helper

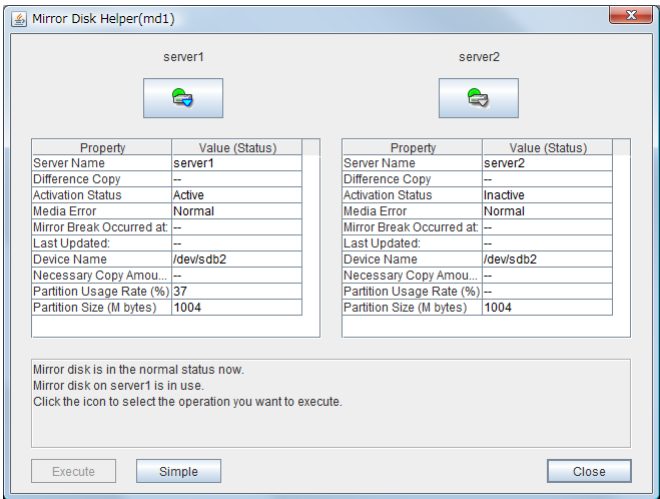
2.6.1 Overview of the mirror disk helper

The Mirror Disk Helper is a tool to help recovery process of mirror disk/hybrid disk from the WebManager. The following shows the layout of the Mirror Disk Helper.



The Mirror Disk Helper can be started by the mirror disk list or mirror disk resource/hybrid disk resource of a group. The following is the description of the each field of the Mirror Disk Helper.

- (1) Resource name
Displays the name of a mirror disk resource/hybrid disk resource.
- (2) Mirror recovery
You can perform various operations by clicking the mirror disk status icon. The **Execute** button is enabled when you select the operation. For the available operations, see "[2.6.2. Operating Mirror Disk Helper](#)".
- (3) Detailed information
When you click **Details**, detailed information is displayed.



Server Name: Server name

Diff Status: Whether differential copying of the mirror disk device is possible

Activation Status: Active status of the mirror disk device on the server

Media Error: Media error of the mirror disk resource

Mirror Break Occurred at: Error break time

Last Update: The time that the data was updated the last time

Device Name: The name of the mirror disk device

Diff Percent: Amount of data that must be copied again to restart mirroring

NMP Size (M bytes): NMP usage of each server's file system

Disk Size (M bytes): Each server's NMP size


Last Data Update Time is displayed when only one of the servers is updated.

Mirror Break Time is displayed when mirror disks cannot be synchronized because mirror disk connect is disconnected.

If the size of the DP partition is different depending on a server, the smaller partition size is NMP Size.










(4) Mirroring disk status

The following table shows the mirroring disk status of servers:

Icon	Mirroring disk status	Mirror color ⁴
	Mirroring status of the server is normal. A mirror disk resource is inactive.	Green

Continued on next page

Table 2.9 – continued from previous page

Icon	Mirroring disk status	Mirror color ⁴
	Mirroring status of the server is normal. A mirror disk resource is active. The server is in the normal mirroring status and has the latest data. It may not be synchronized with the other server.	Green
	Mirror recovery or forced mirror recovery is underway. A mirror disk resource is inactive.	Yellow
	Mirror recovery or forced mirror recovery is underway. A mirror disk resource is active.	Yellow
	The server has an error. Mirror recovery is required.	Red
	The server has an error. Limiting accesses to a mirror disk has been released. (This also appears if a mirror disk resource is already active and it is not possible to automatically determine whether the server has the latest data because another server has started, for example, and if forced mirror recovery is required.)	Red
	Suspended. Determining the server with the latest data is suspended.	Orange
	The server is stopped or its status is unknown. Information on the server status cannot be acquired.	Gray
	Both systems are active.	Blue
	Cluster partition has an error.	Black

(5) Progress bar

When performing the mirror recovery or forced mirror recovery, the progress bar shows an arrow from a source server with the latest data to copy to the destination server.

⁴ To see the mirror color, run the `clpmdstat` or `clphdstat` command.



How far the mirror recovery or forced mirror recovery has progressed and expected time required for copying are displayed in the progress bar.



(6) Server Group Name

Displays the name of server group.

(7) Current Server Name

Displays the name of current server. For information on the procedure for replacing the current server, see "2.6.7. *Changing a current server (Only for hybrid disk resource)*".

2.6.2 Operating Mirror Disk Helper

Available operations on the Mirror Disk Helper window differ depending on the mirror status of servers. Consider what you want to operate referring to this guide before starting the operation. The operation is executed by clicking **Execute** with the desired operation selected. The following screenshots show examples of dialog boxes for the mirror disk resource.

Note:

The following figures are simplified, differing from the actual Mirror Disk Helper screens.

The following description is for operating mirror disk status icon on server1. When operating the icon on server2, replace server1 with server2.

(1) Operation available when server1 is normal

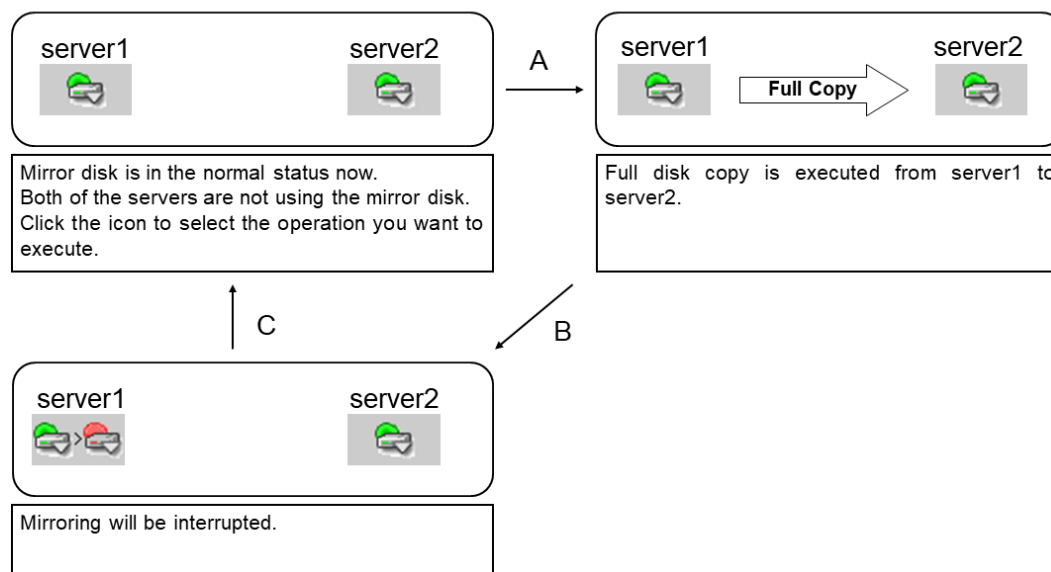
Note: The following operation is available only when server1 is normal and mirror disk resource/hybrid disk resource is inactive. It cannot be performed on the server where any mirror disk resource/hybrid disk resource is activated normally.

1. When server2 is normal and mirror disk resources/hybrid disk resources are inactive

The following describes the operations which can be performed when mirror disk resources/hybrid disk resources are inactive on both servers. The figure on the upper left indicates the initial screen.

Allows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



A. Mirror recovery

Recovers a mirror from server2 to server1. Full mirror recovery can be performed.

B. Mirror disk disconnection

Disconnects a mirror disk of server1. Mirror synchronization is not performed when any mirror disk resource/hybrid disk resource is activated on server2.

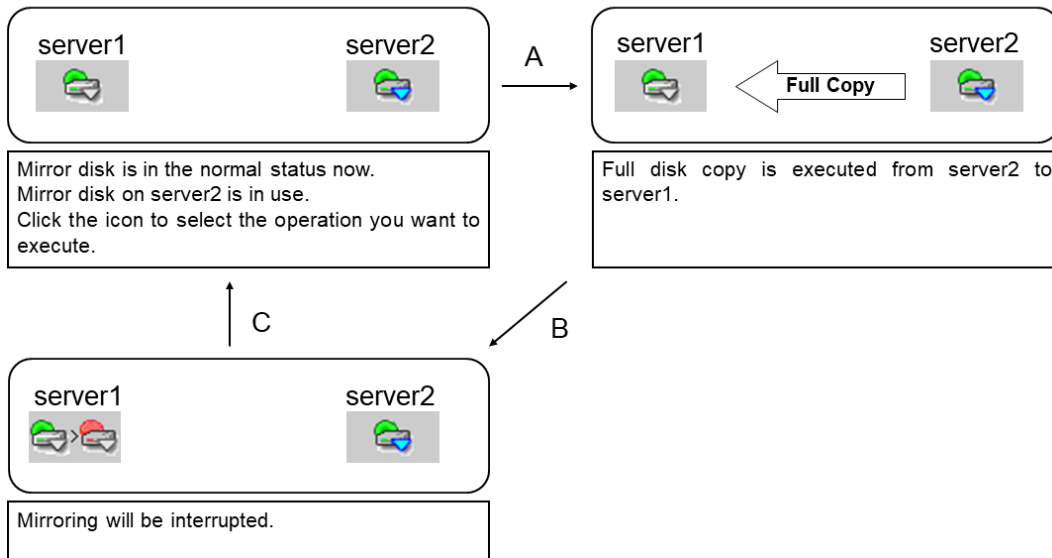
C. Initialization

Returns to the initial status. The current status is displayed.

2. When server2 is normal and any mirror disk resource/hybrid disk resource is active

The following describes the operations which can be performed when any mirror disk resource/hybrid disk resource is active on server2. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



A) Mirror recovery

Recovers a mirror from server2 to server1. Full mirror recovery can be performed.

B) Mirror disk disconnection

Disconnects a mirror disk resource/hybrid disk resource of server1. Mirror synchronization is suspended.

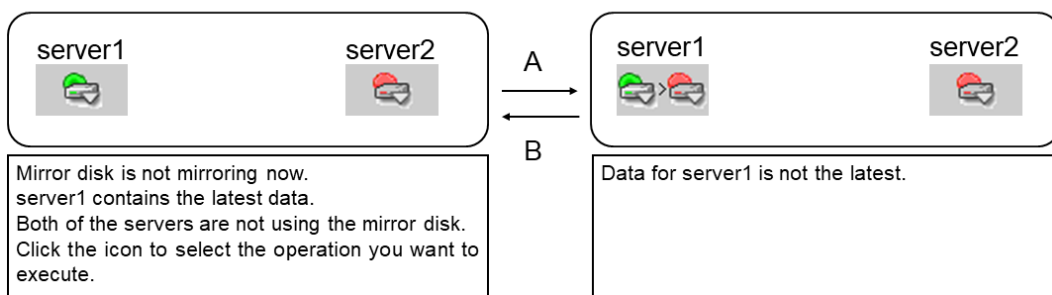
C) Initialization

Returns to the initial status. The current status is displayed.

3. When server2 is not normal

The following describes the operations which can be performed when mirror disk resource/hybrid disk resource is inactive on server1. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



Note: In the figure above, server2 is in abnormal status. Same transitions are made when the status of server2 is not normal.

A) Mirror disk disconnection

Disconnects a mirror disk/hybrid disk of server1. Causes a change from the state in which server1 contains the latest data to the state in which server1 does not contain the latest data.

B) Initialization

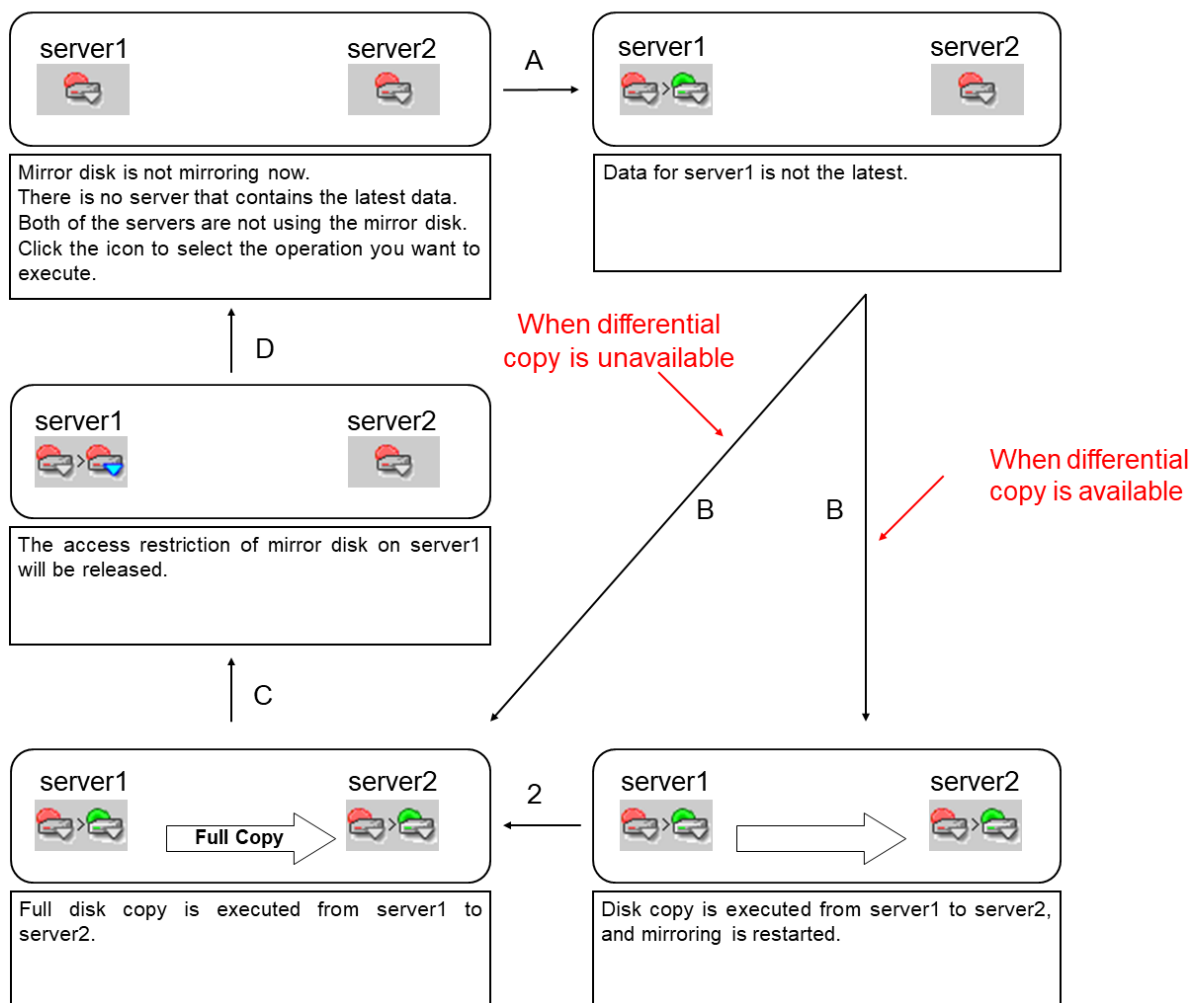
Returns to the initial status. The current status is displayed.

(2) Operation available when server1 is abnormal

1. When server2 is abnormal

The following describes the operations which can be performed when both servers are abnormal. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



A) Forcible mirror recovery on only server1

Makes the status of a mirror disk/hybrid disk normal forcibly. (Causes a change to the state in which server1 contains the latest data.)

When the status of a mirror disk/hybrid disk becomes normal, mirror disk resource/hybrid disk resource can be activated on server1.

B) Mirror recovery

Recovers a mirror from server1 to server2. If differential copy can be performed, differential or full mirror recoveries are available. Mirror disk resource/hybrid disk resource cannot be activated while a mirror is being recovered.

C) Access restriction cancellation

Usually, the mirror and hybrid disks, which are in the abnormal status, cannot be accessed.

Forcibly cancel the access restriction for the mirror and hybrid disks of server1 and then mount the file system so that they can be temporarily accessed.

(This does not place them in the normal active status.)

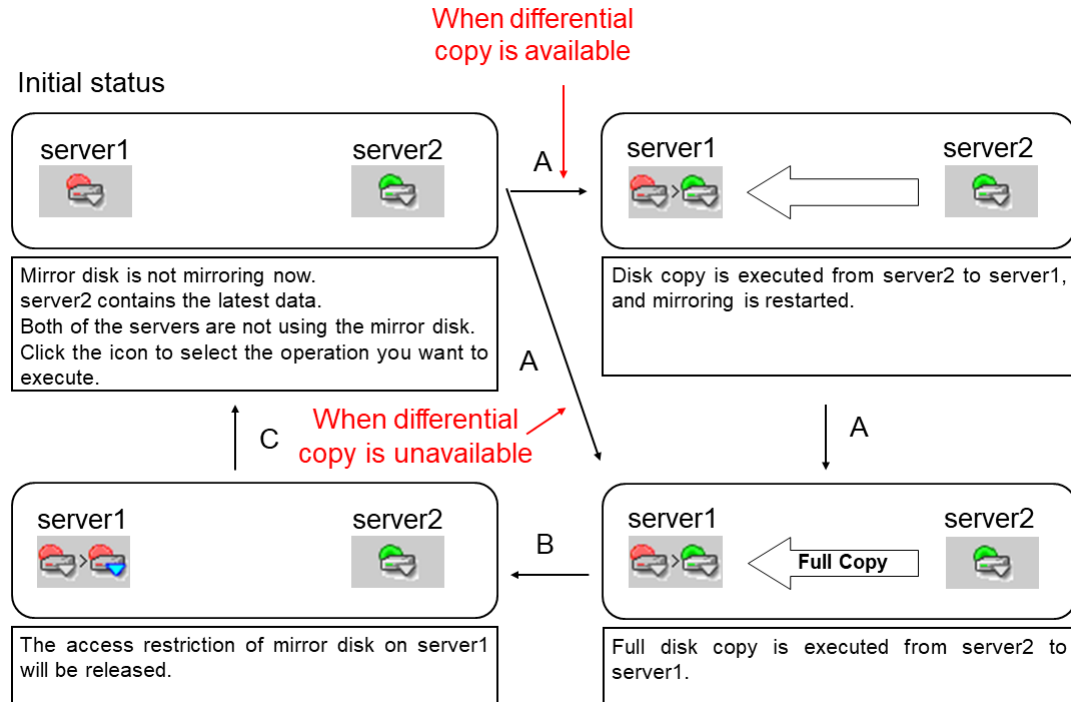
Mirror data is not synchronized even if any writes are made.

D) Initialization

Returns to the initial status. The current status is displayed.

2. When server2 is normal

The following describes the operations which can be performed when mirror disk resource/hybrid disk resource is inactive on server2. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.



Note: In the figure above, mirror disk resource/hybrid disk resource is inactive. Same transitions are made when a mirror disk resource/hybrid disk resource is active.

A) Mirror recovery

Recovers a mirror from server2 to server1. If differential copy can be performed, differential or full mirror recoveries are available. Mirror disk resource/hybrid disk resource cannot be activated while a mirror is being recovered.

When mirror recovery is started, mirror disk resource/hybrid disk resource cannot be activated while mirror recovery is being executed.

B) Access restriction cancellation

Usually, the mirror and hybrid disks, which are in the abnormal status, cannot be accessed.

Forcibly cancel the access restriction for the mirror and hybrid disks of server1 and then mount the file system so that they can be temporarily accessed.

(This does not place them in the normal active status.)

Mirror data is not synchronized even if any writes are made.

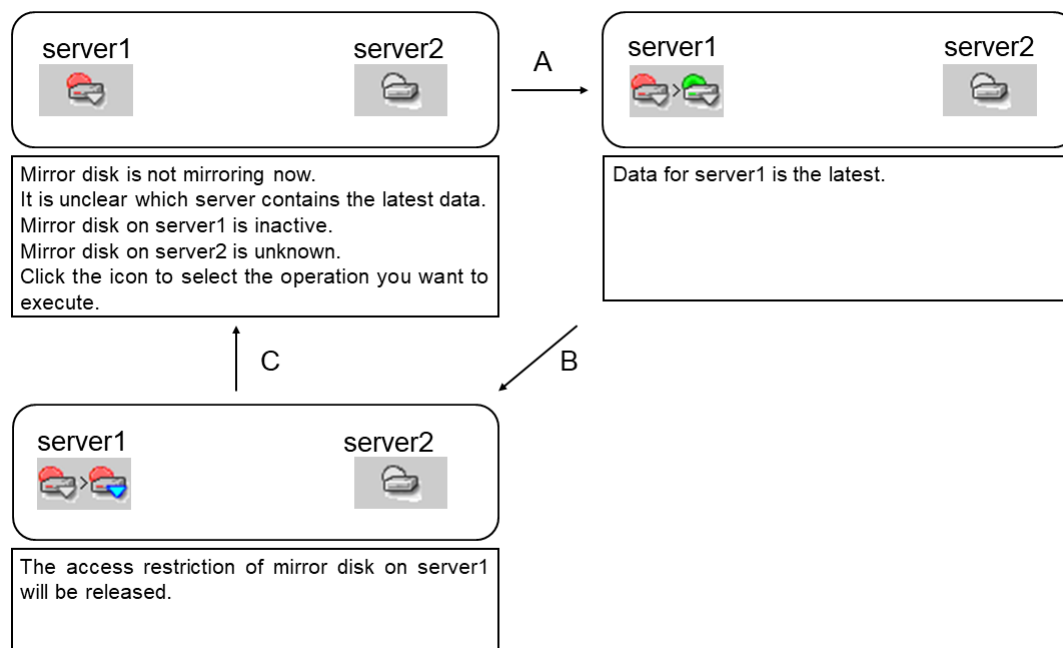
C) Initialization

Returns to the initial status. The current status is displayed.

3. When the status of server2 is unknown

The following describes the operations which can be performed when the status of server2 cannot be checked. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



A) Forcible mirror recovery on only server1

Makes the status of a mirror disk/hybrid disk on server1 normal forcibly.

When the status of a mirror disk/hybrid disk becomes normal, mirror disk resource/hybrid disk resource can be activated on server1.

B) Access restriction cancellation

Usually, the mirror and hybrid disks, which are in the abnormal status, cannot be accessed.

Forcibly cancel the access restriction for the mirror and hybrid disks of server1 and then mount the file system so that they can be temporarily accessed.

(This does not place them in the normal active status.)

Mirror data is not synchronized even if any writes are made.

C) Initialization

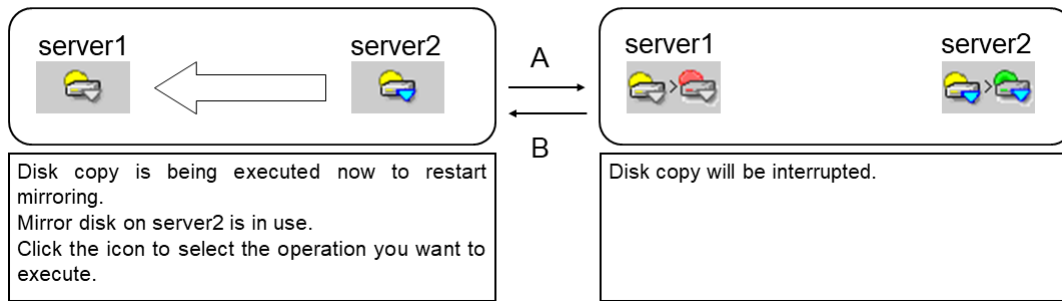
Returns to the initial status. The current status is displayed.

(3) Operation available while a mirror is being recovered

Note: The following operations can be performed only when mirror disk resource/hybrid disk resource is not activated on server1.

The following describes the operations which can be performed when mirror has been recovered. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



Note: In the figure above, mirror disk resource/hybrid disk resource is active on server2. Same transitions are made when mirror disk resource/hybrid disk resource is inactive on server2.

A) Mirror recovery suspension

Suspends a mirror recovery. When the recovery is suspended, the status of a copy source mirror becomes normal and of a copy destination mirror becomes abnormal.

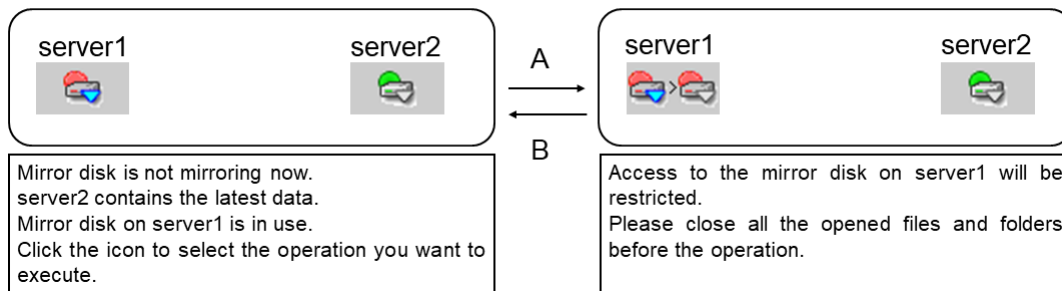
B) Initialization

Returns to the initial status. The current status is displayed.

(4) Operation available when the access restriction is canceled

The following describes the operations which can be performed when the access restriction of a mirror disk/hybrid disk is canceled. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



Note: In the figure above, a mirror disk/hybrid disk on server2 are normal. Same transitions are made regardless of its status.

Note:

Even if access restriction is not canceled, the status shown in the figure above may be assumed.

This situation arises when a mirror disk resource on server1 is operating alone in the normal active status and server2, which contains the latest data, starts up.

At this time, the mirror disk resources on both servers will contain the latest data, but server1 changes from the normal active status to the abnormal active status, and server2 changes from unknown status to the abnormal inactive status, assuming the status in the figure above.

In this case, the mirror disk resource on server1 is in the normal active status, not the access restriction

canceled status that is assumed is the case of a temporary forcible operation. Thus, do not perform the operation described here, but forced mirror recovery. For an explanation of forced mirror recovery, see "Running the forcible mirror recovery using the Cluster WebUI", "Running the forcible mirror recovery with a command" in the "Reference Guide".

A) Access restriction

Return the mirror disk and hybrid disk on server1 from the access restriction status to the original status, and then restrict access. Unmount the temporarily mounted file system.

B) Initialization

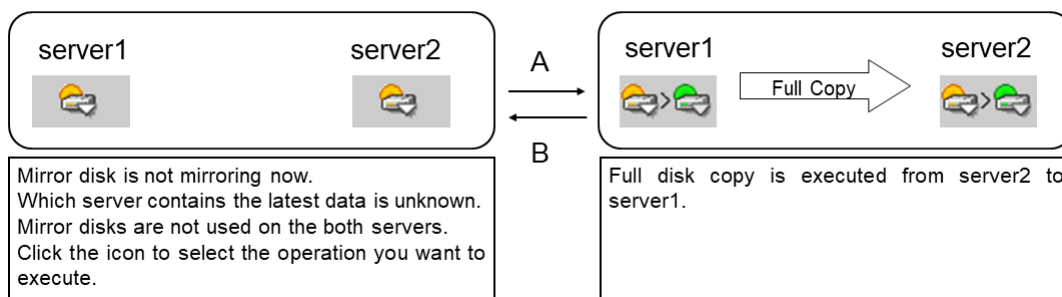
Returns to the initial status. The current status is displayed.

(5) Operation available when server1 is suspended.

1. When server2 is suspended

The following describes the operations which can be performed when the hybrid disks on the both servers are suspended. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



A) Mirror recovery

Recovers a mirror from server1 to server2. Full mirror recovery is performed.

Hybrid disk resource cannot be activated while mirror is being recovered.

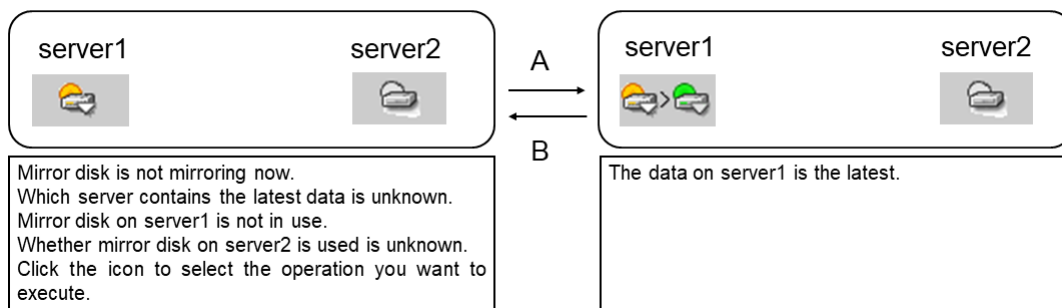
B) Initialization

Returns to the initial status. The current status is displayed.

2. When the status of server2 is unknown:

The following describes the operations which can be performed when the status of server2 cannot be checked. The figure on the upper left indicates the initial screen. Arrows in the figure indicates transitions made when the mirror disk status icon of server1 is clicked.

Initial status



A) Forcible mirror recovery on only server1

Makes the status of a hybrid disk normal forcibly.

When the status of a hybrid disk becomes normal, hybrid disk resource can be activated on server1

B) Initialization

Returns to the initial status. The current status is displayed.

2.6.3 Recovering a mirror (forcefully)

1. Mirror recovery

If there is a difference between the mirror disks on both servers:



If there is a difference between the mirror disks on both servers, and one of the servers has an error, the progress bar direction is fixed. If the group is active, the server on which the group is active becomes the copy source server.

When you click **Execute**, mirror recovery starts.

If there is no difference between the mirror disks on both servers:

If there is no difference, full copy is performed to recover a mirror.

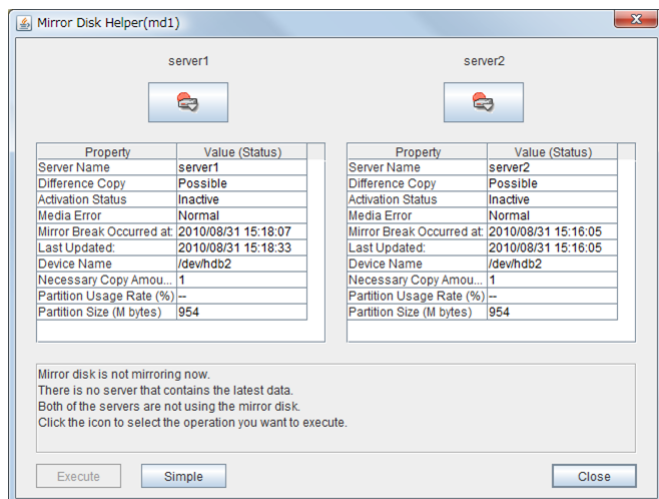


If there is no difference between the mirror disks of both servers, and both servers are running normally, the progress bar arrow is displayed when a source server is specified in the dialog box above. If the group is active, the server on which the group is active becomes the copy source server.

When you click **Execute**, forced mirror recovery starts.

2. Forced mirror recovery

If both servers have errors, click **Details** to determine a source server. When you click **Details**, the following detailed information is displayed.



Check the **Last Data Update Time**, and choose a server with the latest data as the source server. Note that the time you see here is of the OS.

If you select an icon whose status is mirrored disk as the source, the progress bar is displayed. Click **Execute** to start forced mirror recovery.

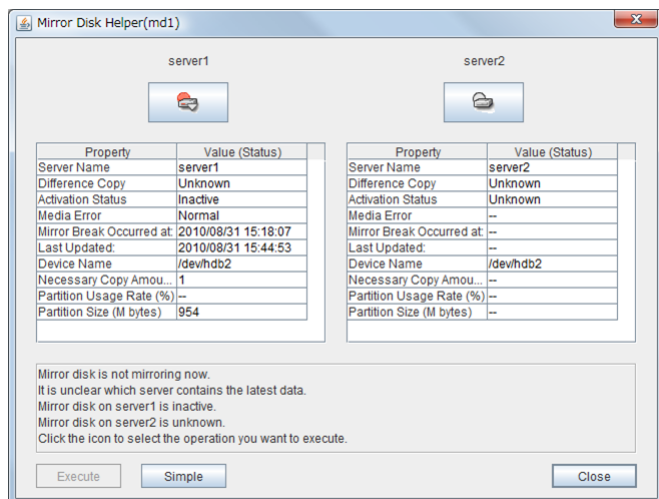
Note:

If the mirror disk is active, and if you want to perform forced mirror recovery with WebManager, you must first deactivate the group and then perform the operation described above.

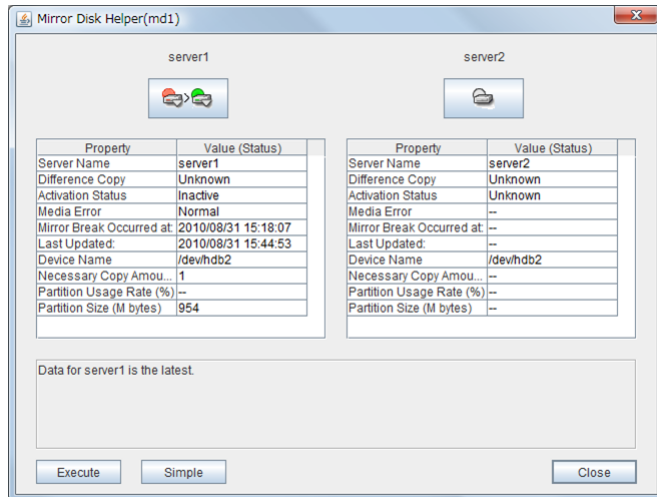
For an explanation of forced mirror recovery, see "Running the forcible mirror recovery using the Cluster WebUI", "Running the forcible mirror recovery with a command" in "Troubleshooting" in the "Reference Guide".

3. Forced mirror recovery only for a single server

When one server has an error while the other is in the unknown status or stopped, the Mirror Disk Helper is displayed.



Click the icon of the server with an error to display the following:

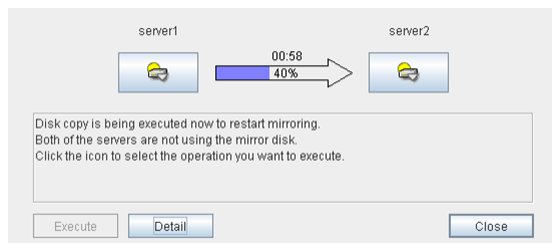


When you click **Execute**, the following dialog box is displayed. Clicking **OK** starts forced recovery only for one of the servers.



2.6.4 Stopping mirror recovery

What is similar to the following is displayed during mirror recovery:



When you click the icon of the server where data will be copied to or from, the following is displayed:



When you click **Execute**, the following dialog box is displayed. If you click **OK**, mirror recovery stops. The server where data is copied from becomes normal status and copied to become error status:

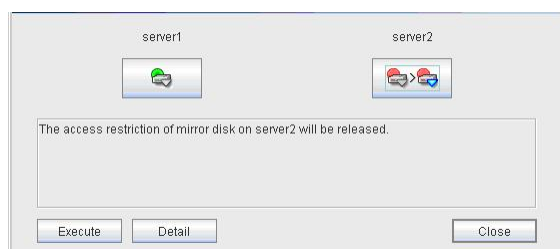


2.6.5 Canceling access restriction

Canceling the access restriction can be performed only when the status of server is error. When the status of one server is normal and other server is error, the following is displayed:



Click the icon of the server with an error a few times to display the following:



When you click **Execute**, access restriction is canceled in the server with an error and a file system is temporarily mounted and becomes accessible. Mirror data is not synchronized even when any writes are made.

To perform mirror recovery, click the icon corresponding to the server for which access restriction has been canceled, apply access restriction again, and then follow the procedure described in ["2.6.2. Operating Mirror Disk Helper"](#).

2.6.6 Disconnecting a mirror disk

Disconnecting a mirror disk can be performed on the server where a mirror disk is not activated and its status is normal. Mirror is not synchronized while a mirror disk is disconnected.

When the status of one server is normal and another is error, the following is displayed:



Click the icon of a server in normal status a few times to display the following:



When you click **Execute**, a mirror disk on the selected server is disconnected.

Even if both servers are in the normal status and inactive status, a mirror disk can be disconnected by performing a similar operation.

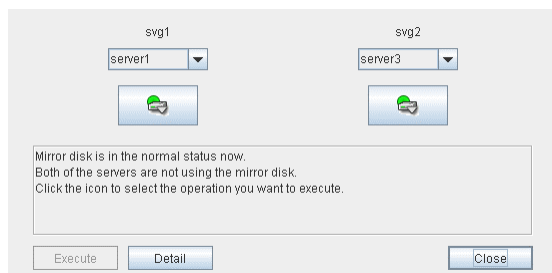
2.6.7 Changing a current server (Only for hybrid disk resource)

You can change a current server on the status like below.

Hybrid disk status	Whether or not current server can be changed	Possible operation			
		Server group 1	Server group 2	Server group 1	Server group 2
normal/inactive	normal/ inactive	Yes	Yes	1	1
normal/inactive	error/ inactive	Yes	Yes	1	1, 3
normal/ active	error/ inactive	No	Yes	-	1, 3
error/ inactive	error/ inactive	Yes	Yes	1,3	1, 3
error/ inactive	error/ forcibly activated	Yes	No	3	-
error/ inactive	Unknown	Yes	No	3	-
suspended/ inactive	suspended/ inactive	Yes	Yes	1	1

1	Recovering mirror (differential/entire data)
2	Forcefully recovering mirror on one server
3	Canceling access restriction (Forcible activation)
4	Disconnecting a mirror disk

When the both servers are normal or inactive, the servers are indicated as follows:



Select the operation to be executed and a name of the target server from the list box of server group containing the current server, and then select **Execute**. The current server will be switched.

2.7 Manually setting WebManager to stop and start

After EXPRESSCLUSTER is installed, the WebManager on servers is configured to start up or stop as the OS starts up or stops.

Run the following commands from the server console to stop and start the WebManager manually.

To stop

For a `init.d` environment:

```
[root@server1 root]# /etc/init.d/clusterpro_alertsync stop
Shutting down clusterpro webalert: OK
[root@server1 root]# /etc/init.d/clusterpro_webmgr stop
Shutting down clusterpro webmanager server: OK
```

For a `systemd` environment:

```
[root@server1 root]# systemctl stop clusterpro_alertsync
[root@server1 root]# systemctl stop clusterpro_webmgr
```

To start

For a `init.d` environment:

```
[root@server1 root]# /etc/init.d/clusterpro_webmgr start
Starting clusterpro webmanager server: OK
[root@server1 root]# /etc/init.d/clusterpro_alertsync start
Starting clusterpro webalert: OK
```

For a `systemd` environment:

```
[root@server1 root]# systemctl start clusterpro_webmgr
[root@server1 root]# systemctl start clusterpro_alertsync
```

Note: For the above commands, only type the bold characters.

2.8 Changing the settings without using the WebManager

If you do not want to use the WebManager for security reasons, change the settings of your OS or that of the Builder not to start the WebManager.

You can use the `chkconfig / update-rc.d` command to control startup and stop of the WebManager-related daemon.

To prevent WebManager from starting up

For a `init.d` environment:

```
[root@server1 root]# chkconfig --del clusterpro_alertsync  
[root@server1 root]# chkconfig --del clusterpro_webmgr
```

For Ubuntu, run the following.

```
[root@server1 root]# update-rc.d clusterpro_alertsync remove  
[root@server1 root]# update-rc.d clusterpro_webmgr remove
```

For a `systemd` environment:

```
[root@server1 root]# systemctl disable clusterpro_alertsync  
[root@server1 root]# systemctl disable clusterpro_awesome
```

To get WebManager to start up

For a `init.d` environment:

```
[root@server1 root]# chkconfig --add clusterpro_webmgr  
[root@server1 root]# chkconfig --add clusterpro_alertsync
```

For Ubuntu, run the following.

```
[root@server1 root]# update-rc.d clusterpro_webmgr defaults 91 4  
[root@server1 root]# update-rc.d clusterpro_alertsync defaults 92 3
```

For a `systemd` environment:

```
[root@server1 root]# systemctl enable clusterpro_webmgr  
[root@server1 root]# systemctl enable clusterpro_alertsync
```

Note: For the above commands, only type the bold characters.

The WebManager can be configured on the **WebManager** tab in **Cluster Properties** of the Builder. For information on how to configure and apply the settings, see "3.11. *Cluster properties* 3.11.11. *WebManager tab*" in "3. *Functions of the Builder*" in this guide.

2.9 Setting usage limitations

The limitation in connection and operation of the WebManager can be configured in **Cluster Properties** in the Builder. For details, see "3.11. *Cluster properties* 3.11.11. *WebManager tab*" in "3. *Functions of the Builder*" in this guide.

2.9.1 Type of limitation

There are two ways to set usage limitations:

- Limiting the access by using client IP addresses
- Limiting the operation by using a password

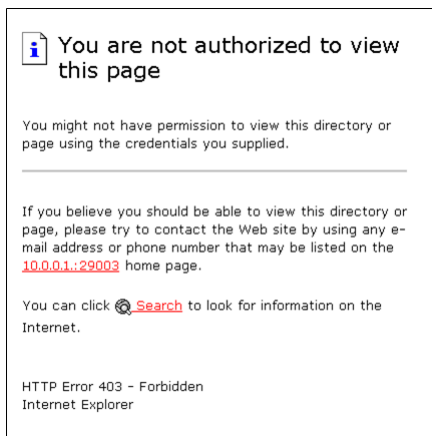
Limiting the access by using client IP addresses

This function limits clients who can access the WebManager and operations on the WebManager by using client IP addresses.

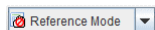
Add IP addresses to **IP Addresses of the Accessible Clients** on the **WebManager** tab in the **Cluster Properties** of the Builder.

When setting the limitation of the connection of the WebManager, if you attempt to access to the WebManager from the IP address that is not added to **IP Addresses of the Accessible Clients**, the following error messages are displayed.

Example: when using the Internet Explorer



The following **Reference Mode** is displayed to the WebManager that is connected from the client registered to limit the operation.



If you limit operations, you cannot perform the following operations from the WebManager.

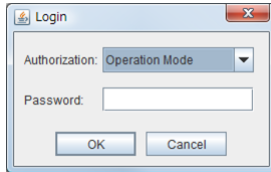
- Shutdown and shutdown reboot of a cluster
- Shutdown and shutdown reboot of servers
- Starting, stopping, and moving of groups
- Operation using the Mirror Disk Helper (only when the Replicator/Replicator DR is used)
- Change to operation mode
- Change to config mode
- Change to verification mode

The limitation by using a password

This function limits viewing and operations on the WebManager by using a password.

To configure this limitation: in **Cluster Properties** of the Builder, click the **WebManager** tab and then **Control connection by using password**.

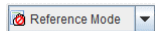
Once password limitation of the WebManager is set, the following authorization dialog box is displayed when trying to access the WebManager by setting a password.



You can log on to the WebManager by selecting **Operation Mode** or **Reference Mode** in **Authorization** and entering a correct password.

- The authorization dialog box is not displayed when the password limitation is not configured (you can log on to the WebManager without authorization).
- You cannot log on to the WebManager if you enter a wrong password three consecutive times.

When you log on with a reference-only authorization, the following **Reference Mode** is displayed.



The following operations cannot be performed from the WebManager when operations are limited.

- Shutdown and shutdown reboot of a cluster
- Shutdown and shutdown reboot of servers
- Starting, stopping, and moving of groups
- Operation using the Mirror Disk Helper (only when the Replicator or Replicator DR is used)

For the information on switching the authorization after log on and/or log out, "[2.9.2. Switch authorization of the WebManager](#)" in "[3. Functions of the Builder](#)".

Combination of the IP address and password

The operational limitations when using both IP addresses and passwords are the following:

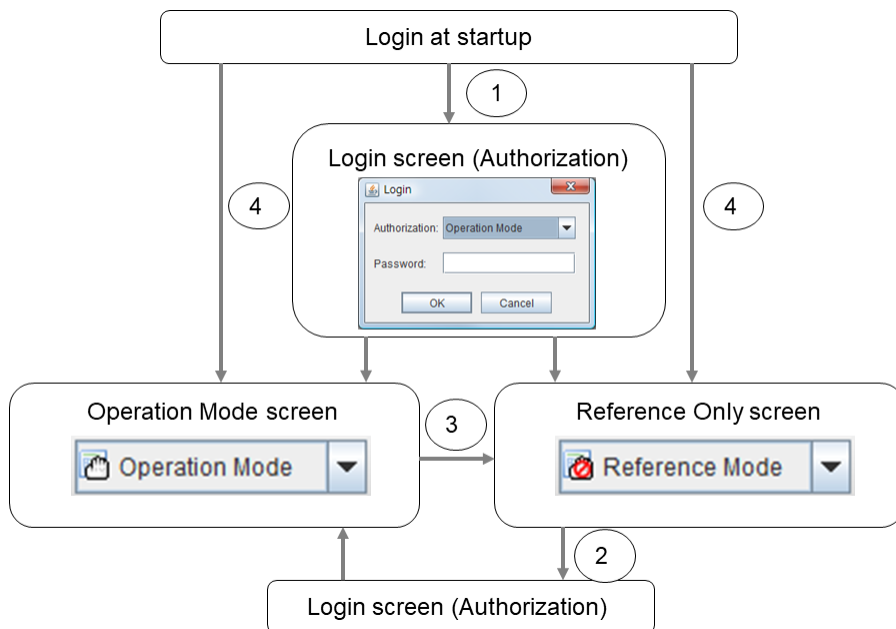
	Password limitation		
Client IP address limitation	Operable mode	Reference only	Unable to operate/view (authorization failed)
Operable Mode	Operable mode	Reference only	Unavailable
Reference Only	Reference only ⁵	Reference only	Unavailable
Cannot Access	Cannot access	Cannot access	Cannot access

Note: Changing the configuration data with the online version Builder is possible only when the WebManager is on the operable mode.

⁵ Authorization cannot be selected.

2.9.2 Switch authorization of the WebManager

The chart below describes the flow of accessing the WebManager and switching authorization.



1. Log on to the WebManager
The log on authorization dialog box is displayed when a password for operation mode or reference only is set. You can log on to the WebManager by selecting the authorization of either **Operation Mode** or **Reference Only** and entering the correct password.
2. Switch the authorization from the reference only screen to the operation mode screen
The dialog box for password authorization is displayed. You can log on by entering the correct password. When password limitation is not configured, log on without entering a password.
3. Switch the authorization from the operation screen to the reference only screen
Authorization can be switched without authentication. You can do so even when the password limitation is configured.
4. Log on when a password for both operation mode and reference only is not set
Log on by following the client IP limitation. If the client IP limitation is not configured, log on to the WebManager whose authorization is in the operation mode. In this case, you cannot switch the authorization to reference only.

2.10 Operating a cluster by using the WebManager

2.10.1 Cluster shutdown and cluster shutdown reboot

For information on performing cluster shutdown and cluster shutdown reboot from the WebManager, see "Objects of the cluster" in *"2.3.2. Operations from the WebManager"*.

2.10.2 Mirror disk resource, hybrid disk resource and mirror disk helper

For information on how to use the mirror disks, hybrid disk resources, and Mirror Disk Helper from the WebManager, see "Servers object" in *"2.3.2. Operations from the WebManager"*.

2.10.3 Shutting down and rebooting an individual server

For information on how to shut down and reboot an individual server from the WebManager, see "Individual server objects" in *"2.3.2. Operations from the WebManager"*.

2.10.4 Starting, stopping, and moving an individual group

For information on how to start, stop, and move an individual group from the WebManager, see "Individual failover group objects" in *"2.3.2. Operations from the WebManager"*.

2.10.5 Starting and stopping an individual resource

For information on how to start and stop an individual resource from the WebManager, see "Individual group resource objects (except mirror disk resources, hybrid disk resources, and VM resources)" in *"2.3.2. Operations from the WebManager"* or "Mirror disk resource object and hybrid disk resource object" in *"2.3.2. Operations from the WebManager"*.

2.10.6 Suspending and resuming a monitor resource

For information on how to suspend and resume a monitor resource from the WebManager, see "Monitors object" in *"2.3.2. Operations from the WebManager"*.

2.10.7 Suspending and resuming an individual monitor resource

For information on how to suspend and resume an individual monitor resource from the WebManager, see "Individual monitor resource objects" in *"2.3.2. Operations from the WebManager"*.

2.11 Limitations of the WebManager

- Information displayed by the WebManager does not always apply the latest status. To acquire the latest information, click the reload icon on the toolbar or **Reload** on the **Tool** menu.
- If a server fails while the WebManager is acquiring information, the information acquisition fails, which may result in the failure to show some objects.
You can either wait until the next auto refresh starts or click the reload icon on the toolbar or **Reload** on the **Tool** menu to acquire the latest information.
- If you use a Linux browser, some window manager combinations may put a dialog box behind other windows. Switch windows by pressing the **ALT + TAB** keys or by other means.
- The EXPRESSCLUSTER logs cannot be collected from two or more WebManager servers simultaneously.
- If you work on the WebManager when no connectivity is established, it may take a while to regain control.
- While the mouse pointer is the hourglass which indicates that the OS is processing something, moving the cursor outside the browser may return to the arrow icon even if the process is still underway.
- When you collect logs, the following message may be displayed in a server console:

```
hda: bad special flag: 0x03  
ip_tables: (C) 2000-2002 Netfilter core team
```

You can ignore this message because it does not affect log collection.

- If a proxy server is used, configure the proxy server so that the port number of the WebManager can be relayed.
- When a reverse proxy server is used, the WebManager does not run normally.
- When updating EXPRESSCLUSTER, close all running browsers. Clear the Java cache (not browser cache) and open browsers.
- When updating Java, close all running browsers. Clear the Java cache (not browser cache) and open browsers.
- If the client PC to connect to WebManager uses Java (TM) Runtime Environment Version 8.0 Update 162 or later, and cannot be connected to the Internet, it may take time to start WebManager. This can be avoided by setting **Execute Certificate Revocation Check** to **Not Check** on Detailed Settings on the Java Control Panel. For details of how to set it, check the Java website.
- Do not set the **Reload Interval** on the **WebManager** tab or less than 30 seconds. If you set it for less than 30 seconds, it may affect the performance of EXPRESSCLUSTER.

2.12 Error messages on the WebManager

The following is a list of error messages displayed when using the WebManager.

Level	Message	Cause	Solution
Error	Could not start the group because necessary responses have not been made.	No status is acquired because EXPRESSCLUSTER is now being started up.	Try reloading the status later.
Error	Could not connect to the server.	Connecting the WebManager to the EXPRESSCLUSTER server failed.	Check if the destination server is running.
Error	Connection Timeout	Internal time-out occurred.	Internal time-out may occur when a time-consuming task is performed. Check the status after the time-out and if there is no problem, you can continue your operations.
Error	Connection is terminated.	The connection between the WebManager and the EXPRESSCLUSTER is disconnected.	Check if the connection destination server has failed.
Error	Could not activate some resources.	Failed to start some resources under the group.	Solve the problem that caused the resource error. See the alert log for the detailed information on the error.
Error	Could not deactivate some resources.	Failed to stop some resources under the group.	Solve the problem that caused a resource error. For the detailed information on the error, see the alert log.
Error	Failed to collect cluster logs from the server.	Failed to collect cluster logs. Some servers may have been shut down during the cluster log collection. There is a possibility that there is an error and some servers cannot be accessed.	Retry cluster log collection. If logs from a certain server cannot be collected, run the clplogcc command on the server to collect logs.
Error	Failed to connect to server(%1 : %2)	Failed to connect to the WebManager.	Check if the WebManager is running on the server.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to find group online server.	Failed to detect the server whose group is online.	The server status may have changed during the operation. Reload the status.
Error	Failed to get data for the cluster tree view from the server.	Failed to acquire the cluster configuration.	Check if EXPRESSCLUSTER is running on the server by using a command.
Error	Failed to get the latest alert log.	1) The alertlog. alt file does not exist or is corrupted. 2) The number of the alert viewer records in the cluster configuration data is over the limitation. (Up to 999)	1) Temporarily store all the files under the /installation_path/alert/log on the server, and then restart the alert synchronization service. 2) Check the maximum number of the alert view records set in the Builder.
Error	Failed to get property from the server.	Failed to acquire a Cluster Properties value.	Run a command on the server to check if EXPRESSCLUSTER is running.
Error	Failed to search the alert logs.	Failed to open alert log files on a server.	Temporarily store the files under the /installation_path/alert/log on the server, and then restart the alert synchronization service.
Error	The response content is invalid.	Connection to the server is disconnected.	Check the server operating status and network connectivity.
Error	Failed to move group "Group Name" to server "Server Name".	Moving the group failed. [Group Name] group_name [Server Name] server_name	Solve the problem causing the failure of moving a group. For the detailed information on the error, see the alert log.
Error	The group is already started.	The target group has already been started up. Other manager or command on the server may have performed operations to the same group.	Try reloading the group status later to update it, and then perform operations to the group.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	The group is already stopped.	The target group has already been stopped. Other manager or command on the server may have performed operations to the same group.	Try reloading the group status later to update it, and then perform operations to the group.
Error	Group is updating its status.	The status of the target group is changing. Other manager or command on the server may have performed operations to the same group.	Try reloading the group status later to update it, and then perform operations to the group.
Error	Internal error.	An internal error of the WebManager occurred.	Perform reloading. If the same error occurs even after reloading, restart the WebManager daemon.
Error	Invalid configuration data.	Failed to acquire the cluster configuration data.	Check the information on the cluster configuration.
Error	Invalid group name.	An internal error of the WebManager occurred.	Perform reloading. If the error occurs even after reloading, restart the WebManager daemon.
Error	Invalid group name or server name.	An internal error of the WebManager occurred.	Perform reloading. If the error occurs even after reloading, restart the WebManager daemon.
Error	Invalid parameter.	An internal error of the WebManager occurred.	Perform reloading. If the error occurs even after reloading, restart the WebManager daemon.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Invalid server name.	An internal error of the WebManager occurred.	Perform reloading. If the error occurs even after reloading, restart the WebManager daemon.
Error	An error occurred in server or group operation.	Some operations failed.	Run a command to check the server status. If there is no problem, you can continue your operations.
Error	Operatable group does not exist.	The operation to the group failed.	Solve the problem that caused the failure of the operation to the group. For the detailed information on the error, see the alert log.
Error	Enter the number of alert logs displayed on each page.	The number of the alert log filter result to be displayed (for example, the number of logs in a window) is not set.	Specify the number of the alert log filter result to be displayed.
Error	Enter the event ID.	The ID for alert log search is not set.	Specify the ID for alert log search.
Error	Enter the module name.	The name of the module for the alert log search is not set.	Specify the name of a module for the alert log search.
Error	Enter the number of searches.	The number of alert logs to be searched is not set.	Specify the number of alert logs to be searched for.
Error	Enter the page number.	The page to show the results of the alert log research is not set.	Specify the page to show the results of the alert log research.
Error	Enter the server name.	The name of a server for alert log search is not set.	The name of the target server for the alert log search is not specified.
Error	Specified server is not active.	The server that initiated the operation is not active.	Wait for a while to perform reloading to update the group, and then perform the operation the group.
Error	Specified server is not active.	The server that initiated the operation is not active.	Wait for a while to perform reloading to update the group, and then perform the operation.
Warning	The cluster tree obtained from the server may not be completed.	An error occurred while acquiring the server's status.	Try reloading later.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	The number of alert logs per page you have entered is not in the specified range (1 to 300).	The specified number of alert log filter results displayed per page is out of the range.	Specify a value between 1 and 300.
Error	The value in "To" is incorrect. Enter the correct value.	The time specified for end of alert log search is invalid.	Set a correct time.
Error	Event ID entered is less than 1.	The ID set for the target of the alert log search is smaller than one.	Specify a value of 1 or greater.
Error	There are no groups that can be started.	Failed to start up a group.	Solve the problem that caused the failure of the operation to the group. For the detailed information on the error, see the alert log.
Error	There are no groups that can be stopped.	Failed to stop the group.	Solve the problem that caused the failure of the operation to the group. For the detailed information on the error, see the alert log.
Error	There are groups that failed to start.	Some operations failed.	Run a command to check the server status. If there is no problem, you can continue your operations.
Error	There are groups that failed to stop.	Some operations have failed.	Run a command to check the server status. If there is no problem, you can continue your operations.
Warning	The number of searches entered is less than 1.	The ID set for alert log search is smaller than one.	Specify a value of 1 or greater.
Error	Page number entered is less than 1.	The number of pages specified for the alert log search is smaller than one.	Specify a value of 1 or greater.
Error	The page number entered is greater than the total page number.	The number of pages specified for alert log search is greater than the number of total pages.	Specify the number that is smaller than the number of the total pages.
Warning	The properties got from server may not be completed.	Some information acquisition failed.	Try reloading later.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	There are groups that failed to stop.	There is a server that may have failed to shut down the cluster.	Check if the server has failed. If it has not failed, make sure that EXPRESSCLUSTER is running.
Error	The value in "From" is incorrect. Enter the correct value.	The time set for start of alert log search is invalid.	Set a correct time.
Error	The value set in "From" is later than the value in "To".	The time set for start of the alert log search is later than the time set for end	Set a correct time.
Info	The total number of pages has been changed. The server alert log will be updated.	The number of total pages of alert log filter results is updated. New alerts may have been issued while the search results were being displayed.	To apply added alerts to the search results, close the window displaying the search results and perform search again.
Error	Failed to get mirror disk list from the server.	An internal error of the Mirror Agent occurred. Communication from the WebManager server to the Mirror Agent failed. The process on the server timed out.	Make sure that the Mirror Agent is working. If the Mirror Agent is not started, reboot the server.
Error	Failed to get mirror status.	The Mirror Agent failed to acquire mirror disk status. An internal error of the Mirror Agent occurred. Communication from the WebManager server to the Mirror Agent has failed. The process in the server timed out.	Check if the Mirror Agent is active. If the Mirror Agent is not started, reboot the server.
Error	Failed to recover the mirror since mirror status has changed.	An error occurred while performing mirror recovery.	Make sure that the Mirror Agent is operating. If the Mirror Agent is not started, restart the server.
Confirmation	Data on two disks are identical. Do you want to execute a mirror recovery?	The mirror disks on both servers have no difference.	-

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Confirmation	%1 is recovering now. Are you sure you want to stop?	It was requested to stop during recovering.	-
Error	The local applet version does not match the server's. Close the browser and clear the applet cache.	A mismatch between the applet and the server occurred because the browser cache remains.	Exit the browser. Clear the cache of Java and restart the browser.
Error	Failed to get server list.	Failed to get a server list.	Check if other log collections are performed.
			Retry after others are completed.
			Reload after waiting for a while.
Error	Server is collecting cluster logs. Try again after cluster log collection is completed.	The server is collecting cluster logs.	Try again after other cluster log collections are completed.
Error	Failed to collect cluster logs from the server.	An error occurred while acquiring cluster logs.	Check the result in dialog box showing the progress of cluster log collection (see "Collecting logs by using the WebManager")
Error	Failed to log on (Internal error)	An internal error occurred when logging on to the WebManager.	Try logging on to WebManager again. Start the WebManager daemon if the error still occurs.
Error	Failed to log on	Incorrect password was entered three consecutive times.	Try logging on to WebManager again with a correct password.
Error	Incorrect password.	Incorrect password was entered.	Enter a correct password.
Error	Authorization failed.	Password was changed when accessing the WebManager.	Try logging on to WebManager again.
Error	Authorization failed. (Internal error.)	An internal error occurred when accessing to the WebManager.	Try logging on to WebManager again. Reboot the WebManager daemon if the error still occurs.
Error	Failed to connect to the server.	Failed to access to the WebManager.	Check if the WebManager is running on the server.
			Check if the WebManager can be connected to the server successfully.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to get the list of mirror disk error.	The Mirror Agent failed to acquire the mirror disk information. An internal error of the Mirror Agent occurred. Failed to access from the WebManager server to the Mirror Agent. The process timed out on the server.	Check if the Mirror Agent is working. If not, restart the server.
Confirmation	Could not obtain the status of the other server. Are you sure you want to execute a forced recovery?	Forced mirror recovery was performed.	-
Confirmation	This cluster will be terminated. Do you want to continue?	The confirmation message for shutting down the cluster.	-
Confirmation	Are you sure you want to suspend "{0}"?	The confirmation message for suspending the cluster. {0} is where the name of the cluster is described.	-
Confirmation	Are you sure you want to resume "{0}"?	The confirmation message for resuming the cluster. {0} is where the name of the cluster is described.	-
Confirmation	Are you sure you want to start "{0}"?	The confirmation message for starting the cluster daemon. {0} is where the name of the cluster is described.	-

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Confirmation	Are you sure you want to stop "{0}"?	The confirmation message for stopping the cluster daemon. {0} is where the name of the cluster is described.	-
Confirmation	Are you sure to restart the manager daemon?	The confirmation message for restarting the server-side service of WebManager.	-
Confirmation	Are you sure to start the mirror agent daemon?	The confirmation message for starting the mirror agent.	-
Confirmation	Are you sure to stop the mirror agent daemon?	The confirmation message for stopping the mirror agent.	-
Confirmation	Are you sure to suspend the cluster?	The confirmation message for suspending the cluster.	-
Confirmation	Are you sure to resume the cluster?	The confirmation message for resuming the cluster.	-
Confirmation	Are you sure to start the cluster?	The confirmation message for starting the cluster daemon.	-
Confirmation	Are you sure to stop the cluster?	The confirmation message for stopping the cluster daemon.	-
Confirmation	Warning: If the server is shut down, in order to recover the mirror which is used on this server to normal status, you need to execute mirror recover operation on it. It may cost long time to perform mirror recovery. Do you want to continue?	The confirmation message for shutting down some of the servers in the cluster. {0} is where the name of the server is described.	-

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Confirmation	<p>Warning: If the server is rebooted, in order to recover the mirror which is used on this server to normal status, you need to execute mirror recover operation on it.</p> <p>It may cost long time to perform mirror recovery.</p> <p>Do you want to continue?</p>	<p>The confirmation message for rebooting some of the servers in the cluster.</p> <p>{0} is where the name of the server is described.</p>	-
Confirmation	<p>Are you sure you want to start "{0}"?</p>	<p>The confirmation message for starting a cluster daemon of some of the servers in the cluster.</p> <p>{0} is where the name of the server is described.</p>	-
Confirmation	<p>Are you sure you want to stop "{0}"?</p>	<p>The confirmation message for stopping a cluster daemon of some of the servers in the cluster.</p> <p>{0} is where the name of the server appears.</p>	-
Confirmation	<p>Are you sure you want to stop "{0}"?</p>	<p>The confirmation message which suspends a failover group.</p> <p>{0} is where the name of the group is described.</p>	-
Confirmation	<p>Are you sure you want to start "{0}"?</p>	<p>The confirmation message for starting some of the resources in the fail over group.</p> <p>{0} is where the name of the resource is described.</p>	Note that the resources in dependency are also started.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Confirmation	Are you sure you want to stop "{0}"?	The confirmation message for stopping some of the resources in the fail over group. {0} is where the name of the resource is described.	Note that the resources in dependency are also stopped.
Confirmation	The file system of mirror disk on {0} maybe abnormal. Are you sure to execute a force recovery?	Mirror recovery has stopped while performing the last mirror recovery. This disk was where to be copied. The mirror disk data of this server may be going to be abnormal when the mirror disk is forcibly recovered. If you execute a mirror recovery, this data is taken as the latest one. The name of the mirror resource is displayed where {0} is represented.	It is recommended to forcibly recover a mirror disk of the other server.
Confirmation	The file system of mirror disk on {0} maybe abnormal. Could not obtain the status of the other server. Are you sure to execute a forced recovery?	Mirror recovery has stopped while performing the last mirror recovery. This disk was where to be copied. The status of the other server cannot be obtained. The mirror disk data of this server may be going to be abnormal when the mirror disk is forcibly recovered. If you execute a mirror recovery or forcible recovery, this data is taken as the latest one. The name of the mirror resource is displayed where {0} is represented.	It is recommended to forcibly recover a mirror disk of the other server.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Confirmation	The file system of mirror disk on {0} may have an error. Are you sure to connect to the mirror disk?	Displayed when a mirror disk is manually performed to be active. Mirror recovery has stopped while performing the latest mirror recovery. This disk was where to be copied. The mirror disk data of this server may be abnormal.	It is not recommended to continue activating a mirror disk because the file system of this disk may not be normal.
Confirmation	Are you sure you want to disable the dummy failures of all monitors?	Confirms whether dummy failure is disabled for all monitors when changing from verification mode to a different mode.	-
Error	Error Cause:{0}	Failed in operations for mirror. For specific cause, refer to the descriptions in where {0} represents.	Refer to the description in where {0} represents.
Error	Failed to communication with mirror disk agent.	Failed to communicate between WebManager and mirror agent.	Make sure the mirror agent is running on each server in the cluster. If not running, restart a server.
Error	Communication between mirror disk agent timeout.	Timeout has occurred in communication between WebManager and the mirror agent.	Make the values of send/receive timeout of mirror agent of the Cluster Properties larger. When the load is temporarily high, change the ratio of timeout using the clptoratio command.
Error	Internal error.	Failed to allocate the memory, attach the shared memory or perform ioctl () to the mirror driver.	Make sure that the setting value related to the mirror disk is properly configured. Shut down and reboot the cluster.
Error	Invalid mirror disk alias.	The specified mirror disk is not found.	Click Reload to display the latest status of a cluster, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to get mirror disk information.	Failed to acquire the mirror disk information from the mirror agent.	Make sure that the setting value related to mirror disk is properly configured. Shut down and reboot the cluster.
Error	Specified server name was not found.	The specified server is not found.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to get the diff percent of mirror disk.	Failed to acquire difference information of mirror disk from the mirror agent.	Make sure that the setting value related to mirror disk is properly configured. Shut down and reboot the cluster.
Error	Invalid license.	Failed in operation because the registered license is invalid or expired.	Confirm the license. Make sure the valid date when using a license for trial.
Error	Mirror disk has already been mounted.	The status of mirror activation operation from another WebManager or by the clpmdctrl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to get mirror disk status.	Failed to acquire the mirror disk status from the mirror agent.	Make sure that the setting value related to mirror disk is properly configured. Shut down and reboot the cluster.
Error	Mirror disk status is not proper.	Possible cause is that the status of mirror is not applied on the display when any operation or transmission that would affect its status occurred.	Click Reload to display the latest status of a cluster, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to read date for cluster partition.	Failed to access a cluster partition.	Make sure that the cluster partition of mirror disk is properly configured. Make sure the partition device set as a cluster partition is normal.
Error	Failed to write date to cluster partition.	Failed to access a cluster partition.	Make sure that the cluster partition of mirror disk is properly configured. Make sure the partition device that set as a cluster partition is normal.
Error	Mirror disk is not mounted.	Failed in operation because a mirror disk is not mounted. Possible cause is that the status of mirror deactivation operation from another WebManager or by the clpmdctrl command is not applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to create mount point.	An error has occurred in the process of creating mount point when a mirror resource is being activated.	Make sure that setting value of mount point of mirror resource is properly configured.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to activate mirror disk, because mirror disk size of both server are not same.	The size of partition set to data partition is not the same between the both servers.Default mirror configuration is not operated in the specified direction.	Follow the steps below. 1. Inactivate the failover group that the mirror resource belongs to. 2. Make sure the data partition size of both servers. 3. Make sure that the server data with small size of data partition is the latest. 4. Operate a mirror recovery from the server with the small size of data partition to the server with the big size of data partition. 5. Activate the failover groups that the mirror resource belongs to.
Error	Failed to recover mirror disk in force mode.	Failed to forcibly recover the mirror disk.	Make sure that mirror disk setting (especially cluster partition, port number) is not wrong. Make sure that the partition device set as a cluster partition is normal.
Error	Failed to set mirror disk.	Failed in mirror disk-related operation.	Make sure that mirror disk setting (especially cluster partition, port number) is not wrong. Make sure that the partition device set as a cluster partition is normal. Shut down and reboot a cluster.
Error	Failed to get server list.	Failed to acquire the server list.	Make sure that the setting of mirror disk does not contain any error. Shut down and reboot a cluster.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Mirror driver is abnormal.	Failed in operation due to a failure of driver of the mirror disk.	<p>Make sure that the driver of mirror disk (liscal) is loaded on each server by executing the lsmod command.</p> <p>Make sure the version information of kernel supported by Replicator option/Replicator DR option and kernel version being used by referring to the startup guide.</p> <p>Shut down and reboot a cluster.</p>
Error	Failed to mirror driver status.	Failed in operation due to the failure of driver.	<p>Make sure that the driver of mirror disk (liscal) is loaded on each server by executing the lsmod command.</p> <p>Make sure the version information of kernel supported by Replicator option/Replicator DR option and kernel version being used by referring to the startup guide.</p> <p>Shut down and reboot a cluster.</p>
Error	Specified recovery mode is invalid.	<p>Failed to operate the mirror recovery because the specified reconfiguration mode is invalid.</p> <p>Possible cause is that the status of mirror is not applied on the display when any operation or transition that would affect its status occurred.</p>	Click Reload to display the latest status of a cluster, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to send recovery data.	Failed in mirror recovery because sending a recovery data failed.	Make sure the setting of mirror disk does not contain any error (especially in mirror connect). Make sure that the network set to mirror connect is in normal state.
Error	Detected disk error while recovering the mirror.	Failed in mirror recovery because the disk error is detected.	Replace an error disk, and then try again.
Error	Failed to cancel recovery of mirror disk.	Failed to stop the process of mirror recovery.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to get sector number of mirror disk.	Failed in operation because acquiring the sector number of mirror disk failed.	Make sure that the setting of mirror disk (especially in partition) does not contain any error.
Error	Specified mirror disk is recovering now.	Failed in operation due to mirror recovery. The status of mirror activation operation from another WebManager or by the clpmdctrl command may not be applied on the display.	Click Reload to display the latest status of the cluster.
Error	Mirror disk status is normal, it is not needed to recover.	Mirror recovery is not needed. The status of mirror may not be applied on the display when any operation or transition that would affect its status occurred.	Click Reload to display the latest status of the cluster.
Error	Failed to fork process.	Failed in mirror recovery, because generating the process required for mirror recovery failed.	Confirm the status of the server where mirror is to be recovered.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Recovery direction is not correct.	Failed in mirror recovery, because a direction of mirror recovery is invalid. The status of mirror may not be applied on the display when any operation or transition that would affect its status occurred.	Click Reload to display the latest status of a cluster, and try again.
Error	Mirror disk has not been initial constructed.	Failed in operation, because default mirror is not configured for mirror disk. The status of mirror may not be applied on the display when any operation or transition that would affect its status occurred.	Click Reload to display the latest status of a cluster, and try again.
Error	Recovery is canceled.	The status of mirror active operation from another WebManager or by the clpmdctrl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to recover mirror disk, because recovery source does not contain the latest data.	Failed in mirror recovery, because the disk which is a source of mirror recovery does not have the latest data. The status of mirror may not be applied on the display when any operation or transition that would affect its status occurred.	Click Reload to display the latest status of a cluster, and change a source of reconfiguration and reconfigure it.
Error	Failed to recover since NMP size of recovery target is smaller than recovery source.	Failed in mirror recovery, because the size of data partition of mirror target is smaller than the one of recovery source.	This message is usually not displayed because the size of data partition is automatically adjusted at the time of initial mirror configuration.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to read configura- tion.	Failed in operation due to the error of cluster config- uration information file.	Make sure that setting of mirror disk does not con- tain any error.
Error	System command return error.	Failed in operation, because the execution result of the command that is performed from mirror agent is error. There is no EXPRESSCLUSTER executable file to be executed from mirror agent.	Make sure that the bin/clprelpath file is stored under the install directory of EXPRESS- CLUSTER.
Error	Command(fsck) timeout.	Failed in operation, be- cause timeout has oc- curred in executing the command (fsck).	Set a larger value for the fsck timeout of mirror re- source.
Error	Command(mount) time- out.	Failed in operation, be- cause timeout has oc- curred in executing the command (mount).	Set a larger value for the mount timeout of mirror resource.
Error	Command(umount) time- out.	Failed in operation, be- cause timeout has oc- curred in executing the command (umount).	Set a larger value for the umount timeout of mirror resource.
Error	Command(clprelpath) timeout.	Failed in operation, be- cause timeout has oc- curred in executing the command (clprelpath).	System is highly loaded. Take the cause of high load off.
Error	Command(mount) return error.	Failed in operation, be- cause an error occurred in executing the mount com- mand.	Make sure that mount option of mirror resource is properly configured. Make sure that mount option that is supported by file system is configured. Make sure that the directory of mount point of the mirror resource exists.
Error	Command(umount) return error.	Failed in operation, be- cause an error occurred in executing the umount command.	Make sure that the direc- tory of mount point of the mirror resource exists.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Command(fsck) return error.	Failed in operation, because an error occurred in executing the fsck command.	Make sure that fsck option of mirror resource is properly configured. Make sure that the fsck option supported by file system exists.
Error	Mirror disk is busy in activate.	Failed in operation, because the mirror disk is now being activated.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to get the diff bitmap of mirror disk.	Failed to acquire the difference information of mirror disk from the mirror agent.	Make sure that the setting value related to the mirror disk is not wrong. Shut down and reboot a cluster.
Error	Failed to get the device size of mirror disk.	Failed in operation, because acquiring the device size of mirror disk failed.	Make sure that mirror disk setting (especially in data partition) does not contain any error.
Error	Failed to start the cluster "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpcl command may not be applied on the display. The name of the cluster is displayed where {0} is represented.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to stop the cluster "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpcl command may not be applied on the display. The name of the cluster is displayed where {0} is represented.	Click Reload to display the latest status of a cluster, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to suspend the cluster "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpcl command may not be applied on the display. The name of the cluster is displayed where {0} is represented.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to resume the cluster "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster at when being operated from another WebManager or by the clpcl command may not be applied on the display. The name of the cluster is displayed where {0} is represented.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to restart the manager service. Click the Reload button, or try again later.	An error occurred on the data transfer server of EXPRESSCLUSTER.	Check the status of the data transfer server of EXPRESSCLUSTER.
Error	Failed to start the server "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of cluster at when the cluster is operated from other WebManager, or the status of server is changed may not be applied. The name of the server is displayed where {0} is represented.	Click Reload to display the latest status of a cluster, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to stop the server "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of cluster at when the cluster is operated from other WebManager, or the status of server is changed may not be applied. The name of the server is displayed where {0} is represented.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to start group "{0}" at server "{1}".	The status of a group may not be the latest. It may be that the status of cluster has been altered from a different WebManager or by a clpgrp command, but the display has not yet reflected these changes. The name of the group is displayed where {0} is represented.	Click Reload to display the latest status of a group, and try again.
Error	Failed to stop group "{0}".	The status of a group may not be the latest. It may be that the status of cluster has been altered from a different WebManager or by a clpgrp command, but the display has not yet reflected these changes. The name of the group is displayed where {0} is represented.	Click Reload to display the latest status of a group, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to migrate group "{0}" to server "{1}".	<p>The status of a group may not be the latest.</p> <p>It may be that the status of cluster has been altered from a different WebManager or by a clpgrp command, but the display has not yet reflected these changes.</p> <p>The name of the group is displayed where {0} is represented.</p>	Click Reload to display the latest status of a group, and try again.
Error	<p>Failed to suspend the monitor "{0}".</p> <p>Click the Reload button, or try again later.</p>	<p>The status of a cluster may not be the latest.</p> <p>The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.</p> <p>The name of the monitor resource is displayed where {0} is represented.</p>	Click Reload to display the latest status of a cluster, and try again.
Error	<p>Failed to resume the monitor "{0}".</p> <p>Click the Reload button, or try again later.</p>	<p>The status of a cluster may not be the latest.</p> <p>The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.</p> <p>The name of the monitor resource is displayed where {0} is represented.</p>	Click Reload to display the latest status of a cluster, and try again.
Error	<p>Failed to suspend the monitor.</p> <p>Click the Reload button, or try again later.</p>	<p>The status of a cluster may not be the latest.</p> <p>The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.</p>	Click Reload to display the latest status of a cluster, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to resume the monitor. Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to update the data in real time. Trying to connect to the server again.	Connection may have already reached the maximum number.	Change the setting on IP Addresses of the Accessible Client of WebManager. Terminate the unneeded WebManager.
Error	Failed to start the resource "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager may not be applied on the display. The name of the resource is displayed where {0} is represented.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to stop the resource "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager may not be applied on the display. The name of the monitor resource is displayed where {0} is represented.	Click Reload to display the latest status of a cluster, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to suspend any monitor. Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to resume any monitor. Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to disable dummy failure of monitors. Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to disable a part of dummy failure of monitors. Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Failed to disable dummy failure of monitor "{0}". Click the Reload button, or try again later.	The status of a cluster may not be the latest. The status of the cluster when being operated from another WebManager or by the clpmonctrl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.

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Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to start mdagent. Click the Reload button, or try again later.	EXPRESSCLUSTER daemon is not started. The status of the cluster when being operated from another WebManager or by the clpcl command may not be applied on the display.	Make sure the EXPRESS-CLUSTER daemon of each server is up and running.
			Click Reload to display the latest status of a cluster, and try again.
Error	Failed to stop mdagent. Click the Reload button, or try again later.	The status of the cluster when being operated from another WebManager or by the clpcl command may not be applied on the display.	Click Reload to display the latest status of a cluster, and try again.
Error	Could not start the group because it has recovering mirror disk. Try again after mirror recovery is completed.	Starting failover group will be stopped because there is a mirror disk resource processing mirror recovery on the failover group.	Perform the same operation after mirror recovery is completed.
Error	Could not move the group because it has recovering mirror disk. Try again after mirror recovery is completed.	Moving failover group will be stopped because there is a mirror disk resource processing mirror recovery on the failover group.	Perform the same operation after mirror recovery is completed.
Error	Could not start the mirror disk because it is recovering now. Try again after mirror recovery is completed.	Starting a resource will be stopped because the mirror disk resource is processing mirror recovery.	Perform the same operation after mirror recovery is completed.
Error	An internal error occurred.	A memory shortage, network error, file system capacity shortage or other OS resource shortage occurred on the server where the WebManager is connected to.	Make sure that there is enough space of OS resource, network or file system in the server.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Mirror Agent service is not running.	Mirror agent daemon is not started.	Start the mirror agent daemon, and then try it again.
Error	The operation timeout period has expired.	Timeout has occurred when the WebManager is collecting data from the mirror agent.	The system is highly loaded. Take the cause of high load off. When the system is temporarily in high load, change the ratio of timeout using the clptoratio command.
Error	Because server "{0}" has I/O error in accessing cluster partition, the action you selected cannot be executed. Please select another server.	The I/O error has occurred in connecting the cluster partition at the server; {1}.	- Select the other server. - Check the shared disk.
Error	Because server "{0}" has I/O error in accessing cluster partition, the action you selected cannot be executed. Please select another server.	The I/O error has occurred in connecting the cluster data partition at the server; {1}.	Select the other server. - Check the shared disk.
Warning	The mirror disk list data may have not been fully obtained from the server.	An error has occurred in acquiring the failed mirror disk list data.	Check to see the status of mirror disk agent, and then, perform the reload.
Error	Failed to start mdagent. Check the cluster and mdagent status. Click the Reload button, or try again later.	EXPRESSCLUSTER daemon/mirror agent is already started. The status of the cluster when being operated from another WebManager or by the clpcl command may not be applied on the display.	Check to see the status of the cluster and mirror disk agent. Click Reload to display the latest status of a cluster, and try again.

Continued on next page

Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to stop mdagent. Check the cluster status. Click the Reload button, or try again later.	The EXPRESSCLUSTER daemon is up and running. The status of the cluster when being operated from another WebManager or by the clpcl command may not be applied on the display.	Check to see the status of the cluster and mirror disk agent. Click Reload to display the latest status of a cluster, and try again.
Error	Failed to change to current server.	Failed to change the current right.	Check to see the status of the mirror agent. Click Reload to display the latest status of a cluster, and try again.
Error	Cannot get the current server information.	An error has occurred in acquiring the current server information.	Check to see the status of mirror agent, and try again.
Error	This server is not current server. Cannot perform this action.	The server you specified is not the current server.	Click Reload to display the latest status of a cluster, and try again.
Error	A server is changing the current server. This action cannot be performed.	A server is changing the current server.	Wait for a while, and try again.
Error	Not connected to the server now. The settings will be displayed when the connection recovers. Wait for a moment.	Failed to communicate with WebManager.	Make sure that the EXPRESSCLUSTER Web Alert service is running on the server side. Make sure that it can normally connect to a server.
Error	Failed to get the license information.	Failed to obtain the license information.	Check to see the license. Shut down and then reboot the cluster.
Error	The license information obtained from the server may be incomplete.	Part of the license information could not be obtained.	Check to see the license. Shut down and then reboot the cluster.

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Table 2.10 – continued from previous page

Level	Message	Cause	Solution
Error	The request to resume the cluster failed on some servers.	Some servers failed to resume the clusters.	Check the status of the server which failed to resume the clusters.
Error	Failed to get the time info from the server.	The time information could not be obtained.	Click Reload to display the latest status of a cluster, and then reexecute the same operation.
Error	Failed to clear the time info.	Failed to clear the time information.	Click Reload to display the latest status of a cluster, and then reexecute the same operation.

FUNCTIONS OF THE BUILDER

This chapter provides information on functions of the Builder.

This chapter covers:


- 3.1. *Overview of the Builder*
- 3.2. *Details on the Builder screen*
- 3.3. *Pop-up menu*
- 3.4. *Using a tool bar of the Builder*
- 3.5. *Using the menu bar of the Builder*
- 3.6. *File menu*
- 3.7. *View menu*
- 3.8. *Edit menu*
- 3.9. *Help Menu*
- 3.10. *Parameter details*
- 3.11. *Cluster properties*
- 3.12. *Server Common Properties*
- 3.13. *Server properties*
- 3.14. *Installing the offline version of the Builder*
- 3.15. *Uninstalling the offline version of the Builder*

3.1 Overview of the Builder

The Builder is a tool for creating and changing the cluster configuration data (config and scripts).

Note: You cannot configure or display functions that have been added to or changed in versions later than EXPRESSCLUSTER X 4.0.

There are two versions of the Builder; online version and offline version.

- Online version
Click **Config Mode** on the **View** menu or select the config mode icon  from the dropdown menu on the toolbar.
With the online version Builder, you can connect to the server directly to create a cluster, change its configuration and distribute the cluster configuration data.
- Offline version
With the offline version Builder, you can create or change the cluster configuration data on the machine which cannot connect to a server.
To distribute the cluster configuration data, you need to use the clpcfcctl command.

See also:

For the system requirements of the Builder, see the corresponding web page.

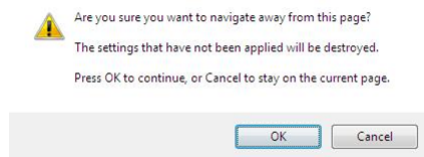
Note:

In this guide, **Builder** refers to the online version of Builder, which runs in the WebManager config mode, and the offline version of Builder, which runs on the management PC.

"Linux version" in this guide represents the Builder that runs on the Linux browser. "Windows version" represents the Builder that runs on the Windows browser. "Host name" in this guide represents the short name that excludes the domain name from a frequently qualified domain name (FQDN).

3.1.1 Limitations of the Builder

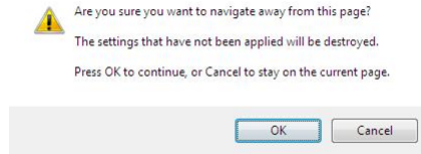
- The following products' cluster configuration data is not compatible.
The Builder of other than the EXPRESSCLUSTER X 4.0 for Linux
- Cluster configuration data created using a later version of this product cannot be used with this product.
- Cluster configuration data of EXPRESSCLUSTER X1.0/2.0/2.1/3.0/3.1/3.2/3.3/4.0 for Linux can be used with this product.
You can use such data by clicking **Import** from the **File** menu in the Builder.
- If you close the Web browser (by clicking **Exit** from the **File** menu or clicking **X** at the top right-hand corner of the window frame), the dialog box to confirm to save is displayed.



When you continue to edit, click the **Cancel** button.

Note: This dialog box is not displayed if JavaScript is disabled.

- If you reload data on the Web browser (by selecting **Reload** from the **Tool** menu or clicking reload icon on the toolbar), the dialog box to confirm to save is displayed.



When you continue to edit, click the **Cancel** button.

Note: This dialog box is not displayed if JavaScript is disabled.

- When creating the cluster configuration data using the Builder, do not enter the value starting with 0 on the text box. For example, if you want to set 10 seconds for a timeout value, enter "10" but not "010."
- If you change the screen resolution while the Builder is running, the Java VM stack trace (example: NullPointerException) may be logged on the Java console. The Builder can keep running.
- If you press **Esc** while a pull-down menu of your browser is displayed, the Java VM stack trace (example: NullPointerException) may be logged on the Java console. The Builder can keep running.
- In some cases, you cannot use the keyboard because the keyboard focus of the Builder becomes disabled (the focus changes to the Web browser). Click the Builder window and get the focus back to the Builder.
- When you are using the multi-display function, do not run the Builder on the secondary display. Otherwise, it may not work properly. For example, the screen is not displayed. Use the Builder on the primary display.
- When using the browser on Linux, depending on the combination with the Window Manager, the dialog may be placed behind other windows. Switch the window with **ALT + TAB**.
- On the **Alert Log** tab (see "3.11.12. *Alert Log tab*"), for **Max. Number to Save Alert Records**, if you set a number smaller than the current one, all alert logs will be deleted. Take into account the available disk space, and specify the number before you start the operation.
- In the environment where **Internet Explorer is used**, disable **Protected Mode on the security setting of Internet Explorer**.
- The JIS 2004-unique characters are not supported. Thus, you cannot enter or view the characters added by JIS 2004.
- The Builder does not run normally through the Reverse Proxy server.
- The default script editor is Notepad (for Windows) / vi (for Linux). vi cannot properly display multi-byte characters, because its default settings on Linux use xterm for the terminal.
- When you use the Offline Builder and the EXPRESSCLUSTER a combination of their versions should be the one shown below. The Builder may not operate properly if they are used in a different combination.

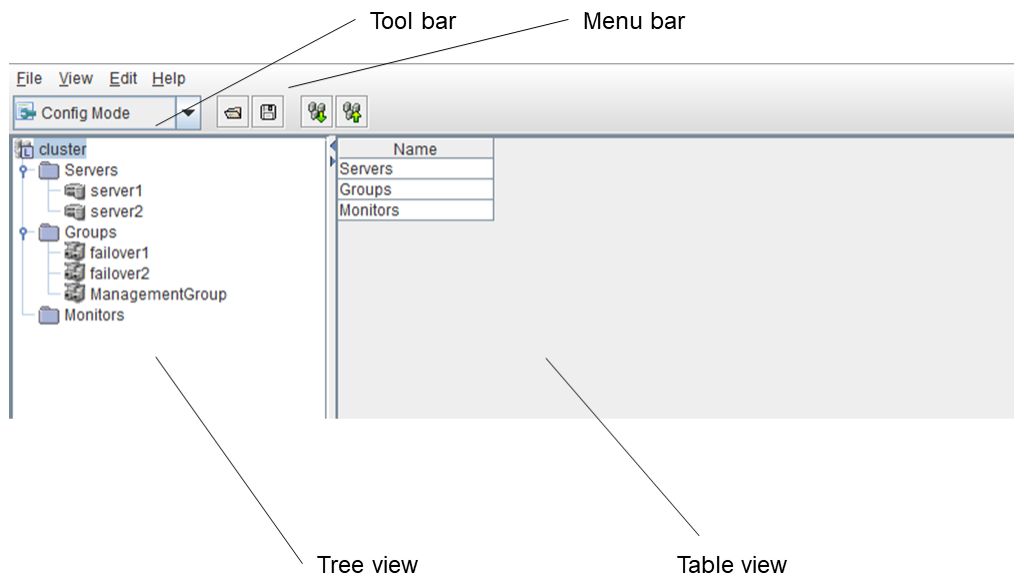
Offline Builder version	EXPRESSCLUSTER internal version
4.0.0-1	4.0.0-1 4.0.1-1

3.2 Details on the Builder screen

This topic explains the Builder screen layout.

3.2.1 Overview of the EXPRESSCLUSTER X Builder

The screen layout of the Builder is displayed below.



The tree view on the left pane shows the cluster objects in the hierarchical order. If you select an object from the tree view, its subordinate objects are displayed in the table view on the right

3.2.2 Tree view

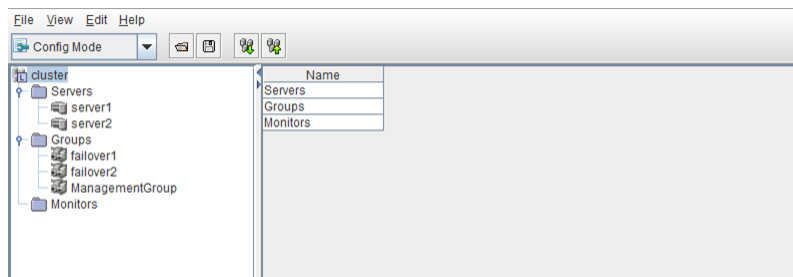
The following objects are displayed in the tree view:

Hierarchy	Object	Contents	Table view when the object is selected
1		Represents the cluster.	Displays cluster names.
2	Servers	Represents a set of servers in the clusters	Displays servers.
3		Represents each server	Displays server names.
2	Groups	Represents a set of groups in the clusters	Displays groups.
3		Represents each group.	Displays group names.
2	Monitors	Represents a set of monitor resources in the clusters	Displays monitors.

3.2.3 Table view

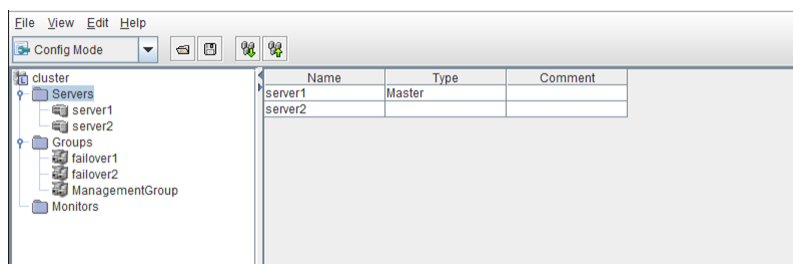
3.2.4 Table for cluster name selection

Displays objects under the root hierarchy.



3.2.5 Table for server selection

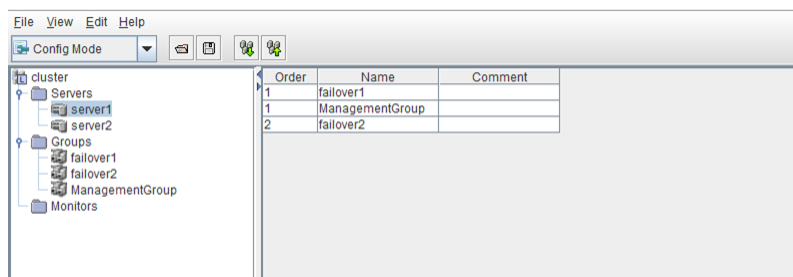
Displays the list of servers.



Column name	Overview
Name	Displays server names in alphanumerical order.
Type	If the server is specified as the master server, "Master" is displayed.
Comment	Displays comments specified for the server.

3.2.6 Table for server name selection

Displays the list of groups allowed to start on the selected server.

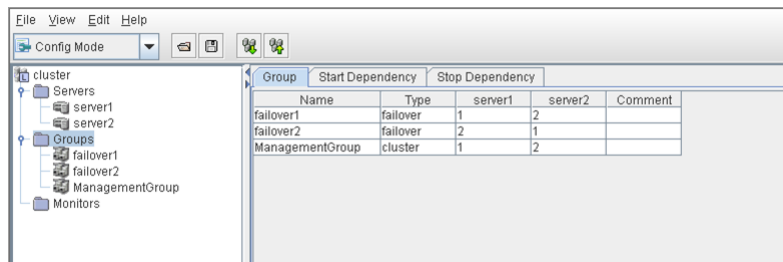


Column name	Overview
Order	Displays the server priority. The groups in the name cells start on servers in this order. "1" is displayed for the top priority. This list is displayed in the descending order of priority.
Name	Displays the group name.
Comment	Displays comments specified for the group.

3.2.7 Table for group selection

Group list

Displays the failover priorities of the groups.



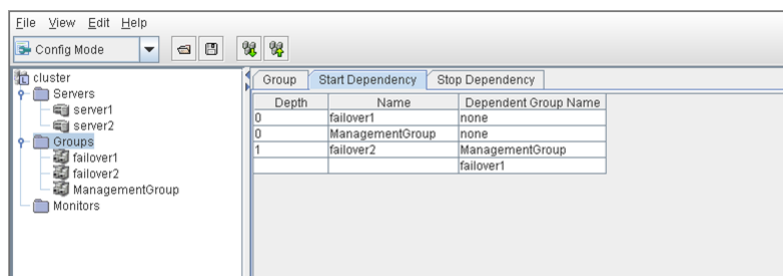
The screenshot shows the ExpressCluster X Builder interface. On the left is a tree view with nodes: cluster, Servers (server1, server2), Groups (failover1, failover2, ManagementGroup), and Monitors. The main pane displays a table with the following data:

Group	Name	Type	server1	server2	Comment
failover1	failover	1	2		
failover2	failover	2	1		
ManagementGroup	cluster	1	2		

Column name	Overview
Name	Displays the group names in alphanumerical order.
Type	Displays the group type.
Server names (The number of columns dynamically increases or decreases according to the number of servers)	Represents the startup order of groups on the servers displayed by column names. The top priority is represented with "1."
Comment	Displays comments specified for the groups.

Start dependence

The dependencies included in the group start dependence are listed.

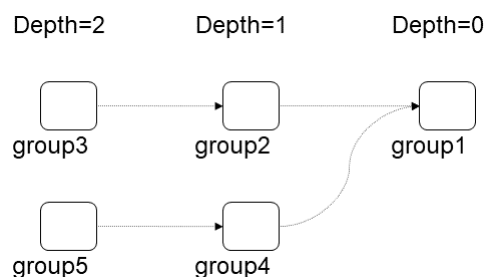


The screenshot shows the ExpressCluster X Builder interface. On the left is the same tree view as before. The main pane displays a table with the following data:

Depth	Name	Dependent Group Name
0	failover1	none
0	ManagementGroup	none
1	failover2	ManagementGroup
		failover1

Column name	Overview
Depth	Represents the target start order of groups in the name cells. If start dependence is not applied to any group, "0" is displayed. Groups are displayed in the depth order.
Name	Displays group names.
Dependent Group Name	Displays the group start dependence names in the name cells. If start dependence is not applied to any group, "none" is displayed. If there are multiple start dependence groups, they are displayed on separate rows.

The levels of depth are illustrated below. Arrows (->) in the figure represent group start dependence targets.

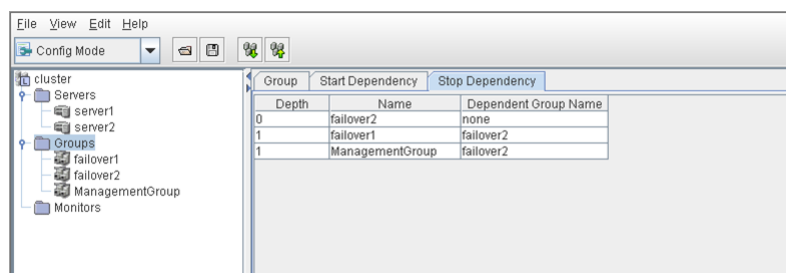


The dependencies represented by this figure are listed below.

Depth	Name	Start dependence group name
0	Group1	None
1	Group2	group1
1	Group4	group1
2	Group3	group2
2	Group5	group4

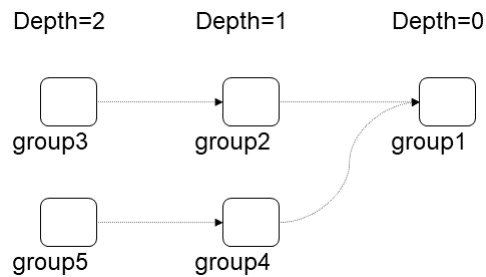
Stop dependence

The dependencies included in the group stop dependence are listed.



Column name	Overview
Depth	<p>Represents the target stop order of groups in the name cells.</p> <p>If stop dependence is not applied to any group, "0" is displayed.</p> <p>Groups are displayed in the depth order.</p>
Name	Displays group names.
Dependent Group Name	<p>Displays the group stop dependence names in the name cells.</p> <p>If stop dependence is not applied to any group, "none" is displayed.</p> <p>If there are multiple stop dependence groups, they are displayed on separate rows.</p>

The levels of depth are illustrated below. Arrows (->) in the figure represent group stop dependence targets.



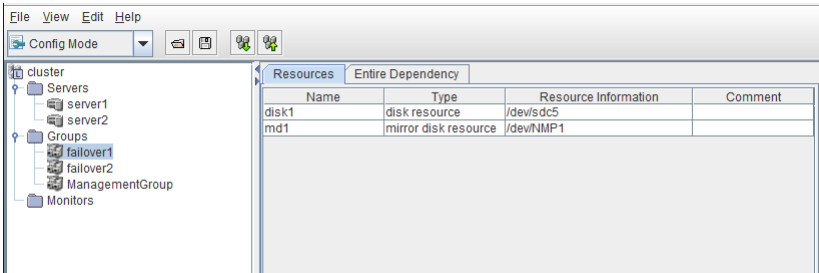
The dependencies represented by this figure are listed below.

Depth	Name	Stop dependence group name
0	group1	none
1	group2	group1
1	group4	group1
2	group3	group2
2	group5	group4

3.2.8 Table for group name selection

Resources

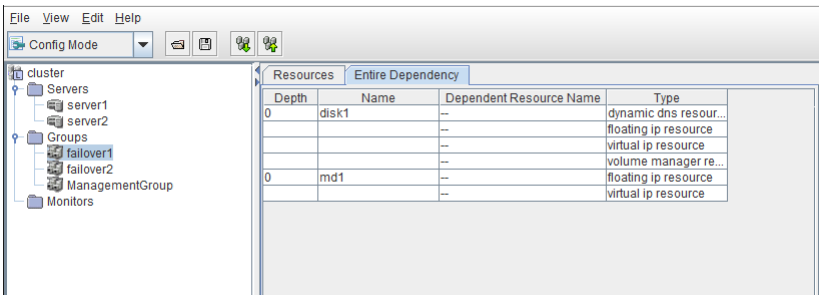
Group resources in the selected group are listed.



Column name	Overview
Name	Displays group resource names in alphanumerical order.
Type	Displays a group resource type.
Resource Information	Displays objects to be activated or deactivated for the group resource.
Comment	Displays comments specified for the group resource.

Dependency List

Dependency among group resources in a selected group is listed.



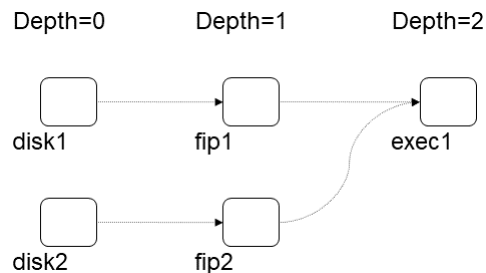
Column name	Overview
Depth	Represents the target activation order of group resources in the name cells. If a group resource does not depend on any group resource, "0" is displayed. Group resources are displayed in the depth order.
Name	Displays the group resource name.
Dependent Resource Name	Displays the group resource names that the group resources in the name cells depend on. If a group resource does not depend on any group resource, "none" is displayed. When following the default dependency, "--" is displayed. If there are multiple dependent resources, they are displayed in separate rows.

Continued on next page

Table 3.11 – continued from previous page

Column name	Overview
Type	Displays the group resource type in Dependent Resource Name. When following the default dependency, the dependent type is displayed.

The levels of depth are illustrated below. Arrows (->) in the figure represent the group resource activation order.

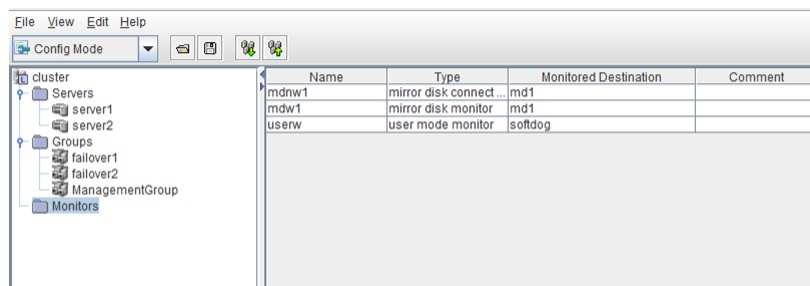


The dependencies in this figure are listed below. These are not the default dependencies, but specified with resource names.

Depth	Name	Dependent Resource Name	Type
0	disk1	none	
0	disk2	none	
1	fip1	disk1	disk resource
1	fip2	disk2	disk resource
2	exec1	fip1	floating ip resource
		fip2	floating ip resource

3.2.9 Table for monitor resource selection

Displays the list of monitor resources.



Column name	Overview
Name	Displays monitor resource names in alphanumerical order.
Type	Displays the monitor resource type.
Monitored Destination	Displays the monitor resource to be monitored.
Comment	Displays comments specified for the monitor resource.

3.3 Pop-up menu

Pop-up menus are displayed by right-clicking a tree object or table row.

If select	Displayed menu	Refer to
no_cluster_name	Cluster Generation Wizard	3.6.1. <i>Creating a new cluster</i>
cluster_name	Remove Cluster	3.8.2. <i>Removing an object</i>
	Rename Cluster	3.8.3. <i>Renaming an object</i>
	Properties	3.8.4. <i>Properties</i>
Servers	Server Definition	3.8.1. <i>Adding an object</i>
	Properties	3.8.4. <i>Properties</i>
server_name	Remove Server	3.8.2. <i>Removing an object</i>
	Rename Server	3.8.3. <i>Renaming an object</i>
	Properties	3.8.4. <i>Properties</i>
Monitors	Add monitor resource	3.8.1. <i>Adding an object</i>
Groups	Add Group	3.8.1. <i>Adding an object</i>
	Add Group for WebManager	3.8.1. <i>Adding an object</i>
	Properties	Group resource details in the Reference Guide.
group_name	Add Resource	3.8.1. <i>Adding an object</i>
	Remove Group	3.8.2. <i>Removing an object</i>
	Rename Group	3.8.3. <i>Renaming an object</i>
	Properties	3.8.4. <i>Properties</i>
<u>group_resource_name</u>	Remove Resource	3.8.2. <i>Removing an object</i>
	Rename Resource	3.8.3. <i>Renaming an object</i>
	Properties	3.8.4. <i>Properties</i>
<u>monitor_resource_name</u>	Remove Monitor Resource	3.8.2. <i>Removing an object</i>
	Rename Monitor Resource	3.8.3. <i>Renaming an object</i>
	Properties	3.8.4. <i>Properties</i>





3.4 Using a tool bar of the Builder

The Builder provides a toolbar:



For details about the icons used to switch to the operation mode, the config mode, or the reference mode, which are common to the WebManager, see "2.2. *Window of the WebManager* 2.2.1. *Main pane of the WebManager* Tool bar" in "2. *Functions of the WebManager*" in this guide.

If you click the combo box and icons on the toolbar specific to the Builder screen, you can perform the same operations as some functions of the pull-down menu displayed on the top of the screen.

Button	Function	Refer to
	Opens a file. This is the same as clicking File on the menu bar and then selecting Open.	"3.6.2. <i>Opening the configuration file</i> "
	Saves a file. This is the same as clicking File on the menu bar and then selecting Save	"3.6.3. <i>Saving the configuration file</i> "
	Get the configuration. This is the same as clicking Download the Configuration File on the File menu.	"3.6.4. <i>Get the configuration file (online version only)</i> "
	Apply the configuration. This is the same as clicking Upload the Configuration File on the File menu.	"3.6.5. <i>Apply the configuration file (online version only)</i> "

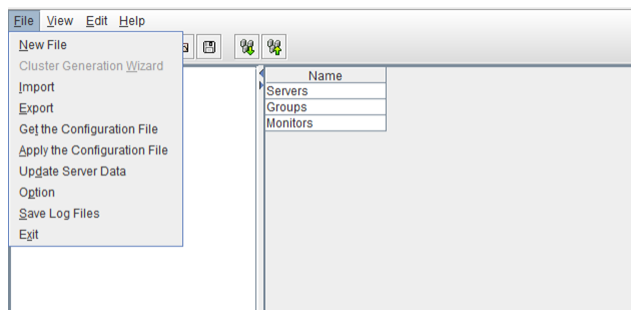
3.5 Using the menu bar of the Builder

You can perform various operations by using the menu bar of the Builder. This topic explains the operations to be executed using the menu bar.

3.6 File menu

Select **File** to display the following menu.

Menu	Functional overview
New File	Creates a cluster.
Cluster Generation Wizard	Opens the cluster generation wizard.
Import	Read the cluster configuration information file.
Export	Save the configuration information as the cluster configuration information file.
Get the Configuration File	Connect to the cluster and get the current configuration information (online version only).
Apply the Configuration File	Apply the configuration information to the cluster (online version only).
Update Server Data	Update the server IP address and the device information (online version only).
Option	Starts the Option dialog box.
Save log files	Starts the Save Logs dialog box.
Exit	Exits the Builder.



3.6.1 Creating a new cluster

Create a new cluster using the Builder.

Important: If you create a new cluster, the cluster configuration data that has been edited will be discarded. Be sure to save the required data before you create a new cluster.

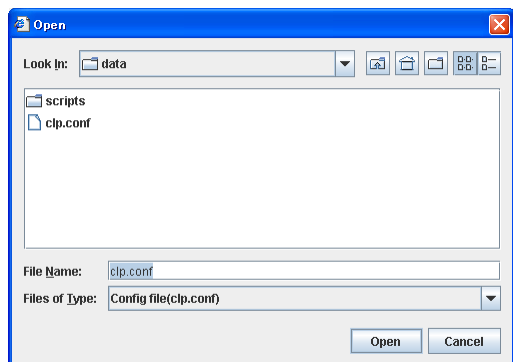
- On the menu bar, click **File** and then click **Create New File**.
- If you made changes in the cluster configuration data, a dialog box asks if you want to save them before they are discarded. Click **Yes** to save the changes. A dialog where you can specify a folder to save the cluster configuration data is displayed. If you do not want to save the changes, click **No**. For how to save the data, see ["3.6.3. Saving the configuration file"](#).
- Right-click the cluster icon on the tree view on the left pane, click **Cluster Generation Wizard** to create a cluster using a wizard.

3.6.2 Opening the configuration file

Select **Import** to open the saved cluster configuration data. A tree view is displayed by the configuration file that has been read.

Select this to restart editing a temporary file saved while editing the configuration data.

How to use:



For **File Name**, select or type "clp.conf."

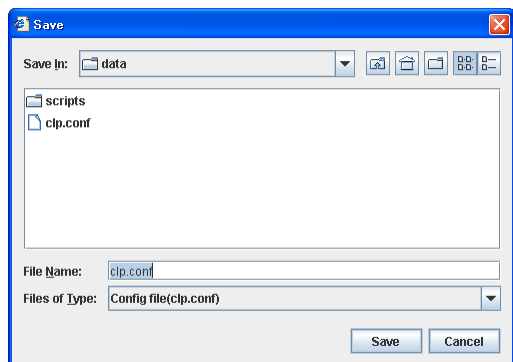
3.6.3 Saving the configuration file

Click **Export** to save the cluster configuration data you are editing. This menu becomes available if you have created a cluster configuration data. Save the file as "clp.conf."

To save a cluster configuration data, the following conditions should be satisfied.

- The server exists.
- LAN heartbeat resource or kernel-mode LAN heartbeat resource exists.

How to use:



For **File Name**, select or type "clp.conf" . The server reads this file by "clp.conf" .

Note:

When using Builder on the server on which EXPRESSCLUSTER is operated, do not edit /opt/nec/clusterpro/etc/clp.conf on the server directory. Otherwise, messages regarding how to apply the

changes are not properly displayed, and/or EXPRESSCLUSTER may not work properly. Save the file on a different directory temporarily.

When uploading is performed by using the `clpcfctrl` command, specify the directory where the file is saved by using the `-x` option.

3.6.4 Get the configuration file (online version only)

Get the cluster configuration file from the cluster server. The tree view is displayed according to the configuration file. If any changes have been made in the data which is being edited, a dialog box that asks if you want to save the data is displayed.

Click **Yes** to save the changes. A dialog where you can specify a folder to save the cluster configuration data is displayed. For how to save the data, see "3.6.3. *Saving the configuration file*".

If you do not need to save the changes, click **No**. The cluster configuration that is being edited is discarded and Builder gets the configuration file from the cluster server.

If you want to cancel getting, click **Cancel**.

3.6.5 Apply the configuration file (online version only)

Apply the cluster configuration data that is being edited to the connected server. You can select this menu when you open a valid cluster configuration file.

The following conditions must be satisfied to apply the configuration file.

- The EXPRESSCLUSTER data transfer (`clusterpro_trn`) in all the servers in the cluster is properly operated.
- A LAN heartbeat resource or kernel mode LAN heartbeat resource is configured.

Note: If this condition is not met, connecting to other server fails, so applying the cluster configuration data fails. In this case, you can only apply the cluster configuration data to a server that can be connected to. For details, see "Changing, backing up, and checking cluster configuration data (`clpcfctrl` command)" in "EXPRESSCLUSTER command reference" in the "Reference Guide".

The following message is displayed while applying the cluster configuration data. If the applying the data fails, take an action according to the error message, and apply the data again.

Message	Solution
The application finished successfully.	-
Changes applied successfully. Some services have been stopped in order to apply the changes. Use the following steps to resume the stopped services. <Necessary steps> Execute now?	If you select Yes, the steps will be executed.

Continued on next page

Table 3.17 – continued from previous page

Message	Solution
The apply was stopped. Applying the cluster configuration file failed in one or more servers.	Since the resource whose settings have been changed has not been stopped, applying the cluster configuration data has been canceled. Stop the resource whose settings have been changed, and then apply the data again.
The apply was stopped. There is one ore more servers that cannot be connected to. To apply cluster configuration information forcibly, run the clpcfctrl command on the server.	<p>Since there is a server that cannot be connected to exist in the cluster, applying the cluster configuration data has been canceled. Make sure that all the servers in the cluster have been started, and then apply the cluster configuration data.</p> <p>If you want to apply the cluster configuration data forcibly even though there is a server that cannot be connected in the cluster, see "Changing, backing up, and checking cluster configuration data (clpcfctrl command)" in "EXPRESSCLUSTER command reference" in the "Reference Guide".</p>
An error occurred when applying data to the cluster. Cfctrl (%0)	Since an error has occurred while performing processing, applying the cluster configuration data has been canceled. Apply the data again.
Checking the cluster configuration file failed. Check the following settings. Server Name, IP address for interconnect, IP address for Integrated WebManager	There are differences between the IP addresses included in the cluster configuration information and the IP addresses currently set to each server. Check correct IP addresses are set or not.

See also:

If a server that cannot be connected to exists in the cluster, the cluster configuration data cannot be applied from the Builder. In this case, by running the clpcfctrl command, you can forcibly apply the cluster configuration data only on the server that can be connected to.

Follow the steps below to forcibly apply the cluster configuration data.

- (1) Save the cluster configuration data to an appropriate directory of the local disk from the Builder.

Example) Save the configuration data to C:\config

- (2) Save the cluster configuration data that you have saved on a server in the cluster.

Example) Save the data in C:\config that you have saved in step (1) in the /root/tmp directory on a server in the cluster.

- (3) Run the following command on the server where the cluster configuration data has been saved.

```
clpcfctrl --push -w -x "Directory where the cluster configuration data has
been saved" --force
```

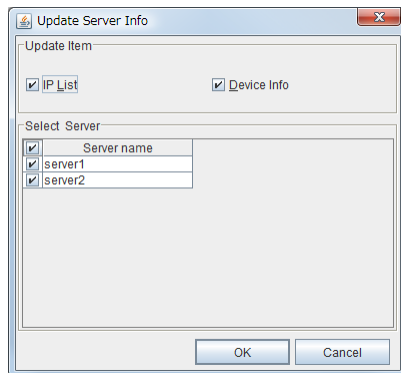
Example) Run the following command on the server where step (2) has been performed.

```
clpcfctrl --push -w -x "/root/tmp" --force
```


3.6.6 Update Server Data (online version)

Get the information of the specified server.

The license information is also obtained when getting the IP list or device information. If the license for **Java Resource Agent** is registered, the **JVM monitor** tab will appear in **Cluster Properties**. You will be able to create resources and monitor resources corresponding to the registered licenses.



Update Item

- IP List
Get the IP address list.
- Device Info
Get the device information of disk and COM.

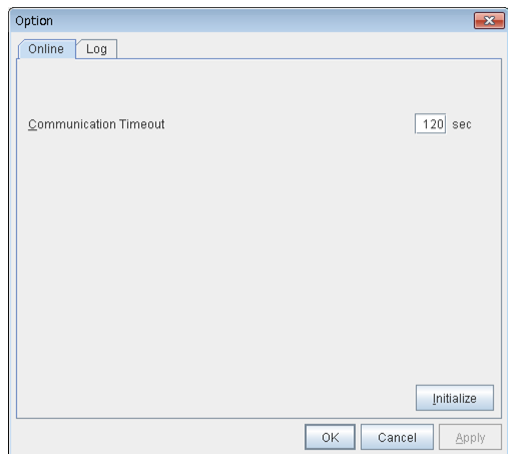
Note: The device information for the disk managed with GPT cannot be acquired.

Select Server

Specify the servers from which the information is gotten. By clicking the check box on the table title, the status of all the server check box can be changed at once.

3.6.7 Changing communication settings

Select **Option** and then click the **Online** tab to change settings for server communications. These settings are not recognized in the offline version.

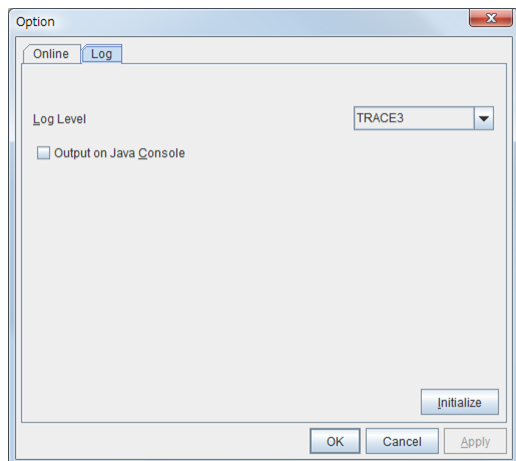


Communication Timeout (0 to 999)

This is the time-out value when accessing a server.

3.6.8 Changing the log level settings of Builder

Select **Option** and then click the **Log** tab to change the Builder log level.



Log Level

Configures the level of internal logs that Builder produces during operation.

- **ERROR**
Select this to read only error-level logs.
- **WARNING**
Select this to read warning-level and error-level logs.
- **INFORMATION**
Select this to read information-level, warning-level, and error-level logs.

- TRACE1,2,3

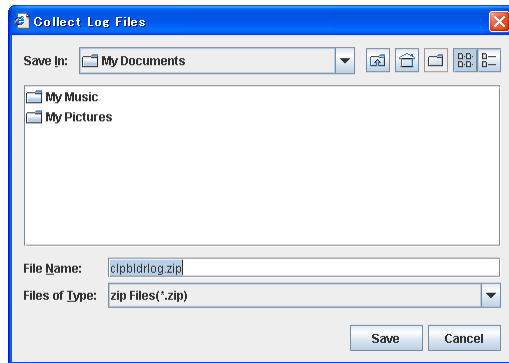
Select this to read logs of internal trace, and those from the information, warning and error levels.
The greater the number is, more detailed the trace is.

Output on Java Console

Click this to configure whether or not to output on Java console.

3.6.9 Collecting Builder log

Select **Save Log Files** to collect the Builder logs.



Specify the destination where logs are to be stored and then click **Save**.

3.6.10 Exiting from the Builder

Exit from the Builder by selecting **Exit**. Do not exit from your Web browser.

If any change was made in the cluster configuration data, a dialog box asks if you want to save the changes.

Click **Yes** to save the changes. You see a dialog box where you can specify a folder to save the file. For how to save the file, see "3.6.3. *Saving the configuration file*".

Click **No** if you do not need to save the changes. Exit from the Builder discarding the changes you made in the cluster configuration data.

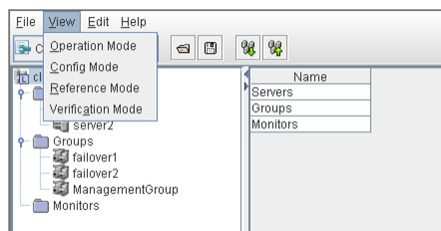
Click **Cancel** to cancel exit.

3.7 View menu

Select **View** menu and the following pull down menu is displayed.

View menu is not displayed on offline version.

Menu	Function description
Operation Mode	Switch to the Operation Mode
Config Mode	Switch to the Config Mode
Reference Mode	Switch to the Reference Mode
Verification Mode	Switch to the Verification Mode.



3.7.1 Operation Mode

Switches from the currently displayed mode to the WebManager operation mode.

This is the same as selecting the  icon from the drop-down menu on the toolbar.

This icon is grayed out if the password for the reference mode is used to log in to the WebManager.

3.7.2 Config Mode

Switches from the currently displayed mode to the Builder config mode.

This is the same as selecting the  icon from the drop-down menu on the toolbar.

3.7.3 Reference Mode

Switches from the currently displayed mode to the WebManager reference mode.

This is the same as selecting the  icon from the drop-down menu on the toolbar.

3.7.4 Verification Mode

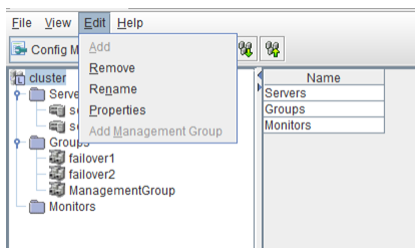
Switches from the currently displayed mode to the WebManager verification mode.

This is the same as clicking the  icon from the drop-down menu on the toolbar.

3.8 Edit menu

To open the **Edit** menu, click Edit on the following menu bar.

Menu	Functional overview
Add	Adds an object.
Remove	Deletes the selected object.
Rename	Renames the selected object.
Properties	Displays the properties of the selected object.
Add Management Group	Adds a management group.



3.8.1 Adding an object

Displays the wizard for adding a cluster, server, group, group resource, or monitor resource.

What you can add varies depending on what you select as shown below.

If select	Object to be added
Groups	Group Management group
<i>group_name</i>	Group resource
Monitor Resources	Monitor resource
Servers	Server

Note: If Auto Failback is set to **Failback Attribute** in **Group Properties**, a mirror disk resource/hybrid disk resource cannot be added. Set **Failback Attribute** to **Manual Failback** and add a mirror disk resource/hybrid disk resource.

3.8.2 Removing an object

Displays a dialog box that asks if you want to remove the selected cluster, server, group, group resource, or monitor resource. Click **Yes** to remove it or **No** to not remove it.

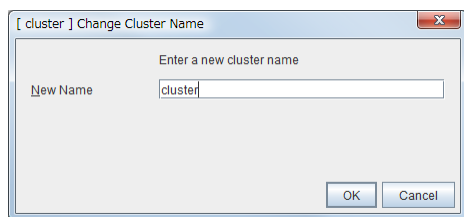
To remove a cluster, follow the same procedures described in "3.6.1. *Creating a new cluster*".

You cannot remove an object if any of the following conditions is met:

If select	Conditions	How to change
Cluster Name	None	
Server Name	<ul style="list-style-type: none"> - There is no other server. - The server is the only server where the group can start up. - The server is registered with a server group. 	Cluster suspend, resume
Group Name	<ul style="list-style-type: none"> - A recovery target of monitor resource⁶. - Has group resources. 	Group stop Cluster suspend, resume Group start
Group Resource Name	<ul style="list-style-type: none"> - A recovery target of monitor resource⁶. - A target object of monitor resource monitoring timing⁶. - Other group resources in the same group depend on it. 	<ul style="list-style-type: none"> - For other than mirror disk resources/hybrid disk resource: <ul style="list-style-type: none"> Group stop Cluster suspend, resume Group start - For mirror disk resources/hybrid disk resources: <ul style="list-style-type: none"> Cluster stop Mirror agent stop Mirror agent start Cluster start
Monitor Resource Name	<ul style="list-style-type: none"> - Auto Mirror Recovery is selected on the Mirror Agent tab of Cluster Properties for mirror disk monitor resource. - A virtual IP monitor resource 	Cluster suspend, resume

3.8.3 Renaming an object

Displays a dialog box for renaming the selected cluster, server, group, group resource, or monitor resource.



The following are restrictions for each of the objects.

⁶ A message asks if you want to delete the specified object's monitor resources. If you select **Yes** (delete), the specified object's monitor resources will be deleted, and the object will be deleted.

If select	Naming rules	How to change
Group Name	<ul style="list-style-type: none"> -Only alphanumeric characters, hyphen (-), underscore (_) and space are allowed for names. -Up to 31 characters (31 bytes) -Names cannot start or end with a hyphen (-) or space. 	<ul style="list-style-type: none"> Stop the group Suspend and resume the cluster daemon Resume the group
Group Resource Name	<ul style="list-style-type: none"> -Only alphanumeric characters, hyphen (-), underscore (_) and space are allowed for names. -Up to 31 characters (31 bytes) -Names cannot start or end with a hyphen (-) or space. 	<ul style="list-style-type: none"> For other than mirror disk resource/hybrid disk resource. Group stop Cluster suspend, resume Group start For mirror disk resource/hybrid disk resource Cluster stop Mirror agent stop Mirror agent start Cluster start
Cluster Name Monitor Resource Name	<ul style="list-style-type: none"> -Only alphanumeric characters, hyphen (-), underscore (_) and space are allowed for names. -Up to 31 characters (31 bytes) -Names cannot start or end with a hyphen (-) or space. 	Cluster suspend, resume
Server Name	<ul style="list-style-type: none"> - There are naming rules that are the same as the host name of TCP/IP that can be set by the OS. It should be completely the same as the name set to the server. - Up to 255 characters (255 bytes) - Neither hyphen (-) nor space can be the first or last letter in names. - Underscores (_) cannot be used. - A name consisting of only numbers is not allowed. - "localhost" cannot be used as a server name. 	When changing a server name, you have to be careful. For the procedure for changing the server name, see "Changing the host name" in "The system maintenance information" in the "Maintenance Guide".

Names should be unique (case-insensitive) by categories such as cluster, server, server group group, group resource and monitor resource.

3.8.4 Properties

Displays properties of a selected cluster, server, group, group resource, monitor resource, Servers.

For details, see "3.10. *Parameter details*".

3.9 Help Menu

3.9.1 Checking the version information of the Builder

To check the version information of the Builder, click the Help icon on the toolbar, or click Help in the menu bar and select **Version Information**.

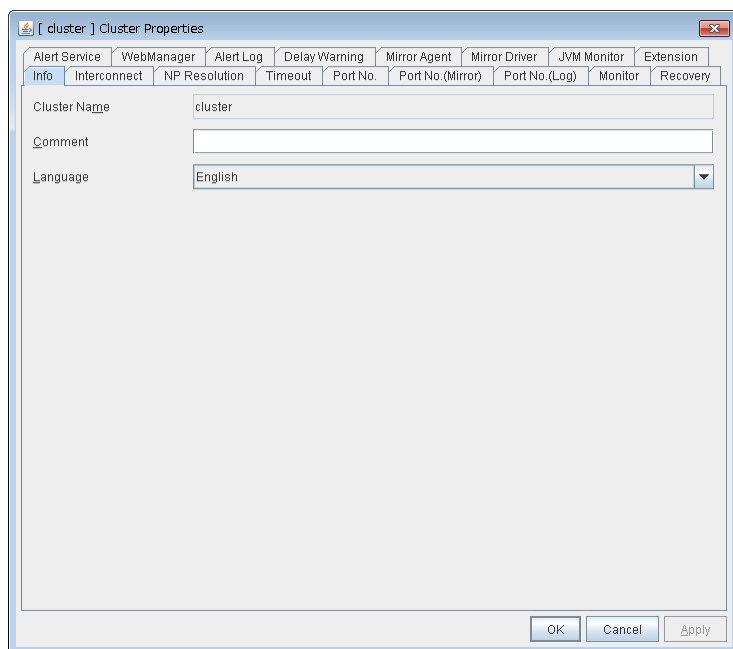
3.10 Parameter details

3.11 Cluster properties

In **Cluster Properties**, you can view and change the cluster's settings.

3.11.1 Info tab

You can view the cluster name, and enter or change a comment for this cluster.



Cluster Name

The cluster name is displayed. You cannot change the name here.

Comment (Within 127 bytes)

You can enter a comment for the cluster. Only alphanumeric characters are allowed.

Language

Select a language for cluster from the following. Set the language (locale) of OS on which the WebManager runs.

- English
- Japanese
- Chinese

WebManager and the results of clpstat command are displayed in the language set in the **Language** settings on the cluster properties.

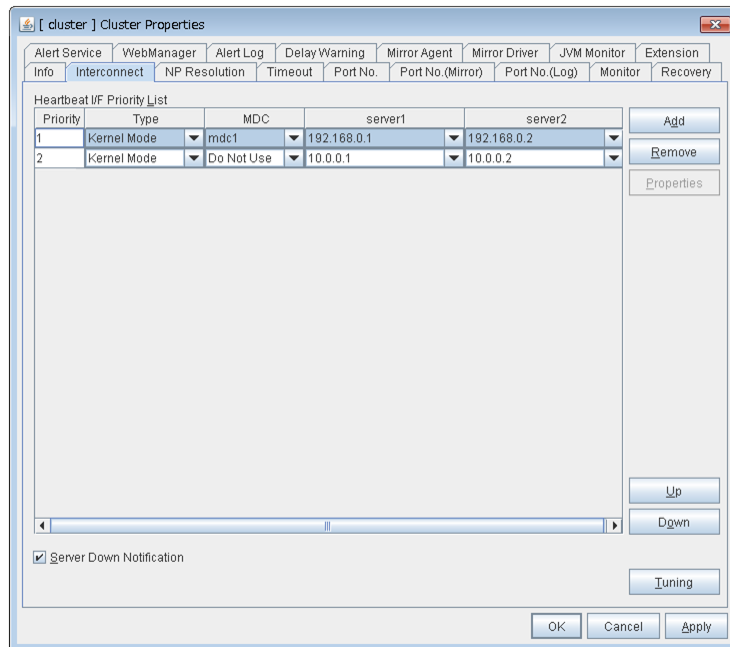
Note:

Run the clpstat command in the environment where the font of the specified language can be displayed.

On the console which is connected to a server directly, setting a frame buffer is required. When logging on to the server remotely using ssh, a terminal emulator which can display the specified language may be needed.

3.11.2 Interconnect tab

This tab allows you to set up network communication paths between cluster servers.



Add

Adds a communication path. To specify the IP address of the communication path for each server, click a cell in each server's column, and then select or enter the address. If some servers are not connected on the communication path, leave the cells for all the unconnected servers empty.

Remove

Removes a communication path. Select the column of the communication path to remove, and then click **Remove** to remove the selected path.

Properties

Displays DISK heartbeat properties window. This is only available only when the type is DISK.

Up, Down

When multiple interconnects are configured, the communication path with the smallest number in the **Priority** column is used preferentially for the internal communication among cluster servers. To change the priority, change the order of selected rows with **Up** or **Down**.

It is recommended to specify a higher priority for the interconnect communication path than any other paths.

Note: **Priority** is used to decide on the priority of communication routes used for internal communication between the servers in the cluster. Heartbeat between the servers in the cluster is implemented on all

communication routes that are set up for heartbeat, regardless of **Priority**.

Tuning

Displays heartbeat I/F tuning property window.

Priority

Displays the priority order of the interconnect.

Type

Select the path to be used for heartbeat from **Kernel Mode**, **User Mode**, **DISK**, **COM**, **BMC**, or **Mirror Communication Only**

- **Kernel mode** performs alive monitoring by using kernel mode LAN heartbeat resources.
- **User Mode** performs alive monitoring by using LAN heartbeat resources.
- **DISK** performs alive monitoring by using disk heartbeat resources.
- **COM** performs alive monitoring by using COM heartbeat resources.
- **BMC** performs alive monitoring by using BMC heartbeat resources.

For details about the heartbeat resources, see "Heartbeat resources details" in the "Reference Guide".

MDC

To use a communication path as the mirror disk connect, click **MDC** and then select **Mirror Connect Disk**.

The contents to be entered differ by type.

- Kernel Mode, User Mode, Mirror Communication Only

Select **Mirror Disk Connect** from the combo box.

When the mirror disk connect is not used, select **Do Not Use**.

Note: A combination of IPv4 and IPv6 is not allowed for the IP addresses that are used for mirror disk connects. Specify IP addresses in either IPv4 only or IPv6 only for all mirror disk connects.

- DISK, COM, BMC

The mirror disk connect cannot be used.

MDC automatically changes to **Do Not Use** and can no longer be edited.

Server column

Entry differs depending on the type.

- Kernel Mode, User Mode, Mirror Communication Only
Enter IP address. Set blank to the not used communication path.
- DISK
Enter disk device. Set blank when not using DISK device.

- COM
Enter COM device. Set blank when not using COM device.
- BMC
Enter the IP address of the BMC. Set blank when not using the BMC.

Note: More than one IP addresses which belong to the same network address cannot exist in a single server. And also, inclusive relation cannot exist like the following relation.

```
IP address:10.1.1.10, subnet mask:255.255.0.0  
IP address:10.1.2.10, subnet mask:255.255.255.0
```

Server down notification

When a server stops successfully (including a shutdown or reboot), the server is reported to be down to other servers in the cluster. You can perform failovers faster by reporting this in advance.

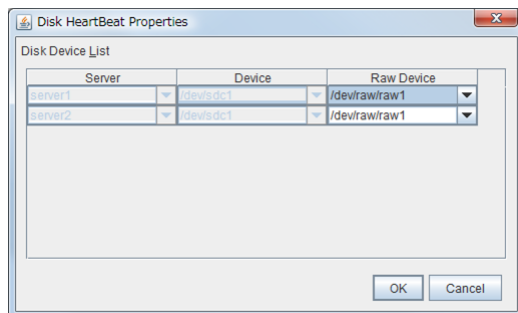
When there is a failure to deactivate groups when a server stops (including a shutdown or reboot), or when other abnormalities occur, other servers are not notified of the server that went down regardless of the server down notification settings.

- When Follow the default dependence is selected:
A server going down is reported.
- When Follow the default dependence is not selected:
A server going down is not reported.

Note: Do not use server down notification when using a hybrid disk resource.

DISK HeartBeat Properties

Displays DISK heartbeat properties.



Server

Displays server list.

Device

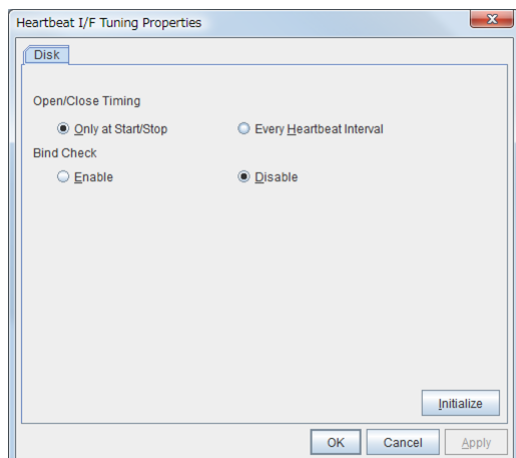
Displays the device configured in the previous window.

Raw Device

When using RAW device, set RAW device by selecting or entering directly.

When not using RAW device, set blank.

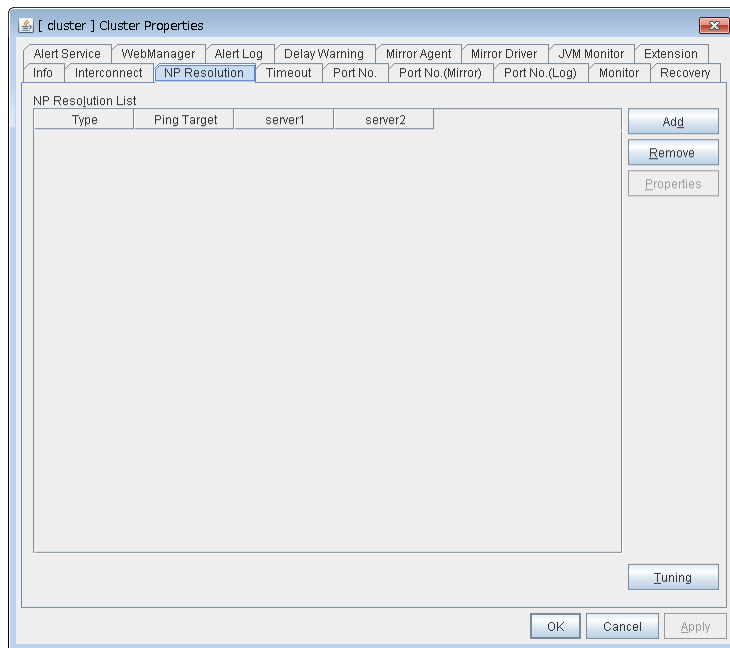
Heartbeat I/F Tuning Properties



- **Open/Close Timing**
 - Only at Start/Stop
Opens raw device when a cluster starts and close it when a cluster stops. Performs only reads and writes of raw device at each heartbeat interval.
 - Every Heartbeat Interval
Opens raw device when a cluster starts, and closes it when a cluster stops. Performs open, reads, writes and close of raw device at each heartbeat interval.
- **Bind Check**
 - Enable
Checks if raw device for disk heartbeat is not bound to the actual device other than for disk heartbeat. Binding raw device is not performed if it is bound to the actual device other than for disk heartbeat. When binding a disk is not performed, the status of disk heartbeat resource becomes offline.
 - Disable
Does not check if raw device for disk heartbeat is not bound to the actual device other than for disk heartbeat. If raw device is bound to the actual device other than for disk heartbeat, the bind is canceled and raw device is bound to the actual device for disk heartbeat.

3.11.3 NP Resolution tab

Change the setting of the network partition interface. The network partition resolution interface used for EXPRESS-CLUSTER is displayed on the **NP**.



Add

Add network partition resolution I/F. Click the Ping target column cell and set the IP address. Click the cell of each server and set **Use** or **Do Not Use**.

Remove

Remove network partition resolution I/F. Select network partition resolution I/F to be removed and click **Remove**, then the selected network partition resolution I/F is removed.

Properties

Display the Ping NP property window.

Tuning

Display network partition resolution tuning property window.

Type

Set the type of network partition resolution I/F. Ping is selectable.

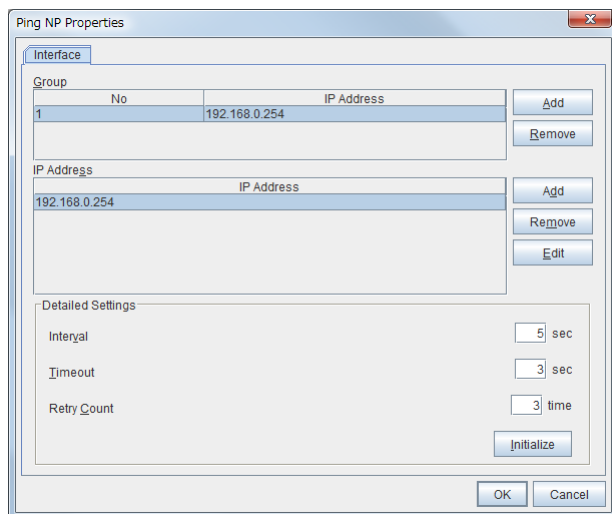
Ping Target

Set Ping target.

Server name

Select either **Use** or **Do Not Use**.

Ping NP Properties

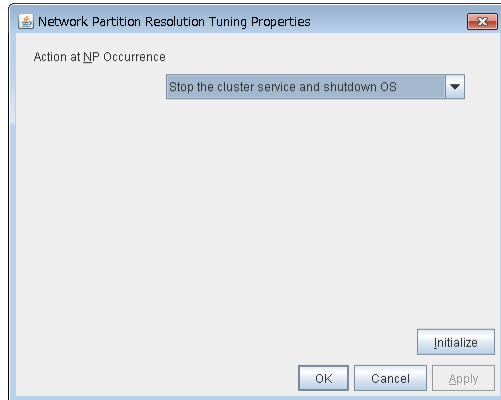


- Add Group List
 - Add group.
 - The maximum number of registered group is 16.
 - If multiple IP addresses are registered in one group, and if the state in which no response to the Ping command is returned from all the IP addresses is maintained, NP resolution processing cannot be performed (if there is even one IP address responding to the Ping command, NP resolution processing can be performed). Also, if multiple groups are registered, and if the state in which no response to the Ping command is returned from any one group is maintained, NP resolution processing cannot be performed (if all groups respond to the Ping command, NP resolution processing can be done).
- Remove Group List
 - Remove the selected group.
- Add IP Address List
 - Add IP address to the selected group.
 - The maximum number of registered IP address is 16.
 - Maximum 256 IP addresses are able to be registered to a single Ping NP, and 16 kinds of IP addresses can be registered. (The same IP addresses can be used.)
- Remove IP Address List
 - Remove the selected IP address from the list.
- Edit
 - Edit the selected IP address.
- Interval
 - Set the Ping interval.
- Timeout
 - Set the Ping timeout.
- Retry Count
 - Set the retry count.

- Initialize
 - Set the interval, timeout and retry count to the default values. Note that, when an interval and retry count are specified, the following conditional expression must be satisfied. If not satisfied, NP resolution processing cannot be performed normally.

Conditional expression)
 $\text{Heartbeat timeout} > (\text{Ping NP Interval} * \text{Ping NP Retry Count}) + \text{Ping} \rightarrow \text{NP Timeout}$

Network Partition Resolution Tuning Properties



- Action at NP Occurrence
 - Stop the cluster service
Stop the cluster service of the server in network partition.
 - Stop the cluster service and shutdown OS
Stops the cluster service of the server in network partition, and then shuts down the OS.
 - Stop the cluster service and reboot OS
Stops the cluster service of the server in network partition, and then reboots the OS.
 - Sysrq Panic
Performs a sysrq panic on the server in network partition.
 - Keepalive Reset
Use this on the server in network partition to perform an OS reset by using the clpkhb and clpka drivers.
 - Keepalive Panic
Use this on the server in network partition to perform an OS panic by using the clpkhb and clpka drivers.
 - BMC Reset
Use this on the server in network partition to perform a hardware reset of the server by using the ipmi command.
 - BMC Power - Off
Use this on the server in network partition to power off the server by using the ipmi command. The OS may be shut down depending on how the ACPI of OS is configured.
 - BMC Power Cycle
Use this on the server in network partition to perform the Power Cycle (powering on/off) by using the ipmi command. The OS may be shut down depending on how the ACPI of OS is configured.
 - BMC NMI

Use this on the server in network partition to generate NMI in the server by using the ipmi command. The behavior after the generation of NMI depends on the OS setting.

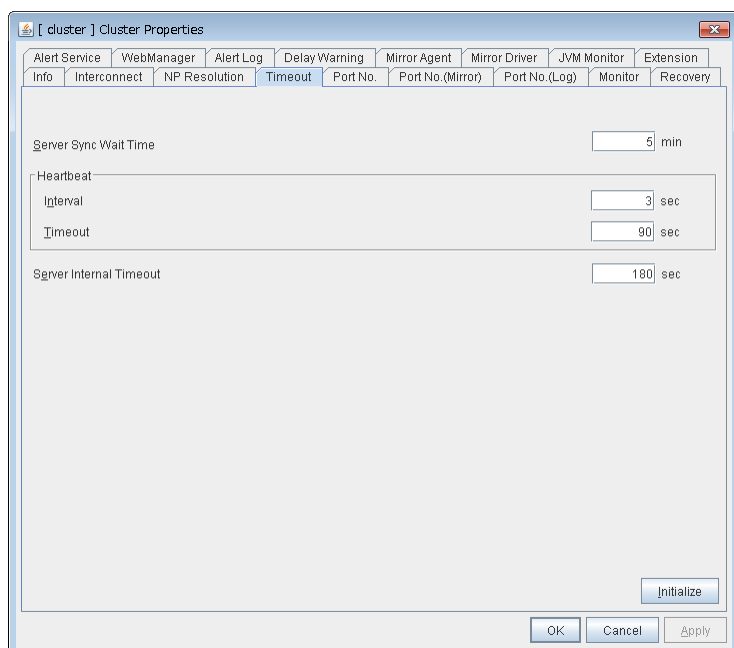
- I/O Fencing(High-End Server Option)

It can't be used.

- Initialize
 - Set the actions at NP occurrence to the default settings.

3.11.4 Timeout tab

Specify values such as time-out on this tab.



Server Sync Wait Time (0 to 99)

For the time specified here, the server will wait at startup until other servers are started.

Heartbeat

Heartbeat interval and heartbeat time-out.

- Interval (1 to 99)
Interval of heartbeats
- Timeout (2 to 9999)
A failed server is determined if there is no response for the time specified here.
- This time-out should be longer than the interval.
- To perform the shutdown monitoring (see "3.11.8. *Monitor tab*"), this time-out should be longer than the time it takes to shut down applications and the operating system.
- When a hybrid disk resource is used, the time-out value must be longer than the value specified at the cluster partition I/O time-out in the **mirror agent** tab.

Server Internal Timeout (1 to 9999)

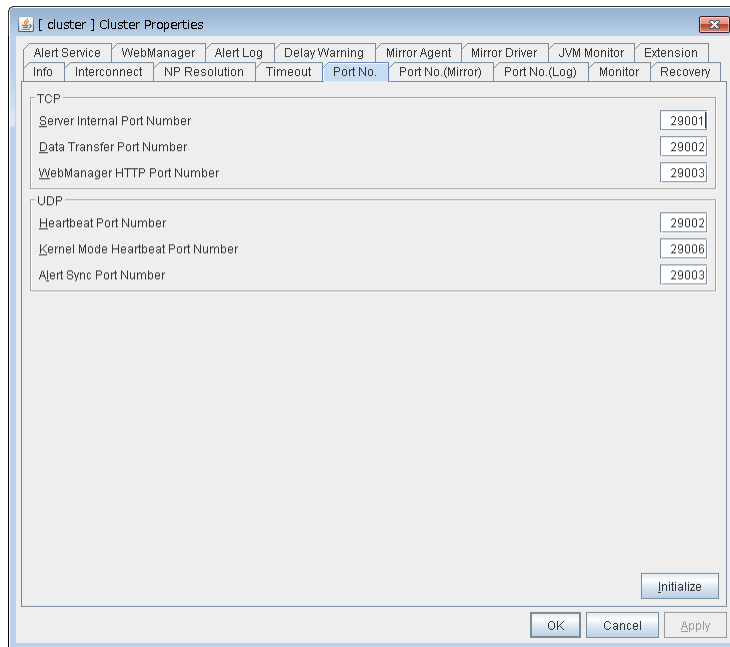
The timeout to be used in the EXPRESSCLUSTER Server internal communications that are performed while an EXPRESSCLUSTER command is executed, or an operation is performed or a screen is displayed by WebManager.

Initialize

Used for initializing the value to the default value. Click **Initialize** to initialize all the items to their default values.

3.11.5 Port No. tab

Specify TCP port numbers and UDP port numbers.



TCP

No TCP port numbers can be overlapped. When the Replicator is used, TCP port numbers on the **Port No.(Mirror)** tab and any mirror data port number of any mirror disk resources/hybrid disk resources cannot be overlapped.

- Server Internal Port Number (1 to 65535⁷)
This port number is used for internal communication.
- Data Transfer Port Number (1 to 65535⁷)
This port number is used for transactions such as applying and backing up the cluster configuration data, sending and receiving the license data and running commands.
- WebManager HTTP Port Number (1 to 65535⁷)
This port number is used for a browser to communicate with the EXPRESSCLUSTER Server.

UDP

No UDP port numbers can be overlapped. When the communication method for internal logs is UDP on the **Port No.(Log)** tab, UDP port numbers cannot be overlapped with the port numbers.

- Heartbeat Port Number (1 to 65535⁷)

⁷ It is strongly recommended not to use well-known ports, especially reserved ports from 1 to 1023.

This port number is used for heartbeat.

- Kernel Mode Heartbeat Port Number (1 to 65535⁷)

This port number is used for kernel mode heartbeat.

- Alert Sync Port Number (1 to 65535⁷)

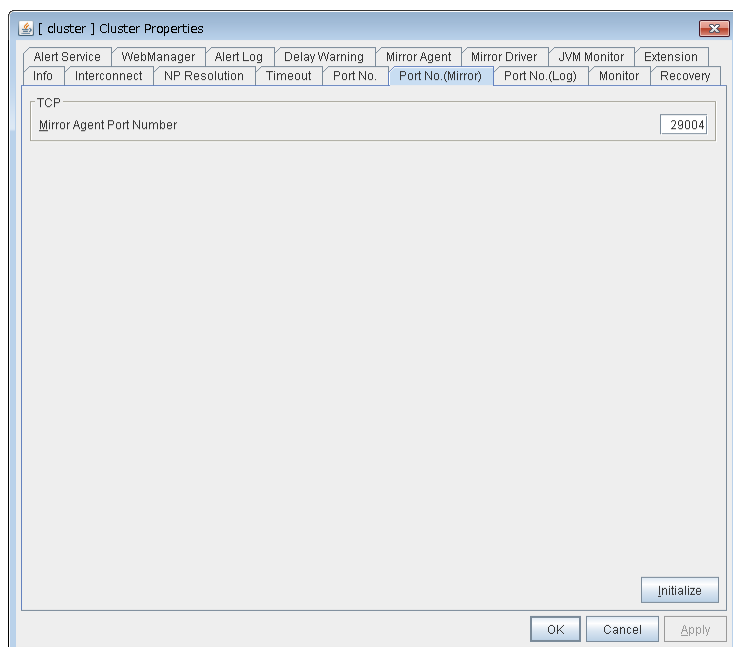
This port number is used for synchronizing alert messages among servers.

Initialize

This is used for initializing the value to the default value. Click **Initialize** to initialize all items to their default values.

3.11.6 Port No. (Mirror) tab ~ For the Replicator/Replicator DR ~

Specify TCP port numbers.



TCP

No TCP port numbers can be overlapped. TCP port numbers on the **Port No.** tab and any mirror data port number of any mirror disk resources/hybrid disk resources cannot be overlapped.

Note: Port numbers are not used when mirror disk resource/hybrid disk resource is not used.

- Mirror Agent Port Number (1 to 65535⁷)

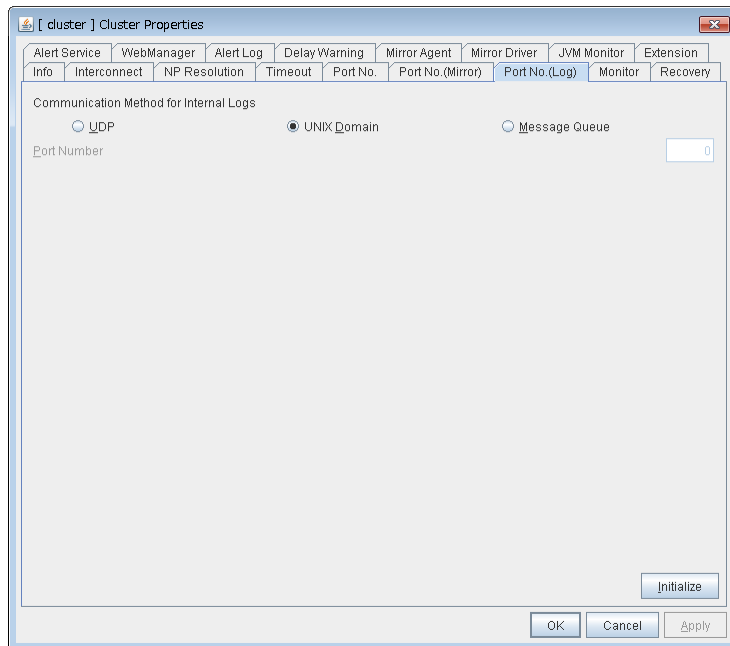
Mirror agent is a user mode module for controlling mirror disk resource/hybrid disk resource. The Mirror Agent uses this port number to communicate with servers.

Initialize

Used for initializing the value to the default value. Click **Initialize** to initialize all the items to their default values.

3.11.7 Port No. (Log) tab

Specify the communication method for internal logs.



Communication Method for Internal Logs

- UDP
Use UDP for the communication method for internal logs.
- UNIX Domain
Use UNIX Domain for the communication method for internal logs.
- Message Queue
Use Message Queue for the communication method for internal logs.

Port No. (1 to 65535)

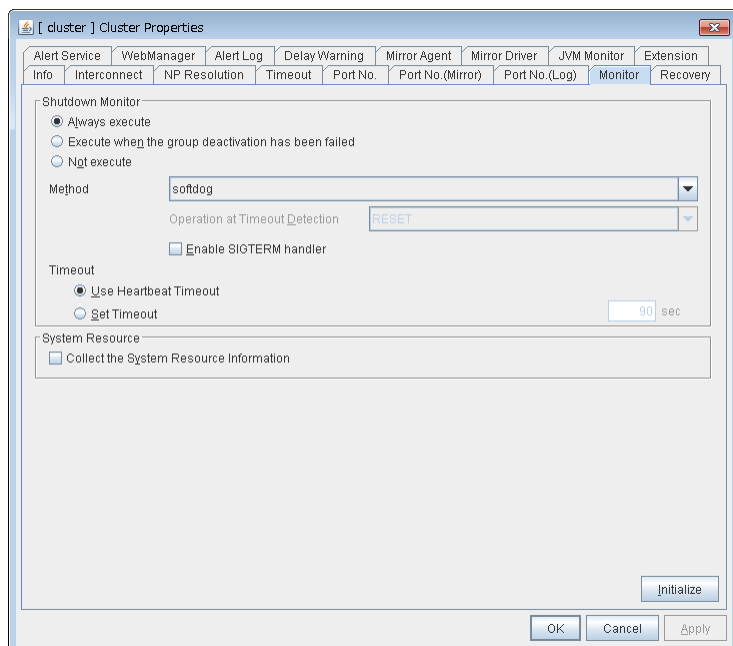
This is the port number used when UDP is selected for the communication method for internal logs.

Initialize

Used for initializing the value to the default value. Click **Initialize** to initialize all the items to their default values.

3.11.8 Monitor tab

Configure the settings for monitoring. For details about the shutdown monitor and reboot limit, see "Monitor resource details" in the "Reference Guide".



Shutdown Monitor

Monitors whether or not the operating system is stalling when an EXPRESSCLUSTER command to shut down the cluster or servers is run. The cluster service forcibly resets the operating system or performs a panic of the operating system if it determines the OS stall. Server panic can be set when the monitoring method is keepalive.

- **Always execute:**

If selected, the shutdown monitor is performed. For the heartbeat time-out, specify a longer time than the time required to shut down every application and the operating system (see "3.11.4. [Timeout tab](#)"). If you use shared disks or mirror disks, it is recommended to select **Always execute**.

- **Execute when the group deactivation has been failed:**

The shutdown monitor is applied only when a group cannot be deactivated. For the heartbeat time-out, specify a longer time than the time required to shut down every application and the operating system (see "3.11.4. [Timeout tab](#)").

- **Not execute:**

If selected, the shutdown monitor is not performed.

- Method

Select the shutdown monitor method from:

- * softdog
- * ipmi
- * ipmi (High-End Server Option)
- * keepalive

For details about the shutdown monitoring method, see "Shutdown monitoring Shutdown monitoring method" in "Information on other settings" in the "Reference Guide".

- Operation at Timeout Detection

Selects the operation performed when the operating system is determined to be stalled. This can be set only when the monitoring method is keepalive.

- * RESET
Resets the server.
- * PANIC
Performs a panic of the server.

- Enable SIGTERM handler

Select this to enable SIGTERM handler when performing the shutdown monitor.

For details about the SIGTERM settings, see "Shutdown monitoring Setting of SIGTERM" in "Information on other settings" in the "Reference Guide".

Note: If you select ipmi in **Method** and set **Enable SIGTERM handler** to **Off**, this may be reset even if the operating system is successfully shut down.

- Use Heartbeat Timeout
Select this for heartbeat time-out to work in conjunction with shutdown monitoring time-out.
- Timeout (2 to 9999)
Specify a time-out when the heartbeat time-out value is not used as shutdown monitoring time-out. A value smaller than the heartbeat timeout value must be specified to prevent both systems from activating when a failover occurs upon detection of a server down.

System Resource

Select whether to collect system resource information.

System resource information is collected regularly so as to improve system operability. System resource information is useful for investigating the operation status of EXPRESSCLUSTER, and makes it easy to determine the cause of a failure attributable to a shortage of system resources.

- When the check box is selected

System resource information related to the CPU, memory, processes, and others is collected regularly while the cluster is running.

The collected system resource information are collected as a log by the clplogcc command or WebManager.

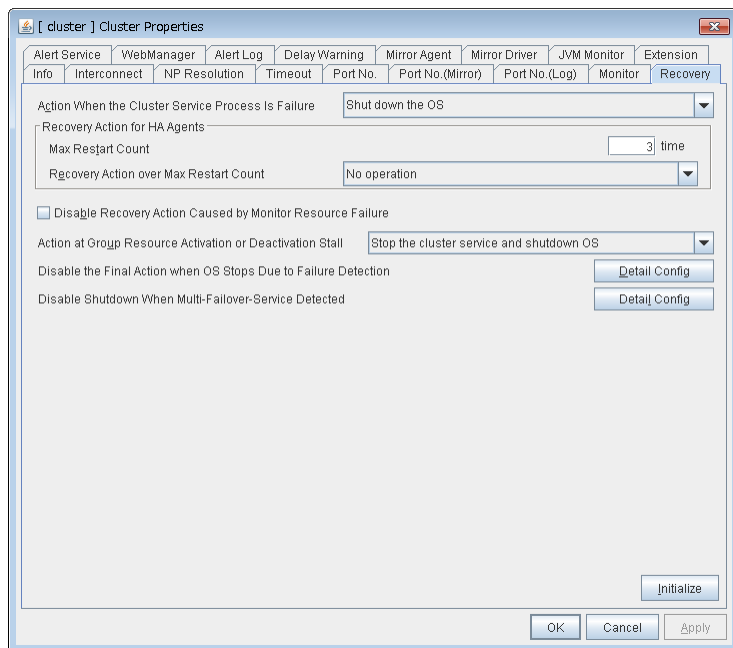
Specify type 2 to collect the log by the clplogcc command; specify Pattern 2 to collect the log by the WebManager. For details about log collection, see "Collecting logs by using the WebManager" in "Functions of the WebManager" in this guide, as well as "Collecting logs (clplogcc command)" in "EXPRESSCLUSTER command reference" in the "Reference Guide".

A disk area of 450 MB or more is required to store the resource information, depending on the system operating conditions such as the number of processes that are running.

- When the check box is cleared
No system resource information is collected.

3.11.9 Recovery tab

Configure the settings for cluster recovery.



Action When the Cluster Service Process Is Failure

Specify the action when a cluster service process error occurs.

- **Shut down the OS**
Shut down the OS.
- **Reboot the OS**
Reboot the OS.
- **Sysrq Panic**
Performs a sysrq panic on the server in network partition..
- **Keepalive Reset**
Use this on the server in network partition to perform an OS reset by using the clpkhb and clpka drivers.
- **Keepalive Panic**
Use this on the server in network partition to perform an OS panic by using the clpkhb and clpka drivers.
- **BMC Reset**
Use this on the server in network partition to perform a hardware reset of the server by using the ipmi command.
- **BMC Power Off**
Use this on the server in network partition to power off the server by using the ipmi command. The OS may be shut down depending on how the ACPI of OS is configured.
- **BMC Power Cycle**
Use this on the server in network partition to perform the Power Cycle (powering on/off) by using the ipmi command. The OS may be shut down depending on how the ACPI of OS is co

- **BMC NMI**

Use this on the server in network partition to generate NMI in the server by using the `ipmi` command. The behavior after the generation of NMI depends on the OS setting.

- I/O Fencing(High-End Server Option)

It can't be used.

Recovery Action for HA Agents

- Max Restart Count (0 to 99)

Specify the max restart count when an HA Agent error has occurred.

- Recovery Action over Max Restart Count

Specify the action when an HA Agent error has occurred.

- No operation
- Stop the cluster service
Stops the cluster service of the server that detected an error.
- Stop the cluster service and shutdown OS
Stops the cluster service of the server that detected an error, and then shuts down the OS.
- Stop the cluster service and reboot OS
Stops the cluster service of the server that detected an error, and then reboots the OS.

Note: The HA process is used with the system monitor resources, JVM monitor resources, and the system resource information collection function.

Disable Recovery Action Caused by Monitor Resource Failure

- When the check box is selected
The recovery action is disabled when the monitor resource is error.
- When the check box is cleared
The recovery action is enabled when the monitor resource is error.

Note: This option is not available for the message receive monitor resource.

Action at Group Resource Activation or Deactivation Stall

Specify the action to apply in the event of an activation/deactivation stall of a group resource.

- Stop cluster service and shutdown OS
Stops the cluster service of the server that stalled, and then shuts down the OS.
- Stop cluster service and reboot OS
Stops the cluster service of the server that stalled, and then restarts the OS.
- Sysrq Panic
Performs a sysrq panic on the server that stalled.
- Keepalive Reset
Use this on the server that stalled to perform an OS reset by using the `clpkhb` and `clpka` drivers.
- Keepalive Panic
Use this on the server that stalled to perform an OS panic by using the `clpkhb` and `clpka` drivers.

- **BMC Reset**
Use this on the server that stalled to perform a hardware reset of the server by using the ipmi command.
- **BMC Power- Off**
Use this on the server that stalled to power off the server by using the ipmi command. The OS may be shut down depending on how the ACPI of OS is configured.
- **BMC Power Cycle**
Use this on the server that stalled to perform the Power Cycle (powering on/off) by using the ipmi command. The OS may be shut down depending on how the ACPI of OS is configured.
- **BMC NMI**
Use this on the server that stalled to generate NMI in the server by using the ipmi command. The behavior after the generation of NMI depends on the OS setting.
- **I/O Fencing(High-End Server Option)**
It can't be used.
- **No Operation (Operates as an activity or deactivity failure)**
Use this to perform recovery upon the detection of an activation/deactivation failure of a group resource. For details on the recovery operation, see the Reference Guide.

Note:

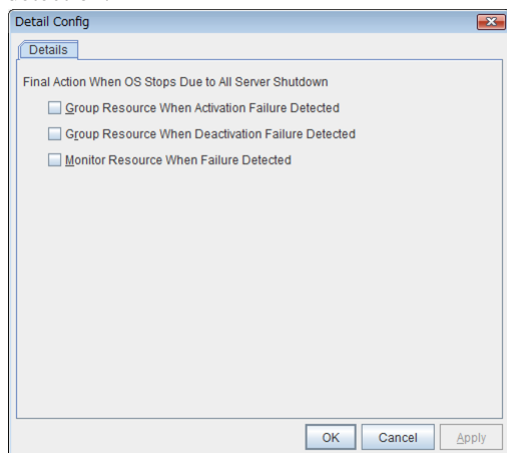
If a stall occurs with "Nothing (handle a stall as an activation/deactivation failure)" specified, the effect on the group resources is undefined, so we do not recommend changing the setting to "Nothing (handle a stall as an activation/deactivation failure).".

If you do specify "Nothing (handle a stall as an activation/deactivation failure)", set the recovery operation upon the detection of an activation/deactivation failure of a group resource as described below.

- **Activation/Deactivation Retry Threshold: 0**
 - **Failover Threshold: 0**
 - **Final Action: Action that accompanies the OS stop**
-

Disable the Final Action when OS Stops Due to Failure Detection

Click **Detail Config** to set suppression of the final action which accompanies the OS stop caused by error detection.



- **Group Resource When Activation Failure Detected**

If the final action caused by an activation error detection in a group resource accompanies the OS stop, the final action is suppressed if all other servers are stopped.

- **Group Resource When Deactivation Failure Detected**

If the final action caused by a deactivation error detection in a group resource accompanies the OS stop, the final action is suppressed if all other servers are stopped.

- **Monitor Resource When Failure Detected**

If the final action caused by an error detection in a monitor resource accompanies the OS stop, the final action is suppressed if all other servers are stopped.

Note:

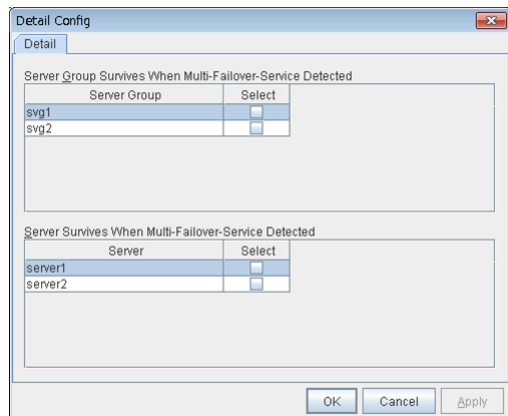
- If errors were detected on multiple servers almost at the same time, and the final action was taken for those servers, the final action which accompanies the OS stop may be taken for all the servers even if the final action caused by an error detection in a monitor resource is set to be suppressed.
- The message receive monitor resource does not become the target for which the final action caused by error detection is suppressed.

The following situations lead to an OS stop during the final action when an activation/deactivation error is detected in a group resource and during the final action when a monitor resource error is detected.

- Cluster service stop and OS shutdown
 - Cluster service stop and OS restart
 - sysrq panic
 - keepalive reset
 - keepalive panic
 - BMC reset
 - BMC power off
 - BMC power cycle
 - BMC NMI
-

Disable Shutdown When Multi-Failover-Service Detected

Click **Detail Config** to suppress the shutdown of all servers upon detection of both-system activation.



Server Group Survives When Multi-Failover-Service Detected

Select one server group. The shutdown of the server, which belongs to the server group selected when the both-system activation of the failover group was detected, is suppressed. When the both-system activation is detected among servers in the selected server group, both of the servers will be shut down. If you want to suppress the shutdown in this case, make the settings to disable shutdown when the following double activation is detected.

Server Survives When Multi-Failover-Service Detected

Select one server. The shutdown of the server, selected when the both-system activation of the failover group was detected, is suppressed.

If a server group to which shutdown is not executed when Multi-Failover is detected is set, it is possible to select only a server belonging to the set server group. If no server group is set, all the servers can be selected.

Note: When the both-system activation is detected, the group statuses will be inconsistent among the servers, and failover and failback operations will be able to fail.

If a group status mismatch occurs, the following alert log is output:

Type: Warning

Module name: rc

Event ID: 503

Message: A mismatch in the group %1 status occurs between the servers.

To fix this problem, restart the group, execute a cluster reboot, restart all the servers on which the groups are not started, or restart the cluster services of all the servers on which the groups are not started

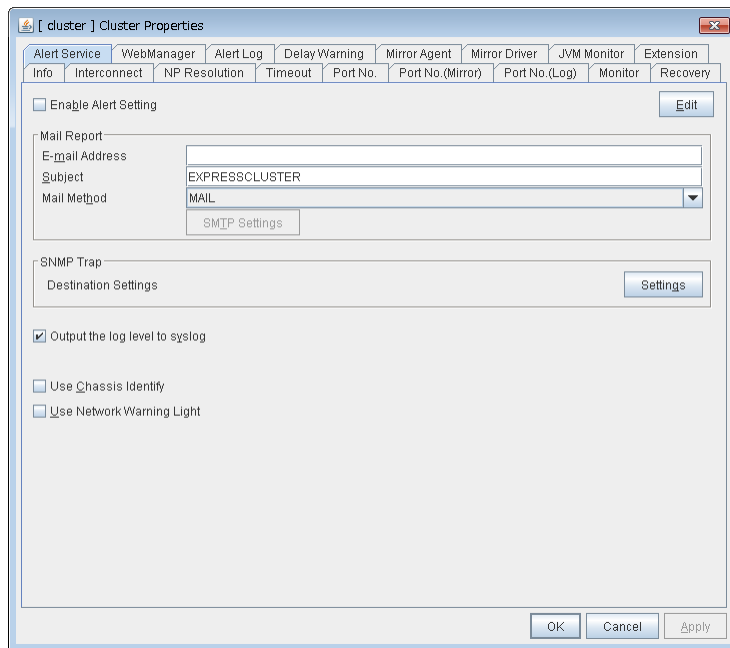
3.11.10 Alert Service tab

Configure the settings for the mail report function, the network warning light, alert report destination, and SNMP trap transmission.

To use the mail report function, register the Alert Service license.

To use the network warning light, register the Alert Service license.

Note: To use the mail report function and the network warning light, purchase the EXPRESSCLUSTER X Alert Service 4.0 for Linux.



Enable Alert Setting

Configure whether to modify the alert destination from the default value. To modify the alert report destination, click **Edit** to configure the address.

By canceling **Enable Alert Setting**, the modified destination turns to the default value temporarily.

For details about the default alert destination, see "Messages reported by syslog, alert, mail, SNMP trap, and Message Topic" in "Error messages" in the "Reference Guide".

E-mail Address (Within 255 bytes)

Enter the e-mail address to which the report is sent. If more than two e-mail addresses are set, delimit the address by semicolon.

Subject (Within 127 bytes)

Enter the subject title for the e-mail message.

Mail Method

Configure the methods to send mail.

- **MAIL**
This method uses the mail command. Check that a mail is sent to the mail address by using the mail command in advance.
- **SMTP**
This method allows for sending mail by directly communicating with the SMTP server.

Destination Settings

Configure the SNMP trap transmission function. Click **Setting** to configure the SNMP trap transmission destination.

Output Log Level to syslog

Add Log Level to the syslog messages which EXPRESSCLUSTER put out while it is in operation.

Use Chassis Identify

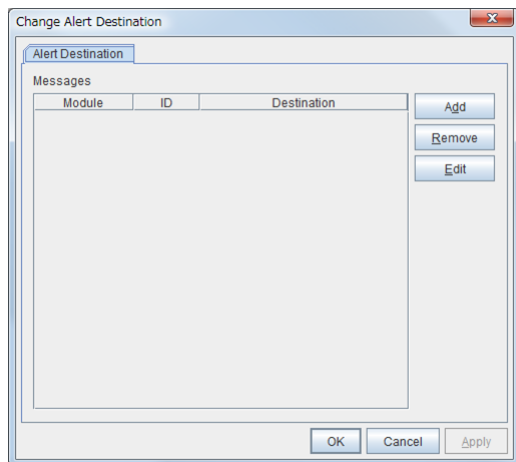
Configure whether or not to enable **Use Chassis Identify**.

Use Network Warning Light

Specify whether to use a network warning light (specified by NEC) controlled by network. Enter an IP address in server properties.

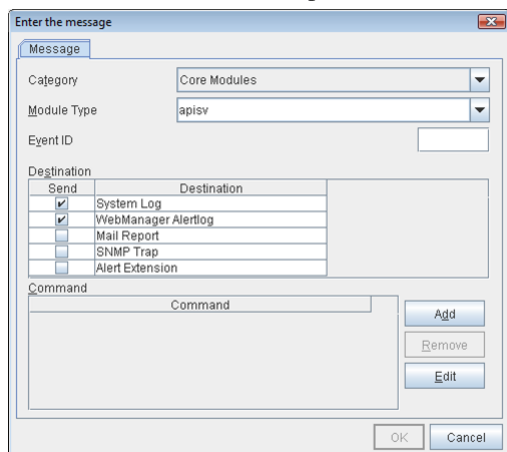
Change Alert Destination

Click **Edit** to display the **Change Alert Destination** dialog box.



Add

Click this to select the event ID and the module type for which you want to customize the report destinations. Click **Add** to open the **Enter the Message** dialog box.



Category

Select a major category of the module type.

Module Type (Within 31 bytes)

Select the name of module type that you want to change the destination address.

Event ID

Enter the event type of the module type for which you want to change the destination address. For details about the event ID, see " Messages reported by syslog, alert, mail, SNMP trap, and Message Topic" in "Error messages" in the "Reference Guide".

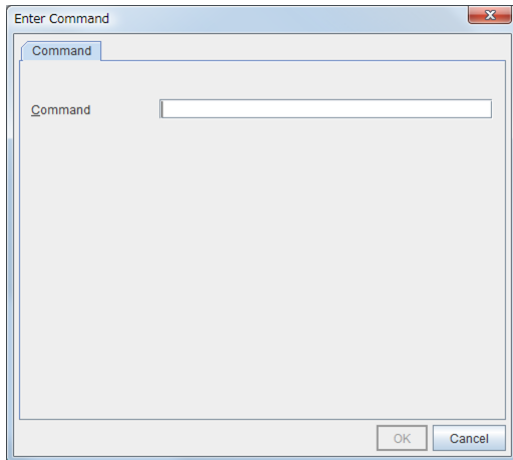
Destination

Select the destination.

- **System Log**
This sends message to syslog of the OS.
- **WebManager Alertlog**
This sends message to the alert view of the WebManager.
- **Mail Report**
This sends message by using the mail report function.
- **Alert Extension**
This sends message by the Alert Extension function. Modify the extension settings using **Add** and **Edit**.
- **SNMP Trap**
Uses the SNMP trap transmission function to send messages.

Add

Add a command of the alert extension function. Click **Add** to open the **Enter Command** dialog box. Up to 4 commands can be registered with one event ID.



Command (Within 511 bytes)

Enter a command such as SNMP trap to execute reporting with the absolute path. The execution results of the specified command cannot be shown.

- **Keyword**
If you specify `%%MSG%%`, the body message of the target event ID is inserted.
You cannot specify multiple `%%MSG%%` for one command.
Configure within 511 bytes including the description of `%%MSG%%`. Since blank characters can be included in `%%MSG%%`, if you specify this for an argument of commands, specify this as `"%%MSG%%"`.

Configuration example

```
/usr/local/bin/snmptrap -v1 -c HOME 10.0.0.2 0 10.0.0.1 1 0 ' ' 1 s "%%MSG%%"
```

Remove

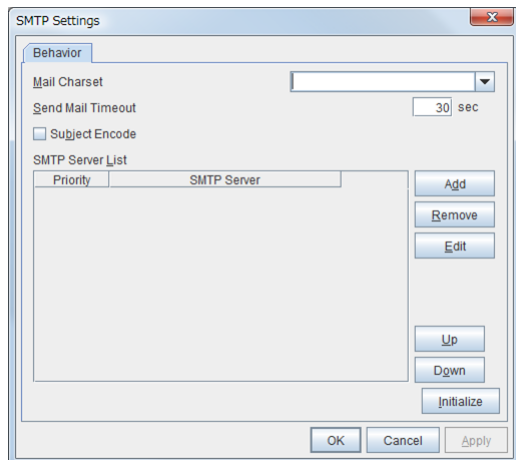
Click this to remove a command of alert extension function. Select the command and then click **Remove**.

Edit

Click this to modify a command of alert extension function. Select the command and then click **Edit**.

SMTP Settings

Click **SMTP Settings** to display the **SMTP Settings** dialog box.



Mail Charset (Within 127 bytes)

Configure the character set of the e-mails sent for mail report.

Send Mail Timeout (1 to 999)

Configure the timeout value for communicating with the SMTP server.

Subject Encode

Select whether or not to encode the subject of e-mails.

SMTP Server List

Use this button to display a SMTP server that is configured. Four SMTP servers can be configured in this version.

Add

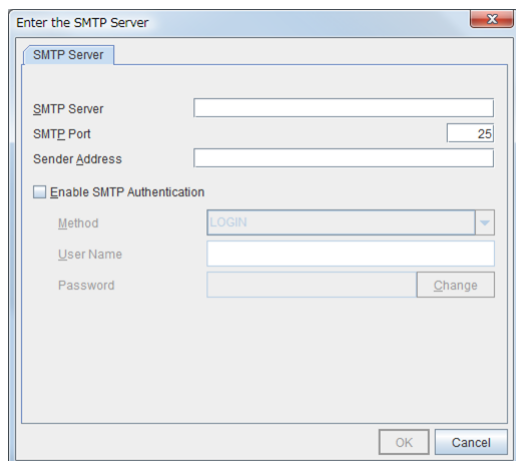
Use this button to add a SMTP server. Click **Add** to display the **Enter the SMTP Server** dialog box.

Remove

Use **Remove** to remove the SMTP server settings.

Edit

Use **Edit** to modify the SMTP server settings.



SMTP Server (Within 255 bytes)

Configure the IP address or host name of the SMTP server.

SMTP Port (1-65535)

Configure the port number of the SMTP server.

Sender Address (Within 255 bytes)

Configure the address from which an e-mail of mail report is sent.

Enable SMTP Authentication

Configure whether or not to enable SMTP authentication.

Method

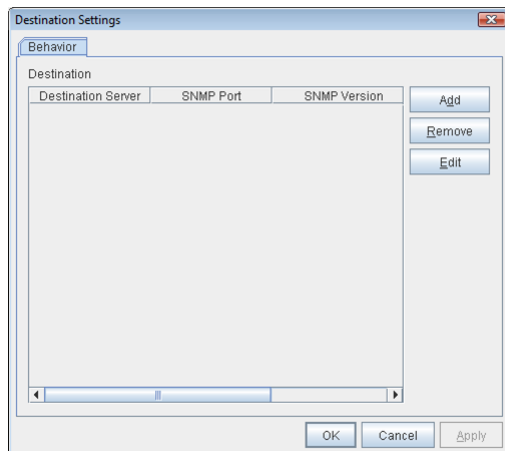
Select a method of SMTP authentication.

User Name (Within 255 bytes)

Configure the user name used for SMTP authentication.

Password (Within 255 bytes)

Configure the password used for SMTP authentication.



Destination

Displays the set SNMP trap transmission destinations. With this version, up to 255 SNMP trap transmission destinations can be set.

Add

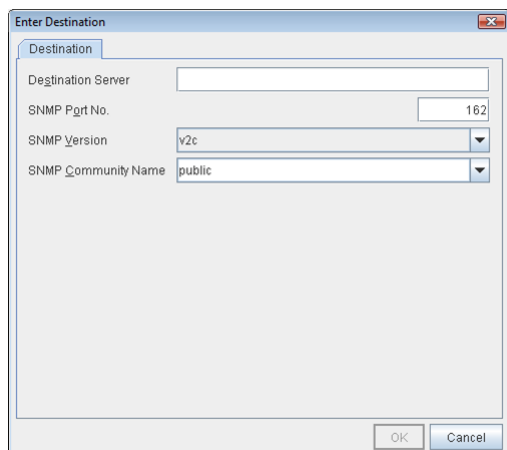
Adds an SNMP trap transmission destination. Click **Add** to display the Change SNMP Destination dialog box.

Remove

Use **Remove** to remove the SNMP trap transmission destination settings.

Edit

Use **Edit** to modify the SNMP trap transmission destination settings.



Destination Server (up to 255 bytes)

Configure the name of the SNMP trap transmission destination server.

SNMP Port No. (1-65535)

Configure the port number of the SNMP trap transmission destination.

SNMP Version

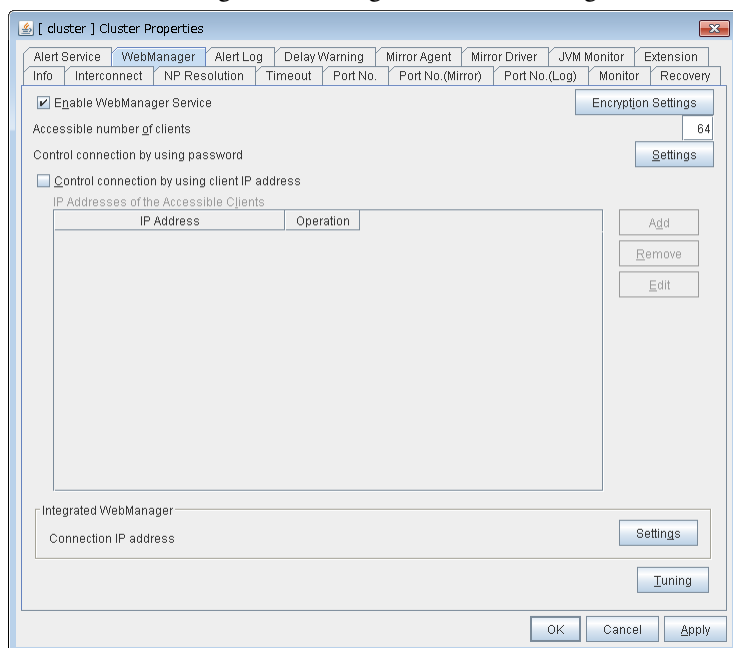
Configure the SNMP version of the SNMP trap transmission destination.

SNMP Community Name (up to 255 bytes)

Configure the SNMP community name of the SNMP trap transmission destination.

3.11.11 WebManager tab

Use this tab to configure the settings for the WebManager.



Enable WebManager Service

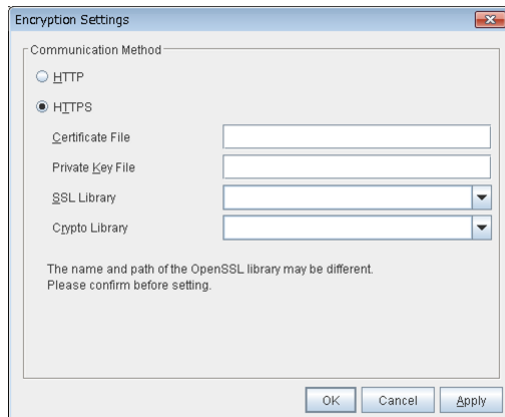
Enables the WebManager Service.

- When the check box is selected:
The WebManager service is enabled.
- When the check box is not selected:
The WebManager service is disabled.

Encryption Settings

Make settings to encrypt the WebManager service.

Click **Encryption Settings** to display the **Encryption Settings** dialog box.



Communication Method

- HTTP
No encryption is used for communicating with a client.
- HTTPS
Encryption is used for communicating with a client.

Certificate File

Sets the server credential file used for connecting to a client. Users need to prepare the server credential file.

Private Key File

Sets the private key file used for connecting to a client. Users need to prepare the private key file.

SSL Library

Sets the SSL library file used for encryption and selects the SSL library file included in OpenSSL. Users need to change it based on the environment, such as an installation folder.

Crypto Library

Sets the Crypto library file used for encryption and selects the Crypto library file included in OpenSSL. Users need to change it based on the environment, such as an installation folder.

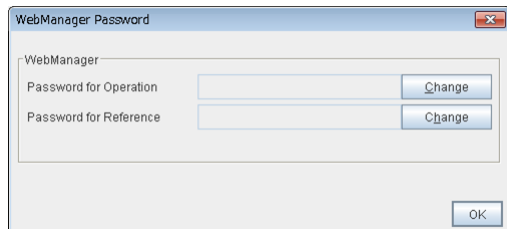
Note: OpenSSL library is necessary to use HTTPS.

Accessible number of clients (1 to 999)

Set the number of requests that can be simultaneously received from clients. If more requests than the number set here are generated, the excess requests will be discarded.

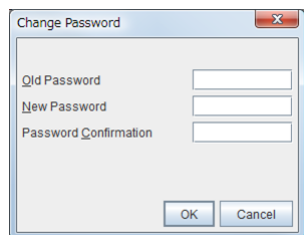
Control connection by using password

Click **Settings** to display the **WebManager Password** dialog box.



WebManager

- Password for Operation
Set a password that must be entered to enable connection to the WebManager in operation mode, config mode, or simulate mode.
Click **Change** to display the **Change Password** dialog box.
- Password for Reference
Set a password that must be entered to enable connection to the WebManager in reference mode.
Click **Change** to display the **Change Password** dialog box.



- Old Password: (**Within** 255 bytes)
Enter the current password. If the password is not set, leave it blank.
- New Password: (**Within** 255 bytes)
Enter a new password. When deleting the old password, leave it blank.
- Password Confirmation: (**Within** 255 bytes)
Enter the password again which you entered in **New Password**.
Passwords can consist of one-byte upper- and lower-case letters, digits, symbols, and spaces (0x20 to 0x7E in ASCII code).

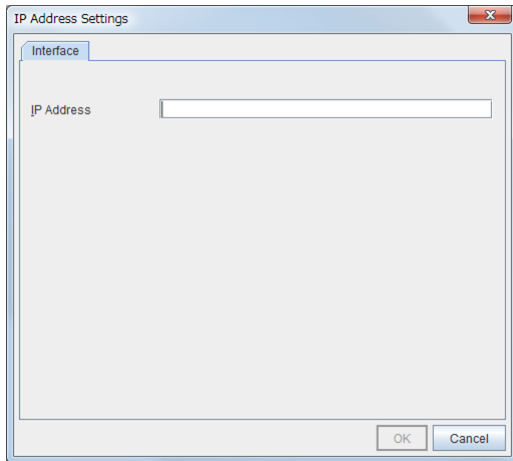
Control connection by using client IP address

If selected, accesses are controlled by client IP addresses.

- When the check box is selected:
Add, **Remove** and **Edit** are enabled.
- When the check box is not selected:
Add, **Remove** and **Edit** are disabled.

Add

Use **Add** to add an IP address in **IP Addresses of the Accessible Clients**. Click **Add** to display the **IP Address Settings** dialog box. Newly added IP addresses have the rights for the operation.



- **IP Address (Within 80 bytes)**

Specify a client IP address that can be connected.

- IP address: 10.0.0.21
- Network address: 10.0.1.0/24

Remove

Use **Remove** to remove an IP address from **IP Addresses of the Accessible Clients**. Select the IP address to be removed from **IP Addresses of the Accessible Clients** and then click **Remove**.

Edit

Use **Edit** to edit an IP address. Select the IP address you want to edit from **IP Addresses of the Accessible Clients** and then click **Edit**. A dialog box where the specified IP address is preset is displayed. The rights for operating the edited IP addresses remain the same.

Note: The IP addresses of the accessible clients specified here are also used to restrict connections for external operations using clprexec.

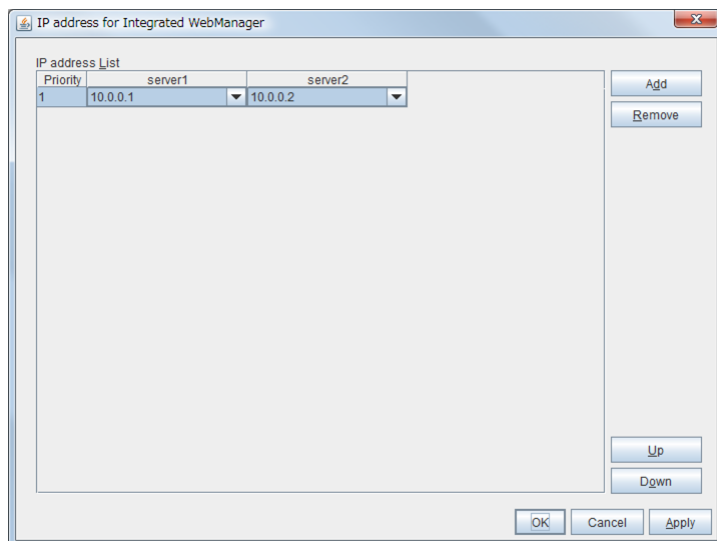
Control connection by using client IP address

Sets the operation rights for IP addresses that are registered in **IP Addresses of the Accessible Clients**.

- When the check box is selected:
A client can operate a cluster and display its status.
- When the check box is not selected:
A client can only view the status of a cluster.

IP address for Integrated WebManager

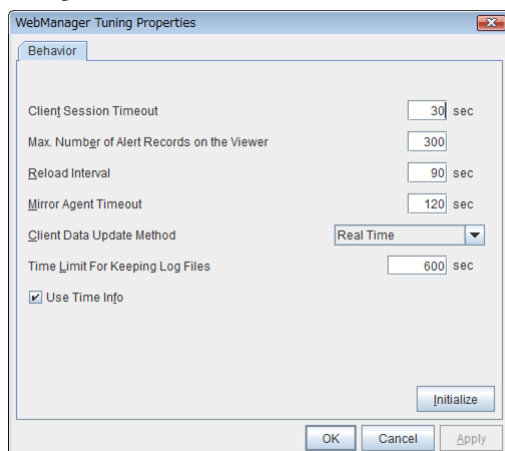
Click **Settings** to open the IP address dialog box for the Integrated WebManager.



- **Add**
Add IP addresses for the Integrated WebManager. Click the column cell of each server and select or enter IP address for the IP address of each server. For the communication path not connected to some server, set blank to the server cell of which the server is not connected.
- **Remove**
Remove the communication path. Select the communication path to be removed and click **Remove**, then the selected path is removed.
- **Up, Down**
When multiple IP addresses for Integrated WebManager are configured, the communication path with the smallest number in the **Priority** column is used preferentially for the internal communication among cluster servers. When changing the priority, click **Up** and **Down** to change the order of the selected row.

Tuning

Use **Tuning** to tune the WebManager. Clicking **Tuning** displays the **WebManager Tuning Properties** dialog box.

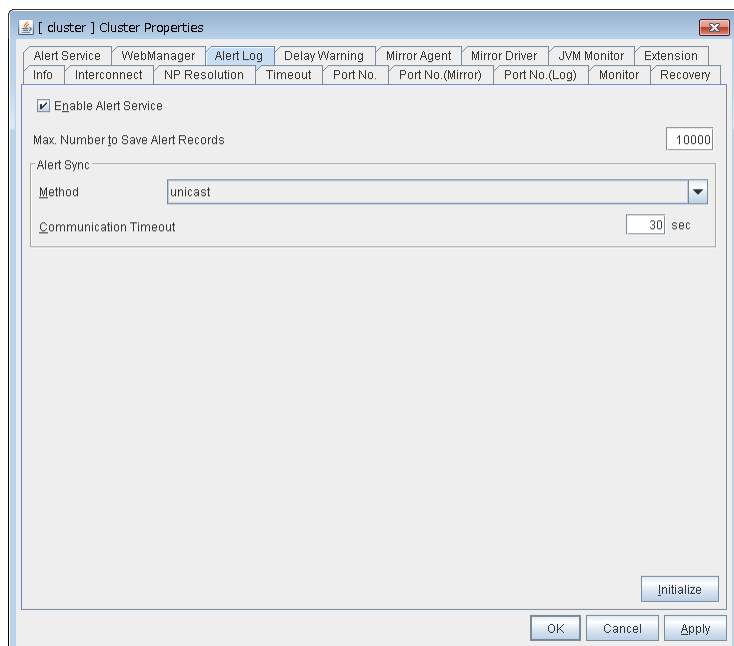


- **Client Session Timeout (1 to 999)**
Specify the client session time-out. A time-out is determined if the time specified here elapses after the last communication between the WebManager Server and the WebManager.

- **Max. Number of Alert Records on Viewer** (1 to 999)
Specify the maximum number of alert viewer records to display on the Alert Viewer of the WebManager.
- **Reload Interval** (0 to 999)
Specify the screen data update interval. At this time interval, the WebManager screen is refreshed.
- **Mirror Agent Timeout** (1 to 999)
Set the data waiting time output from the mirror agent.
- **Client Data Update Method**
Specify how to update the data on a screen from the following options:
 - Polling
Updates the data regularly.
 - RealTime
Updates the data in real time.
- **Time Limit For Keeping Log Files** (60 to 43200)
Specify the expiration period for deleting log collection information that is temporarily stored on a server. Log information on a server will be deleted if the expiration period is exceeded after the dialog box prompting saving log collection information is displayed.
- **Use Time Info Display Function**
Specify whether the time information display function is enabled or disabled.
 - When the check box is selected:
The time information display function is enabled.
 - When the check box is not selected:
The time information display function is disabled.
- **Initialize**
Click **Initialize** to reset all settings on this dialog to default. Click **Initialize** to set all the items to their default values.

3.11.12 Alert Log tab

Configure the settings for the alert log.



Enable Alert Service

Select this to start alert service for the server.

- When the check box is selected:
Alert service is enabled.
- When the check box is not selected:
Alert service is disabled.

Max. Number to Save Alert Records (1 to 99999)

Specify the maximum number of alert records that can be retained. Alert service for server can retain alert messages up to this number.

Alert Sync: Method

This communication mode is used for Alert Log synchronization. Only unicast is available in **Method** list box for this version.

Alert Sync: Communication Timeout (1 to 300)

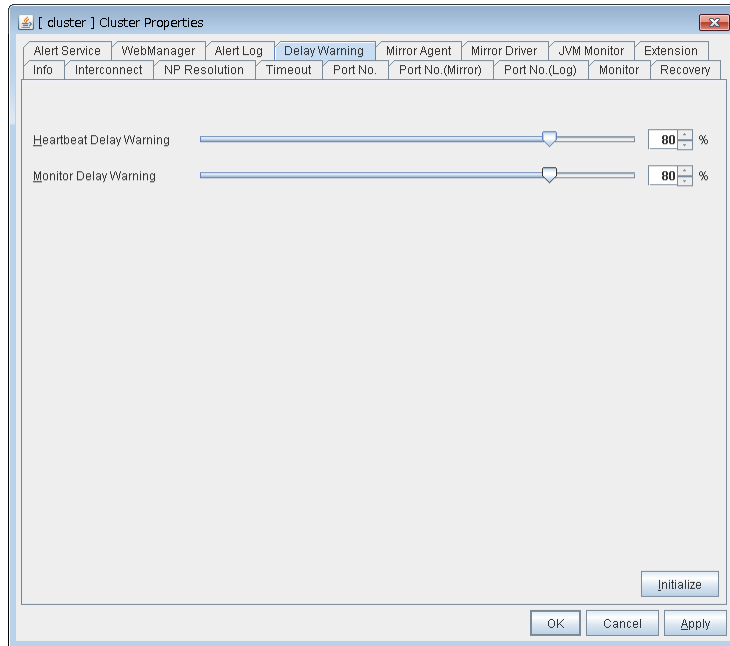
Specify a communication time-out. A communication time-out is determined if the time specified here elapses after the last communication between Alert service and servers.

Initialize

Click **Initialize** to reset all settings on this tab to default. Click **Initialize** to set all the items to their default values.

3.11.13 Delay Warning tab

Configure the settings for Delay Warning on this tab. For details, see "Monitor resource Delay warning of monitor resources" in "Monitor resource details" in the "Reference Guide".



Heartbeat Delay Warning (0 to 100)

Set a percentage of heartbeat time-out at which the heartbeat delay warning is issued. If the time for the percentage passes without any heartbeat response, the warning will be produced in an alert log. If you set 100, the warning will not be issued.

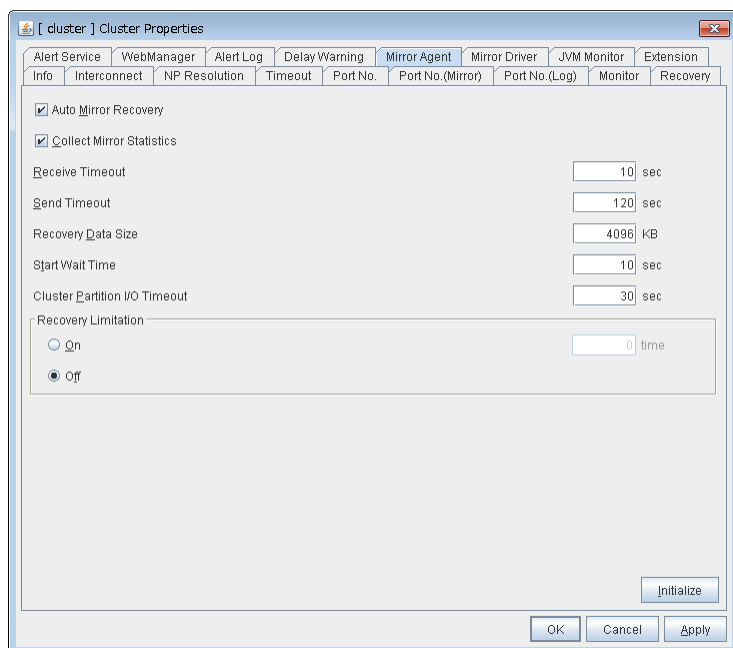
Monitor Delay Warning (0 to 100)

Set a percentage of monitor time-out at which the monitor delay warning is issued. If the time for the percentage passes without any monitor response, the warning will be produced in an alert log. If you set 100, the warning will not be issued.

Note: If you specify 0% for the delay warning, an alert log is shown in every heartbeat interval and monitor interval. Setting 0% allows you to see the time spent for monitoring. This will be helpful particularly in a test operation. Make sure not to set low values such as 0% in the production environment.

3.11.14 Mirror Agent tab ~ For the Replicator/Replicator DR~

Configure the settings for the Mirror Agent on this tab.



Auto Mirror Recovery

When the check box is selected, the mirror recovery is automatically performed if there is any difference between mirror disks on both servers. In some cases, you cannot perform the auto-mirror recovery even if this is selected. For details, see "Automatically recovering from mirroring" in "Troubleshooting" in the "Reference Guide".

- When the check box is selected:
The mirror recovery is automatically performed.
- When the check box is not selected:
The mirror recovery is not automatically performed.

Collect Mirror Statistics

This function can be used to collect and reference information about the mirroring performance. For details, see "Mirror statistics information collection function" in "The system maintenance information" in the "Maintenance Guide".

- When the check box is selected
Mirror Statistics Collection is performed.
- When the check box is not selected
Mirror Statistics Collection is not performed.

Receive Timeout (1 to 600)

Set the time-out for the Mirror Agent waiting to receive data after establishing the connection.

Send Timeout (1 to 600)

Set the time-out for the Mirror Agent to send data to the Mirror Agent of the other server and wait it to be processed.

Recovery Data Size (64 to 32768)

Specify the recovery data size.

Start wait time (10 to 600)

For using a hybrid disk resource in a shared disk, set the waiting time to synchronize the starts of the servers connected to the shared disk. If another server does not start within the time configured here, the current right is obtained temporarily.

Cluster partition I/O timeout (5 to 300)

For using hybrid disk resource, set the timeout value for accessing the cluster partition.

- The time-out value must be smaller than the heartbeat time-out specified at the **Timeout** tab.

Recovery Limitation

Specify the retry count to perform mirror recovery again if the data has been updated during a mirror recovery.

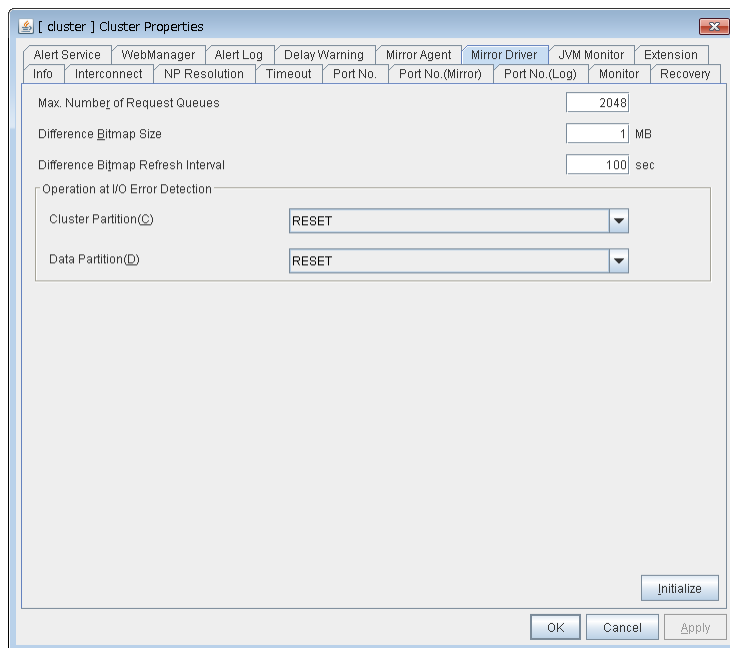
- On (1 to 100)
The mirror recovery retry is performed the times specified on the box.
- Off
When there is update data, mirror recovery is performed until there is no difference.

Initialize

This is used to reset the values to the default value. Clicking **Initialize** sets all the items to their default values.

3.11.15 Mirror driver tab ~ For Replicator/Replicator DR ~

Configure the settings for the mirror driver on this tab.



Max. Number of Request Queues (2048 to 65535)

Set the number of queues for mirror disk driver for queuing I/O requests from the upper system.

Difference Bitmap Size (1-5)

Users can specify the length of Record Area of the Difference Bitmap. This setting can be changed only when the mirror disk resource and/or hybrid disk resource do not exist in the cluster.

Difference Bitmap Refresh Interval (1 to 600)

Set the interval to check if the standby system writes the difference bitmap.

Operation at I/O Error Detection

- **Cluster Partition**
Set an operation when an I/O error occurs in a cluster partition.
- **Data Partition**
Set an operation when an I/O error occurs in a data partition.

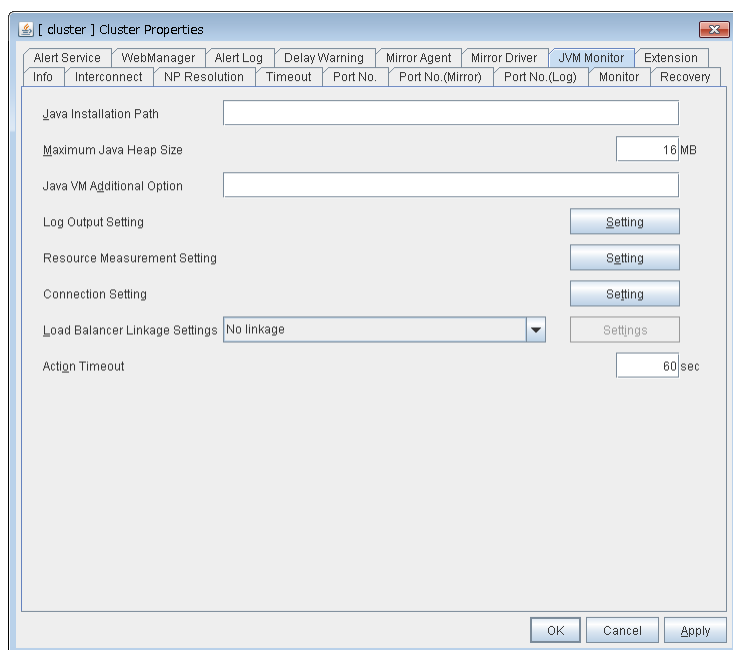
Initialize

Use **Initialize** to reset the values to the default value. Click **Initialize** to set all the items to their default values.

3.11.16 JVM monitor tab

Configure detailed parameters for the JVM monitor.

Note: To display the **JVM monitor** tab on the online version Builder, you need to execute **Update Server Info** from the **File** menu after the license for Java Resource Agent is registered.



Java Installation Path (up to 255 bytes)

Set the Java VM install path used by the JVM monitor. Specify an absolute path using ASCII characters. Do not add "/" to the end of the path. This setting becomes common for all servers in the cluster. Specification example: /usr/java/jdk-9

Maximum Java Heap Size (7 to 4096)

Set, in megabytes, the maximum Java VM heap size used by the JVM monitor (equivalent to -Xmx of the Java VM startup option). This setting becomes common for all servers in the cluster.

Java VM Additional Option (up to 1024 bytes)

Set the Java VM startup option used by the JVM monitor. However, specify -Xmx in the [Maximum Java Heap Size]. This setting becomes common for all servers in the cluster. Specification example: -XX:+UseSerialGC

Log Output Setting

Click the Setting button to open the Log Output Setting dialog box.

Resource Measurement Setting

Click the Setting button to open the Resource Measurement Setting dialog box.

Connection Setting

Click the **Setting** button to open the **Connection Setting** dialog box.

Load Balancer Linkage Settings

Select the load balancer type and then click the **Settings** button. The **Load Balancer Linkage Settings** dialog box appears.

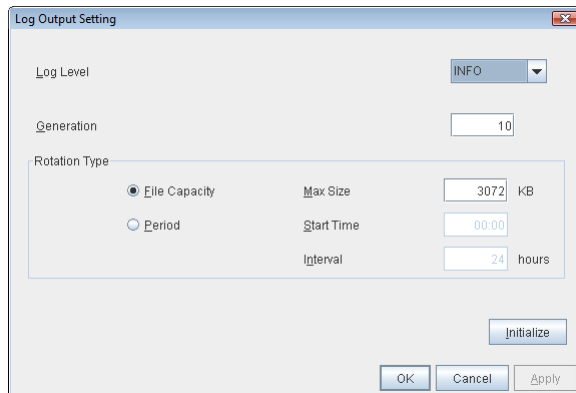
Select the load balancer type from the list. To perform load balancer linkage, select the load balancer you are using. To cancel the load balancer linkage, select **No linkage**.

Action Timeout (30 to 300)

Set the timeout value of [Command] specified in each window of the JVM monitor. This setting becomes common for all the [Command] items.

Log Output Setting

Clicking **Setting** displays the **Log Output Setting** dialog box.



Log Level

Select the log level of the log output by the JVM monitor.

Generation (2 to 100)

Set the number of generations to be retained for log output by the JVM monitor. When **Period** is selected for **Rotation Type**, the rotation count is reset when cluster is suspended. Therefore, note that log files under the <EXPRESSCLUSTER_install_path>loghajra increase per cluster suspend.

Rotation Type

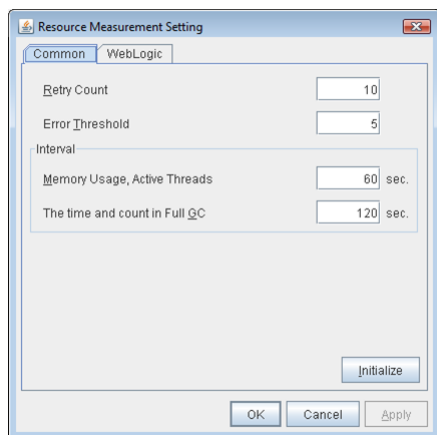
Select a rotation type for the log output by the JVM monitor. If you select **File Capacity** as the rotation type, set the maximum size (200 to 2097151), in kilobytes, for each log file such as the JVM operation log. If you select **Period** as the rotation type, set the log rotation start time in "hh:mm" format (hh: 0 to 23, mm: 0 to 59) and the rotation interval (1 to 8784) in hours.

Initialize

Clicking **Initialize** returns the log level, generation, and rotation type items to their default values.

Resource Measurement Setting [Common]

Clicking **Setting** displays the **Resource Measurement Setting** dialog box. For details about the scheme for error judgment by the JVM monitor, see "Monitor resource details" in the "Reference Guide".



Retry Count (1 to 1440)

Set a resource measurement retry count to be applied if the JVM monitor fails in resource measurement.

Error Threshold (1 to 10)

Set the number of times abnormal judgment is performed when the usage of the Java VM or the application server resources collected by the JVM monitor via resource measurement continuously exceed the customer-defined threshold.

Memory Usage, Active Threads (15 to 600)

Set the interval at which the JVM monitor measures the memory usage and active thread count.

The time and count in Full GC (15 to 600)

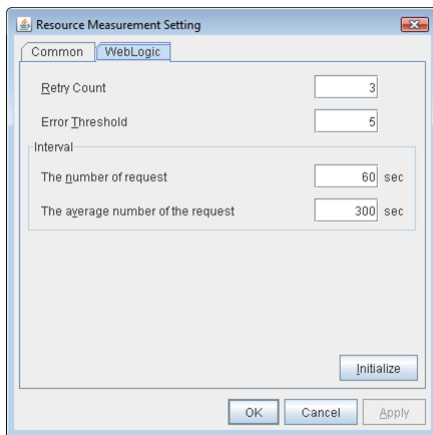
Set the **interval** at which the JVM monitor measures the time and count in Full GC execution.

Initialize

Clicking **Initialize** returns the retry count, error threshold, and interval items to their default values.

Resource Measurement Setting [WebLogic]

Clicking **Setting** displays the **Resource Measurement Setting** dialog box. For details about the scheme for error judgment by the JVM monitor, see "Monitor resource details" in the "Reference Guide".

**Retry Count (1 to 5)**

Set the resource measurement retry count to be applied if the JVM monitor fails in resource measurement.

Error Threshold (1 to 10)

Set the number of times abnormal judgment is to be performed when the usage of the Java VM or the application server resources collected by the JVM monitor via resource measurement continuously exceed the customer-defined threshold.

The number of request (15 to 600)

Set the interval at which the JVM monitor measures the number of work manager or thread pool requests during WebLogic monitor.

The average number of the request (15 to 600)

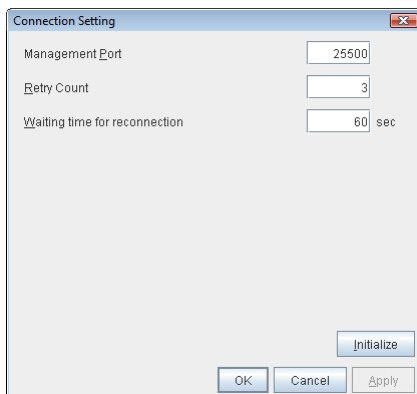
Set the interval at which the JVM monitor measures the average number of work manager or thread pool requests during WebLogic monitor. Set a value that is an integer multiple of the value set in **The number of request**.

Initialize

Clicking **Initialize** returns the retry count, error threshold, and interval items to their default values.

Connection Setting

Clicking **Setting** displays the Connection Settings dialog box.

**Management Port (10000 to 65535)**

Sets the port number internally used by the JVM monitor resource. Make sure not to set the port number that has been used by other functions or programs. This setting becomes common for all the servers in

the cluster. Do not set 32768 to 61000.

Retry Count (1 to 5)

Set the retry count to be applied if connection to the monitor target Java VM fails.

Waiting time for reconnection (15 to 60)

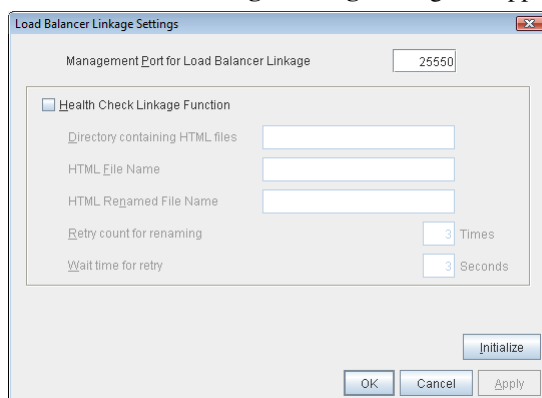
Set the interval at which the JVM monitor retries connection if it fails in Java VM connection.

Initialize

Clicking **Initialize** sets the management port, retry count, and wait time for reconnection items to their default values.

Load Balancer Linkage Settings

If you select other than BIG-IP LTM as the load balancer type and then click the **Settings** button, the **Load Balancer Linkage Settings** dialog box appears.



Management Port for Load Balancer Linkage (10000 to 65535)

Set the port number used by the load balancer linkage function. This setting becomes common to all the servers in the cluster. Do not set 32768 to 61000.

Health Check Linkage Function

Set whether to use the load balancer health check function if the monitor target Java VM detects a failure.

Directory containing HTML files (up to 1023 bytes)

Set the directory in which the HTML file used by the load balancer health check function is stored. Specify an absolute path using ASCII characters. Do not add "/" to the end of the path.

HTML File Name (up to 255 bytes)

Set the HTML file name used by the load balancer health check function. Specify this filename using ASCII characters.

HTML Renamed File Name (up to 255 bytes)

Set the HTML renamed file name used by the load balancer health check function. Specify this file name using ASCII characters. Specify an HTML renamed file name that is different from the HTML file name.

Retry count for renaming (0 to 5)

Set the number of times HTML file renaming is retried if it fails.

Wait time for retry (1 to 60)

Set the interval at which HTML file renaming is retried if it fails.

Initialize

Clicking **Initialize** returns the management port for load balancer linkage, health check linkage function, directory containing HTML files, HTML file name, HTML renamed file name, retry count for renaming and wait time for retry items to their default values.

Load Balancer Linkage Settings

Select BIG-IP LTM as the load balancer type and then click the **Settings** button. The **Load Balancer Linkage Settings** dialog box appears.

Server Name	IP address
-------------	------------

Management Port for Load Balancer Linkage (10000 to 65535)

Set the port number used by the load balancer linkage function. This setting becomes common to all the servers in the cluster. Do not set 42424 to 61000.

mgmt IP address

Set the BIG-IP LTM IP address.

Management User Name (up to 255 bytes)

Set the BIG-IP LTM management user name.

Password (up to 255 bytes)

Set the BIG-IP LTM management user password.

Communications Port (10000 to 65535)

Set the communication port number for BIG-IP LTM.

Add

Add the server name and IP address for the distributed node. For the server name, specify the EXPRESSCLUSTER server name. For the IP address, specify the value set to **Members** in **LocalTraffic - Pools:PoolList - Relevant pool - Members** of BIG-IP Configuration Utility. To change the value, select the line and directly edit the description.

Remove

Remove the server name and IP address for the distributed node. Select the line to be removed and then click **Remove**. The selected server is removed.

Initialize

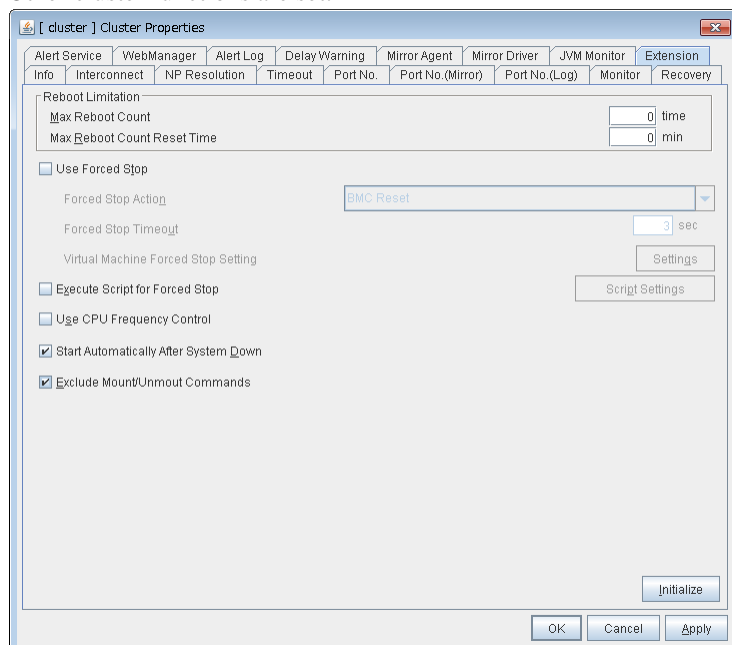
Clicking **Initialize** returns the management port for load balancer linkage, management user name, and communication port number to the default settings.

3.11.17 Oracle Clusterware linkage tab

It can't be used.

3.11.18 Extension tab

Other cluster functions are set.



Reboot Limitation

If the final action at abnormality detection for group resources and monitor resources is specified with the setting accompanied by OS reboot, reboot may be repeated infinitely. By setting the reboot limit, you can prevent repeated reboots.

- **Max Reboot Count (0 to 99)**
Specify how many times the operating system can reboot. The number specified here is separately counted for group resource and monitor resource.
- **Max Reboot Count Reset Time (0 to 999)**
When the max reboot count is specified, if the operation from the cluster startup keeps running normally for the time specified here, the reboot count is reset. The time specified here is separately counted for group resource and monitor resource.

Note: If **Max Reboot Count Reset Time** is set to 0, the reboot count is not reset. If you want to reset the reboot count, use `clpregctrl` command.

Use Forced Stop

Use this to select whether or not to enable the forced stop.

- **On**
If selected, the forced stop function is enabled.

For a physical machine, configure the settings on the **BMC** tab of the server properties. For a virtual machine (guest OS), configure the **Virtual Machine** setting on the **Info** tab of the server properties.

- Off
If selected, the forced stop function is disabled.

Forced Stop Action

Specify an action of the forced stop.

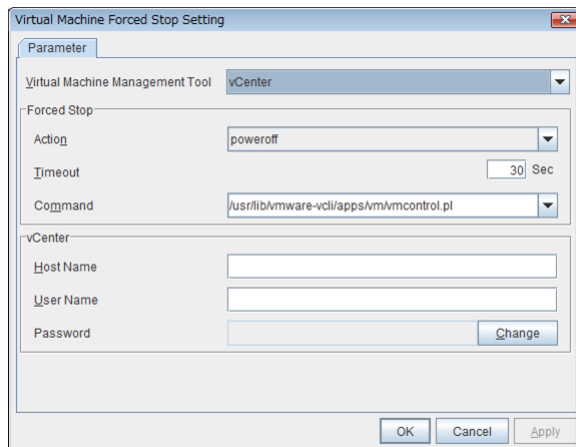
- BMC Reset
Use this to perform a hardware reset of the server by using the ipmitool command.
- BMC Power Off
Use this to power off the server by using the ipmitool command. The OS may be shut down depending on how the ACPI of OS is configured.
- BMC Power Cycle
Use this to perform the Power Cycle (powering on/off) by using the ipmitool command. The OS may be shut down depending on how the ACPI of OS is configured.
- BMC NMI
Use this to generate NMI by using the ipmitool command. The performance after the generation of NMI depends on the OS setting.

Forced Stop Timeout (0 to 99)

Configure the timeout value when performing Forced Stop. After the above commands are executed, activating failover groups starts when the time specified elapses

Virtual Machine Forced Stop Setting

Configure forced stop for the virtual machine (guest OS). Click **Setting** to display the **Virtual Machine Forced Stop Setting** dialog box.



Virtual Machine Management Tool

- vCenter
Select this when you want to use vCenter to control the virtual machine.

Forced Stop

- Action
Specify the action performed upon a forced stop.
- poweroff

Use this to power off the server by using the command specified in **Command**.

- Timeout (0 to 99)
Set the timeout value to be used when performing a forced stop. After the above command is executed, the activation of failover groups starts when the time specified here elapses.
- Command (Within 1023 bytes)
Specify the command for forced stop.

vCenter

- Host Name (Within 45 bytes)
Specify the host name of the virtual machine management tool.
- User Name (Within 255 bytes)
Specify the user name of the virtual machine management tool.
- Password
Specify the password for the virtual machine management tool.

Note: Do not use a double quotation mark (") in the password.

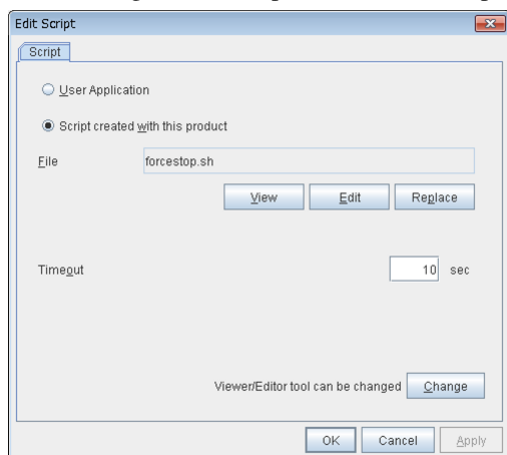
Execute Script for Forced Stop

Use this to select whether or not to execute a script for the forced stop.

- On
If selected, the script is executed for the forced stop.
- Off
If selected, the script is not executed.

Script Setting

Make settings on the script for the forced stop. Click **Script Setting** play the **Edit Script** dialog box.



User Application

Use an executable file (executable shell script file or execution file) on the server as a script. For the file name, specify an absolute path or name of the executable file of the local disk on the server. If there is any blank in the absolute path or the file name, put them in double quotation marks (") as follows.

Example:

"/tmp/user application/script.sh"

Each executable file is not included in the cluster configuration information of the Builder. They must be prepared on each server because they cannot be edited or uploaded by the Builder.

Script created with this product

Use a script file which is prepared by the Builder as a script. You can edit the script file with the Builder if you need. The script file is included in the cluster configuration information.

File (Within 1023 bytes)

Specify a script to be executed (executable shell script file or execution file) when you select **User Application**.

View

Click here to display the script file with the editor when you select **Script created with this product**. The information edited and stored with the editor is not applied. You cannot display the script file if it is currently displayed or edited.

Edit

Click here to edit the script file with the editor when you select **Script created with this product**. Overwrite the script file to apply the change. You cannot edit the script file if it is currently displayed or edited. You cannot modify the name of the script file.

Replace

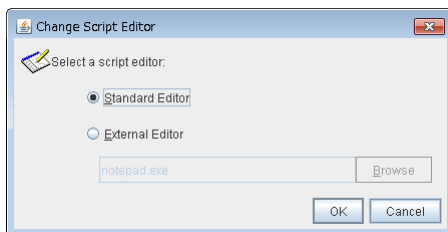
Click here to replace the contents of a script file with the contents of the script file which you selected in the **file selection** dialog box when you select **Script created with this product**. You cannot replace the script file if it is currently displayed or edited. Select a script file only. Do not select binary files (applications), and so on.

Timeout (1 to 9999)

Specify the maximum time to wait for completion of script to be executed. The default value is set as 10.

Change

Click here to display the **Change Script Editor** dialog. You can change editor for displaying or editing a script to an arbitrary editor.



Standard Editor

Select this option to use the standard editor for editing scripts.

- Linux: vi (vi which is detected by the user's search path)
- Windows: Notepad (notepad.exe which is detected by the user's search path)

External Editor

Select this option to specify a script editor. Click **Browse** to select an editor.

To specify a CUI-based external editor on Linux, create a shell script.

The following is a sample shell script to run vi:

```
xterm -name clpedit -title "Cluster Builder" -n "Cluster Builder" -e vi "$1"
```

Use CPU Frequency Control

Select the check box when you use CPU frequency control.

When CPU frequency control is used, the CPU frequency of the server where a failover group is activated is set to high, and that of the server where a failover group is stopped is set to low.

When CPU frequency control is performed by a command or WebManager, the settings changed by the command or WebManager are given higher priority regardless of whether the failover group is started or stopped. Note that the settings changed by the command or WebManager is discarded after the cluster is stopped/started or suspended/resumed, so that CPU frequency is controlled by the cluster.

- When the check box is selected
CPU frequency control is performed.
- When the check box is cleared
CPU frequency control is not performed.

Note: For using CPU frequency control, it is required that the frequency is changeable in BIOS settings and the CPU supports the frequency control by OS power management function and that kernel is supported.

Start Automatically After System Down

Set whether to prohibit automatic startup of the cluster service at the next OS startup when the server has been stopped by a means other than cluster shutdown or cluster stop, or when cluster shutdown or stop does not terminate normally.

For the conditions to prohibit automatic startup of the cluster service after system down, see "Conditions for automatic startup prohibition" in "Information on other settings" in the "Reference Guide".

Exclude Mount/Unmount Commands

Specify the exclusion of mount and unmount of the file systems executed in disk resource, mirror disk resource, hybrid disk resource, NAS resource and VxVOL resource. If this option is selected, problems such as mount or unmount command failure can be avoided due to the /etc/mounttab lock. It may take time to activate and deactivate a resource if there are many resources because mount and unmount processes are executed in order.

- When the check box is selected:
The exclusion is performed.
- When the check box is not selected:
The exclusion is not performed.

Initialize

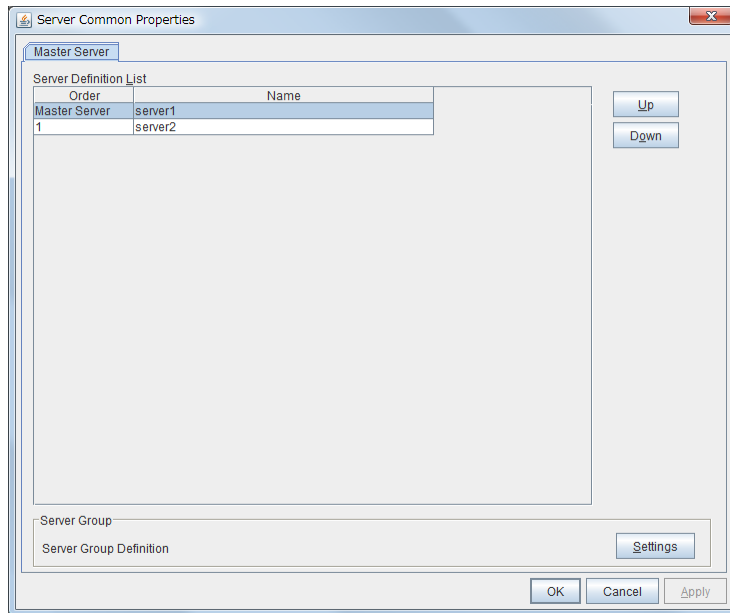
Use **Initialize** to reset the values to the default value. Clicking **Initialize** sets all the items to their default values.

3.12 Server Common Properties

Configure setting information of all servers in Servers Properties.

3.12.1 Master Server Tab

Configure the priority order of the servers and the server group. All the registered servers are displayed. Master server is the server to keep the master of cluster configuration information. And also, it is the server of the highest priority order.

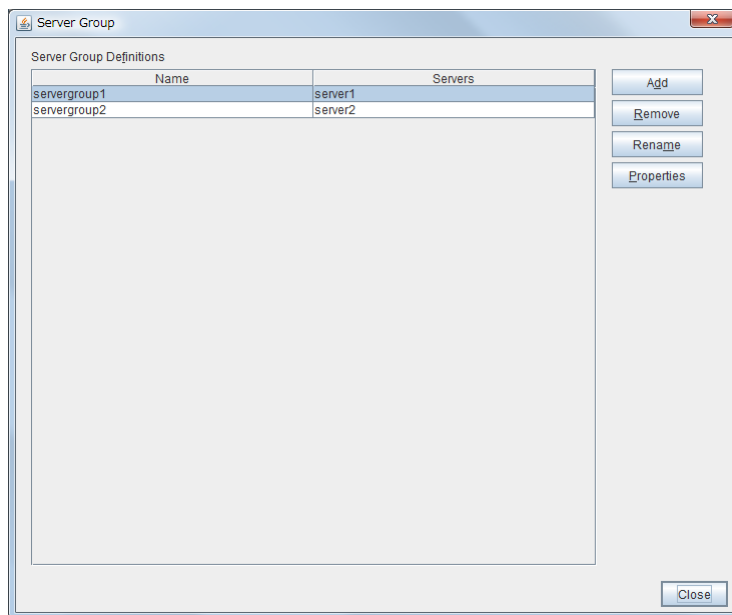


Up, Down

Used when changing the priority order of the servers. Select the server to be changed from the server definition list, and select **Up** or **Down**. The selected row moves.

Settings

Used when configuring the server group. Select **Settings** and the **Server Group** dialog box is displayed.



- **Add**
Add server groups. The wizard windows for adding the server group is displayed.
- **Remove**
The confirmation dialog box is displayed. When removing, select Yes. Then the selected server group is removed. When not removing, select No.

When the following conditions are matched, the server group cannot be removed.

Selected target	Conditions that the server group cannot be removed	Application method
Server group name	The server group is registered as the server group of the failover group.	Cluster stop Mirror agent stop Mirror agent start Cluster start

- **Rename**
The change server group name dialog box of the selected server group is displayed.

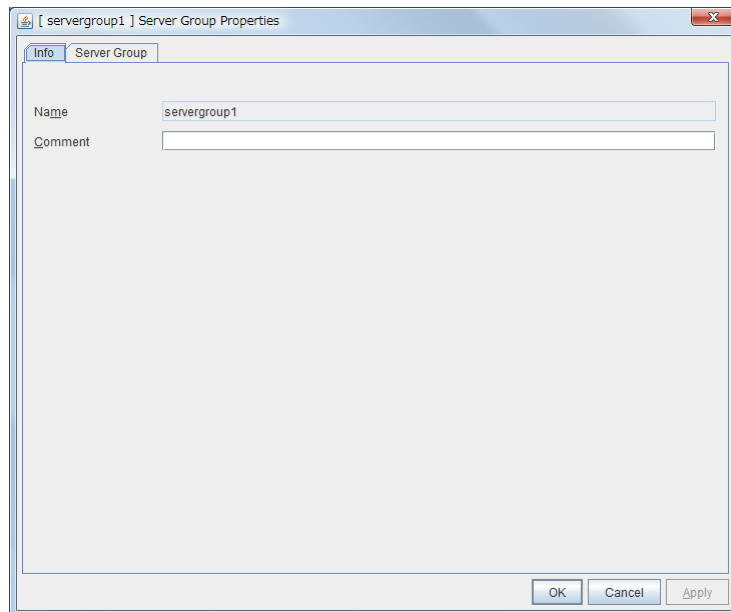


There are the following naming rules

Selected target	Naming rules	Application method
Server group name	<ul style="list-style-type: none"> - There are naming rules that are the same as the host name of TCP/IP that can be set by the OS. - Up to 31 characters (31 bytes). - Names cannot start or end with a hyphen (-) or a space. - A name consisting of only numbers is not allowed. 	<ul style="list-style-type: none"> Cluster stop Mirror agent stop Mirror agent start Cluster start

Names should be unique (case-insensitive) in the server group.

- Properties
Display the properties of the selected server group.
- Name
Display the server group name.
- Servers
Display the server names which belong to the server group.
- Server Group Properties - Info tab
You can display the server group name, and register and make a change to a comment on this tab.



Name

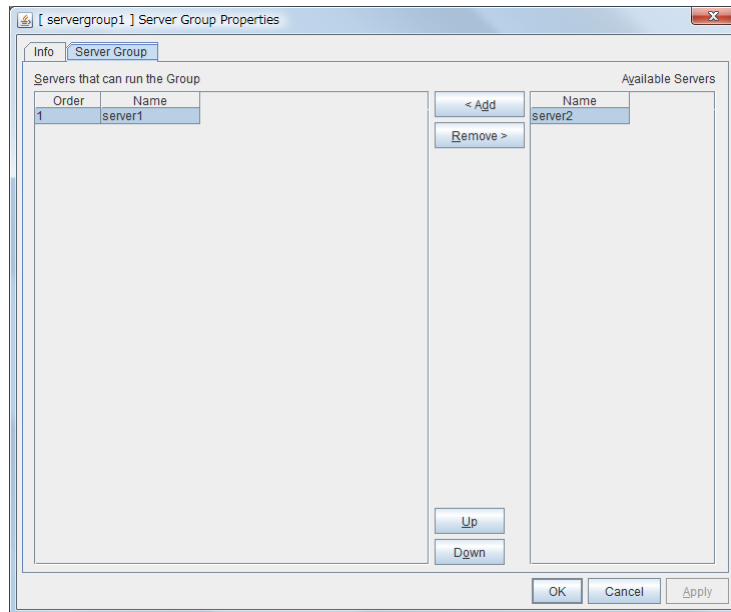
The selected server name is displayed. You cannot change the name here.

Comment(Within 127 bytes)

You can specify a comment for the server. Only alphanumeric characters are allowed.

- Server Group Properties - Server Group

Configure the server group settings.



Add

Add the selected server in **Available Servers** to **Servers that can run the Group**.

Remove

Remove the selected server in **Servers that can run the Group** from the list.

Up, Down

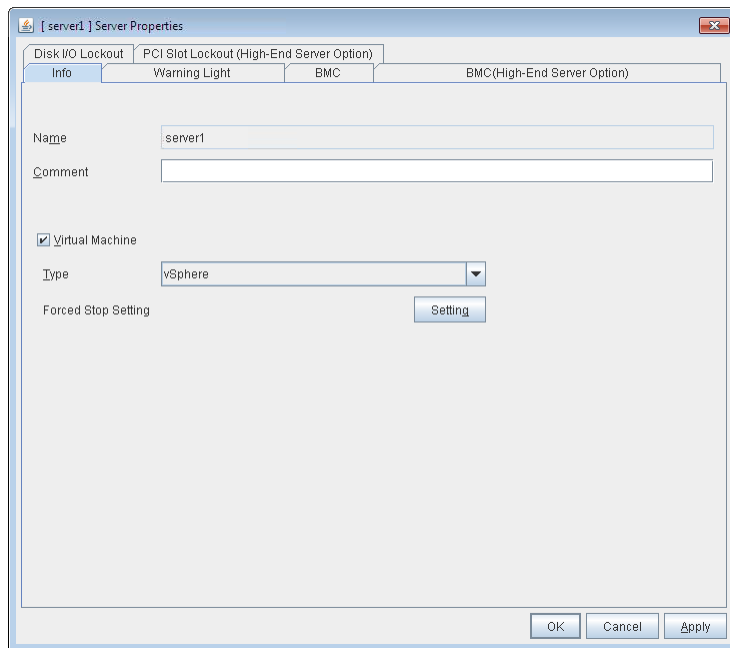
Used when changing the priority order of the server. Select the server to be changed from **Servers that can run the Group** and click **Up** or **Down**. The selected row moves.

3.13 Server properties

Configure individual settings on each server constructing the cluster in Server Properties.

3.13.1 Info tab

You can display the server name and make a change to a comment on this tab.



Name

The selected server name is displayed. You cannot change the name here.

Comment (Within 127 bytes)

You can specify a comment for the server. Only alphanumeric characters are allowed.

Virtual Machine

Specify whether this server is a virtual machine (guest OS).

- On
If selected, the server is a virtual machine (guest OS). You can configure this virtual machine.
- Off
If selected, the server is a physical machine. You cannot configure a virtual machine.

Type

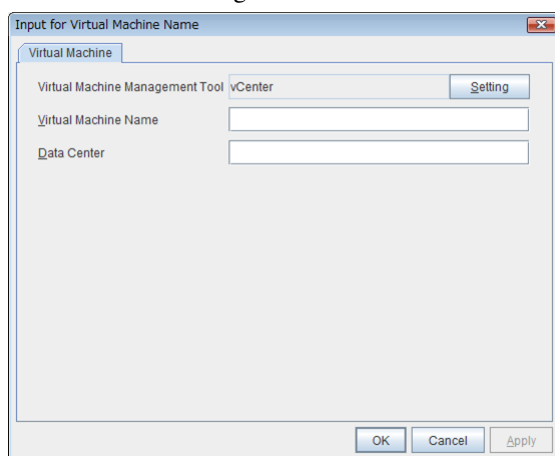
Specify the type of virtual infrastructure.

- vSphere
Virtual infrastructure provided by VMware, Inc.
- KVM
Linux kernel virtual infrastructure.

- XenServer
Virtual infrastructure provided by Citrix Systems, Inc.
- Container
Virtual infrastructure provided by Oracle Systems, Inc.
- Hyper-V
Virtual infrastructure provided by Microsoft Corporation.
- other
Specify this option to use any other virtual infrastructure.

Forced Stop Setting

Set the information about the virtual machine (guest OS). Click **Setting** to display the **Input for Virtual Machine name** dialog box.



Virtual Machine name (Within 80 bytes)

Set the virtual machine (guest OS) name.

Note: Do not use a double quotation mark (") or percent sign (%) in the virtual machine name.

Data Center (Within 80 bytes)

Set the name of the data center that manages the virtual machine (guest OS).

Note: Do not use a double quotation mark (") or percent sign (%) in the virtual machine name.

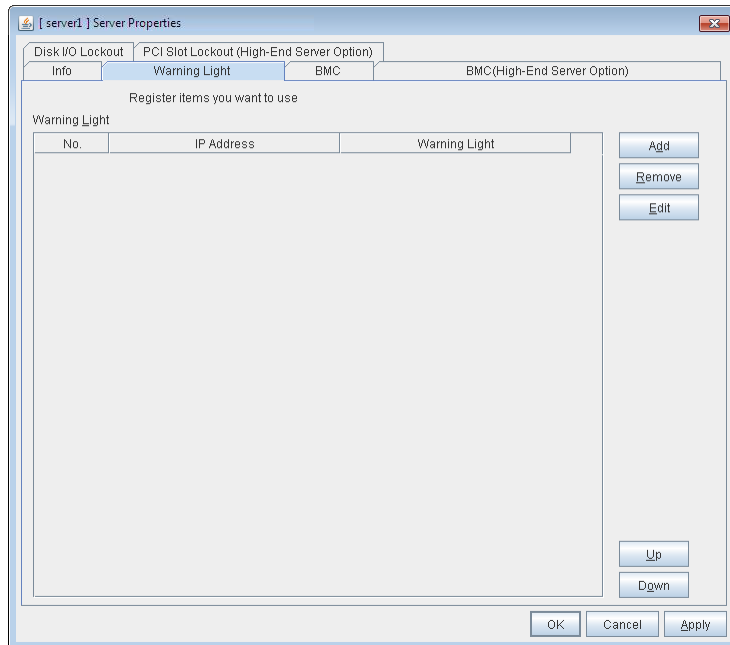
vCenter

Set the vCenter server that manages the virtual machine (guest OS). Click **Setting** to display the **Virtual Machine Forced Stop Setting** dialog box.

For more information on **Virtual Machine Forced Stop Setting**, refer to the description of the "[3.11.18. Extension tab](#)".

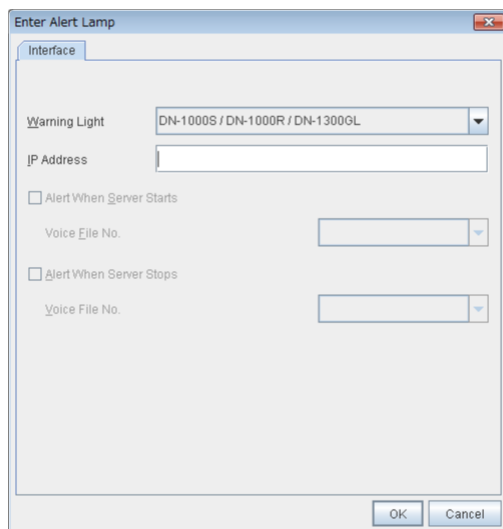
3.13.2 Warning Light tab

Set an IP address of warning light (specified by NEC) controlled by network.



Add

Use **Add** to add an interface. Clicking **Add** displays the **Warning Light Settings** dialog box.



- IP Address (**Within 80 bytes**)
Enter an IP address of the warning light.

Note: One warning light is required per one server. Do not set an IP address of the same warning light to multiple servers.

- Warning Light

Select the product number of the warning light you use. The products corresponding to each number are as follows.

Product Number	Product Name
DN-1000S/DN-1000R/DN-1300GL	DN-1000S/DN-1000R/DN-1300GL
DN-1500GL	DN-1500GL
NH-FB series/NH-FB1 series	NH-FB series/NH-FB1 series
NH-FV1 series	NH-FV1 series

- Playback of an audio file

Playback of an audio file is enabled when DN1500GL or NH-FV1 series is selected as the warning light type.

If you change the warning light type to other than DN1500GL or NH-FV1 series after playback of an audio file was enabled, playback of an audio file will be disabled.

Alert When Server Starts

- When the check box is selected:
Reproduces the audio file at server start. The audio file is reproduced only once.
- When the check box is not selected:
Does not reproduce the audio file at server start.
- Voice File No. (DN1500GL:01 to 20, NH-FV1 series: 01 to 70)
Set the number of the voice file to be played when the server starts

Alert When Server Stops

- When the check box is selected:
Reproduces the audio file at server stop. The audio file is continuously reproduced until it is stopped manually.
- When the check box is not selected:
Does not reproduce the audio file at server stop.
- Voice File No. (DN1500GL:01 to 20, NH-FV1 series: 01 to 70)
Set the number of the voice file to be played when the server stops.

Edit

Use **Edit** to edit the warning light setting.

Note:

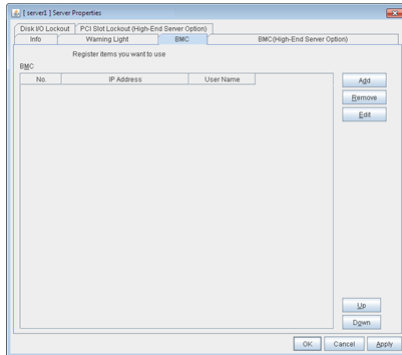
To play back the audio file, it must be registered in the network warning light.

For more information on audio file registration, refer to the instruction manual of the network warning light to be used.

Set the audio file number corresponding to the audio file that is registered for the network warning light.

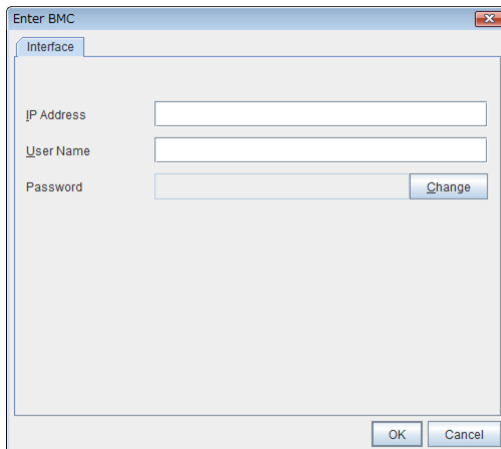
3.13.3 BMC tab

Configure a LAN port for managing BMC when using the forced stop and the chassis identify.
Configure one for each server.



Add

Use this button to newly configure a server. Click **Add** to opens the **BMC Settings** dialog box.



- **IP Address (Within 80 bytes)**
Enter the IP address set for the LAN port for managing BMC.
- **User Name (Within 255 bytes)**
Enter the user name with administrator privilege from the user names configured in BMC.
If you do not enter anything, the argument of user name is not configured when the ipmitool command.
The valid length of user name varies depending on the ipmitool command and the specification of BMC of the server.
- **Password (Within 255 bytes)**
Enter the password of the user configured above.
The valid length of password varies depending on the specifications of ipmitool command and the BMC of the server.
For more information on user name and password, refer to the manual of the server.

Remove

Use this button to remove the settings. Select the target setting, and then, click **Remove**.

Edit

Use this button to modify the settings. Select the target setting, and then, click **Edit**. The **BMC Settings** dialog box is displayed.

When a cluster consists of the different types of servers and includes a server which does not have BMC function, do not configure the **BMC** tab for the server.

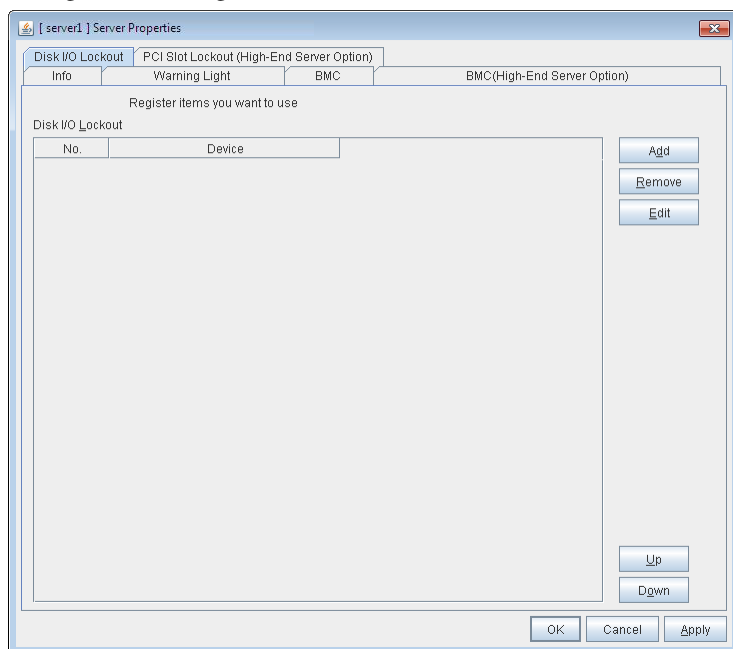
In such a configuration, if **Chassis Identify** and/or the forced stop function, the alert telling you "failed in the BMC action" is displayed.

3.13.4 BMC(High-End Server Option) tab

It can't be used.

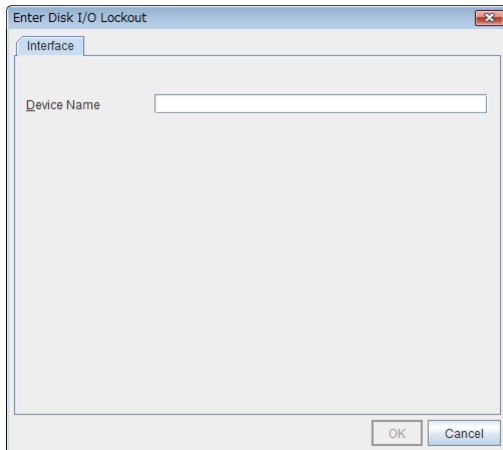
3.13.5 Disk I/O Lockout tab

Configure the settings for disk I/O lockout devices.



Add

Use **Add** to add lockout devices. Clicking **Add** displays the **Enter the device name** dialog box.



- **Device Name (Within 1023 bytes)**
Enter a disk I/O lockout device.

Remove

Use **Remove** to remove lockout devices. Select the device to remove from the **Disk I/O Lockout** device and then click **Remove**.

Edit

Use **Edit** to edit disk I/O lockout devices. Clicking **Edit** opens the **Enter the device name** dialog box.

UP & Down

Use **UP & Down** to change the I/F number. Select the I/F you want to change from the I/F list and then click **Up** or **Down**. The selected row moves up and down accordingly.

3.13.6 PCI Slot Lockout(High-End Server Option) tab

It can't be used.

3.14 Installing the offline version of the Builder

It is not necessary to install the Builder (offline version) to the server where configure a cluster. Install it only when modifying the cluster configuration data on a PC excluding the servers that configure a cluster.

Note: The offline version of Builder supports only a Windows environment.

Follow the procedures below to install the Builder (offline version)

When you install the Builder, install it in a directory where you can access (read/write) by the security right granted to you.

Note: When the Builder has already been installed, uninstall then install again, or install in another location.

1. Set the Installation CD-ROM in the CD-ROM drive.
2. Navigate to the \Linux\4.0\en\builder\ in the CD-ROM and execute the following:

```
expresscls-[version #]-[release #].linux.x86_64.exe
```

Select where to install in the **Cluster Builder self-extracting dialog** box and click **Extract**.

The default install folder is Program Files. In the folder specified here, CLUSTERPRO\clpbuilder-l directory is created. The Builder is installed in this directory.

3. Click **OK** in the ZIP self-extract dialog box. Installation is completed.

Note: To change the location where the Builder is installed, move all files in your installation folder without changing the structure of the clpbuilder-l directory.

Load the following file with a Web browser to start up the offline version of the Builder:

<installation path>/clptrek.htm

3.15 Uninstalling the offline version of the Builder

For Linux

Note: You must log on as root user when uninstalling the Builder.

Follow the procedures below to uninstall the Builder:

1. Close all Web browsers.
2. Run the `rpm -e expressclsbuilder` command.

Note: Do not specify other options than the one stated above.

For Windows

To uninstall the Builder, follow the procedures below:

1. Exit from all Web browsers (confirm that the JavaVM icon is no longer in the task tray).
2. Delete the Builder installation folder from Windows Explorer.

TROUBLESHOOTING

4.1 Error messages when installing the EXPRESSCLUSTER X Builder

	Error message	Cause	Action
1	failed to open //var/lib/rpm/packages.rpm error: cannot open //var/lib/rpm/packages.rpm	The user logged on is not root user.	Log on as root user.
2	error: package expressclsbuilder-* is already installed	The Builder is already installed.	Uninstall the Builder and reinstall it.

4.2 Error messages when uninstalling the EXPRESSCLUSTER X Builder

	Error messages	Cause	Action
1	failed to open //var/lib/rpm/packages.rpm error: cannot open //var/lib/rpm/packages.rpm	The user logged on is not root user.	Log on as root user.
2	error: Cluster Builder is running	The Builder is active.	Exit from the Web browser. Uninstall it again after waiting for a while.

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REVISION HISTORY

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1st	Apr 10, 2020	New manual
2nd	Apr 09, 2021	Corrected the appearance.

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