EXPRESSCLUSTER X for Windows
Legacy Feature Guide

Release 2

NEC Corporation

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CHAPTER

ONE

PREFACE

1.1 Who Should Use This Guide

The EXPRESSCLUSTER X Legacy Feature Guide describes EXPRESSCLUSTER X 4.0 WebManager, Builder, and EXPRESSCLUSTER Ver 8.0 compatible commands.

1.2 How This Guide is Organized

- 2. *Functions of the WebManager*: Provides information on function of the EXPRESSCLUSTER WebManager.
- 3. *Function of the Builder*: Provides information on function of the EXPRESSCLUSTER Builder.
- 4. *Compatible command reference*: Provides information on the commands that are compatible to the commands used in the older versions of EXPRESSCLUSTER.

1.3 EXPRESSCLUSTER X Documentation Set

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

Getting Started Guide

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

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.

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".

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.

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".

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, Builder, and EXPRESSCLUSTER Ver 8.0 compatible commands.

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]`
Monospace (courier)	Indicates path names, commands, system output (message, prompt, etc), directory, file names, functions and parameters.	`c:\Program files\ EXPRESSCLUSTER`
Monospace **bold** (courier)	Indicates the value that a user actually enters from a command line.	Enter the following: **clpcl -s -a**
Monospace italic (courier)	Indicates that users should replace italicized part with values that they are actually working with.	`clpstat -s [-h host_name]`

1.5 Contacting NEC

For the latest product information, visit our website below:

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

CHAPTER

TWO

FUNCTIONS OF THE WEBMANAGER

This chapter describes the functions of the WebManager.

This chapter covers:

2.1 Starting up the WebManager

Accessing to the WebManager is required to create cluster configuration data. In this section, the overview of the WebManager is explained. After that, access to the WebManager. How to create cluster configuration data is explained.

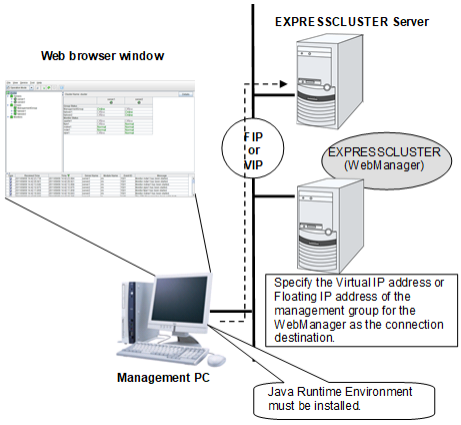
Note: You cannot configure or display functions that have been added to or changed in versions later than *EXPRESSCLUSTER* X 4.0.

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 to start the Builder, set up the cluster, monitor the cluster status, start up and stop servers and groups, and collect 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.

Specify the floating IP address or virtual IP address for accessing WebManager for the URL when connecting from a Web browser of the management PC. These addresses are registered as the resources of the management group. When the management group does not exist, you can specify the address of one of servers configuring the cluster (fixed address allocated to the server) to connect management PC with the server. In this case, the WebManager cannot acquire the status of the cluster if the server to be connected is not working.

2.1.2 Setting up Java Runtime Environment

In order to access the WebManager, a Java Runtime Environment (JRE) must be installed on the browser in a management PC. For a Java Runtime environment whose operation has been verified, refer to the website.

If the JRE is not installed on the management PC, the browser might prompt you to install.

Make sure that the JRE version is supported by WebManager when determining whether to install it.

To install Java Plug-in on a browser, refer to the browser's help and the Java 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 procedure 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://10.0.0.3:29003/main.htm

   Specify the port number of the WebManager specified at installation. (Default: 29003)

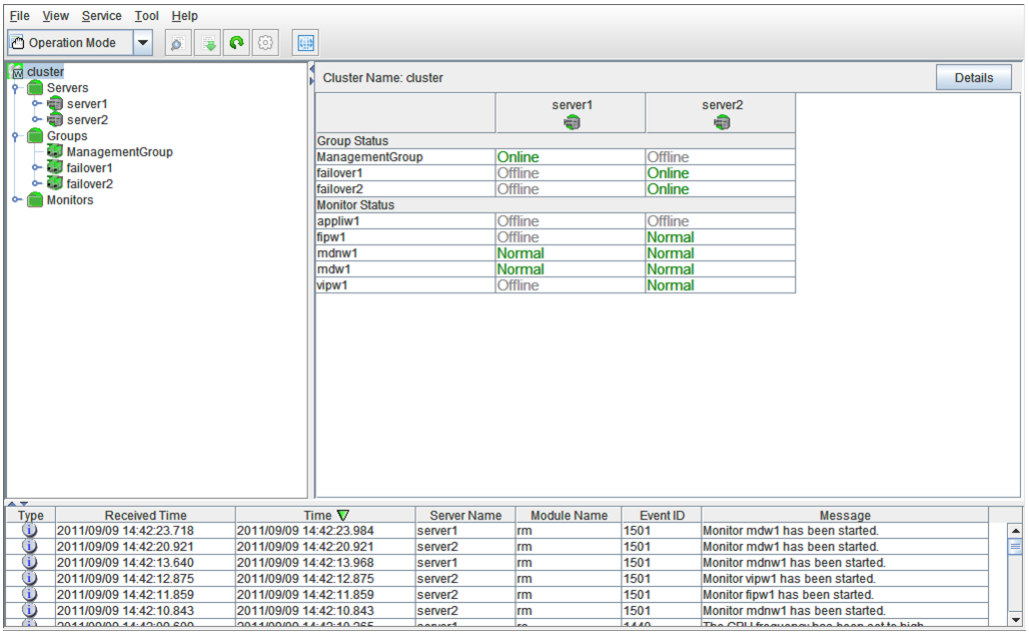
   Specify the actual IP address of the first server constituting the cluster because a management group does not exist right after the installation.

   Note:

   In Java Runtime Enviroment 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 "3.11.9. *WebManager tab*" in "3.11. *Cluster properties*" in "3. *Function of the Builder*" in this guide. Enter the following to perform encrypted communication.

https://10.0.0.1:29003/main.htm

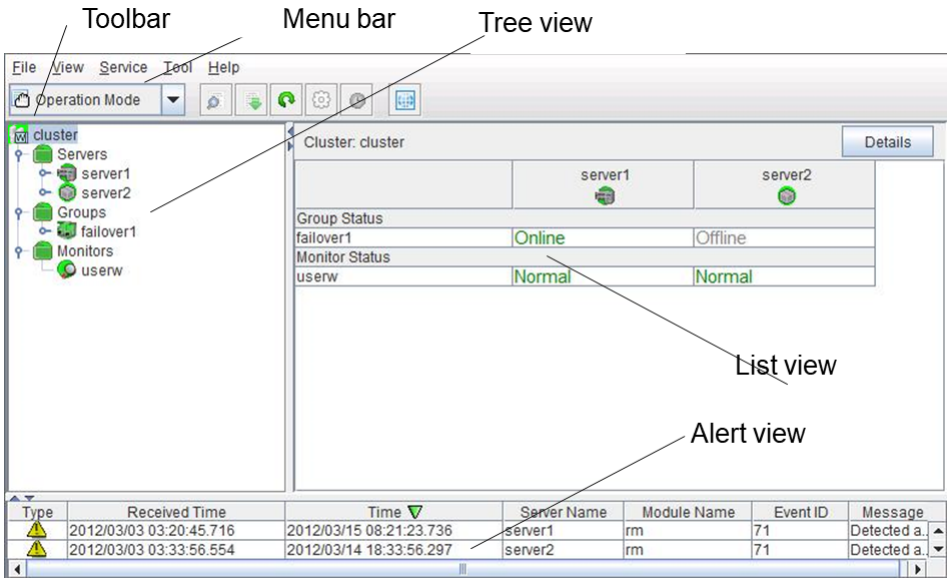
2.2 Window of the WebManager

This chapter provides information about the WebManager window.

Note: For the language used on the WebManager screen, see " 3.13.1. *Info tab*" in "3.11., *Cluster properties*" in "3. *Function of the Builder*" in this guide.

2.2.1 Main window of the WebManager

The WebManager window consists of two bars and three views.



Menu bar

The menu bar has the five menus described below. The contents of these menus differ depending on the config mode and operation/reference mode. The menu items displayed in the operation/reference mode are described later in this chapter. For details about the menus displayed in the config mode, see the next chapter.

- **File** menu
- **View** menu
- **Service** menu
- **Tool** menu
- **Help** menu

Toolbar

If you click one of the five icons or the drop-down menu on the toolbar, you can perform the same operation as when selecting the corresponding item on the menu bar.

Icon/menu	Description	Refer to:
 Operation Mode	Changes the WebManager to the operation mode. This is the same as clicking **View** on the menu bar and then selecting **Operate Mode**.	2.2.2. *Changing the WebManager operation mode*
 Config Mode	Changes the WebManager to the config mode (online version of the Builder). This is the same as clicking **View** on the menu bar and then selecting **Config Mode**.	2.2.2. *Changing the WebManager operation mode*
 Reference Mode	Changes the WebManager to the reference mode. This is the same as clicking **View** on the menu bar and then selecting **Reference Mode**.	2.2.2. *Changing the WebManager operation mode*
 Verification mode	Changes the WebManager to the verification mode. This is the same as clicking **View** on the menu bar and then selecting **Verification mode**.	2.2.2. *Changing the WebManager operation mode*
	Searches for an alert. This is the same as clicking **Tool** on the menu bar and then selecting **Alert Search**.	2.2.3. *Searching for an alert by using the WebManager*
	Collects 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**.	2.2.6. *Updating the WebManager information*
	Displays the option. This is the same as clicking **Tool** on the menu bar and then selecting **Option**.	2.2.5. *Changing the WebManager screen layout*

Continued on next page

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

Tree view

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

List view

The upper part of the view provides information on each cluster resource selected in the tree view. The lower part lists the start/stop statuses and comments of each server, group resource, and monitor resource. If you click **Details** 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 Changing the WebManager operation mode

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 **Operate Mode** on the **View** menu or 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.
- 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 the toolbar 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 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 switch to the **Config Mode**.

- Verification mode

  This mode allows the user to generate a simulated fault in specified monitor resources.

  Select **Verification mode** on the **View** menu or the toolbar to switch to the **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 simulated fault status of all the monitor resources. Select **Yes** to place all the monitor resources in the simulated fault status back in the normal monitored status. Select **No** to switch to another mode while keeping the monitor resources in the simulated fault status.

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.

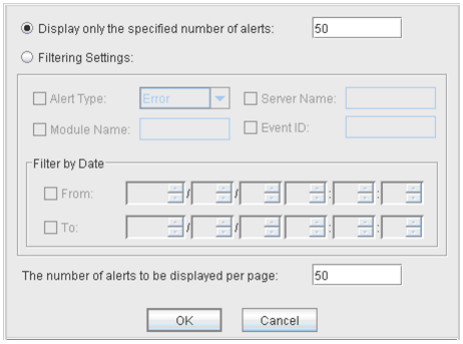
The operation performed on the pop-up window continues.

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 on the **Tool** menu or click the alert search icon [ ] on the toolbar. The window for specifying alert log search conditions is displayed.



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 click **OK**. Past alert logs are displayed as many as you have specified.

Note: The maximum value to enter is the number 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 Name	Category
pm	Whole EXPRESSCLUSTER
rc	Group/resource related
rm	Monitor resource related
nm	Heartbeat resource related
lankhb	Kernel mode LAN heartbeat resource
bmchb	BMC heartbeat resource
disknp	DISK network partition resolution resource
fip	Floating IP resource
vcom	Virtual computer name resource
ddns	Dynamic DNS resources
ddnsw	Dynamic DNS monitor resources
vip	Virtual IP resource
cifs	CIFS resource
diskw	Disk RW monitor resource
sdw	Disk TUR monitor resource
hdtw	Hybrid disk TUR monitor resource
db2	DB2 monitor resources
db2w	DB2 monitor resources
ftp	FTP monitor resources
ftpw	FTP monitor resources
http	HTTP monitor resources
httpw	HTTP monitor resources
imap4	IMAP4 monitor resources
imap4w	IMAP4 monitor resources
odbc	ODBC monitor resources
odbcw	ODBC monitor resources
oracle	Oracle monitor resources
oraclew	Oracle monitor resources
otx	WebOTX monitor resource
otxw	WebOTX monitor resource
pop3	POP3 monitor resources
pop3w	POP3 monitor resources
psql	PostgreSQL monitor resources
psqlw	PostgreSQL monitor resources
smtp	SMTP monitor resources
smtpw	SMTP monitor resources
sqlserver	SQL Server monitor resources
sqlserverw	SQL Server monitor resources

Continued on next page

Table 2.2 – continued from previous page

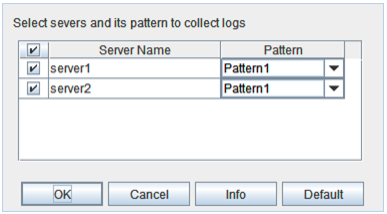
Module Name	Category
tux	Tuxedo monitor resources
tuxw	Tuxedo monitor resources
was	Websphere monitor resources
wasw	Websphere monitor resources
wls	Weblogic monitor resources
wlsw	Weblogic monitor resources
jra	JVM monitor resources
jraw	JVM monitor resources
sraw	System monitor resources
psw	Process name monitor resources
diskperf	Disk performance information management module
diskagent	Disk agent monitor resource
sdfunc	Disk function related
mdadmn	Mirror disk related
hdadmn	Hybrid disk related
armcmd	Compatible commands
event	Event log
lcns	License related
logcmd	Message output command
ptun	Parameter tuning related
lamp	Network warning light alert related
mail	Mail alert related
userw	User space monitor resources

- **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.
    For more information on the event ID, refer to "Error messages" in the "Reference Guide".
  - **Start Time, 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 Type 1 to Type 4 as the log collection pattern.

	Type 1	Type 2	Type 3	Type 4
(1) Default collection information	✓	✓	✓	n/a
(2) Event log	✓	✓	✓	✓
(3) Windows error report	✓	✓	✓	✓
(4) User dump	✓	✓	n/a	n/a
(5) Diagnosis program report	✓	✓	n/a	n/a
(6) Registry	✓	✓	✓	n/a
(7) Script	✓	✓	✓	n/a
(8) Logs of ESM-PRO/AC and ESM-PRO/UPSC	✓	✓	✓	n/a
(9) Logs of HA	n/a	✓	n/a	n/a

For detailed information of (1) to (9), see "Collecting logs (clplogcc command)" in "EXPRESSCLUSTER command reference" in the "Reference Guide".

OK

Starts log collection and displays the dialog box of log collection progress.

Cancel

Closes this dialog box.

Info

Displays the information for each pattern.

Default

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

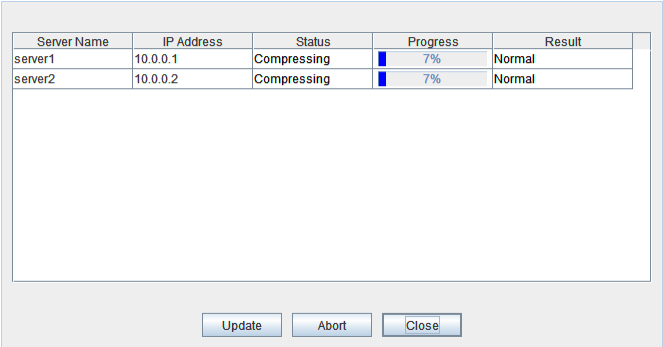


Fig. 2.1: The dialog box of the log collection progress

Update

Updates the dialog box of the log collection progress.

Abort

Aborts the log collection.

Close

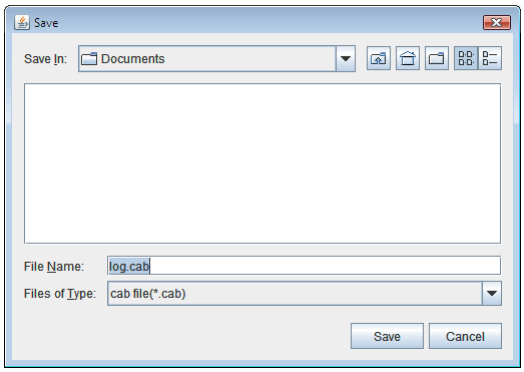
Closes the **Log Collection Progress** dialog box. Log collection is continued.

At this time, the display of **Collect Logs** in title view has changed to **Progress**. Click **Progress** to display the **Log Collection Progress** dialog box again.

Collect Logs Results

Result	Description
Normal	Log collection succeeded.
Abort	Log collection was canceled by user.
Invalid Parameters	Internal error may have occurred.
Communication Error	Connecting error occurred.
Timeout	Timeout 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 log collection completes, the browser displays a 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.

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

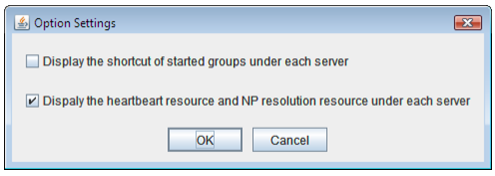
Note: If the size of the log file exceeds 2 GB, log collection may fail depending on the compression format. Adjust the log to be collected or change the log collection pattern.

2.2.5 Changing the WebManager screen layout

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

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

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.



2.2.6 Updating the WebManager information

Click **Reload** on the **Tool** menu or click the reload icon [ ] on the toolbar to update the information displayed in the WebManager.

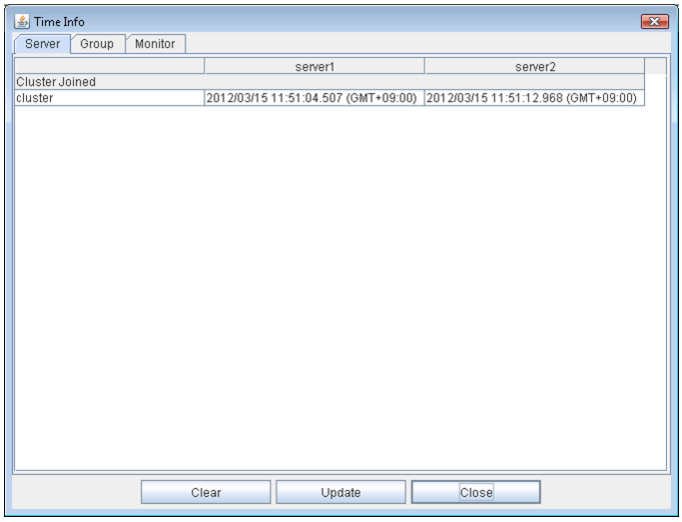
Note:

If the client data update method of the WebManager is set to **Polling**, the information displayed in the WebManager is regularly updated and the latest status is not immediately displayed even if the status has changed. To display the latest information, click the **Reload** icon or **Reload** in the **Tool** menu after performing an operation.
To configure the automatic **reload interval of the WebManager**, Open **Cluster Properties** dialog box - **WebManager** tab. Click **Tuning** button and 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.

2.2.7 Checking the time information from the WebManager

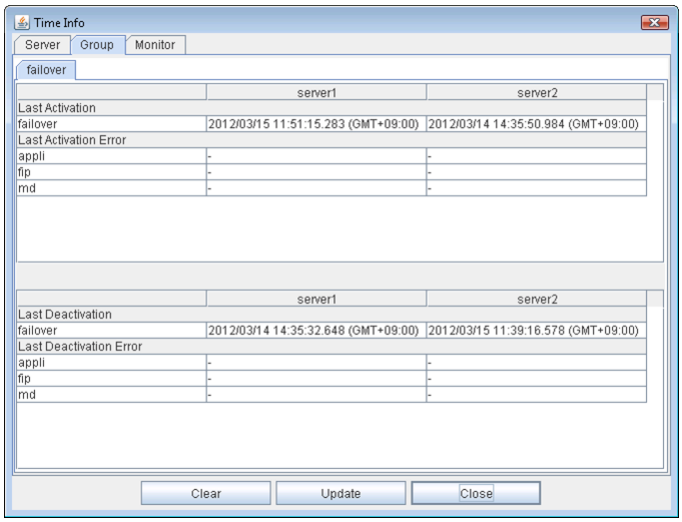
Check the time information from the WebManager by clicking **Time info** on the **Tool** menu or by clicking the time information icon [ ] on the toolbar.

Time information displayed on the Server tab



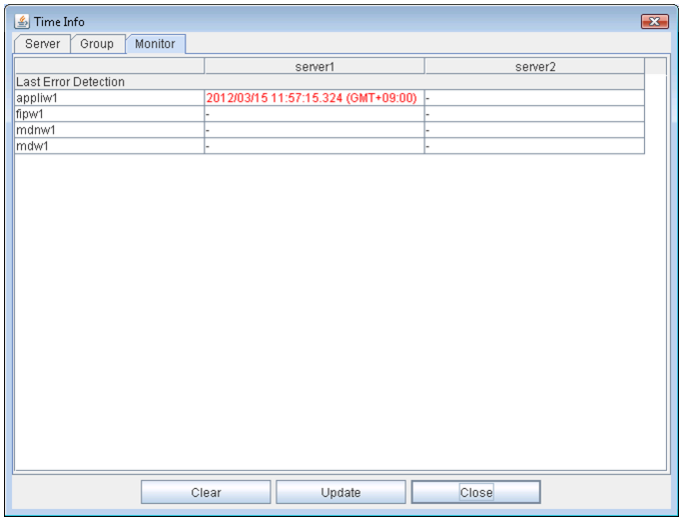
- Cluster joined
  Displays the most recent time at which each server joined the cluster.

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.

Note: Message receive monitor resources is not dealing.

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: If the Client Data Update Method of the WebManager is set to Polling, when clear button was pushed , Lighting up Time info on the Tool menu. But it's no problem as cluster.

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.

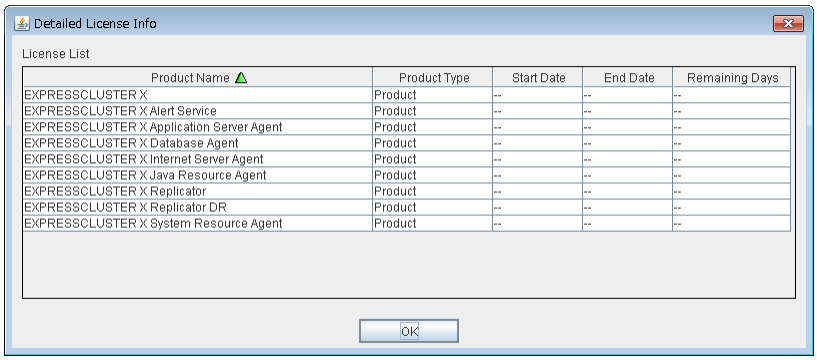
2.2.9 Operating a cluster and cluster services on the WebManager

To operate cluster services on the WebManager, select the relevant items below from the **Service** menu.

- **Suspend Cluster**
  Suspends a cluster. This menu can be selected only when all the servers in a cluster are running. Upon the completion of **Suspend Cluster**, **Suspend** appears in the tree view of WebManager.
- **Resume Cluster**
  Resumes a suspended cluster. This menu can be selected only when all the servers in a cluster are suspended.
- **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. Upon the completion of **Stop Cluster**, **Stop** appears in the tree view of WebManager.
- **Restart Manager**
  Restarts a manager.

2.2.10 Confirming the license from the WebManager

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



License List

Displays the licenses registered on the connection destination server.
You can change the display order by selecting a specific field name on the title bar of the list.
By default, the licenses are sorted in ascending order of **Product Name**.

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

OK button

Closes the **Detailed License Info** dialog box.

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

You can see the status of the objects that configure the cluster on the WebManager by following the steps below.

1. Start the WebManager.
2. On the left pane of the window, a tree is displayed. Check the status by looking at each 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 is down or in the pending status.
			Unknown	No information is acquired.
3	Individual server		Online	The server is running normally.
			Suspension (Network Partition Unsolved)	The network partition cannot be solved, because the disk network partition resolution resource is in the error status.

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No.		Icon	Status	Description
			Suspension (Isolated)	The server has been rebooted after it was shut down a way other than Suspend Cluster or a cluster shutdown.
			Offline or Unknown	The server is not working, or no information is acquired.
4	Individual server (Virtual machine)		Online	The server is running normally.
			Suspension (Network Partition Unsolved)	The network partition cannot be solved, because the disk network partition resolution resource is in the error status.
			Suspension (Isolated)	The server has been rebooted after it was shut down a way other than Suspend Cluster or a cluster shutdown.
			Offline or Unknown	The server is not working, or no information is acquired.
5	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.
6	BMC heartbeat resource		Normal	The resource can communicate with all servers.
			Caution	One or more servers in the cluster cannot be accessed.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The resource is not working normally.
			Unknown	No status is acquired.
			Not Used	The heartbeat resource is not registered.
7	Disk network partition resolution 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 disk network partition resolution resource is not registered.
8	COM network partition resolution 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 network partition resolution resource is not registered.
9	PING network partition resolution 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 PING network partition resolution resource is not registered.
10	Majority Network Partition Resolution 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 Majority 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.
			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	Application resource		Online	The application resource has been started.
			Error	The application resource has an error.
			Offline or Unknown	The application resource is stopped, or no information is acquired.
14	Floating IP resource		Online	The floating IP resource has been started.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The floating IP resource has an error.
			Offline or Unknown	The floating IP resource is stopped/ no information is acquired.
15	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.
16	Registry synchronization resource		Online	The registry synchronization resource has been started.
			Error	The registry synchronization resource has an error.
			Offline or Unknown	The registry synchronization resource is stopped, or no information is acquired.
17	Script resource		Online	The script resource has been started.
			Error	The script resource has an error.
			Offline or Unknown	The script resource is stopped, or no information is acquired.
18	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.
19	Service resource		Online	The service resource has been started.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The service resource has an error.
			Offline or Unknown	The service resource is stopped, or no information is acquired.
20	Print spooler resource		Online	The print spooler resource has been started.
			Error	The print spooler resource has an error.
			Offline or Unknown	The print spooler resource is stopped, or no information is acquired.
21	Virtual computer name resource		Online	The virtual computer name resource has been started.
			Error	The virtual computer name resource has an error.
			Offline or Unknown	The virtual computer name resource is stopped, or no information is acquired.
22	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.
23	CIFS resource		Online	The CIFS resource has been started.
			Error	The CIFS resource has an error.
			Offline or Unknown	The CIFS resource is stopped, or no information is acquired.
24	NAS resource		Online	The NAS resource has been started.
			Error	The NAS resource has an error.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Offline or Unknown	The NAS resource is stopped, or no information is acquired.
25	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.
26	Virtual machine resource		Online	The virtual machine resource has been started.
			Error	The virtual machine resource has an error.
			Offline or Unknown	The virtual machine resource has been stopped, or no information has been acquired.
27	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 is acquired.
28	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.
29	AWS virtual ip resource		Normal	The AWS virtual ip resource is running normally.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The AWS virtual ip resource has an error.
			Offline or Unknown	The AWS virtual ip resource is stopped, or no information is acquired.
30	AWS DNS resource		Online	AWS DNS resource has been started.
			Error	AWS DNS resource has an error.
			Offline or Unknown	AWS DNS resource is stopped, or no information is acqauired.
31	Azure probe port resource		Normal	The Azure probe port resource is running normally.
			Error	The Azure probe port resource has an error.
			Offline or Unknown	The Azure probe port resource is stopped, or no information is acquired.
32	Azure DNS resource		Online	Azure DNS resource has been started.
			Error	Azure DNS resource has an error.
			Offline or Unknown	Azure DNS resource is stopped, or no information is acquired.
33	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.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			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 is inhibited.
			Caution (Recovery Action Disabled)	In the warning status, the recovery action disabled.
			Error (Recovery Action Disabled)	In the error status, the recovery action disabled.
			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.
34	Application monitor resource[2]		Normal	The application is running normally.
			Caution	There are one or more servers with application problems, or monitoring is suspended on a server.
			Error	All servers have application errors.
			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.
35	Disk RW 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.
36	Floating IP monitor resource[2]		Normal	The floating IP address has no error.
			Caution	One or more servers cannot communicate with the floating IP address, or monitoring is suspended on a server.
			Error	No servers can communicate with the floating IP address.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
37	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.
			Unknown	No information is acquired.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
38	Mirror connect monitor resource		Normal	The mirror connect is running normally.
			Caution	One of the servers has mirror connect problems, or monitoring is suspended on a server.
			Error	A mirror connect error has occurred on both servers.
			Unknown	No information is acquired.
39	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.
			Unknown	No information is acquired.
40	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.
41	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.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	Multi target has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
42	Registry synchronization monitor resource[2]		Normal	The registry synchronization is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The registry synchronization has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
43	Disk TUR 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 the servers have disk errors.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
44	Service monitor resource[2]		Normal	The service is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The service has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
45	Print spooler monitor resource[2]		Normal	The print spooler monitor is running normally.
			Caution	Monitoring is suspended on a server.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The print spooler has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
46	Virtual computer name monitor resource[2]		Normal	The virtual computer name is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The virtual computer name has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
47	Virtual IP monitor resource[2]		Normal	The virtual IP is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The virtual IP has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
48	CIFS monitor resource[2]		Normal	The CIFS is working normally.
			Caution	Monitoring is suspended on a server.
			Error	The CIFS has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
49	NAS monitor resource[2]		Normal	The NAS is working normally.
			Caution	Monitoring is suspended on a server.
			Error	The NAS has an error.
			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.
50	Hybrid disk monitor resource		Normal	The Hybrid disk is working normally.
			Caution	Mirroring is now being recovered, or monitoring is suspended on a server.
			Error	The hybrid disk has an error. Mirror recovery is needed.
			Unknown	No information is acquired.
51	Hybrid disk TUR monitor resource[2]		Normal	The disk is working normally.
			Caution	One of servers has a problem with the disk, or monitoring is suspended on a server.
			Error	All the servers have disk errors.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
52	Custom monitor resource[2]		Normal	No error is detected by monitor script.
			Caution	There is a server where monitoring is suspended, or an error has been detected in one of the servers.
			Error	Monitor script has detected an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
53	VM monitor resource		Normal	The VM is running normally.
			Caution	The virtual machine is not working on one or more servers, or monitoring is suspended on a server.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The VM has an error.
			Unknown	No information is acquired.
54	Message receive monitor resource		Normal	No error message has been received.
			Caution	Change to "A server has received an error message, or monitoring is suspended on a server."
			Error	An error message has been received.
			Unknown	No information is acquired.
55	DB2 monitor resource[2]		Normal	The DB2 is working normally.
			Caution	Monitoring is suspended on a server.
			Error	The DB2 has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
56	FTP monitor resource[2]		Normal	The FTP is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The FTP has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
57	HTTP monitor resource[2]		Normal	The HTTP is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The HTTP has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
58	IMAP4 monitor resource[2]		Normal	The IMAP4 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	The IMAP4 has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
59	ODBC monitor resource[2]		Normal	The ODBC is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The ODBC has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
60	Oracle monitor resource[2]		Normal	The Oracle monitor resource is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The Oracle monitor resource has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
61	POP3 monitor resource[2]		Normal	The POP3 monitor resource is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The POP3 monitor resource has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
62	PostgreSQL monitor resource[2]		Normal	The PostgreSQL is running normally.
			Caution	Monitoring is suspended on a server.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The PostgreSQL has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
63	SMTP monitor resource[2]		Normal	The SMTP monitor is running smoothly.
			Caution	Monitoring is suspended on a server.
			Error	The SMTP resource has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
64	SQL Server monitor resource[2]		Normal	The SQL Server is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The SQL Server has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
65	Tuxedo monitor resource[2]		Normal	The Tuxedo is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The Tuxedo has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
66	Websphere monitor resource[2]		Normal	The WebSphere is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The WebSphere 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
67	WebLogic monitor resource[2]		Normal	The WebLogic is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The WebLogic has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
68	WebOTX monitor resource[2]		Normal	The WebOTX is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The WebOTX has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
69	JVM monitor resource[2]		Normal	JavaVM is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The load on the JavaVM exceeds the configured value.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
70	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.
71	Process name monitor resource[2]		Normal	The specified process is running normally.
			Caution	Monitoring is suspended on a server.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
			Error	The specified process is suspended.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
72	User space monitor resource[2]		Normal	The user space is running normally.
			Caution	One or more servers have an error, or monitoring is suspended on a server.
			Error	The user space is not running normally on all servers.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
73	Dynamic DNS monitor resource		Normal	The dynamic DNS monitor resource is running normally.
			Caution	Monitoring is suspended on a server.
			Error	The dynamic DNS monitor resource has an error.
			Unknown	No information is acquired.
74	AWS elastic ip monitor resource[2]		Normal	The AWS elastic ip monitor resource is running normally.
			Caution	Acquiring the AWS CLI command response failed on a server, 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.

Continued on next page

Table 2.5 – continued from previous page

No.		Icon	Status	Description
75	AWS virtual ip monitor resource[2]		Normal	The AWS virtual ip monitor resource is running normally.
			Caution	Acquiring the AWS CLI command response failed on a server, or monitoring is suspended on a server.
			Error	The AWS virtual ip monitor resource has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
76	AWS AZ monitor resource[2]		Normal	The AWS AZ monitor resource is running normally.
			Caution	Acquiring the AWS CLI command response failed on a server, 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.
77	AWS DNS monitor resource[2]		Normal	AWS DNS monitor resource is running normally.
			Caution	Acquiring the AWS CLI command response failed on a server, or monitoring is suspended on some servers.
			Error	AWS DNS monitor resource 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
78	Azure probe port monitor resource[2]		Normal	The Azure probe port monitor resource is running normally.
			Caution	Probe port wait timeout occurred in the Azure probe port monitor resource to be monitored on a server, or monitoring is suspended on a server.
			Error	The Azure probe port monitor resource has an error.
			Dummy Failure	Dummy Failure is enabled.
			Unknown	No information is acquired.
79	Azure load balance monitor resource[2]		Normal	The Azure load balance monitor resource is running normally.
			Caution	Monitoring for the Azure load balance monitor resource 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.
80	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.

Continued on next page

Table 2.5 – continued from previous page

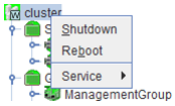
No.		Icon	Status	Description
			Unknown	No information is acquired.

2.3.2 Operations from the WebManager

You can operate a cluster by right-clicking (1) a cluster, (3) an individual server, (10) an individual group, or (24) a VM resource and choosing an operation.

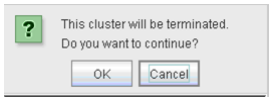
Objects of the cluster

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



- Shut down

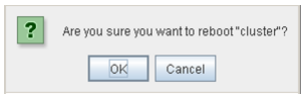
  Shuts down all running servers. When you select **Shutdown**, the following dialog box is displayed for confirmation.

  The server that cannot communicate with the server (all LAN heartbeat resources are stopped) connected to the WebManager does not shut down.

- Reboot

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

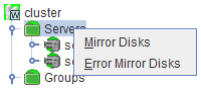
  

- Service

  If you select **Service**, **Suspend Cluster**, **Resume Cluster**, **Start Cluster**, **Stop Cluster** and **Restart Manager** are displayed on the shortcut menu.

Server object

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

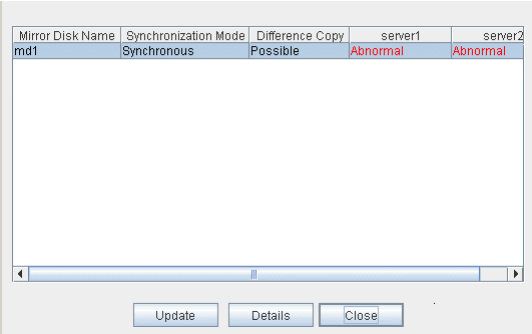


- Mirror Disk List

  If you select this operation, the following dialog box of the mirror disk list is displayed, and the list of all mirror disk resources and hybrid disk resources is displayed.

[1] If recovery action triggered by monitor resource error is disabled, "Recovery Action Disabled" is indicated next to the monitor. If a monitor resource for which a dummy failure occurred exists, "Failure Verification" is indicated.

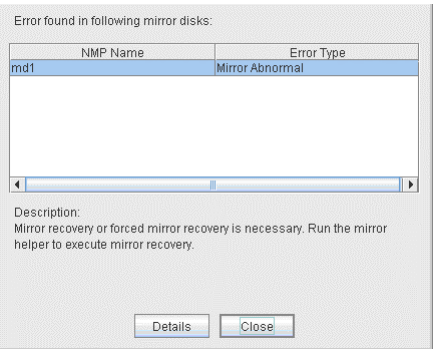
[2] If a dummy failure has occurred, "Dummy Failure" is indicated.



- **Detail** (Starts **Mirror Disk Helper**)
  Starts the **Mirror Disk Helper** dialog box for the selected mirror disk resource/hybrid disk resource.

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

- Error Mirror Disk List
  Lists mirror disk resources and hybrid disk resources with an error in the dialog box.



  If there is a mirror disk with an error listed below in the cluster, the above dialog box will be displayed automatically.
  The description provides what you should do for the error.

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.

Continued on next page

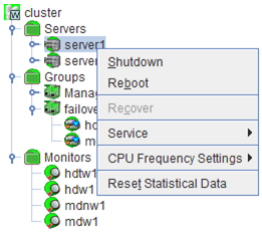
Table 2.6 – continued from previous page

Error type	Description
Mirror Error (Single Server Run)	Only one server is running, and the latest data of a mirror 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.

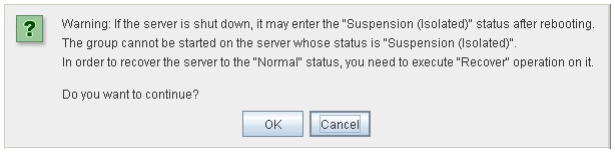
Individual server objects

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



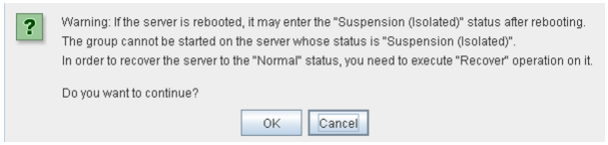
- Shut down

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



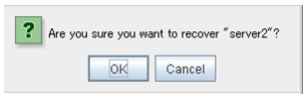
- Reboot

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



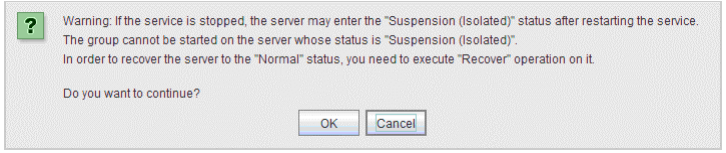
- Recover

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

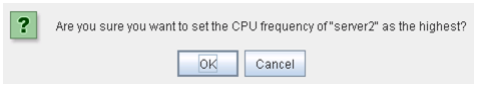


- Service

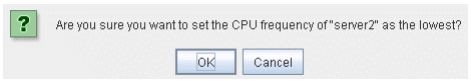
  Starts and stop the selected service. If you select this operation, the following dialog box is displayed for confirmation.



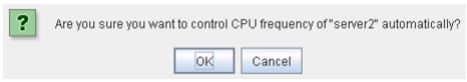
- CPU Frequency Settings
  Configures the CPU frequency control function of the selected server.
  - Highest Frequency
    Sets the CPU frequency to the highest.

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

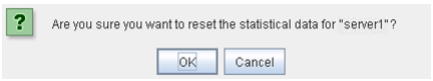
    

  - Auto
    Restores the CPU frequency control to the control by EXPRESSCLUSTER.

    This function cannot be used when **Use CPU Frequency Control** is not checked on the **Extension** tab of **Cluster Properties**.

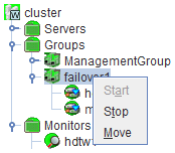
- Reset Statistical Data
  Resets the statistical data for the selected server. If you select this operation, the following dialog box is displayed for confirmation.

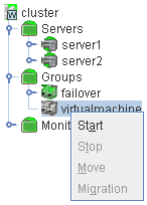
Individual group objects

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

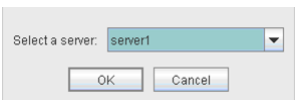
When group type is failover.



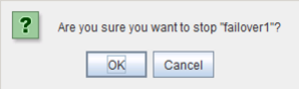
When group type is virtualmachine.



- 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.

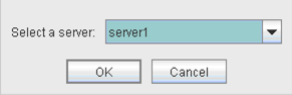
  

- Stop (enabled only when the group has been started up or when it has an error)
  Stops the selected group. When you select this operation, the following dialog box is displayed for confirmation.



- 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.

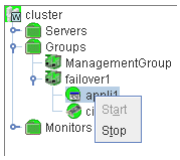
- Migration (Only selectable when group type is virtualmachine and it is running.)
  Stop the virtual machine temporarily which is managed by the virtual machine resource of the selected group, and move the group to another server. The dialog is displayed to select the server to which the selected group is moved.



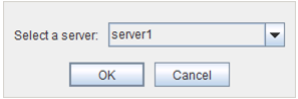
  The temporarily stopped virtual machine is resumed on the destination server.

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

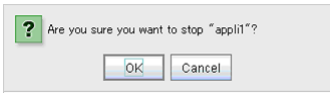
When you right-click an individual group resource object, the following shortcut menu is displayed.



- 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.

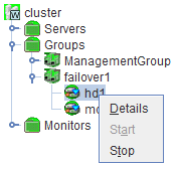


- Stop (enabled only when the group has been started up or when it has an error)
  Stops the selected group resource. When you selected this operation, the following dialog box is displayed for confirmation.



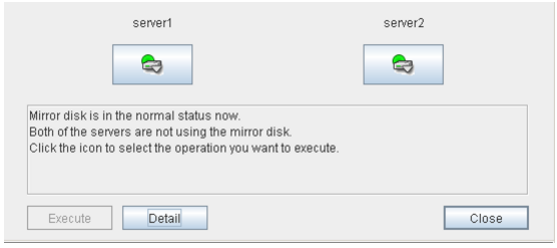
Objects of mirror disk resource and hybrid disk resource

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



- Details

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

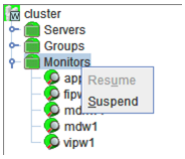


  For information on using the Mirror Disk Helper, see "2.6. *Mirror disk helper*".

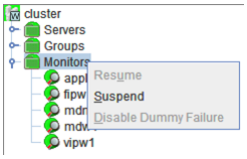
Monitor resource objects

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

When operation mode is selected

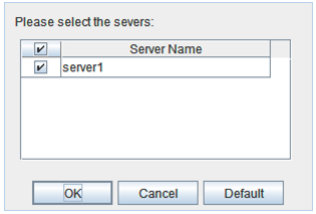


When verification mode is selected



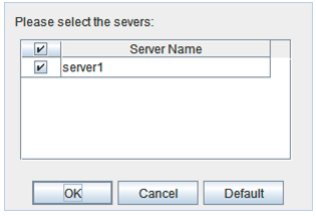
- Resume (enabled when the resources are stopped temporarily)

  Resumes all the currently configured monitor resources. This operation is not performed for those monitor resources for which the suspending/resuming of monitoring is not possible. A dialog box for selecting the server on which the monitor resources will be resumed is displayed.



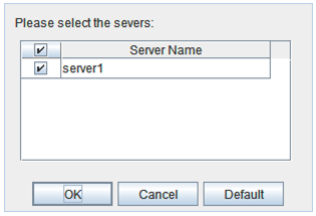
- Suspend (enabled when the resources are monitoring)

  Suspends all the currently configured monitor resources. This operation is not performed for those monitor resources for which the suspending/resuming of monitoring is not possible. A dialog box for selecting the server on which the monitor resources will be stopped temporarily is displayed.



- Stop Dummy Failure (enabled only when dummy failure is started)

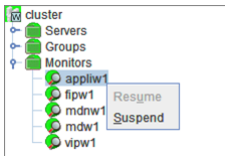
Stops the dummy failure that has been set for all monitor resources. The following dialog box for selecting the server on which dummy failure in the monitor resources is to be stopped is displayed.



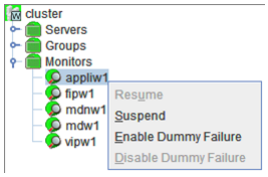
Individual monitor resource objects

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

When operation mode is selected

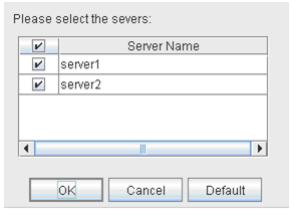


When verification mode is selected



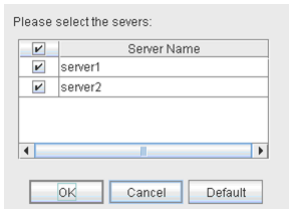
- Resume (enabled when the resource is stopped temporarily)

  Resumes a selected monitor resource. The dialog box for choosing the server on which the selected monitor resource is resumed.



- Suspend (enabled when the resource is monitoring)

  Resumes the selected monitor resource. The dialog box for choosing the server on which the selected monitor resource is stopped temporarily.



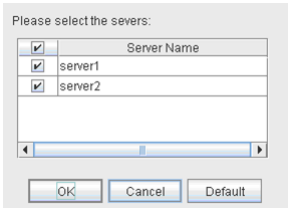
- Start Dummy Failure (enabled when verification mode is not executed)

  Generates a simulated fault in a selected monitor resource. A simulated fault can be generated only on a server on which **Resource Status on Each Server** of the relevant monitor resource is other than **Error** or **Dummy Failure**.

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

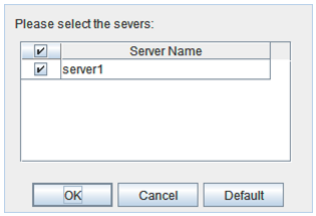
- Mirror connect monitor resource
- Mirror disk monitor resource
- Hybrid disk monitor resource
- Message receive monitor resource
- VM monitor resource

The following dialog box for selecting the server on which A dummy failure is generated. for a selected monitor resource is displayed.



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.

- Stop Dummy Failure (enabled when verification mode is executed)
  Stops the dummy failure generated in a selected monitor resource. The following dialog box for selecting the server on which the dummy failure is to be stopped for a selected monitor resource is displayed.

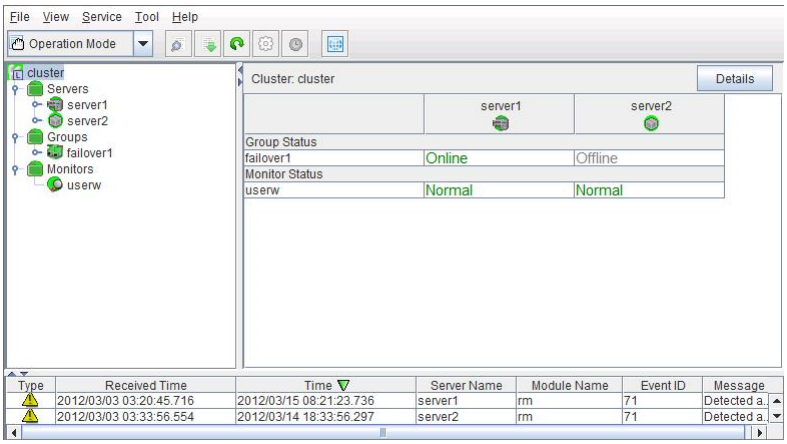


2.4 Checking the cluster status by the WebManager list view

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

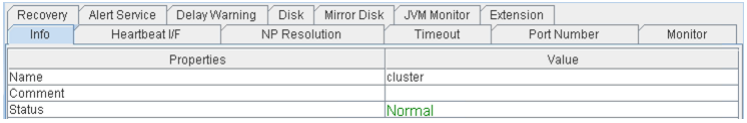
2.4.1 To display information on the whole cluster

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 resource status of each server are displayed.



3. Click Details to display the following in the dialog box.

Info

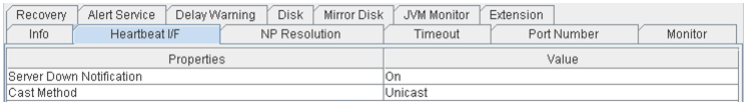


Name: Cluster name

Comment: Comment for the cluster

Status: Status of the cluster

Heartbeat I/F

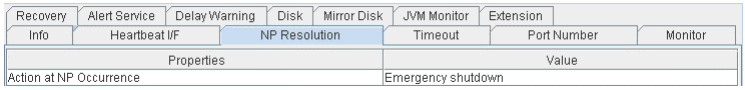


Server Down Notification: When you set this to On, one server is allowed to tell the other servers that it is being shut down by the commands from WebManager or command line, so that a failover occurs independently of the heartbeat timeout settings.

Note: Even if **Server Down Notification** is set to **On**, failover is performed after a heartbeat timeout when shutdown is performed with a method other than the WebManager or a command.

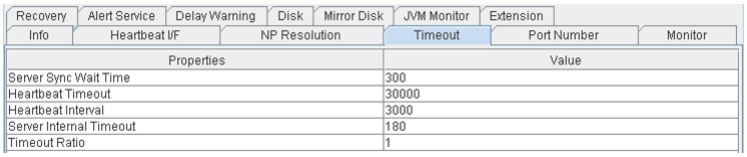
Cast Method: Configures the Heartbeat Cast Method (Unicast / Broadcast); Broadcast is unavailable when the IP address of the Heartbeat I/F is configured with IPv6.

NP Resolution



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

Timeout



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

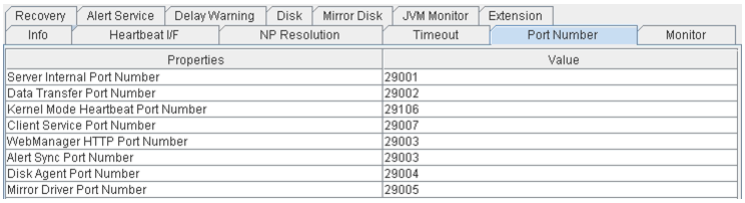
Heartbeat Timeout: Heartbeat timeout (in milliseconds)

Heartbeat Interval: The interval for sending heartbeats (milliseconds)

Server Internal Timeout: Internal communication timeout (in seconds)

Timeout Ratio: Current timeout ratio

Port Number



Server Internal Port Number: Port number for internal communication

Data Transfer Port Number: Port number for data transfer

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

Client Service Port Number: Port number for client service

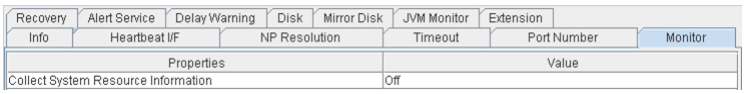
WebManager HTTP Port Number: Port number for WebManager

Alert Sync Port Number: Port number for alert synchronization

Disk Agent Port Number: Port number for disk agent

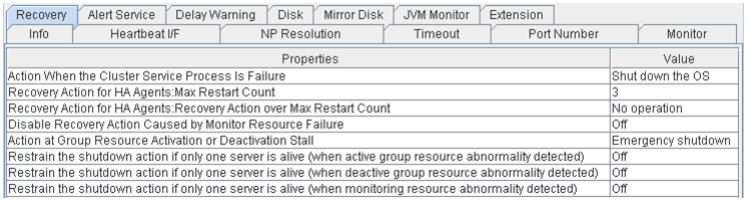
Mirror Driver Port Number: Port number for mirror driver (Only when Replicator/Replicator DR is used)

Monitor



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

Recovery



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	Emergency shutdown
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

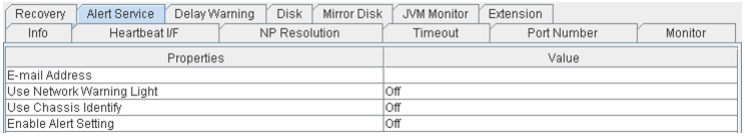
Action at Group Resource Activation or Deactivation Stall: Action to be taken when group resource activation/deactivation is stalled

Restrain the shutdown action if only one server is alive (when active group resource abnormality detected): Whether to disable shutdown at activation failure in the case of the last one server

Restrain the shutdown action if only one server is alive (when deactive group resource abnormality detected): Whether to disable shutdown at deactivation failure in the case of the last one server

Restrain the shutdown action if only one server is alive (when monitoring resource abnormality detected): Whether to disable shutdown at monitoring failure in the case of the last one server

Alert Service



Properties	Value
E-mail Address	
Use Network Warning Light	Off
Use Chassis Identify	Off
Enable Alert Setting	Off

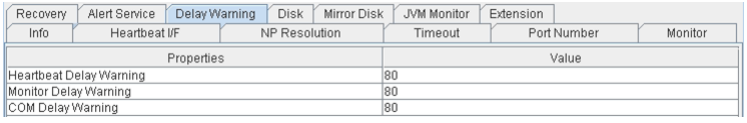
E-mail Address: Destination mail address

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

Use Chassis Identify: Whether or not to use chassis ID lamp association

Enable Alert Setting: Whether or not to enable setting

Delay Warning



Properties	Value
Heartbeat Delay Warning	80
Monitor Delay Warning	80
COM Delay Warning	80

Heartbeat Delay Warning: Heartbeat delay warning (%)

Monitor Delay Warning: Monitor delay warning (%)

COM Delay Warning: COM communication delay warning (%)

Disk

Recovery | Alert Service | Delay Warning | Disk | Mirror Disk | JVM Monitor | Extension
Info | Heartbeat I/F | NP Resolution | Timeout | Port Number | Monitor

Properties	Value
Shared Disk Disconnection Retry Threshold	10
Shared Disk Disconnection Timeout	1800
Shared Disk Disconnection Retry Interval	3
Shared Disk Disconnection Final Action	Disconnect forcefully

Shared Disk Disconnection Retry Threshold: Shared disk disconnection retry threshold

Shared Disk Disconnection Timeout: Shared disk disconnection timeout (in seconds)

Shared Disk Disconnection Retry Interval: Shared disk disconnection retry interval (in seconds)

Shared Disk Disconnection Final Action: Shared disk disconnection final action

Mirror disk (Only when Replicator/Replicator DR is used)

Recovery | Alert Service | Delay Warning | Disk | Mirror Disk | JVM Monitor | Extension
Info | Heartbeat I/F | NP Resolution | Timeout | Port Number | Monitor

Properties	Value
Auto First Mirror Construction	On
Auto Mirror Recovery	On
Collect Mirror Statistics	On
Difference Bitmap Size (MB)	1
History Recording Area Size in Asynchronous Mode (MB)	1
Mirror Disk Disconnection Retry Threshold	10
Mirror Disk Disconnection Timeout	1800
Mirror Disk Disconnection Retry Interval	3
Mirror Disk Disconnection Final Action	Disconnect forcefully

Auto First Mirror Construction: Whether or not to perform auto mirror initial construction.

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

Collect Mirror Statistics: Whether or not to perform mirror statistics collection

Difference Bitmap Size (MB): Size of differential bitmap

History Recording Area Size in Asynchronous Mode (MB): Size of history record area of unsent data in asynchronous mode.

Mirror Disk Disconnection Retry Threshold: Mirror disk disconnection retry threshold

Mirror Disk Disconnection Timeout: Mirror disk disconnection timeout (in seconds)

Mirror Disk Disconnection Retry Interval: Mirror disk disconnection retry interval (in seconds)

Mirror Disk Disconnection Final Action: The final action at mirror disk disconnection

JVM monitor

Recovery | Alert Service | Delay Warning | Disk | Mirror Disk | JVM Monitor | Extension
Info | Heartbeat I/F | NP Resolution | Timeout | Port Number | Monitor

Properties	Value
Java Install Path	a
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 Installation Path: Java installation path

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

Load Balancer Connection Setting: 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: Resource measurement: Measurement retry count

Resource Measurement: Threshold for Abnormal Judgment: Resource Measurement: Threshold for Abnormal Judgment:

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

Resource Measurement: Interval for Full GC: Resource measurement: Interval for Full GC measurement (sec)

WebLogic Monitoring: Retry Count: WebLogic monitoring: Measurement retry count

WebLogic Monitoring: Threshold for Abnormal Judgment WebLogic monitoring: Threshold for Abnormal Judgment:

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

WebLogic monitoring: Interval for Average measurement: WebLogic monitoring: 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

Directory containing HTML files: HTML storage directory

HTML File Name: HTML file name

HTML Renamed File Name: Renamed HTML file name

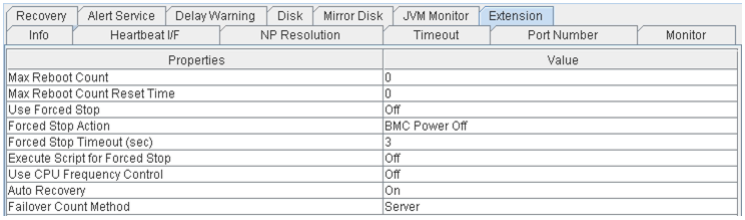
Retry Count for renaming: Retry count if renaming fails

Wait time for retry: 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

Extension



Max Reboot Count: Maximum reboots count

Max Reboot Count Reset Time: Time to reset maximum reboot count (in seconds)

Use Forced Stop: Whether or not to perform the forced stop function

Forced Stop Action: Action of forced stop function

Forced Stop Timeout (sec): Wait time until activation of failover group starts after forced stop has been performed (in seconds)

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

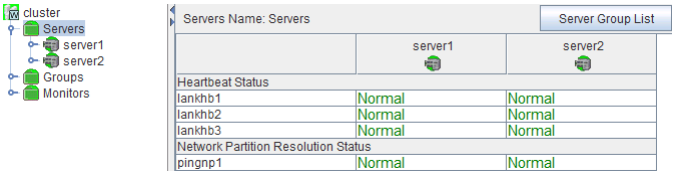
Use CPU Frequency Control: Whether or not to use CPU frequency control

Auto Recovery: The setting whether server recovery is automatically performed after cluster server is rebooted from "Suspension (Isolated)."

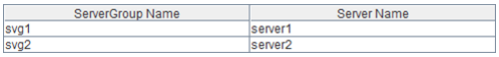
Failover Count Method: Settings to specify the method of counting failovers (by Server or Cluster)

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

1. Start the WebManager.
2. In the tree view, select the object icon for the entire server. In the upper part of the list view in the right pane, the heartbeat status and network partition resolution status list of each server are displayed.

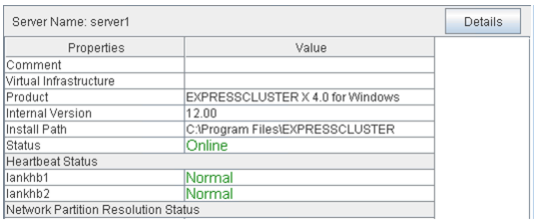


Additionally, click **Server Group List** to display the information of the server group on the pop up dialog.



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

1. Start the WebManager.
2. If the object of a server is selected in the tree view, **Comment**, **Version, Product, Internal Version, Install Path** and **Status** of the server are displayed.



Comment: Comment for the server

Virtual Infrastructure: Virtual infrastructure name

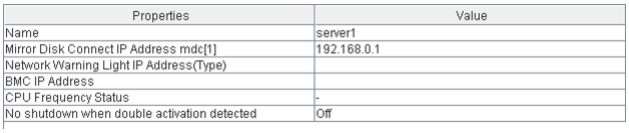
Product: Name of the product

Internal Version: Internal version

Install Path: Install path of EXPRESSCLUSTER

Status: Status of the server

3. Click **Details** to display the following in the dialog box.



Name: Server name

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

Network Warning Light IP Address(Type): IP address of network warning light

BMC IP address: BMC IP address

CPU Frequency Status: Current setting status of CPU frequency control

No shutdown when double activation detected: Whether to disable shutdown when activation of both disks is detected

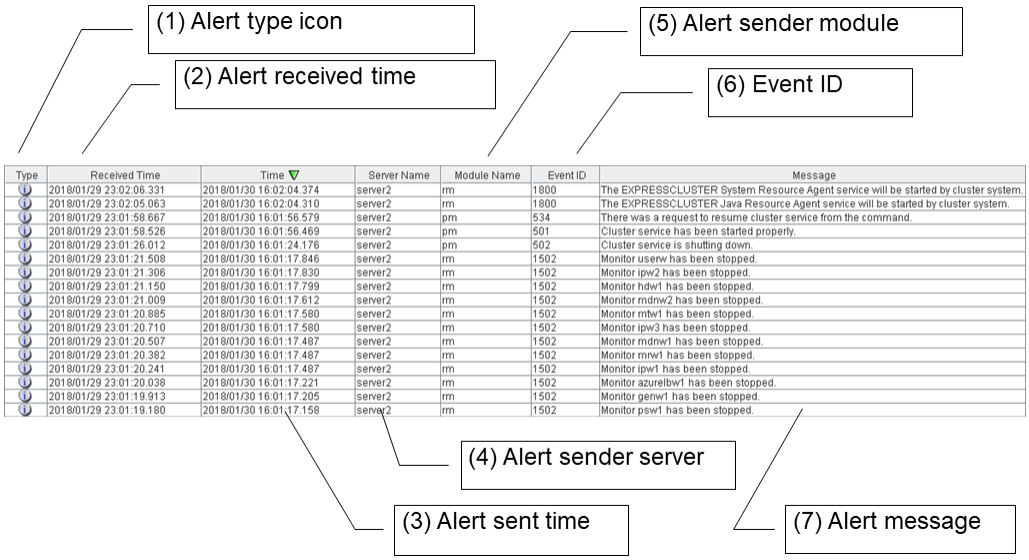
2.4.4 Checking the status of the whole monitor in the WebManager list view

1. Start the WebManager.
2. In the tree view, select the object icon for the entire monitor . In the list view, Monitor Name and a list of server statuses are displayed.

[3] The I/F number of the mirror disk connection is entered to the number in the parentheses.

2.5 Checking alerts using the WebManager

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



Type	Received Time	Time	Server Name	Module Name	Event ID	Message
	2018/01/29 23:02:06.331	2018/01/30 16:02:04.374	server2	rm	1800	The EXPRESSCLUSTER System Resource Agent service will be started by cluster system.
	2018/01/29 23:02:05.063	2018/01/30 16:02:04.310	server2	rm	1800	The EXPRESSCLUSTER Java Resource Agent service will be started by cluster system.
	2018/01/29 23:01:58.667	2018/01/30 16:01:56.579	server2	pm	534	There was a request to resume cluster service from the command.
	2018/01/29 23:01:58.526	2018/01/30 16:01:56.469	server2	pm	501	Cluster service has been started properly.
	2018/01/29 23:01:26.012	2018/01/30 16:01:24.176	server2	pm	502	Cluster service is shutting down.
	2018/01/29 23:01:21.508	2018/01/30 16:01:17.846	server2	rm	1502	Monitor userw has been stopped.
	2018/01/29 23:01:21.306	2018/01/30 16:01:17.830	server2	rm	1502	Monitor ipw2 has been stopped.
	2018/01/29 23:01:21.150	2018/01/30 16:01:17.799	server2	rm	1502	Monitor hdw1 has been stopped.
	2018/01/29 23:01:21.009	2018/01/30 16:01:17.612	server2	rm	1502	Monitor mdnw2 has been stopped.
	2018/01/29 23:01:20.885	2018/01/30 16:01:17.580	server2	rm	1502	Monitor mtw1 has been stopped.
	2018/01/29 23:01:20.710	2018/01/30 16:01:17.580	server2	rm	1502	Monitor ipw3 has been stopped.
	2018/01/29 23:01:20.507	2018/01/30 16:01:17.487	server2	rm	1502	Monitor mdnw1 has been stopped.
	2018/01/29 23:01:20.382	2018/01/30 16:01:17.487	server2	rm	1502	Monitor mrw1 has been stopped.
	2018/01/29 23:01:20.241	2018/01/30 16:01:17.487	server2	rm	1502	Monitor ipw1 has been stopped.
	2018/01/29 23:01:20.038	2018/01/30 16:01:17.221	server2	rm	1502	Monitor azurelbw1 has been stopped.
	2018/01/29 23:01:19.913	2018/01/30 16:01:17.205	server2	rm	1502	Monitor genw1 has been stopped.
	2018/01/29 23:01:19.180	2018/01/30 16:01:17.158	server2	rm	1502	Monitor psw1 has been stopped.

For the meanings of alert messages, see "Error messages" in the "Reference Guide". For information about searching 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) Alrert 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 name 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*".

(6) Event ID
The event ID number set to each alert.

(7) Alert message
The alert messages.

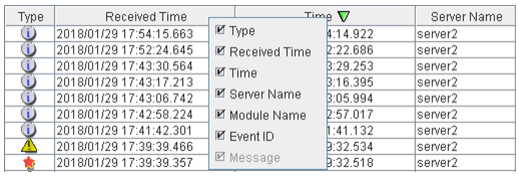
2.5.2 Alert view operation

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

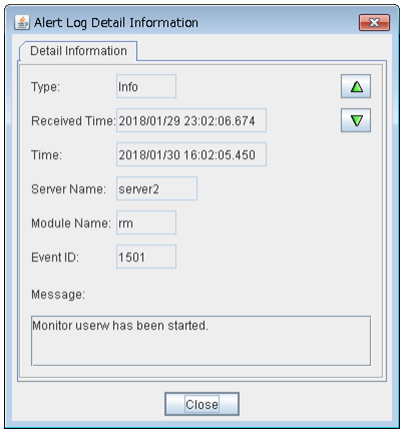
Whenever you select an item, the ▲ or ▼ mark is displayed in each field.

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

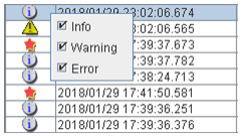
By default, alerts are displayed in the **Time** descending order.
When you right-click this bar, the following pop-up window is displayed so that you can select the items to be displayed. All items are selected by default.



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.

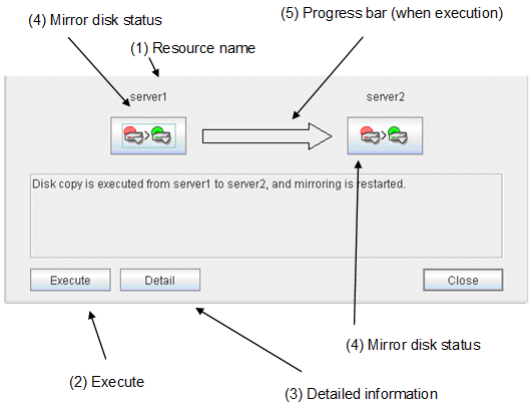


2.6 Mirror disk helper

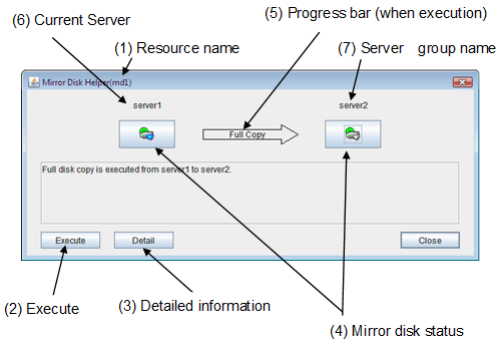
2.6.1 Overview of the mirror disk helper

The Mirror Disk Helper is a tool to help the recovery of mirror disk/hybrid disk. It is used by starting up from the WebManager. The following shows the layout of the Mirror Disk Helper.

For mirror disk resource



For hybrid disk resource



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

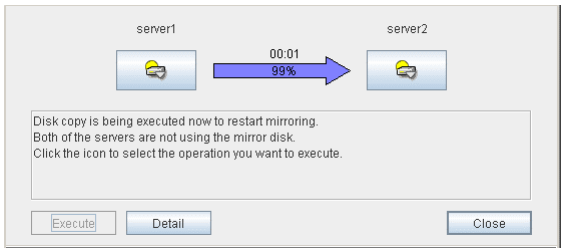
The following is the description of the each field of the Mirror Disk Helper.

(1) Resource name

Displays the name of the mirror disk resource/hybrid disk resource.

(2) Execute

When you click **Execute**, mirror recovery is started as displayed in the following dialog box. If there is any difference between the mirror disks in both servers, the mirror recovery is started.



If there is no difference between the mirror disks in both servers, the following dialog box is displayed.

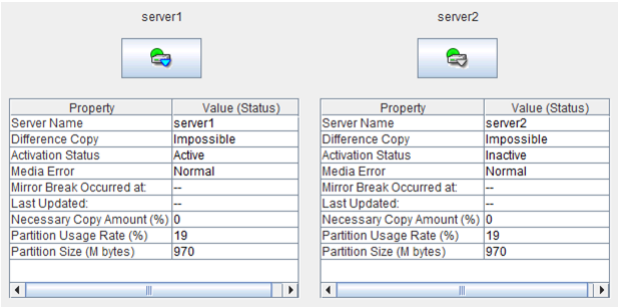
If you click **OK**, full copy of the mirror begins.

If **Auto Mirror Recovery** is set to **On**, mirror recovery begins automatically. However, mirror recovery does not begin automatically if there is no difference between both servers or if there are errors in the mirror disks on both servers.

(3) Detailed information

When you click **Details**, detailed information is displayed.

For mirror disk resource



Server Name: Server name

Difference Copy: Whether differential copying of the mirror disk resource 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: Mirror break time

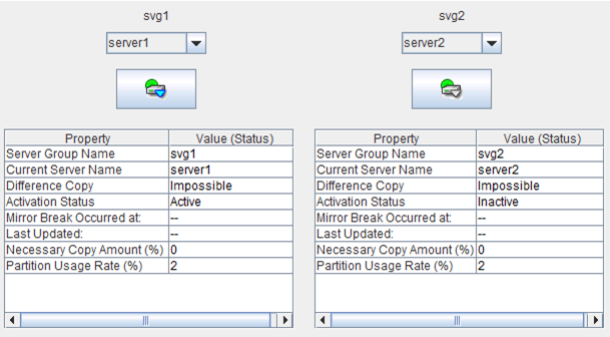
Last Updated: The time that the data was updated the last time

Necessary Copy Amount (%): Amount of data to be copied again to resume mirroring

Partition Usage Rate (%): Partition usage rate

Partition Size (M bytes): Partition size

For hybrid disk resource



Server Group Name: Server group name

Current Server Name: Name of the server that uploads and manages the disks in the server group.

Differential Copy: Whether differential copying of the mirror disk resource is possible

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

Mirror Break Occurred at: Mirror break time

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

Necessary Copy Amount (%): Amount of data to be copied again to resume mirroring

Partition Usage Rate (%): Partition usage rate

Last Data Update Time is displayed when only one of the servers is updated.
Mirror Break Time is displayed when mirror connect is disconnected.
Partition Usage Rate is displayed for the server of which resources are active.

(4) Mirroring disk status

The following table shows the mirroring disk status of servers:
You can select what to perform for the mirror disk by clicking the icon.

Icon	Mirroring disk status	Mirror color[4]
	Mirroring status is normal. The server is inactive.	Green
	Mirroring status is normal. The server is active.	Green
	Mirror recovery or forced mirror recovery is underway. The server is inactive.	Yellow
	Mirror recovery or forced mirror recovery is underway. The server is active.	Yellow
	There might be a difference, but it has not been determined which has the latest information. Mirror recovery is required.	Orange
	The server has an error. Mirror recovery is required.	Red
	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

[4] To see the mirror color, run the clpmdstat command.

(5) Progress bar

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

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

(6) Current server (only hybrid disk resource)

Current server displays the current server that updates and manages the disks. You can check the status of each member server of the server group by clicking the drop-down arrow. The current server is represented in the bold font. The server represented in gray font is in the down state.

When performing mirror recovery or canceling access restrictions, **you can select a server from the list shown by clicking the drop-down arrow to change a current server.**

(7) Server group name (only hybrid disk resource)

The server group name is displayed. For more information on server groups, refer to "Understanding server groups" in "What is a group?""Group resource details" in the "Reference Guide".

2.6.2 Recovering a mirror (forcefully)

1. Mirror recovery

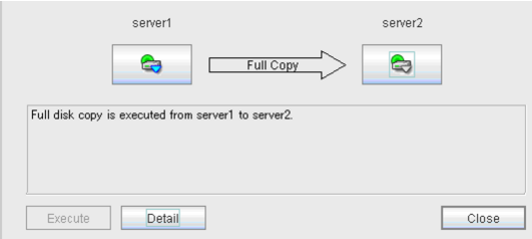
If there is a difference between the mirror disks on both servers:

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

When you click **Execute**, mirror recovery starts. If any group is active, the server with the active group becomes the source server. When it is possible to recover differences, only the difference is recovered. If it is impossible to recover differences, whole partition area is recovered.

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

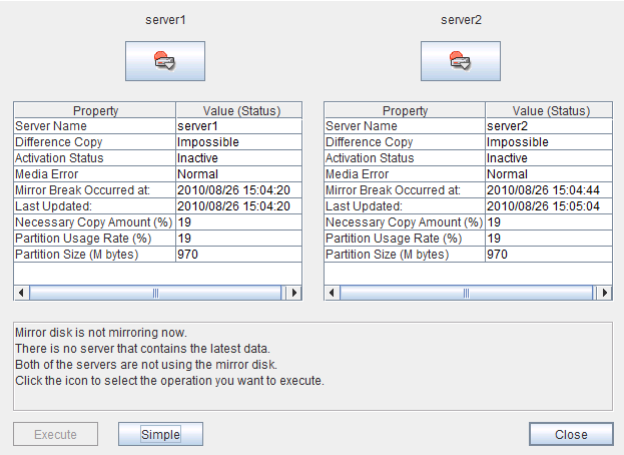
If there is no difference, full copy of the mirror is performed.



If there is no difference between the mirror disks of both servers, and both servers are running normally, the progress bar is displayed. When you click **Execute**, mirror recovery starts.

If the status of both servers is Error:

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

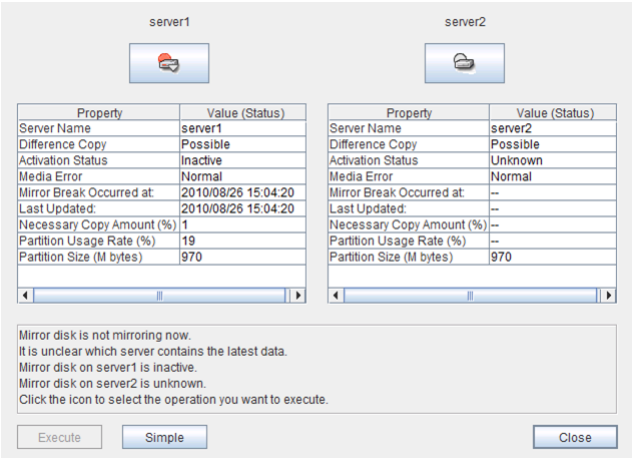


Check the **Last Data Update Time**, and choose a server with the latest data as the source server. Note that the time you see here is of the OS.

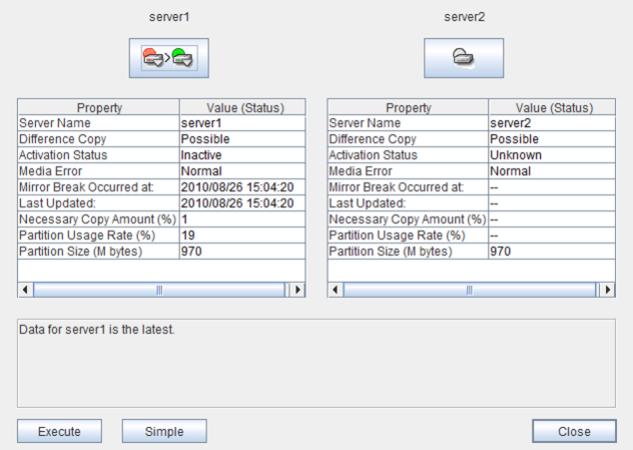
If you select an icon whose status is mirrored disk as the source, the progress bar is displayed. Click **Execute** to start mirror recovery.

2. 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.



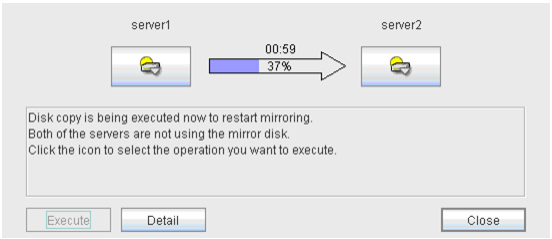
When you click the icon of the server with an error, the following is displayed:



When you click **Execute**, forced mirror recovery of only one server starts.

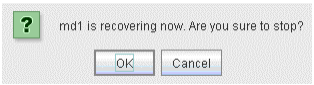
2.6.3 Stopping mirror recovery

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:

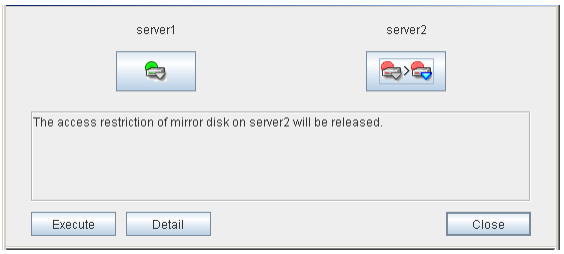
When you click **Execute**, the following dialog box is displayed. If you click **OK**, mirror recovery stops. The server where data is copied from becomes normal status and copied to become error status:



2.6.4 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:

When you double-click the icon of the server with error, the following is displayed:



When you click **Execute**, access restriction is canceled in the server with an error.

To perform mirror recovery, click the icon of the server for which the access restriction is canceled, perform access restriction, and then follow the procedures in "2.6.2. *Recovering a mirror (forcefully)*".

Note: When the Auto Mirror Recovery is enabled and one of the servers is operating normally, it is necessary to disable Auto Mirror Recovery in advance or suspend the mirror disk monitor resource or hybrid disk monitor resource so that Auto Mirror Recovery does not operate when the access restriction is canceled in the server that is abnormal.

2.7 Manually stopping and starting the WebManager

Once EXPRESSCLUSTER is installed, the WebManager automatically starts and stops along with the operating system.
If you wish to stop and start the WebManager specifically, just stop or start the service for the WebManager from the Services console of Administrative Tools.

2.8 When you do not want to use the WebManager

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

To specify the settings by using **Service** of **Management Tool**, change the **Startup Type** of the EXPRESSCLUSTER Manager service to **Manual**.

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 "3.11.9. *WebManager tab*".

2.9 Setting limitations on the connection and operation of the WebManager

The limitation in connection and operation of the WebManager can be configured in **Cluster Properties** in the Builder. For details, see "3.11.9. *WebManager tab*".

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 the 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 **Cluster Properties** of the Builder. For details, see "3.11.9. *WebManager tab*".

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

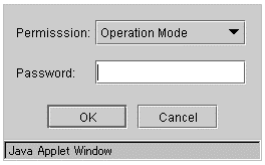
When connecting to the WebManager from the client of which the operation is limited, WebManager becomes **Reference only** and is not able to switch to **Operation Mode** nor **Verification mode**.

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**. For details, see "3.11.9. *WebManager tab*".

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 Only** 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 in with **Reference Only** selected for **Permission**, the WebManager is placed in reference mode. When you attempt to switch to operation mode, config mode, or verification mode in this status, the above authorization dialog is displayed, and you are requested to enter a password for **Operation Mode**.

Combination of the IP address and password

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

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

[5] Authorization cannot be selected.

2.10 Operating a cluster by using the WebManager

2.10.1 Cluster shutdown and cluster shutdown reboot

For information on how to perform cluster shutdown and cluster shutdown reboot from the WebManager, see "2.3.2. *Operations from the WebManager*".

2.10.2 Mirror disk resource and hybrid disk resource

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

2.10.3 Recovering servers

When **Auto Return** is set to **Off** on the **Extension** tab in **Cluster Properties** of the Builder, and a server is shut down or rebooted without using the cluster shutdown command, the server is started in the suspension (isolated) state. A server in this status does not run as a part of the cluster system. Thus, you need to return the server to the cluster system after you have finished the necessary maintenance work on the server. For more information on how to return a server to a cluster system by using the WebManager, see "Individual server objects" in "2.3.2. *Operations from the WebManager*".

2.10.4 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*".

2.10.5 Starting, stopping, and moving an individual group

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

2.10.6 Starting and stopping a group resource

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

2.10.7 Resuming, suspending, and stopping dummy failure of monitor resources

For information on how to resume, suspend, or stop dummy failure of a monitor resource from the WebManager, see "Monitor resource objects" in "2.3.2. *Operations from the WebManager*".

2.10.8 Resuming, suspending, starting dummy failure, and stopping dummy failure of an individual monitor resource

For information on how to resume, suspend, start or stop dummy failure of a 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 reflect the latest status. To acquire the latest information, click the Reload icon on the toolbar or Reload in 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.
- Wait for the next automatic update, or click the Reload icon on the toolbar or Reload in the Tool menu to reacquire the latest information.
- The EXPRESSCLUSTER logs cannot be collected from two or more WebManager instances 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.
- 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
Info	Alert Service is already started.	The status of the alert service became normal.	-
Error	Alert service is inactive.	Starting the alert service failed.	Check the configuration of alert-related modules.
Error	Could not start the group because necessary responses have not been made.	No status can be acquired because the 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 timeout occurred.	Internal timeout may occur when a time-consuming task is performed. Check the status after the timeout and if there is no problem, operations can be continued.
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 details 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. Some servers may not be able to be accessed due to error.	Retry log collection. If logs from a certain server cannot be collected, run the clplogcc command on the server to collect logs.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to connect to server({0} : {1}).	Failed to connect to the WebManager.	Check if the EXPRESSCLUSTER Web Alert service is running on the server.
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 maximum 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 viewer records set in the Builder.
Error	Failed to get property from the server.	Failed to acquire a cluster property 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 that failed to move the group. For the detailed information on the error, see the alert log.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
Error	The group is already started.	The group which is the target of the operation has already been started. Another manager or command on the server may have performed operations on the same group.	Try reloading the group status later to update it, and then perform operations on the group.
Error	The group is already stopped.	The group which is the target of the operation has already been stopped. Another manager or command on the server may have performed operations on the same group.	Try reloading the group status later to update it, and then perform operations on the group.
Error	Group is updating its status.	The status of the group which is the target of the operation is changing. Another manager or command on the server may have performed operations on the same group.	Try reloading the group status later to update it, and then perform operations on the group.
Error	Internal error.	An internal WebManager error occurred.	Perform reloading. If the same error occurs even after reloading, restart the EXPRESSCLUSTER Web Alert service.
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 EXPRESSCLUSTER Web Alert service.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
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 EXPRESSCLUSTER Web Alert service.
Error	Invalid parameter.	An internal error of the WebManager occurred.	Perform reloading. If the error occurs even after reloading, restart the EXPRESSCLUSTER Web Alert service.
Error	Invalid server name.	An internal error of the WebManager occurred.	Perform reloading. If the error occurs even after reloading, restart the EXPRESSCLUSTER Web Alert service.
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, operations can be continued.
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.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
Error	Enter the server name.	The name of a server for alert log search is not set.	Specify the name of the server to be searched for.
Error	The selected server is invalid.	The server specified as the destination for moving the group is invalid.	Wait for a while to perform reloading to update the group status, and then perform the operation to 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 complete.	An error occurred while acquiring the server status.	Try reloading later.
Error	The number of alert logs per page you have entered is not in the specified range (1 to {0}).	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.	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 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 details 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, operations can be continued.
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, operations can be continued.
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.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
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 total page number.	Specify the number that is smaller than the total page number.
Warning	The properties got from server may not be completed.	Failed to acquire some information.	Try reloading later.
Error	There are servers that failed to stop.	There is a server that may have failed to shut down the cluster.	Check if the server is down. If it is not down, check 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 server.	An internal error of the Disk Agent occurred. Communication from the WebManager server to the EXPRESSCLUSTER Web Alert service failed. The process on the server timed out.	Make sure that the Disk Agent is working. If the Disk Agent is not started, reboot the server.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to get mirror status.	The Disk Agent failed to acquire mirror disk status. An internal error of the Disk Agent occurred. Communication from the EXPRESSCLUSTER Web Alert service to the Disk Agent has failed. The process in the server timed out.	Check if the Disk Agent is active. If the Disk Agent is not started, reboot the server.
Error	Failed to recover the mirror.	An error occurred while performing mirror recovery.	Make sure that the Disk Agent is operating. If the Disk Agent is not started, restart the server.
Error	Detected disk error while recovering the mirror.	A disk error was detected during the mirror recovery.	Run the clpmdstat --mirror command to check disk error status on each server.
Error	Failed to recover the mirror since mirror status has changed.	Mirror recovery failed because the mirror status is changed after the Mirror Disk Helper dialog box was displayed.	Close this error message dialog box, and the information will be updated.
Confirmation	Data on two disks are identical. Are you sure to execute a mirror recovery?	The mirror disks on both servers have no difference. Do you want to continue mirror recovery?	-
Confirmation	{0} is recovering now. Are you sure to stop?	Do you want to stop mirror recovery?	-
Error	Failed to stop recovery.	Failed to stop the mirror recovery.	The server may be heavily loaded. Start up the Mirror Disk Helper again.
Error	Failed to get recovery status.	Acquiring information on the progress of mirror recovery failed.	The server may be heavily loaded. Start up the Mirror Disk Helper again.
Error	The local applet version does not match the server's. Close the browser and clear the applet cache.	A mismatch between the Java applet and the server occurred because the Java cache remains.	Exit the browser. Clear the cache of Java and restart the browser.
Error	Failed to recover since NMP size of "{0}" is smaller than "{1}".	Data partition size of the source server is larger than that of the destination server when recovering a mirror. The recovery is stopped. Initial mirror may not have been configured properly.	Specify a server as a source whose data partition size is smaller.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to get server list.	Failed to get a server list.	Check log collection from another WebManager is running or not. Restart after another log collection completes.
Error	Server is collecting logs. Try again after log collection is completed.	The server is collecting logs.	Try again after other log collections are completed.
Error	Failed to collect cluster logs from the server.	An error occurred while collecting cluster logs.	Check the result in dialog box showing the progress of log collection (See "2.2.4. *Collecting logs by using the WebManager*").
Error	Failed to Login (Internal error)	An internal error occurred when logging on to the WebManager.	Try logging on to the WebManager again. Start the EXPRESSCLUSTER Web Alert service if the error still occurs.
Error	Failed to login.	Incorrect password was entered three consecutive times.	Try logging on to the WebManager again with a correct password.
Error	Incorrect password.	Incorrect password was entered.	Enter a correct password.
Error	Authorization failed.	Password was changed while accessing the WebManager.	Try logging on to the WebManager again.
Error	Authorization failed. (Internal error.)	An internal error occurred when accessing to the WebManager.	Try logging on to the WebManager again. Reboot the EXPRESSCLUSTER Web Alert service if the error still occurs.
Error	Failed to connect to the server.	Failed to communicate with the WebManager.	Check if the EXPRESSCLUSTER Web Alert service is working on the server. Check if connecting to the server can be performed successfully.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to get the list of mirror disk error.	Disk Agent failed to get the information on the mirror disk. Internal error of the Disk Agent occurred. The access to the Disk Agent from the EXPRESSCLUSTER Web Alert service failed. The processing timed out on the server.	Check if the Disk Agent is operating. If the Disk Agent is not operating, restart the server.
Error	Failed to get the data for the cluster tree view from the server.	Failed to get the cluster data of the destination server. Failed to get all cluster data in the cluster tree view.	Check if EXPRESSCLUSTER is operating by running a command on the destination server Check if all cluster management IPs in the tree view are running normally.
Error	Another user is performing auto-search now. Try it again later.	Auto-search has already been performed from the other manager.	Retry auto-search later.
Error	Internal error.	An internal error of the WebManager has occurred.	Perform the auto-search again. If an error still occurs, restart the EXPRESSCLUSTER Web Alert service.
Error	Not connected to the server now. The settings will be displayed when the connection recovers. Wait for a moment.	Because communication with WebManager failed, the changed setting is applied as soon as the connection is recovered.	Confirm that the EXPRESSCLUSTER Web Alert service is operating on the server side. Confirm that the server is connected normally.
Error	Failed to recover the server "{0}". Click the Reload button, or try again later.	The displayed server status might not be the latest status. The status of the server that was changed by a different operation is not reflected on the display.	Click the Reload button, and retry the operation once the status has been updated.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to migrate group "{0}" to server "{1}".	The displayed group status might not be the latest status. Operation from a different WebManager or operation by means of the clpgrp command might not have been reflected in the group status on the display.	Click the Reload button, and retry the operation once the status has been updated.
Error	Failed to disable dummy failure of monitors. Click the Reload button, or try again later.	The displayed cluster status might not be the latest status. Operation from a different WebManager or operation by means of the clpmonctrl command might not have been reflected in the cluster status on the display.	Click the Reload button, and retry the operation once the status has been updated.
Error	Failed to disable a part of dummy failure of monitors. Click the Reload button, or try again later.	The displayed cluster status might not be the latest status. Operation from a different WebManager or operation by means of the clpmonctrl command might not have been reflected in the cluster status on the display.	Click the Reload button, and retry the operation once the status has been updated.
Error	Failed to enable dummy failure of monitor "{0}". Click the Reload button, or try again later.	The displayed cluster status might not be the latest status. Operation from a different WebManager or operation by means of the clpmonctrl command might not have been reflected in the cluster status on the display.	Click the Reload button, and retry the operation once the status has been updated.

Continued on next page

Table 2.11 – continued from previous page

Level	Message	Cause	Solution
Error	Failed to disable dummy failure of monitor "{0}". Click the Reload button, or try again later.	The displayed cluster status might not be the latest status. Operation from a different WebManager or operation by means of the clpmonctrl command might not have been reflected in the cluster status on the display.	Click the Reload button, and retry the operation once the status has been updated.
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.
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 the Reload button, and retry the operation once the status has been updated.
Error	Failed to clear the time info.	Failed to clear the time information.	Click the Reload button, and retry the operation once the status has been updated.

CHAPTER

THREE

FUNCTION OF THE BUILDER

This chapter provides information on functions of the EXPRESSCLUSTER X Builder.

This chapter covers:

3.1 Overview of the Builder

The Builder is a tool for creating and changing the cluster configuration data (config and/or script) for the EXPRESSCLUSTER Ver3.0 or later.

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
  To start the Builder, click Config Mode on the View menu or select the config mode icon [] from the dropdown menu on the toolbar.
  You can also directly connect to the server to create a cluster or 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 clpcfctrl command.

See also:

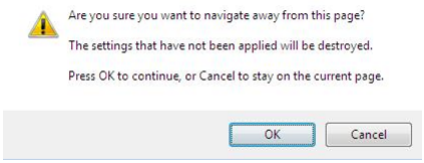
For the system requirements of the Builder, see the corresponding web page.

Note:

In this guide, Builder refers to both the online version of Builder, which runs in WebManager config mode, and the offline version of Builder, which runs on the management PC.
"Host name" used 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

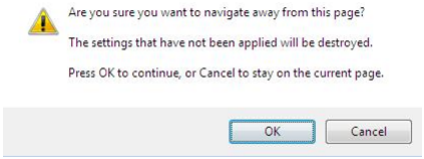
- The following products' cluster configuration data is not compatible.
  A Builder other than that of EXPRESSCLUSTER X 4.0 for Windows
  The Builder of the EXPRESSCLUSTER for Linux
  The Builder of the EXPRESSCLUSTER for Windows Value Edition
- Cluster configuration data created using a later version of this product cannot be used with this product.
- Cluster configuration data of EXPRESSCLUSTER X1.0/2.0/2.1/3.0/3.1/X3.2/X3.3/4.0 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** on the **File** menu or by clicking **X** on 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.

- Reloading the Web browser (by clicking **Reload** on the **Tool** menu or the **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.

- 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.
- On the **Alert Log** tab (see "3.11.10. *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.
- When you use the Offline Builder and the EXPRESSCLUSTER rpm, 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.

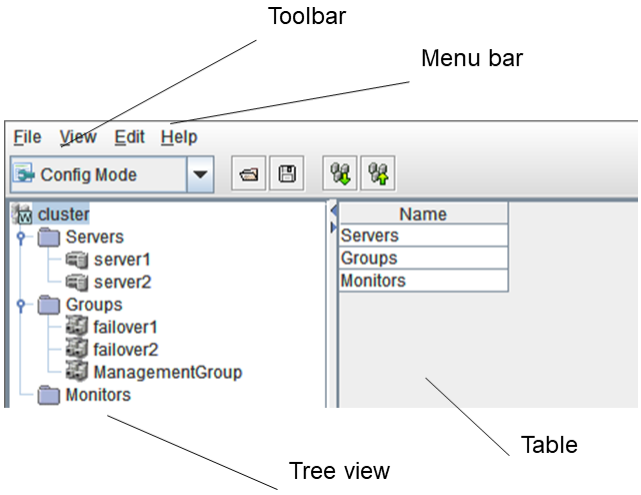
Offline Builder version	EXPRESSCLUSTER internal version
4.0.0-1	12 12.01

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 pane.

3.2.2 Tree view

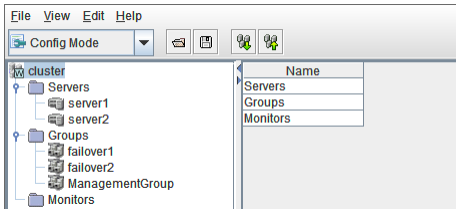
The following objects are displayed in the tree view:

Hierarchy	Object	Contents	Table view when the object is selected
1		Represents the cluster.	Displays cluster names.
2	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.
2	Servers	Represents a set of servers in the clusters	Displays servers.
3		Represents an individual server.	Displays server names.

3.2.3 Table view

3.2.4 Table for cluster name selection

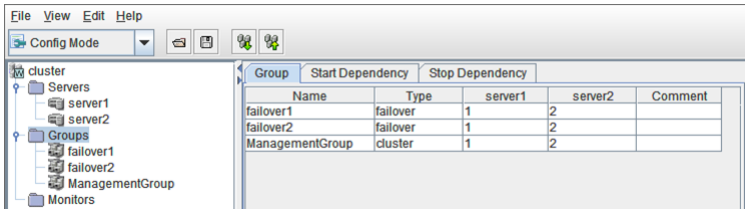
Displays objects in the root hierarchy.



3.2.5 Table for group selection

Group list

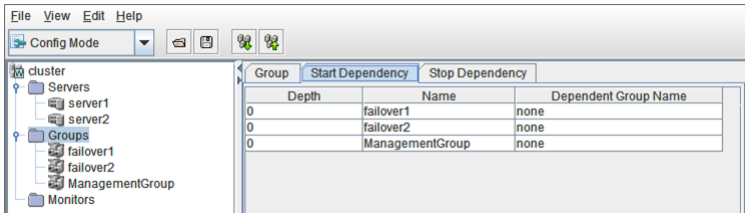
Displays the failover priorities of the groups.



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." This is blank if the startup priority is the same as that of the server. This is blank for the WebManager group.
Comment	Displays comments specified for the groups.

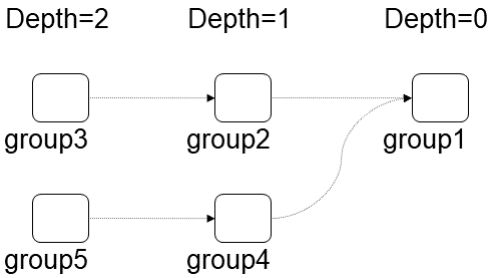
Start Dependence

The dependencies included in the group start dependence are listed.



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.

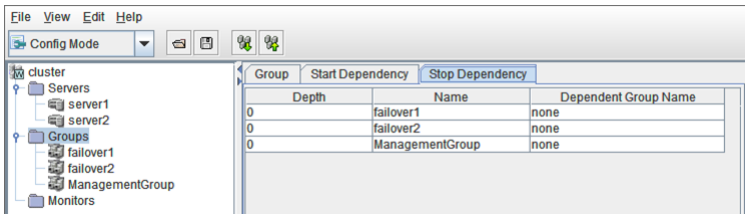


The dependencies represented by this figure are listed below.

Depth	Name	Start Dependence Group Name
0	group1	none
1	group2	group1
1	group4	group1
2	group3	group2
2	group5	group4

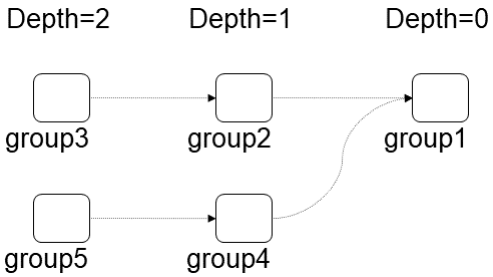
Stop Dependence

The dependencies included in the group stop dependence are listed.



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

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



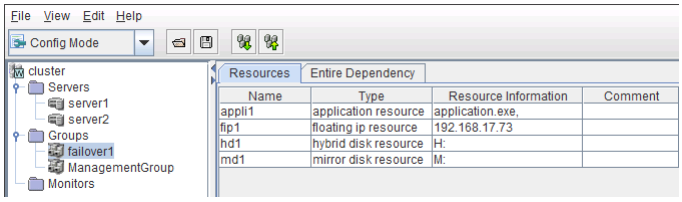
The dependencies represented by this figure are listed below.

Depth	Name	Stop Dependence Group Name
0	group1	none
1	group2	group1
1	group4	group1
2	group3	group2
2	group5	group4

3.2.6 Table for group name selection

Resources

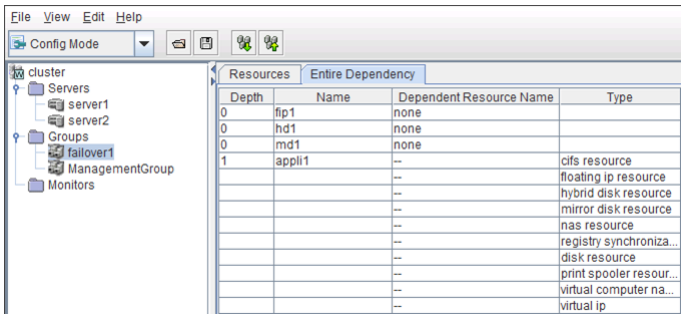
Group resources in the selected group are listed.



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.

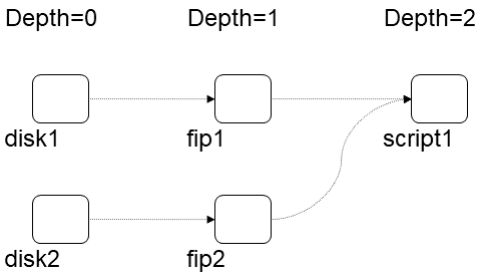
Dependency List

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.
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.

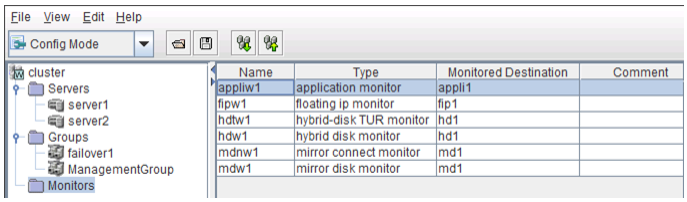


The dependencies in this figure are listed below. These are not the default dependencies, but specified with resource names.

Depth	Name	Dependent Resource Name	Type
0	disk1	none	-
0	disk2	none	-
1	fip1	disk1	disk resource
1	fip2	disk2	disk resource
2	script1	fip1	floating ip resource
-	-	fip2	floating ip resource

3.2.7 Table for monitor resource selection

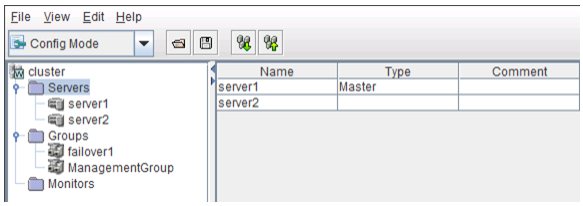
Displays the list of monitor resources.



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.

3.2.8 Table for server selection

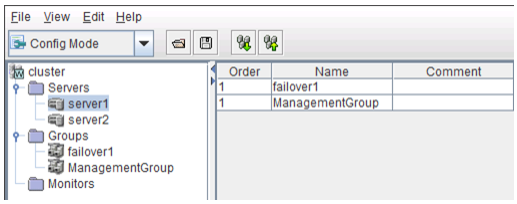
Displays the list of servers.



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.

3.2.9 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. This field is blank if the group does not have a specific startup order of servers (if it follows the servers' priorities). The WebManager group is not displayed.
Name	Displays the group name.
Comment	Displays comments specified for the group.

3.3 Pop-up menu

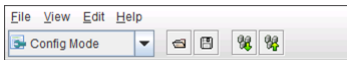
Pop-up menus are displayed by right-clicking a tree object or table row.

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

3.4 Using a tool bar of the Builder

The Builder provides a toolbar:

- Online Version



- Offline Version

There is a drop down menu for mode switch on the left side of the toolbar with online version. For details on this menu, see "2.2. *Window of the WebManager*" "2.2.1. *Main window of the WebManager*" "Toolbar" in "2. *Functions of the WebManager*".

Click each icon on the tool bar to do the same operation of the some items on the menu bar.

Button	Function	Refer to
	Opens a file. This is the same as clicking File from the menu bar and then selecting Open.	"3.6.2. *Opening the configuration file*"
	Saves a file. This is the same as clicking File from the menu bar and then selecting Save.	"3.6.3. *Saving the configuration file*"
	Get the configuration. This is the same as clicking Get the Configuration File on the File menu. This is not available with the offline version.	"3.6.4. *Get the configuration file (online version only)*"
	Apply the configuration. This is the same as clicking Apply the Configuration File on the File menu. This is not available with the offline version.	"3.6.5. *Apply the configuration file (online version only)*"

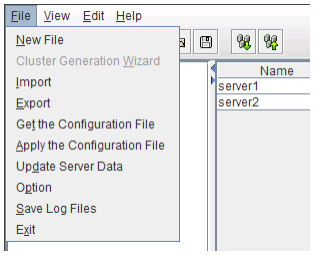
3.5 Using the menu bar of the Builder

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	Function
New File	Creates a new cluster.
Cluster Generation Wizard	Starts 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.

---

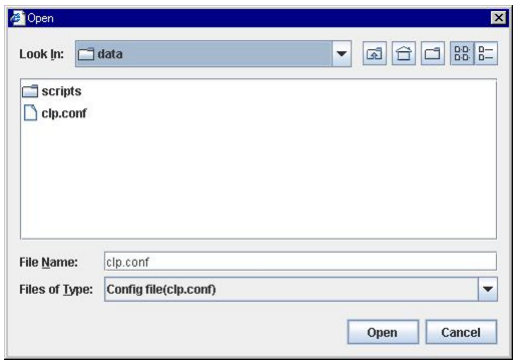
1. On the menu bar, click **File** and then click **New File**.
2. If you made changes in the cluster configuration data, a dialog box asks if you want to save them before they are discarded. Click **Yes** to save the changes. A dialog where you can specify a folder to save the cluster configuration 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*".
3. On the left pane of the screen on the tree view displayed, right-click the cluster icon and click **Cluster Generation Wizard**. Use the **Cluster Generation Wizard** to create a cluster.

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:

1. Click **Import** from the **File** menu.
2. The **Open** dialog is displayed. Select an appropriate configuration file and click **Open**. The data of the configuration file is displayed in the Builder.



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

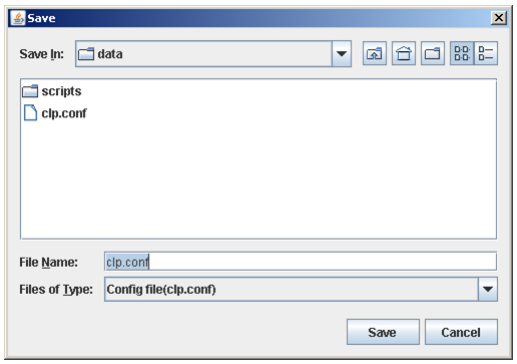
3.6.3 Saving the configuration file

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.
- Kernel-mode LAN heartbeat resource exists.

How to use:

1. Select **Export** from the **File** menu.
2. The **Save** dialog is displayed. Select an appropriate place to save the configuration file and click **Save**.



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

Note:

When using Builder on the server on which EXPRESSCLUSTER is operated, do not edit `etc\clp.conf` in the EXPRESSCLUSTER installation path. 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 data set to the connected server. Tree view is displayed according to the got 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 the configuration file is got.
If you want to cancel getting, click **Cancel.**

Note: Do not create a folder or a file under the *<EXPRESSCLUSTER installation path>*`\scripts` on the server. Getting the configuration file may fail if you create a file or a folder.

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.

- A server exists.
- A LAN heartbeat resource of kernel mode exists.

Note: If this condition is not satisfied, connection to the other server will fail, so applying of the cluster configuration data fails. In this case, you can forcibly apply the cluster configuration data only to a server to which connection is possible. For details, see "Creating a cluster (clpcfctrl --push)" in "Creating a cluster and backing up configuration data (clpcfctrl command)" in " EXPRESSCLUSTER command reference" in the "Reference Guide".

Note: When using a hybrid disk resource, do not apply configuration information if any part of the server is stopped. If configuration information is applied in this state, an error will be detected in the control module of the hybrid disk resource, possibly causing the server to shut down.

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 apply is completed 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 operation> Execute now ?	If you select Yes, indicated operation is carried out.
There is the disk information that is not configured. Are you sure you want automatic configuration?	Some GUID information of the volume is not configured. If you select Yes, automatic configuration is performed by determining the current GUID information from the derive letter.
There is the HBA information that is not configured. Are you sure you want automatic configuration?	The HBA information is not configured for the server where the information of HBA for accessing the shared disk was configured at the time of the installation. If you select Yes, the information configured at the time of the installation is inherited.
There is difference between the disk information in the configuration information and the disk information in the server. Are you sure you want automatic modification?	The combination between the GUID information of the volume and the drive letter does not match with the one on the actual servers. If you select Yes, automatic configuration is performed by determining the current GUID information from the derive letter.
The upload was stopped. There is one or more servers that cannot be connected to. To apply cluster configuration information forcibly, run the clpcfctrl command on the server.	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. If you want to apply the cluster configuration data forcibly even though there is a server that cannot be connected in the cluster, see "Creating a cluster (clpcfctrl --push)" in "Creating a cluster and backing up configuration data (clpcfctrl command)" in " EXPRESSCLUSTER command reference" in the Reference Guide.
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.

Continued on next page

Table 3.17 – continued from previous page

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

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 `C:\tmp` directory on a server in the cluster.

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

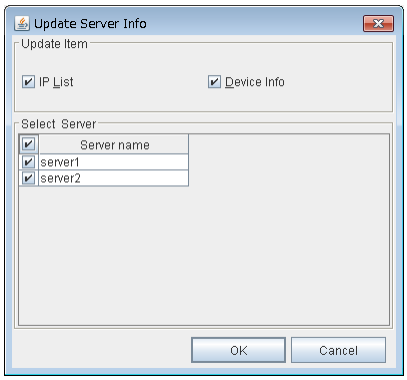
```
clpcfctrl --push -x "Directory where the cluster configuration data has
↪been saved" --force
```

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

```
clpcfctrl --push -x "C:\tmp" --force
```

3.6.6 Updating the server information (online version only)

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.

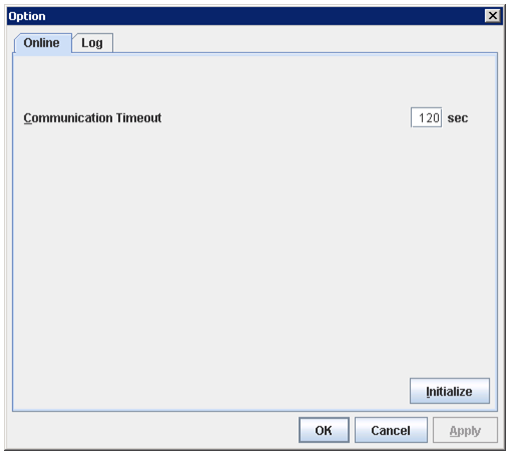
- Device Info
  Get the device information of disk.

Select Server

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

3.6.7 Changing communication settings

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

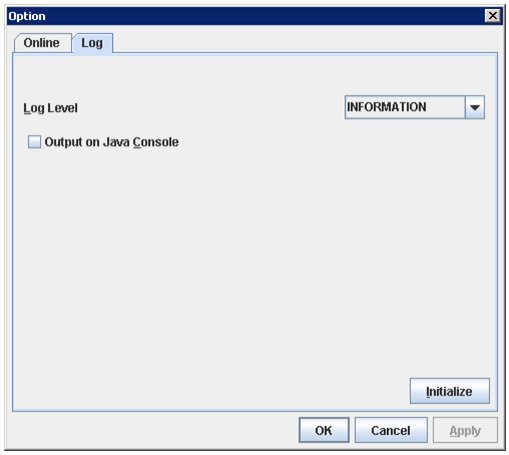


Communication Timeout (0 to 999)

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

3.6.8 Changing log level settings of Builder

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



Log Level

Configure the level of internal logs that Builder produces during operating.

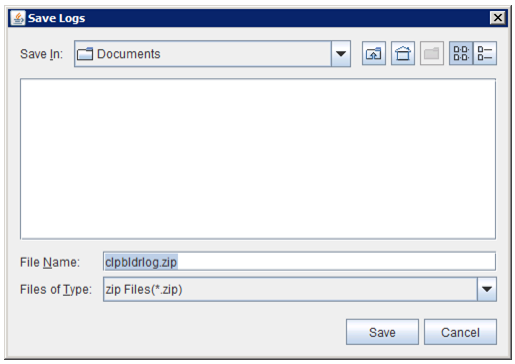
- ERROR
  Select this to read only error-level logs .
- WARNING
  Select this to read warning-level and error-level logs.
- INFORMATION
  Select this to read information-level, warning-level, and error-level logs.
- TRACE1,2,3
  Select this to read logs of internal trace, and those from the information, 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 report logs to the Java console.

3.6.9 Collecting Builder logs

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



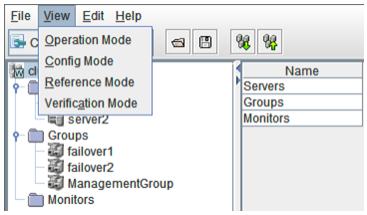
Specify the destination to store logs, and select **Save**.

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.
Select **Yes** to save the changes. The dialog box where you can specify a folder to save the file is displayed. For how to save the file, refer to "3.6.3. *Saving the configuration file*". Select **No** if you do not need to save the changes. Exit from the Builder discarding the changes you made in the cluster configuration data.

3.7 View menu

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



3.7.1 Operation Mode

Switches from the currently displayed mode to the WebManager operation mode.
This is the same as selecting **Operation Mode** from the drop-down menu on the toolbar.

3.7.2 Config Mode

Switches from the currently displayed mode to the Builder setup mode.
This is the same as selecting **Config Mode** 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 **Reference Mode** from the drop-down menu on the toolbar.

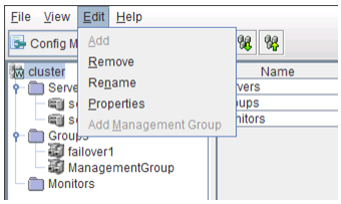
3.7.4 Verification Mode

Switches from the currently displayed mode to the WebManager verification mode.
This is the same as selecting **Verification Mode** from the drop-down menu on the toolbar.

3.8 Edit menu

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

Menu	Function
Add	Adds the object.
Remove	Deletes the selected object.
Rename	Changes the name of the selected object.
Properties	Displays the properties of the selected object.
Add Management Group	Adds the management group.



3.8.1 Adding an object

Displays the wizard for adding a 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
	Group for WebManager
group_name	Group resource
Monitors	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 and 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. Select **Yes** for removing and **No** for not removing it.

To remove a cluster, select **New File** from the **File** menu.

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

If select	Conditions	How to change
 Cluster Name	None	
 Server Name	- There is no other server. - The server is the only server where the group can start up.	Suspend and resume the cluster daemon
 Group Name	- A recovery target of monitor resource[6] . - Has group resources.	Stop the group Suspend and resume the cluster daemon Resume the group
Group Resource Name	- A recovery target of monitor resource[6] . - A target object in the monitoring timing of monitor resource[6] . - To be monitored by the mirror disk monitor resource[6] . - A mirror disk resource that uses the mirror connect to be monitored by the mirror disk connect monitor resource[6] . - Other group resources in the same group depend on it.	Stop the group Suspend and resume the cluster daemon Resume the group
Monitor Resource Name	- No condition for those other than mirror disk monitor resource. - Auto Mirror Recovery is selected on the Mirror Disk tab of Cluster Properties for mirror disk monitor resource.	Suspend and resume the cluster daemon

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

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.

If select	Naming rules	How to change
Group Name	- Only alphanumeric characters, hyphen (-), underscore (_) and space are allowed for names. - Up to 63 characters (63 bytes) - Names cannot start or end with a hyphen (-) or space.	Stop the group Suspend and resume the cluster daemon Resume the group
Group Resource Name	- Only alphanumeric characters, hyphen (-), underscore (_) and space are allowed for names. - Up to 63 characters (63 bytes) - Names cannot start or end with a hyphen (-) or space.	Stop the group Suspend and resume the cluster daemon Resume the group
Cluster Name Monitor Resource Name	- Only alphanumeric characters, hyphen (-), underscore (_) and space are allowed for names. - Up to 63 characters (63 bytes) - Names cannot start or end with a hyphen (-) or space.	Suspend and resume the cluster daemon

Continued on next page

Table 3.21 – continued from previous page

If select	Naming rules	How to change
Server Name	- 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 63 characters (63 bytes) - Neither hyphen (-) nor space can be the first or last letter in names. - Underscore (_) is not allowed. - A name consisting of only numbers is not allowed. - Do not use "localhost" as the server name.	When changing a server name, you have to be careful. For the server name renaming procedure, see "The system maintenance information" in the "Maintenance Guide".

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

3.8.4 Properties

Displays properties of a selected cluster, servers, server, group, group resource, or monitor resource.
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 **Help** in the menu bar, and then select **Version Information.**

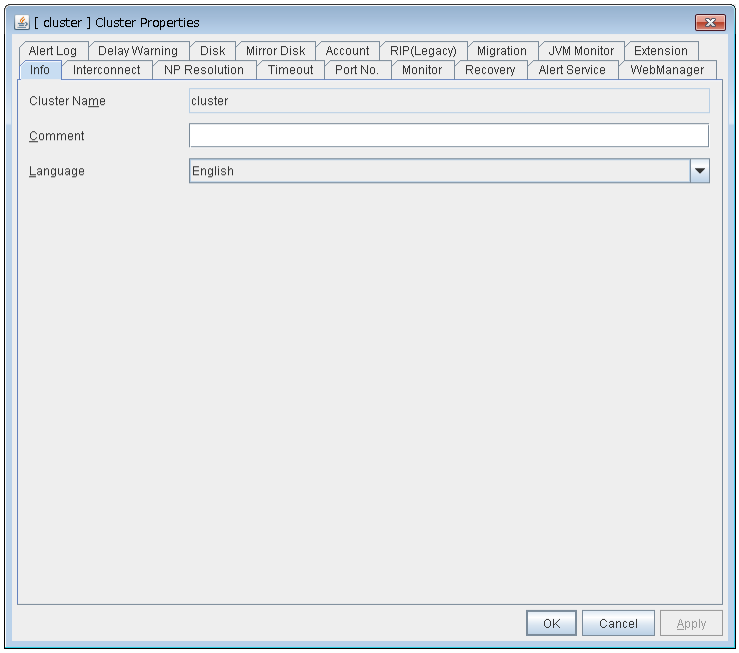
3.10 Parameter details

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

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

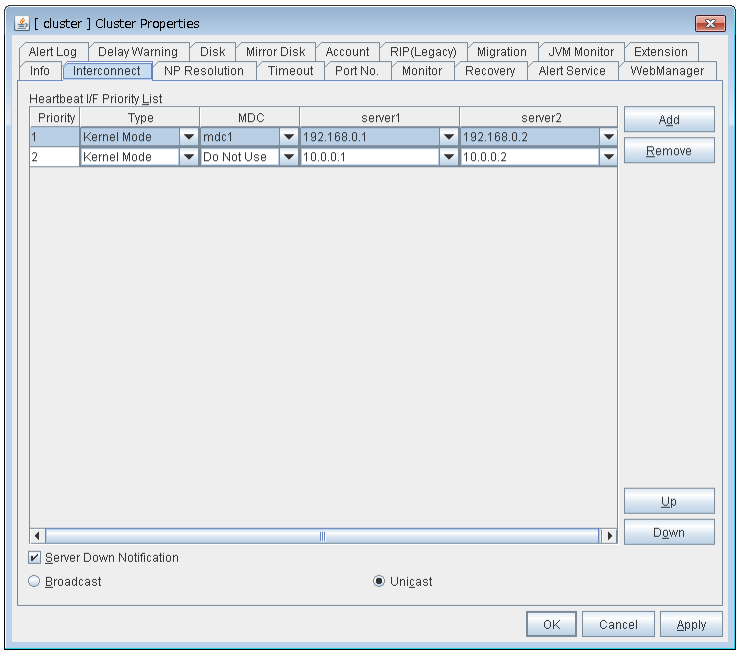
Language

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

- English
- Japanese
- Chinese

3.11.2 Interconnect tab

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



The **Heartbeat I/F Priority List** displays network communication paths between servers in the cluster.

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. For a communication route to which some servers are not connected, leave the cells for the unconnected servers blank.

Remove

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

Type

For a communication route used for kernel mode LAN heartbeat transmission (interconnect), click a cell in the **Type** column, and then select **Kernel Mode**.

Specify as many communication routes for the interconnect as possible.

To use a BMC heartbeat resource, select **BMC**.

To prepare a dedicated data mirroring communication path (mirror disk connect), click the **Type** column cell and then select **Mirror Communication Only**.

MDC column

To use a communication path as a mirror disk connect, click the **MDC** column cell and then select a mirror disk connect.

The entry differs depending on the type.

- Kernel Mode or Mirror Communication Only
  Select a mirror disk connect from the combo box.
  When a mirror disk connect is not used, select **Do Not Use**.
- BMC

No mirror disk connect is available.

Do Not Use is automatically entered in the **MDC** column cell and the cell cannot be edited.

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. 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.

Server column

The entry differs depending on the type.

- Kernel Mode or Mirror Communication Only
  Enter IP address. Leave the cells for any unused paths blank.
- BMC
  Enter the BMC IP address. When the BMC is not used, leave the cell blank.

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
```

- To list the IP addresses to be set for the interconnect in the list box on the online version Builder, execute **Update Server Info** from the **File** menu.

Server Down Notification

When a server stops successfully (including shutdown and reboot), it is notified to other servers in the cluster. You can perform failover faster by notifying it in advance.

When failing to deactivate groups when a server stops (including shutdown and reboot), or when other abnormalities occur, other servers are not notified of it regardless of the settings of failed server notification.

- When the check box is selected
  Server down will be notified.
- When the check box is not selected
  Server down will not be notified.

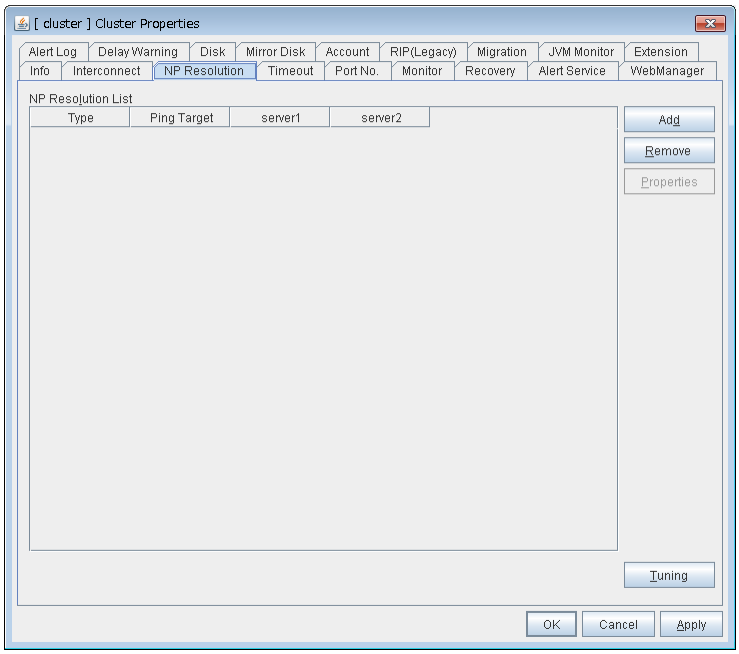
Broadcast and Unicast

Select the communication method of a kernel mode LAN heartbeat from the following.

- Broadcast
  Communicate in broad cast method. However, it cannot be used with IP v6.
- Unicast
  Communicate in unicast method

3.11.3 NP Resolution tab

Set up the network partition (NP) resolution method.



Add

Add network partition resolution (NP resolution) resource. Click the **Type** column cell and select the type of NP resolution type (**COM**, **DISK**, **Ping**, **Majority**). If the type is **Ping**, click the Ping target column cell and set the IP address of the Ping destination device. Click the cell of each server and set **Use** or **Do Not Use**.

Remove

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

Properties

Only available when the selected resource type is **DISK** or **Ping**. The **DISK NP Properties** or **Ping NP Properties** window is displayed.

Tuning

Network Partition Resolution Tuning Properties window is displayed.

Type

Set the type of network partition resolution resource. **COM**, **DISK**, **Ping**, **Majority** is selectable.

Ping Target

Set the IP address of the Ping destination device with Ping method NP resolution. Available only when the type is **Ping**.

Server

Entry differs depending on the type.

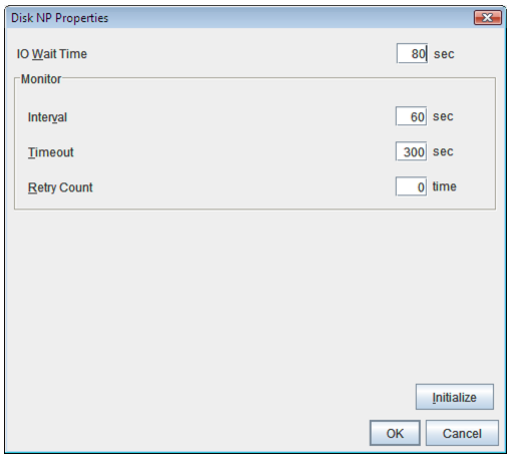
- COM
  Enter the COM port used on communication.

- DISK
  Enter the drive letter for disk heartbeat partition.

Note: To list the drive letters to be set for the disk heartbeat partition in the list box on the online version Builder, execute **Update Server Info** from the **File** menu.

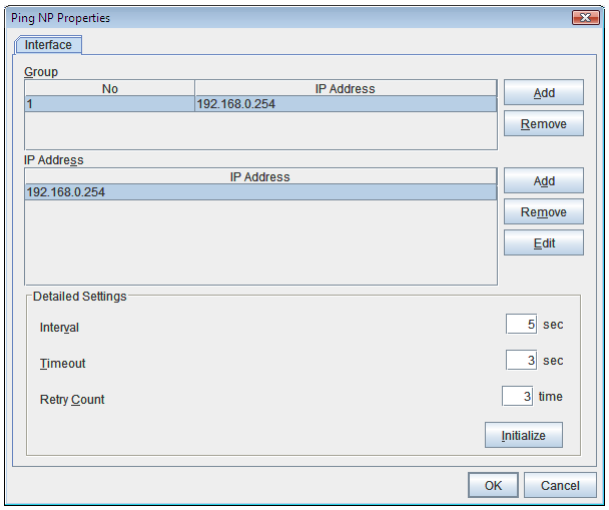
- Ping, Majority
  Select either **Use** or **Do Not Use**.

DISK NP Properties



- IO Wait Time
  Set the disk I/O wait time. Set the value so that the value exceeds the maximum delay time of the disk I/O of the shared disk device. When the disk path is duplicated, I/O delay caused by switching path needs to be considered.
- Interval
  Set the disk heartbeat interval.
- Timeout
  Set the disk heartbeat timeout.
- Retry Count
  Set the retry count.
- Initialize
  Set the I/O wait time, interval, timeout and retry count to the default values.

Ping NP Properties



- Add Group List

  Add IP address group of Ping target.

  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 resource, 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 timeout of Ping response wait.

- Retry Count

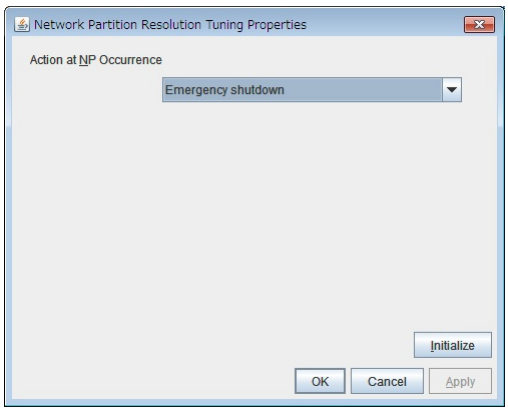
  Set the retry count.

- 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)
    Heartbeat timeout > (interval * retry count)
```

Network Partition Resolution Tuning Properties



- Action at NP Occurrence
  - Stop the cluster service
    Stop the EXPRESSCLUSTER Server service of the server in network partition.
  - Stop the cluster service and shutdown OS
    Stop the EXPRESSCLUSTER Server service of the server in network partition, and then shuts down the OS.
  - Stop the cluster service and reboot OS
    Stop the EXPRESSCLUSTER Server service of the server in network partition, and then reboots the OS.
  - Emergency shutdown
    Shutdown the server in network partition.
  - Generate an intentional stop error
    Intentionally cause stop error for the server in network partition.
  - Reset the hardware[7]
    Restart the server by HW reset in network partition.

Note:

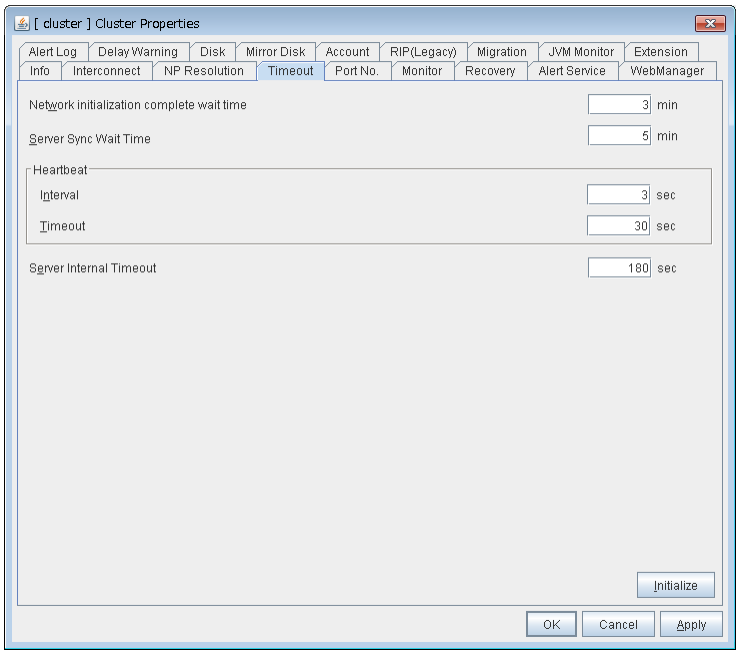
When mirror disk resources or hybrid disk resources are used, it is not recommended that you set **Stop the cluster service** for **Action at NP Occurrence**.
If **Stop the cluster service** is set, you might have to run the forcible mirror recovery at the time of recovery from NP occurrence.

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

[7] This function does not require ipmiutil, unlike the forced stop function.

3.11.4 Timeout tab

Specify values such as time-out on this tab.



Network initialization complete wait time (0 to 99)

This is the time the server waits until its NIC becomes valid after startup.

Server Sync Wait Time (0 to 99)

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

Heartbeat

- Interval (1 to 99)
  Interval of heartbeats
- Timeout (2 to 9999)
  A server is determined to be failed if there is no response for the time specified here.
  - This time-out should be longer than the interval.

Server Internal Timeout (1 to 9999)

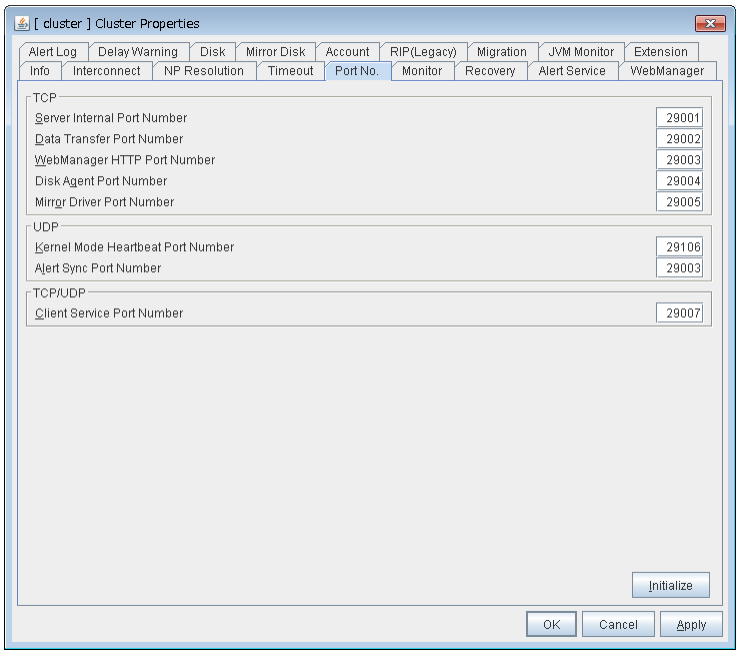
The timeout to be used in the EXPRESSCLUSTER Server internal communications that are performed while an EXPRESSCLUSTER command is executed, or an operation is performed or a screen is displayed by WebManager.

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/Replicator DR is used, they should not be overlapped with any mirror data port number of any mirror disk resources and hybrid disk resource.

- Server Internal Port Number (1 to 65535[8])
  This port number is used for internal communication.
- Data Transfer Port Number (1 to 65535[8])
  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 65535[8])
  This port number is used for a browser to communicate with the EXPRESSCLUSTER Server.
- Disk Agent Port Number (1 to 65535[8])
  This port number is used for a disk agent port number.
- Mirror Driver Port Number (1 to 65535[8])
  This port number is used for a mirror driver.

UDP

No UDP port numbers can be overlapped.

- Kernel Mode Heartbeat Port Number (1 to 65535[8])
  This port number is used for kernel mode heartbeat.
- Alert Sync Port Number (1 to 65535[8])
  This port number is used for synchronizing alert messages among servers.

TCP/UDP

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

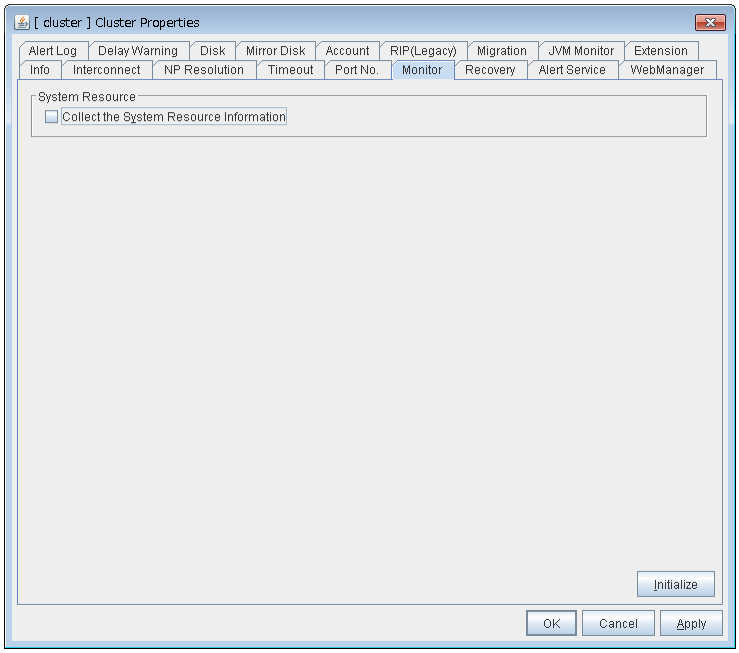
- Client Service Port Number (1 to 65535[8])
  This port number is used for client service.

Initialize

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

3.11.6 Monitor tab

Specify the settings for monitoring.



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 is collected when the clplogcc command or WebManager collects logs.

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

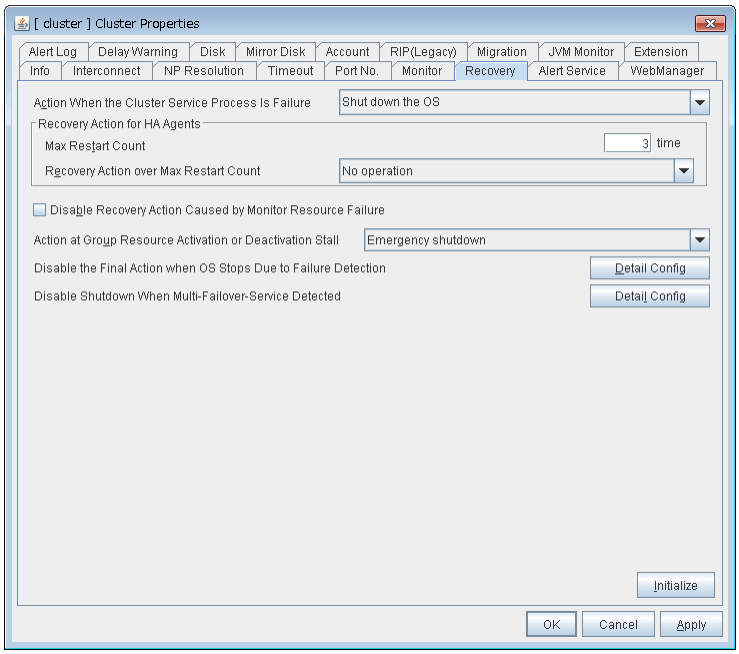
  A disk area of 450 MB or more is required to store the resource information, depending on the system operating conditions such as the number of processes that are running.

- When the check box is not selected

  No system resource information is collected.

3.11.7 Recovery tab

Make settings on cluster recovery.



Action When the Cluster Service Process Is Failure

Specify an action at process abnormity of the cluster service.

- Shut down the OS
  Shut down the OS.
- Generate an intentional stop error
  Generate a stop error (Panic) intentionally and restart the server.
- Reset the hardware[9]
  Restart the server by HW reset.

The following two cluster service processes are monitored by this function:

- clprc.exe
- clpnm.exe

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

[9] This function does not require ipmiutil, unlike the forced stop function.

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 resource, JVM monitor resource, and 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 not selected
The recovery action is enabled when the monitor resource is error.

Note:

This recovery action suppression function is intended to suppress the recovery action due to the error detection of a monitor resource. This does not suppress the recovery action at the time of an activation error of a group resource.
This function is not enabled for the action at the time of the stall error detection of the disk RW monitor resource or at the time of a timeout of the user space monitor resource.
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.

- Emergency shutdown
Shutdown the server on which a stall occurred.
- Generate an intentional stop error
Intentionally cause a stop error (Panic) on the server on which a stall occurred.
- 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 "Recovery Operation tab" in "Resource Properties" in "Group resource details" in the "Reference Guide".

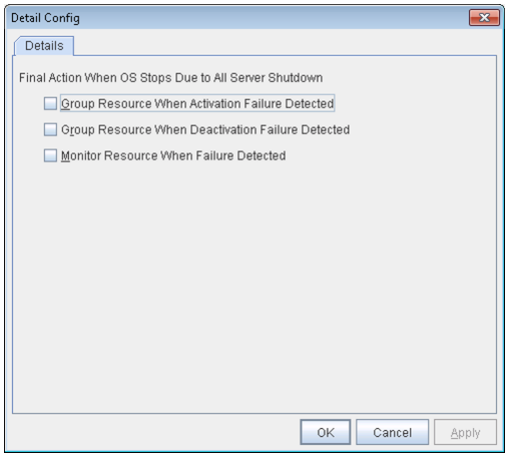
Note: If a stall occurs with "Nothing (handle a stall as an activation/deactivation failure)" specified, the effect on the group resources is undefined, so we do not recommend changing the setting to "Nothing (handle a stall as an activation/deactivation If you do specify "Nothing (handle a stall as 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 (times)
- Failover threshold: 0 (times)
- Final action: Intentionally causing a stop error

If **Stop the cluster service and shut down OS** or **Stop the cluster service and reboot OS** is specified as the final action, it takes a considerable amount of time for the cluster service to 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

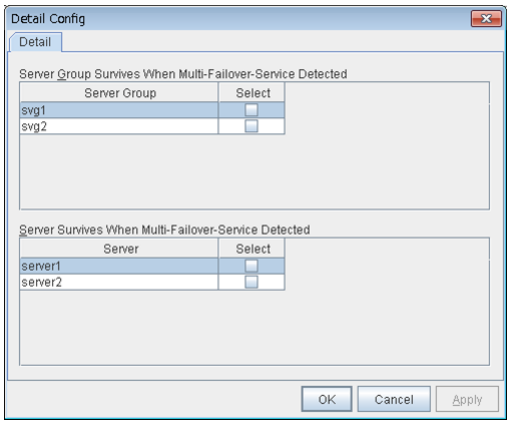
  If the final action caused by an error detection in a monitor resource accompanies the OS stop, the final action is suppressed if all other servers are stopped.

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.
  - Stop the cluster service and shutdown OS
  - Stop the cluster service and reboot OS
  - Generate an intentional stop error

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. 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.

Important:

Suppose that shutdown is suppressed upon the detection of both-system activation in an environment in which the mirror disk resource is used for setting automatic mirror recovery. In this case, automatic mirror copying starts when the server which is shut down upon the detection of both-system activation is re-started through the OS. Care is needed since this discards one piece of data from among that updated separately on the mirror disk of each server at both-system activation.

You need to select a server for which the data is to be protected when suppressing shutdown caused by the detection of both-system activation in an environment in which the mirror disk resource is used.

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: 1104
Message: A mismatch in the group %1 status occurs between the servers.

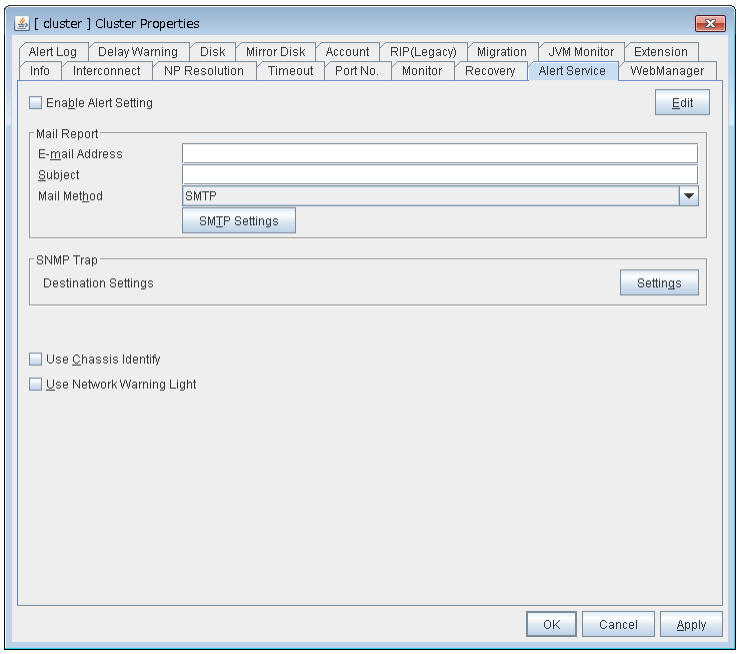
To fix this problem, restart the group, execute a cluster reboot, restart all the servers on which the groups are not

started, or restart the cluster services of all the servers on which the groups are not started.

3.11.8 Alert Service tab

Set up the alert service, chassis ID, and network warning light.

Note: To use the mail alert function and network warning light, EXPRESSCLUSTER X Alert Service 4.0 for Windows is required.



Enable Alert Setting

Configure whether to modify the alert destination from the default value. If you modify the alert destination, click **Edit** to set the destination address.

If you clear the check box, the destination address you have modified returns to the default settings temporarily.

For the default settings for the destination address, see "Messages reported by event log and alert" 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. In this version, SMTP is the only option in this.

- SMTP
  Sends a mail by communicating directly with the SMTP server.

Destination Settings

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

Use Chassis Identify

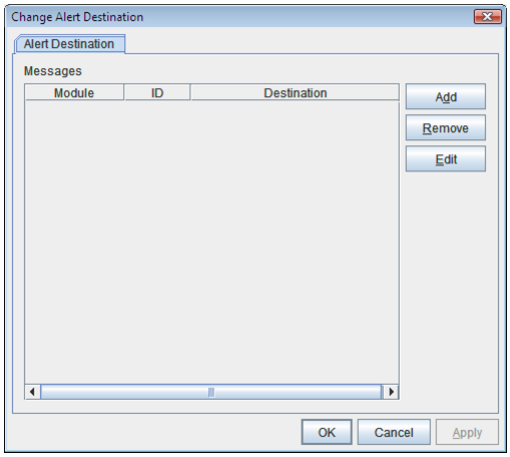
Configure whether or not to use the chassis identify function.

Use Network Warning Light

Configure whether or not to use the warning light (dedicated product) controlled by network. The IP address of warning light is entered on the server property.

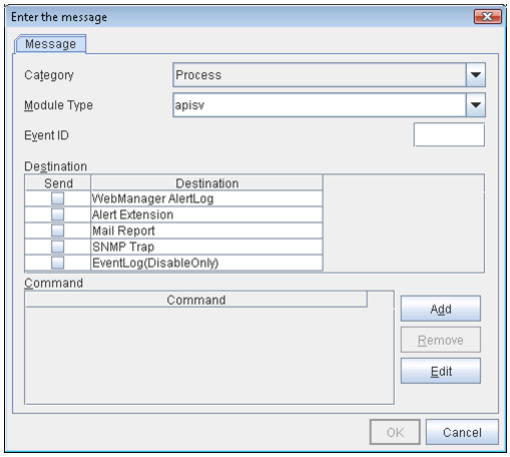
Change Alert Destination

Clicking **Edit** displays the **Change Alert Destination** dialog box.



Add

Add the alert ID of the destination which you want to customize. Clicking **Add** displays 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 message ID of the module type for which you want to change the destination. For information on the message IDs, see "Messages reported by event log and alert " in "Error messages" in the "Reference Guide".

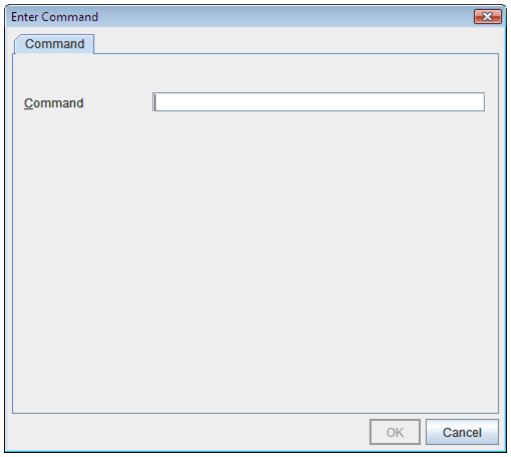
Destination

Select a message destination from the following options.

- WebManager Alertlog
  This sends messages to the alert view of the WebManager.
- Alert Extension
  This executes the specified function by using the alert extension function. Modify the extension settings by using Add and/or Edit. (The command must be specified within four lines.)
- Mail Report
  Uses the mail report function.
- SNMP Trap
  Uses the SNMP trap transmission function to send messages.
- Event Log (Disable only)
  You can disable the settings whereby the OS reports logs to the event log by clearing this check box. (You cannot configure the settings to report messages that are not reported to event logs.)

Add

Add a command of the alert extension function. Click **Add** to display the **Enter Command** dialog box.



Command (Within 511 bytes)

Enter any command you want to use.

- Keyword
  If you specify %%MSG%%, the 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%%.
  If you set %%MSG%% as an argument for a command, you need to add backslash () and double quotation (") like below.
  <any command you want to use> \"%%MSG%%"

Remove

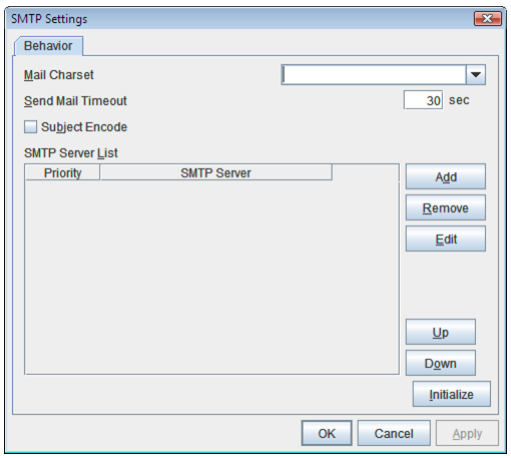
Click this to remove a command of alert extension function. Select the command and then click **Remove**.

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 used for the mail alert.



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

Clicking this displays the configured SMTP servers. No more than four SMTP servers can be configured with this version.

Add

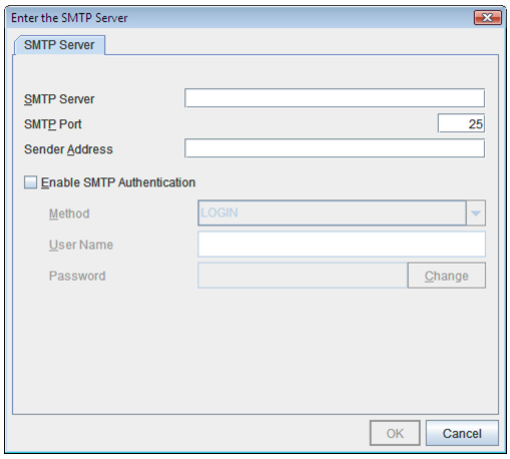
Use this button to add a SMTP server. Click **Add** to display the **Enter the SMTP Server** dialog box.

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 to 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)

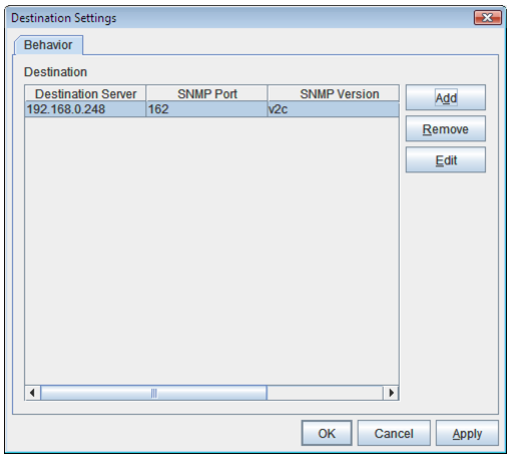
Configure the user name used for SMTP authentication.

Password (Within 255 bytes)

Configure the password used for SMTP authentication.

SNMP Settings

Click this to display the **Destination Settings** dialog box which is used for the SNMP trap.



Destination

Displays the set SNMP trap transmission destinations. With this version, up to 32 SNMP trap transmission destinations can be set.

Add

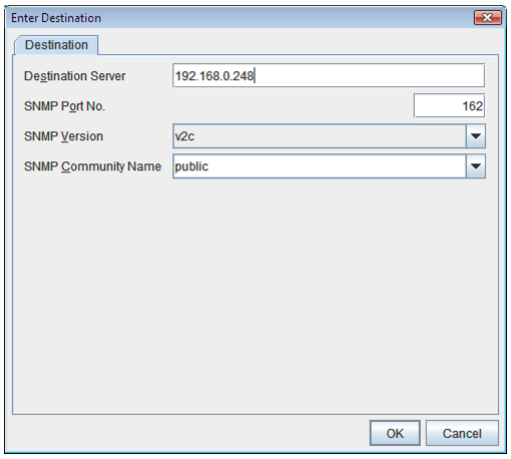
Adds an SNMP trap transmission destination. Click **Add** to display the **Change SNMP Destination** dialog box.

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 to 65535)

Configure the port number of the SNMP trap transmission destination.

SNMP Version

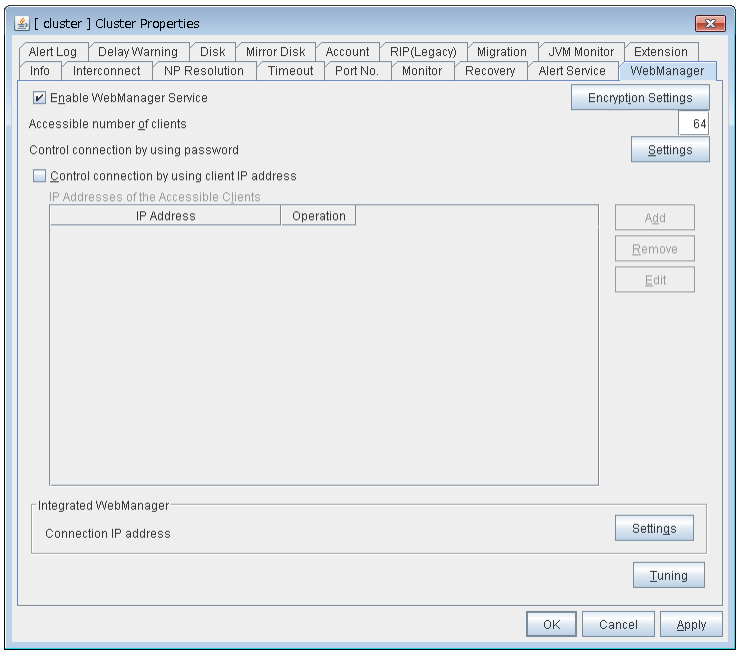
Configure the SNMP version of the SNMP trap transmission destination.

SNMP Community Name (up to 255 bytes)

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

3.11.9 WebManager tab

Use this tab to configure the settings for the WebManager.



Enable WebManager Service

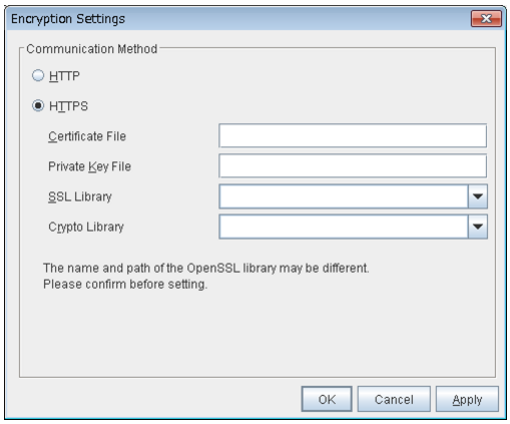
Enables the WebManager Service.

- 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 Setting** to display the **Encryption Setting** 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.

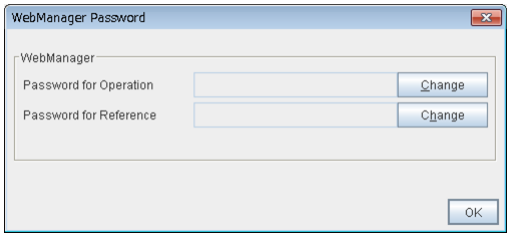
Note: OpenSSL library is necessary to use HTTPS.

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.

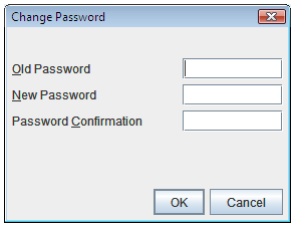
Control connection by using password

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 the operation mode, config mode, or verification 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 the 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).

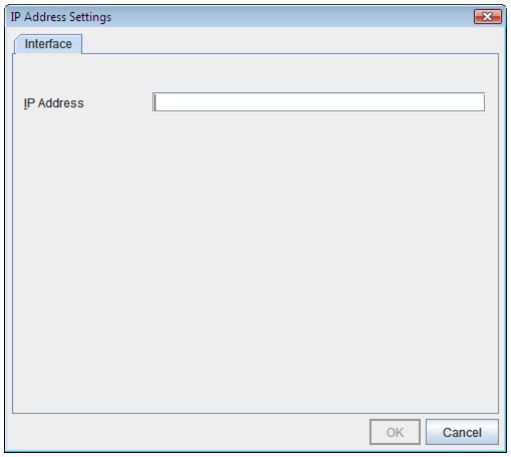
Control connection by using client IP address

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 to **IP Addresses of the Accessible Clients**. Click **Add to display the IP Address Settings** dialog box is displayed. 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 you want to remove from **IP Addresses of the Accessible Clients** and then click **Remove**.

Edit

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

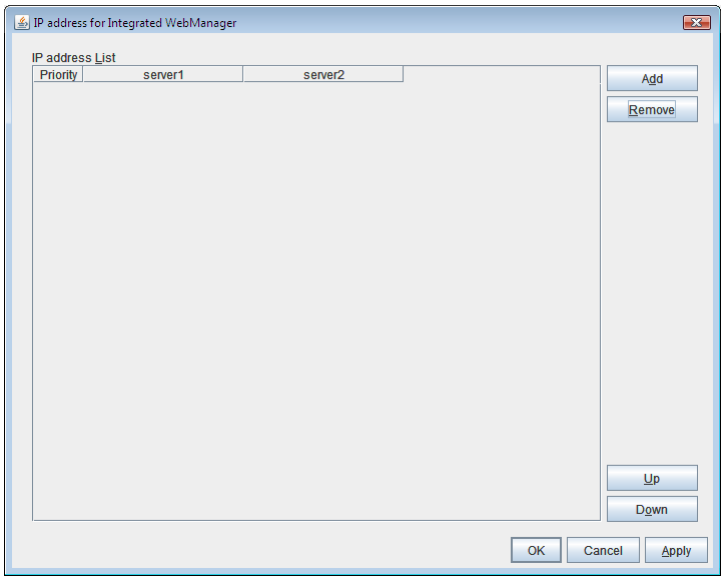
Control column

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 display the **IP address for Integrated WebManager** dialog box.



- 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

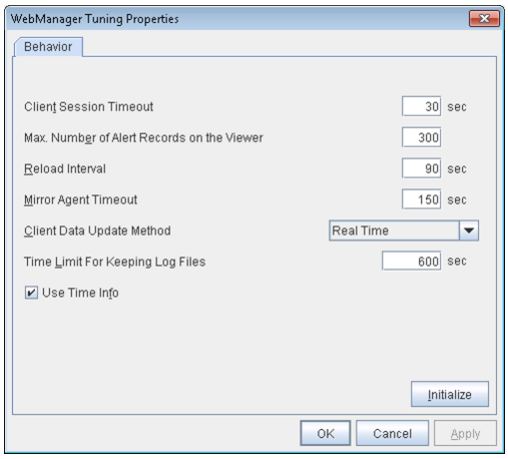
  Remove the communication path. Select the communication path to be removed and click Remove, then the selected path is removed.

- 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 Properties

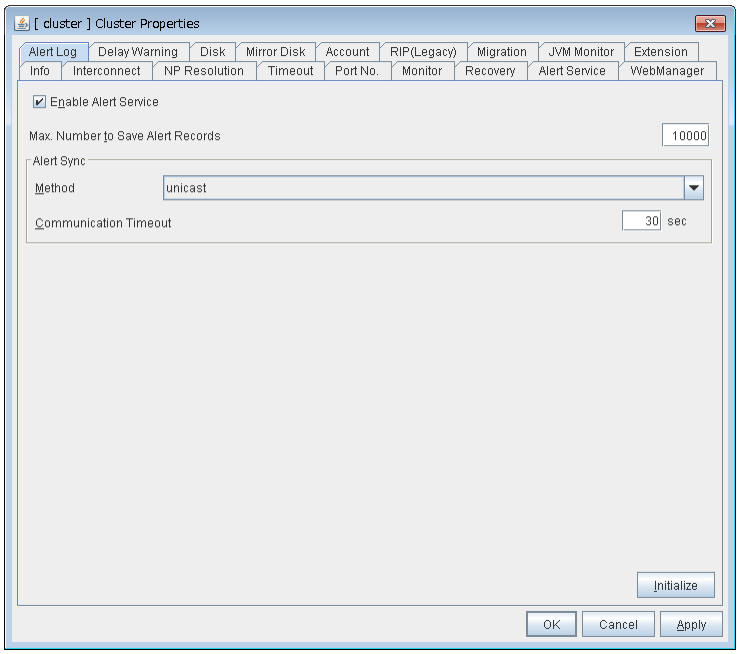
Use **Tuning** to tune the WebManager. Clicking **Tuning** displays the **WebManager Tuning Properties** dialog box.



- 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 the 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)
  Specify the mirror agent time-out. A time-out is determined if the time specified here elapses till the mirror disk information is acquired.
- Client Data Update Method
  You can select the method to update the screen data of the WebManager from the following.
  - Polling
    The screen data is updated regularly.
  - Real Time
    The screen data is updated on the real time.
- Time Limit For Keeping Log Files (60 to 43200)
  Time limit determines when the log collection information temporarily saved on the server will be deleted. When the time specified here has elapsed, the log collection information will be deleted unless you save the file when the dialog box asking you if you save the log collection information is displayed.
- Use Time Info
  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 items to their default values.

3.11.10 Alert Log tab

Configure the settings for the alert log.



Enable Alert Service

Select this to start EXPRESSCLUSTER Web Alert service for the server.

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

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

Specify the maximum number of alert records that can be retained. EXPRESSCLUSTER Web 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)

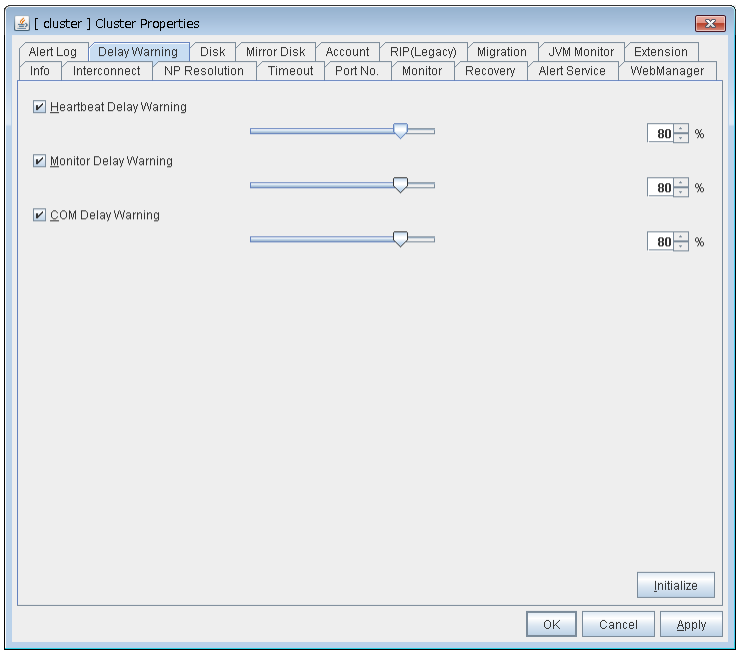
Specify a communication time-out. A communication time-out is determined if the time specified here elapses after the last communication between EXPRESSCLUSTER Web Alert service and servers.

Initialize

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

3.11.11 Delay Warning tab

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



Heartbeat Delay Warning (1 to 99)

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.

Monitor Delay Warning (1 to 99)

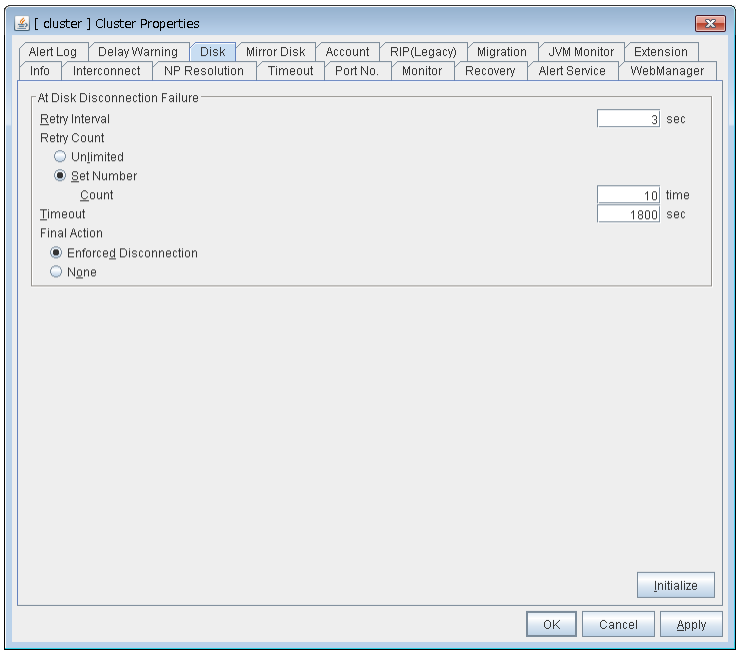
Set a percentage of monitor time-out at which the monitor delay warning is issued. If the time for the percentage passes without any monitor response, the warning will be produced in an alert log.

COM Delay Warning (1 to 99)

Set a percentage of COM I/F delay warning. If the time for the percentage passes without any COM response, the warning will be produced in an alert log.

3.11.12 Disk tab

Configure the setting for a shared disk.



At Disk Disconnection Failure: Retry Interval (1 to 10)

Set the interval time required to retry disconnecting, when disconnecting a shared disk has failed.

At Disk Disconnection Failure: Retry Count (0 to 180)

Set the count to retry disconnecting when disconnecting a shared disk has failed.

- Unlimited
  Select this to retry disconnecting a disk infinitely.
- Set Number
  Select this to specify the count to retry to disconnect a disk.

At Disk Disconnection Failure: Timeout (1 to 9999)

Set the timeout at which to disconnect a shared disk.

At Disk Disconnection Failure: Final Action

If the count to disconnect a shared disk again is specified, set the action that will be taken in the case that disconnecting is failed for the specified count.

- Enforced Disconnection
  Select this to disconnect a disk forcibly.
- None
  Select this not to disconnect a disk forcibly.

Initialize

This operation is used to return the value to the default value. Click **Initialize** to set all items to their default values.

Note:

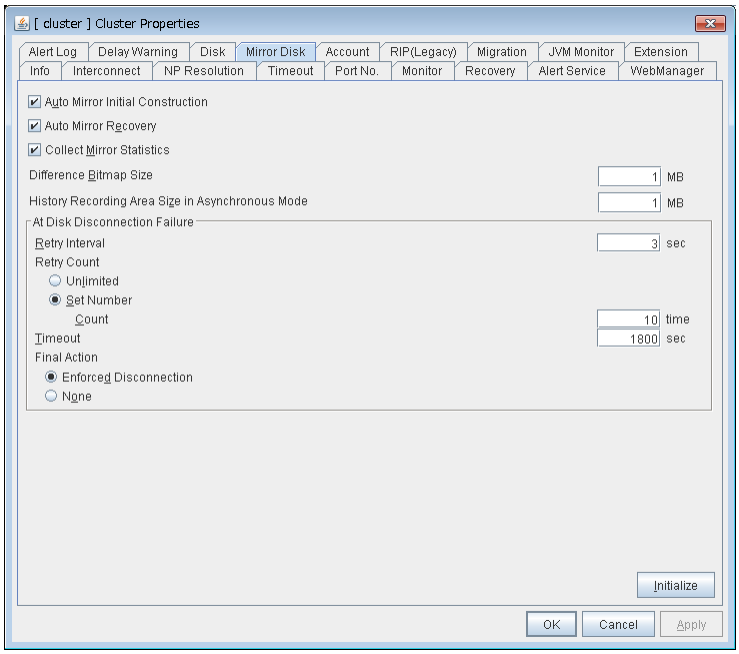
If the disk fails to be disconnected, retry or the final action is performed as many times as the value set above for each disk resource deactivation.

However, an emergency shutdown occurs if a single deactivation takes 9999 or more seconds.

To change the retry count and retry interval, set the values in consideration of the above event.

3.11.13 Mirror Disk tab

Configure the setting for a mirror disk.



Auto Mirror Initial Construction

Specify whether to perform the mirror initial construction automatically when the newly created mirror disk resource is activated for the first time.

- When selected
  Mirror initial construction is performed automatically.
- When cleared
  Auto mirror initial construction is not performed

Auto Mirror Recovery

An automatic mirror recovery is performed when any difference occurs in the data of mirror disks between both servers. There is a case that mirror recovery cannot be performed automatically even if it is selected. For details, see "Troubleshooting" "Automatically recovering from mirroring" in "Troubleshooting" in the "Reference Guide"

- When selected
  Mirror recovery is performed automatically.
- When cleared
  Mirror recovery is not performed automatically.

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 selected
  Mirror Statistics Collection is performed.
- When cleared
  Mirror Statistics Collection is not performed.

Difference Bitmap Size (1 to 5)

Users can set the size of an area in which the data differential information between servers is recorded, when a mirror break occurs. If the data partition is data transfer for mirror recovery is optimized by enlarging the size.
This item needs to be set before establishing a mirror disk resource and a hybrid disk resource. If the mirror disk resource and the hybrid disk resource already exist in the cluster, the setting cannot be changed.

History Recording Area Size in Asynchronous Mode (1 to 100)

Users can set the size of an area in which the history of unsent data is recorded. In the asynchronous mode, a mirror break occurs if a certain amount of unsent data is stored. Larger size makes it harder for the mirror break to occur.
This item needs to be set before establishing a mirror disk resource and a hybrid disk resource. If the mirror disk resource and the hybrid disk resource already exist in the cluster, the setting cannot be changed.

At Disk Disconnection Failure: Retry Interval (1 to 10)

Set the interval time required to retry disconnecting, when disconnecting a mirror disk has failed.

At Disk Disconnection Failure: Retry Count (0 to 180)

Set the count to retry disconnecting when disconnecting a mirror disk has failed.

- Unlimited
  Select this to retry disconnecting a disk infinitely.
- Set Number
  Select this to specify the count to retry to disconnect a disk.

At Disk Disconnection Failure: Timeout (1 to 9999)

Set the timeout at which to disconnect a mirror disk.

At Disk Disconnection Failure: Final Action

If a retry count is set for mirror disk disconnection, set the action when that will be taken in the case that disconnection still fails after the specified retry count exceeds.

- Enforced Disconnection
  Select this to disconnect a disk forcibly
- None
  Select this not to disconnect a disk forcibly.

Initialize

This operation is used to return the value to the default value. Click **Initialize** to set all items to their default values.

Note:

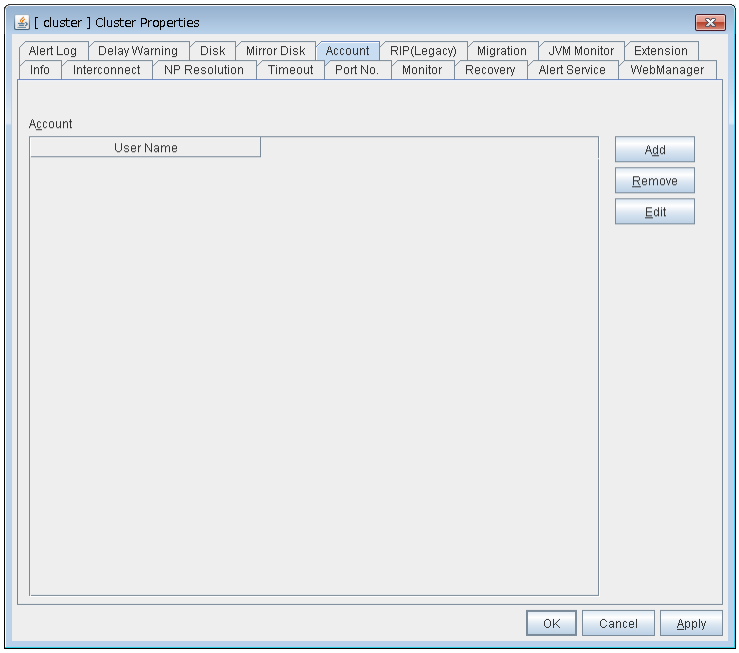
If the disk fails to be disconnected, retry or the final action is performed as many times as the value set above for each mirror disk resource deactivation.

However, an emergency shutdown occurs if a single deactivation takes 9999 or more seconds.

To change the retry count and retry interval, set the values in consideration of the above event.

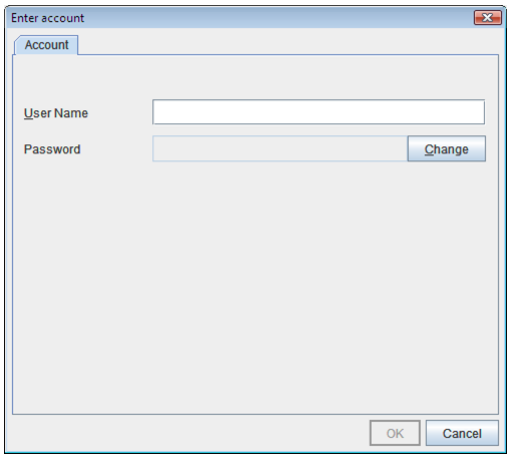
3.11.14 Account tab

The **Account** tab is used to register and/or delete the user account that is used in the /U option of the ARMLOAD-compatible command. You can set up to sixteen user accounts for one cluster system. The accounts that have already set on the all cluster servers are the target to be registered. The user accounts that are currently registered on the **Account** are displayed.



Add

Use **Add** to add a user account on the Account List. Click **Add** to display the **Enter account** dialog box.



- User Name
  Enter a user account name to be registered. When specifying an account of a domain, enter, for example, "*Domain Name\Account Name.*"
- Password
  Enter a password of the user account to be registered.

Remove

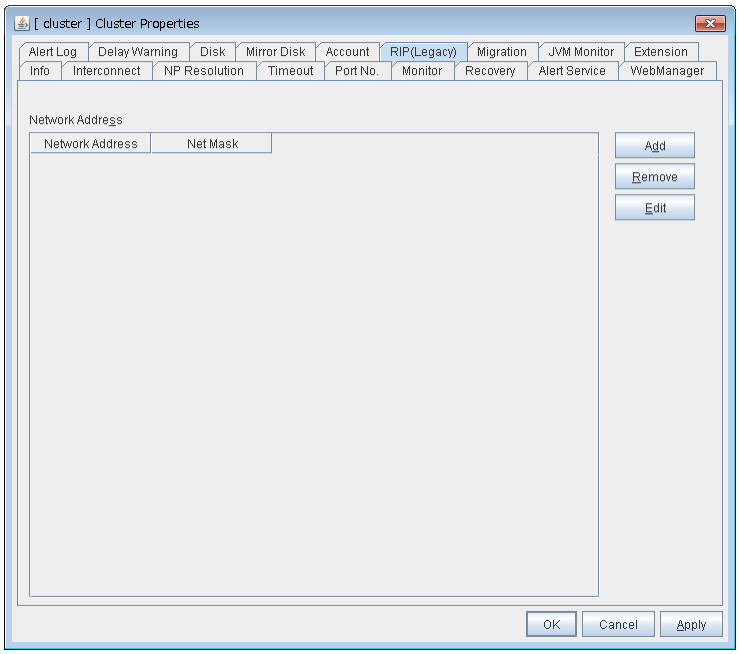
Use **Remove** to remove a user account from the Account List. Select the user account you want to remove from **Account** and then click **Remove**.

Edit

Use **Edit** to edit a user account. Select the user account you want to edit from **Account** and then click **Edit**. The **Enter account** dialog box where the selected account was entered is displayed.

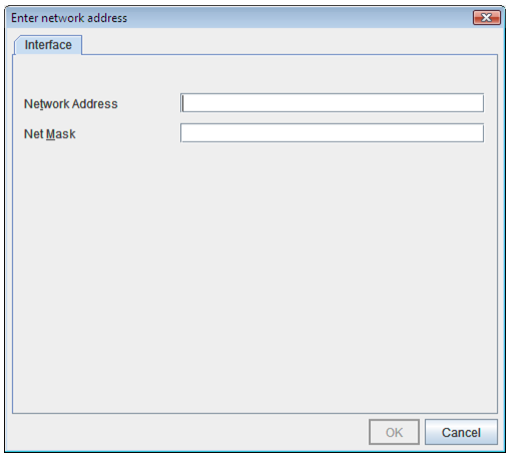
3.11.15 RIP (Legacy) tab

When connecting to the EXPRESSCLUSTER Server from a remote LAN by using a virtual IP address, RIP must be sent to the public LAN which a router is connected to. The broadcast address of the RIP which is set on the cluster is displayed on the **Network Address**.



Add

Use **Add** to add a network address to the **Network Address**. Clicking **Add** displays the **Enter network address** dialog box.



- Network Address
  Enter a network address to be registered.
- Net Mask
  Enter a network mask to be registered.

Remove

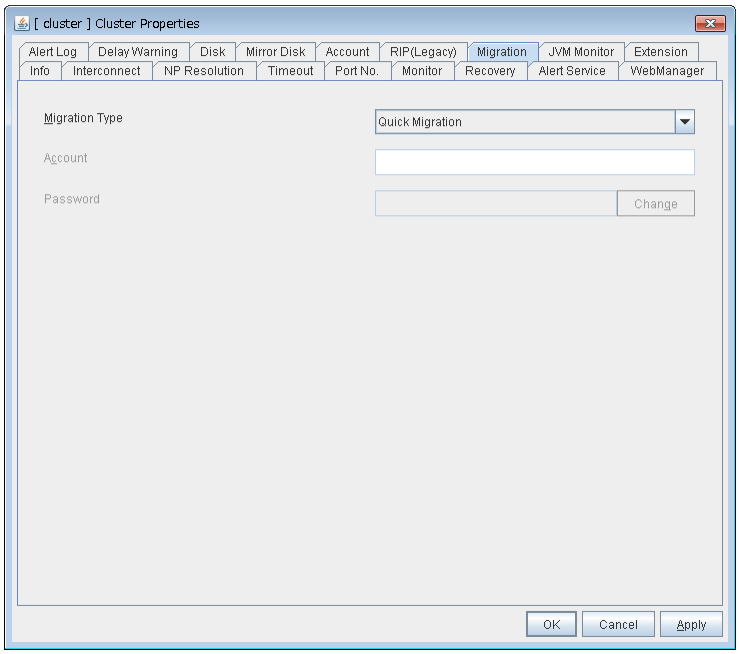
Use **Remove** to remove a network address from the **Network Address**. Select the network address you want to remove from the **Network Address** and then click **Remove**.

Edit

Use **Edit** to edit a network address. Select the network address you want to edit from **Network Address** and then click **Edit**. The **Enter network address** dialog box where the selected network address was entered is displayed.

3.11.16 Migration tab

Set the migration of the virtual machine resource.



Migration Type

- Quick Migration
  Performs quick migration.
- Live Migration
  Performs live migration.

Account

Enter the name of the user account to be registered. Enter "*domain_name\account_name*."

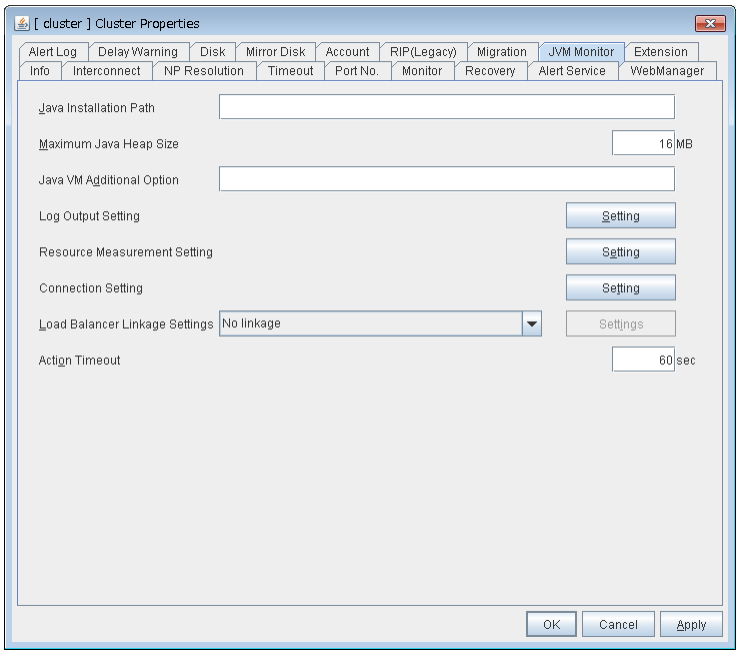
Password

Enter the password for the user account to be registered.

3.11.17 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: `C:\Program Files\Java\jdk1.8.0_102`

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 for **Maximum Java Heap Size**. This setting becomes common for all the 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.

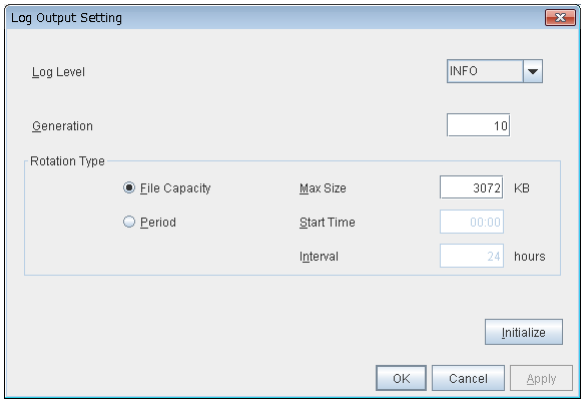
Select the load balancer type from the list. To perform load balancer linkage, select the load balancer you are using. To cancel the load balancer linkage, select **No linkage**.

Action Timeout (30 to 300)

Set a timeout value for the **Command** that has been specified on each window of the JVM monitor. This setting becomes common for all of the **Command**.

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 the 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>*\log\ha\jra increase per cluster suspend.

Rotation Type

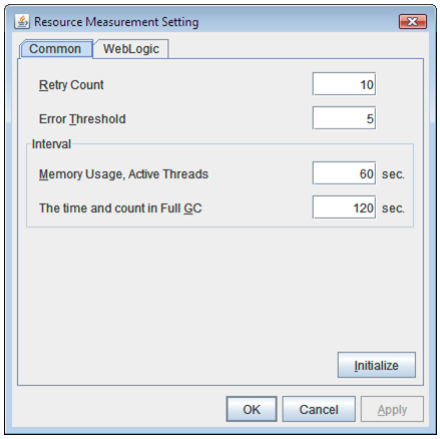
Select a rotation type for the log output by the JVM monitor. If you select **File Capacity** as the rotation type, set the maximum size (200 to 2097151), in kilobytes, for each log file such as the JVM operation log. If you select **Period** as the rotation type, set the log rotation start time in "hh:mm" 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 on the scheme for error judgment by the JVM monitor, see "Monitor resource details." in the "Reference Guide".



Retry Count (1 to 1440)

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 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)

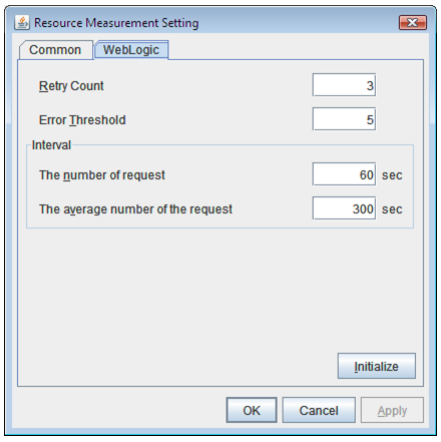
Set the interval at which the JVM monitor measures the time and count in Full GC execution.

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 on 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 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)

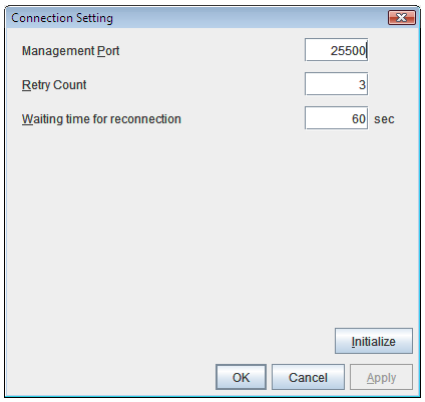
Set the interval at which the JVM monitor measures the average number of work manager or thread pool requests during WebLogic monitor. Set a value that is an integer multiple of the value set in **Interval: The number of request**.

Initialize

Clicking **Initialize** returns the retry count, error threshold, and interval items to their default values.

Connection Setting

Clicking **Setting** displays the **Connection Setting** 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 42424 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)

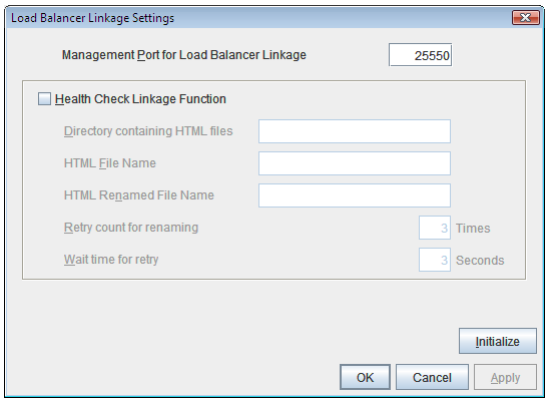
Set the interval at which the JVM monitor retries connection if it fails in Java VM connection.

Initialize

Clicking **Initialize** sets the management port, retry count, and waiting 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 42424 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 255 bytes)

Set the directory in which the HTML file used by the load balancer health check function is stored.

HTML File Name(up to 255 bytes)

Set the HTML file name used by the load balancer health check function.

HTML Renamed File Name(up to 255 bytes)

Set the HTML renamed file name used by the load balancer health check function.

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)

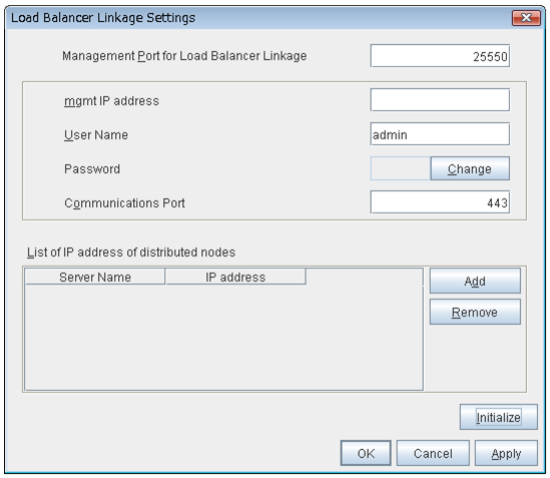
Set the interval at which HTML file renaming is retried if it fails.

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 interval 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.



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.

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 computer name. For the IP address, specify the value set to **Members** in **LocalTrafic** - **Pools:PoolList** - **Relevant pool** - **Members** of BIG-IP Configuration Utility.

To change the value, select the line and directly edit the description.

Remove

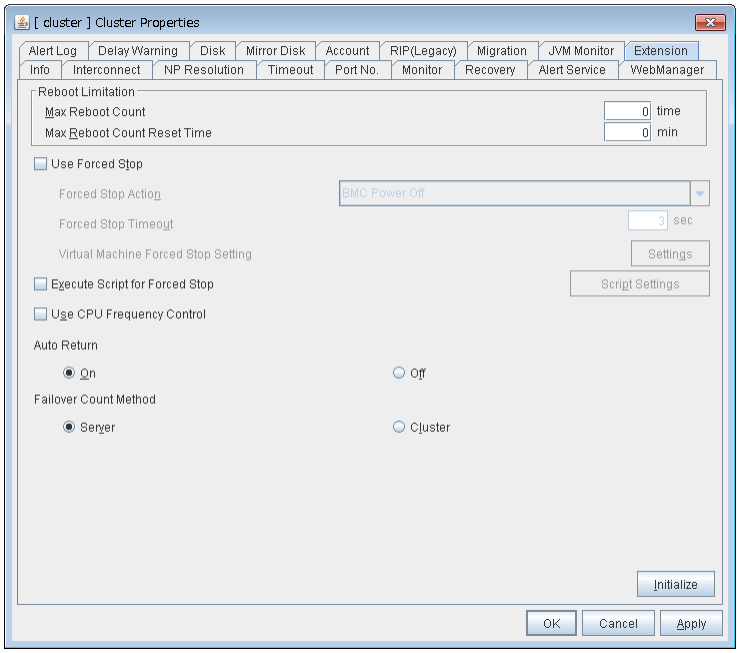
Remove the server name and IP address for the distributed node. Select the line to be removed and then click **Remove**. The selected server is removed.

Initialize

Clicking Initialize returns the management port for load balancer linkage, management user name, and communication port number to the default settings.

3.11.18 Extension Tab

Other cluster functions are set.



Reboot Limitation

You can specify the **Reboot OS** or **Shut down OS** as the final action at abnormality detection for group resources and monitor resources. If either of them is selected, 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.

  However, the number of reboots may not be counted with **Generate an intentional stop error** selected.

- 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** is set to 1 or greater, usually set **Max Reboot Count Reset Time** to 1 or greater (default: 0). If **Max Reboot Count Reset Time** is set to zero (0), the reboot count is not reset. To reset the reboot count, use the 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 hwreset command or the ireset command.

- BMC Power Off

  Use this to power off the server by using the hwreset or ireset command. The OS may be shut down depending on how the **Power Options** of OS is configured. For details, see "Forced stop function Notes on forced stop" in "Other settings" in the "Reference Guide".

- BMC Power Cycle

  Use this to perform the Power Cycle (powering on/off) by using the hwreset or ireset command. The OS may be shut down depending on how the ACPI of OS is configured. For details, see "Forced stop function Notes on forced stop" in "Other settings" in the "Reference Guide".

- BMC NMI

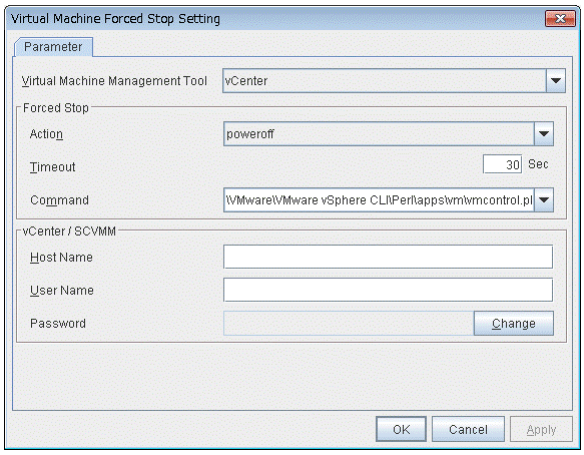
  Use this to generate NMI by using the hwreset or ireset command. The behavior after NMI is generated depends on the OS settings.

Forced Stop Timeout (0 to 999)

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
  Specify this option when using vCenter for virtual machine control.
- SCVMM
  Specify this option when using SCVMM for virtual machine control.

Forced Stop

- Action
  Specify the action performed upon a forced stop.
  - power off
    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 / SCVMM

- 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

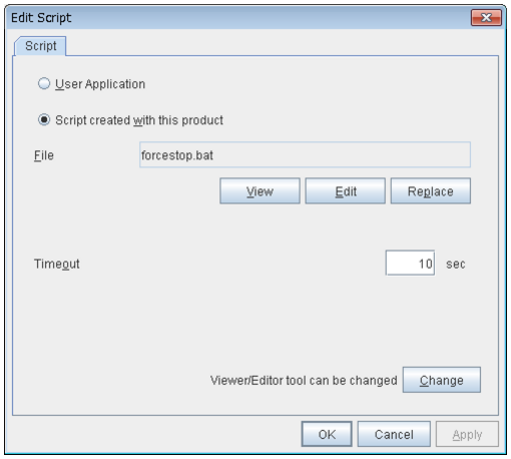
Use this to select whether or not to execute a script for the forced stop.

- On
  If selected, the script is executed for the forced stop.
- Off

If selected, the script is not executed.

Script Settings

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 batch 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 you specify only the name of the executable file, you must configure the path with environment variable in advance. If there is any blank in the absolute path or the file name, put them in double quotation marks ("") as follows.

  Example:

  ```
  C:\Program Files\script.bat
  ```

  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 batch 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.

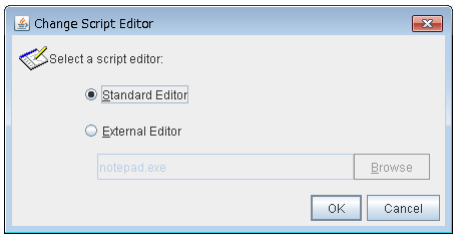
- **Replace**

  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 999)

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 here to use a standard editor (Notepad (notepad.exe)) as a script editor.
- **External Editor**
  Select here to specify an arbitrary script editor. Click **Browse** to specify the editor to be used.

Use CPU Frequency Control

Configure whether or not to use the function to turn it to power-saving mode by controlling the CPU frequency of the standby server.

Select the check box when you use CPU frequency control. If you uncheck the check box, CPU frequency control is disabled.

See also:

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.

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 Windows OS power management function.

Note:

If you disable CPU frequency control function with CPU frequency changed, the CPU frequency does not return to the state before changing.

In this case, return the CPU frequency to the defined value by the following way.

Select **Balanced** in **Power Options** -> **Choose or customize a power plan** in **Control Panel**.

Auto Return

Configure whether to perform "Auto Recovery" when a cluster server is restarted after server failure has occurred.

- On
  Select this to perform the auto recovery.
- Off
  Select this not to perform the auto recovery.

Failover Count Method

Select the method to count the number of failovers from Server or Cluster.

- Server
  Count the number of failovers by server.
- Cluster
  Count the number of failovers by cluster.

Initialize

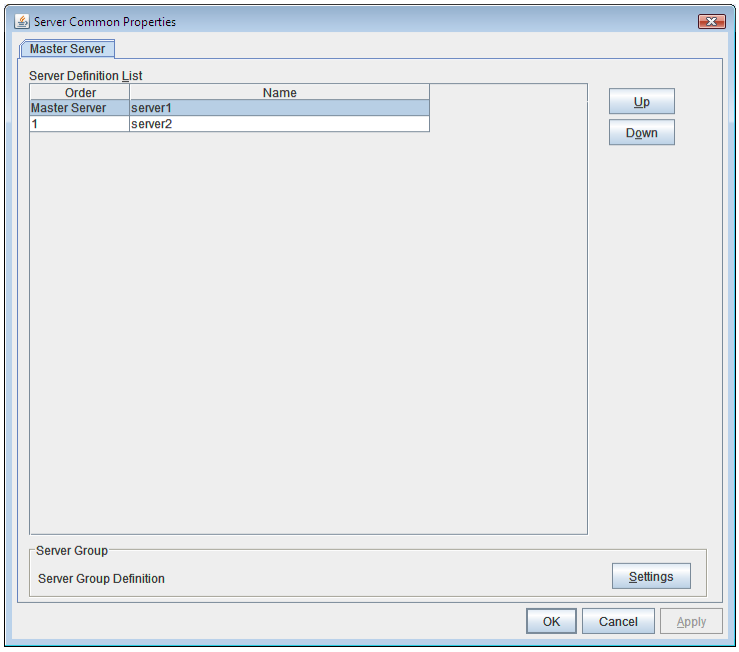
This operation is used to return the value to the default value. Click **Initialize** to set all items to their default values.

3.12 Servers 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.

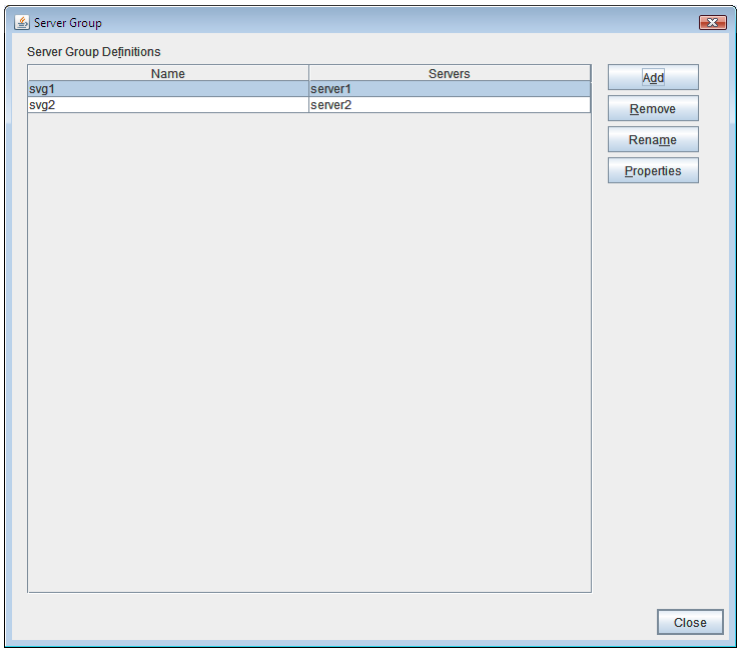


Up, Down

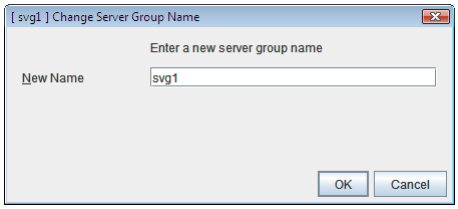
Used when changing the priority order of the servers. Select the server to be changed from the server definition list, and select **Up** or **Down**. The selected row moves.

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 selected server group is used for the settings of the startup server of the failover group, the server group cannot be removed.
- Rename
  The change server group name dialog box of the selected server group is displayed.



  There are the following naming rules.
  - 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.

  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

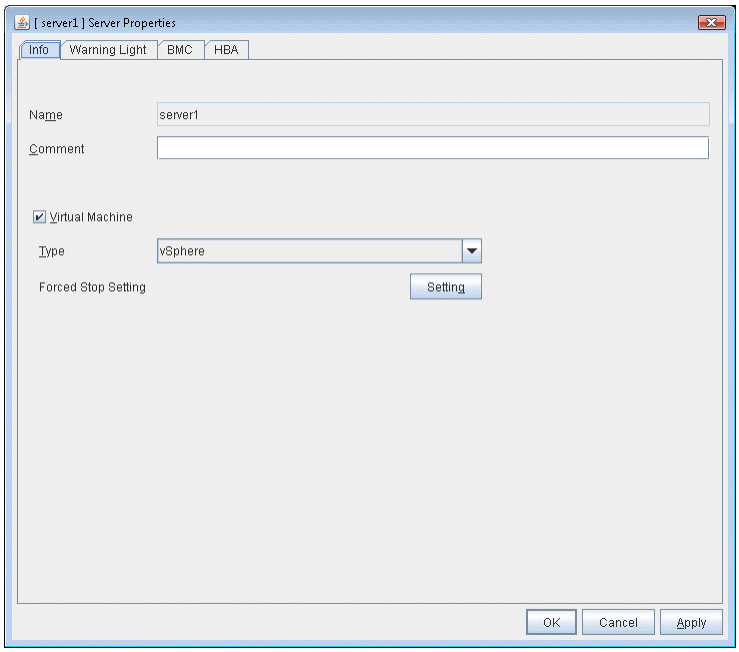
Display the server names which belong to the server group.

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 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

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).

- When the check box is selected
  The server is a virtual machine (guest OS). You can configure this virtual machine.
- When the check box is not selected
  The server is a physical machine. You cannot configure a virtual machine.

Type

Specify the type of virtual infrastructure.

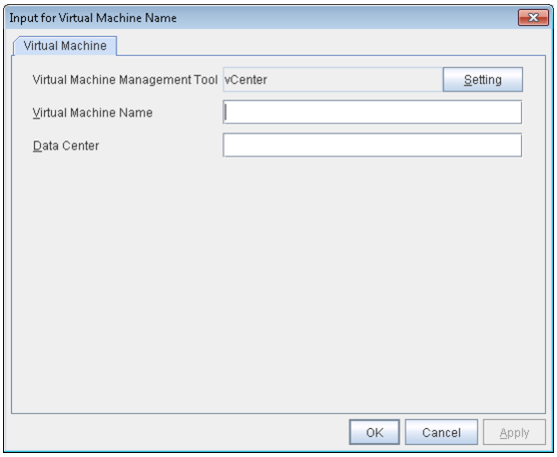
- vSphere
  Virtual infrastructure provided by VMware, Inc.
- KVM
  Linux kernel virtual infrastructure.
- XenServer

Virtual infrastructure provided by Citrix Systems, Inc.

- Container
  Virtual infrastructure provided by Oracle, 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 Management Tool

Set the virtual machine management tool that manages the virtual machine (guest OS).
Click **Setting** to display the **Virtual Machine Forced Stop Setting** dialog box.

For details on **Virtual Machine Forced Stop Setting**, refer to the **Extension** Tab.

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.

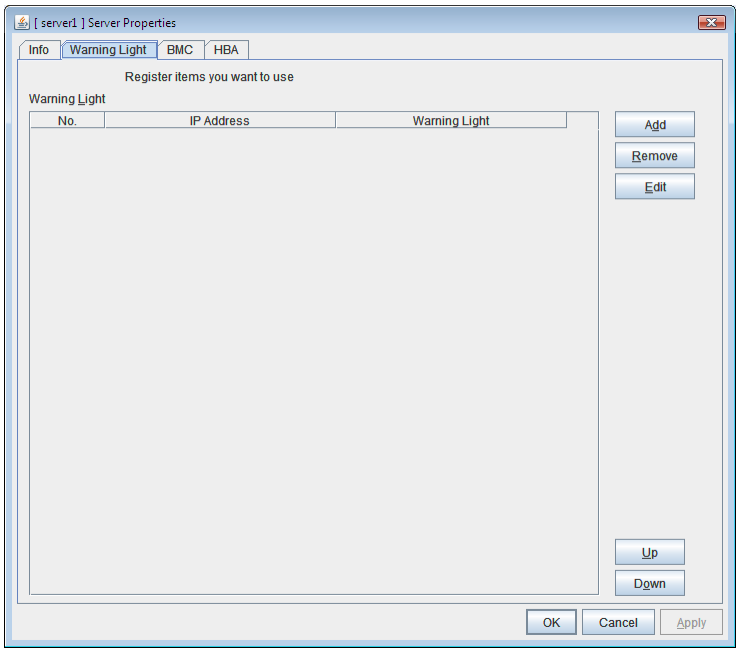
Data Center (Within 80 bytes)

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.

3.13.2 Warning Light tab

Set an IP address of warning light (specified by NEC) controlled by network.



Add

Use this button to add an IP address of warning light. Click **Add** to open the **Warning Light Settings** dialog box.

Remove

Use this button to remove an IP address of warning light. Select the target setting, and then, click **Remove**.

Up

It can't be used because only 1 warning light can be registered at present.

Down

It can't be used because only 1 warning light can be registered at present.

- 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

- 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.

- User Name
  Enter the user name of the execution account on the server used for controlling the warning light. Also, the user name specified here is used as the remote user name for the rsh command.
- Password
  Enter the password of the execution account on the server used for controlling the warning light.

Note: Enter Administrator for user name, Administrator for password.

- Specify rsh command execution file path
- When the check box is selected
  The rsh command execution file path can be specified.
- When the check box is not selected
  The rsh command execution file path cannot be specified.
- File path

  Enter the full path of the rsh command to be used for controlling the warning light.
  Specification example: `C:\WINDOWS\system32\rsh.exe`

- 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 reproduced at server start.

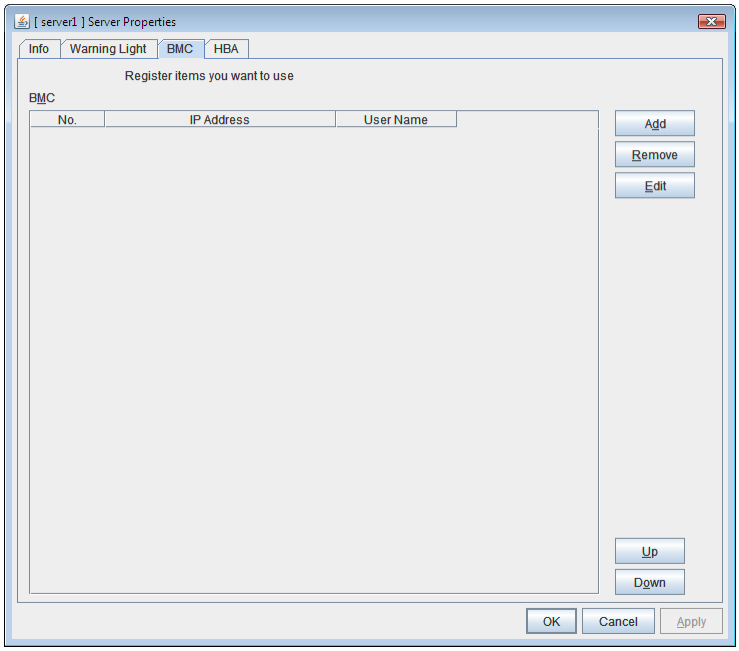
- Alert When Server Stops
  - When the check box is selected
    Reproduces the audio file at server stop. The audio file is continuously reproduced until it is stopped manually.
  - When the check box is not selected
    Does not reproduce the audio file at server stop.
- Voice File No. (DN1500GL: 01 to 20, NH-FV1 series: 01 to 70)
  Set the number of the voice file to be reproduced at server stop.
- Edit
  Use **Edit** to edit the warning light setting.

Note: To play 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.

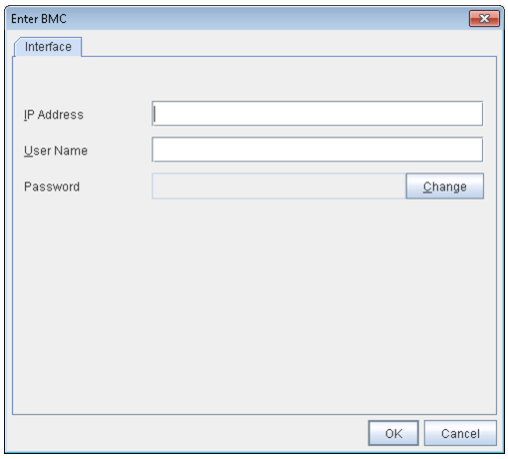
3.13.3 BMC tab

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 new settings. Click **Add** to open 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 name of a user with administrator privilege from the user names configured in BMC.
  If you do not enter anything, do not configure the user name argument when executing the hwreset, alarms, ireset, or ialarms command.
  The length of the actually valid user name depends on the hwreset command, alarms command, ireset command, ialarms command, and the BMC specifications of the server.
- Password (within 255 bytes)
  Enter the password of user configured above.
  The length of the actually valid user name depends on the hwreset command, alarms command, ireset command, ialarms command, and the BMC specifications of the server.
  For information on user name of BMC and how to configure the password, refer to the manual of the server.

Remove

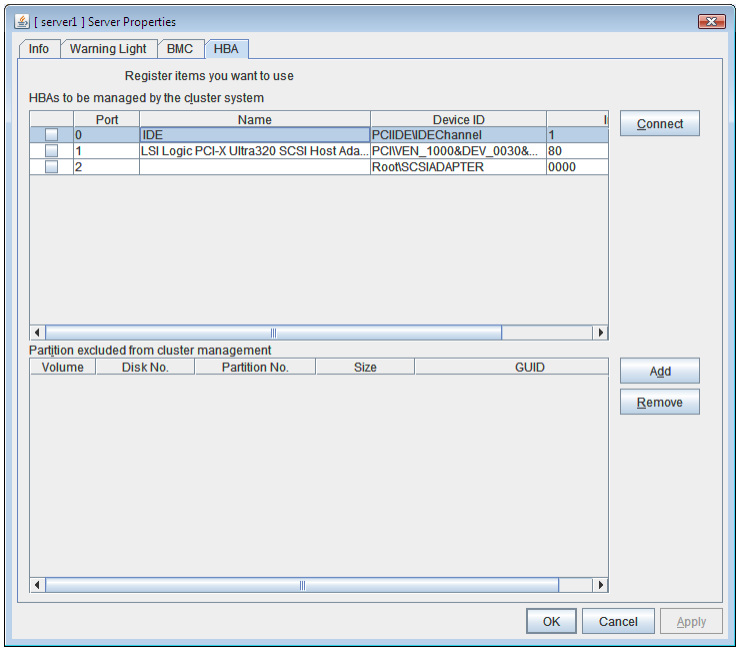
Use this button to remove the settings. Select the target setting, and then, click **Remove**.

Edit

Use this button to modify the settings. Select the target setting, and then, click **Edit**. The **BMC Settings** dialog box is displayed.

3.13.4 HBA tab

Set the HBA to which the shared disk is connected.



List of HBAs to be managed by the cluster system

Set the access to the shared disk. If the check box is selected, access to all disks connected to the HBA is controlled when starting the OS next time. To protect data, it is required to select the check box of the HBA to which the shared disk is connected.
If the HBA list is not displayed, it can be displayed by clicking the **Connect** button.

Important:

- Do not connect the shared disk to any HBA whose check box is not selected. Even though the check box is selected, do not connect to the shared disk when the OS is not started again after configuring the settings. Data on the shared disk may be corrupted.
- Do not select the check boxes other than those of HBAs to which the shared disk is connected. If access to the system partition on which the OS has been installed is restricted, the OS may not be started.
- Do not select the check boxes of HBA that connects the mirroring target internal disk if **you use mirror disk resource. Starting mirror disk resource fails.**

Partitions excluded from cluster management

When a disk other than the shared disk is connected to the HBA set in **HBAs to be managed by the cluster system**, register the partitions on the disk. The access to the partitions registered with this list is not restricted.

Important: In principle, do not register the partitions on the shared disk that can be accessed from multiple servers. Data on the shared disk may be corrupted.

Connect

Select this to get the HBA data by connecting to the server.

Add

Add a partition that should not be restricted in its access in **Partition excluded from cluster management**.

Remove

Remove the selected partition from **Partition excluded from cluster management.**

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 when a PC that cannot connect to the cluster through a Web browser is used for creating and modifying the cluster configuration data. Follow the procedures below to install the Builder (offline version).

Note: Install the Builder with the administrator privilege.

1. Insert the Installation CD-ROM to the CD-ROM drive.
2. Select **EXPRESSCLUSTER® for Windows**.

   Note: If the menu screen does not open automatically, double-click menu.exe in the root folder of the CD-ROM.

3. Select **EXPRESSCLUSTER® Accessories**.
4. Select **EXPRESSCLUSTER® Builder**.
5. Select where to install in the **Cluster Builder self-extracting dialog** box and click **Extract**.
6. Click **OK** in the ZIP self-extract dialog box. Installation is completed.
   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

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.

CHAPTER

FOUR

COMPATIBLE COMMAND REFERENCE

This chapter describes compatible commands.

This chapter covers:

4.1 Compatible command overview

Compatible commands have compatibility with commands used in EXPRESSCLUSTER Ver8.0 or earlier in functions. This section explains how to use compatible commands.

4.2 Note on compatible commands

The following is the note on compatible commands.

- To use a compatible command, the name of a cluster, server and group needs to be configured according to the naming rules of the conventional version.
- Compatible commands cannot be used when the server is in the suspension (isolated) status.
- Run the following compatible commands as a user with Administrator privileges.

4.3 Compatible commands

- Commands that can be used only in scripts

command	Description	Page
armbcast.exe	Displays a default or optional message on the client on which the EXPRESSCLUSTER client is running.	4.4. *Displaying the messages on EXPRESSCLUSTER clients (armbcast command)*
armlog.exe	Registers log messages to the log file.	4.5. *Registering the messages on a log file or an alert log (armlog command)*
armload.exe	Starts an application. The application started by the armload.exe can be stopped by the armkill.exe in any position of a script.	4.6. *Starting the applications or services (armload command)*
armkill.exe	Stops the application started by the armload.exe.	4.7. *Terminating the application or service (armkill command)*
armgwait.exe	Waits for the start or stop of groups	4.8. *Waiting for the start or stop of groups (armgwait command)*
armcall.exe	Executes a command specified as a parameter or a program exclusively on nodes.	4.9. *Exclusive control between servers command (armcall command)*
armgetcd.exe	Retrieves the value specified to the desired variable by the armsetcd.exe command. This command can be used for branch conditions of scripts.	4.10. *Retrieving the cluster wide variable or local variable (armgetcd command)*
armsetcd.exe	Sets the value to the desired variable. This value can be referred by the armgetcd.exe command.	4.11. *Setting the cluster wide variable or local variable (armsetcd command)*
armwhshr.exe	Monitors errors on the connection to the shared name.	4.12. *Monitoring errors on the connection to the shared resources (armwhshr command)*

- Commands that can be used both in and outside scripts.

command	Description	Page
armaswth.exe	Starts or stops the application or service, or suspends or resumes the monitoring or the application or service that is started by the armload.exe command.	4.13. *Controlling the applications or services started by the armload command (EXPRESSCLUSTER Task Manager)*
armdown.exe	Shuts down a server when you want to fail over a group intentionally, such as when starting or stopping the application or service fails.	4.14. *Shutting down the server (armdown command)*
armfover.exe	Moves or fails over groups.	4.15. *Moving or failing over a group (armfover command)*
armgstrt.exe	Starts groups.	4.16. *Starting a group (armgstrt command)*
armgstop.exe	Stops groups.	4.17. *Stopping a group (armgstop command)*

Continued on next page

Table 4.2 – continued from previous page

command	Description	Page
armloadc.exe	Start or stop the application or service, or suspends or resumes the monitoring.	4.18. *Starting or stopping the application or service, suspending or resuming the monitoring (armloadc command)*
armpause.exe	Suspends scripts. This command can be used as a debugger. Permit the interaction with desktop. You can configure the setting for the interaction with desktop on the Service of Administrative Tools on Programs.	4.19. *Suspending the script execution until the user's direction (armpause command)*
armsleep.exe	Suspends the script execution for a specified time.	4.20. *Suspending the script execution for the specified time (armsleep command)*
armnsadd.exe	Starts sharing a network drive. This command functions in the same way as the net share shared_name=path_name.	4.21. *Starting the network sharing of the directory (armnsadd command)*
armnsdel.exe	Releases the network sharing forcibly specified by the net share shared_name=path_name.	4.22. *Stopping the network sharing of the directory (armnsdel command)*
armwsset.exe	Sets the IP address returned by executing gethostbyname() on the local server to the specific application.	4.23. *Setting the IP address returned by gethostbyname() (armwsset command)*

- Commands that can be used only outside scripts

command	Description	Page
armdelay.exe	Sets or refers to the delay time of the EXPRESSCLUSTER service startup on the NEC Express5800/ft series or servers that have equivalent fault-tolerant functions.	4.24. *Setting or displaying the start delay time (armdelay command)*
armem.exe	Sets or refers to the mode at emergency shutdown.	4.25. *Setting or displaying operations at the occurrence of the emergency shutdown (armem command)*
armstdn.exe	Shuts down a cluster.	4.26. *Shutting down the whole cluster (armstdn command)*
armmode.exe	Returns servers to a cluster.	4.27. *Returning the server with the status of "Suspension (isolated)" (armmode command)*
mdopen.exe	Permits an access to the mirror disk.	4.28. *Permitting an access to the mirror disk (mdopen command)*
mdclose.exe	Prohibits an access to the mirror disk.	4.29. *Prohibiting an access to the mirror disk (mdclose command)*

Important: **The** installation directory contains executable-format files and script files that are not listed in this guide. Do not execute these files other than EXPRESSCLUSTER. Any problems caused by not using EXPRESSCLUSTER will not be supported.

4.4 Displaying the messages on EXPRESSCLUSTER clients (armbcast command)

the armbcast.exe command displays the messages on EXPRESSCLUSTER clients.

Command line

Format 1
armbcast.exe /ID *n* /S *group_name*

Format 2
armbcast.exe /MSG *msg_strings* [/A | /S *group_name*]

Description
This command displays the default or optional messages on monitors of clients.

Parameter

/ID <n>

Displays a message that corresponds to the ID specified in *n*. You need to register this message in advance.
This parameter cannot be specified with /MSG.

/MSG <msg_strings>

Displays a character string *msg_strings* on clients. The maximum size of a string is 127 bytes.
When the character string includes spaces, enclose it in double quotation marks. When you use double quotation marks in the string, describe them as \".
This parameter cannot be specified with /ID.

/A
Displays a message on all clients.

/S <group_name>

Displays a message on all clients that use the group specified in *group_name*.
When using a Format 1, you cannot omit this parameter.
When using a Format 2, you cannot specify this parameter with /A. You can omit /A and /S. When omitted, /A is assumed to be specified.

Return Value

0	Success
7	The EXPRESSCLUSTER Server service has not been started.
9	The parameter is invalid.

Notes
This command cannot be used when recovering servers to a cluster (when the environment variable of start script "CLP_EVENT" is "RECOVER").

Remarks
This command can be used only in scripts.

4.5 Registering the messages on a log file or an alert log (armlog command)

The armlog exe command registers the messages on a log file or an alert log.

Command line

armlog.exe *log_strings* [/arm]

Description

This command registers specified messages to a log file or an alert log.

The messages are registered on the log file (arm.log) of the server on which this command is run. They are also displayed on the Alert view of the WebManager.

Parameter

<log_strings>

Specifies a message string to be registered.

The maximum size of a string is 128 bytes (when a string is displayed on the Alert view, the size is 111 bytes).

When the character string includes spaces, enclose it in double quotation marks. When you use double quotation marks in the string, describe them as \".

/arm

Displays a message on the Alert view of the WebManager.

When this parameter is omitted, a message is registered only to a log file.

Return Value

0	Success
1	Logs were not registered due to an error.
8	The EXPRESSCLUSTER Server service has not been started.
9	The parameter is invalid.

Remarks

This command can be specified only in scripts.

4.6 Starting the applications or services (armload command)

the armload.exe command starts applications or services.

Command line

Format 1: application

armload.exe *watchID* [[/U *user-name*] | [/WINDOW *size*]] [/WIDKEEP] [/C [CMD]] [<*mode*>] *exec-name* [*parameter-1 parameter-2 .....*]

For <*mode*>, one of the following can be specified.

- /W
- /M [/FOV [/CNT *count*]]
- /R *retry* [/H *hour*] [/SCR] [/FOV [/CNT *count*]] [/INT *time*]

Format 2: service

armload.exe *watchID* /S [/A] [/WIDKEEP] [/WAIT *time*] [/C [CMD]] [<*mode*>] *service-name* [*parameter-1 parameter-2 .....*]

For <*mode*>, one of the following can be specified.

- /M [/FOV [/CNT *count*]]
- /R *retry* [/H hour] [/SCR] [/FOV [/CNT *count*]] [/INT *time*]

Description

This command starts applications or services.
A failover or restart occurs when the started application or service fails (when specified as a monitoring target). Monitoring failures continues until the application or service is terminated by ARMKILL.
A failure is a loss of a process for the application, and a service stop (SERVICE_STOPPED) and abnormal termination for the service.

Parameter

<watchID>

ID for monitoring.
This ID is used for terminating the application or service by the ARMKILL command. Be aware of the following notes when using this parameter:

- The same IDs cannot be specified within a cluster.
- You cannot use IDs starting with "NEC" since those are already allocated (IDs of "NEC_*product_name*+ something extra" are used for the product programs of NEC).
- Specify the ID with alphanumeric characters of up to 255 bytes (case-sensitive).

/U <user-name>

Specifies the user account name that runs the application.
This parameter is optional. When omitted, the application is started with the local system account.

- This parameter cannot be specified in Format 2.

- When specifying this parameter, refer to (3) on Note.

/WINDOW <size>

Specifies the window size of an application. The following can be specified to *size*.
maximum The application or service starts with windows of a maximum size.
normal The application or service starts with windows of a size specified by the application.
hide The application or service starts with hidden windows.
This parameter is optional. When omitted, the application or service starts with windows of a minimum size.

- This parameter cannot be specified in Format 2.

/C [CMD]

Specifies the format to pass the parameter-n to the application or service. Specify this option when the parameter-n ends with an escape character (). Refer to the following examples to specify the parameter-n.

Example 1) when the command passes `c:\` to app.exe.

```
ARMLOAD WatchID /C app.exe c:\
```

Example 2) when the command passes `c:\Program Files\` to app.exe. Enclose `c:\Program Files\` in double quotation marks, and add escape characters for the number of escape characters in the end.

```
armload WatchID /C app.exe "c:\Program Files\"
```

- Specify "CMD" as well when specifying this parameter and the type of application is command.

/WIDKEEP
Starts or stops the application or service with no monitoring parameter (/M, /R) specified by using the EXPRESSCLUSTER Task Manager or the ARMLOADC command.

- This option is ignored when /W, /M or /R is specified.

/W
Waits until the execution of the application is terminated. When this parameter is specified, controls are not returned from this command until the application terminates. This parameter is optional.

- This parameter cannot be specified with /M or /R.
- This parameter cannot be specified in Format 2.

/M
Monitors the application or service. This parameter is optional. When omitted, monitoring is not performed.

- This parameter cannot be specified with /W or /R.
- When you use this parameter without specifying /FOV, servers are shut down at failure.

/R <retry>
Monitors the application or service and specifies the threshold of the restart count. This parameter is optional. When omitted, monitoring is not performed.

- The value from 1 through 9 can be specified.

- This parameter cannot be specified with /M or /W.

/H <hour>
Specifies the time to reset the restart count of the application or service to 0. The time can be specified by hours. When the application or service starts and operates normally during the time specified with the /H option, the restart count is reset to 0.

- The value from 1 through 24 can be specified.
- Restart count is not reset if this parameter is omitted with the parameter /R specified.

/SCR
When this parameter is specified, the application or service is restarted by scripts. This parameter is optional.

- The application or service is restarted by itself if this parameter is omitted with the parameter /R specified.

/FOV
Fails over groups when the restart count threshold is exceeded on the application or service monitoring. This parameter is optional.

- Servers are shut down if this parameter is omitted with the parameter /M or /R specified.

/CNT <count>

A failover is not performed when the number of failovers already performed exceeds the count specified by this option. This is to avoid servers from repeating failing over endlessly. The number of failovers is counted for each server.
The value from 1 through 255 can be specified.
When omitted, 8 is specified.
The failover count is reset to 0 on a specific server when:

- the normal status continues more than 1 hour
- the server is restarted
- the failover group is activated

<exec-name>
Specifies an executable file name.

- This parameter cannot be specified in Format 2.

<parameter-n>
Passed to an executable file. This parameter is optional.

/S
Specifies that the target to be started is a service.

- This parameter cannot be specified in Format 1.

/A

Specify this parameter when you want to specify the service as a monitoring target even though it is already started.
This parameter is optional.

- This parameter cannot be specified in Format 1.

/WAIT <time>
Specifies the time to wait for the completion of a service startup by the second. When this parameter is specified, this command does not return controls while waiting for the service to complete startup (SERVICE_RUNNING) or within the wait time. This parameter is optional. When omitted, the command does not wait for the completion of a startup.

- This parameter cannot be specified in Format 1.
- The value from 0 through 3600 can be specified. When 0 is specified, the command waits for the completion of a startup endlessly.

/INT <time>
Specifies restart interval of the application or service, or scripts by the second. This parameter is optional When omitted, 0 (second) is specified to the restart interval.

- This parameter is valid when /R or /SCR option is specified.
- The value from 0 through 3600 can be specified.

<service-name>
Specifies the service name.

- This parameter cannot be specified in Format 1.

For *service-name*, specify one of the following:

(1) Specify the service name that is displayed on the **Services** on the **Administrative Tools**.

(2) Specify *xxxx* that matches with the service name displaying "DisplayName", the key of *xxxx* of the following registry in **Services** on **Administrative Tools**.

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services*xxxx*

Example) For FTP service of IIS

Name displayed on the **Service** window

```
FTP Publishing Service
```

Name displayed on the registry

```
...\Services\MSFTPSVC
DisplayName:REG_SZ: FTP Publishing Service
```

Format:

```
armload WatchID /S "FTP Publishing Service"
```

or

```
armload WatchID /S MSFTPSVC
```

Return Value

0	Success (the target application or service has started)
1	Cannot start the target application or service
2	Cannot perform process monitoring
3	The specified watchID is already used.
4	Time-out occurred while waiting for the service to complete startup (the service is starting up).
8	The EXPRESSCLUSTER Server service is not started.
9	The parameter is invalid.

Remarks

(1) This command can be used only in scripts.

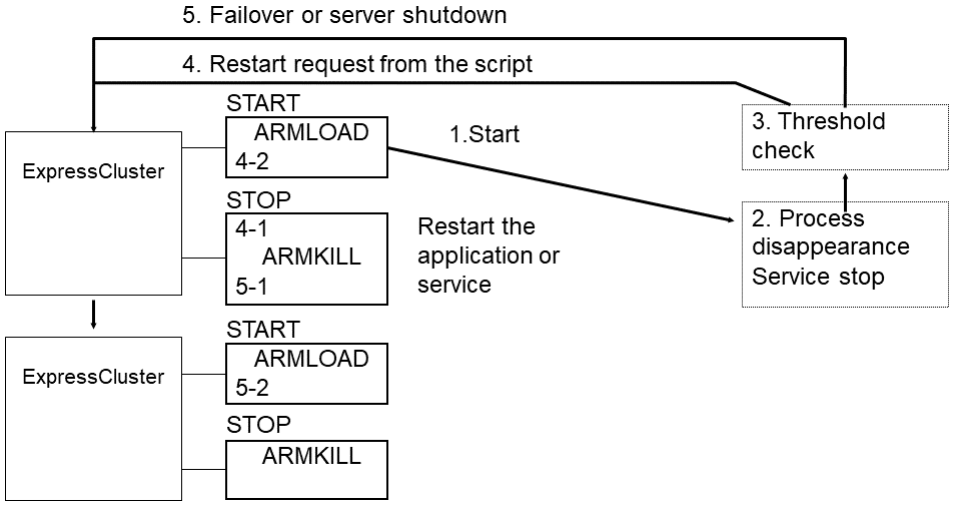
(2) Multiple parameters can be specified for a command that is passed to an executable file.

(3) The figure below indicates operations performed when the application or service started by ARMLOAD fails.

1. The application or service is started by ARMLOAD
2. A failure occurs
3. Threshold check
4. When the threshold is not exceeded, the application or service is restarted by scripts.

   4-1: Stop script execution 4-2: Start script execution
5. When the threshold is exceeded, a failover occurs or a server shuts down

   5-1: Stop script execution 5-2: Fails over to another EXPRESSCLUSTER server



Notes

(1) This command can be specified only in scripts.

(2) When you start the application with GUIs without specifying an account, select **Allow service to interact with desktop** on the EXPRESSCLUSTER Server service. When not selected, GUIs of the application are not displayed.

(3) When you specify a user account, it should have "local logon" permission. For information on the user permissions, see the help of the domain user administrator.

When you specify the domain of an account explicitly, specify the following. Note that the domain name and the user name should be within 15 characters.

- When the account is a local administrator

```
armload watchid /u administrator ap.exe
```

- When the account is a domainadministrator

```
armload watchid /u domain\administrator ap.exe
```

(4) When you use the monitoring function (/M option) of the ARMLOAD command, make the setting so that the debugger is not automatically started, nor monitoring processing is prevented.

(5) Applications not suitable for ARMLOAD monitoring function
The applications whose processes do not stay resident persistently are not suitable for the process monitoring (*). Since the process monitoring is assumed to monitor processes that stay persistently and do not terminate by themselves, it determines that an error occurs on an application when the started process is terminated.
(*) The following applications are examples:
An application whose process started by ARMLOAD does not stay resident persistently
An application whose process started by ARMLOAD starts its child process, and the process started first does not stay resident persistently (ARMLOAD only monitors the process it started)

(6) The application that requires GUIs may be terminated when it is started by the ARMLOAD command and logged off. To prevent the application from being terminated, start it with an account (/U option).

(7) If you use this command with the [/U] option and any account other than built-in Administrator, the command might fail.

(8) If you use this command with the [/S] option, it is recommended to set the recovery operation not to be performed by the service control manager so that applications other than EXPRESSCLUSTER will not control services.
If a service is set to restart upon the recovery operation by the service control manager, an unexpected action might be performed due to duplication with the recovery operation by EXPRESSCLUSTER.

Limitations

(1) The ARMLOAD command with an account cannot be used in a batch program that is run with an account.

(2) The application that is run with an account (including a child process) cannot use the LogonUser() function.

(3) Do not execute a 16-bits application since it cannot be terminated by the ARMKILL command.

(4) When including spaces in a parameter, enclose it in quotation marks.
Example) `ARMLOAD Wid1 "\Program Files\Application.exe"`

(5) Only the process that is started by the ARMLOAD command can be terminated by the ARMKILL command.

(6) Do not run the applications (*XXXX*.EXE) that EXPRESSCLUSTER provide.

The ARMLOAD command may terminate abnormally (return value 1: Cannot start the target application or service) if the application with an account is started while it cannot access the domain controller (due to a failed server or network disconnection, etc.).

4.7 Terminating the application or service (armkill command)

the armkill exe command terminates the application or service.

Command line

armkill.exe *watchID* [/C | /T *time*]

Description

This command terminates the application or service that was started up by the ARMLOAD command.

When one service is operated (monitoring target) with several ARMLOAD commands (when several ARMLOAD commands with /A option operate one service), the service is not terminated until ARMKILL is run for all *watchID*.

Parameter

<watchID>

Specifies the monitoring ID of the application or service you want to terminate.

Use the ID specified when the application or service was started up by the ARMLOAD command.

/C

Cancels the monitoring of the application or service but does not terminate the application or service.

This parameter is optional. When omitted, the application or service is terminated. This parameter cannot be specified with the /T parameter.

Do not use this option when stopping an application that was started by specifying the /U option of the ARMLOAD command.

/T <time>

Sets the termination wait time of the application or service.

The range that can be specified is from 0 to 3600 seconds. If 0 is specified, the command waits for the completion of termination of the application or service endlessly. This parameter is optional. When omitted, the wait time is set to 40 seconds. This parameter cannot be specified with the /C parameter.

Return Value

0	Success (the target application or service was terminated).
1	The application or service has already been terminated.
2	The application or service was not terminated. (The application or service is being terminated.)
8	The EXPRESSCLUSTER Server service has not been started.
9	The parameter is invalid.

Remarks

(1) This command can be specified only in scripts.

(2) To terminate the application, this command sends the WM_CLOSE message to it. If the application does not terminate within the specified time (/T *time*), this command executes the TerminateProcess() for the target application to forcibly terminate the application process.

(3) To terminate the service, the requirement to stop the service is sent to the service control manager (SCM). When terminating the service has not been completed within the specified time (/T *time*), the return value of 2 is returned.

(4) If /C is specified on this command, the application or service cannot be terminated by ARMKILL.

4.8 Waiting for the start or stop of groups (armgwait command)

the armgwait.exe command waits for the start or stop of groups.

Command line

armgwait.exe *group_name* [*time-out*] [/stop]

Description

This command waits for the start or stop of groups.

This command waits until the status of a group becomes active (when waiting for activation) or inactive (when waiting for termination), or until the specified time is exceeded.

Parameter

<group_name>

Specifies a name of the group whose completion of start or stop the command waits for.

<time-out>

Specifies the time-out by the second.

When this parameter is omitted, the time-out value is set to default (120 seconds).

/stop

Waits until the group is terminated.

When this parameter is omitted, this command waits for the startup of the group.

Return Value

0	The status of the failover group is active or inactive.
1	The time-out has elapsed.
7	The EXPRESSCLUSTER Server service has not been started.
8	The specified group does not exist.
9	The parameter is invalid.

Notes

Do not run this command directly from the start or stop script. When using this command from those scripts, prepare the batch file on which the command is described, and then run the batch file on the start or stop script by writing "START *batch_file_name*" on it.

Remarks

This command can be run only in scripts. Follow the process on Note when using this command on the start or stop script.

4.9 Exclusive control between servers command (armcall command)

the armcall.exe command runs commands or programs exclusively on nodes.

Command line

armcall.exe [/L *lockname*] *exec_name* [*parameter* ...]

Description

This command executes a program from a script without terminating it, and returns the control to the script that is invoked again. This program is executed exclusively between nodes.

Parameter

/L <lockname>

Specifies the lock name. When this option is omitted, "Default" is specified for the name.
The commands are run exclusively for each lock name specified by this parameter.

<exec_name>

Specifies the command or program to be run.

<parameter...>

Specifies the command line information required to run the program specified in *exec_name*.

Return Value

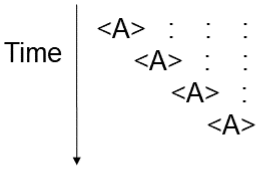
0	Success
8	The program was not run due to an error.
9	The parameter is invalid.

Remarks

This command can be run only in scripts.

Examples

When the process <A> must be run on all nodes, and the running of process <A> must be exclusive between nodes:



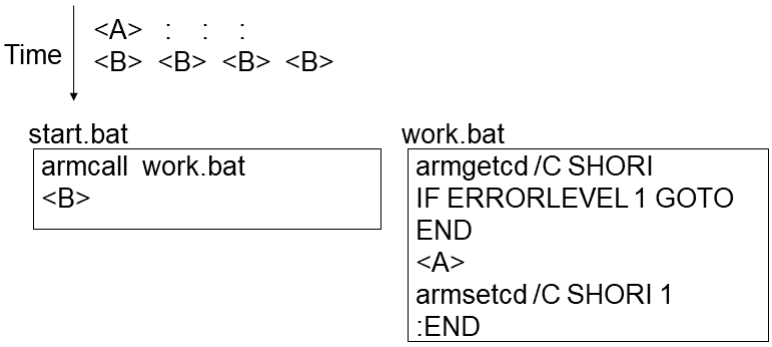
start.bat

```
armcall  work.bat
```

work.bat

```
<A>
```

When the process <A> should be run only on one node and the process <B> should be run at all nodes, and the process <B> must be started after the completion of the process <A>.


Time
<A> : : :
<B> <B> <B> <B>
start.bat
armcall work.bat
<B>
work.bat
armgetcd /C SHORI
IF ERRORLEVEL 1 GOTO
END
<A>
armsetcd /C SHORI 1
:END

4.10 Retrieving the cluster wide variable or local variable (armgetcd command)

the armgetcd.exe command retrieves the cluster wide variable or local variable.

Command line

armgetcd.exe [/C] *variable*

Description

This command retrieves the setting value of the cluster wide variable or local variable specified by the armsetcd command.

Parameter

/C

Retrieves the setting value of the cluster wide variable. When this parameter is omitted, the value of the local variable is retrieved.

<variable>

Specifies the variable name set by the armsetcd command.

Return Value

0	The value could not be retrieved due to an error.
1-255	The value set by the armsetcd command is returned.

Remarks

This command can be specified only in scripts.

If you specify the variable name which is not set by the armsetcd command, 0 is returned.

4.11 Setting the cluster wide variable or local variable (armsetcd command)

The armsetcd.exe sets the cluster wide variable or local wide variable.

Command line

armsetcd.exe [/C] *variable value*

Description

This command sets the cluster wide variable or the local variable.

The setting value of the variable set by this command can be referred by using the armgetcd command on the same or other scripts.

The cluster wide variable is shared between servers in a cluster. The variable set by the armsetcd command on one server can be referred or changed on another server.

The local variable is valid only on the server on which the armsetcd command is run.

Parameter

/C

Sets the variable as a cluster wide variable.

When this parameter is omitted, the variable is set as a local variable.

<variable>

Specifies the name of the variable to be set. Specify the name with up to 127 alphanumeric characters. (The name is case-sensitive.)

<value>

Specifies the value to be set to the variable on *variable* in integers from 1 through 255.

Return Value

0	Success
8	The variable was not set due to an error.
9	The parameter is invalid.

Remarks

This command can be run only in scripts.

Variable names are controlled separately for the cluster wide variable and the local variable. Thus, you can set both variables with one variable name. In this case, those are operated as two different variables.

The local variable is valid until the EXPRESSCLUSTER Server service of the server on which this command was run is terminated.

The cluster wide variable is valid until the EXPRESSCLUSTER Server services of all servers in a cluster are terminated.

4.12 Monitoring errors on the connection to the shared resources (armwhshr command)

the armwhshr.exe command monitors errors on the connection to the shared name.

Command line

armwhshr.exe *share-name ip-addr* [/INT *time*] [/LOG *log-strings*] [/PROC *exec-name parameter-1 parameter-2 ... parameter-n*]

Description

This command monitors errors on the connection to the shared name.

It checks if the ping is reached to the specified shared name server or monitors the connection error to the shared name. It registers the event log (ID:3514) when the ping is reached normally and an error occurred while connecting to the shared name.

However, the event log is not registered when the connection error is already detected. It is registered when the status of connection changes from normal to error.

With options, this command sends messages to the WebManager and starts specified executable files.

Parameter

<share-name>
Specifies a shared name (UNC name).

<ip-addr>
Specifies the IP address of a server that possesses shared name.

/INT <time>

Specifies monitoring interval (by the second).

The range which can be specified is from 30 through 86400. This parameter is optional.

When omitted, 180 (sec) is set for the interval.

/LOG <log-strings>
Specifies the character string to be reported to the WebManager when an error occurs on the connection to a shared name. It is reported to the WebManager every time an error on the connection to the shared name is detected. Maximum of 111 bytes can be specified for the string. If the string includes spaces, enclose it in double quotation marks. When you use the double quotation marks in the strings, describe them with \ ("). This parameter is optional.

/PROC <exec-name>
Specifies the name of an executable file that is started when an error occurs on the connection to the shared name. The executable file is started when the status of shared name connection changes from normal to abnormal. This parameter is optional.

<parameter-n>
This parameter is passed to the executable file. This parameter is optional.

Return Value

0	Success
1	The parameter is invalid.
2	Insufficient memory
8	The EXPRESSCLUSTER Server service has not been started.

How to use

When using the ARMWHSHR command, configure the following settings.

(1) Registering the user account

Register the user account with an administrator right.

(2) Describing the ARMWHSHR command in scripts

Create a new failover group for monitoring errors on the connection to the shared name(*), and describe the ARMWHSHR command in scripts.

* Setting a failover group

Add only one server to the **Servers that can run the Group** by clicking the **Startup Server** tab on the **Group Properties**.

For example, to monitor errors on the connection to the shared name (temp) of the server (server name: server public LAN IP address: 100.100.100.1), describe the following in the start script:
(Lines in the script that is run when CLP_EVENT is START)

```
ARMLOAD watchID /U Administrator
ARMWHSHR \\server\temp 100.100.100.1
```

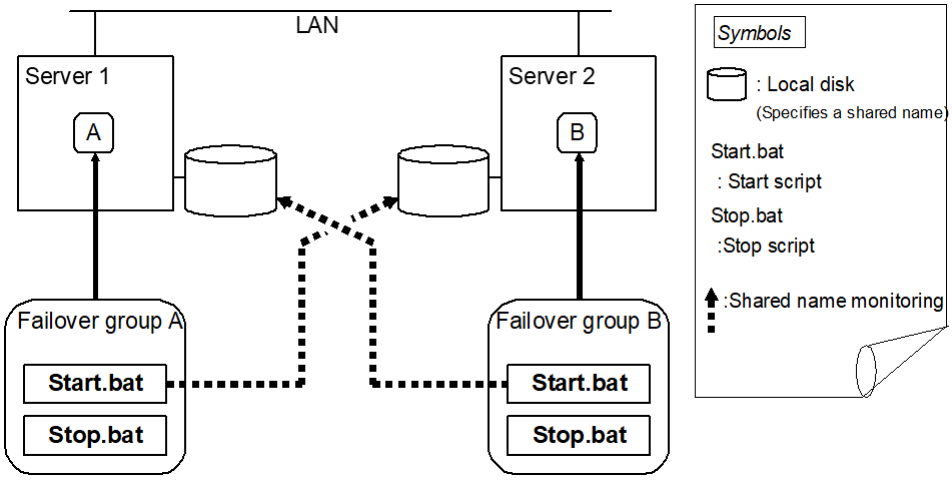
Describe the following in the stop script
(Lines in the script that is run when CLP_EVENT is START)

```
ARMKILL watchID
```

Usage example

This command is used to confirm whether the local disk of the server can be accessed from the network. On the cluster system with 2 servers, accessibility to local disks on both servers from the network can be checked by monitoring another server from both servers. The following indicates the examples of configuration and script descriptions.

Example



Server Information:

	Server1	Server2
Server name	server1	server2
Public LAN IP address	100.100.100.1	100.100.100.2
Shared name	(1)share1	(1)share2
	(2)share3	

Script example

(1) Start.bat of Server 1

```
IF "%CLP_EVENT%" == "START" GOTO NORMAL
GOTO EXIT
:NORMAL
ARMLOAD W1 /U Administrator ARMWHSHR \\server2\share2 100.100.100.2
:EXIT
EXIT
```

(2) Stop.bat of Server 1

```
ARMKILL W1
EXIT
```

(3) Start.bat of Server 2

```
IF "%ARMS_EVENT%" == "START" GOTO NORMAL
GOTO EXIT
:NORMAL
ARMLOAD W2 /U Administrator ARMWHSHR \\server1\share1 100.100.100.1
ARMLOAD W3 /U Administrator ARMWHSHR \\server1\share3 100.100.100.1
:EXIT
EXIT
```

(4) Stop.bat of Server 2

```
ARMKILL W2
ARMKILL W3
EXIT
```

Notes

This command can be specified only in scripts.

4.13 Controlling the applications or services started by the armload command (EXPRESSCLUSTER Task Manager)

the armaswth.exe command lists applications or services started by the armload command in GUI.

Command line

armaswth.exe

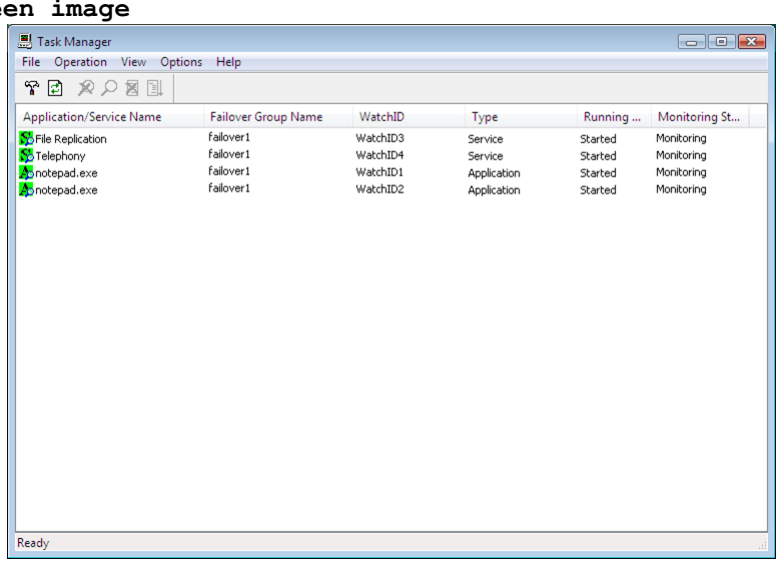
Description

This command lists the applications or services started by the armload command in GUI. In addition, it can start or stop the applications or services, and suspend or resume the monitoring in the same way as the armload command.

Remarks

This command can be specified both in and outside scripts.

Screen image



Description

- Application/Service Name

  Displays the names of applications or services started by the ARMLOAD command. Icons indicate the following status:

  A: Application that is not monitored

  A: Application that is being monitored

  A: Application that is not a monitoring target

  S: Service that is not monitored

  S: Service that is being monitored

  S: Service that is not a monitoring target

  Background colors of icons indicate the following status:

  ■: Started / Being started

  ■: Stopped / Being stopped

- Failover Group Name

  Displays the group names that the started applications or services belong to

- Type

  Displays the types (application or service)

- Running Status
  Started: Application or service has started
  Stopped: Application or service has not started
  Starting: Application or service is being started
  Stopping: Application or service is being stopped
- Monitoring status
  Monitoring: Application or service is being monitored
  Not monitoring: Application or service is not being monitored
  Not monitored: Application or service is not a monitoring target (is not set as a monitoring target but started by the ARMLOAD command)

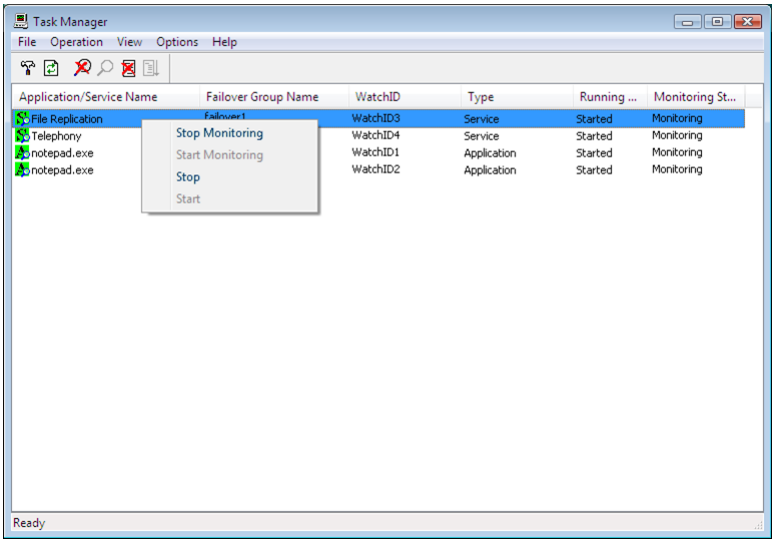
Sort

Click any of **Application/Service Name**, **Failover Group Name**, **WatchID**, **Type**, **Running Status**, or **Monitoring Status** to sort the list into ascending or descending order of the clicked item.

Operation

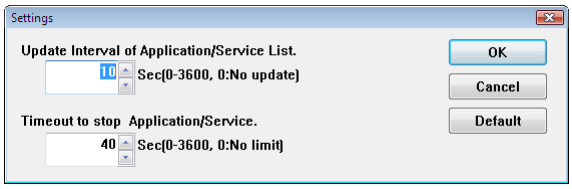
Same as the ARMLOADC command, four operations of monitoring stop, monitoring resume, stop, start can be performed. Operations that can be performed vary depending on the status of the application or service start and the monitoring. For details, see "ARMLOADC command."
Select the application on the list (you cannot select multiple applications), and operate it by one of the following ways:

- **Operation** menu
- Toolbar
- Shortcut menu displayed by right-clicking the application name (shown below)



Settings

To configure the settings, click **Settings** on the **Option** menu or on the toolbar.



Update Interval of Application/Service List

Specify the interval to automatically update the application or service list by the second. The value from 0 through 3600 can be specified. When 0 is set, the list is not updated automatically. The default is 10 (seconds).

Timeout to stop Application/Service

Specify the wait time to stop when stopping the application or service by the second. The value from 0 through 3600 can be specified. When 0 is set, the termination of the application or service is waited endlessly. The default is 40 (seconds). If the application or service is not stopped after the stop time is exceeded, the application is forcibly stopped. This setting is used only when the application or service is stopped by the EXPRESSCLUSTER Task Manager.

4.14 Shutting down the server (armdown command)

the armdown.exe command shuts down the server.

Command line
armdown.exe [reboot | off | stop]

Description
This command stops the EXPRESSCLUSTER service of the server on which this command is run, and shuts down the server.

Parameter

No parameter
Shuts down the server and turns off the power.

reboot
Shuts down the server and reboots it. This parameter cannot be specified with "OFF" or "stop" parameter.

off
Shuts down the server and turns off the power. This parameter cannot be specified with "reboot" or "stop" parameter.

stop

Stops the EXPRESSCLUSTER Server service without shutting down the server.
This parameter cannot be specified with "reboot" or "OFF" parameter.

Return Value

0	Success (The server shutdown has started).
8	The EXPRESSCLUSTER Server service is not running.
9	The parameter is invalid.

Notes
Do not run this command directly from the start or stop script. When using this command from those scripts, prepare the batch file on which the command is described, and then run the batch file on the start or stop script by writing "START *batch_file_name*" on it.

Remarks

This command can be specified both in and outside scripts. When running this command on the start or stop script, follow the steps on Notes.
To shut down whole cluster normally, run the armstdn command.

4.15 Moving or failing over a group (armfover command)

the armfover.exe command moves or fails over a group

Command line

armfover.exe [/F] *group_name*

Description

This command moves or fails over a group.

A group is moved or failed over to the server next to the current server, in ascending order, on which the group can be started. If a subsequent server does not exist, the group is moved or failed over to the first server.

Parameter

/F

Fails over a group.

When this parameter is omitted, a group is moved.

When a group is failed over, "FAILOVER" is set to the environment value of the start script "CLP_EVENT" on the destination server.

When a group is moved, "START" is set to the environment value of the start script "CLP_EVENT" on the destination server.

<group_name>

Specifies the name of the group to be moved or failed over.

Return Value

0	Success (the group was moved or failed over).
7	The specified group has not been started.
8	The EXPRESSCLUSTER Server service has not been started.
9	The parameter is invalid.

Notes

Do not run this command directly from the start or stop script. When using this command from those scripts, prepare the batch file on which the command is described, and then run the batch file on the start or stop script by writing "START *batch_file_name*" on it.

Remarks

This command can be specified both in and outside scripts. When running this command on the start or stop script, follow the steps on Notes.

4.16 Starting a group (armgstrt command)

the armgstrt.exe command starts a group

Command line
armgstrt.exe *group_name* [*host_name*]

Description
This command starts a group on a specified server

Parameter

<group_name>
Specifies the name of a group to be started

<host_name>
Specifies the name of a server on which a group is started. When this parameter is omitted, the server is determined according to a group failover policy.

Return Value

0	Success
1	The status on which the specified operation is not available. (checking if the shared disk is powered on or not)
7	The specified group has already been started.
8	The EXPRESSCLUSTER Server service has not been started.
9	The parameter is invalid.

Notes
Do not run this command directly from the start or stop script. When using this command from those scripts, prepare the batch file on which the command is described, and then run the batch file on the start or stop script by writing "START *batch_file_name*" on it.

Remarks
This command can be specified both in and outside scripts. When running this command on the start or stop script, follow the steps on Notes.

4.17 Stopping a group (armgstop command)

the armgstop.exe command stops a group

Command line
armgstop.exe *group_name*

Description
This command stops a group.

Parameter
group_name Specifies the name of a group to be stopped.

Return Value

0	Success
7	The specified group has not been started.
8	The EXPRESSCLUSTER Server service has not been started.
9	The parameter is invalid.

Notes
Do not run this command directly from the start or stop script. When using this command from those scripts, prepare the batch file on which the command is described, and then run the batch file on the start or stop script by writing "START *batch_file_name*" on it.

Remarks
This command can be specified both in and outside scripts. When running this command on the start or stop script, follow the steps on Notes.

4.18 Starting or stopping the application or service, suspending or resuming the monitoring (armloadc command)

the armloadc.exe command starts or stops the application or service, or suspends or resumes the monitoring.

Command line

armloadc.exe *watchID* /W *mode* [/T *time*]

Description

This command starts or stops the application or service, or suspends or resumes the monitoring.
This command terminates when the operations of starting or stopping the application or service is completed.

Parameter

<watchID>

This ID is for monitoring. Specify the ID used when the application or service is started by the ARMLOAD command.

/W <mode>

Controls the monitoring.
The following values can be specified for *mode*.

- <mode>
  - pause
    Suspends the monitoring of the application or service.
  - continue
    Resumes the monitoring of the application or service. When the application or service has terminated, the monitoring is resumed after a startup.
  - start
    Starts the application or service.
  - stop
    Terminates the application or service. When the application or service is being monitored, it is terminated after suspending the monitoring.

/T <time>

This parameter is valid when "continue," "start" or "stop" is specified to *mode* of /W *mode.*

- When "continue" or "start" is specified to *mode* of /W *mode*:
  Specifies the wait time to start the service (this parameter is invalid for the application). The value from 0 through 3600 (seconds) can be specified. When 0 is specified, the command waits for the startup of the service endlessly. This parameter is optional. When omitted, the command only starts the service and returns the control without waiting for completion of start.
- When "stop" is specified to *mode* of /W *mode*:
  Specifies the wait time to stop the service. The value from 0 through 3600 (seconds) can be specified. When 0 is specified, this command waits for the termination of the application or service endlessly. This parameter is optional. When omitted, the command waits for maximum of 40 seconds.

Return Value

0	Success
1	The status is invalid.
2	The application or service was not stopped. (The application or service is being started or stopped.)
7	An error occurred in WIN32API.
9	The parameter is invalid.

Remarks

(1) This command can be specified both in and outside scripts.

(2) To terminate the application, send WM_CLOSE message to the application. When the application is not terminated within the specified time (/T *time*), run TerminateProcess() to forcibly terminate the application process.

(3) To start or stop the service, send requests for start or stop of the service to the service control manager (SCM). When the start or stop has not been completed within the specified time (/T *time*), the return value of 2 is returned.

(4) Refer to the table below for the values that can be specified in *mode.* If *mode* is invalid, the return value of 1 is returned.

Notes

Before stopping the service (mode = stop), suspend the monitoring of watchID (mode=pause) which is monitoring the same service name, if any. A service error is detected (event ID=3506 - 3510) if the service is stopped without suspending the monitoring.

Application/Service specification matrix

Status	Monitoring				Suspending monitoring			
Mode	Started	Starting	Terminating	Terminated	Started	Starting	Terminating	Terminated
pause	O	O	X	-	X	X	X	X
continue	X	X	X	-	O	O	O[11]	O[11]
start	X	X	X	-	X	X	X	O
stop	O[10]	O	X	-	O	O	X	X

O: Executable X: Not executable (Invalid status) :This combination does not exist.

[11] When "continue" is executed, the application and service is started, and monitoring of the application or service is resumed.
[10] When "stop" is executed, monitoring of the application or service is suspended, and the application and service is stopped.

4.19 Suspending the script execution until the user's direction (armpause command)

the armpause.exe command displays a message box, and suspends the script execution until the user clicks **OK**.

Command line

armpause.exe *msg_strings*

Description

This command displays the message box and suspends the script execution. When the user clicks **OK** in the message box, script execution is resumed.

Parameter

<msg_strings>

Specifies the character string to be displayed on the message box. Maximum of 128 bytes can be specified.

Return Value

0	Displaying the message was terminated.
1	The message cannot be displayed.
9	The parameter is invalid.

Notes

To use this command in scripts, select **Allow service to interact with desktop on** the properties of the EXPRESSCLUSTER Server service.

Remarks

This command can be specified both in and outside scripts.

4.20 Suspending the script execution for the specified time (armsleep command)

the armsleep.exe command suspends the script execution until the specified time is exceeded.

Command line

armsleep.exe *seconds*

Description

This command suspends the script execution until the specified time is exceeded.

Parameter

<seconds>

Specifies the time to suspend the script execution by the second.

Return Value

0	Success
9	The parameter is invalid.

Remarks

This command can be specified both in and outside scripts.

4.21 Starting the network sharing of the directory (armnsadd command)

the armnsadd.exe command starts the network sharing of the directory.

Command line

armnsadd.exe *share_name path*

Description

This command starts the network sharing of the directory. This is the same function as "net share *shared_name=path_name*."

Parameter

<share_name>

Specifies the shared name of the network sharing to be started.

<path>

Specifies the directory to be shared by entering full path.

Return Value

0	Success
1	The parameter is invalid.
2	The path name cannot be found.
3	The shared name is invalid.
5	No access right.
7	Insufficient memory.
8	Already shared by the same shared name.
9	Other error

Remarks

This command can be specified both in and outside scripts.

When using the net share command, it waits for the entry on the console when the shared name of more than 8 characters is specified. Thus, it is not suitable to be used in scripts. In such a case, use this command instead of the net share command.

4.22 Stopping the network sharing of the directory (armnsdel command)

the armnsdel.exe command starts the network sharing of the directory.

Command line

armnsdel.exe *share_name*

Description

This command stops the network sharing of the directory. This is the same function as "net share *shared_name*/delete."

Parameter

<share_name>

Specifies the shared name of the network sharing to be stopped.

Return Value

0	Success
1	The parameter is invalid.
5	The access was denied.
8	Insufficient memory
2310	The shared name cannot be found.

Remarks

This command can be specified both in and outside scripts.

The net share command waits for the entry on the console depending on the status of connection to the clients when the network sharing is stopped. In such a case, use this command instead of the net share command. This command stops the network sharing regardless of the status of connection to the clients.

4.23 Setting the IP address returned by gethostbyname() (armwsset command)

the armwsset.exe command sets the IP address returned by the gethostbyname() executed on the local server.

Command line

Format1 armwsset.exe [/P] <path> [<ip_address> ...]

Format2 armwsset.exe /L

Format3 armwsset.exe /DEL

Description

This command sets the IP address returned by the gethostbyname() executed on the local server.
Use this command when you want to return the virtual IP address as a local server's IP address that the application retrieves.

Parameter

/P

If this parameter is specified, settings are not deleted at system reboot. The settings are maintained after the system is restarted.
When this parameter is omitted, settings are deleted at system reboot.

<path>
Specifies the full path to the executable file of the target application.

<ip_address...>

Specifies the IP address returned by the gethostbyname().
More than one IP address can be specified by separating them by spaces.
When multiple addresses are specified, those are set in the array returned by gethostbyname() in the described order.
When this parameter is omitted, the settings of the application specified by *path* are deleted.

/L
Lists the current settings.

/DEL
Deletes all current settings.

Return Value

0	Success
1	Failed to configure the settings.

Notes

The settings by this command function only when the application downloads wsock32.dll directly as a socket library. They do not function when the application uses ws2_32.dll.

Run this command before starting the application.

To use this command, execute the following steps for each application in advance.

(1) Copy wsock32.dll that is included with OS and stored in `%SystemRoot%\system32` to the stored directory for the application program, and change the name to "wsock__.dll."

(2) Copy wsock32.dll stored in the **accessories** folder under the EXPRESSCLUSTER installation directory to the stored directory of the application program.

(3) Execute the steps above on all servers that run the application.

Remarks

This command can be specified both in and outside scripts.

4.24 Setting or displaying the start delay time (armdelay command)

the armdelay.exe command sets or displays the delay time at the EXPRESSCLUSTER service startup.

Command line

armdelay.exe /N [*seconds*]

Description

This command sets or displays the delay time at startup of the EXPRESSCLUSTER Server service or the EXPRESSCLUSTER Disk Agent service.

Parameter

/N [seconds]

Sets or displays the delay time at startup of the EXPRESSCLUSTER Server service or the EXPRESSCLUSTER Disk Agent by the second. These services are started after the delay time is exceeded.

For *seconds*, the value from 0 through 3600 can be specified.

When *seconds* is omitted, the current setting values are displayed.

Return Value

0	Success
7	An error occurred in WIN32API.
9	The parameter is invalid.

Remarks

This command can be specified only outside scripts.

The default value of the delay time immediately after the installation is 0 second.

The delay time specified by this command is valid until the EXPRESSCLUSTER Server is uninstalled.

The delay time must be set for each server. The setting values are valid only on the server on which this command was run.

Normally, changing the delay time is not required. Setting the delay time is needed when using the EXPRESSCLUSTER on the fault-tolerant servers such as NEC Express5800/ft series.

4.25 Setting or displaying operations at the occurrence of the emergency shutdown (armem command)

the armem.exe command sets or displays the operation mode at the occurrence of emergency shutdown.

Command line

armem.exe /M [shutdown | reboot | poweroff]

Description

This command sets or displays the operation mode at the occurrence of the emergency shutdown.

Parameter

/M <mode>

- <mode>
  - (None)
    Displays the current operation mode.
  - shutdown
    This parameter is for compatibility. It functions in the same way as the poweroff parameter.
  - reboot
    Reboots the server after shutdown.
  - poweroff
    Powers off the server after shutdown.

Return Value

0	Success
7	An error occurred in WIN32API.
9	The parameter is invalid.

Remarks

This command can be specified only outside scripts.

The default value of the operation mode immediately after the installation is "shutdown."

The operation mode specified by this command is valid until the EXPRESSCLUSTER Server is uninstalled.

The operation mode must be set for each server. The setting values are valid only on the server on which this command was run.

4.26 Shutting down the whole cluster (armstdn command)

the armstdn.exe command shuts down the whole cluster.

Command line
armstdn.exe [reboot | off | stop]

Description
This command stops the EXPRESSCLUSTER service in the whole cluster, and shuts down all servers.

Parameter

No parameter
Powers off the server after shutdown.

reboot

Reboots the server after shutdown.
This parameter cannot be specified with the off or stop parameter.

off

Powers off the server after shutdown.
This parameter cannot be specified with the reboot or stop parameter.

stop

Stops only the EXPRESSCLUSTER Server service without shutting down the server.
This parameter cannot be specified with the reboot or off parameter.

Return Value

0	Success
8	The EXPRESSCLUSTER Server service is not running.
9	The parameter is invalid.

Notes

Servers which cannot be communicated from the server on which this command was run are not shut down.
Do not run this command while activating a group. Since a group cannot be inactivated while being activated, an emergency shutdown is executed.

Remarks
This command can be specified only outside scripts.

4.27 Returning the server with the status of "Suspension (isolated)" (armmode command)

the armmode.exe command returns the server whose status is "Suspension (isolated)" to the normal status.

Command line

armmode.exe [/F]

Description

This command returns the server whose status is "suspension (isolated)" to the normal status.
Run this command on the server whose status is "suspension (isolated)."

Parameter

No parameter Returns the server

/F

This parameter is for compatibility.
When specified, the command functions in the same way when no parameter is specified.

Return Value

0	Success
1	The status of the server is not "Suspension (isolated)."
8	The EXPRESSCLUSTER Server service is not running.
9	The parameter is invalid.

Remarks

This command can be specified only outside scripts.
When the server did not shut down normally, the status of the server becomes "Suspension (isolated)" at the next server startup. On the server of that status, activating a group is prohibited. Activating a group becomes possible after returning the server to the normal status by this command.

4.28 Permitting an access to the mirror disk (mdopen command)

the mdopen.exe command permits an access to the mirror disk.

Command line

mdopen.exe *mirrordisk_alias*

Description

Normally, the mirror disk is accessible only when the resource is activated. In other cases the access is prohibited.

This command permits the access to the inactivated mirror disk.

Parameter

<mirrordisk_alias>

Specifies the mirror disk resource name to which you want to permit the access.

Return Value

0	Success
1	The parameter is invalid.
2	The mirroring is in progress. The access cannot be permitted.
3 or larger	Other error (possible causes are described below) • The Replicator/Replicator DR is not used. • There is a task accessing the target mirror disk resource. • Internal error

Notes

When accessing the mirror disk is permitted by using this command, be sure to prohibit the access using the mdclose command before recovering the mirror.

Remarks

This command can be specified only outside scripts.

This command is available only when the Replicator/Replicator DR is used.

This command is for executing the snapshot backup by a batch processing. For details on the snapshot backup, see "Performing a snapshot backup" in "The system maintenance information" in the "Maintenance Guide".

4.29 Prohibiting an access to the mirror disk (mdclose command)

the mdclose.exe command prohibits an access to the mirror disk.

Command line

mdclose.exe *mirrordisk_alias*

Description

This command prohibits the access to the mirror disk that is permitted by the mdopen command.

Do not run this command when there is no task accessing the specified mirror disk resource.

Parameter

<mirrordisk_alias>

Specifies the name of a mirror disk resource to which you want to prohibit the access.

Return Value

0	Success
1	The parameter is invalid.
2 or larger	Other error (possible causes are described below) • The Replicator/Replicator DR is not used. • There is a task accessing the target mirror disk resource. • Internal error

Notes

When accessing the mirror disk is permitted using the mdopen command, be sure to prohibit the access using this command before recovering the mirror.

Remarks

This command can be specified only outside scripts.

This command is available only when the Replicator/Replicator DR is used.

This command is for executing the snapshot backup by a batch processing. For details on the snapshot backup, see "Performing a snapshot backup" in "The system maintenance information" in the "Maintenance Guide".

4.30 Permitting an access to the shared disk (sdopen command)

the sdopen.exe command permits an access to the shared disk

Command line

sdopen.exe *disk_resource_name*

Description

In general, the shared disk is accessible only when the disk resource is activated. In other cases the access is prohibited.

This command permits the access to the inactivated disk resource.

Parameter

<disk_resource_name>

Specifies the disk resource name to which you want to permit the access.

Return Value

0	Success
1	The parameter is invalid.
3 or larger	Other error (possible causes are described below) • Invalid HBA settings • Invalid drive letter settings • Internal error

Notes

Make sure that the disk resource is inactivated before using this command. If this command is executed in the state that the disk resource is activated, data on the shared disk may be corrupted.

When access to the shared disk is permitted by using this command, be sure to prohibit the access by using the sdclose command before activating the disk resource. If the disk resource us activated in the state where the access is not prohibited, data on the shared disk may be corrupted.

Remarks

This command can be used only outside scripts.

4.31 Prohibiting an access to the shared disk (sdclose command)

the sdclose command prohibits an access to the shared disk

Command line
sdclose.exe *disk_resource_name*

Description
This command prohibits accesses to the disk resource that are permitted by the sdopen command.

Parameter

<disk_resource_name>
Specifies the disk resource name to which you want to prohibit the access.

Return Value

0	Success
1	The parameter is invalid.
3 or larger	Other error (possible causes are described below) • Invalid HBA settings • Internal error

Notes
When accessing the disk resource is permitted by using the sdopen command, be sure to prohibit the access by using this command before activating the disk resource.

Remarks
This command can be used only outside scripts.

4.32 Error messages of the compatible commands

Message	Description	Solution
armbcast succeeded.	armbcast succeeded.	-
armbcast has received an invalid parameter.	armbcast received an invalid parameter.	Specify the valid input parameter.
armbcast failed in the internal processes (1%03d). The error code is 0x%x.	armbcast T failed in the internal processing.	Check if the memory is sufficient and/or OS is stable.
Cannot execute armbcast.	armbcast cannot be executed.	armbcast cannot be used when the arms_event of the start script is in the recover status. This is because the server is recovering the cluster.
armcall succeeded. command name=%.16s.	armcall succeeded.	-
armcall has received an invalid parameter.	armcall received an invalid parameter.	Specify an valid input parameter.
armcall failed to lock the file.	armcall failed to acquire the privilege to write lock for exclusive access control.	Check if the memory is sufficient and/or OS is stable.
armcall received a console close signal. The server will be shut down.	The server was shut down because the armcall console window was closed by a user's request.	-
armcall failed in the internal processes ("%03d"). The error code is 0x%x.	armcall failed in the internal processing.	Check if the memory is sufficient and/or OS is stable.
armcall failed to execute the command line. The error code is 0x%x.	Execution of exec-name specified in the command line of armcall failed.	Check if the valid values are specified for the path name, file name and parameter-n in the command lines.
armdown succeeded. option=%s.	armdown succeeded.	-
armdown has received an invalid parameter. option=%s.	armdown received an invalid parameter.	Specify an valid input parameter.
armdown shuts down the server. option=%s.	armdown started a server shutdown.	-
armdown cannot execute specified action. option=%s	armdown cannot be executed.	The server may have failed. Check it.
armdown failed in the internal processes (%03d). The error code is 0x%x.option=%s	armdown failed in the internal processing.	Check if the memory is sufficient and/or OS is stable.
armem succeeded. mode=%.	armem succeeded.	-
armem has received an invalid parameter.	armem received an invalid parameter.	Specify a valid input parameter.
armdown failed in the internal processes (%04d). The error code is 0x%x.option=%s	armem failed in the internal process.	Check if the memory is sufficient and/or OS is stable.

Continued on next page

Table 4.6 – continued from previous page

Message	Description	Solution
armforver succeeded. option=%s group-name=%s	armforver succeeded.	-
armforver has received an invalid parameter. option=%s group-name=%s	armforver received an invalid parameter.	Specify a valid input parameter.
Cannot execute armfover . option=%s group-name=%s	armforver cannot be executed.	Check if the failover group is being stopped or is already stopped.
armfover failed in the internal processes (1%03d). The error code is 0x%x.option=%s.group-name=%s.	armforver failed in the internal process.	Check if the memory is sufficient and/or OS is stable.
armgetcd succeeded.	armgetcd succeeded.	-
armgetcd has received an invalid parameter.	armgetcd received an invalid parameter.	Specify a valid input parameter.
armgetcd received a console close signal. The server will be shut down.	The server was shut down. This is because the console window of armgetcd was closed by a user's request.	-
armgetcd failed in the internal processes ("%03d"). The error code is 0x%x.	armgetcd failed in the internal process.	Check if the memory is sufficient and/or OS is stable.
armgstrt succeeded. group-name=%s.server-name=%s.	armgstrt succeeded.	-
armgstrt has received an invalid parameter.group-name=%s.server-name=%s.	armgstrt received an invalid parameter.	Specify a valid input parameter.
armgstrt failed in the internal processes (1%03d). The error code is 0x%x.group-name=%s.server-name=%s.	armgstrt failed in the internal process.	Check if the memory is sufficient and/or OS is stable.
armgstrt cannot execute the specified operation. group-name=%s server=%s	armgstart is not in the status to execute the specified operation.	The failover group is being started or it has been started, or the server may not be operating successfully. Check them.
armgstop succeeded. group-name=%s	armgstop succeeded.	-

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Table 4.6 – continued from previous page

Message	Description	Solution
armgstop has received an invalid parameter. group-name=%s	armgstop received an invalid parameter.	Specify a valid input parameter.
armgwait succeeded.	armgwait succeeded.	-
armgwait has received an invalid parameter.	armgwait received an invalid parameter.	Specify a valid input parameter.
armgwait timed out.	armgwait timed out.	Check the target failover group name.
armgwait failed to run the internal processes (1%03d). The error code is 0x%x.	armgwait failed in the internal process.	Check if the memory is sufficient and/or OS is stable.
armkill (WID="%0.16s") succeeded.	armkill succeeded.	-
armkill has received invalid WID ("%0.10s") as a parameter.	armload is not executed by the specified WID.	Check the command line (watcID) of the armload.
armkill has received an invalid parameter.	armkill received an invalid parameter.	Specify a valid input parameter.
armkill (WID="%0.16s") forcefully terminated application.	The application was forcefully terminated because it did not end within a designated time period.	Examine the application to find why it did not terminate within the designated time period.
armkill (WID="%0.16s") could not forcefully terminated application.	The application was forcefully terminated, because it did not end within a designated time period. However the forced termination failed.	Same as above
armkill (WID="%0.16s") could not stop the service.	The service did not end within the specified time period.	Examine the service to find why it did not end within the specified time period.
armkill (WID="%0.16s") has failed in the internal processes (3%03d). The error code is 0x%x.	armkill failed in the internal process.	When the "internal process" is 3060, the application is already closed. Examine the application to find why it ended. If not above, check if the memory is sufficient and/or OS is stable.
armkill (WID="%0.32s") failed to stop the service. Detailed information:%0.160s	armkill failed to stop the service.	The request to stop the service that was asked to the service control manager failed. Investigation needs to be conducted in the service.
armload (WID="%0.16s") succeeded.	armload succeeded.	-
armload has received invalid WID ("%0.16s") as an invalid parameter.	WID is overlapped.	Specify a unique WID.
armload has received an invalid parameter.	armload received an invalid parameter.	Specify an valid input parameter.

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Table 4.6 – continued from previous page

Message	Description	Solution
armload (WID="%0.16s") has reached the maximum number of processes that can be run simultaneously.	An attempt to start up applications/services more than executable number of applications/servers (256) was made	Create scripts to make the number of running applications/ services within 256.
armload has received WID ("%0.16s") that exceeds the maximum character count as a parameter.	The character string of WID has more than 256 characters	Make the character string of WID to have up to 255 characters.
armload(WID="%0.16s") detected the service starting time-out.	The service did not end within a designated time period.	Examine the service to find why it did not end within the designated time period.
armload (WID="%0.16s") failed in the internal processes(1%03d). The error code is 0x%x.	armload failed in the internal processes.	Check if the memory is sufficient and/or OS is stable.
armpoll has received an invalid parameter.	Command monitoring process received an invalid parameter.	Check if the memory is sufficient and/or OS is stable.
armpoll (WID="%0.16s") detected extinction of the application. The stop code is %d.	Command monitor process did not detect any application.	Detected an application termination. Examine the application to find why it ended.
armload (WID="%0.16s") couldn't log on to user ("%0.32s"). The error code is 0x%x.	Failed to log on to the user account.	Check user account registration information (user ID, password), and if the domain name is indicated, also check the domain name in NEC EXPRESSCLUSTER manager.
armload (WID="%0.16s") failed to execute the command line. The error code is 0x%x.	Failed to start the application.	Check if the valid path name and file name are specified in the execname of the armload command line. Check if a valid value is specified to the parameter-n.
armload (WID="%0.16s") could not log on to user ("%0.32s"). The error code is 0x%x.	Failed to acquire a password of a user account.	Check if the user account registration is done in NEC EXPRESSCLUSTER manager .
armload (WID="%0.16s") could not log on to user ("%0.32s"). The error code is 0x%x.	Command monitoring process failed in internal processing.	Check if the memory is sufficient and/or OS is stable.
Command monitor process (WID="%0.16s") detected a failure in the services. The stop code is %d & %d.	Command monitor process detected a failure of the service.	Detected service termination. Examine the service to find it terminated.
Command monitor process (WID="%0.16s") failed to get the environmental variable name.	Command monitor process failed in acquiring an environmental variable name.	It may have been started from outside of the scripts Start from outside of script is not supported. If not above, check if memory is sufficient, and/or OS is stable.

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Table 4.6 – continued from previous page

Message	Description	Solution
Command monitor process (WID="%0.16s") restarted script.	Command monitor process restarted scripts.	Due to detection of application/service termination, the scripts restarted.
Command monitor process (WID="%0.16s") restarted application.	Command monitor process restarted the application.	Due to detection of termination of the application, the application restarted.
Command monitor process (WID="%0.16s") restarted Service	Command monitor process restarted the service	Due to detection of termination of the service, the restarted.
Command monitor process (WID="%0.16s") completed the failover of the group ("%0.10s").	Command monitor process performed a failover to the group.	Due to detection of application/service termination, the failover group failed over.
Command monitor process (WID="%0.16s") shut down the server.	Command monitor process shut down the server.	Due to detection of application/service termination, the server shut down.
armpoll (WID="%0.16s") has received an invalid service name ("%0.10s") as a parameter.	armload received an invalid service name as a parameter.	In the armload command line, check if the valid service name is specified for service-name. Check if the valid value is designated for parameter-n as well.
armload (WID=""%0.16s"") failed to get user (""%0.32s"") information. The user name may be incorrect. The error code is 0x%x.	Failed to acquire a domain name from the user name.	Check if the user name is registered in the system.
armpoll (WID="%0.16s") detected extinction of the application.	Command monitor process did not detect any application (Failed to acquire the application termination code of the application).	Detected termination of an application. Examine the application to find why it terminated.
armload (WID="%0.16s") failed to start the service. The error code is 0x%x.	Failed to start the service.	Examine the service to find why it failed to start.
Command monitor process (WID="%0.16s") failed to fail over the group(%s). The error code is 0x%x.	Command monitor process failed to failover the group.	Check if the failover destination server is operating successfully as a cluster.
Command monitor process (WID="%0.32s") failed to stop the service. Detailed information:%0.160s	Command monitor process failed to stop the service.	The service stop request for the service control manager failed. Examine the service.
Command monitor process (WID="%0.16s") forcefully terminated the application.	Command monitor process forced to finish the application.	The application was forcefully terminated by TerminateProcess() because it could not end within the specified time period. Check the application.

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Table 4.6 – continued from previous page

Message	Description	Solution
Command monitor process (WID="%0.16s") failed to forcefully terminate the application.	Command monitor process failed to finish the application.	The application could not end within the specified time period due to the WM_CLOSE message. An attempt to forcefully terminate by the TerminateProcess() was made. However it did not end. Check the application.
Command monitor process (WID="%0.16s") failed to stop Service.	Command monitor process failed to stop Service.	Service did not end within the specified time period. Check the Service.
armloadc succeeded. WatchID=%0.16s.mode=%s.time=%s.	armloadc succeeded.	-
armloadc received an invalid parameter. WatchID=%0.16s.mode=%s.time=%s.	armloadc received an invalid parameter.	Specify a valid input parameter.
Cannot execute armloadc. WatchID=%0.16s.mode=%s.time=%s.	armloadc cannot be executed.	Check "startup state" and "monitoring state" by NEC EXPRESSCLUSTER task manager. Check whether or not armloadc can be executed by referring to application/service specification matrix of command reference (armloadc).
armloadc detected time-out while waiting to start/stop the application/service. WatchID=%0.16s mode=%s time=%s	Application/service did not end within the designated time period.	Examine the application/service to find why it did not end within the designated time period.
armloadc Win32API error.WatchID=%0.16s.mode=%s.time=%s	armloadc failed in the internal processing.	Check if the memory is sufficient and/or OS is unstable.
armmode succeeded. option=%s.	armmode succeeded.	-
armloadc received an invalid parameter. WatchID=%0.16s.mode=%s.time=%s.	armloadc received an invalid parameter.	Specify a valid input parameter.

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Table 4.6 – continued from previous page

Message	Description	Solution
armmode cannot execute the specified action (%03d). option=%s.	armmode cannot execute the specified operation.	Force-return (/F) : Some servers are not isolated. Check the servers. Server isolation (/I) : The local server is not operating successfully in the cluster. Or there are no two or more servers that are working successfully in the cluster. Check the servers. Server isolation (/I) : The local server is not operating successfully in the cluster. Check the server.
armmode failed in the internal processes(%03d).The error code is 0x%x.option=%s.	armmode failed in the internal processing.	Check if the memory is sufficient and/or OS is stable.
armnsadd succeeded (share=%.80s,path=%.80s).	armnsadd succeeded.	-
armnsadd has received an invalid parameter.	armnsadd received an invalid parameter.	Specify a valid input parameter.
armnsadd failed to run the internal processes (1%03d). The error code is 0x%x.	armnsadd failed in the internal processing.	If the internal process is 1020, the shared name has more than 80 characters. Specify it within 80 characters. If the internal process is 1040, the path name is invalid. Check the path name. If the internal process is 1050, the shared name is invalid. Check if you did not use characters that cannot be specified for shared names. If the internal process is 1060, you do not have the privilege to access the path name. Check the access privilege. If the internal process is 1090, the same name is already used. Specify a shared name that does not overlap with others. If not above, check if the memory is sufficient, and/or OS is stable.
armnsdel succeeded (share=%.80s).	armnsdel succeeded.	-

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Table 4.6 – continued from previous page

Message	Description	Solution
armnsdel has received an invalid parameter.	armnsdel received an invalid parameter.	Specify a valid input parameter.
armnsdel failed to run the internal processes (1%03d). The error code is 0x%x.	armnsdel failed in the internal processing.	If the internal process is 1030, you do not have the privilege to access the shared name. Check the access privilege. If the internal process is 1060, the shared name cannot be found. Check the name. If not above, check if the memory is sufficient, or OS is stable.
armpause succeeded.	armpause succeeded.	-
armpause has received an invalid parameter.	armpause received an invalid parameter.	Specify a valid input parameter.
armpause cannot display the message.	armpause cannot display dialog messages.	Check if the memory is sufficient and/or OS is stable.
armsetcd succeeded.	armsetcd succeeded.	-
armsetcd has received an invalid parameter.	armsetcd received an invalid parameter.	Specify a valid input parameter.
armsetcd received a console close signal. The server will be shut down.	server shutdown was executed because armsetcd console window was closed by user's request.	-
armsetcd failed in the internal processes ("%03d"). The error code is 0x%x.	armsetcd failed in the internal processing.	Check if the memory is sufficient And/or OS is stable.
armsleep succeeded.	armsleep succeeded.	-
armsleep has received an invalid parameter.	armsleep received an invalid parameter.	Specify a valid input parameter.
armstdn failed in the internal processes(%03d).The error code is 0x%x.option=%s.	armstdn failed in the internal processing.	Check if the memory is sufficient and/or OS is stable.
armstdn succeeded. cmd=%s	armstdn succeeded.	-
Failed to shut down the cluster. The server is not operating as a cluster.	Failed to acquire a cluster name.	The server is not operating as cluster. Check it.
Failed to shut down the cluster. The error code is 0x%x.	armwhshr failed in internal processing.	Check if the memory is sufficient and/or OS is stable.
Failed to shut down the cluster. EXPRESSCLUSTER Server Service is not started.	"The EXPRESSCLUSTER Server" service is not started.	"The EXPRESSCLUSTER Server" service is not started. Check it.
armwhshr has received an invalid parameter.	armwhshr received an invalid parameter.	Specify a valid input parameter.

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Table 4.6 – continued from previous page

Message	Description	Solution
armwhshr failed in the internal processes(1%03d). The error code is 0x%x.	armwhshr failed in the internal processing.	Check if the memory is sufficient and/or OS is stable.
armwhshr detected connection error to share-name(%.48s). The error code is 0x%x.	armwhshr detected error in connection to the shared name.	The shared name cannot be used. Recover devices that are associated to the shared name. 1.OS is unstable. Check it. 2. Make sure that power is supplied to the devices. 3. Make sure that the devices and the servers are connected properly.
armwhshr detected connection recovery to shared name(%.48s). The error code is 0x%x.	rmwhshr detected recovery of connection to the shared name.	-
mdopen failed. An internal error occurred.	mdopen failed. An internal error occurred.	Check if the memory is sufficient and/or OS is stable.
mdopen failed. The resource is busy.	mdopen failed. The resource is busy.	The partition may be being used. Retry later.
mdopen failed. A network error occurred.	mdopen failed. A network error occurred.	Check how the interconnect is connected.
mdopen failed. Cannot establish the mirror disk connection.	mdopen failed to establish the communication of the mirror disk.	Check if the cluster configuration data is valid.
mdopen failed. The resource name is invalid.	mdopen failed. The resource name is invalid.	Check if the cluster configuration data is valid.
mdopen failed. The status is invalid.	mdopen failed. The status is invalid.	Mirror recovery is required.
mdopen failed. The resource is not initialized.	mdopen failed. The resource is not initialized.	Check if the partition is allocated , the disk is recognized by OS and the cluster configuration data is correct.
mdopen failed. The resource is not performed first mirror construction.	mdopen failed. Initial mirror construction is not done for resources.	Initial mirror construction is required.
mdopen failed. Cannot lock the mirror disk.	mdopen failed to lock the mirror disk.	Check if the memory is sufficient and/or OS is stable.
mdopen failed. The license is not registered.	mdopen failed. The license is not registered.	Register the license.
mdopen failed. The trial version has expired.	mdopen failed. The trial version has expired.	Register the license.
mdopen failed. The license authentication failed.	mdopen failed. The license authentication failed.	Register the license.
mdopen failed. Cannot find the history folder.	mdopen failed. The history folder cannot be found.	Check if the cluster configuration data is correct.

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Table 4.6 – continued from previous page

Message	Description	Solution
mdopen failed. The mirror connect is not initialized.	mdopen failed. The mirror connect is not initialized.	Check the connection status of the mirror connect. Check if the cluster configuration data is correct.
mdopen failed. Cannot find the partition specified for the cluster partition.	mdopen failed. The partition specified for the cluster partition cannot be found.	Check if the partition is allocated and the disk is recognized by OS.
mdopen failed. Cannot find the partition specified for the data partition.	mdopen failed. The partition specified for the data partition cannot be found.	Check if the partition is allocated and the disk is recognized by OS.
mdopen failed. Cannot change the drive letter for the cluster partition.	mdopen failed. The drive letter for the cluster partition could not be changed.	Check the specification of the drive letter of the cluster configuration data. Make sure that the drive letter is not used by any other partitions.
mdopen failed. Cannot change the drive letter for the data partition.	mdopen failed. The drive letter for the data partition could not be changed.	Check the specification of the drive letter of the cluster configuration data. Make sure that the drive letter is not used by any other partitions.
mdopen failed. The server name is invalid.	mdopen failed. The server name is invalid.	Check if the cluster configuration data is correct.
mdopen has received an invalid parameter.	mdopen received an invalid parameter.	Specify a valid input parameter.
mdopen failed in the internal processes(%2). The error code is %3.	mdopen failed in the internal processing.	Check if the memory is sufficient and/or OS is stable.
mdopen succeeded. The mirror disk resource is %2.	mdopen succeeded.	-
mdclose failed. An internal error occurred.	mdclose failed. An internal error occurred.	Check if the memory is sufficient and/or OS is stable.
mdclose failed. The resource is busy.	mdclose failed. The resource is busy.	Retry it later.
mdclose failed. A network error occurred.	mdclose failed. A network error occurred.	Check the connection status of the interconnect.
mdclose failed. Cannot establish the mirror disk connection.	mdclose failed to establish the mirror disk connection.	Check if the cluster configuration data is correct.
mdclose failed. The resource name is invalid.	mdclose failed. The resource name is invalid.	Check if the cluster configuration data is correct.
mdclose failed. The status is invalid.	mdclose failed. The status is invalid.	Mirror recovery is required.
mdclose failed. The resource is not initialized.	mdclose failed. The resource is not initialized.	Check if the partition is allocated, if the disk is identified by OS and if the cluster configuration data is correct.
mdclose failed. The resource has not performed initial mirror construction.	mdclose failed. The initial mirror construction has not been done for the resource.	Initial mirror construction is required.
mdclose failed. Cannot lock the mirror disk.	mdclose failed to lock the mirror disk.	Check if the memory is sufficient and/or OS is stable.
mdclose failed. The license is not registered.	mdclose failed. The license is not registered.	Register the license.

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Table 4.6 – continued from previous page

Message	Description	Solution
mdclose failed. The trial version has expired.	mdclose failed. The trial version has expired.	Register the license.
mdclose failed. The license authentication failed.	mdclose failed. The license authentication failed.	Register the license.
mdclose failed. Cannot find the history folder.	mdclose failed to find the history folder.	Check if the cluster configuration data is correct.
mdclose failed. The mirror connect is not initialized.	mdclose failed. The mirror connect is not initialized.	Check the connection status of the mirror connect. Check if the cluster configuration data is correct.
mdclose failed. Cannot find the partition specified for the cluster partition.	mdclose failed to find the partition specified for the cluster partition.	Check if the partition is allocated and if the disk is identified by OS.
mdclose failed. Cannot find the partition specified for the data partition.	mdclose failed to find the partition specified for the data partition.	Check if the partition is allocated and if the disk is identified by OS.
mdclose has received an invalid parameter.	mdclose received an invalid parameter.	Specify a valid input parameter.
mdclose failed in the internal processes(%2). The error code is %3.	mdclose failed in the internal processing.	Check if the memory is sufficient and OS is stable.
mdclose succeeded. The mirror disk resource is %2.	mdclose succeeded.	-
sdopen succeeded. (%2)	sdopen succeeded.	-
sdopen failed. Internal error occurred. (%1)	sdopen failed. Internal error occurred.	Check if the memory and/or the resource of OS are sufficient.
sdopen failed. Failed to load cluster configuration data. (%1)	sdopen failed to load cluster configuration data.	Check if the cluster configuration data exists in the place it should be.
sdopen failed. Failed to unload cluster configuration data. (%1)	sdopen failed to unload cluster configuration data.	Check if the cluster configuration data exists in the place it should be.
sdopen failed. Failed to get cluster configuration data. (%1)	sdopen failed to acquire the cluster configuration data.	Check if the cluster configuration data is correct.
sdopen failed. Failed to allocate memory. (%1)	sdopen failed to allocate memory.	Check if the memory and/or the resource of OS are sufficient.
sdopen failed. Failed to activate resource. (%1)	sdopen failed to activate resource.	Check if the setting of HBA is correct. The partition may be being used. Check it.
sdopen failed. Failed to create thread. (%1)	sdopen failed to create thread.	Check if the memory and/or the resource of OS are sufficient.
sdopen failed. Timeout occurred on thread. (%1)	sdopen failed. Timeout occurred on thread.	Check if the memory and/or the resource of OS are sufficient.
sdopen failed. Failed to dismount the partition specified by the resource. (%1)	sdopen failed to dismount the partition specified by the resource.	The partition may be being used. Check it.
sdopen failed. Failed to lock the partition specified by the resource. (%1)	sdopen failed to lock the partition specified by the resource	The partition may be being used. Check it.
sdopen failed. Server does not exist in cluster configuration data. (%1)	sdopen failed. The server does not exist in cluster configuration data.	Check if the server exists in the cluster configuration data.

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Table 4.6 – continued from previous page

Message	Description	Solution
sdopen failed. Resource does not exist in cluster configuration data. (%1)	sdopen failed. The resource does not exist in cluster configuration data.	Check if the resource exists in the cluster configuration data.
sdopen failed. Cannot find the specified partition. (%1)	sdopen failed to find the specified partition.	Check if the specified partition is recognized by OS.
sdopen failed. Cannot change the drive letter. (%1)	sdopen failed to change the drive letter.	Check if the specified drive letter is not used in other partitions.
sdclose succeeded. (%2)	sdclose succeeded.	-
sdclose failed. Internal error occurred. (%1)	sdclose failed. Internal error occurred.	Check if the memory and/or the resource of OS are sufficient.
sdclose failed. Failed to load cluster configuration data. (%1)	sdclose failed to load cluster configuration data.	Check if the cluster configuration data exists in the place it should be.
sdclose failed. Failed to unload cluster configuration data. (%1)	sdclose failed to unload cluster configuration data.	Check if the cluster configuration data exists in the place it should be.
sdclose failed. Failed to get cluster configuration data. (%1)	sdclose failed to acquire the cluster configuration data.	Check if the cluster configuration data is correct.
sdclose failed. Failed to allocate memory. (%1)	sdclose failed to allocate memory.	Check if the memory and/or the resource of OS are sufficient.
sdclose failed. Failed to deactivate resource. (%1)	sdclose failed to deactivate resource.	Check if the setting of HBA is correct.
sdclose failed. Failed to create thread. (%1)	sdclose failed to create thread.	Check if the memory and/or the resource of OS are sufficient.
sdclose failed. Timeout occurred on thread. (%1)	sdclose failed. Timeout occurred on thread.	Check if the memory and/or the resource of OS are sufficient.
sdclose failed. Failed to dismount the partition specified by the resource. (%1)	sdclose failed to dismount the partition specified by the resource.	The partition may be being used. Check it.
sdclose failed. Failed to lock the partition specified by the resource. (%1)	sdclose failed to lock the partition specified by the resource.	The partition may be being used. Check it.
sdclose failed. Server does not exist in cluster configuration data. (%1))	sdclose failed. Server does not exist in cluster configuration data.	Check if the server exists in the cluster configuration.
sdclose failed. Resource does not exist in cluster configuration data. (%1)	sdclose failed. The resource does not exist in cluster configuration data.	Check if the resource exists in the cluster configuration.
sdclose failed. Cannot find the specified partition. (%1)	sdclose failed to find the specified partition.	Check if the specified partition is recognized by OS.

CHAPTER

FIVE

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CHAPTER

SIX

REVISION HISTORY

Edition	Revised Date	Description
1st	Apr 10, 2019	New manual
2nd	Apr 09, 2021	Corrected the appearance.