Environment Guide

JobCenter

R15.1

Precautions on exporting
This product (software) falls under a category of technology where establishment specified in the foreign exchange currency law is regulated. Please file necessary applications, such as permission for trade, with the Japanese government prior to exporting this product. Contact the dealer where you purchased the product or our nearest sales office for information on documents necessary for filing such applications.

Introduction

This manual describes various setting methods for building an environment, migrating the environment, and linking JobCenter with other products that are required for using JobCenter. Note that the screens shown in this manual may differ from actual screens.

Note that this document is subject to change without prior notice.

1. How to read this manual

If you are installing JobCenter or upgrading it

→ Refer to the JobCenter Installation Guide.

If you are using JobCenter for the first time

→ Read the Quick Start Guide in the order of its contents.

If you wish to understand the basic operating methods of JobCenter

→ Refer to the Basic Guide.

If you wish to understand the construction of environments and the setting of various functions

→ Read this manual in the order of its contents.

If you wish to know about other functions

→ Read the related manuals, referring to the manuals pertaining to particular functions to be used.

2. Legend

The legend used in this manual is explained below.

	Information that you should pay attention to.
	Supplementary information about a description in the text.
	Supplementary tip about a description in the text.
Note	Explanation of a note that appears in the text.
__	The underlined parts in the descriptions for the installation window for UNIX mean inputs from a keyboard.

3. Related manuals

The following are manuals related to JobCenter. They are contained in JobCenter Media.

For information on the latest manuals, refer to the download page of the JobCenter product site.

http://www.nec.co.jp/middle/WebSAM/products/JobCenter/download.html (Japanese only)

Document title	Overview
JobCenter Installation Guide	Describes how to newly install JobCenter or upgrade it.
JobCenter Quick Start Guide (Japanese only)	Describes the basic functions of JobCenter, as well as a complete set of operations, for first-time users of JobCenter.
JobCenter Basic Guide	Describes the basic functions of JobCenter, as well as how to operate it.
JobCenter Environment Guide	Describes various setting methods on the construction of environments required for using JobCenter, transferring of environment, linkage with other products, etc.
JobCenter Guide for using NQS function (Japanese only)	Describes methods of using NQS functions, the basis of JobCenter, from JobCenter.
JobCenter Guide for using operation logs and execution logs	Describes the functions for acquiring operation logs and job network execution logs from JobCenter CL/Win, as well as how to set the functions.
JobCenter Command Reference (Japanese only)	Describes JobCenter commands for performing job network entry and execution state referencing, etc. from the command line like a GUI.
JobCenter Guide for using Cluster function	Describes linkage methods for operating JobCenter in the cluster system.
JobCenter Guide for using Helper function (Japanese only)	Describes the following three functions that enable efficient operation of JobCenter using Excel: JobCenter Definition Helper (definition information maintenance), JobCenter Report Helper (business report creation), and JobCenter Analysis Helper (performance analysis).
JobCenter Guide for using SAP function (Japanese only)	Describes how to link JobCenter and SAP.
JobCenter Guide for using WebOTX Batch Server linkage function (Japanese only)	Describes how to link JobCenter and WebOTX Batch Server.
JobCenter Guide for Using the Web Function	Describes JobCenter CL/Web that is a function to monitor jobs by using a web browser.
JobCenter Guide for using the text definition function (Japanese only)	Describes how to define a job network, schedule, calendar, custom job template by using a text file.
JobCenter Guide for upgrading the version and applying the patches in a cluster environment (Japanese only)	Describes how to upgrade the version of JobCenter and apply the patches in a cluster environment.
JobCenter R15.1 Release Notes	Provides the information specific to JobCenter R15.1.

4. Revision History

Edition	Date of revision	Item	Format	Contents of revision, and reason
1	September 7, 2017	New	-	First Edition

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<Environment Guide>

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1 Building a JobCenter Environment

JobCenter is a job management product designed for realizing efficient automatic operations of jobs in network distributed environments by multi-platforms/multi-vendors.

A JobCenter system can be built using the products described below and OSs.

1.1. What is the JobCenter Product Suite?

The JobCenter Product Suite consists of the following products: JobCenter Manager (MG), Server (SV), JobCenter Viewer (CL/Win), and SAP option.

Table 1.1. JobCenter Product Suite

Function	Product Name	Key Function
Manager function	JobCenter MG	Provides centralized management for constructing the job execution environment and monitoring of job execution status.
Server function	JobCenter SV	Provides NQS-based job execution functions.
Viewer function	JobCenter CL/Win	Provides a Windows client GUI for JobCenter users. Connects to the manager and server.
SAP linkage function	JobCenter for ERP Option	Submits jobs to the SAP ERP and SAP BI system.

Figure 1.1, "Image of the product structure of JobCenter" shows the image of the JobCenter. On the Windows platform, you can make a small system on the machine in which JobCenter MG, JobCenter SV, and JobCenter CL/Win are installed.
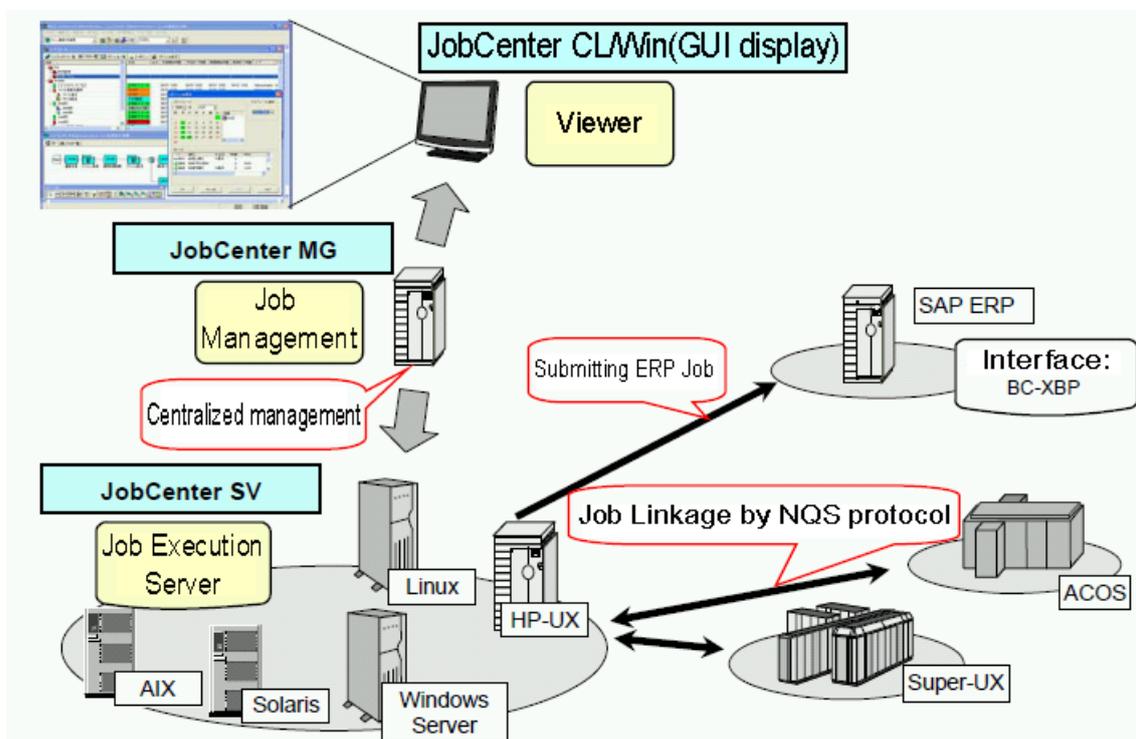
Figure 1.1. Image of the product structure of JobCenter

1.2. Each JobCenter Product and Supporting OSs

For each JobCenter product and supported operating system, refer to "Operating Environment" in <Release Notes>.

2 Building a Network Environment

To build a JobCenter network, build a network environment between servers.

In a JobCenter network environment, communications between JobCenter servers and within each server use TCP port numbers.

The UNIX and Windows versions of JobCenter, and SUPER-UX NQS can be interconnected.

> ⚠️ When JobCenter is started up, an attempt is made to bind each resident process to the port numbers below.
>
> Note that, if other applications are already using the port numbers, or if the JobCenter process is already a resident process for some reason and the port numbers are being used, starting up JobCenter fails.

> ⚠️ Notes on using rsh.exe in Windows
>
> rsh.exe might stop responding due to a port conflict in an environment in which JobCenter and rsh.exe are used together. To avoid this situation, execute another rsh.exe. rsh.exe checks for an empty port in descending order and then performs an operation.

> ⚠️ Notes concerning the port used by the NQS in Windows
>
> The time required to wait for disconnection specified by TIME_WAIT is relatively long due to the implementation of the Windows OS. If another PP is frequently connected and disconnected or a large number of NQS job requests are submitted close together, the Windows OS runs out of empty ports, delaying the processing of JobCenter. In this case, add a Windows registry called TcpTimedWaitDelay as specified below to release the connection port after about 30 to 60 seconds.
>
> | Key name | HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip \Parameters\TcpTimedWaitDelay |
> | --- | --- |
> | Value type | REG_DWORD |
> | Valid range | 30 to 300 (in decimal format, in seconds) |
> | Default value | 0x78 (120 in decimal format) |
>
> Links
>
> ■Packet retransmission via TCP communication in Windows XP or Windows Server 2003
>
> http://support.microsoft.com/kb/933805/ja
>
> ■TCP/IP Registry Values for Microsoft Windows Vista and Windows Server 2008
>
> http://www.microsoft.com/downloads/details.aspx?FamilyID=12ac9780-17b5-480c-aef7-5c0bde9060b0&displaylang=en

2.1. TCP Ports Used by the JobCenter

The network between JobCenter servers operates on the Transmission Control Protocol/Internet Protocol (TCP/IP). Specify settings so that the mutual TCP/IP and host name resolution of MG and SV operate normally.

For JobCenter inter-server communication and server-internal communication, use multiple TCP port numbers when setting up JobCenter. Note that, to use port numbers that differ from the setting values, it is necessary to specify settings so that all MG and SV instances that make up a given system use the same numbers.

> R13.2 a different way to set in earlier and R14.1 or later.
>
> ■R13.2 previous
>
> Please correct the information that is described in the following file.(Information that you specified during installation has already been written)
>
> ```
> \WINDOWS\system32\drivers\etc\SERVICES
> ```
>
> ■R14.1 or later
>
> Please correct the information that has been described in both the following two files. (Information that you specified during installation has already been written)
>
> ```
> \WINDOWS\system32\drivers\etc\SERVICES\<JobCenter Installation folder>\etc\services
> ```
>
> If you want to change the port of jccombase (611), there is a need to change the port during the setup of the CL / Win to that port.
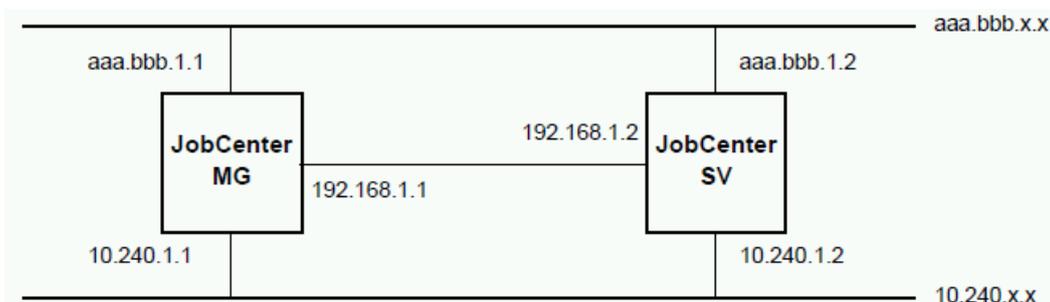
Figure 2.1. Specifying IP addresses

In the above figure, aaa.bbb.1.1 to aaa.bbb.1.2 indicate global addresses, and 10.240.1.1 to 10.240.1.2, 192.168.1.1, and 192.168.1.2 indicate private addresses. It is necessary to appropriately set up the network routing table so that jobs are transferred from MG to SV and results are returned from SV to MG by way of the same network.

Next, the six types of protocols and TCP port numbers used for JobCenter MG, JobCenter SV, and JobCenter CL/Win are described. Refer to this information when specifying the filtering rules for the firewall and other software.

Port number expression	Meaning

n/tcp → m/tcp	This indicates the TCP connection established from source port n to destination port m. The TCP connection is used for bidirectional data communication.

2.1.1. NQS

This protocol is used when exercising control (unit job request transfers or result acquisition) between MG and SV or between SV and SV.

For NQS, because bidirectional communication is performed for job transfers, result file transfers, and notifications of the status from SV to MG, the used ports are as shown in the table below.

When transferring job requests from MG to SV or returning job execution results from SV to MG, the connection is immediately closed when the data transfer finishes.

■Ports used by the NQS protocol

JobCenter MG	Direction in which the connection is established	JobCenter SV
512 to 1023/tcp[Note 1]	→	607/tcp
607/tcp	←[Note 2]	512 to 1023/tcp[Note 1]
512~1023/tcp	→	607/tcp[Note 3]

	Note 1	These ports are normally called well-known ports. Of the unused TCP ports, select numbers 512 to 1023 for use as source ports.
		For details about the source IP address of IP packets, refer to Section 5.3.1, "Setting the daemon.conf File for Cluster Environment/Using Multiple NIC". (Be careful when controlling access using the firewall by using the source IP address.)
	Note 2	In addition to job request transfers and returning results, one connection is constantly maintained for reporting the status from SV to MG (job execution status notification).
		Because no keepalive operation is performed for this connection, if there is a router or firewall on the network between MG and SV, the session might be closed for only the router for which the no-communication status is detected, resulting in a half-open session status and TCP/IP communication problems. To avoid this, take action such as the following:
		▪ Setting up a schedule in which empty jobs for which only "exit" is specified are regularly submitted from MG to SV (to forcibly perform the communication necessary to report the status from SV to MG)
		▪ Adding MG machine groups to SV (to regularly perform the communication necessary for SV to report the status to MG in machine groups)
		Note that the system operates such that one local instance of this connection is constantly maintained.
	Note 3	This session is created when you connect to a scheduler machine having a machine group configuration from CL/Win as the administration user.
		If no difference is made to the tracker data of SV when you connect to the scheduler from CL/Win as the administrator, a no-communication status occurs due to this session, in which case the communication may be reset by the firewall, router, etc. To avoid this, take an appropriate action, such as

> unselecting [Auto Refresh] in the [User Config] dialog box or creating a dummy job network definition in SV so that a job network is submitted or the status of the submitted job network is updated at regular intervals.

2.1.2. jccombase (JobCenter's proprietary protocol)

Protocol used for operating JobCenter from CL/Win. When the Nscl_Submit, Nscl_Refer, jnwsubmitcmd -r, jdh_upload, jdh_download, or jnwdelete (for the Windows version only) command is executed, the command data is transmitted to the target remote host by using this protocol.

This protocol is also used for performing JobCenter management operations such as managing the list of machines and exercising queue control between MG and SV. There is no direct relationship with job execution control.

A new connection is established each time there is an operation request from CL/Win to SV or a transfer of results from SV to CL/Win, and the connection is immediately closed when the data transfer finishes.

■Ports used by the jccombase protocol

JobCenter CL/Win Nscl_Submit and other remotely executed commands	Direction in which the connection is established	JobCenter MG/SV
1024 or greater/tcp[Note 4]	→	611/tcp

JobCenter MG	Direction in which the connection is established	JobCenter SV
1024 or greater/tcp[Note 4]	→	611/tcp

	Note 4	The ephemeral port selected and used as the source port. Please note that you will not be able to connect a free ephemeral port is eliminated. It should be noted that does not put a connection to from MG/SV CL/Win.
		In this protocol, the IP address for the segment that can communicate with the destination IP address is used as the source IP address of the IP packet (As this also applies to cluster sites, be careful when controlling access using the firewall by using the source IP address. For details, refer to each note in Section 5.3.1, "Setting the daemon.conf File for Cluster Environment/Using Multiple NIC".)

2.1.3. jcevent (JobCenter's proprietary protocol)

This protocol is used by the linkage function for the Event Transmission/Reception parts of JobCenter. A new connection is established each time event transmission is performed from an event transmission part, and the connection is immediately closed when the data transfer finishes.

Note that, under certain conditions, a connection may be established to send a notification from the Event Reception part to the Event Transmission part.

Also, when a file waiting part is set to "wait for a file on another JobCenter server", a connection using this protocol is established to MG/SV on the remote machine. This connection is maintained until the wait for the remote file is complete.

■Ports used by jcevent protocol

JobCenter MG/SV	Direction in which the connection is established	JobCenter MG/SV
1024 or greater/tcp[Note 5]	→	10012/tcp
10012/tcp	←[Note 6]	1024 or greater/tcp[Note 5]

Note 5	The ephemeral port selected and used as the source port. Please note that you will not be able to connect a free ephemeral port is eliminated. It should be noted that does not put a connection to from MG/SV CL/Win.	
	In this protocol, the IP address for the segment that can communicate with the destination IP address is used as the source IP address of the IP packet (As this also applies to cluster sites, be careful when controlling access using the firewall by using the source IP address. For details, refer to each note in Section 5.3.1, "Setting the daemon.conf File for Cluster Environment/Using Multiple NIC".)	
Note 6	The Event Reception part establishes a connection to the Event Transmission part to send a status notification in the following cases:	
	■ Reception Check is set to "ON" for the Event Transmission part, and the Event Reception part is started later and receives the event.	
	■ The transmitted event is overwritten by an identical event later.	
	■ When the transmitted event is received, the number of events that the Event Reception part can retain is exceeded and the oldest received event is discarded. (This applies when JNWENGINE_OPT is not set to -u. For details, refer to the section on JNWENGINE_OPT in Section 5.2.1, "Common in Windows and UNIX".)	

2.1.4. jnwengine (JobCenter's proprietary protocol, Windows version only)

This protocol is used for communication between a host and site-internal process. Use the port number 609/tcp.

2.1.5. jcdbs (Windows version only)

This protocol is used for communication between processes in the host or site. The ephemeral port to communicate with the port number 23131 / tcp as a source port. Please note that you will not be able to connect a free ephemeral port is eliminated.

2.1.6. https

This protocol is used for communication between CL/Web servers and web browsers.

■Ports used by https protocol

Web browser	Direction in which the connection is established	JobCenter CL/Web
n/tcp[Note 7]	→	443/tcp

Note 7	Ask the web browser vendor about the port number used by web browser.	

In addition to the above, use the ephemeral port for internal communication of CL / Web server was selected as the source port. Please note that you will not be able to connect a free ephemeral port is eliminated.

2.2. Notes on Building Network Connection

This section describes connection between the UNIX version of JobCenter and Windows version of JobCenter or SUPER-UX NQS.

You may register a machine not from JobCenter CL/Win (GUI screen), but with the nmapmgr command.

■In this case, specify "necnt" for NQS TYPE of the Windows version of JobCenter in nmapmgr on a UNIX machine.

■On a Windows machine, specify "nec" for NQS TYPE of the UNIX version of JobCenter in nmapmgr.

■To link an ACOS machine to NQS by using OLF/JB-SV or OLF/JB-CL, register "cos" as the ACOS machine NQS TYPE.

  ▪ Register a machine by using the nmapmgr command

```
# nmapmgr  ↵
NMAPMGR:> add mid <machine-id> <machine-name>
```

  ▪ Register NQS Type of JobCenter by using the nmapmgr command

```
# nmapmgr  ↵
NMAPMGR:> set type <NQS TYPE>
```

For details, see "6.5.2 Remote machine definitions" in <JobCenter Guide for using NQS function> (Japanese only) or "3.12 Managing the napmgr Network Configuration" in <JobCenter Command Reference> (Japanese only).

2.2.1. Connecting JobCenter for UNIX and JobCenter for Windows

The following limitations are applied when connecting the UNIX version and the Windows version of JobCenter. For details, see the "Release Notes."

■Jobs must be described in a batch file instead of a shell script.

■Since the system operates on the Graphical User Interface (GUI), it is impossible to see states using information display commands (for example, qstat).

■The path specified for the qsub and other commands in the result file can include a drive name (for example, "A:"). However, a single character machine name is interpreted as a drive name.

2.2.2. Connecting JobCenter for UNIX and SUPER-UX NQS

The SUPER-UX NQS is a Network Queuing System used by the UNIX operating system on the NEC "SX series" super computer. For functional details of the SUPER-UX NQS, see "NQS User Guide" supplied with the SUPER-UX NQS.

When submitting jobs from the JobCenter, a number of options can be specified to enable SUPER-UX functions. It is also possible to check the state of the job execution on the SUPER-UX by using qstat and other commands. For details of commands, see Chapter 4, "User Command List" in <JobCenter Guide for using NQS function> (Japanese only).

When connecting to SUPER-UX NQS, specify the original machine type (i.e. "nec") in the nmapmgr command. For details, see "3.12 Managing the napmgr Network Configuration" in <JobCenter Command Reference> (Japanese only)

2.3. Resolving Names in Windows

JobCenter may not operate normally due to failure to resolve name because of Windows problems.

To resolve this problem, the following methods are used.

■Using functions supported by Windows to resolve names

■Using resolv.def to resolve names

2.3.1. Using functions supported by Windows to resolve names

Specify the settings so that both forward and reverse lookup are possible by using the following methods supported in Windows.

■Using DNS to resolve names

■Using the hosts file (<Windows system directory>\drivers\etc\hosts) to resolve names

2.3.2. Using resolv.def to resolve names

If a function supported by Windows to resolve names cannot solve the problem or if a problem occurs in resolving names because of the following conditions, use the name resolving function (resolv.def file) in JobCenter.

■It is difficult to change the DNS or hosts file setting due to an environmental factor, such as when JobCenter is used in a closed internal LAN while the names are resolved according to the specified IP address for an open LAN.

■JobCenter is operated in an MSCS or an MSFC environment.

■JobCenter is operated in a multi-NIC environment.

■When CL/Win connections and operations such as screen transitions are slow in an environment in which the computer name cannot be looked up in reverse from the IP address.

> In a multi-NIC environment, the setting must be made so that when jobs are submitted from remote JobCenter SV, a reverse lookup is not performed to get the host name based on the submitter IP address.
>
> For details, refer to Section 5.3.1, "Setting the daemon.conf File for Cluster Environment/ Using Multiple NIC".

The resolv.def file is stored in the following locations:

| MG/SV | <installation directory>\etc\resolv.def |
| CL/Win | <installation directory>\resolv.def |

> Be sure to restart JobCenter if the resolv.def file is modified.

The format for specifying resolv.def file is as follows.

```
<SV1-IP address of the public LAN> <SV1-computer-name1> <SV1-computer-name2>
<SV2-IP address of the public LAN> <SV2-computer-name1> <SV2-computer-name2>
<SV3-IP address of the public LAN> <SV3-computer-name1> <SV3-computer-name2>
```

```
:
:
<SVn-IP address of the public LAN> <SVn-computer-name1> <SVn-computer-name2>
<relocatable-IP-address>        <cluster-site-name1>    <cluster-site-name2>
```

> ✏️ ■Even if running JobCenter in Windows, correctly specify files, including differences between upper and lower case, because the machine names specified in the hosts file and resolv.def file are case-sensitive.
>
> ■Use a 1-byte space or tab to separate the <IP address> and <computer name 1>, <computer name 1>, and <computer name 2>.
>
> ■Designate FQDN or a host name for <computer name 1> and <computer name 2>. The computer name returned by the operating system may be FQDN or a host name, so only the type returned by the OS needs to be designated. However, we recommend listing both for safety. Any order is allowed when both are designated.
>
> Example
>
> ```
> 192.168.0.1 hostA.example.com hostA
> ```
>
> ■The same IP address cannot be specified on multiple lines.
>
> ■If invalid settings for which name resolution is not possible on the network are specified, they are ignored. Be sure to specify a combination for which name resolution is possible.
>
> > ⚠️ Unlike hosts file, the "comment out" feature is disabled in the resolv.def file .
> >
> > NG example
> >
> > ```
> > 192.168.0.1 hostA.example.com hostA #DB Server
> > ```

If the resolv.def file exists, JobCenter SV (or MG) references this file before the DNS or hosts file. Specify the settings in the resolv.def file so that any machine resolves the names correctly when JobCenter SV (or MG) performs a forward or reverse lookup.

The following shows an example of how to specify a resolv.def file and daemon.conf file if there are machines connected to multiple LANs and you only want JobCenter to use one of them.
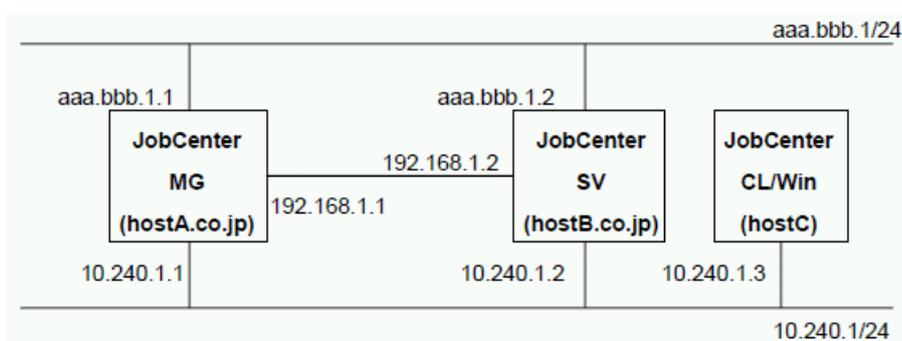
Figure 2.2. Sample IP address specification

> ✏️ In the above figure, aaa.bbb.1.1 to aaa.bbb.x.x indicate global addresses.

> 10.240.1.1 to 10.240.x.x, 192.168.1.1, and 192.168.1.2 indicate private addresses.

Example settings for resolv.def in <install-directory>\etc of an MG or SV machine

```
10.240.1.1   hostA.co.jp   hostA
10.240.1.2   hostB.co.jp   hostB
10.240.1.3   hostC
```

Example settings for daemon.conf in <install-directory>\etc of an MG machine

```
ipaddress=10.240.1.1
ipcheck=OFF
```

Example settings for daemon.conf in <install-directory>\etc of an SV machine

```
ipaddress=10.240.1.2
ipcheck=OFF
```

> <install-directory> is the installation directory of JobCenter. This is C:\JobCenter\SV (C:\JobCenter\CL for CL/Win) by default.

2.4. Setting JobCenter When Multiple NICs Are Used

To use JobCenter in a multiple-NIC environment, IP addresses at which JobCenter is bounded must be specified. You can set daemon.conf to specify IP addresses to be used by JobCenter.

For details on the setting method, refer to Section 5.3.1, "Setting the daemon.conf File for Cluster Environment/Using Multiple NIC".

In Windows, name resolution using a resolv.def file might be required. For details about how to resolve names, see Section 2.3, "Resolving Names in Windows".

The following are the operating specifications and precautions when using JobCenter in a multiple-NIC environment (or using the local and cluster sites on the same machine at the same time).

■Source IP

In JobCenter, the source IP address for TCP/IP communication is assigned as shown below.

Protocol used in JobCenter	source IP
NQS (607/tcp)	IP address obtained by looking up the local site name in forward[Note 1]
jccombase (611/tcp)	INADDR_ANY
jcevent (10012/tcp)	INADDR_ANY

[Note 1]This is the default setting and can be changed to INADDR_ANY. (To be explained below.)

■Operation when the source IP is INADDR_ANY

The IP address for the segment that can communicate with the destination IP address is used as the source IP address for TCP/IP. The priority used to determine which IP address is used is determined by the OS.

This is not limited to a multiple-NIC environment. The source IP address could be the IP address of the local site during communication between a cluster site and local site that operate on the same machine.

■Settings when the MG-SV belongs to a different segment

When the MG-SV belongs to a different segment, NQS communications may not be possible because the system attempts to forward look up the own site name and use the obtained IP address as the source IP address. To solve this problem, "NQSDAEMON_OPT=-x wildcard=ON" must be specified in daemon.conf. In this setting is specified, NQS communication also uses INADDR_ANY.

In this case, also specify "ipcheck=OFF" in daemon.conf used by the MG/SV at the destination IP address.

> For details about the daemon.conf settings, see Section 5.2, "Available Parameters of a Daemon Configuration File".

■Restrictions on communication such as firewall

By changing the source IP address to INNADDR_ANY, different segments can be linked. However, if there are multiple IP addresses that can be used for communication, an IP address to used is determined based on the NIC priority. Note this point when restricting communication by using a method such as firewalls.

Especially in a cluster environment where a local site and cluster sites belong to the same segment, cluster site communications do not use floating IP addresses but use local site IP addresses, depending on the NIC priority. In such cases, include local site IP addresses in firewall exceptions.

3 Building the JobCenter Network Environment

Building a JobCenter network environment allows centralized management including monitoring the states of queues and requests, and operating of several machines on the network.

Jobs are transferred using pipe queues. Therefore, after defining the machine ID of another machine on the network to which to transfer jobs, you need to link the user who submits jobs with the user who executes jobs. The following settings are required.

■Register machine IDs of other machines on the network.

■Associate users. (User Mapping)

Specify these environment settings as a JobCenter administrator.

Without above settings, trying to submit jobs through the network generates the following error.

```
Client machine-id is unknown at transaction peer;
No account authorization at transaction peer;
```

> ⚠️ When the machine environment is changed, make sure that the machine ID setting and user mapping are correctly respecified.
>
> JobCenter R14.2 and later have a new command with which to examine whether a machine added to the machine list can communicate with each port to be used in JobCenter. For example, after the environment has been built, or if normal submission of a request has not been achieved, use this command to check whether communication to each port can be achieved. For details, refer to Section 6.3, "jc_ping - Communication check for the specified site" in <JobCenter Command Reference> (Japanese only).

3.1. Registering the Machine ID of Another Machine on the Network

The machine ID of another machine on the network, which is the job transfer destination, can be registered. The machine ID of the local machine is registered during installation.

The following three methods can be used to register the machine ID of another machine on the network.

■Standard remote machine configuration

■Machine group configuration (Registering the machine ID of another machine from JobCenter CL/Win)

■Machine group configuration (Registering the machine ID of another machine from the command line)

3.1.1. Advantages and Disadvantages of the Standard Remote Machine Configuration and Machine Groups

The standard remote machine configuration can be used as a basic configuration for adding a machine icon and setting up user mapping. In machine groups, controlled, more useful functions can be used to control the entire system is centrally. For details about machine groups, see "6.7.6 Machine groups / Scheduler machine" in <JobCenter Guide for using NQS function> (Japanese only).

The standard remote machine configuration and machine group configuration have the advantages and disadvantages described below. Although the standard remote machine configuration is recommended for normal remote job request execution because of its simple settings, note the following points and select the best system configuration.

	Standard remote machine configuration	Machine group configuration
Work required to change settings	Little	Much
Network load	Low	High
Information accessibility	Low	High
Synchronization of the operating day calendar	Manual	Auto
Load balancing based on on-demand delivery	Not possible	Possible
Other	See below.	See below.

■Work required to change settings

With machine group configuration, when connecting to an SV machine in a machine group through CL/Win with the JobCenter administrator account, the connection is always established in the EUI mode. Therefore, the queue configuration and other environment settings cannot be changed. (To change these settings, the SV machine must be removed from the machine group.)

■Network load

With standard remote machine configuration, the network load is small because constant communication does not occur between the machines.

With machine group configuration, constant communication with the SV machines in the machine group occurs for referencing statuses. In addition, because the tracker data of all machines is transferred for displaying the Tracker List@all_machine tab, the load for obtaining the job execution statuses is larger than when the standard remote machine configuration is used.

In addition, the recommended number of member machines to register in a machine group is eight. If ten or more machines are registered and controlled in a machine group, be careful of the overhead traffic due to the increase in the amount of communication. (Divide the machine group as required.)

■Information accessibility

With standard remote machine configuration, when checking a queue or tracker of another machine, it is necessary to open a separate window for each machine icon.

With machine group configuration, the tracker information of all users and all machines in a machine group can be viewed in the [Tracker List@all_machine] tab for the MG machine.

■Synchronization of the operating day calendar

With standard remote machine configuration, to synchronize the operating day calendar with other machines, [Operation Calendar Update] must be separately executed for each machine icon.

With machine group configuration, if the operating day calendar is updated on a schedule machine, it is distributed to the member machines in the machine group. This unifies the management of the calendar if the operating day calendar reference schedule is used to start a job network placed on another machine.

■Load balancing based on on-demand delivery

With standard remote machine configuration, load balancing based on on-demand delivery is not available.

With machine group configuration, a load balanced environment can be built based on on-demand delivery by specifying multiple queues of multiple machines.

■Other

With standard remote machine configuration, remote operation is not performed just by adding a machine icon. At the least, the user mapping among the JobCenter administrators must be set up manually.

With machine group configuration, JobCenter must be running on all machines in the machine group. For example, it might not be possible to delete a machine if JobCenter is not running on a machine in the group.

3.1.2. Standard Remote Machine Configuration

The following describes how to register the machine ID of another machine in the standard remote machine configuration.

> ⚠ In the Machine List window, two machine icons labeled with the "host name only" and as "FQDN" might be displayed for one machine. This is because, during setup or when a machine recognized by FQDN is added to a machine group, an alias that has only a host name is automatically added for that machine.
>
> An alias can be used to identify machines by their operational role in [Machine List] in the Manager Frame or to improve the usability of the nmapmgr and qmgr subcommands. Note, however, that the alias is only valid in your machine (site). It cannot be used for name resolution during communication.
>
> An alias can be deleted by using the nmapmgr command instead of CL/Win. (It is not possible to delete just the alias from CL/Win.)

> For how to delete an alias, refer to "Delete Name $alias" in "3.12.3 Subcommands" in <JobCenter Command Reference> (Japanese only).

■Adding a machine to the Machine List

1. Login with the administrator account (UMS Mode), and then open the [Machine List] tab in the Manager Frame window.

2. Click [New] on the shortcut menu which appears by right-clicking on the [Machine List] window. Alternatively, on the menu bar, select [File] and then click [New].
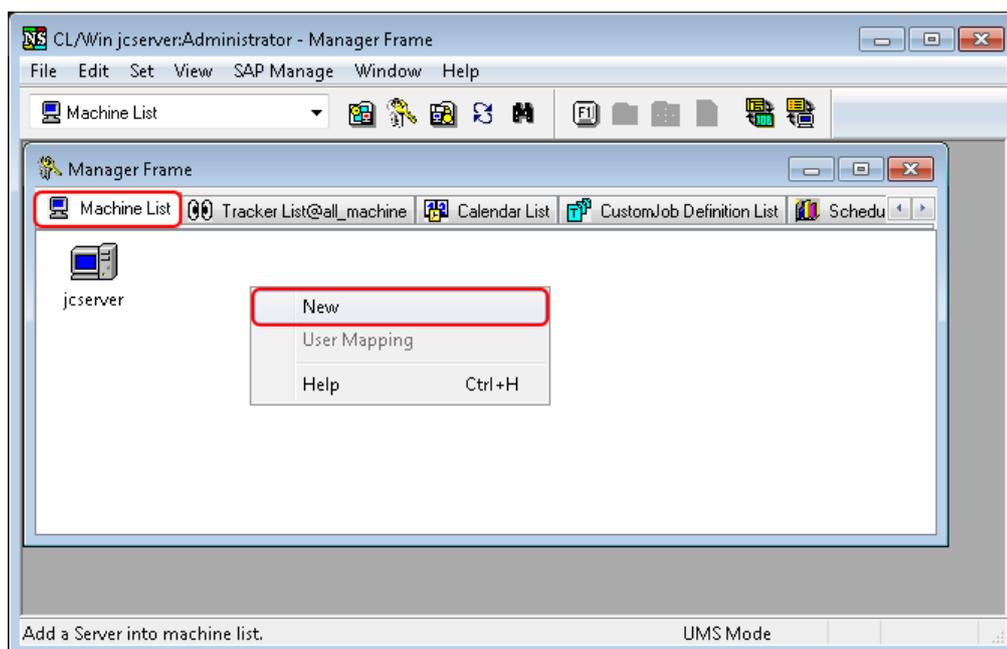
Figure 3.1. Screenshot that shows a machine that has been added to the Machine List (Standard Remote Machine Configuration)

3. The [Add new machine] dialog box opens. Enter the host name to be added.
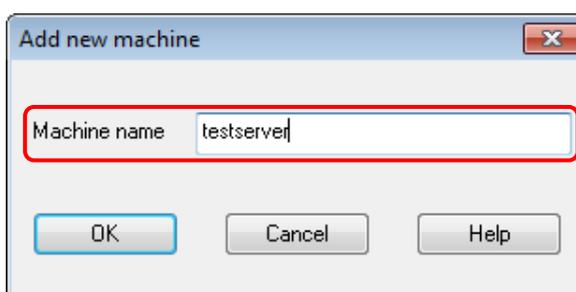
Figure 3.2. Screenshot of an [Add new machine] dialog box

4. After specifying the host name, click [OK].

5. The added machine appears on the [Machine List] in the Manager Frame window.
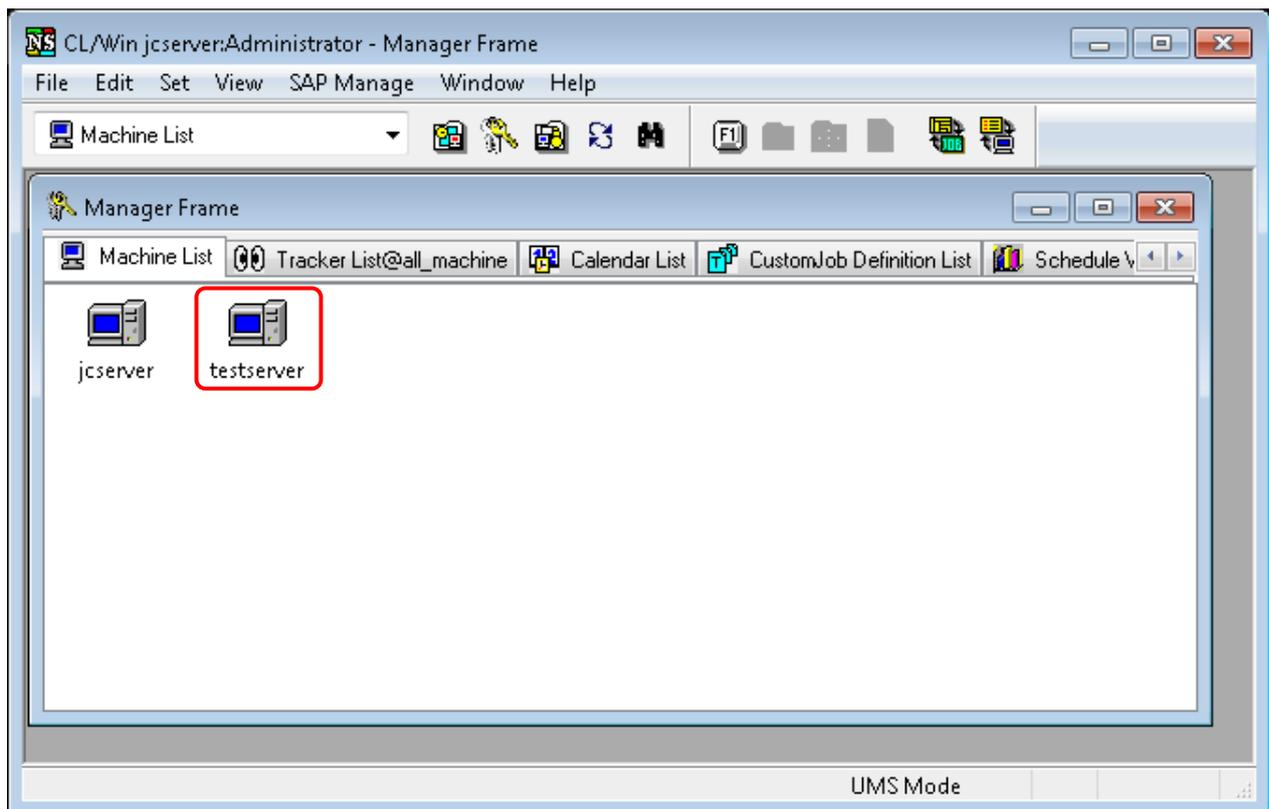
Figure 3.3. Screenshot of the [Machine List] after a
machine is added (Standard Remote Machine Configuration)

■Deleting a machine from the Machine List

1. Display the [Machine List] window in the same way as in the operation for adding a machine.

2. Point the cursor to a machine to be deleted and select [Delete] on the shortcut menu which appears by right-clicking the machine icon. Alternatively, select the machine to be deleted. On the menu bar, select [File] and then click [Delete].

3. The machine is deleted from [Machine List]. When the machine is deleted, all aliases of the machine are also deleted.

> ⚠ Note that, if a machine that was added to the machine group is deleted from the Machine List window, the machine is also automatically deleted from the machine group.

3.1.3. Machine Group Configuration (Registering Another Machine from JobCenter CL/Win)

Add or delete another machine on the network to or from a machine group. If a machine that is not in the Machine List window is added to a machine group, the machine ID of that machine is added to the Machine List window, and the user mapping among the JobCenter administrators is modified.

> ⚠ ■A machine cannot be added to multiple machine groups.
>
> ■If a machine in a machine group is added to a different machine group, that machine is deleted from the previous machine group. Note, however, that this modification does not

apply to the scheduler machine in the previous machine group. If you want to add a machine in a machine group to a different machine group, therefore, be sure to delete that machine from the machine group settings for the scheduler machine in the previous machine group in advance.

■When a machine that was added to the machine group is deleted from the machine list, the machine is also automatically deleted from the machine group.

■Only change the host name or cluster site name of a machine that was added to the machine group after deleting the machine from the machine list and machine group of the scheduler machine.

■Adding a machine to the machine group

1. Log in to the machine to be used as the scheduler machine with the administrator account (UMS Mode), and then on the menu bar, select [Set] and then click [Machine Group].
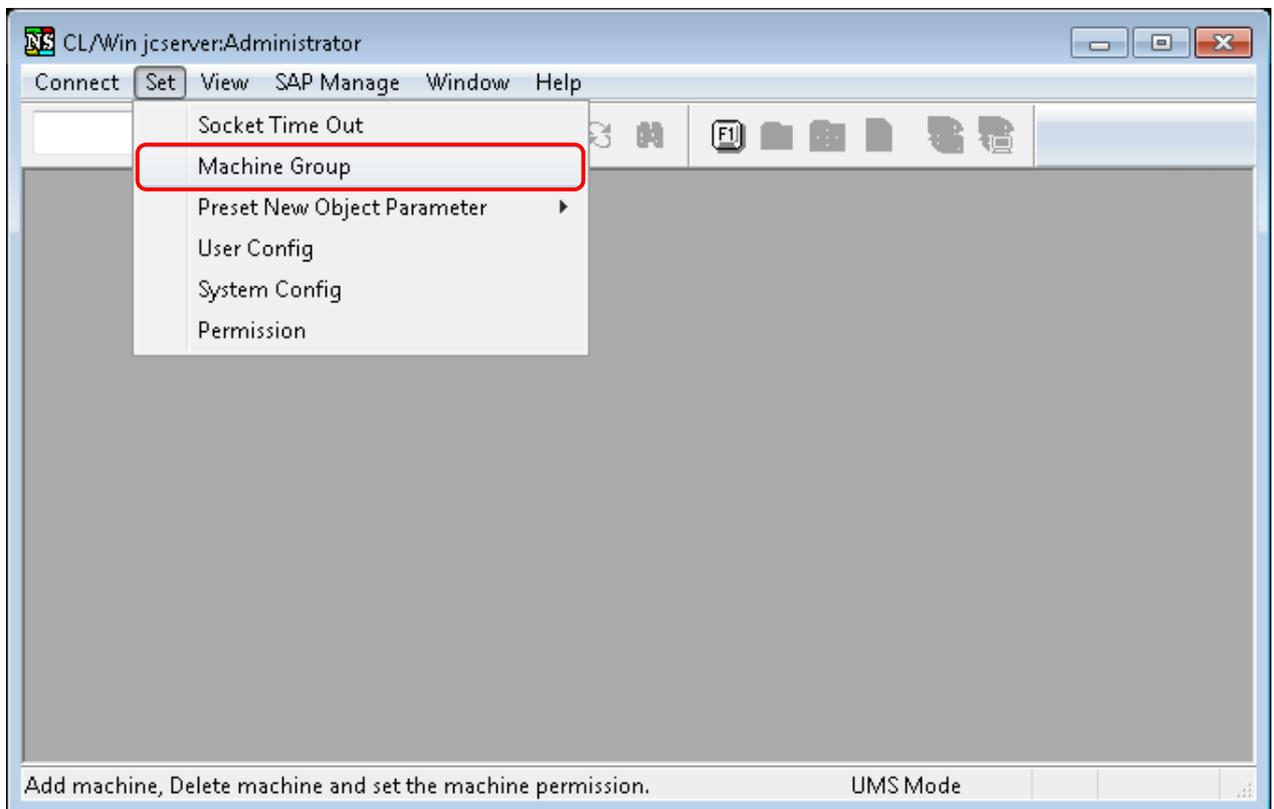
Figure 3.4. Screenshot that shows [Set] - [Machine Group] are selected from the menu bar

2. The [Machine Group] dialog box opens. Click [Add].
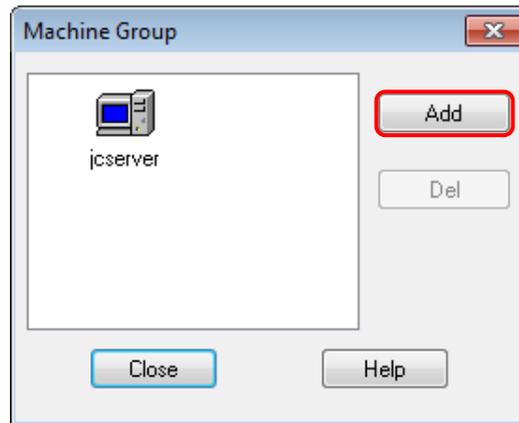
Figure 3.5. Screenshot of The [Machine Group] dialog box

3. The [Add new machine] dialog box opens. Enter the right host name of the machine to be added to the Machine Group. (Make the name resolution setting so that the host name can be obtained with a forward or reverse lookup.)

Figure 3.6. Screenshot of a [Add new machine] dialog box

4. After configuration, click [OK].

5. The machine is added to the [Machine Group] dialog box.
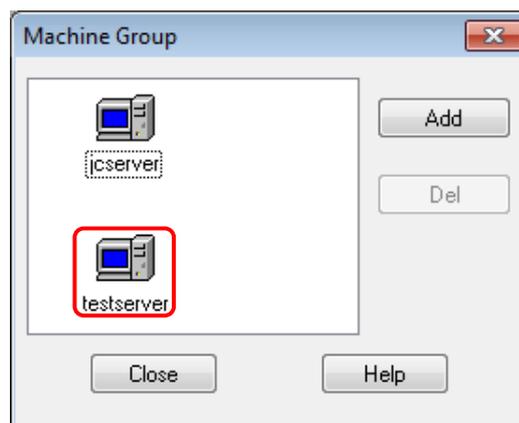
Figure 3.7. Screenshot of the [Machine Group] dialog box after a machine is added

■Deleting a machine from the machine group

1. Display the [Machine Group] dialog box in the same way as in the operation for adding a machine.

2. Select a machine to be deleted and then click [Del].

3. The [Confirm] window opens. Click [OK].

4. The machine is deleted from the [Machine Group] dialog box.

5. Make sure that the machine deleted from the machine group is still in the Machine List window.

> ⚠ When deleting a machine added to a machine group from the Machine List window, it is automatically deleted from the machine group.

3.1.4. Machine Group Configuration (Registering a Machine Group from the Command Line)

When setting up a machine group from the command line, use the nmapmgr or qmgr command. (The remote machine definition does not add or delete a specific machine, but redefines the machine group.)

For details about both commands, refer to "6.5.2 Remote machine definitions", which is in <JobCenter Guide for using NQS function> (Japanese only), and "3.12 Managing the nmapmgr Network Configuration" and "3.13 Managing the qmgr Configuration and Operations", which are in <JobCenter Command Reference> (Japanese only).

1. Executing subcommand add mid <machine-id> <machine-name> of the nmapmgr command

    The machine to be added must be registered the Machine List in advance. Perform this operation for all machines to be added to the machine group.

    To register machines running both Windows and UNIX, NQS TYPE must be set appropriately using the SEt Type subcommand of the nmapmgr command.

2. Executing subcommand SEt MAChine_group= (<scheduler-machine-name> [, <machine-name> ...]) of the qmgr command

    Register target machines to the machine group. The first machine specified in the machine group is used as the scheduler machine. The local machine must belong to that machine group.

    Up to 256 bytes per line (for UNIX) or 254 bytes per line (for Windows) including the SEt MAChine_group= section must be specified as the arguments of the qmgr command.

    A registered alias can also be specified as the machine name. To remove registered machines, set up the machine group again, including only the local machine.

    To check the values after setting, use the SHOw MAChine_group subcommand of the qmgr command.

3.2. Associating Users (User Mapping)

After defining the machine ID of another machine on the network, the user who submits jobs and the user who executes jobs must be linked. This operation is called user mapping.

There are two methods for setting user mapping: User mapping from the GUI screen and user mapping from the command line.

For other machines added to the machine group according to Section 3.1.3, "Machine Group Configuration (Registering Another Machine from JobCenter CL/Win)", the user mapping among the JobCenter administrator accounts is automatically set up.

> ⚠️ ■A user ID of the submitting machine cannot be mapped to multiple user IDs of the executing machine (1:n mapping). This is because the job executing user cannot be determined. Multiple user IDs of the submitting machine can be mapped to a user ID of the executing machine (n:1 mapping).
>
> ■If the same user name is used for node machines in a cluster site but the user IDs differ, user mapping inconsistency might occur at failover, resulting in abnormal operation. Be sure to specify the same user ID for cluster node machines.

3.2.1. Defining User Mapping from CL/Win (Viewer)

JobCenter To perform user mapping from CL/Win (the GUI window) (standard remote machine configuration), connect to the machine/site on the side that submits job requests by using CL/Win.

1. Display [Machine List] in Manager Frame.

2. Select [User Mapping] from the shortcut menu displayed by right-clicking the [Machine List] window or select [Set] and then [User Mapping] from the menu bar.
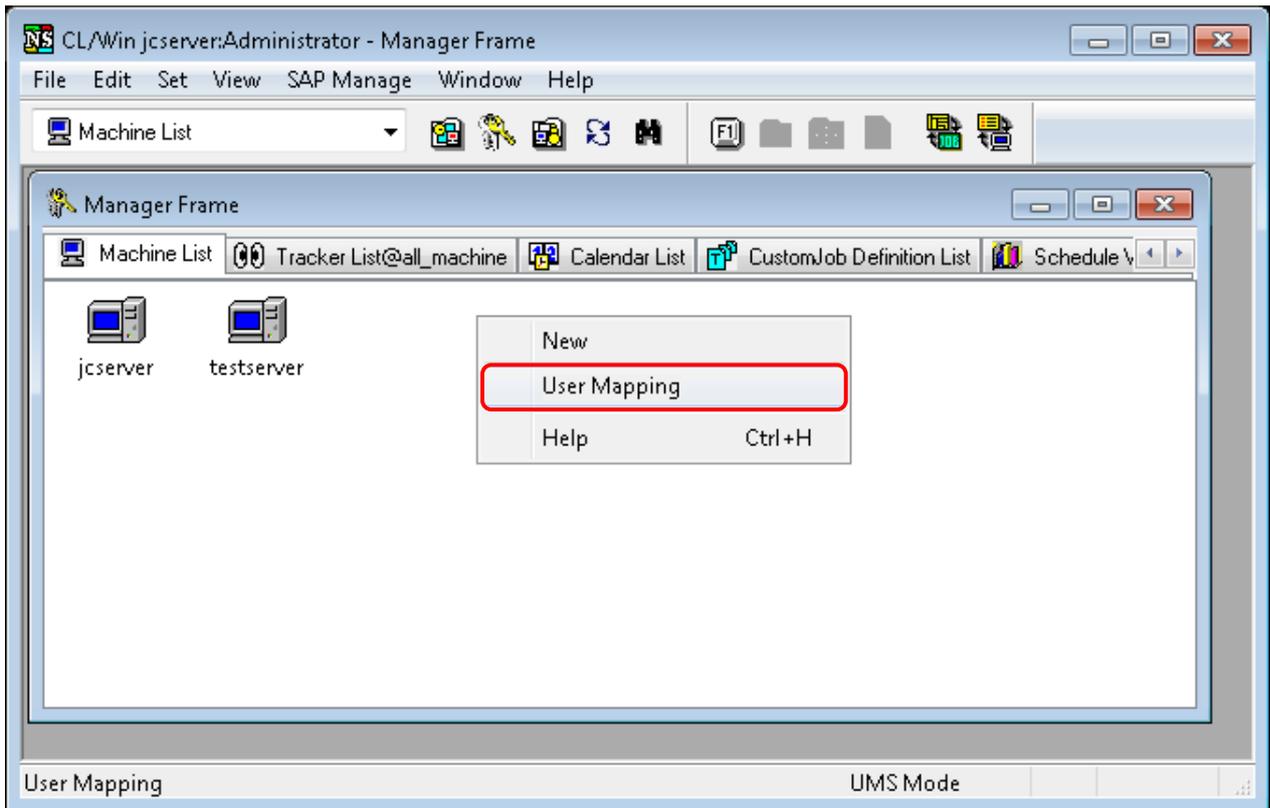
Figure 3.8. Screenshot that shows User Mapping is
selected (Standard Remote Machine Configuration)

3. The [User Mapping Setting] dialog box appears. Select the machine and user of the source machine
and the machine and user of the destination machine from the list.
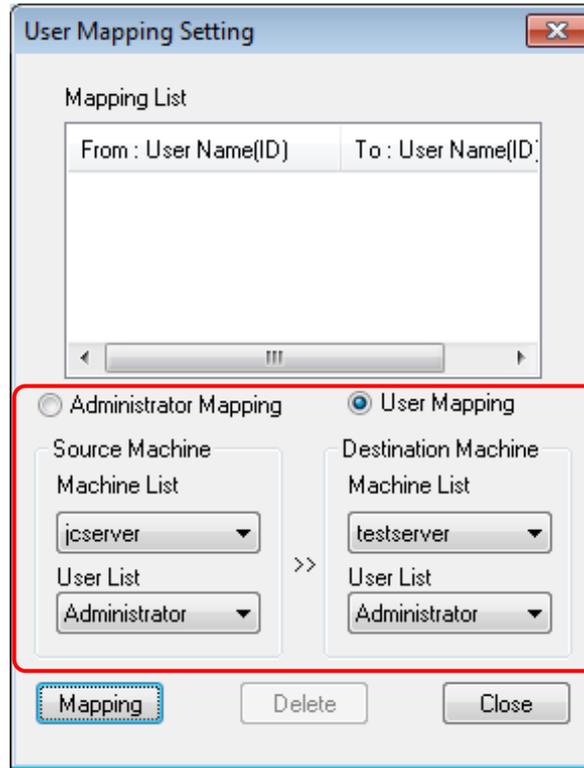
Figure 3.9. Screenshot of the [User Mapping Setting] dialog box

> ⚠️ If the transfer-destination machine is running Windows, only users who are registered to the Windows instance of JobCenter MG or SV and users who have connected using CL/Win are displayed.
>
> If the transfer destination is running UNIX, all users who are registered to the OS are displayed.
>
> For details about user registration, refer to Section 12.4, "Setting Up a User".

4. After configuration, click [Mapping].

The setting items in the [User Mapping Setting] dialog box are described below:

■Mapping List

This list displays information on user mapping between the associated transfer destination machine and transfer source machine.

From:User Name (ID)	Transfer the source machine user name (ID)
To:User Name (ID)	Transfer the destination machine user name (ID)

■Administrator Mapping/User Mapping

Select the types applicable for mapping. Chose administrator mapping or user mapping.

Administrator Mapping	The administration user of the transfer source machine and the administration user of the transfer destination machine server are selected implicitly for association.

	■ The administration user of the UNIX server is a user who has nsumsmgr or root authorization.
	■ The administrator user of the Windows server is a user who has the JobCenter administrator account.
User Mapping	Select the user account of the manager and server user to be associated.

■Source Machine

Select the transfer source machine and user to be user mapped.

Machine List	Select a transfer source machine from this list.
User List	Select a user of the transfer source machine from this list.

■Destination Machine

Select the transfer destination machine and user to be user mapped.

Machine List	Select a transfer destination machine from this list.
User List	Select a user of the destination machine from this list.

■[Mapping] button

Clicking this button starts user mapping. When mapping completes successfully, new mapping is added to the mapping list.

■[Delete] button

Clicking this button deletes the selected user mapping from the mapping list.

■[Close] button

Clicking this button closes the [User Mapping Setting] dialog box.

> ⚠ **If an error is output after user mapping**
>
> In the manager frame of the CL/Win instance connected to the user mapping source and user mapping destination machines, select the displayed partner machine on the [Machine List] tab.
>
> 1. Select [Change MID List] from the shortcut menu displayed by right-clicking the mouse button. Check that each machine ID is registered in the [MID list Setting] window on the other machine.
>
> 2. If either machine is not registered, click the [Update] button in the [MID list Setting] window and check that the machine is registered.
>
> 3. If the above does not work, carefully check the network settings because the two resolved names might not match.

3.2.2. Defining User Mapping from the Command Line

The three patterns below are available for the user mapping mode (mapping mode).

Mode	Features
TYPE1	Mapping that uses user names

	Because the same authentication system as rsh is used and the user names of the job request submission machine and execution machine are used to perform identification, submission machine host name (and user name) settings are required in .rhosts on the execution machine.
TYPE2	Individual JobCenter mapping Because the uid is used to identify a user, user mapping must be set up in advance by using CL/Win or commands.
TYPE3	This is used for TYPE1 and TYPE2. There are no problems as long as TYPE1 or TYPE2 mapping is set up. The individual JobCenter mapping is prioritized.

For details about each mapping mode, refer to "6.5.1 Overview of the JobCenter Network Environment: (2) User-related network environment" in <JobCenter Guide for using NQS function> (Japanese only).

This section describes how to use commands to specify the same settings as when setting up by using CL/Win as described in Section 3.2.1, "Defining User Mapping from CL/Win (Viewer)" (that is, how to set up the individual JobCenter mapping used for TYPE2 or TYPE3).

For individual JobCenter mapping, the information below is specified for "the machine/site used for execution upon reception" when a job request is received from the submission machine.

■Which machine/site the job request is from

■Which user uid the job request is associated with

■Which user uid on the local machine to use when executing the process

Note that the above settings are not specified on the job request submission side.

> Settings specified using CL/Win are specified by connecting to the job request submission machine/site, but the actual setting values are propagated to the mapping settings on the execution machine/site as shown above and stored.

To set up individual JobCenter mapping, log on to the job request execution machine by using a root account (in UNIX) or a JobCenter administrator account (in Windows), activate the nmapmgr command, and execute sub-commands.

1. First, determine the machine ID of the job request submission machine/site for which you want to obtain mapping.

```
# nmapmgr
NMAPMGR:> show state
HOST NAME: host2.co.jp HOST ID: 120
NQS TYPE: EXTENDED TYPE OF NEC-NT
MAIL ADDRESS: not set
USER MAPPING

GROUP MAPPING
```

"HOST ID: 200", which is next to "HOST NAME: host2.co.jp", shows the machine ID.

2. Next, check /etc/passwd (in UNIX) or the server environment settings (in Windows) for the uid of the user for whom you want to obtain mapping between the submission machine and the execution machine, and then set up the mapping as shown below.

```
NMAPMGR>: add uid <submission machine ID> <submission machine user ID> <execution-side local
 machine user ID>
```

> ⚠️ For the Windows version, note that, for the JobCenter administrator, all 0s are assigned to the user ID regardless of whether it is an actual uid.

3. Make sure that the settings were specified without problems. In the example below, the host2.co.jp user for whom uid=200 is mapped to the user on the execution-side local machine for whom uid=300.

```
# nmapmgr
NMAPMGR:> show state
HOST NAME: host2.co.jp HOST ID: 120
NQS TYPE: EXTENDED TYPE OF NEC-NT
MAIL ADDRESS: not set
USER MAPPING
200 -> 300
GROUP MAPPING
```

> ✏️ Even if a different name is specified as the show state parameter machine name, the information is displayed.

3.3. Notes on Building a JobCenter Network Environment

3.3.1. Maximum Number of Managed Machines

In general, a single machine can manage up to eight machines.

It is possible to manage nine or more machines, however, with heavy network load and poor response.

To build a large configuration, create several machine groups that are set up and managed by different machines to distribute load.

3.3.2. Adding a Unix Server to the Machine Group

After adding a Unix JobCenter SV to the machine group, capturing the machine group could fail depending on its timing.

If this happens, close the dialog for adding to the machine group and re-open the dialog. If the server has already been added to the machine group, it is not necessary to add it again.

3.3.3. Job Execution by a User Who Has Not Connected with CL/Win (Viewer)

There are cases where a user, who has not connected with JobCenter CL/Win, wants to execute jobs when transferring jobs from another server, etc. The user with the current privilege cannot execute jobs.

To solve this, connect from the JobCenter CL/Win with the current privilege or start "Environment Setting" and register the user's password in "User Manage". To register the user, enter the user name and password, and then click the [Add] button.

3.3.4. Operations in a WAN Environment

If the JobCenter SV on the network is managed with the JobCenter MG function, communication is performed at least once per 10 minutes even if no job is executed.

Therefore, when operating in a WAN environment, communication cost should be considered.

3.3.5. Administrator and User Passwords

This section describes the actions required when changing JobCenter administrator and job executing user passwords.

■For UNIX

There is no action you need to take. Always ensure that the OS account is valid.

■For Windows

When the password for the JobCenter administrator (account) has been changed, set a new password in JobCenter MG/SV and restart JobCenter MG/SV.

Perform either of the following when the password for the job execution user has been changed.

- Reconnect to JobCenter MG/SV from CL/Win by using a new password.

- Set a new password in JobCenter MG/SV.

If a job (script) to be executed by a user whose password has been changed includes a process that accesses a remote machine, such as copying files to remote machines, restart JobCenter MG/SV.

For information about how to set a password in JobCenter MG/SV, refer to Section 12.4, "Setting Up a User".

> When changing the passwords of domain users in an environment that uses multiple JobCenter MG/SVs, there may be multiple JobCenter MG/SVs that correspond to the following:
>
> ▪ The user may be a JobCenter administrator,
>
> or
>
> ▪ The user may be a job executing user.
>
> Check each JobCenter MG/SV to refer to if the above apply, and be sure to take the appropriate actions for each and every instance.

3.3.6. Number of Users That Can Be Registered

Up to 1,000 users can be registered in the JobCenter group.

If more than 1000 users are registered, JobCenter may not operate normally due to reduced response performance.

4 Creating Queues

To create an environment required for using JobCenter, queues must be created.

JobCenter is a system for performing batch processing. Batch processing places received requests in a queue and process them sequentially.

When the JobCenter receives a request, it places the request in a queue. The requests in the queue are processed sequentially. More than one queue can be defined in the system. Each queue may carry attributes such as the maximum number of concurrent requests, users allowed to submit, resource limits, and execution priority between queues.

This chapter describes how to create default queues that are used for executing a Job Network (JNW) on the machine.
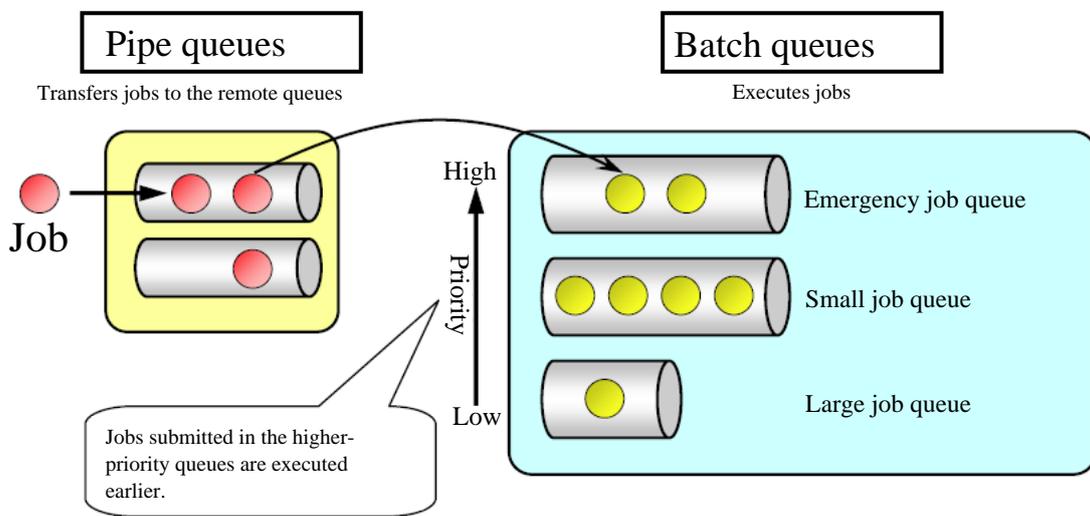
Figure 4.1. Image of batch processing

> ⚠ After changing the account password in Windows, check the status of the password on the [User] screen opened from [Server Environment Setting].
>
> If the status of the displayed user password is not [OK], specify a new password as that user using CL/Win and connect to MG/SV again or register a new password on the [User] screen to change the status to [OK].
>
> If you try to execute a job request when the password status is not [OK], the batch queue stops due to authentication failure, making it impossible to execute jobs.
>
> (Although it is not necessary to specify a new password in UNIX, always ensure that the OS account is valid.)

4.1. Queues the JobCenter Creates by Default

During installation of JobCenter, the queues shown in Figure 4.2, "Queues created by default" and Table 4.1, "Queues created by default and their initial values" are created by default.
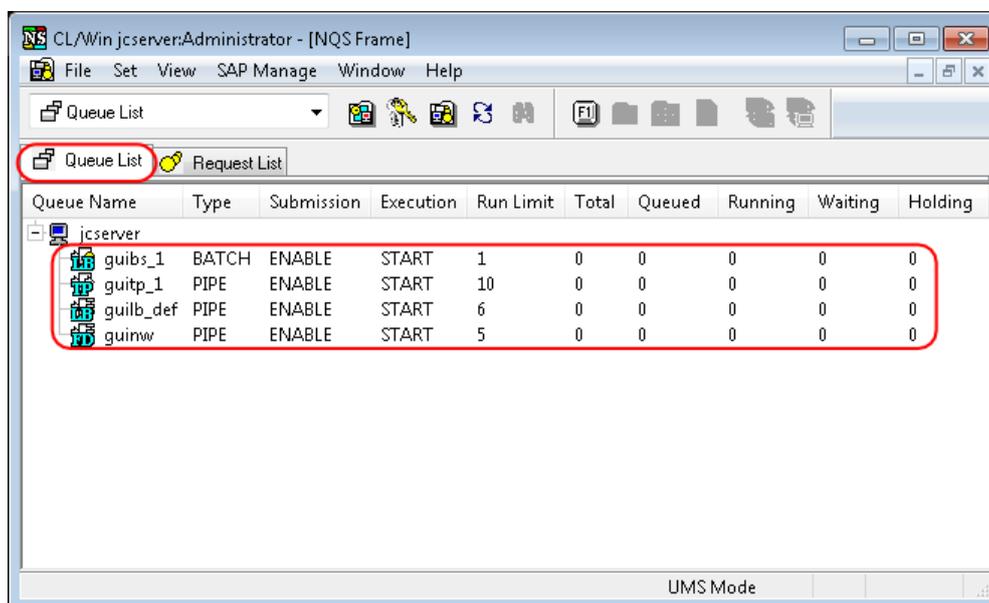
Figure 4.2. Queues created by default

Table 4.1. Queues created by default and their initial values

Queue name	Attribute	Function	Initial Values
guibs_1	Load balancing batch queue	Accepts and executes job requests from the load balancing pipe queue when using the on-demand delivery method.	Priority = 10 Multiplicity = 1
guinw	Pipe queue	Free Transfer Queue. Used to transfer requests to other machines.	Priority = 10 Multiplicity = 5
guitp_1	Transparent pipe queue	Transfers jobs to the local batch queue at high speed and with a low load.	Priority = 10 Multiplicity = 10 Destination = guibs_1
guilb_def	Load balancing pipe queue	Pipe queue effective for load balancing. This is specified as the initial submission destination queue by default.	Priority = 10 Multiplicity = 6 Destination = guitp_1
DefaultNetQue (UNIX version only)	Network queue	The queue for transferring the job request execution results back can only be viewed or controlled using qmgr. (The queue cannot be displayed using CL/Win. Note that, when this queue is stopped, unit jobs are left in the executing status.)	Multiplicity = 50

For details about the transfer order for the queue created by default, see Section 4.2, "Default Order of Transfer".

For details of functions, see Chapter 2, "JobCenter Configuration - 2.2 Queue" in <JobCenter Guide for using NQS function> (Japanese only).

4.2. Default Order of Transfer

By default, when a job network is executed, unit jobs are submitted to the default submission-destination pipe queue guilb_def in order according to the flow.

Next, requests are transferred in the order below.

guilb_def Load balancing pipe queue	→	guitp_1 Transparent pipe queue	→	guibs_1 Load balancing batch queue

> ⚠ By default, because the multiplicity value of the batch queue guibs_1 is set to 1, multiple job requests cannot be executed at the same time, and one is processed at a time in order.
>
> Therefore, job requests that are submitted later wait for execution. If necessary, change the multiplicity value of guibs_1 to 2 or greater.

4.3. Building Queue Configurations Freely

In JobCenter CL/Win, determination of a standard queue configuration reduces user operation. However, users themselves can construct queue configurations freely. To set up the queue configuration, it is necessary to log in from CL/Win by using an administrator account (in the UMS mode).

The following two types of queues can be added. Up to 500 queues can be created.

■Batch queue (Queue to enter batch requests)

■Pipe queue (Queue to transfer requests to other queues)

For details of creating batch queues and setting parameters, and creating pipe queues and setting parameters and destinations, refer to in <Basic Guide>Chapter 10, 「Usage of Network Queuing System (NQS)」. For details on each setting item, refer to <JobCenter Guide for using NQS function> (Japanese only).

4.4. Limiting Users Who Can Use Queues

If logged in with JobCenter administrator account, the administrator user can permit users to use arbitrary queues or prohibit users from using queues.

To limit users who can use queues, follow the procedure below:

1. Login with the administrator account (UMS Mode), and then open the [Machine List] tab in the Manager Frame window.

2. Select a queue to control user and then click [Queue Use Rights] on the shortcut menu which appears by right-clicking the queue.
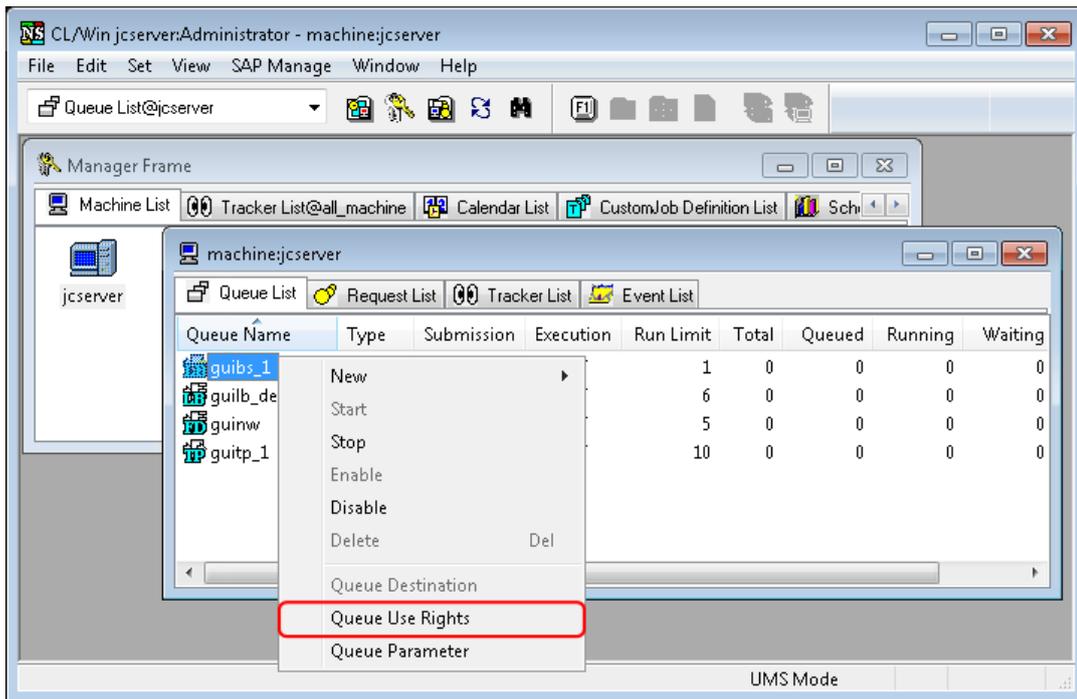
Figure 4.3. Screenshot that shows [Queue Use Rights] is Selected from the Menu

3. Select a queue to control user and then click [Queue Use Rights] on the shortcut menu which appears by right-clicking the queue. All users registered in the selected machine are displayed in [User List].

By default, [Allow all users] is selected. In this status, all users can use the queue.
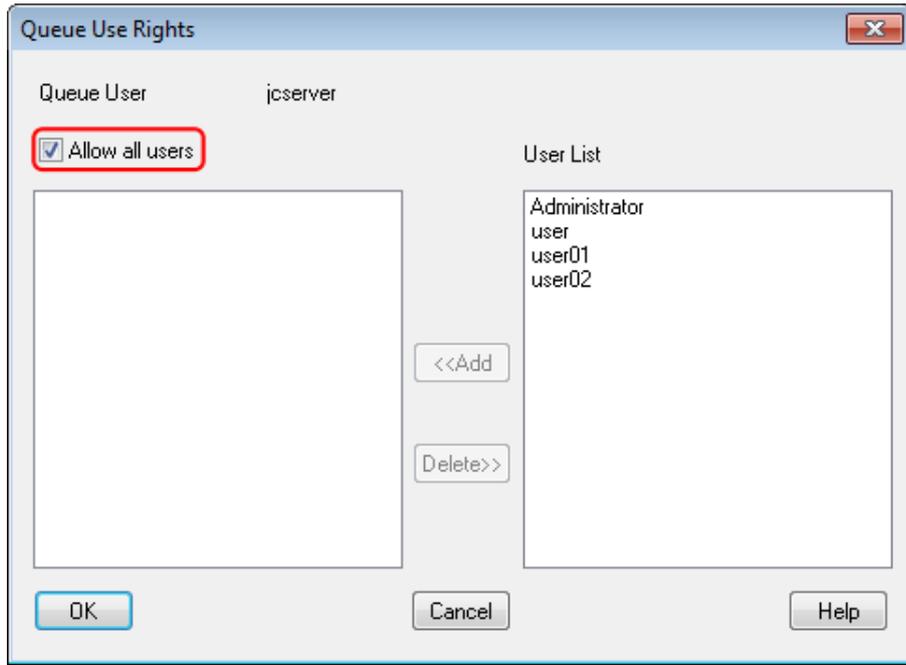
Figure 4.4. Screenshot of the [Queue Use Rights] dialog box

4. To add a user who can use the queue, clear the [Allow all users] check box.

5. To add a user who can use the queue, select the user and group from [User List], and then click the [Add] button. To delete users who can use the queue, select the users you want to delete, and then click the [Delete] button.
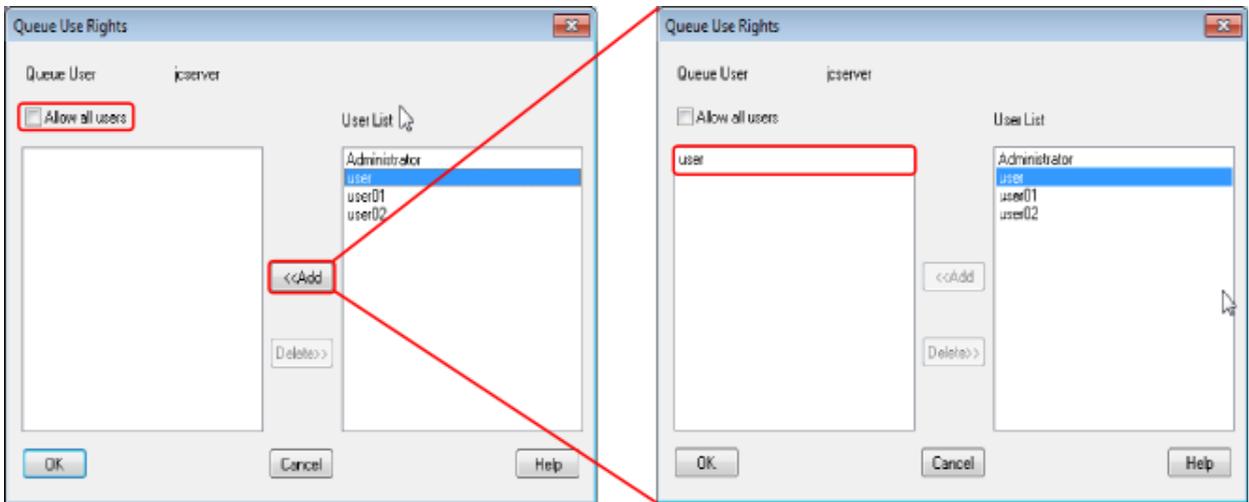
Figure 4.5. Screenshot that shows a user or group who can use the queue is added

6. After configuration, click [OK].

4.5. Setting Details on Management Machine

Edit machine parameters and set details on the management machine.

1. In [Queue List] in the NQS frame, select a machine, and then select [NQS Parameter] in [Set] in the menu bar to display parameters currently set in the machine.
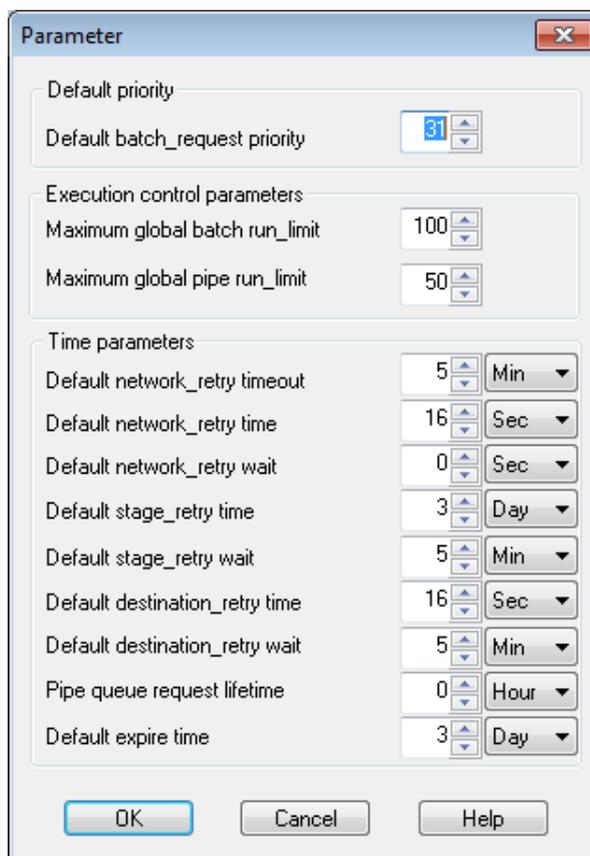
Figure 4.6. Screenshot of [Parameter] of NQS

2. After configuration, click [OK] and then the machine parameters is updated to the modified value.

For details, refer to 6.3, "JobCenter Environment Setting" in <JobCenter Guide for using NQS function> (Japanese only).

Subcommands of the qmgr command are provided for defining and changing environment parameters, respectively. details about the sub-commands of the qmgr command, see "3.13 Managing the qmgr Configuration and Operations" in <JobCenter Command Reference> (Japanese only).

An example of changing the number of batch requests that can be executed concurrently is shown below.

(Example) Changing the number of batch requests that can be executed concurrently to 15

```
# qmgr ↵
Mgr:  set global batch_request_limit 15
```

5 Changing Startup Settings for JobCenter

The JobCenter starts; it can load daemon configuration file (daemon.conf) to alter its settings. The settings include invalidating the schedule while the JobCenter is stopped, which improves recovery operation.

Note that, if the settings in daemon.conf are changed, they are not applied until JobCenter is restarted.

5.1. Storage Location of the Daemon Setup File (daemon.conf)

The storage location of the Daemon configuration file (daemon.conf) varies according to the environment.

5.1.1. For Windows

When creating a daemon configuration file, store it in the following location.

When JobCenter is started up, the installed files are read for each local environment and cluster environment site.

Local site	Under %InstallDirectory%\etc
Cluster site	Under %JobCenterDatabaseDirectory%\etc

%InstallDirectory% is the installation directory of JobCenter. The default directory is C:\JobCenter\SV.

Note that %JobCenterDatabaseDirectory% is a database directory on the shared disk specified when setting up cluster sites by using cjcmksite.

5.1.2. For UNIX

When creating a daemon configuration file, store it in the following location.

When JobCenter is started up, first the common files that exist by default are read, and then the files installed for each site are read. The parameters specified in files that are read later are prioritized.

Common	/usr/lib/nqs/rc/daemon.conf
	(This file, which exists by default, is read before the local and cluster daemon configuration files.)
Local site	/usr/spool/nqs/daemon.conf
Cluster site	<JobCenterDB path>/daemon.conf

When the ipaddress or ipcheck setting is specified in the common daemon.conf file, a network resource conflict occurs between local and cluster resources, and the system does not run normally.

Therefore, do not specify the ipaddress or ipcheck setting in the common daemon.conf file.

5.2. Available Parameters of a Daemon Configuration File

5.2.1. Common in Windows and UNIX

1. SCLAUNCHD_FORGET

   SCLAUNCHD_FORGET=<seconds> When the sclaunchd daemon, which manages schedule execution, is started by specifying a daemon configuration file as shown above, it is possible to specify settings so that job networks for which the schedule data is <seconds> old are not started.

   The specifiable range for <second> is 1 to 2,147,483,647.

   For example, the following parameter setting prevents any schedules a day or older from running when the system restarts.

   ```
   SCLAUNCHD_FORGET=86400
   ```

2. NQSDAEMON_OPT

   By specifying a daemon configuration file as shown above, it is possible to put all queues in the STOP status when starting up JobCenter.

   ```
   NQSDAEMON_OPT=-s
   ```

   In addition, by specifying the file in combination with the -x option and a sub-option as shown below, the JobCenter startup settings can be changed.

   ```
   NQSDAEMON_OPT=-x trkappend=ON
   ```

Suboption	Description
trkappend=ON	Adds the contents of the standard output and standard error output to the previous execution result of a unit job when the unit job is reexecuted with a Continue part.
trkappend=OFF	Overwrites the previous execution result of a unit job with the contents of the standard output and standard error output when the unit job is reexecuted with a Continue part. This value is used as the default when this suboption is not specified.
wildcard=ON	When multiple IP addresses are used to wait for communication, the IP address for the segment that can communicate with the destination IP address is selected and used as the source IP address for TCP/IP during NQS job request transfer. This avoids a remote submission error caused because NQS communication is tried using different routes (routing) between the job request submission source and the submission destination if the machine has an interface to access multiple segments. ⚠ Be sure to specify this setting in daemon.conf on the machine that submits NQS job requests and specify ipcheck=OFF in daemon.conf on the SV that receives job requests. (For the setting to wait for communication using multiple IP addresses and the ipcheck=OFF setting, refer to Section 5.3.1, "Setting the daemon.conf File for Cluster Environment/Using Multiple NIC".)

wildcard=OFF	When multiple IP addresses are used to wait for communication, the IP address that the OS obtains from the local site name through name resolution is always used as the source IP address for TCP/IP during NQS job request transfer. This value is used as the default when this suboption is not specified.
idc_keepalive Interval (seconds)　=	In an environment having machine groups or the MG-SV environment, the session remains open between NQSs. When this suboption is specified, a dummy packet is transmitted to the session at specified intervals. In a network environment where routers and firewalls are configured to automatically delete a session in the no-communication status, this prevents a session from being deleted because of the no-communication status. As the interval, an integer in the range of 60 to 86,400 can be specified. If an integer smaller than 60 is specified, 60 is assumed. If an integer larger than 86,400 is specified, 86,400 is assumed. As the interval, specify a value smaller than the timeout value used for routers and firewalls to detect the no-communication status. When specifying this suboption, set it for both MG and SV. When this suboption is not specified, a dummy packet is not transmitted at regular intervals.
stage_retry_ failed_action= copytotempdir	If the standard output or standard error output from the job executed in SV is not sent to MG, the output is saved to the file uder the following directory. In UNIX: <table><tr><td>Standard output</td><td><home_directory_for-the_job-executing-user>/job-name.o%seqno%</td></tr><tr><td>Standard error output</td><td><home_directory_for-the_job-executing-user>/job-name.e%seqno%</td></tr></table> In Windows: <table><tr><td>Standard output</td><td><JobCenterDB-path>\spool\work\<job-name>.o%seqno%</td></tr><tr><td>Standard error output</td><td><JobCenterDB-path>\spool\work\<job-name>.e%seqno%</td></tr></table> These are the default values set when this suboption is not specified. ■The %seqno% is the numerical value of the sequenece number in a request ID. ■In a local site, the <JobCenterDB-path> is the directory where JobCenter is installed. The default path is "C:C:\JobCenter\SV". In a cluster site, <JobCenterDB-path> is the database directory on the shared disk which was set when the cluster site was configured.

stage_retry_ failed_action= delete	If the standard output or standard error output from the job executed in SV is not sent to MG, the output is not saved.

3. JNWENGINE_OPT

For JWENGINE_OPT, by specifying the options below for the daemon configuration file with hyphens before them, the operation of each JobCenter job network part can be changed.

When specifying two or more options, delimit them with a space as follows.

```
JNWENGINE_OPT=-os -ot -m 1000
```

Option	Description
oe	When this option is specified, the EXIT code when a timeout occurs is treated as an error. ✏️ This option is valid only when the -ot option is set.
ot	Specifying this option prevents timeout of File Waiting parts and Event Transmission/Reception parts from being taken as error.
os	When this option is specified and an executing part is skipped, the status of the corresponding part becomes SKIP+ERROR. Note that, when this option is not specified and the job network tracker is re-executed, jobs that had the SKIP+ERROR status before re-execution change to SKIP+DONE, but, when this option is specified, those jobs remain in the SKIP+ERROR status.
s	When this option is specified, reconstruction of existing JNW information is not performed. Reconstruction of existing job network information refers to the processing used to reconstruct lost job network information based on tracker data before archival when the daemon is restarted during job execution.
Ef	When error occurs in File Waiting parts, the job network will stop automatically.
Es	When error occurs in Event Transmission parts, the job network will stop automatically.
Er	When error occurs in Event Reception parts, the job network will stop automatically.
Tf	To calculate the relative time of File Waiting parts update reference time and timeout, change the standard from the job network start time to File Waiting parts start time. When the Tf option is specified and JobCenter is restarted during waiting operation of a File Waiting part with a relative time specified, the relative time is recalculated for the Waiting part from the restart time.
Tt	To calculate the relative time of Time Waiting parts update reference time and timeout, change the standard from the job network start time to Time Waiting parts start time. Even if this option is specified, however, the time displayed in the actual wait time dialog box, which is displayed from a Time Waiting Part, is based on the same

| | Job Network start time in the same manner as when this option is not specified. This is a problem in the JobCenter CL/Win display, but Time Waiting parts operate correctly based on the start time set to the Time Waiting part. The correct time can be confirmed in the Job Network log.

When the Tt option is specified and JobCenter is restarted during waiting operation of a Time Waiting part with a relative time specified, the relative time is recalculated for the Waiting part from the restart time. |
|---|---|
| Ts | To calculate the relative time of Event Transmission parts receive confirmation timeout and event valid time timeout, change the standard from the job network start time to Event Transmission parts start time. |
| Tr | To calculate the relative time of Event Reception parts receive timeout, change the standard from the JNW start time to Event Reception parts start time. |
| n times | This is the number of communication retries performed so that event transmission (including the jnwetvcmd command) does not time out due to the communication status or other factor.

Any integer from 1 to 2,147,483,647 can be specified. The default value is 0 times (no retry) if a value outside this range is specified. |
| i-second interval | This is the interval at which event transmission is retried when the i option is specified.

Any integer from 1 to 2,147,483,647 can be specified. The default value is 30 seconds if a value outside this range is specified. |
| m events | Changes the number of events transmitted from event transmission parts to the local machine that can be retained.

The range which can be set to the number of events is 500 to 5000. If this option is not available, use the default value 500 events. |
| u | When the number of events exceeded the number of reservable events, event overwriting is prohibited and sending an event is ended abnormally. |
| p times | Specifies the retry count of warning operation performed when skip or forced stop operation is performed from the GUI during job transfer processing, when a critical point warning is issued, or when the expected time is exceeded.

Any integer from 1 to 2,147,483,647 can be specified, and the default value is 10 times if a value outside this range is specified. |
| r-second interval | Specifies the retry interval of warning operation performed when skip or forced stop operation is performed from the GUI during job transfer processing, when a critical point warning is issued, or when the expected execution time is exceeded.

Any integer from 1 to 2,147,483,647 can be specified, and the default value is 8 times if a value outside this range is specified. |
| R times | This is only supported for Windows and is the number of times to retry communication when final file wait judgment times out due to the communication status or another problem if the target of the file waiting part is a file on a network drive.

Any integer from 1 to 2,147,483,647 can be specified, and the default value is 10 times if a value outside this range is specified. |
| I-second interval | This is only supported for Windows and is the retry interval used when performing file wait retry processing of the R option. |

	Any integer from 5 to 60 can be specified, and the default value is 5 times if a value outside this range is specified.
lt	When this option is specified, the log time output to the tracker log is displayed down to milliseconds. When this option is not specified, the log time is displayed only up to the second level.
F	When "Exist" or "Update" is specified as the passing condition for a file waiting part, a check is made to see that the target file has not been opened by another process and has not been updated for a specified amount of time. When this option is not specified (default), it is judged that the passing condition is met whenever a file entry is created on the disk, even while the file is still in the process of being created. For this option, the following two suboptions can be specified. <table><tr><td>close_check=ON</td><td>A check is made to see that the target file has not been opened by another process.</td></tr><tr><td>update_check_value= interval (seconds)</td><td>A check is made to see that the last update time of the file has not been updated for a specified amount of time. Specify the interval in seconds.</td></tr></table> If the file remains open while it is being created, all you need to do is specify "close_check=ON". If the file is opened and closed repeatedly, specify "update_check_value" so that you can tell that the creation of the file is complete by the fact that the file has not been updated for a specified amount of time since its last update time. You can specify both of these suboptions at the same time. An example of specifying both of the suboptions is given below. JNWENGINE_OPT=-F close_check=ON,update_check_value=60 ⚠ In UNIX/Linux, close_check is executed using the **fuser** system command. Therefore, **fuser** needs to be installed in the locations shown below. ■Linux: /sbin/fuser ■Other than Linux: /usr/sbin/fuser Note that close_check does not function effectively for a process that cannot be detected by fuser. In Windows, close_check opens the target file in non-share mode and, if the file can be opened, closes it immediately, judging that there is no process that has the file opened. In the time during which the file is opened and closed in this check, no other process can access the file. Therefore, if the file is opened and closed repeatedly while it is created, it is necessary to take an appropriate action, such as making a retry, in anticipation of a file access error. If this is difficult to do, specify only update_check_value to check the last update time.

4. JNWENGINE_RMTFCHECK_PKTTIMEOUT

The timeout period for returning a processing result packet from when a file check query packet is sent to the remote machine while a file waiting part waits for a file on another JobCenter server can be changed by specifying JNWENGINE_RMTFCHECK_PKTTIMEOUT=<seconds> in daemon.conf.

■Specify a value for <seconds> from 1 to 2,147,483,647.

■This setting is invalid if 0 or a negative value is specified. If such a value is specified, timeout processing is performed using the default value of 900 seconds, which is the default operation.

For example, to execute a timeout if no response is returned within an hour of transmitting a file wait processing packet to the remote machine, specify the following:

```
JNWENGINE_RMTFCHECK_PKTTIMEOUT=3600
```

5. JNWENGINE_RMTFCHECK_RTYTIMEOUT

The retry period (in seconds) before determining an abnormal end upon occurrence of a communication failure with the remote machine (including a packet communication timeout) while a file waiting part "waits for a file on another JobCenter server" can be specified by specifying JNWENGINE_RMTFCHECK_RTYTIMEOUT=<seconds> in daemon.conf.

■Specify a value for <seconds> from 1 to 2,147,483,647.

■This setting is invalid if 0 or a negative value is specified. If such a value is specified, the file waiting part is terminated abnormally if a communication failure continuously occurs for an interval of 900 seconds, which is the default operation.

For example, to abnormally terminate the file waiting part if a communication failure occurs during remote file wait processing and continues for an hour, specify the following:

```
JNWENGINE_RMTFCHECK_RTYTIMEOUT=3600
```

6. JNWENGINE_RMTFCHECK_INTERVAL

The interval for checking the state of the wait target file on the remote machine while a file waiting part "waits for a file on another JobCenter server" can be specified by specifying JNWENGINE_RMTFCHECK_INTERVAL=<seconds> in daemon.conf.

■Specify a value for <seconds> from 1 to 2,147,483,647.

■This setting is invalid if 0 or a negative value is specified. If such a value is specified, the wait target file on the remote machine is checked using an interval of 20 seconds, which is the default operation.

For example, to check the remote file waiting processing every two minutes to reduce the server load, specify the following:

```
JNWENGINE_RMTFCHECK_INTERVAL=120
```

⚠ If a short file check interval is specified and wait processing for multiple remote files is performed simultaneously, the load on JobCenter increases. Consider the computer specs when specifying this parameter.

7. JNWENGINE_RMTFCHECK_RUNLIMIT

The number of remote files on another JobCenter server that a file waiting part can simultaneously wait for can be specified by specifying JNWENGINE_RMTFCHECK_RUNLIMIT=<number-of-processes-executed-simultaneously> in daemon.conf.

■Specify <number-of-processes-executed-simultaneously> in the range of the file descriptor restriction value and less than the JobCenter restriction value, 400, for one process specified for the OS.

■This setting is invalid if 0 or a negative value is specified. If such a value is specified, wait processing of remote files is performed with a maximum of 30 executing file wait parts, which is the default operation.

For example, to enable a file waiting part to simultaneously wait for up to 45 remote files, specify the following:

```
JNWENGINE_RMTFCHECK_RUNLIMIT=45
```

> ⚠ The load on JobCenter increases if a greater number of remote files than a file waiting part can wait for simultaneously is specified. Consider the computer specs when specifying this parameter.
>
> If the number of files that a file waiting part can simultaneously wait for exceeds the upper limit (default: 30), the remote file wait processing enters the RUN[HOLD] status.
>
> The remote file wait processing resumes when the number of files that are waited for decreases to less than the upper limit.

8. ipaddress

By describing multiple IP addresses in ipaddress in the format shown below (specifying multiple IP addresses, each separated by a comma (,)), it is possible to wait for communication with those multiple IP addresses.

Up to five IPv4 addresses and up to five IPv6 addresses can be described.

```
ipaddress=<IPv4 address1>,<IPv4 address2>,<IPv4 address3>,<IPv4 address4>,<IPv4 address5>,<IPv6
 address1>,<IPv6 address2>,<IPv6 address3>,<IPv6 address4>,<IPv6 address5>
```

9. bindmode

By setting one of the options listed below in bindmode, you can have JobCenter wait for communication with IPv4 addresses only, IPv6 addresses only, or both.

If no option is set, JobCenter waits for communication with an IPv4 address when there is any IPv4 address or with an IPv6 address when there is only an IPv6 address. (Precedence is given to IPv4 addresses only.)

```
bindmode=all
```

Option	Description
ipv4	JobCenter waits for communication with IPv4 addresses only.
ipv6	JobCenter waits for communication with IPv6 addresses only.
all	JobCenter waits for communication with both IPv4 and IPv6 addresses.

> ⚠ If the ipaddress parameter is set in daemon.conf, the bindmode parameter is invalid.

10. ipcheck

If you set ipcheck to OFF in the daemon configuration file, a reverse lookup from the submission source IP address to a host name is not performed to check the submission source SV.

If this parameter is not set, a reverse lookup from the submission source IP address to a host name is performed to check the submission source SV.

```
ipcheck=OFF
```

11. JL_LOGMONITOR_FORGET

```
JL_LOGMONITOR_FORGET=ON
```

By specifying the daemon setting file as described above, logs added to the target text log file specified in the trigger while JobCenter stops are not monitored at startup of JobCenter.

Check the details of text log monitoring by the trigger in <Basic Guide>Chapter 7, 「Submitting the Job Network Independently of the Schedule」.

If this parameter is not set or JL_LOGMONITOR_FORGET is OFF, logs added to the target text log file specified in the trigger while JobCenter stops are monitored at startup of JobCenter.

> ⚠ If a large volume of logs is output to the target text log file specified in the trigger while JobCenter stops, JobCenter may be greatly loaded at startup.

12. JL_LOGMONITOR_INTERVAL

By specifying this parameter as JL_LOGMONITOR_INTERVAL=<second> in the daemon setting file, monitoring intervals can be set for the text log file targeted by the trigger monitors .

Check the details of text log monitoring by the trigger in <Basic Guide>Chapter 7, 「Submitting the Job Network Independently of the Schedule」.

■Specify <second> in the range of 1 to 2147483647.

■This setting is invalid if 0 or a negative value is specified. If such a value is specified, the log is monitored at 10-second intervals, which is the same as the default setting.

13. JL_LOGMONITOR_MAXLINE

By specifying this parameter as JL_LOGMONITOR_MAXLINE=<line number> in the daemon setting, you are able to set the maximum line number of added logs to be read at a time when the trigger monitors the text logs in the target text log file. The contents of a log that exceeds the maximum number of lines are carried over to the next monitoring process.

Check the details of text log monitoring by the trigger in <Basic Guide>Chapter 7, 「Submitting the Job Network Independently of the Schedule」.

■Specify <line number> in the range of 1 to 2147483647.

■This setting is invalid if 0 or a negative value is specified. If such a value is specified, up to 10,000 lines are read, which is the same as the default setting.

5.2.2. For Windows

> ⚠ When the SYN Attack Protection function[Note 1] is enabled in Windows Server 2003[Note 2], this function is activated when a large number of jobs are submitted and the number of TCP/

IP connection requests will exceed the backlog value of the Winsock listening socket, which results in an error in job submission or an error is returned as the execution result.

To solve this problem, specify the b and B options of NQSDAEMON_OPT, JNWENGINE_OPT, and COMAGENT_OPT to adjust the back log value.

Example:

```
NQSDAEMON_OPT=-b 300
JNWENGINE_OPT=-b 300 -B 300
COMAGENT_OPT=-b 300
```

Note 1   When a large number of SYN packets are received continuously, it will be judged as a Denial of Service (DoS) attack and the TCP connection immediately after opening is forcibly shut down by using an RST packet.

Note 2   This function is enabled by default in Windows Server 2003 SP1.

1. NQSDAEMON_OPT

In addition to parameters common to Windows and UNIX, the following option can be specified.

Option	Description
b back log value	Back log value of nqsdaemon (port number 607) * The default value is 300 when not specified.
c	This option is used to specify user token information to be acquired each time a job is executed.

In the Windows version of JobCenter, user tokens are cached when a job is executed for the first time. After that, the cached tokens are recycled to execute jobs. Therefore, even if user settings such as the group to belong to are changed after the first job is executed, the changes are not applied unless JobCenter is restarted.

When this option is specified, user tokens are acquired each time a job is executed so that changed user settings are immediately applied. Note, however, that JobCenter execution performance will be degraded. |

The sub-options of the -x option are listed below.

```
NQSDAEMON_OPT=-x tcp_keepalivetime=900,tcp_keepaliveinterval=10
```

Sub-options	Overview
tcp_keepalivetime = Idle time (seconds)	Sends the KeepAlive packet of TCP/IP if there is no communication from SV during the specified idle time (tcp_keepalivetime) in the session connected to the NQS port of MG. Specify this parameter between 5 and 1800 (seconds). The default value is 900 (seconds).
tcp_keepaliveinterval = Resend interval (seconds)	Sends the KeepAlive packet at the specified resending interval (tcp_keepaliveinterval) if there is no response from SV to the KeepAlive packet. [note]If there is no response to the packets sent for the number of times of resending the packet specified in the OS, this session is discontinued. Specify this parameter between 1 and 30 (seconds). The default value is 10 (seconds).

[note]Value set as TcpMaxDataRetransmissions in TCP/IP settings of Windows

2. JNWENGINE_OPT

In addition to parameters common to Windows and UNIX, the following option can be specified.

Option	Description
b back log value	Back log value of jnwengine (port number 609) * The default value is 300 when not specified.
B back log value	Back log value of jnwengine (port number 10012) * The default value is 300 when not specified.

3. COMAGENT_OPT

In addition to parameters common to Windows and UNIX, the following option can be specified.

Option	Description
b back log value	Back log value of comagent (port number 611) * The default value is 300 when not specified.

5.2.3. For UNIX

1. NQSDAEMON_OPT

For parameters other than those common to Windows, refer to "7.3 Daemon Startup Options" in <JobCenter Guide for using NQS function> (Japanese only).

2. NQSDAEMON_PATH_EXPORT

```
NQSDAEMON_PATH_EXPORT=1
```

By specifying the above daemon configuration file, it is possible to inherit the environment variable PATH from the job submission source to the job submission destination during job execution.

In this version, this function is enabled even if a value other than 1 is specified in NQSDAEMON_PATH_EXPORT. However, since the specification method may be changed in the future, be sure to specify 1.

To disable this function, delete "NQSDAEMON_PATH_EXPORT" from the daemon configuration file (daemon.conf).

For details of exporting environment variable PATH, refer to Section 14.1.2, "Environment Variables of JobCenter SV Side".

3. schedule_timezone

```
schedule_timezone=OFF
```

By specifying the above daemon configuration file, it is possible to make a change so that schedule times are calculated using the OS time zone specified by the server (environment variable: TZ value).

> ⚠️ If using JobCenter in a time zone other than Japan (JST-9), be sure to specify this setting. For details, see Section 15.1, "Settings Required After Setting Up JobCenter".

5.3. Setting daemon.conf When Multiple IP Addresses Are Used

This section describes how to set daemon.conf when multiple IP addresses are used.

5.3.1. Setting the daemon.conf File for Cluster Environment/Using Multiple NIC

To perform operations using multiple IP addresses in the cluster configuration, communication can be waited by multiple IP addresses with the following setting.

> ⚠️ Use the following settings to "wait for" TCP/IP socket communication using multiple IP addresses. For the IP addresses to be used when performing TCP/IP socket communication, refer to the description of implementing source IP allocation with wildcard=ON/OFF provided later.

1. local_daemon (for UNIX)

   If a local site and cluster site exist on the same machine, specify the local_daemon parameter in the daemon.conf file on the local site side so that processing starts in the site mode, and then restart the local site. For details about the local_daemon parameter, see "7.3 Daemon Startup Options" in <JobCenter Guide for using NQS function> (Japanese only).

   ```
   local_daemon=SITE
   ```

2. ipaddress (common to Windows and UNIX)

   Describe multiple IP addresses in the ipaddress parameter in the format shown below (specify multiple IP addresses, each separated by a comma (,)), and then restart JobCenter. For details, refer to ipaddress in Section 5.2.1, "Common in Windows and UNIX".

   ```
   ipaddress=<IP address1>,<IP address2>,<IP address3>,<IP address4>,<IP address5>
   ```

3. ipcheck (common to Windows and UNIX)

   If you do not want to check the submission source SV by performing a reverse lookup from the submission source IP address to a host name, set the parameter shown below in daemon.conf and then restart JobCenter. For details, refer to ipcheck in Section 5.2.1, "Common in Windows and UNIX".

   ```
   ipcheck=OFF
   ```

If a cluster site JobCenter MG/SV and local site JobCenter MG/SV exist in one Windows machine, the above ipaddress and ipcheck settings must be specified not only in the cluster site daemon.conf file, but also in the local site file.

Be careful not to specify the same IP address for the ipaddress parameter in the daemon.conf files in the local and cluster sites. If the same IP address is specified, the local and cluster sites compete for communication packets, making normal communication impossible.

> ⚠️ For windows, there is a problem with the OS name resolution method, and communication might not be possible if only the above ipaddress and ipcheck settings are specified. If communication is not possible, settings must be added to the resolv.def file. For details, see Section 2.3, "Resolving Names in Windows".

Note the following points when using JobCenter in a multiple-NIC environment (or using the local and cluster sites on the same machine at the same time). Take extra care for example when controlling access using the firewall by using the source IP address for TCP/IP.

> For details about the wildcard setting, refer to the NQSDAEMON_OPT suboption "wildcard" in Section 5.2.1, "Common in Windows and UNIX".

1. The source IP address for TCP/IP communication is allocated in JobCenter as shown below, according to whether wildcard is ON or OFF.

Protocol used in JobCenter	wildcard=ON	wildcard=OFF
NQS (607/tcp)	INADDR_ANY	IP address that the OS obtains from the local site name by using name resolution
jccombase (611/tcp)	INADDR_ANY	INADDR_ANY
jcevent (10012/tcp)	INADDR_ANY	INADDR_ANY

The operation is as follows when the source address IP is INADDR_ANY.

■The IP address for the segment that can communicate with the destination IP address is used as the source IP address for TCP/IP. The priority to determine which IP address is used is determined by the OS. (This is not limited to a multiple-NIC environment. The source IP address could be the IP address of the local site during communication between a cluster site and local site that operate on the same machine.)

■In addition, ipcheck=OFF must be specified for MG/SV on the machine with the destination IP address.

2. An example of the settings specified and operations executed when using JobCenter in a cluster configuration or multiple-NIC environment is shown below.

Assume that the server below (host A) is operating under the following conditions:
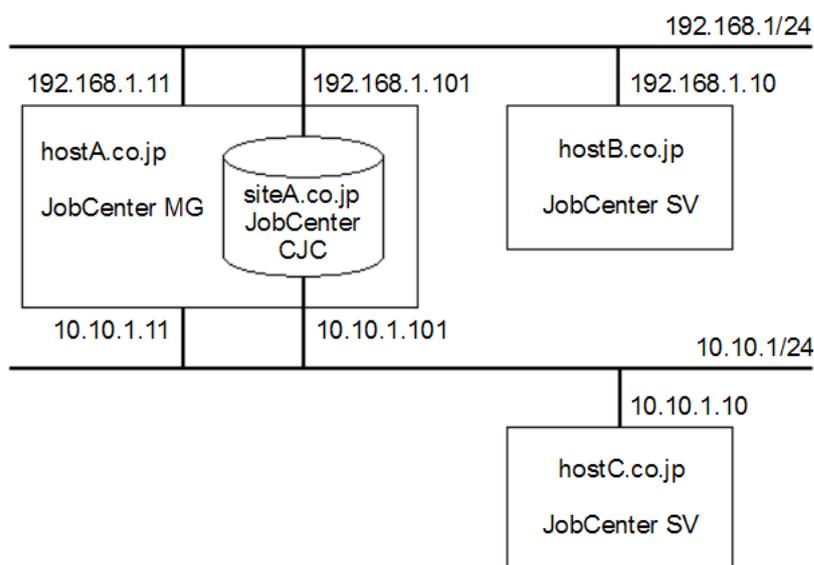
Figure 5.1. Example of Cluster Configuration/Multiple-NIC Environment

■The OS gives priority to the server's actual IP address "192.168.1.11" as the source IP address during TCP/IP communication addressed to 192.168.1/24.

■The OS gives priority to the server's actual IP address "10.10.1.11" as the source IP address during TCP/IP communication addressed to 10.10.1/24.

■The server (host A) does not perform IP forwarding between 192.168.1/24 and 10.10.1/24.

■The SVs, host B and host C, register siteA.co.jp as the MG with the machine icon in the manager frame because the same site must be registered and recognized using the same machine name and machine ID between the linked JobCenter MG and SV.

Host machine	hosts (network) settings		daemon.conf settings
host A (operates JobCenter MG in cluster site siteA.co.jp)	hostA.co.jp hostB.co.jp hostC.co.jp hostA10.co.jp siteA.co.jp siteA10.co.jp (*: Virtual IP)	192.168.1.11 192.168.1.10 10.10.1.10 10.10.1.11 192.168.1.101 * 10.10.1.101 *	(daemon.conf for siteA.co.jp) ipaddress= 　　192.168.1.101,10.10.1.101 wildcard=ON
hostsB (JobCenter SV)	hostB.co.jp hostA.co.jp siteA.co.jp	192.168.1.10 192.168.1.11 192.168.1.101	ipcheck=OFF
hostsC (JobCenter SV)	hostB.co.jp hostA.co.jp siteA.co.jp	10.10.1.10 10.10.1.11 10.10.1.101	ipcheck=OFF

3. Because wildcard=ON is specified for cluster site siteA.co.jp and ipcheck=OFF is specified for host B and host C, the IP address reverse resolution check is not performed for NQS packets. Therefore, each SV accepts unit job submission without problem in the following situation.

Communication direction	Operation		IP address in TCP/IP packet	
			Source IP address	Destination IP address
site A to host B	Machine linkage	Machine icon registration Queue reference User mapping setting and other operations	192.168.1.11	192.168.1.10
	NQS unit job remote submission			
host B to site A	Return of unit job execution result		192.168.1.10	192.168.1.101
site A to host C	Machine linkage	Machine icon registration Queue reference User mapping setting and other operations	10.10.1.11	10.10.1.10

	NQS unit job remote submission		
host C to site A	Return of unit job execution result	10.10.1.10	10.10.1.101

4. If wildcard=OFF is specified in daemon.conf for cluster site siteA.co.jp, the IP address is allocated as shown below. As a result, NQS unit jobs cannot be remotely submitted to host C.

Communication direction	Operation		IP address in TCP/IP packet	
			Source IP address	Destination IP address
site A to host C	Machine linkage	Machine icon registration Queue reference User mapping setting and other operations	192.168.1.101 (Because this is not included in the hosts settings for host C, TCP/IP level communication is not allowed.)	10.10.1.10
	NQS unit job remote submission			

5. In addition to 4, if the IP address of site A is changed as shown below in the hosts settings for host C, the server (host A) does not perform IP forwarding. Therefore, the unit job execution status or execution result cannot be returned by using TCP/IP communication from hostC.co.jp to siteA.co.jp.

Host machine	hosts (network) settings	daemon.conf settings
hostsC (JobCenter SV)	hostC.co.jp 10.10.1.10 hostA.co.jp 10.10.1.11 siteA.co.jp 192.168.1.101 (Packets addressed to 192.168.1.101 are not forwarded from the interface at 10.10.1/24.)	ipcheck=OFF

6. In addition to 4 and 5, if you add the following entry to the routing table for the host C OS, site A waits for multiple IP addresses, making communication possible. (The example below is for a Windows OS.)

```
# route add 192.168.1.101 mask 255.255.255.255 10.10.1.101 ↵
```

However, be sure to check that making these changes to the host C network settings will not affect other PPs.

5.3.2. Setting the daemon.conf File for Waiting for Communication with an IPv6 Address

From R14.1 onward, JobCenter can wait for communication with an IPv6 address. For the OSs that support IPv6, refer to in <Release Notes>Chapter 3, 「Operating Environment」 .

5.3.2.1. Prerequisites for JobCenter to Support the IPv6 Environment

All the prerequisites described below need to be met for JobCenter to support the IPv6 environment.

■Scope of available IPv6 addresses

Address type	Unicast address
Scope	Global address

⚠️ Communication using a link local address (e.g., fe80::20c:29ff:fe8e:d4b) or special address (e.g., IPv4 compatible address, IPv4-mapped address, multicast address, or anycast address) is not supported.

■Name resolution

It is necessary to support a lookup and reverse lookup of a host name and IPv6 address.

■Restriction on the Windows version

The Windows version does not support an IPv6 address-only environment. IPv4 addresses are always required.

⚠️ Both forward and reverse IPv4/IPv6 address lookups need to be supported for the same host name.

When name resolution is to be implemented using resolv.def, describe resolv.def so that name resolution can be performed using the same host name for both an IPv4 and an IPv6 address.

■Communication between machines

Communication from an IPv4 address to an IPv6 address or from an IPv6 address to an IPv4 address is not supported. Communication from an IPv4 address to an IPv4 address and from an IPv6 address to an IPv6 address is supported.

5.3.2.2. Waiting for Communication with an IPv6 Address Only

By setting the "ipaddress" or "bindmode" parameter in daemon.conf as described below, you can have JobCenter wait for communication with an IPv6 address only.

⚠️ When you have the local site and the cluster site coexist on the same machine for the Windows version and set daemon.conf on the local site side, be sure to set the ipaddress parameter. If you set the bindmode parameter, the local site cannot coexist with the cluster site normally.

1. ipaddress (common to Windows and UNIX)

   If you want JobCenter to wait for communication with multiple IPv6 addresses, describe the ipaddress parameter in the format shown below (specify multiple IP addresses, each separated by a comma (,)), and then restart JobCenter. For details, refer to ipaddress in Section 5.2.1, "Common in Windows and UNIX".

   ```
   ipaddress=<IPv6 address1>,<IPv6 address2>,<IPv6 address3>,<IPv6 address4>,<IPv6 address5>
   ```

2. bindmode (common to Windows and UNIX)

   If you want JobCenter to wait for communication with an IPv6 address obtained through name resolution, describe the bindmode parameter, as described below, and then restart JobCenter. For details, refer to bindmode in Section 5.2.1, "Common in Windows and UNIX".

   ```
   bindmode=ipv6
   ```

5.3.2.3. Waiting for Communication with Both IPv4 and IPv6 Addresses

By setting the "ipaddress" or "bindmode" parameter in daemon.conf as described below, you can have JobCenter wait for communication with both IPv4 and IPv6 addresses.

> ⚠️ When you have the local site and the cluster site coexist on the same machine for the Windows version and set daemon.conf on the local site side, set the ipaddress parameter. If you set the bindmode parameter, the local site cannot coexist with the cluster site normally.

1. ipaddress (common to Windows and UNIX)

   If you want JobCenter to wait for communication with multiple IPv4 and IPv6 addresses, describe the ipaddress parameter in the format shown below (specify multiple IP addresses, each separated by a comma (,)), and then restart JobCenter. For details, refer to ipaddress in Section 5.2.1, "Common in Windows and UNIX".

   ```
   ipaddress=<IPv4 address1>,<IPv4 address2>,<IPv4 address3>,<IPv4 address4>,<IPv4 address5>,<IPv6
    address1>,<IPv6 address2>,<IPv6 address3>,<IPv6 address4>,<IPv6 address5>
   ```

2. bindmode (common to Windows and UNIX)

   If you want JobCenter to wait for communication with an IPv4 or IPv6 address obtained through name resolution, describe the bindmode parameter, as described below, and then restart JobCenter. For details, refer to bindmode in Section 5.2.1, "Common in Windows and UNIX".

   ```
   bindmode=all
   ```

> ⚠️ Both forward and reverse IPv4/IPv6 address lookups need to be supported for the same host name.

5.4. Format of Daemon configuration file

Daemon configuration file "daemon.conf" must be created in the following format.

```
#
# Daemon configration file
#
# Copyright 1998 NEC Corporation.
#
#


#
# maintenance
# ------------
#
# Daemon process contorl for SITE environment.
#
# ON    No execute daemon
# OFF   execute daemon (default)
#
#
# Sample:
# maintenance=ON


#
# local_daemon
# -------------
#
# Local daemon mode option.
#
# COMPAT Execute local daemon
#       (compatible mode, exclusive with SITE)
#       (default)
# SITE  Execute local daemon (co-work with SITE)
# OFF   No execute local daemon
#
#
# Sample:
# local_daemon=SITE


#
# NQSDAEMON_OPT
# --------------
#
# nqsdaemon process option.
#
# -x errmail=ON|OFF      Sending mail to job owner at error.
#                        (default ON)
# -x moerr=ON|OFF        Making error status to job when
#                        fails to copy job output files.
#                        (default ON)
# -x reqsig=ON|OFF       Set SIGTERM handler to SIG_DEF.
#                        Specified OFF, set to SIG_IGN.
```

```
#                           (default ON)
# -x ofauth=COMPAT|RESTRICT|LOOSE|JNW
#                       Policy of receiving job output file.
#                       COMPAT          all file receive.
#                       RESTRICT        Receive the file if job
#                                       submittable each other.
#                       LOOSE           Root can not receive the file,
#                                       without standaer JNW output path.
#                       JNW             Everyone can not receive the file,
#                                       without standaer JNW output path.
#                       (default COMPAT)
# -x schevt=ON|OFF      If set "ON" option,  Send request event
#                        to scheduler machine(UMS).
#                       (default OFF)
# -x macgroup_check=<interval>
#                       Set the machine group status check interval.
#                       Valid range is between 300 seconds and 86400 seconds.
#                       Default value is 600 seconds.
# -x shell_uselocallang=ON|OFF
#                       Use local lang when run shell.
#                       (default OFF)
# -x stage_retry_failed_action=copytotempdir|delete
#                       When stage retry failed, whether copy ".o" and ".e" files to
#                       the the home directory of execute user.
#                       (default copytotempdir)
#
#
# Sample:
# NQSDAEMON_OPT=-x
 errmail=OFF,ofauth=JNW,macgroup_check=600,shell_uselocallang=OFF,stage_retry_failed_action=copytotempdir


#
# JNWENGINE_OPT
# -------------
#
# jnwengine process option.
#
# -os                   (Compatibility)
#                       Job stop with error and skipped.
#                       The status is error.
# -ot                   (Compatibility)
#                       When a wait parts reashes time-limit,
#                       The status is done.
# -s                    No scan JNW entries.
#
# Sample:
# JNWENGINE_OPT=-os



#
# NOTE:
# =====
#
# These options are over written by each local specification file:
#
#  /usr/spool/nqs/daemon.conf
```

```
#      or
#  /usr/spool/nqs/XXXXXXXX/daemon.conf
#
```

For daemon configuration file, see 7.3, "Daemon Start Option" in <JobCenter Guide for using NQS function> (Japanese only).

5.5. License Check at Startup of JobCenter

During OS startup, the JobCenter service might start before the IP address is allocated to the interface, depending on when the network interface drivers are read. In this case, JobCenter cannot be started automatically because the IP address that JobCenter uses for communication cannot be allocated.

This problem can be avoided by making the settings described below. Follow the procedure below to make these settings.

1. After logging on to Windows with the administrator account, select [All Programs], [JobCenter], [SV], and then [Environment Setting] from the Windows [Start] menu to open the Server Environment Setting window.

2. Click Properties in the left pane, and then double-click [General Settings] in the right pane to open the [General Settings Properties] dialog box.
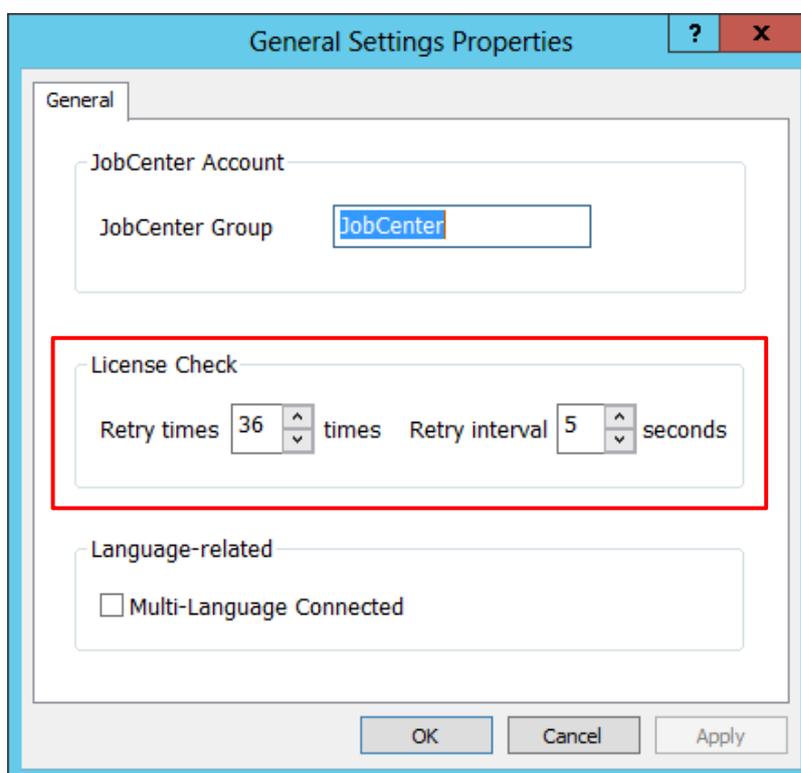
Figure 5.2. Screenshot of the License Check Setting dialog box

3. Modify the following parameters in the [License Check] section.

Retry times (times)	Specify a value between 0 and 825.
Retry intervals (seconds)	Specify a value between 0 and 90.

> ⚠ If the BOOT_TIMEOUT setting in the site configuration file (site.conf) specifies control of site startup, the license check is not retried for longer than the startup time. Retry the license check within the range of the BOOT_TIMEOUT time.
>
> For details about the site configuration file (site.conf), refer to Section 5.6.3, "Creating a site configuration file (site.conf)".

5.6. Operation Settings of JobCenter for Windows

The operation can be changed by adjusting the following settings in JobCenter MG/SV for Windows.

5.6.1. Loading the User Profile during Job Execution

This operation can be switched by changing the job execution setting. For details, refer to Section 12.3.3, "Specifying job execution settings".

5.6.2. Changing the Logon Operation Type

When the platform is Windows Server 2008 or later, JobCenter executes scripts written as jobs by using the BATCH logon type.

To switch execution of Windows commands in scripts to the interactive (INTERACTIVE) logon type, perform the following setting steps.

1. Open the registry editor and open the file under the following key.

   HKEY_LOCAL_MACHINE\Software\NEC\NetShepherd/SV

2. Create the following new values.

Name	LogonUserType
Type	Character string value
Value	I * This is the letter "I" in uppercase.

3. Restart JobCenter.

> ⚠️ If the above settings are specified, the following restriction applies: When the JobCenter Manager executes a job, the execution permission within JNW changes to a Normal User at the OS level if the UAC function is enabled and the JobCenter Manager is not the administrator.

5.6.3. Creating a site configuration file (site.conf)

By creating the site.conf file in the following path, the time used for starting and stopping local sites and cluster sites can be controlled.

Local site	<JobCenter installation directory>\etc\site.conf
Cluster site	<site database path>\etc\site.conf

If there are many jobs being executed when starting, restarting, or stopping a site, starting, restarting, or stopping a site may take a considerably long time.

When a site stop command is executed, the process that monitors the job process (jcservice for local sites, and cjcpw for cluster sites) will execute appropriate termination processes for each JobCenter process and then terminates itself (normal termination).

If an error occurs and normal termination is not possible, the process that monitors the job process will forcibly terminate each JobCenter process (forced termination).

Setting the site.conf parameters will enable control of the time required for normal termination and forced termination.

The file format and items that can be set are shown below.

```
BOOT_TIMEOUT=<value>
STOP_TIMEOUT=<value>
FORCEKILL_TIME=<value>
```

> ⚠ Do not enter spaces or tabs at the beginning of a line or before and after equal (=) signs.

■BOOT_TIMEOUT

This parameter specifies the site startup process timeout value in seconds. If the site cannot start up within this time, then site startup will be interrupted.

■STOP_TIMEOUT

This parameter specifies the site termination process timeout value (the sum of the time required for normal termination and forced termination) in seconds. If the site cannot be terminated within this time, then site termination will be interrupted.

■FORCEKILL_TIME

This parameter specifies the forced termination process time in seconds.

> ⚠ For STOP_TIMEOUT, specify a greater value than the value specified for FORCEKILL_TIME.
>
> If the site termination command is executed while the value set to STOP_TIMEOUT is smaller than the value set to FORCEKILL_TIME, JobCenter forcibly terminate each process (the termination time will be the FORCEKILL_TIME value). If such a value is specified, then normal site termination becomes impossible.

The default, maximum, and minimum values of each parameter are shown below. (The setting units are in seconds). If a site.conf file is not created or a parameter is not set, then the default values will be used. If an invalid value such as negative number and character strings, is specified, the setting will be set at the minimum value.

Table 5.1. site.conf Parameter Ranges

Parameter	Default	Minimum	Maximum
BOOT_TIMEOUT	180	30	2147483647
STOP_TIMEOUT	180	30	2147483647
FORCEKILL_TIME	10	1	2147483647

> ⚠ The maximum value for each parameter is the maximum integer (2147483647), but if an extremely high number is specified, JobCenter will freeze for a long time when a site startup or termination process fails.

5.6.4. Changing the Database Memory Usage

By changing the database setting file (jcdbs.conf), the amount of memory of the database to be used for JobCenter can be specified.

5.6.4.1. Storage Location of the Database Setting File (jcdbs.conf)

The files located in the local environment and cluster environment are read at startup of JobCenter.

The file used for a local site and sharing	\<JobCenter installation directory\>\etc\jcdbs.conf
The file used for the Cluster site	\<Path to the database at site\>\etc\jcdbs.conf

> If the database settings are described both in jcdbs.conf for sharing and using at a local site and in jcdbs.conf for using at a cluster site, the latter takes precedence.

5.6.4.2. Available Parameters of the Database Setting File

■maxheap

The amount of memory used for the database (jcdbs) can be restricted. The format of this file is described below.

```
maxheap <value>{MB|GB}
```

The jcdbs process that starts up in the local site and cluster site secures virtual memory of maxheap size when the database is reconstructed. If an error occurs in securing virtual memory, the jcdbs process has insufficient resource and an error occurs in JobCenter.

Adjust this parameter according to the resource required by jcdbs and resource available on the server. For the amount of resource required by jcdbs, refer to Section 19.5.2, "Amount of Memory Required by jcdbs".

> The default value is 1 GB.

6 Changing JobCenter Parts Parameters and Environment Settings

Default parameter values can be defined to use when setting up new job network, unit job, ERP job, BI job, PC job, UCXSingle job, WOBS job, dialog, and event transmission/reception JobCenter parts.

This operation makes the resetting of each parameter unnecessary when multiple parts for which the same parameter is set are created.
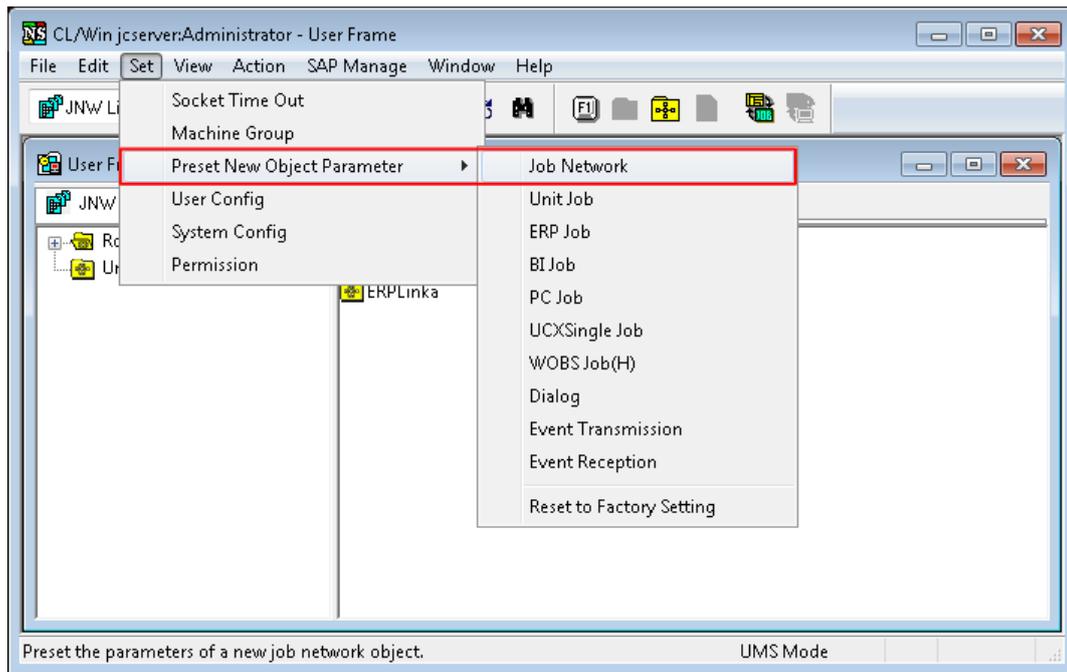
Figure 6.1. Screenshot that shows [Preset New Object Parameter] is selected

In addition, the current settings of the execution environment parameters can be browsed and changed.

Figure 6.2. Screenshot that shows [User Config] is selected

6.1. Defining Default Parameter Values for JobCenter Parts

From the [Preset New Object Parameter] menu which appears by clicking [Set] on the menu bar, the parameter default values for creating job network, unit job, ERP job, BI job, PC job, UCXSingle job, WOBS job, dialog, event transmission, and event reception parts can be defined.

Note that the default parameters of each part can be updated using the values that JobCenter CL/Win has on shipment (the preset values).

> ⚠️ ■When the job network or each part of another user is created, not the default parameter values of the login user, but the default parameter values of another user are used.
>
> To set default parameter values, log in with the user who owns the job network (access destination user).
>
> ■To set default parameter values, an access authority to create, change, and delete a job network is required.

6.1.1. Job network

The default values for the job network parameters can be specified in the [Job Network Default Parameter] dialog box.

For details on job network parameter settings, refer to in <Basic Guide>Section 3.3.4, "Setting Parameters of a Job Network".

6.1.2. Unit Job

The default values for unit job parameters can be specified in the [Unit Job Default Parameter] dialog box.

For details on unit job parameter settings, refer to in <Basic Guide>Section 4.2.2, "Setting up Conditions (Parameters) for Executing a Unit Job".

6.1.3. ERP Job

The default values for ERP job parameters can be specified in the [ERP Job Default Parameter] dialog box.

For details on ERP job parameter settings, refer to 1.5.1.4, "ERP Job Parameter Settings" in <JobCenter Guide for using SAP function> (Japanese only).

6.1.4. BI Job

The default values for SAP BI job parameters can be specified in the [BI Job Default Parameter] dialog box.

For details on SAP BI job parameter settings, refer to 2.2.1.2, "SAP BI Job Parameter Settings" in <JobCenter Guide for using SAP function> (Japanese only).

6.1.5. PC Job

The default values for SAP PC job parameters can be specified in the [PC Job Default Parameter] dialog box.

For details on SAP PC job parameter settings, refer to 2.3.1.2, "SAP PC Job Parameter Settings" in <JobCenter Guide for using SAP function> (Japanese only).

6.1.6. UCXSingle Job

The default values for the UCXSingle job parameters can be specified in the [UCXSingle Job Default Parameter] dialog box.

For details about how to set UCXSingle job parameters, refer to 3.2 "Setting UCXSingle Job Parameters" in <JobCenter Guide for using UCXSingle jobs> (Japanese only).

6.1.7. WOBS Job

The default values for the WOBS job parameters can be specified in the [WOBS Job Default Parameter] dialog box.

For details about specifying WOBS job parameters, see "3.1 Parameters" in the "JobCenter WebOTX Batch Server Linkage Function User's Guide".

6.1.8. Dialog

The default values of dialog parameters can be specified in the [Dialog Default Parameter] dialog box.

For details on dialog parameter settings, refer to in <Basic Guide>Section 4.4.1, "Setting a Dialog".

6.1.9. Event Transmission

The default values for event parameters can be specified in the [Event Transmission Default Parameter] dialog box.

For details on event send parameter settings, refer to in <Basic Guide>Section 4.5.1, "Setting an Event Transmission".

6.1.10. Event Reception

The default values for event parameters can be specified in the [Event Reception Default Parameter] window.

For details on event receive parameter settings, refer to in <Basic Guide>Section 4.5.2, "Setting Up an Event Reception".

6.1.11. Loading Existing Value

Updates each default parameter with the factory preset value of JobCenter CL/Win.

6.2. Changing User Environment Settings

The current settings of the execution environment parameters of the user can be browsed and changed in the [User Config] dialog box.

Each setting item is basically saved in the server as the setting for the relevant login user.

Figure 6.3. Screenshot of [User Config]

To change a parameter, enter a new value and click the [Apply] or [OK] button. If a wrong value is entered, click the [Cancel] button.

The settings on the [Base Config] tab are described below.

[Default Job Network parameter]

This control specifies the default of the job network to be executed.

■Default Submission Queue name

This specifies the default value of the queue used to submit each job that belongs to a job network.

If no submission queue is specified in the parameters for job networks and unit jobs (if the submission queue item field is blank), the queue specified here is automatically selected to submit jobs.

Clicking the [Browse] button pops up the [Submission Queue setting], in which a queue can be selected.

Note that, when setting up JobCenter, only guilb_def can be selected for the queue created by default.
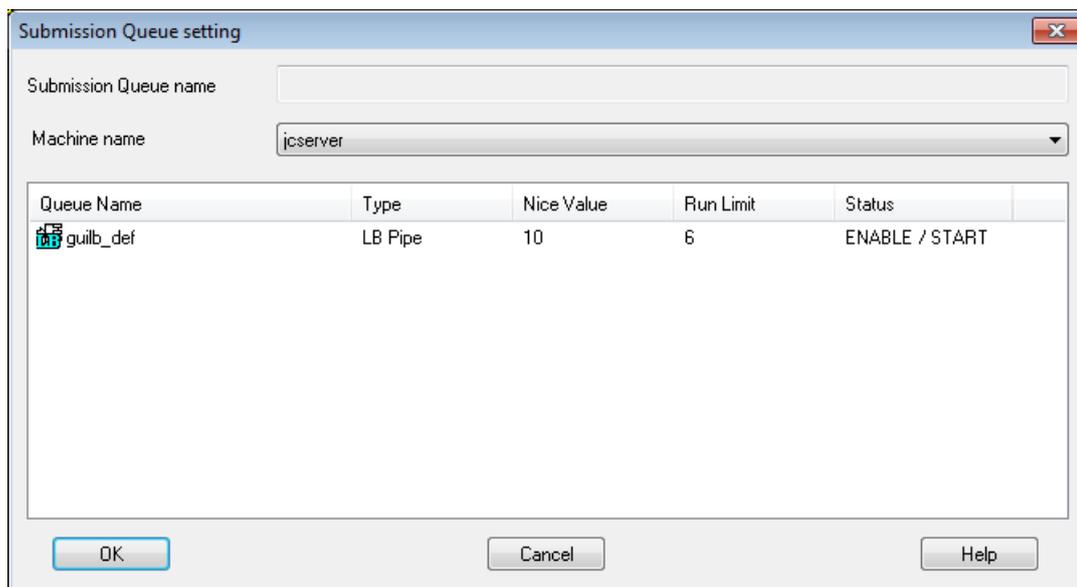
Figure 6.4. Queue Selection Dialog Box

■Behavior on failure

This control specifies the default operation of the job network when an error occurs.

If a [DEFAULT] is selected in the parameter of each job network, its value is referred.

STOP	Stops the job network when an error occurs.
NON-STOP	Does not stop the job network when an error occurs.
ABORT	Aborts execution of the job network when an error occurs.

■Overtime

This control specifies the operation when the execution of the job network or unit job does not end at the preset time.

The setting of this control is effective if [DEFAULT] is selected for Overtime in the parameter of the job network.

CONTINUE	Continues execution of the job network or a unit job.
STOP	Stops execution of the job network or a unit job.
SKIP	Skips execution of the job network or a unit job.

To check the current setting, follow the procedure below:

1. Select a job network you want to reference in [JNW List] in User Frame.

2. Right-click the mouse button and select [Parameter] from the displayed shortcut menu. The [Jnw Parameter] window of [Parameter] appears.

3. Check the value selected for [Overtime].

[ERP Parameter]

This control field sets up the ERP options.

■ERP Job Auto Start

When an ERP job is submitted, it is in submitted state.

If selected	The job is automatically switched to execution state by JobCenter.
If not selected	When an ERP job is submitted, it is registered to the SAP ERP system. However, the job is not started. It remains in the [SUBMIT] state, waiting for an instruction for execution.

To execute (release) an ERP job, follow the procedure below:

1. Right-click the job in the tracker flow and select [Manual Start (IMMEDIATELY/ASAP)] from the shortcut menu.

2. Enter an execution host name (with an instance name) in the [Tracker Operation Confirm] screen and click [OK].

3. A dialog box for confirming operation is displayed. Click [OK].

4. The ERP job enters execution (RUN) state.

[Zoom}

This control sets the default value for the display magnification ratio for Job Network flows.

The flow display magnification ratio can be specified from 10 to 100%.

6.3. Changing the Tracker Display Settings

The currently specified user tracker display settings can be viewed or changed on the [Tracker Config] tab of the [User Config] dialog box. What the tracker list window of the User Frame and Manager Frame initially displays is determined by the settings you make on this dialog box.

> ⚠ The changes you make in the [User Config] dialog box take effect when you connect to CL/ Win again or the next time you open the [User Frame] or [Manager Frame] window.
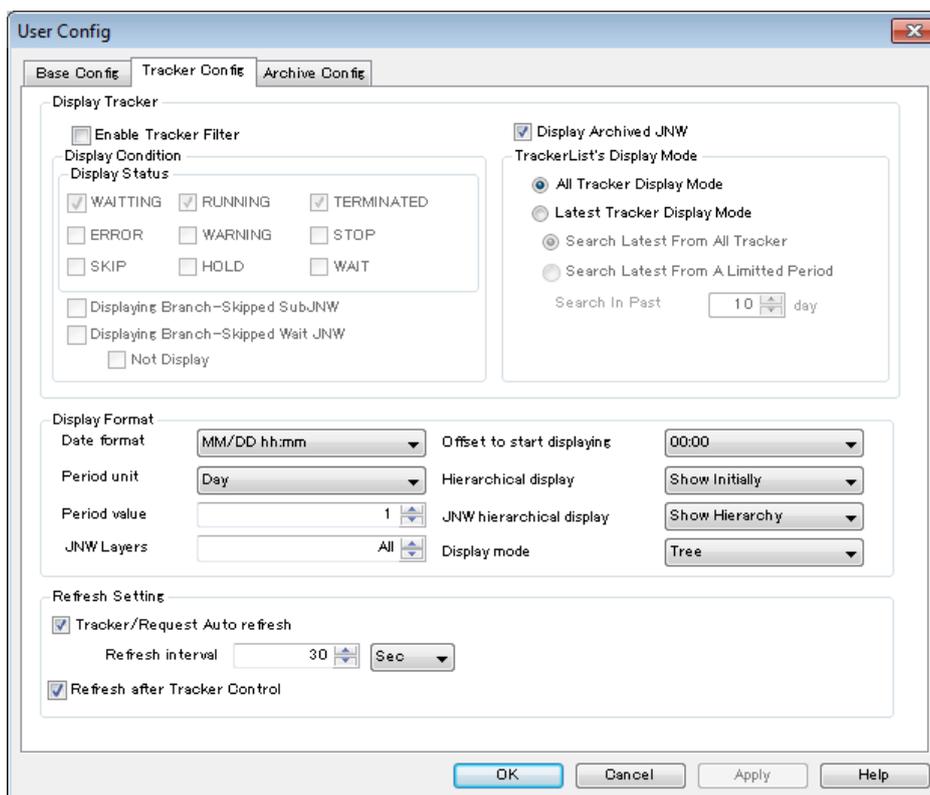
Figure 6.5. [Tracker Config] tab example

To change a parameter, enter a new value and click the [Apply] or [OK] button. If a wrong value is entered, click the [Cancel] button.

The settings on the [Tracker Config] tab are as follows.

[Display Tracker]

Specify the list of trackers to display.

■Enable Tracker Filter

Select whether to select the display condition settings.

If selected	The options in the [Display Condition] section can be selected, and only trackers that match the selected conditions are displayed.
If not selected	The [Display Condition] section is dimmed (unselectable) and trackers of all statuses are displayed.

[Display Condition]

Specify the statuses of trackers to display.

■Display Status

The status conditions of trackers to be displayed are shown in a tracker list. Multiple conditions can be selected from those below.

WAITING	Only display trackers for which execution has not yet started.
RUNNING	Only display trackers for which execution has started.
TERMINATED	Only display trackers for which execution has already finished.
ERROR	Only display trackers for which an abnormality occurred.
WARNING	Only display trackers for which a warning occurred.
STOP	Only display trackers that stopped with an error.
SKIP	Only display trackers that have the skipped status.
HOLD	Only display trackers that have the held status.
WAIT	Only display trackers that have the waiting status.

■Displaying Branch-Skipped SubJNW

Select whether to display sub-job networks for which branch skipping is judged to have finished by judging actual processing branching (calendar branching) for trackers in the tracker list other than those that have the planned status.

If selected	Unexecuted sub-job networks are displayed as having finished branch skipping.
If not selected	Unexecuted sub-job networks are not displayed.

⚠ The value of this setting is saved to the PC on which CL/Win runs and is applied to each connected terminal.

■Displaying Branch-Skipped Wait JNW

Select whether to judge the actual processing branching (calendar branching) of trackers in the tracker list that have the planned status.

If performing judgment is specified, whether to display unexecuted sub-job networks as having finished branch skipping or not to display them can be selected.

If selected	Sub-job networks that are not to be executed by calendar branching are judged and displayed as having finished branch skipping. Note that, if skipping is not selected in the display conditions, nothing is displayed.
If not selected	Sub-job networks that are not to be executed by calendar branching are not judged.
Not Display	If this check box is selected, sub-job networks for which branch skipping has finished are not displayed.

⚠ The value of this setting is saved to the PC on which CL/Win is running and is applied to each connected terminal.

■Display Archived JNW

Select whether to display archived trackers.

If selected	Archived trackers are also displayed.
If not selected	Archived trackers are not displayed.

[TrackerList's Display Mode]

Specify whether to use the all display mode or latest tracker display mode to display the tracker list window.

For details about each tracker display mode setting for the tracker list and the latest tracker display mode, see in <Basic Guide>Section 8.3.2, "Setting a Latest Tracker Display Mode".

[Display Format]

Specify the display format used to display the tracker list.

■Date format

This control specifies the default display format of the scheduled and actual start and end times that are indicated in the tracker list in text mode.

One of the following formats can be selected.

hh:mm	Displays the time.
MM/DD hh:mm	Displays the date and time.
YYYY/MM/DD hh:mm:ss	Displays the date and time.

■Offset to start displaying

The time after which trackers are listed can be selected from the drop-down combo box in a range from 00:00 to 23:00 in hours.

■Hierarchical display

This control selects whether to automatically display trackers in low levels in the sub job network. One of the following values can be selected.

Use selected view	Retains the selected state.
Show Initially	Automatically displays low levels.
Hide Initially	Does not automatically display low levels.

■Period unit

This control specifies the default range of trackers to be listed. One of the following values can be selected.

- Min

- Hour

- Day

- Week

- Month

■JNW hierarchical display

This control specifies the hierarchical display format of the trackers.

Show Hierarchy	Always displays the trackers in a hierarchical view starting from the root job network.
Hide Hierarchy	Displays only the trackers that meet the specified conditions.

■Period value

This control specifies the default range of the tracker listing. A value in one of the following ranges can be selected depending on the unit selected in the [Period unit].

Perido unit	Period value
Min	1 to 59
Hour	1 to 23
Day	1 to 7
Week	1 to 5
Month	1 to 3

■Number of JNW levels displayed

This control specifies the number of hierarchical levels in job networks that are displayed in the tracker display mode. One of the following values can be selected.

All	Displays all job networks.
1 to 40	Displays up to 40 levels of job networks.

> ⚠ This setting is ignored if [Hide Hierarchy] is selected for [JNW hierarchical display] or if [Use selected view] or [Hide Initially] is selected for [Hierarchical display].

■Display mode

This control specifies the default tracker display mode. One of the following can be selected.

Tree	Displays the tree structure of trackers in a hierarchical fashion.
Time	Displays trackers in the ascending order of the expected start time.
Sort	Sorts trackers of all machines of a machine group or of a specific machine in the ascending order of the expected start time.

> ⚠ The "Sort" mode is available only in the Tracker List display in the machine window or Tracker List@all_machine in the Manager Frame. In other Tracker List windows, trackers are displayed in the "Tree" mode.

[Refresh Setting]

This control field sets up trackers and requests to be executed.

■Tracker/Request Auto refresh

This control specifies the update method of the windows for trackers and requests.

If selected	Regularly updates display.
If not selected	Does not update display.

> ⚠ There are two ways to put the changes you make in the [User Config] dialog box into effect. One way of putting the changes into effect is to connect to CL/Win again. The other way is to choose [User Config] on the menu bar, uncheck the [Tracker/Request Auto refresh] box in [Refresh Setting], click the [Apply] button to disable auto refresh, and then check the [Tracker/Request Auto refresh] box again.

■Refresh interval

This control specifies the update interval when the windows for trackers and requests are updated regularly.

An interval in the range of 10 to 3600 seconds, or 1 to 60 minutes can be selected.

To set the update interval of trackers, follow the procedure below:

1. Display [Tracker List] in User Frame and select a tracker to which to set the update interval.

2. On the menu bar, select [View] and click [Auto Refresh] and then [Realtime refresh time interval setting] dialog box opens. The windows are refreshed with an interval selected from the range of 10 to 60 seconds or 1 to 60 minutes.
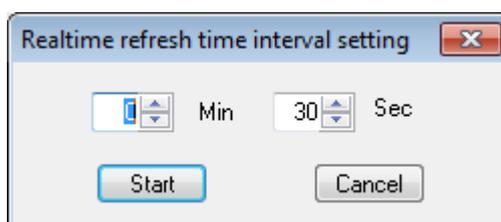
Figure 6.6. Realtime refresh time interval setting Dialog Box

■Refresh after Tracker Control

This control specifies whether to update all items in Tracker List after a tracker is operated.

If selected	Updates all items in Tracker List after a tracker is operated (default).
If not selected	Does not update all items in Tracker List after a tracker is operated.

6.4. Changing the Archive Settings

The currently specified user archive settings can be viewed or changed on the [Archive Config] tab in the [User Config] dialog box.

In general, each setting is saved to the server, and the settings are used on a logged in user basis.
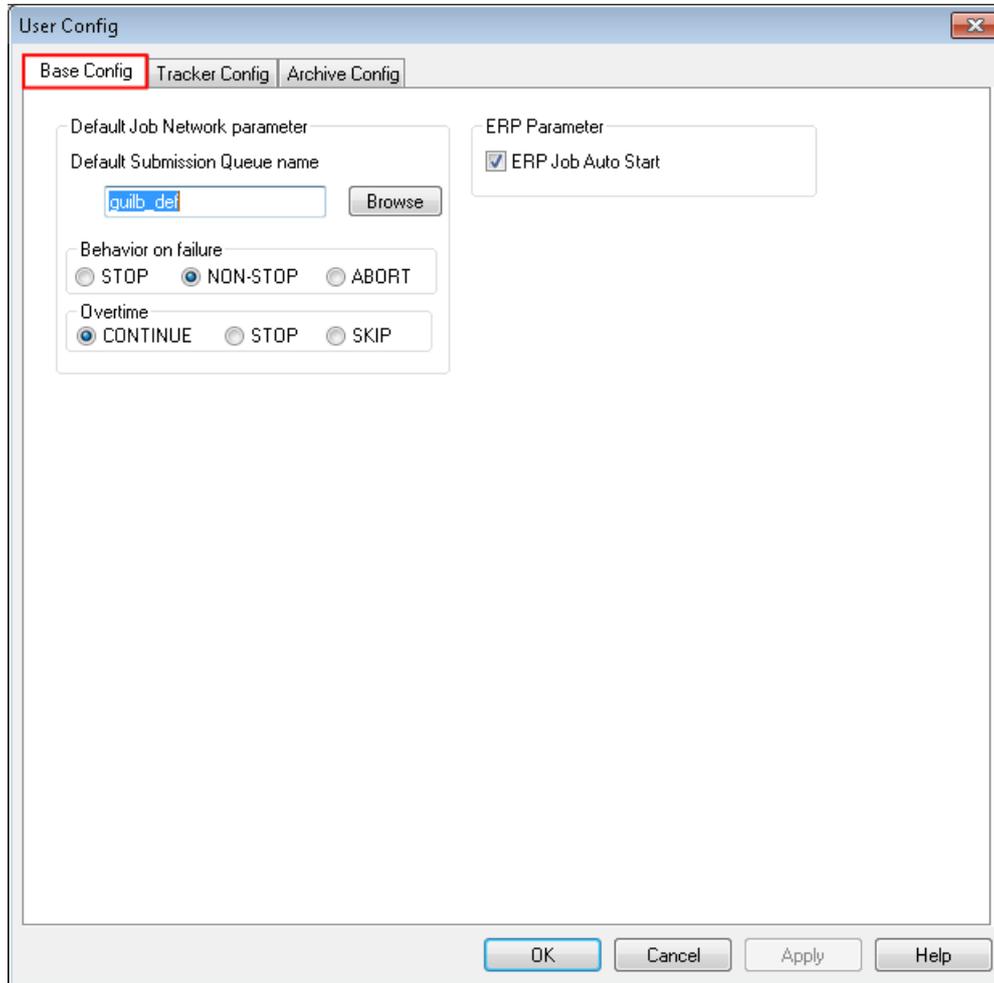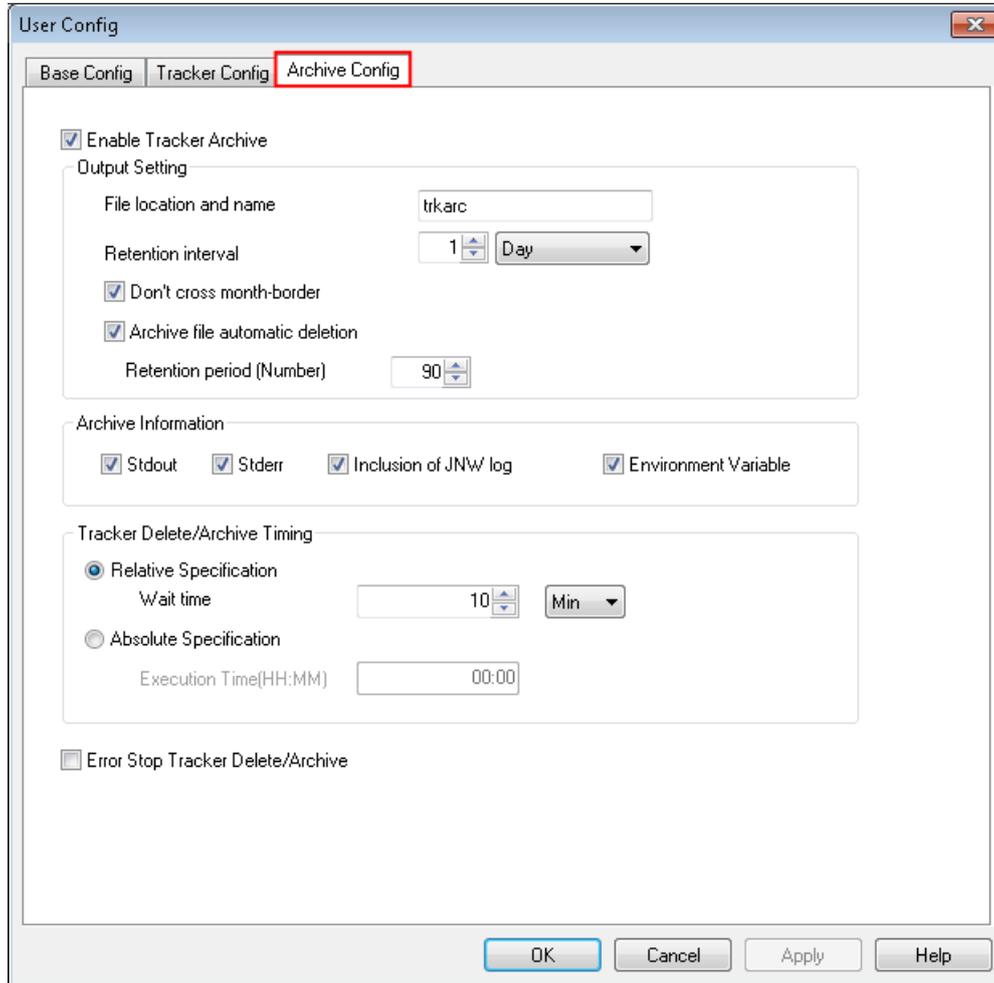

Figure 6.7. [Archive Config] Tab Example

To change a parameter, enter a new value and click the [Apply] or [OK] button. If a wrong value is entered, click the [Cancel] button.

The [Archive Config] tab settings are as follows

■Enable Tracker Archive

Specify whether to save the tracker information in a tracker archive file.

If selected	The tracker information is saved.
If not selected	The tracker information is not saved. (The tracker is deleted after the archive waiting time elapses.)

⚠️ If you clear the [Enable Tracker Archive] check box and click [Apply], trackers whose execution has ended are deleted without being archived immediately after the archive waiting

> time specified by [Tracker Delete/Archive Timing] elapses. Note that deleting a tracker is irreversible.

[Output Setting]

Specify the conditions for saving tracker information of executed sub-job networks as an archive.

■File location and name

This text box accepts the name of the archive file in which the tracker file information is saved.

> ⚠ Double-byte characters and the following characters are not allowed for the tracker archive file name:
>
> +, ', #, ,, ;, :, *, ?, ", <, >, |, \, and /.

■Retention interval

This drop-down combo box selects the retention interval of the archive files.

The retention period and retention interval need to be selected so that the total period does not exceed one year.

Retention interval	Allowable retention period (in intervals)
1 (Month)	0 to 12
12 (Month)	0 or 1
1 (Week)	0 to 53
53 (Week)	0 or 1
1 (Day)	0 to 365 (366)
365 (Day)	0 or 1

■Don't cross month-border

This check box selects whether to divide the retention interval of the archive file by a month if Week has been chosen for Retention interval that will be discussed later.

If selected	Divides by a month
If not selected	Does not divide by a month.

(Sample Setting)

Figure 6.8. Calendar Example

If [Don't cross month-border] is selected for the above example calendar, tracker data for 28th to 31st and 1st to 3rd is stored in different archive files. If [Don't cross month-border] is not selected, all tracker data is store in the same file.

■Archive file automatic deletion

This check box selects whether to automatically delete archive files whose expiration periods have expired.

If selected	Deletes expired archive files automatically
If not selected	Does not delete expired archive files automatically

■Retention period (Number)

This spin box specifies the number of archive files that are retained after their retention period is expired.

The allowable range of the retention period (the number of archive files) is 0 to 365.

⚠ ■Save data of more than past one year manually.

■Note that the archive files may become too large if the number of retention periods increases or the retention interval is long.

JobCenter does not operate properly if the size of an archive file exceeds 2 GB.

For calculating the size of an archive file, refer to Section 19.3.2, "Estimating the Disk Space Used for Tracker Archive" (UNIX version) or Section 19.6.2, "Estimating the Disk Space Used for Tracker Archives" (Windows version).

■Note that, in JobCenter R12.5.4 or later, when the following three conditions are satisfied, JobCenter can operate if the size of an archive file exceeds 2 GB:

▪ The JobCenter version for each OS is one of the following:

Windows	R12.5.4 or later
HP-UX(IPF)	R12.5.4 or later
Linux	R15.1 or later

▪ The volume containing the archive file is a file system which supports large files.

▪ The file system-related parameter of the OS is set to support large files.

When the maximum size of a user or process file is set, however, the maximum size is also restricted according to the setting.

■If processing for adding tracker data to an archive file fails because the maximum file size is exceeded or unused disk space is insufficient, the tracker data is not archived.

For the tracker which is not archived, like an archived tracker, reexecution and other processing cannot be performed.

In the tracker list, the tracker is displayed as an archived tracker (archiving this tracker is retried by restarting JobCenter).

In JobCenter R12.5, however, a tracker which cannot be archived may be lost and the archive file may be invalid.

■The archive files change at the retention interval. Because archive file changes are controlled based on GMT, and the number of archive files (retention interval) might not match the elapsed days (retention period).

How the retention period and retention intervals are handled

This control sets the retention period with a spin box for specifying the retention interval and a drop-down combo box for selecting the number of intervals.

The default recommended retention period (number) is 90 and default recommended retention interval is 1. The unit of retention interval is day. In this case, 90 one-day storage archive files can be saved. Therefore the storage duration setting is 90 days.

(How the retention period is handled)
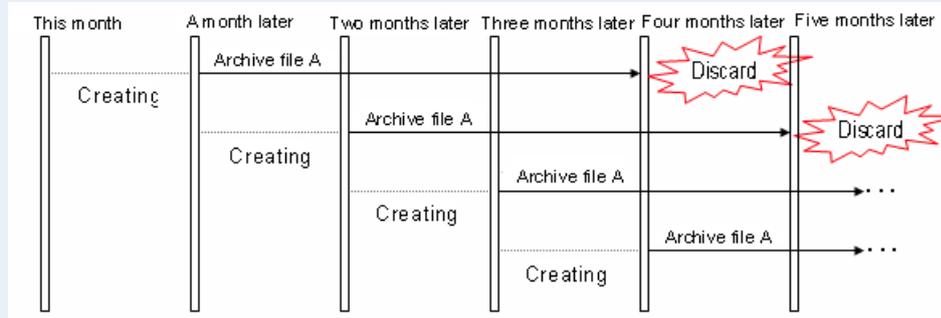
Figure 6.9. Save Period Specification Window

The above chart shows an example where storage duration is set to three months where the storage duration (quantity) is set to 3, the storage interval is set to 1, and the storage interval unit is set to duration (month).

Note that, when the save period units are enlarged, the size of each archive file increases.

[Archive Information]

Specify the tracker information to include in archive files.

■Stdout

This option button selects whether or not to save the output to the Standard Output from each job in the tracker archive file.

If selected	Saves the tracker information.
If not selected	Does not save the tracker information.

■Stderr

This option button selects whether or not to save the output to Standard Error Output from each job in the tracker archive file.

If selected	Saves the tracker information.
If not selected	Does not save the tracker information.

■Inclusion of JNW log

This option button selects whether or not to save the log generated by execution of job networks in the archive file.

If selected	Saves the tracker information.
If not selected	Does not save the tracker information.

■Environment Variable

This option button selects whether to save the environment variables in the archive file during job network execution.

If selected	Saves the tracker information.
If not selected	Does not save the tracker information.

[Tracker Delete/Archive Timing]

Specify the timing at which trackers are deleted or archived.

■Relative Specification/Absolute Specification

Specify whether the timing at which trackers are deleted or archived is when a certain amount of time elapses after tracker execution or at a specified time.

Relative Specification	Trackers are deleted or archived when the specified wait time elapses after job network execution finishes.
Absolute Specification	Trackers are deleted or archived when the specified time is reached the next time after job network execution finishes.

■Wait time

If [Relative Specification] is selected, specify the wait time that must elapse after job network execution before trackers are deleted or archived.

During this period, the job network can be re-executed. The default period is 10 minutes.

> ■ Unarchived tracker information is also retained in the resident process memory during the archive waiting time. If a long waiting time is specified, the memory continues to retain this information during the wait time, affecting the machine performance and other factors.
>
> ■ The tracker is managed using one directory per job network for each user. Individual directories, which are different from those used for the parent job network, are used to manage sub job networks. Therefore, if a job network contains sub job networks, the number of directories increases in accordance with the number of sub job networks.
>
> This means that the longer the archive waiting time, the more directories that remain for the unarchived trackers. Adjust the archive waiting time so that the number of directories that can be stored in one directory will not reach the file system limit.
>
> ■ When the machine is restarted, the wait time is reset and counting restarts. Example: If a wait time of one hour is specified and the machine is restarted 30 minutes after job network execution finishes, archiving is not performed until one hour elapses following the restart.

■Execution Time

If [Absolute Specification] is selected, specify when trackers are deleted or archived.

After job network execution finishes, job network re-execution is possible until trackers are archived. The default is 00:00.

For the execution time, specify a time from 00:00 to 23:59 in the HH:MM format.

> ⚠ ▪ When the machine is restarted, the execution time is reset and counting restarts. Example: If an execution time of 00:00 is specified, the job network finishes at 23:00, the machine is stopped at 23:30, and then the machine is restarted at 00:10, archiving is not performed until the time next becomes 00:00.

■Error Stop Tracker Delete/Archive

Specify whether to delete or archive trackers that stop with an error according to the tracker deletion/archiving timing setting.

If selected	Trackers that stop with errors are deleted or archived according to the tracker deletion/archiving timing setting.
If not selected	Trackers that stop with errors are not deleted or archived according to the tracker deletion/archiving timing setting.

6.5. Changing System Environment Settings

The currently specified system environment parameters can be viewed or changed on the [Time Config] tab in the [System Config] dialog box.

The [Time Config] values can only be changed by the user who logged in using an administrator account and connected in the UMS mode.

> The [Operation&Execute Log] tab in the [System Config] dialog box is displayed in JobCenter R12.5.4 or later. For details of the function, refer to <JobCenter Guide for using operation and execution log function> (Japanese only).
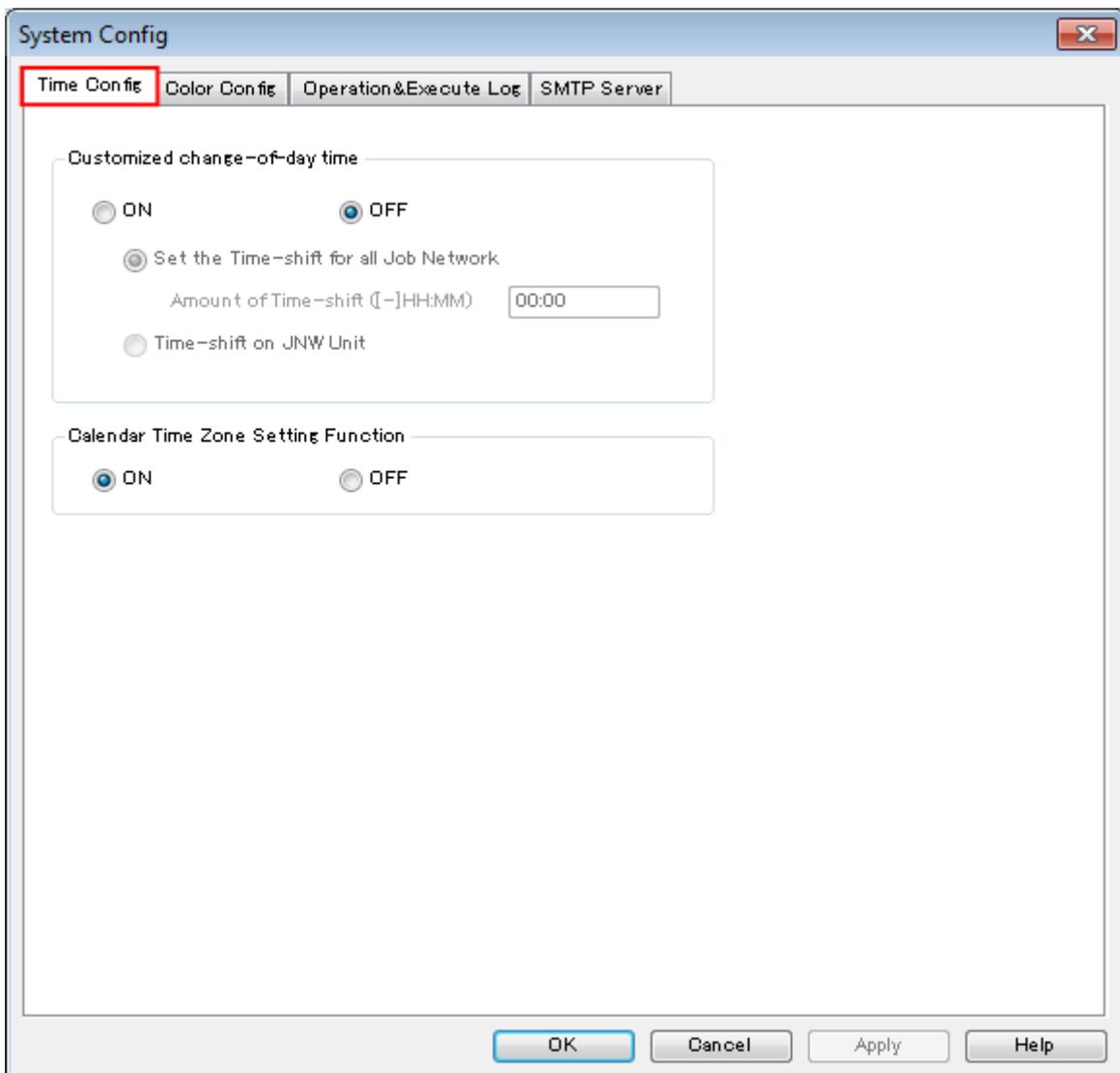
Figure 6.10. Screenshot of [System Config]

To change a parameter, enter a new value and click [Apply]. If a wrong value is entered, click [Cancel].

The settings on the [Time Config] tab are as follows.

■Customized change-of-day time

Selects whether to use the correction time.

ON	The correction time setting function is used.	
	The same correction time can be specified for the entire system, or different correction times can be separately specified for each job network.	
	Set the Time-shift for all Job Network	The specified correction time is applied to the entire site.
	Time-shift on JNW Unit	Different correction times can be specified for each job network.
OFF	The correction time is not used.	

> ⚠️ In some versions of JobCenter, if you select [OFF] for [Customized change-of-day time] with [Time-shift on JNW Unit] selected so as to not use the correction time across the whole system (site) and click [OK] or [Apply], the correction time setting for each job network may remain enabled and be applies.
>
> To reliably change the correction time setting across the whole system (site) from [ON] to [OFF], take the following steps:
>
> 1. Display the [Time Config] tab in the [System Config] dialog box.
>
> 2. (If [Customized change-of-day time] is [OFF], temporarily select [ON].) Select [Set the Time-shift for all Job Network].
>
> 3. Select [OFF] under [Customized change-of-day time] and click [OK] or [Apply] to apply the setting.

■Amount of Time-shift ([-]HH:MM)

Sets the time when the date is advanced.

If the correction time setting is [Set the Time-shift for all Job Network] and [Time-shift on JNW Unit] is specified in the [System Config] tab, specify the correction time settings in the parameter setting window for the job network.

The correction time is specified as a relative time starting at 0:00, and any time from -23:59 to 23:59 can be specified. The range is the same regardless of whether you are specifying a setting for the entire system or specifying separate settings for each job network.

If the correction time is set to [ON], parts of the job network flow operate as follows.

Example: When [Customized change-of-day time] is [ON] and [Amount of Time-shift] is "13:00," the job network is started at 14:00.
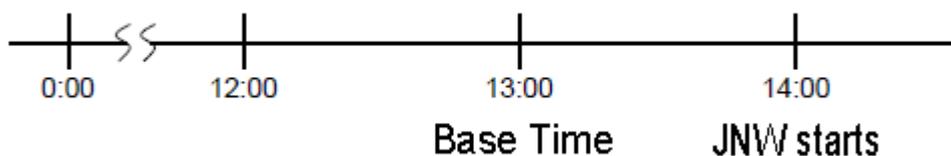
Figure 6.11. Time correction example

▪ If the set time of the waiting part is 12:30, the process waits until 12:30 the next day.

- If the set time of the waiting part is 13:30, when JNW starts, it operates as if the wait time has passed.

When [ON] is selected for [Customized change-of-day-time], each object operates as follows.

- Calendar Branch

  The corrected reference time is used for branch condition judgment as the date switching time.

- Time Waiting

  Uses the corrected base time as a waiting condition.

  If the specified time has already been passed, JobNetwork processing is continued without waiting. However, if no base time is set, the process waits for specified time of the next day as before.

- File Waiting

  Uses the corrected base time as a waiting condition. (This control is used in both conditions for the updated base time and timeout.)

  If the specified time has already been passed, JobNetwork processing is continued without waiting. However, if no base time is set, the process waits for specified time of the next day as before.

- Critical Point Warning

  Uses the corrected base time as a warning condition. If the specified time has already been passed, it sends a warning and operates as specified for the warning occurrence.

[Calendar Time Zone Setting Function]

By specifying a time zone for the calendar, this function makes it possible to start up at a time according to the time zone using which the schedule used to perform association was specified, as well as to wait or perform a warning operation at the time according to the time zone using which settings were specified.

For details, refer to Chapter 15, 「Usage in a Non-Japanese Time Zone」 .

6.6. Changing Color Settings

The [Color Config] tab in the [System Config] dialog box allows browsing and changing the current parameter settings of the current colors.

The [Color Config] values can only be changed by the user who logged in using an administrator account and connected in the UMS mode.

However, when [ON] is selected for [Color change in EUI mode], Normal Users can change the colors.
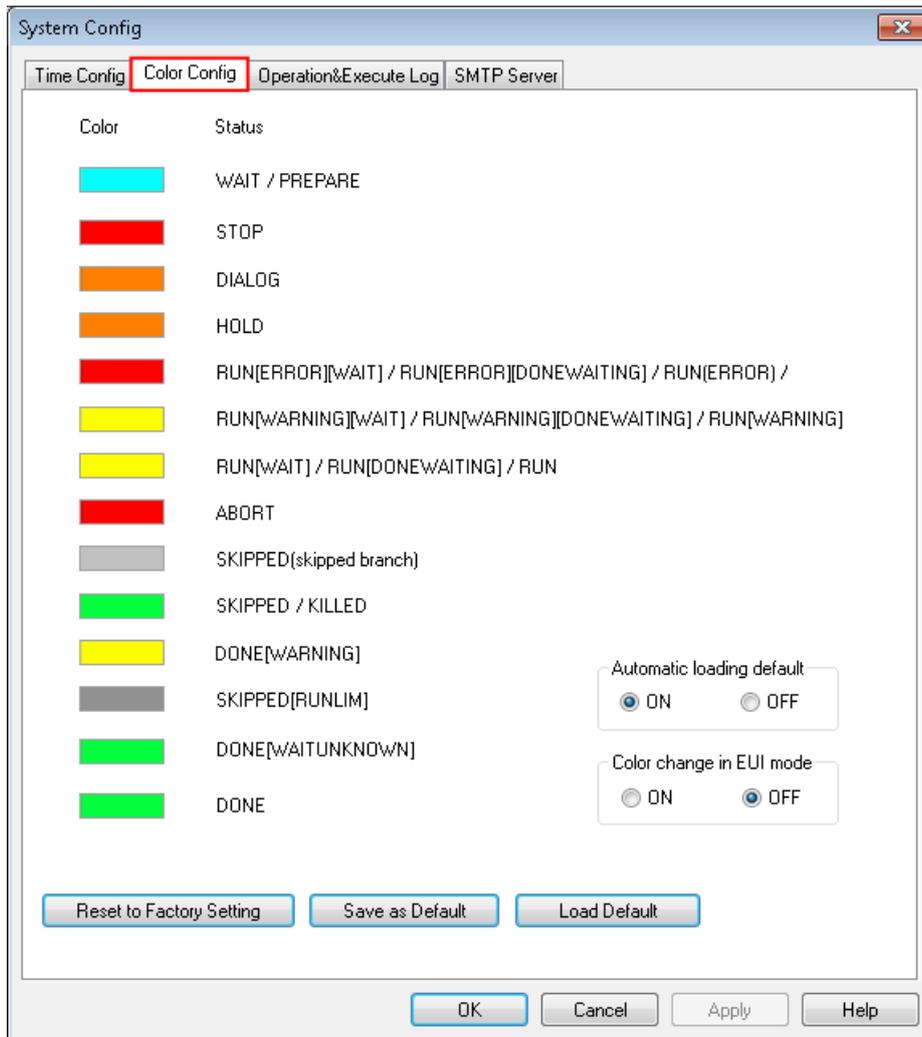
Figure 6.12. Screenshot of [Color Config]

To change a parameter, enter a new value and click the [Apply]. If a wrong value is entered, click the [Cancel].

The setting items in the [Color Config] tab are described below.

■Color/Status

This control allows changing the display color of each state in the tracker list.

Click a color box. The [Color] dialog box appears.

The current set color can be changed.

Figure 6.13. [Color] Dialog Box

■Automatic loading default

ON	Automatically makes changes with this control effective after reconnecting from the JobCenter CL/Win.
OFF	Does not load the change s automatically.

■Color change in EUI mode

ON	Allows changing colors in EUI mode.
OFF	Does not allow changing colors in EUI mode.

For the EUI mode, refer to in <Basic Guide>Section 2.3.3, "GUI Display Mode per Login User, Login Mode when Connecting Server".

■Reset to Factory Setting

Resets the color data to the factory setting.

■Save as Default

Saves the color data for the current display as the default.

■Load Default

Load the saved default color data.

This button is effective even in [EUI Mode].

6.7. Operation Log and Execution Log

The [Operation&Execute Log] tab in the [System Config] dialog box allows the settings of parameters related to logs of operation executed from JobCenter CL/Win and job network execution logs to be referenced and changed.

The [Operation&Execute Log] values can only be changed by the user who logged in using an administrator account and connected in the UMS mode.

For details of the formats of the output operation and execution logs, output destinations, and other items, refer to <JobCenter Guide for using operation and execution log function> (Japanese only).
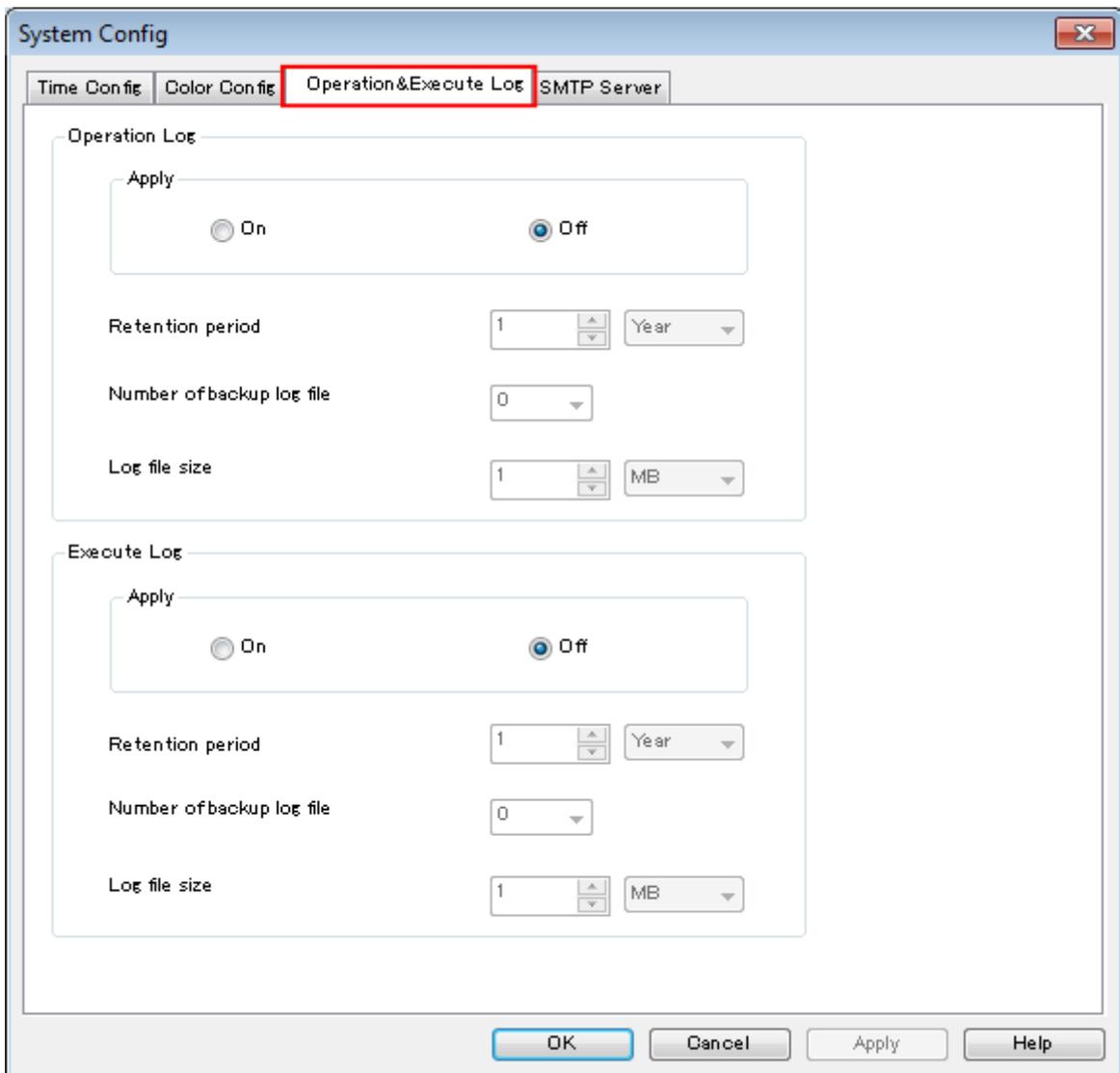
Figure 6.14. Screenshot of [Operation&Execute Log]

To change a parameter, enter a new value and click the [Apply] button. If a wrong value is entered, click the [Cancel] button.

The setting items in the [Operation&Execute Log] tab are described below.

■Apply

Set whether to output the operation or execution log.

On	Outputs the operation or execution log.
Off	Does not output the operation or execution log.

■Retention period

The operation and execution logs are output once a day.

Set the number of days for which to save the log.

■Number of backup log file

If operation or execution log data exceeds the maximum size, the excess data is saved in a backup file with an alias. Set the maximum number of backup files to be created a day.

■Log file size

Specify the maximum size of one operation or execution log file.

6.8. SMTP Server

The SMTP server used to send mail when an error occurs can be set up. For details about how to set up the server, see in <Basic Guide>Section 15.1, "Setting up the SMTP Server to Use".

7 Operating Day Calendar Setup

The Operating Day Calendar defines dates on which jobs are executed for each site.

The Operating Day Calendar is used to define a date on which the job is to be operated (called "Workday") and a date on which the job is not to be operated (called "Holiday").

Only a user with the JobCenter administrator authority can create the Operating Day Calendar.

Each user can set up a schedule that considers holidays by applying the operating day calendar to any schedule in order to combine relative operating days and holiday shifts with the schedule for automatically executing created jobs.

The Operating Day Calendar is created by combining rules such as "Every Day of the Week". Up to 200 calendars can be created for each site.
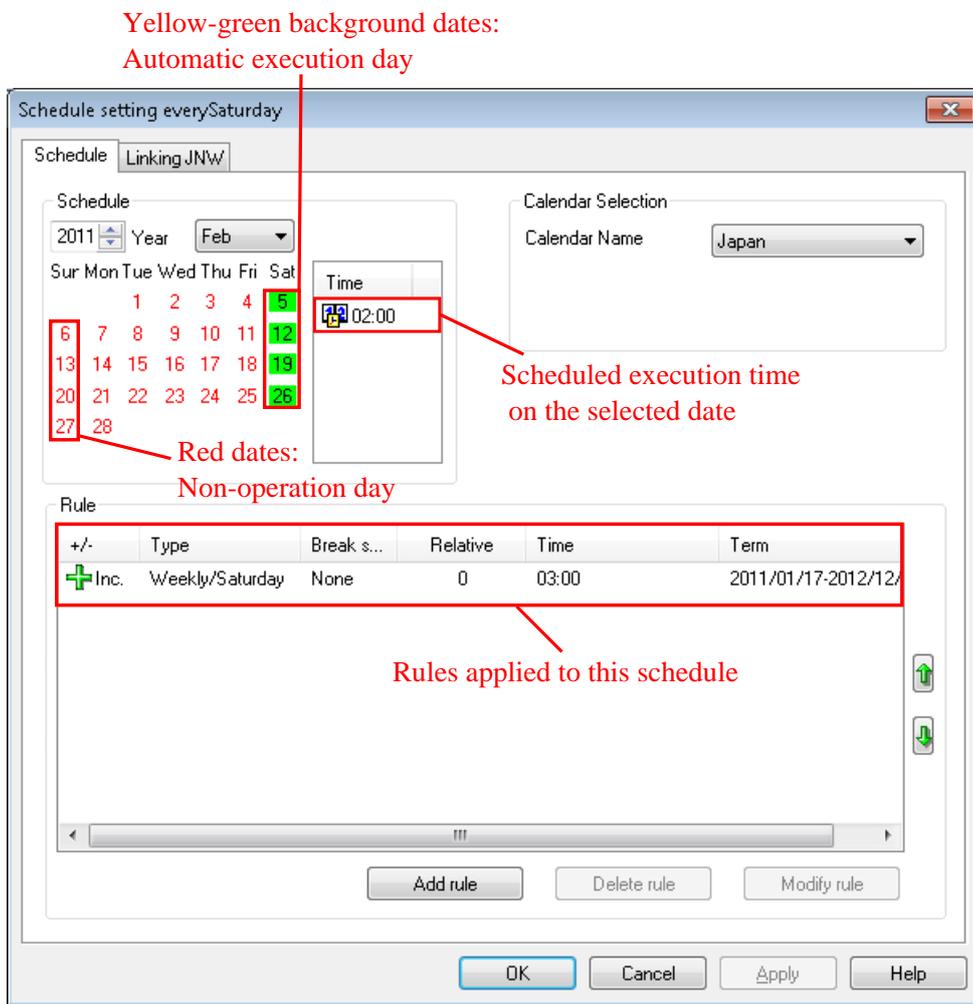
Figure 7.1. Screenshot of [Schedule setting]

7.1. Setting Up an Operating Day Calendar

Only the user who logs in with the administrator account can set an operating day calendar. When a user who is not the administrator browses an operating day calendar, only the calendar section in the operating day calendar is displayed.

To create a new operating day calendar, follow the procedure below:

1. Display [Calendar List] in [Manager Frame].

2. Click [New Calendar] in the shortcut menu which appears by right-clicking [Calendar List], or on the menu bar, select [File] and then click [New].
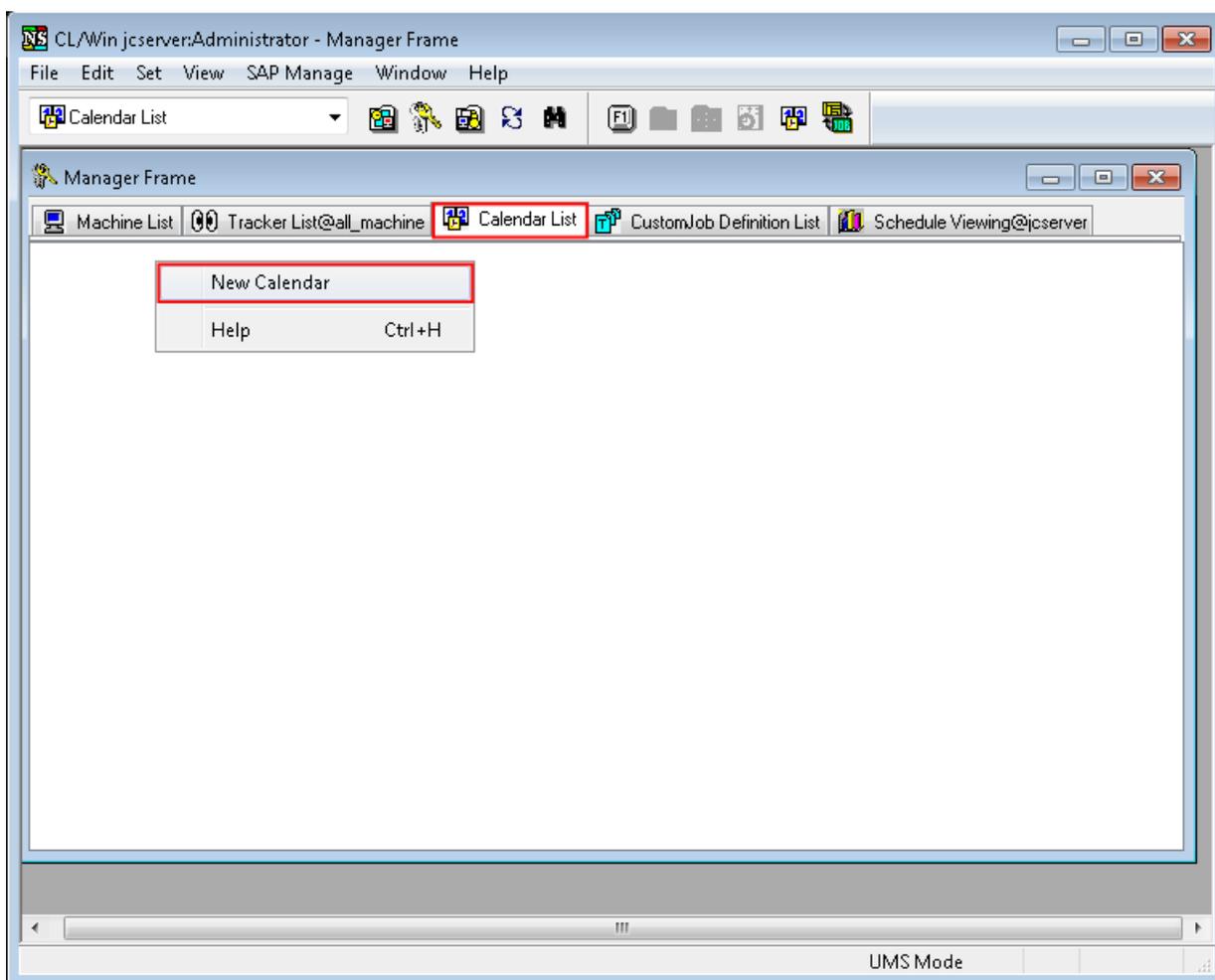
Figure 7.2. Screenshot that shows [New Calendar] is
selected from the menu for an operating day calendar

3. The [Name setting] dialog box of the Operating Day Calendar opens. Enter the name of the Operating Day Calendar to be created.
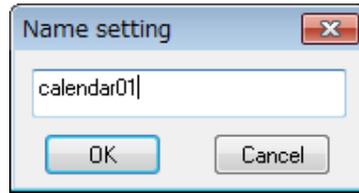
Figure 7.3. Screenshot of [Name setting] for an operating day calendar

4. After setting the Operation Day Calendar, click [OK]. [Calendar List] is displayed again.

5. Point the name of the calendar in [Calendar List] on which an Operating Day Calendar is to be set up and double-click the name or click [Open] from the shortcut menu which appears by right-clicking.
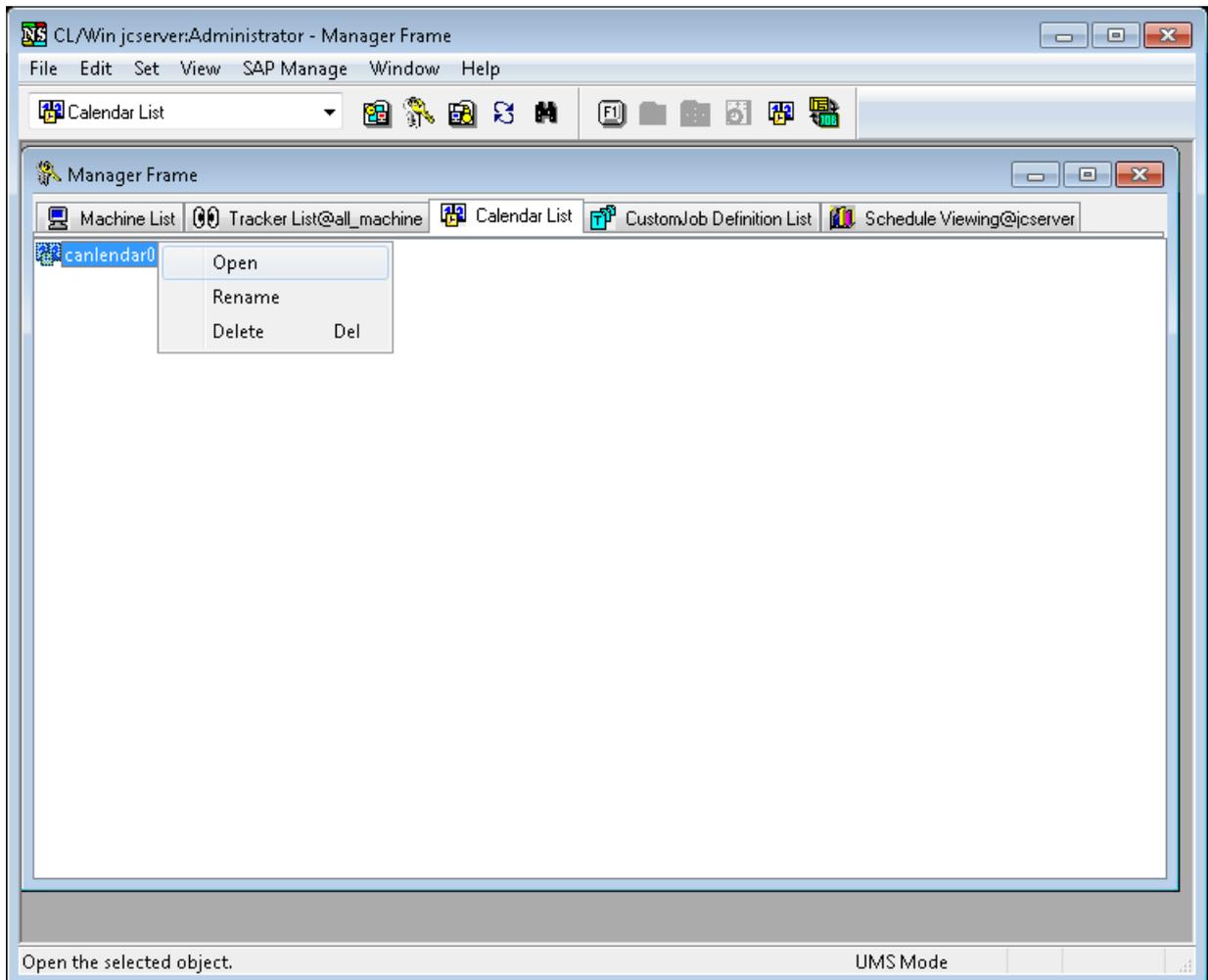
Figure 7.4. Screenshot that shows that [Open] is
selected from the menu for an operating day calendar

6. The [Calendar setting] dialog box opens. Click [Add rule] or [Modify rule].
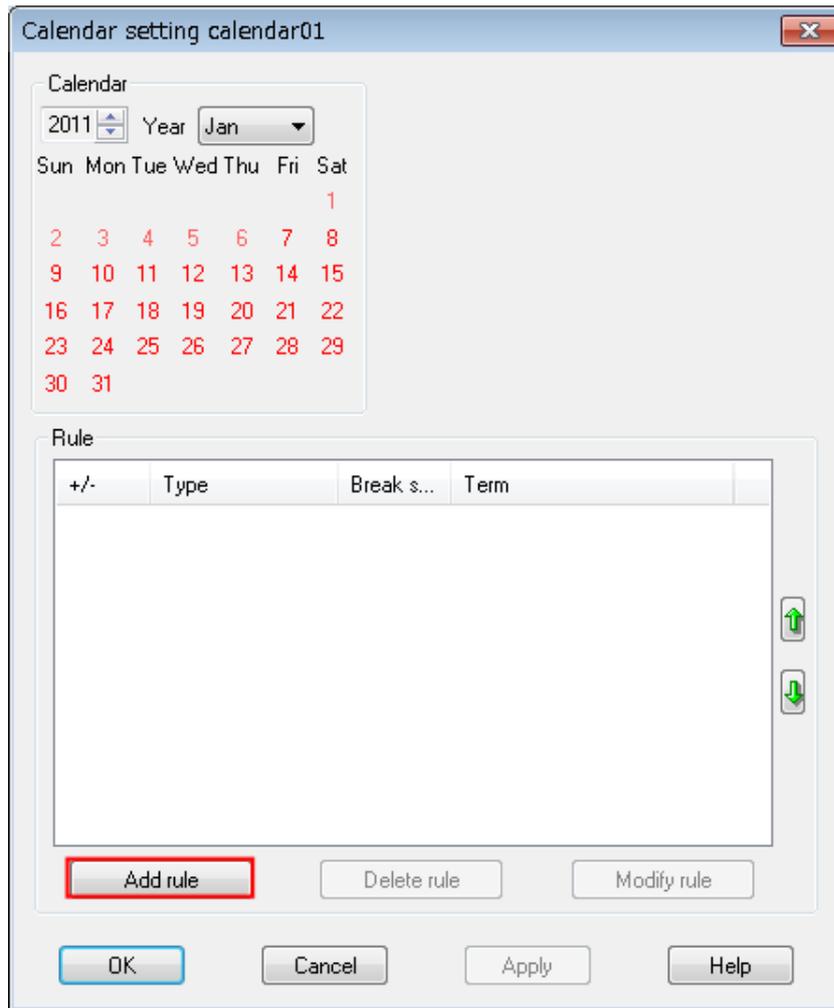
Figure 7.5. Screenshot of the [Calendar setting] dialog box

7. The [Rule setting] dialog box opens. Specify rules.

Figure 7.6. Screenshot of the [Rule setting] dialog box for an operating day calendar

For example, the following rules can be set by using the [Rule setting] dialog box.

■1stWeekend rule

"1stWeekend" can be used as a calendar setup rule.

This rule executes a job at the end of the first weekend in each month. It is similar to "Monthly (1), Monthly (Saturday) + Shift Backward" rule. However, if shifting back returns to the previous month, execution is postponed to the next weekend.

To set up this rule, select "Extra" calendar rule and "1stWeekend."

■Yearly (Day of the week) rule

"Yearly (Day of the week)" can be used as a calendar setup rule.

This rule executes jobs on a day of the week in the "n-th (1st, 2nd, 3rd, 4th, 5th, or last) week" in "month MM".

For details about how to set up rules and the settings, see in <Basic Guide>Section 6.1.3, "Creating a Schedule Rule".

⚠	Restrictions related to a change to an operating day calendar
	A change of a rule or term during which applying a rule for an operating day calendar with which a schedule (and job network) is associated may cause unexpected operation due to recalculation of scheduled dates. More specifically, the following symptoms may occur. (The following shows an example where the Operating Day Calendar is modified on March 17.)

Symptom:	An executed schedule is shifted with Break day shift and the execution is scheduled again.
Conditions:	1. After is specified in Break day shift, a workday on which a schedule was executed in the past is changed to a holiday, and the days from the day after the holiday to the day(*1) when the change is made are all set to holidays.

Example	Operating Day Calendar setting:	3/13	14	15	16	17	18
		-	-	✓	-	-	✓

Schedule: The scheduled day is set to March 13, and then shifted to March 15 (on which day a job has been executed).

If the Operating Day Calendar is changed on March 17 to specify March 15 as a holiday, the shift is re-calculated and the job execution schedule specified for March 13 is applied to March 18.

2. After is specified in Break day shift and the day when the change is made is changed to a holiday after the time on the day at which a schedule has been executed.

Example	Operating Day Calendar setting:	3/15	16	17	18
		-	-	✓	✓

Schedule: The scheduled day is set to March 15, and then shifted to March 17 (on which day a job has been executed).

If the Operating Day Calendar is modified on March 17 (after job execution) to specify March 17 as a holiday, the shift is re-calculated and the job execution schedule specified for March 15 is applied to March 18.

3. Before is specified in Break day shift, the days from the day after a workday on which a schedule was executed in the past to the scheduled day before the change are all set to holidays due to the shift, and days (or several days) following the day(*2) when the change is made are changed to workdays.

Example 1:	Operating Day Calendar setting:	3/15	16	17	18	19	20
		✓	-	-	-	-	-

Schedule: The scheduled day is set to March 15 and 20, and then the scheduled day setting of March 20 is shifted to March 15 (on which day a job has been executed).

If the Operating Day Calendar is modified on March 17 to specify March 18 as a workday, the shift is re-calculated and the job execution schedule specified for March 20 is applied to March 18.

Example 2:	Operating Day Calendar setting:	3/15	16	17	18
		✓	-	-	-

Schedule: The scheduled day is set to March 18, and then shifted to March 15 (on which day a job has been executed).

If the Operating Day Calendar is modified on March 17 to specify March 17 as a workday, the shift is re-calculated and the job execution schedule specified for March 18 is applied to March

17. Depending on the specified scheduled time, jobs are executed immediately if the specified time has passed.

Symptom:	A schedule set in a future day is not executed because the schedule is deleted.
Conditions:	1. After is specified in Break day shift and contiguous past holidays (or some past holidays) from the scheduled day to the day(*1) when the change is made are set to workdays.

Example Operating Day Calendar setting:

	3/13	14	15	16	17	18
	-	-	-	-	-	✓

Schedule: The scheduled day is set to March 14 and then shifted to March 18, on which day scheduled jobs will be executed.

If the Operating Day Calendar is modified on March 17 to specify March 15 as a workday, the shift is re-calculated and the job execution schedule specified for March 18 is canceled while the schedule specified for March 14 is valid. Note, however, that the jobs scheduled for March 14 are immediately executed if JobCenter detects that the scheduled day has passed.

2. After is specified in Break day shift, the days from the scheduled day to the day when the change is made are all holidays, and the day when the change is made is changed to a workday after the scheduled time.

Example Operating Day Calendar setting:

	3/15	16	17	18
	-	-	-	✓

Schedule: The scheduled day is set to March 15 and then shifted to March 18, on which day scheduled jobs will be executed.

If the Operating Day Calendar is modified on March 17 to change the scheduled time to a time after that for March 15 and to specify March 17 as a workday, the shift is re-calculated and the job execution schedule shifted to March 18 is canceled. (The jobs scheduled for March 15 are not executed on March 17.)

3. Before is specified in Break day shift and the contiguous workdays from the day(*2) when the change is made to the scheduled day are all changed to holidays.

Example Operating Day Calendar setting:

	3/16	17	18
	✓	✓	✓

Schedule: The scheduled day is set to March 18 and Before is specified for Break day shift.

If the Operating Day Calendar is modified on March 17 to specify March 17 and 18 as holidays, the job execution schedule specified for March 18 is not shifted backwards and is canceled.

Example Operating Day Calendar setting:

	3/16	17	18

| | ✓ | - | ✓ |

Schedule: The scheduled day is set to March 19 and Before is specified for Break day shift.

If the Operating Day Calendar is modified on March 17 to specify March 19 as a holiday, the job execution schedule specified for March 19 is not shifted backwards and is canceled.

(*1) Day before the day when the change is made when the scheduled time is after the time at which the calendar is changed

(*2) Day after the day when the change is made when the scheduled time is before the time at which the calendar is changed

■Avoidance

The cases caused by changing a past workday or holiday setting can be avoided by changing the operating day calendar so that past days are not affected.

These cases may occur, for example, when [Term(rule applied to)] is changed. When [Term(rule applied to)] is changed, since the application start day is after the day when the change is made, the days before the day when the change is made are all assumed to be outside the term (holidays). In this case, add a rule with a different rule-applied term instead of changing the rule-applied term in the existing rule. (The rules are applied in order from the bottom of the list.)

Delete an existing rule after the application term when enough time has elapsed so that the Break day shift setting does not affect other settings.

Where a day after the current day (when the Operating Day Calendar is modified) is changed, the relevant trackers must be individually deleted, skipped, or immediately submitted after the Operating Day Calendar is modified.

7.2. Distributing Operating Day Calendar

If a machine group is configured, then updated Operating Day Calendars are automatically distributed to all machines in the machine group. However, they are not automatically distributed to terminated machines, so the calendars must be manually distributed when these member machines are restarted.

In a standard remote machine configuration, the calendars must also be distributed manually. (For details about the machine groups and standard remote machine configuration, see Chapter 3, 「Building the JobCenter Network Environment」.)

To distribute the Operating Day Calendar manually:

1. Open the [Machine List] tab in the Manager Frame window.

2. Select the machine to which the Operating Day Calendar is to be distributed, and then click [Operation Calendar Update] from the shortcut menu which appears by right-clicking the machine icon.

3. The operating day calendar is transferred to the specified machine.

8 Setting Up Connections Between Different Language Environments

Windows version of JobCenter In general, an MG/SV instance can only be connected to a CL/Win or MG/SV instance in the same language environment. For example, connection and linkage operations are not possible in the cases below.

■Connecting a Japanese CL/Win instance to a Windows MG/SV instance set up in English

■Connecting a Chinese CL/Win instance to a Windows MG/SV instance set up in Japanese

■Adding an icon of a Windows MG/SV instance to an MG instance set up in Japanese and then setting up a standard remote machine configuration

■Combining machine groups using an MG instance set up in English, adding a Japanese Windows SV instance to a machine group, etc.

To set up the above sorts of combinations, the "Multi-Language Connected" setting in the server environment settings is necessary for the Windows machine to be connected or the Windows machine managed on the side managed by MG (the SV side).

1. After logging on to Windows with the administrator account, select [All Programs], [JobCenter], [SV], and then [Environment Setting] from the Windows [Start] menu to open the Server Environment Setting window.

2. Click Properties in the left pane, and then double-click [General Settings] in the right pane to open the [General Settings Properties] dialog box.

3. Select the [Multi-Language Connected] check box.
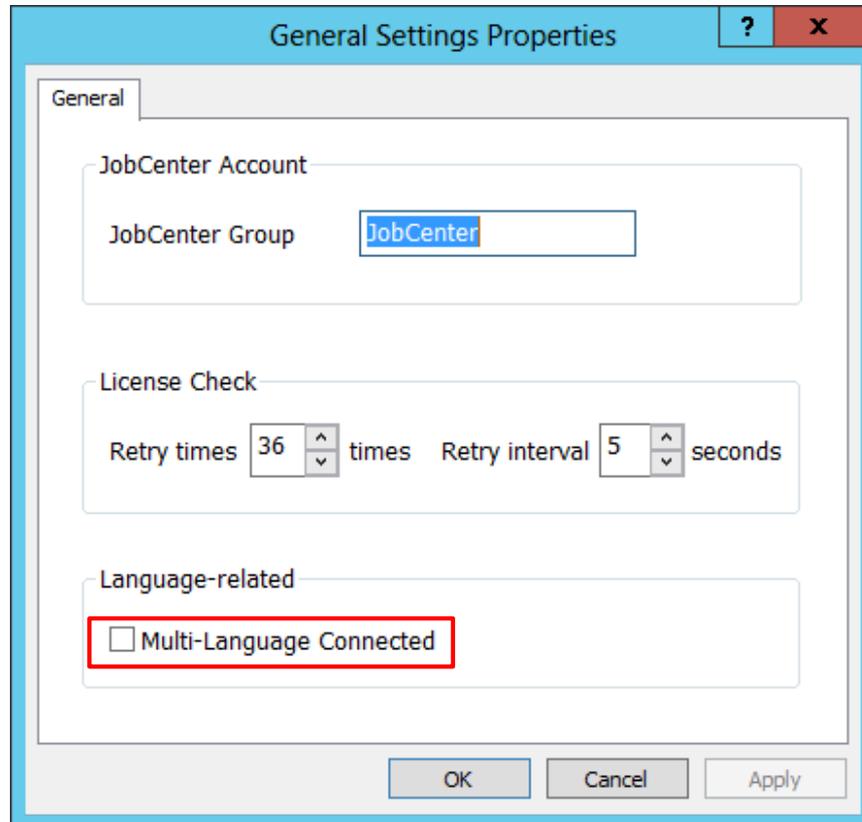
Figure 8.1. [General Settings Properties] dialog box

Whether to allow logging in to a different language environment through JobCenter CL/Win and whether to allow adding machines to a machine group of JobCenter MG in a different language environment are determined by whether the [Multi-Language Connected] check box is selected, as follows.

Table 8.1. Relationship between whether the [Multi-Language Connect] check box is selected and connection between different language environments

Multi-Language Connection Setting	Machine Type	Adding to a JobCenter MG machine group using a different language and viewing the SV queue from MG	Login from JobCenter CL/Win in a different language environment
ON	JobCenter MG	_Note	Available
	JobCenter SV	Available	Available
OFF	JobCenter MG	_Note	Not available
	JobCenter SV	Not available	Not available

> Note 1   JobCenter MG cannot be added to the machine group of another JobCenter MG regardless of the language environment.

> ⚠ ■If the [Multi-Language Connected] check box is cleared on the destination machine while JobCenter MG or SV is connected from JobCenter CL/Win in a different language environment, the connection is still effective at that time.
>
> However, JobCenter MG or SV cannot be reconnected to through CL/Win.

9 User Authority (Permission)

Set authorities for users who use JobCenter, based on authority groups. An authority group means a group having specific authorities according to the purpose.

The JobCenter administrator makes each user belong to a user-defined authority group that is arbitrarily added or an authority group provided by default to give the user appropriate access authorities. This allows the following operations:

1. A user-defined authority group can be added according to the purpose.

2. Default authority groups are provided with considering general use forms.

3. The job network of another user can be referenced, created, and executed.

4. Only specific users can be allowed to access the job network tracker and other items of another user.

5. For each authority group to which users belong, access destination users can be limited.

6. For specific users, only job network execution and tracker operation can be allowed and job network creation and change can be prohibited.

> ⚠️ Authority groups are made by extending user levels A to D in R12.4.x or an earlier version and enhancing their functions.

9.1. Types of Access Authorities

The following table lists access authorities that can be set for authority groups.

Table 9.1. Access authorities that can be set for authority groups

Access authority	Description
List and refer to the user's own JNW	This authority permits the user to display the JNW List and Schedule List tabs for the user's own job network. The user can refer to the user's own job network and schedules.
Create/modify/delete the user's own JNW	This authority permits the user to create, modify, and delete the user's own job network and set schedules for the job network. Specify this authority together with authority "list and refer to the user's own JNW."
Execute the user's own JNW	This authority permits the user to execute the user's own job network. Be sure to also set authority "operate the user's own tracker."
List and refer to the user's own Tracker	This authority permits the user to display the Tracker List and Schedule List tabs for the user's own tracker. The user can refer to the job network tracker.
Operate the user's own Tracker	This authority permits the user to refer to, forcibly start, skip, hold, and release the user's own job network tracker. Specify this authority together with authority "list and refer to the user's own tracker." To execute (immediately submit) the user's own job network, this authority is also required.
List and refer to other user's JNW	This authority permits the user to display the JNW List and Schedule List tabs for other user's JNW. The user can refer to other user's job network and schedules.
Create/modify/delete other user's JNW	This authority permits the user to create, modify, and delete other user's job network and set schedules for the job network. Specify this authority together with authority "list and refer to other user's JNW." This authority also permits the user to change the user authority for a unit job. For details, refer to in <Basic Guide>Section 4.2.2, "Setting up Conditions (Parameters) for Executing a Unit Job".
Execute other user's JNW	This authority permits the user to execute other user's job network. Be sure to also set authority "operate other user's tracker." The executed job network tracker is created in the tracker of the owner of that job network.
List and refer to other user's Tracker	This authority permits the user to display the Tracker List and Schedule List tabs for other user's tracker. The user can refer to other user's job network tracker.

Operate other user's Tracker	This authority permits the user to refer to, forcibly start, skip, hold, and release other user's job network tracker.
	Specify this authority together with authority "list and refer to other user's tracker."
	To execute (immediately submit) other user's job network, this authority is also required.

⚠	For setting of access destination permission related to other users, refer to in <Basic Guide>Section 14.3, "Restricting the Permission to Access Other Users' Job Networks and Trackers".

9.2. Authority Group by Default

Table 9.2, "Authority groups provided by default and access authorities"lists the authority groups provided by default and access authorities given to them. Table 9.3, "Uses of the authority groups provided by default"lists uses of the authority groups provided by default.

Table 9.2. Authority groups provided by default and access authorities

Default Authority Group Access Authorities	JobCenter Manager	JNW Developer	JNW Operator	Execution Surveillant	Normal User
List and refer to the user's own JNW	✓	✓	✓	-	✓
Create/modify/delete the user's own JNW	✓	✓	-	-	✓
Execute the user's own JNW	✓	✓	✓	-	✓
List and refer to the user's own Tracker	✓	✓	✓	✓	✓
Operate the user's own Tracker	✓	✓	✓	-	✓
List and refer to other user's JNW	✓	✓	✓	-	-
Create/modify/delete other user's JNW	✓	✓	-	-	-
Execute other user's JNW	✓	✓	✓	-	-
List and refer to other user's Tracker	✓	✓	✓	✓	-
Operate other user's Tracker	✓	✓	✓	-	-

1. ✓: Permitted, -: Prohibited

2. A new authority group can additionally be defined and desired authorities can be set. The authorities of the authority groups provided by default cannot be changed.

3. When a default authority group is displayed, a one-byte asterisk "*" is added following the authority group name.

Table 9.3. Uses of the authority groups provided by default

Authority Group	Description

JobCenter Manager	This authority group (privileged user) can manage the JobCenter system configuration.
	
	All authorities are given.
	
	The following operations for managing the JobCenter system configuration are allowed (authority is not given to the JNW Developer):
	
	    Setting and managing authority groups
	
	    Managing machines and machine groups and managing and monitoring the NQS (queues)

	Monitoring all trackers in the machine group and managing the operating day calendar Configuring the system and setting tracker colors The users belonging to this authority group, unlike other authority groups, are fixed. UNIX system: root and nsumsmgr Windows: User set in Manager Account in Server Environment Setting
JNW Developer	This authority group assumes users who develop job networks in the JobCenter system and set schedules. The user in this authority group can create, modify, and execute other user's job network and set schedules for the job network.
JNW Operator	This authority group assumes users who perform only job network operations including the execution of job networks in the JobCenter system and the tracker operation for waiting and being executed job networks. The user in this authority group can also execute other user's job network.
Execution Surveillant	This authority group assumes users who only monitor the job network execution status (waiting, being executed, error stopped, etc). The user in this authority group cannot operate trackers.
Normal User	This authority group can create and execute the user's own job network only. This authority group contains all users who do not belong to other authority groups including user-defined authority groups. Any user cannot explicitly be made to belong to this authority group.

9.3. Setting an Authority Group

Login to the JobCenter with JobCenter administrator user (administrator account).

On the menu bar, select [Set] and then click [Permission].

The [Permission] dialog box opens. The user authority groups currently set for the machine are displayed.
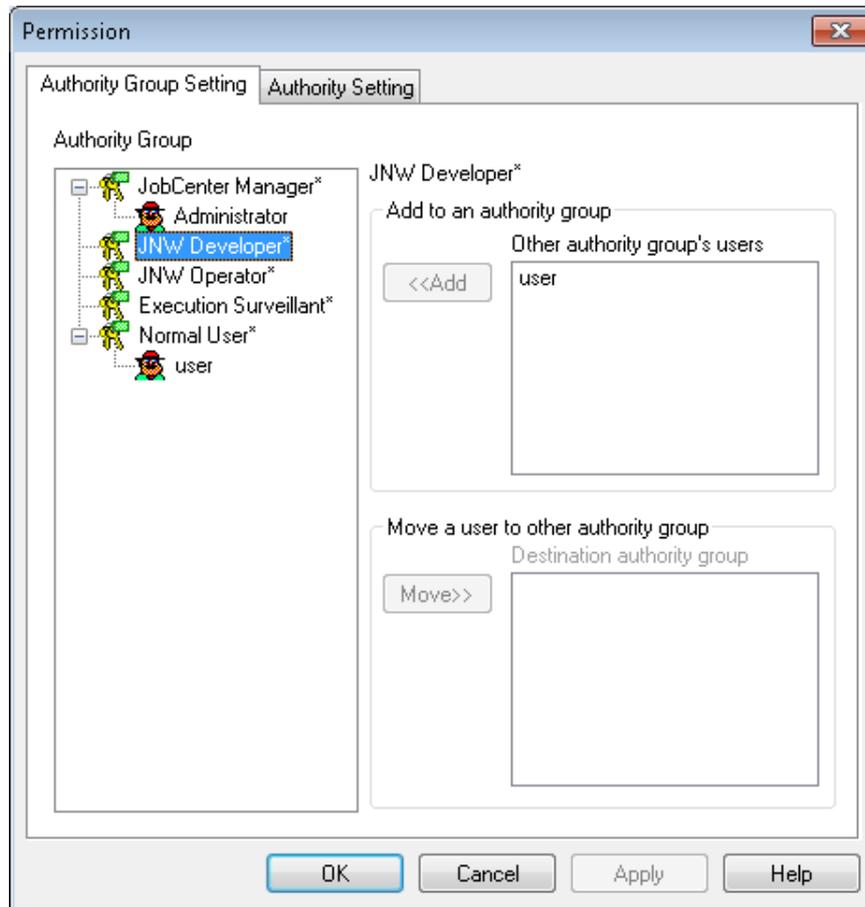
Figure 9.1. Screenshot of the [Permission] dialog box

In the [Permission] dialog box, the following items can be set. For the setting methods, refer to the each item in the "JobCenter Basic Guide."

Item	Chapter in Basic Guide
Setting an authority group	in <Basic Guide>Section 14.1, "Setting Authority Groups"
Making a user belong to an authority group	in <Basic Guide>Section 14.1.1, "Adding a User to an Authority Group"
Moving a user to another authority group	in <Basic Guide>Section 14.1.2, "Moving a User to Another Authority Group"
Creating an authority group	in <Basic Guide>Section 14.2, "Creating an Authority Group"

Adding a new authority group name	in <Basic Guide>Section 14.2.1, "Adding a New Authority Group"
Setting authorities to the added authority group	in <Basic Guide>Section 14.2.2, "Setting the Authority of an Added Authority Group"
Limiting job network and tracker access permissions to other users	in <Basic Guide>Section 14.3, "Restricting the Permission to Access Other Users' Job Networks and Trackers"
Reflecting the modified authority setting	in <Basic Guide>Section 14.4, "Getting the Changed Authority Settings Reflected"

9.4. Examples of Setting Authority Groups

This section introduces examples of setting authority groups and access permissions, according to job network configuration policies actually assumed.

9.4.1. Scenario 1

1. Policy

   ■Multiple developers develop a set of job networks.

   ■Users who perform operation are prohibited from creating or editing a job network. (An example of user restriction is described in scenario 2.)
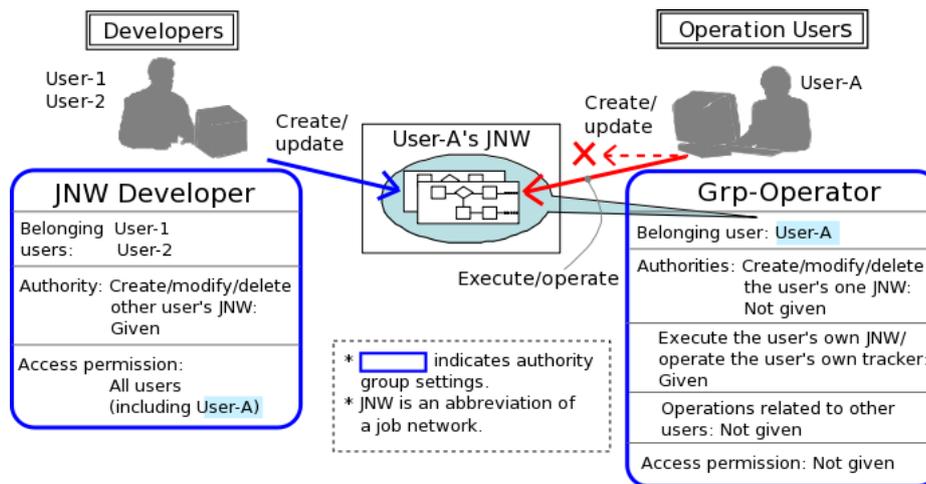
Figure 9.2. Image of scenario 1

2. Setting users

   a. Create a user made to own a job network (User-A below).

   b. Create users who develop a job network.

      The following describes an example of creating two users, User-1 and User-2.

      With the same user account, two or more users can log in to JobCenter CL/Win and edit a job network, so this policy is also enabled with one user account. Create different user accounts when an environment or security is required for each developer.

   ⚠️ Creating a user is operation of creating a user account, logging in from JobCenter CL/Win with the user account, and logging out once.

3. Setting authority groups

   a. Make User-1 and User-2 belong to "JNW Developer."

   b. Replicate "Normal User," create an original authority group (Grp-Operator in this example), and delete authority "create/modify/delete the user's own JNW."

   c. Make User-A belong to the authority group created in Figure 9.2, "Image of scenario 1", Grp-Operator.

> ✏ For details about the above operations, see in <Basic Guide>Section 14.1, "Setting Authority Groups" and in <Basic Guide>Section 14.2, "Creating an Authority Group".

4. During development

■A developer logs in from JobCenter CL/Win with user name User-1 or User-2.

■The developer opens User Frame of another user User-A and develops a job network.

5. During operation

■An operator logs in from JobCenter CL/Win with user name User-A. The operator submits jobs and monitors execution from his or her own User Frame.

> ✏ When different machines are used for developing and operating the job network, this policy is also enabled by using only User-A, in the development machine, making User-A belong to "JNW Developer," and in the operation machine, making User-A belong to the original authority group described above.
>
> Alternatively, this policy is enabled by making User-A belong to an original authority group created by replicating "JNW Developer" during development and reducing the authorities of this authority group during operation.

9.4.2. Scenario 2

1. Policy

■Multiple developers develop large groups of applications (AP groups below) using job networks.

■Each developer is made to access the job network for a specific AP group (AP group 1 or 2 below).

■Users who perform operation are allowed to execute the job networks of all AP groups.
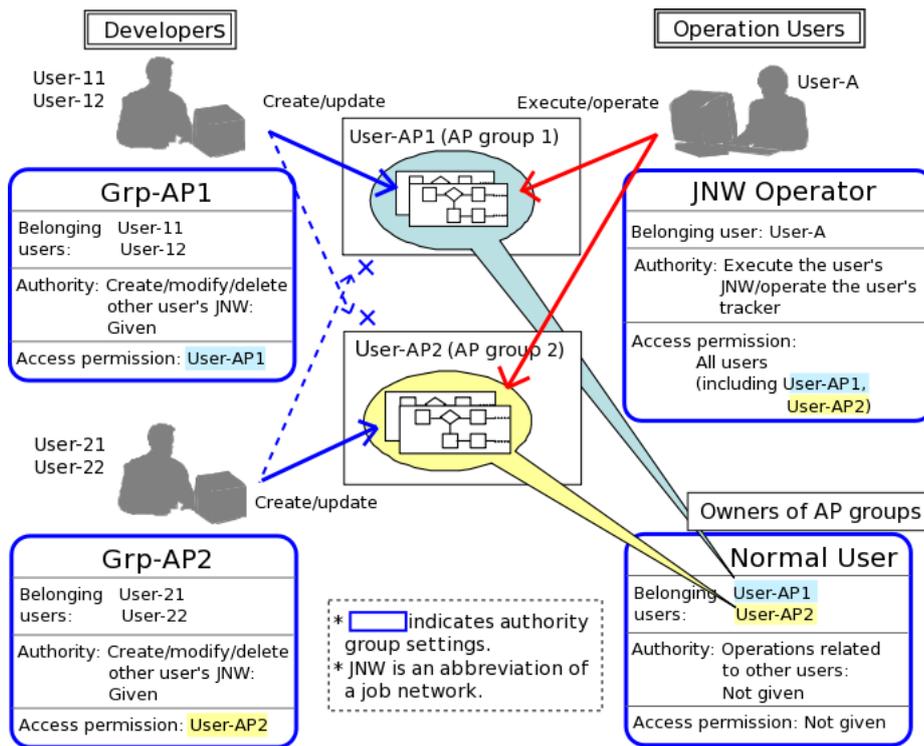
Figure 9.3. Image of scenario 2

2. Setting users

a. Create a user for each AP group (User-AP1 or User-AP2 below).

b. Create users who develop job networks (User-11, User-12, User-21, and User-22 below).

c. Create a user who perform operation (User-A below).

> ⚠ Creating a user is operation of creating a user account, logging in from JobCenter CL/Win with the user account, and logging out once.

3. Setting authority groups

a. Replicate "JNW Developer" and create the authority group corresponding to each AP group (Grp-AP1 or Grp-AP2 below). As either user, "JNW Developer" can be used as it is.

b. Set User-AP1 as the user allowed to access authority group Grp-AP1 and user-AP2 as the user allowed to access authority group Grp-AP2.

c. Make User-11 and User-12 belong to authority group Grp-AP1 and User-21 and User-22 belong to Grp-AP2.

d. Make User-A belong to "JNW Operator."

e. In this status, User-AP1 and User-AP2 belong to "Normal User." To prohibit modification and other processing after login with User-AP1 and User-AP2, create an original authority group with reduced authorities and make User-AP1 and User-AP2 belong to the authority group.

> For details about the above operations, see in <Basic Guide>Section 14.2, "Creating an Authority Group" and in <Basic Guide>Section 14.3, "Restricting the Permission to Access Other Users' Job Networks and Trackers".

4. During development

- ■After a user logs in from CL/Win with user name User-11 or User-12, he or she can develop only the AP group corresponding to user-AP1 (in User Frame of another user User-AP1).

- ■After a user logs in from CL/Win with user name User-21 or User-22, he or she can develop only the AP group corresponding to User-AP2 (in User Frame of another user User-AP2).

5. During operation

- ■An operator logs in from JobCenter CL/Win with user name User-A. The operator submits jobs and monitors execution in User Frame of User-AP1 or User-AP2.

> For simplification, in the example of "scenario 2," two AP groups are provided and there is a one-to-one correspondence between development groups and AP groups.
>
> In actual development, divide APs into AP groups according to the units of desired access restrictions and create a user corresponding to each group as the owner of the job network.
>
> Create multiple authority groups for types of access destination AP groups and set one or more access permissions to the user corresponding to each AP group.
>
> For developers, create one user or a user for individuals in authority group units and make the user belong to an authority group corresponding to the type of access destination AP group.

9.5. Notes on Setting Authorities

9.5.1. Users Made to Belong to an Authority Group and Access Destination Users

Users who have logged in from JobCenter CL/Win can be set as a user made to belong to an authority group and a destination user to which access is allowed.

Log in and out with each user who uses JobCenter before setting the user.

9.5.2. Submission According to a Schedule and Operations Using Commands

Access authority settings are valid when made from JobCenter CL/Win.

Job network submission according to a schedule and job network submission and tracker operations using the jnwsubmitcmd and jnwop commands can be executed regardless of access authority settings.

9.5.3. Operations That Must Be Performed with a Login User

1. Default values of job network parameters

   For the default values of job network and part parameters, the default parameter values of the user who owns that job network are used.

   To use setting with default parameter values, log in with the user who owns the relevant job network and set the default parameter values in advance (refer to in <Basic Guide>Section 3.3.4, "Setting Parameters of a Job Network").

2. Settings of environment variables used at the execution of a job network

   For the environment variables of jobs started at the execution of a job network of another user, the environment set for the owner of the job network is used.

   To execute the job network of another user or set up the schedule of another user, log in to that job network as its owner at least once before execution.

   In the UNIX version, the environment variables used at the execution of a job network are updated only when the login user himself or herself changes his or her schedule.

   To set environment variables used at the execution of a job network, log in with the user who owns the job network and set the environment variables by changing the schedule as described in a note in Section 14.1.3, "Setting Environment Variables".

10 LDAP (Active Directory) Linkage Function

The LDAP linkage function associates authority groups used to manage JobCenter user authorities with LDAP groups to enable JobCenter user authorities to be managed using LDAP.

When JobCenter user authorities are managed using CL/Win, the authorities need to be set individually on a user-by-user basis, which takes a long time if there are many users to manage. The use of LDAP makes it easy to manage users and their authorities. Especially, if you manage users in groups using LDAP, you can set JobCenter authorities on a group-by-group basis and easily change the authorities of all the users of a specific group at once.

The LDAP linkage function also allows users and authorities to be managed in a centralized manner using LDAP, thus offering high expandability and operability.

⚠️ Currently, only Active Directory can be used as an LDAP server. Note also that only the Windows version of JobCenter is supported.
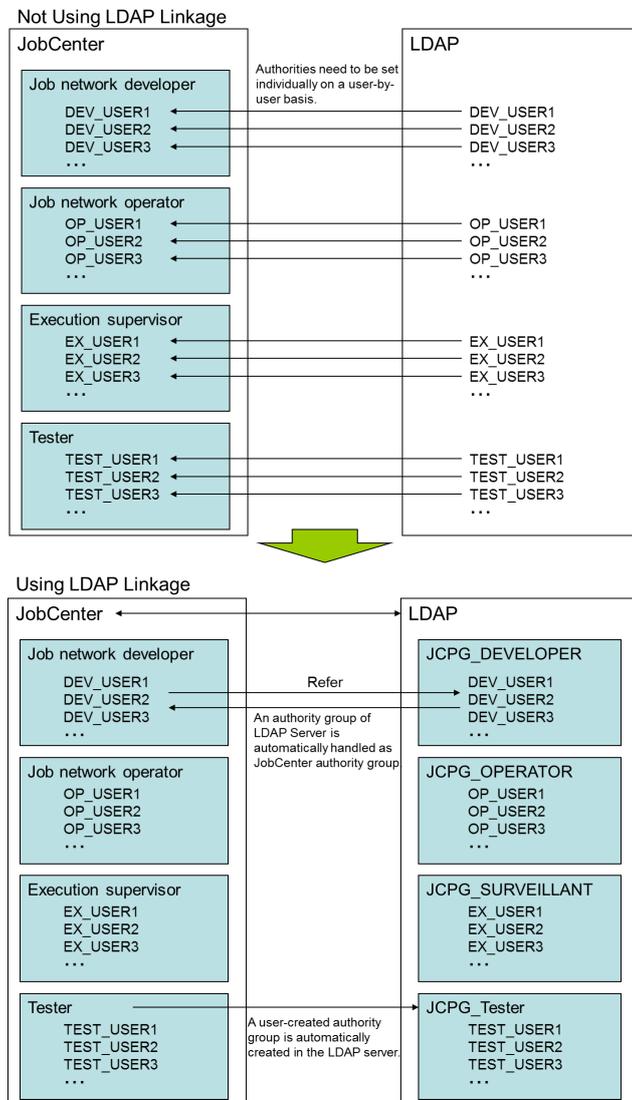
Figure 10.1. Benefits of using the LDAP linkage function

10.1. LDAP Linkage Setup

The settings necessary for LDAP linkage are outlined below.

1. Set an LDAP server on the JobCenter side.

2. Add an LDAP user to a JobCenter authority group in the LDAP server.

3. Add the LDAP authority group to a JobCenter group in the server on which JobCenter is installed. (This is necessary for the user to log in to JobCenter.)

10.1.1. Setting JobCenter

From Server Environment Setting, select [Site], [<site-name>], and then [Properties]. In the [LDAP Server Setting] tab shown in Figure 10.2, "LDAP server settings for JobCenter", specify the settings about the LDAP server to connect.
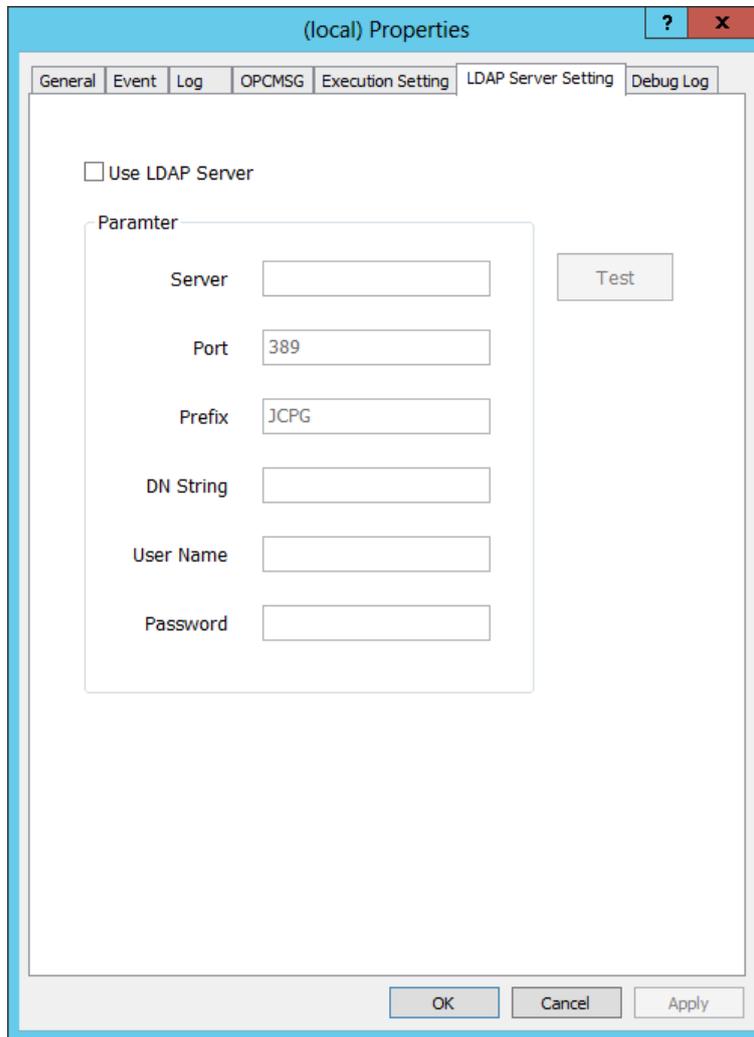
Figure 10.2. LDAP server settings for JobCenter

Table 10.1, "LDAP server items to be set for JobCenter" explains the items in the setting window.

Table 10.1. LDAP server items to be set for JobCenter

Item	Value

Use LDAP server	To use an LDAP server, select this check box. (Selecting this check box makes the following items available.)
Server	Host name or IP address of the LDAP server to be linked
Port	Port to be connected to the LDAP server. (Default: 389)
Prefix	Prefix to be used in the group name to be created on LDAP. (Default: JCPG)
DN String	DN character string to which the LDAP administrator to be entered in the [User name] text box below, LDAP users to log in to JobCenter, and the authority group to be created on LDAP belong.
User Name	Administrator to log in to the LDAP server
Password	Password of the LDAP server administrator

When you set the items mentioned above, a group corresponding to the default authority group prepared in JobCenter is created in the LDAP server. Table 10.2, "Correspondence between a JobCenter authority group and an LDAP authority group" shows the correspondence.

If necessary, a new authority group can also be created. Once the items described in Section 10.1.1, "Setting JobCenter" are set, a user-created authority group is automatically created in the LDAP server as well. The name of such a group created in the LDAP server has the format of <GRP_PREFIX>_<user-defined-authority-group> as shown in Table 10.2, "Correspondence between a JobCenter authority group and an LDAP authority group". <GRP_PREFIX> is the value specified in the [Prefix] text box.

Table 10.2. Correspondence between a JobCenter authority group and an LDAP authority group

JobCenter authority group name	LDAP authority group name
NW Developer	<GRP_PREFIX>_DEVELOPER
JNW Operator	<GRP_PREFIX>_OPERATOR
Execution Surveillant	<GRP_PREFIX>_SURVEILLANT
Normal User	<GRP_PREFIX>_COMMONUSER
<user-defined-authority-group>	<GRP_PREFIX>_<user-defined-authority-group>

10.1.2. Setting LDAP

Set the LDAP server as follows.

1. Add a user to the LDAP server who is to be connected to JobCenter.

2. Make the created user belong to the authority group of the LDAP server.

For information about how to add a user to the LDAP server and make a user belong to an authority group of the LDAP server, refer to the manual of the LDAP server.

10.1.3. Setting a JobCenter Group

Add the LDAP authority group to the JobCenter group in the server on which JobCenter is installed. The default authority group and user-defined authority groups all need to be added to the JobCenter group.

> Authority groups that will not be used do not necessarily need to be added to the JobCenter group. Considering the possibility of changing user authority groups, however, it is recommended to add those authority groups that will not be used to the JobCenter group as well. (If a user is changed to an LDAP authority group that does not belong to the JobCenter group, that user cannot log in to JobCenter.)

10.2. LDAP Linkage Setup Example

This section describes an example of how to set up LDAP linkage under the conditions shown below.

Table 10.3. LDAP linkage setup example

Condition	Content
LDAP server to use	Active Directory
Name of the host on which the LDAP server runs	ldap.domain.co.jp
LDAP server wait port	389 (default)
Prefix to be assigned to the LDAP authority group name	JCPG (default)
LDAP server administrator	Administrator

The users and the authority groups to which they belong are as follows.

Table 10.4. Authority groups of the users

User	Authority group
dev_user_1 to dev_user_10	Job network developer
op_user_1 to op_user_10	Job network operator

10.2.1. JobCenter Setup Example

Linkage with Active Directory can be achieved by selecting [Site], [<site-name>], and then [Properties] from Server Environment Setting of JobCenter and specify the settings in the [LDAP Server Setting] tab of the "[site-name> Properties] dialog box, as shown in Figure 10.3, "Examples of the LDAP server settings for JobCenter". After specifying the settings, click the [Test] button and check that "Connection to LDAP server succeeded" is displayed.

Figure 10.3. Examples of the LDAP server settings for JobCenter

> In the [DN character string] text box, enter the DN character string that is output by the following command executed in the server on which Active Directory is running, excluding the user name.
>
> ```
> dsquery user -name <user-name>
> ```

Because only the default authority group is used in this example, a new authority group does not need to be created from CL/Win.

10.2.2. Active Directory Setup Example

The setup example applicable when the LDAP server to be used is Active Directory is described below. For details of the procedure, refer to the manual of Active Directory.

1. In the [Active Directory Users and Computers] window, create a user. Or, use the dsadd user or other command to create a user. An example of the command used to create dev_user_1 in the Users container is shown below. (Specify the user information in CN and the domain information in DC.)

```
dsadd user CN=dev_user_1,CN=Users,DC=domain,DC=co,DC=jp
```

2. Assign the created users from dev_user_1 to dev_user_10 as job network developers and those from op_user_1 to op_user_10 as job network operators, by using the window or command. An example of the command used to assign dev_user_1 as a job network developer is shown below. (In the CN parameters preceding -addmbr, specify the group information. In the CN parameters following -addmbr, specify the user information.)

```
dsmod group CN=JCPG_DEVELOPER,CN=Users,DC=domain,DC=co,DC=jp -addmbr
 CN=dev_user_1,CN=Users,DC=domain,DC=co,DC=jp
```

10.2.3. JobCenter Group Setup Example

Make the default authority group registered in Active Directory belong to the JobCenter group in the server on which JobCenter is installed. For details of the procedure, refer to the manual of the OS of the server on which JobCenter is installed.

When the above-mentioned settings are specified, the users from dev_user_1 to dev_user_10 can log in with the job network developer authority and the users from op_user_1 to op_user_10 can log in with the job network operator authority.

10.3. Notes on LDAP Linkage

This section describes the points to note when accomplishing LDAP linkage.

10.3.1. Name of a User to Be Added to Active Directory

When a user is added to Active Directory, the user's full name and user login name need to match. If they do not match, Active Directory cannot be referenced and the correct authority group fails to be set, causing the user to log in as a Normal User.

10.3.2. Blocking a User from Logging In

To block a specific user from logging in to JobCenter, delete that user from the members of the JobCenter group in the server on which JobCenter is installed. When deleting a user from the members of the JobCenter group, make sure that JobCenter is stopped.

If JobCenter cannot be stopped, create an authority group having no authority and make the user belong to that group. This makes the user unable to perform any operation at all although he or she can log in to JobCenter.

10.3.3. Changing the LDAP Server to Link

To change the LDAP server to link to JobCenter, change the settings as follows.

1. Clear the [Use LDAP Server] check box with the other settings intact, and click the [Apply] button.

2. Select the [Use LDAP Server] check box, change the desired settings, and then click the [Apply] button.

10.3.4. Terminating Linkage with the LDAP Server

To terminate linkage with the LDAP server, change the settings as follows.

■Clear the [Use LDAP Server] check box without changing other settings.

10.3.5. LDAP Servers and Linked Sites

■A site can link with only one LDAP server.

■When one LDAP server needs to manage multiple sites, a different prefix must be assigned to each site.

■Even when sites are linked to an LDAP server, the settings on one site are not reflected at other sites. Authorities must be set for each site.

10.3.6. Authority When a User Belongs to a Nested Group

A user belonging to an LDAP authority group having a parent-child relationship has only the authority of the parent group. If the name of the group to which a user belongs directly does not begin with <GRP_PREFIX>_, the authority of a general user is set for that user. Therefore, make sure that the name of the group to which a user belongs directly begins with <GRP_PREFIX>_.

10.3.7. Authority When a User Belongs to Two or More Groups

If a user belongs to two or more authority groups that do not have a parent-child relationship, it becomes unclear which authority is set for that user. Therefore, avoid making a user belong to two or more authority groups that do not have a parent-child relationship.

11 Event Linkage

This chapter describes how to use the event linkage function.

11.1. Overview of Event Linkage

If you want to monitor the JobCenter job execution state on an integrated monitoring server, this can be done using this function.

The event linkage function outputs events to the monitored target or notifies the integrated monitoring server of events, thereby allowing the integrated monitoring server to monitor events occurring in JobCenter, such as the start or end of a unit job.

For diagram of overviews of event linkage, refer to Figure 11.1, "Image of event linkage in UNIX version" and Figure 11.2, "Image of event linkage in Windows version".
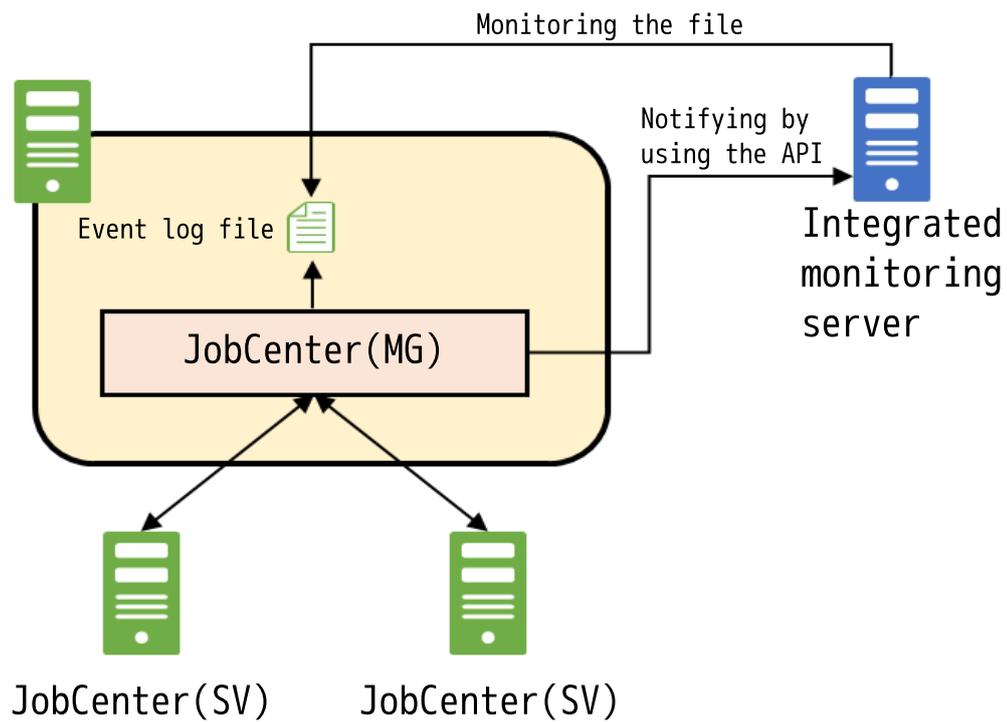
Figure 11.1. Image of event linkage in UNIX version
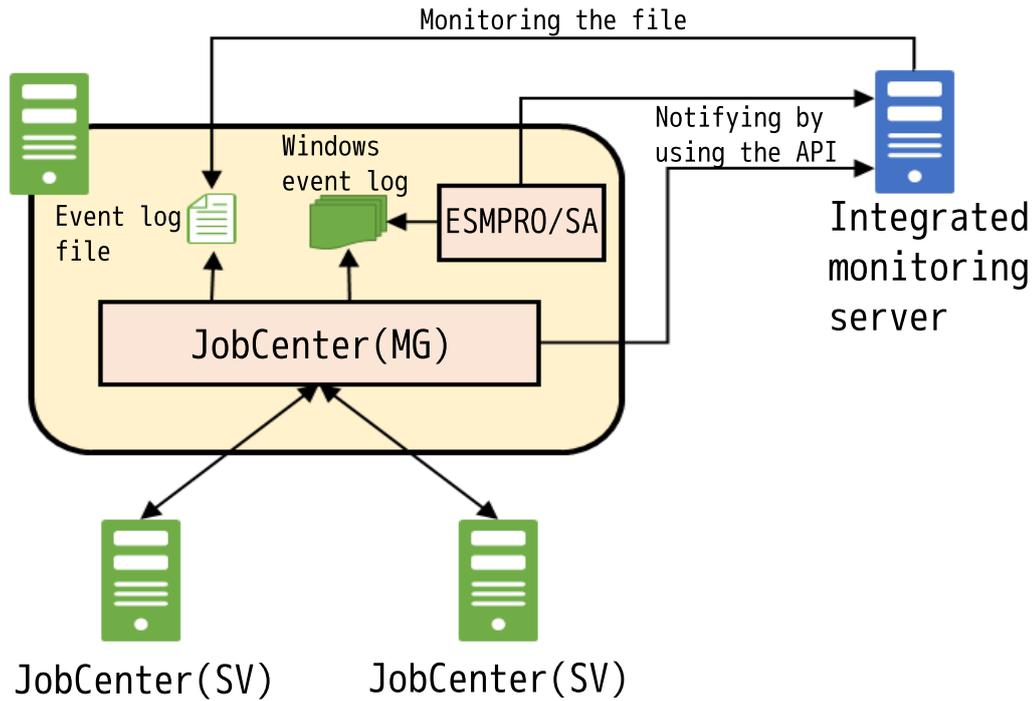
Figure 11.2. Image of event linkage in Windows version

The integrated monitoring software products that uses event log files for event linkage with include MCOperations and SystemManager. For details of how to set up integrated monitoring software file monitoring, refer to the manual of your integrated monitoring software.

■For connecting between UNIX version JobCenter and Windows version JobCenter, refer to Section 2.2, "Notes on Building Network Connection".

■To output a JobCenter event, you can use the JobCenter (MG) machine, which contains the job network definition associated with the event. Therefore, if the job is transferred and executed, the destination machine (i.e., JobCenter (SV)) cannot output the event.

There are three event linkage methods.

1. Outputting a JobCenter event to the specified event log file

2. Outputting a JobCenter event to the Windows event log

3. Notifying of a JobCenter event by using the API of the integrated monitoring software.

The scope of supported event linkage methods varies depending on whether JobCenter is the UNIX or Windows version.

Table 11.1. Event linkage types supported by the event linkage function

JobCenter event output/notification method	UNIX version	Windows version
Output to the specified event log file	✓	✓
Output to the Windows event log	-	✓

Notification via the API of integrated monitoring software[Note 1]	✓	✓

[Note 1]The integrated monitoring software supporting this method is only HP Operations Manager.

11.2. Event Linkage in UNIX version

The UNIX version can perform the following event linkage operations:

■The UNIX version can perform the following event linkage operations: To output a JobCenter event to the specified event log file, refer to Section 11.2.1, "Method of Outputting an Event to the Event Log File".

■To send an event to the HP OperationsManager message viewer via the API, refer to the following:

Section 11.2.2, "Event Setting File"

Section 11.2.3, "Event Definition File"

11.2.1. Method of Outputting an Event to the Event Log File

This section describes how to output a JobCenter event to the event log file.

1. With the event setting file, enable output setting of the event log file. For details of the event setting file, refer to Section 11.2.2, "Event Setting File".

   1. In LOGFILE, specify the name of the destination file to which to output the JobCenter event.

   2. In LOGSIZE, specify the maximum size of the event log file.

   3. Enable the log output settings separately for the JobCenter events to be output.

      To enable log output, change the LOG value to ON in the transmission event setting (EVENT).

      For the list of the JobCenter events that can be output, refer to Section 11.2.4, "Event List".

2. Restart the JobCenter MG for which the event setting file was edited.

11.2.2. Event Setting File

■Path

Local site	/usr/spool/nqs/gui/jnwcaster.conf
Cluster site	<JobCenterDB-path>/nqs/gui/jnwcaster.conf, which is on the shared disk

■Explanation

Describe the operation conditions of the event output daemon (inwcaster) in this file. This file is read when daemon is started.

■Format

- Log file

```
LOGFILE <logfilename>
```

Describes a log file name. If a log file is specified, an event whose LOG is set to ON by the EVENT tag will be recorded.

The log file name must be the absolute path. If a relative path is used for description, it corresponds to /usr/spool/nqs/gui (in the cluster environment, <JobCenterDB Path>/nqs/gui on the shared disk). Since a malfunction may be caused, however, place the above log file in /usr/spool/nqs (in a cluster environment, <JobCenterDB Path>/nqs on the shared disk) and do not place any user file in that directory.

⚠️
- Be aware that if <logfilename> is inaccessible when JobCenter starts up, an error occurs, resulting in startup failure.

- The character code used for log output depends on the character code setting made when JobCenter is set up.

■ Log file size

```
LOGSIZE <size>
```

Specify the size of log files. Sizes are specified in Kbytes. The maximum size is the long maximum value - 1 or maximum file size set in the OS, which is smaller. If a size is set to 0, the log is not output.

When the specified size is exceeded, a file is created with file-name.log.bak and two generations of files (file-name.log and file-name.log.bak) are saved. The number of backed up generations cannot be changed. When the specified size is exceeded again, the older log file is overwritten.

■ Transmission interface

```
EVENTIF {NNM|SS|OPCMSG}
```

Specifies an interface for event transmission. If this is not specified, the setting value "SS" is used.

EVENTIF tag	Operation
OPCMSG	Transmits events using OPC message of HP Operations Manager.

⚠️
It is necessary to replace the linkage module (jnwopcr) with the module appropriate for the HP Operations Manager (formerly OVO) version before starting up JobCenter. Obtain the linkage module from the customer service center with which you have a maintenance contract. (Only HP-UX versions are provided.)

■ SNMP transmission destination specification

```
SNMPDEST <hostname>
```

Specifies the transmission destination of SNMP packets. Generally, the host name where the NNM manager is operating is specified. Omission of this item transmits packets to the started host itself.

■ NQS transmission setting

```
NQSEVENT {ON|OFF}
```

Sets whether or not events of job network are transmitted to NQS Daemon. For JobCenter R5.1 or higher, always set this item to OFF.

■ Transmission event setting

```
EVENT <Event-Name> MESSAGE={ON|OFF} LOG={ON|OFF}
```

Event-Name	Specifies an event name.
MESSAGE	Select whether or not the applicable event is to be transmitted. To make notification, set this item to ON.

LOG	Specify whether to output events to the LOG file specified for LOGFILE above. To output an event, set this item to ON.

▪ Error stop event setting

```
SEND_MSG_ESTOP {ON|OFF}
```

Specify whether to output a time-exceeded warning event when an event indicating that the job network tracker stopped with an error is output.

Normally, of the above EVENT settings, MESSAGE=ON is specified for error stop (jnwsv.xxx.estop) events, and a JNW_ERROR_STOP event is output when the job network tracker stops with an error. If the flow includes job waiting parts for which warnings have not arrived or parts for which settings with excessive warnings or critical point warnings are specified in the job network, and MESSAGE=ON is specified for the time-exceeded warning (jnw.xxx.ovt) event, when the job network tracker stops with an error, the result is that the time is exceeded and two error events are output: an error stop event and a time-exceeded event.

The related time-exceeded settings are as follows.

· End time excess of job network

· Critical point of job network

· End time excess of unit job

· Critical point of unit job

· Behind Schedule Alarm of Time Waiting part

When this parameter is specified, the operation is as follows.

SEND_MSG_ESTOP	Job network parameter [Behavior on failure] setting	Operation
ON	Enable/Disable	Outputs all events that are set to be output. (as in earlier versions)
OFF	Enable	Does not output time excess warning event if job network stops due to an error. (Do not output an event twice or more.)
	Disable	Outputs all events that are set to ON for time excess warning.

11.2.3. Event Definition File

■Path

Local site	/usr/spool/nqs/gui/jobmsg.conf
Cluster site	<JobCenterDB-path>/nqs/gui/jobmsg.conf, which is on the shared disk

■Explanation

This file specifies the event that is output to the event log file and the format of the event that is notified via the API.

Related tags are as shown below.

▪ Event that is output to the event log file

```
EVENT <Event-Name> <MsgID> <Message-Body>
```

Specifies the format of the event that is output to the event log file.

Event-Name	This is an event type name character string that indicates the type of event.
MsgID	Event ID. For details on events, refer to Section 11.2.4, "Event List".
Message-Body	Specifies a message pattern to be output. Note that, for the same MsgID, the expression differs in the event summary recognized by the JobCenter tracker log event name and BASECenter/HP OpenView NNM side.

▪ Event that is notified via the HP Operations Manager API

```
OPCMSG <eventname> [APL=application] [OBJ=object] [SEV=severity] [GRP=msggrp] [NODE=node]
```

The HP Operations Manager interface specifies message parameters in events

For eventname, use the name specified for Event-Name, which is defined in "BaseCenter/ SystemManager, HP OpenView NNM related". However, opcmsg.default is used to specify a value to be used with each parameter omitted. A value must be specified in a line.

The meaning of parameter KEY is as shown below.

APL	Specifies an application name.
OBJ	Specifies an object name.
SEV	Represents a level of message. Specify one of the following. NORMAL WARNING MINOR MAJOR CRITICAL
GRP	Specifies a message group.
NODE	Specifies a node of an event.

When a parameter with the format of KEY=value is specified, value can be put in double quotation marks (" ") or single quotation marks (' ').

▪ Common

[TIMEFMT]

This is a supplemental parameter related to the time display format. The following formats are available.

```
TIMEFMT starttime1 <time-format>
TIMEFMT starttime2 <time-format>
TIMEFMT endtime1   <time-format>
TIMEFMT endtime2   <time-format>
```

The above parameters specify time output formats at their own message macros.

Format <time-format> is the same as that used with library function strftime (3).

The parameters are specified in jobmsg.conf in advance as follows.

```
TIMEFMT starttime1 %c
TIMEFMT starttime2 %R
TIMEFMT endtime1   %T
TIMEFMT endtime2   %R
```

There are two types of each parameter: starttime1 and starttime2, and endtime1 and endtime2. Use the different parameters according to the message type to change the time output format.

[Message output pattern]

Generally, character strings specified for message output patterns of the EVNET and OPCMSG tags are output as they are. However, character strings that are surrounded by % characters as shown in the table below are parsed as macro characters.

Macro characters can be converted into a fixed pattern in accordance with messages.

The number of macros available in an event is up to 10. If the number of macros in use exceeds the value, the excessive macro parts are ignored.

Macro	Conversion target	Specifiable event name
%occur%	Is converted into the machine name where the event occurred. Host names are not omitted.	jnwsv.*
%occurS%	Is converted into the machine name where the event occurred. The domain portion and characters more than 63 characters are omitted.	jnwsv.*
%occurD%	Is converted into the machine name where the event occurred. The domain portion and characters more than 60 characters are indicated as "..."	jnwsv.*
%jnwname%	Is converted into a job network name.	jnwsv.*
%jnwnameB%	Of the job network names, is converted into a name obtained by eliminating the parent job network name.	jnwsv.*
%starttime1%	When a job network or unit job is submitted, the format specified by TIMEFMT starttime1 is used for conversion.	jnwsv.*
%starttime2%	When a job network or unit job is submitted, the format specified by TIMEFMT starttime2 is used for conversion.	jnwsv.*
%endtime1%	When a job network or unit job finishes, the format specified by endtime1 is used for conversion.	jnwsv.*.end jnwsv.uj.err jnwsv.uj.estop
%endtime2%	When a job network or unit job finishes, the format specified by endtime2 is used for conversion.	jnwsv.*.end jnwsv.uj.err jnwsv.uj.estop
%ujname%	Is converted into a unit job for message.	jnwsv.dialog.*

			jnwsv.uj.*
			jnwsv.holdevent.*
%ujexecmac%	Is converted into an execution machine name of the unit job corresponding to the message.		jnwsv.uj.end
			jnwsv.holdevent.*
%ujerrmsg%	Is converted into an error message.		jnwsv.uj.err
			jnwsv.uj.estop
%dialog-msg%	Is converted into a dialog message.		jnwsv.*
%jnwuser%	Is converted into the user who has submitted job network.		jnwsv.jnw.*
			jnwsv.uj.*
%jnwstat%	Is converted into the status of job network (NORMAL, ERROR).		jnwsv.jnw.*.end
%trkid%	Is converted into the tracker id.		jnwsv.holdevent.*
%evtid%	Is converted into the event id.		jnwsv.holdevent.*
%sitename%	Is converted into the name of host or cluster site where jnwcaster is running.		notice.daemon.* (OPCMSG tag only)

11.2.4. Event List

Table 11.2, "Events" lists events.

Note that "event name" is the name output to the log specified for LOGFILE/LOGSIZE in the tracker log and jnwcaster.conf, and that "event summary" is the name identified by the viewer of event linkage software. However, the same message is output as both "event name" and "event summary" for the following events.

■jnwsv.que.ustart

■jnwsv.que.ustop

■jnwsv.que.sstop

■jnwsv.release.start

■jnwsv.release.end

■jnwsv.release.err

Table 11.2. Events

Event ID	Event type name	Meaning of event	Event name (tracker log output) Event summary
0x2001	jnwsv.jnw.root.start	Parent job network execution has started.	JNW_START JOBS_JNW_START
0x2002	jnwsv.jnw.root.end	Parent job network execution has ended.	JNW_END JOBS_JNW_END
0x2001	jnwsv.jnw.sub.start	Sub job network execution has started.	JNW_START JOBS_JNW_START

0x2002	jnwsv.jnw.sub.end	Sub job network execution has ended.	JNW_END JOBS_JNW_END
0x2004	jnwsv.jnw.ovt	Job network execution has exceeded the scheduled time.	JNW_TOTAL_TIME_EXCEEDED JOBS_JNW_OVERTIME
0x2009	jnwsv.jnw.cri	Critical point warning time set in job network has been exceeded.	JNW_CRITICAL_POINT_CHECK JOBS_JNW_CRITICALPOINT_ALERT
0x2010	jnwsv.dialog.start	Waiting for dialog.	JNW_DIALOG_START JOBS_DIALOG_START
0x2011	jnwsv.dialog.end	Restarted from the state of waiting for dialog.	JNW_DIALOG_END JOBS_DIALOG_END
0x2020	jnwsv.eventsend.start	Event transmission has started.	JNW_EVENTSEND_START JOBS_JNW_EVENTSEND_START
0x2021	jnwsv.eventsend.end	Event transmission has ended.	JNW_EVENTSEND_END JOBS_JNW_EVENTSEND_END
0x2022	jnwsv.eventsend. timeout	Event transmission has exceeded the scheduled time.	JNW_EVENTSEND_TIMEOUT JOBS_JNW_EVENTSEND_TIMEOUT
0x2024	jnwsv.eventrecv.start	Event reception has ended.	JNW_EVENTRECEIVE_START JOBS_JNW_EVENTRECEIVE_START
0x2025	jnwsv.eventrecv.end	Event reception has ended.	JNW_EVENTRECEIVE_END JOBS_JNW_EVENTRECEIVE_END
0x2026	jnwsv.eventrecv. timeout	Event reception has exceeded the scheduled time.	JNW_EVENTRECEIVE_TIMEOUT JOBS_JNW_EVENTRECEIVE_TIMEOUT
0x2030	jnwsv.holdevent. overwrite	The retained event is overwritten.	JNW_HOLDEVENT_OVERWRITE JOBS_JNW_HOLDEVENT_OVERWRITE
0x2031	jnwsv.holdevent.max	The retained number of events exceeded the number of reservable events.	JNW_HOLDEVENT_MAX JOBS_JNW_HOLDEVENT_MAX
0x2032	jnwsv.holdevent. timeout	The retained events disappeared after exceeding the validity period.	JNW_HOLDEVENT_TIMEOUT JOBS_JNW_HOLDEVENT_TIMEOUT
0x2006	jnwsv.uj.start	Unit job has started.	JNW_UNITJOB_START JOBS_UJOB_START
0x2007	jnwsv.uj.end	Unit job has ended.	JNW_UNITJOB_END JOBS_UJOB_END

0x2003	jnwsv.uj.err	Unit job has ended due to an error.	JNW_UNITJOB_ERROR JOBS_UJOB_ERROR
0x2008	jnwsv.uj.estop	Unit job execution has stopped due to an error.	JNW_ERROR_STOP JOBS_UJOB_ESTOP
0x2005	jnwsv.uj.ovt	Execution of unit job has exceeded the scheduled time.	JNW_UNITJOB_TIME_EXCEEDED JOBS_UJOB_OVERTIME
0x200a	jnwsv.uj.cri	Critical point warning time set in a unit job has been exceeded.	JNW_UNITJOB_CRITICAL_POINT_CHECK JOBS_UJOB_CRITICALPOINT_ALERT
0x200b	jnwsv.uj.warn	Execution of unit job has ended receiving warning.	JNW_UNITJOB_WARNING JOBS_UJOB_WARNING
0x2006	jnwsv.sapj.start	ERP job has started.	JNW_ERPJOB_START JOBS_UJOB_START
0x2007	jnwsv.sapj.end	ERP job has ended.	JNW_ERPJOB_END JOBS_UJOB_END
0x2003	jnwsv.sapj.err	ERP job has ended due to an error.	JNW_ERPJOB_ERROR JOBS_UJOB_ERROR
0x2008	jnwsv.sapj.estop	ERP job execution has stopped due to an error.	JNW_ERPJOB_ERROR_STOP JOBS_UJOB_ESTOP
0x2005	jnwsv.sapj.ovt	Execution of ERP job has exceeded the scheduled time.	JNW_ERPJOB_TIME_EXCEEDED JOBS_UJOB_OVERTIME
0x2006	jnwsv.sbwj.start	BI job has started.	JNW_BIJOB_START JOBS_UJOB_START
0x2007	jnwsv.sbwj.end	BI job has ended.	JNW_BIJOB_END JOBS_UJOB_END
0x2003	jnwsv.sbwj.err	BI job has ended due to an error.	JNW_BIJOB_ERROR JOBS_UJOB_ERROR
0x2008	jnwsv.sbwj.estop	BI job execution has stopped due to an error.	JNW_BIJOB_ERROR_STOP JOBS_UJOB_ESTOP
0x2005	jnwsv.sbwj.ovt	Execution of BI job has exceeded the scheduled time.	JNW_BIJOB_TIME_EXCEEDED JOBS_UJOB_OVERTIME
0x2006	jnwsv.spcj.start	PC job has started.	JNW_PCJOB_START JOBS_UJOB_START
0x2007	jnwsv.spcj.end	PC job has ended.	JNW_PCJOB_END JOBS_UJOB_END

0x2003	jnwsv.spcj.err	PC job has ended due to an error.	JNW_PCJOB_ERROR JOBS_UJOB_ERROR
0x2008	jnwsv.spcj.estop	PC job execution has stopped due to an error.	JNW_PCJOB_ERROR_STOP JOBS_UJOB_ESTOP
0x2005	jnwsv.spcj.ovt	Execution of PC job has exceeded the scheduled time.	JNW_PCJOB_TIME_EXCEEDED JOBS_UJOB_OVERTIME
0x2006	jnwsv.ucxsj.start	UCXSingle job has started.	JNW_UCXSJOB_START JOBS_UJOB_START
0x2007	jnwsv.ucxsj.end	UCXSingle job has ended.	JNW_UCXSJOB_END JOBS_UJOB_END
0x2003	jnwsv.ucxsj.err	UCXSingle job has ended due to an error.	JNW_UCXSJOB_ERROR JOBS_UJOB_ERROR
0x2008	jnwsv.ucxsj.estop	UCXSingle job execution has stopped due to an error.	JNW_UCXSJOB_ERROR_STOP JOBS_UJOB_ESTOP
0x2005	jnwsv.ucxsj.ovt	Execution of UCXSingle job has exceeded the scheduled time.	JNW_UCXSJOB_TIME_EXCEEDED JOBS_UJOB_OVERTIME
0x200a	jnwsv.ucxsj.cri	Critical point warning time set in a UCXSingle job has been exceeded.	JNW_UCXSJOB_CRITICAL_POINT_CHECK JOBS_UJOB_CRITICALPOINT_ALERT
0x2006	jnwsv.wobsj.start	WOBS job has started.	JNW_WOBSJOB_START JOBS_UJOB_START
0x2007	jnwsv.wobsj.end	WOBS job has ended.	JNW_WOBSJOB_END JOBS_UJOB_END
0x2003	jnwsv.wobsj.err	WOBS job has ended due to an error.	JNW_WOBSJOB_ERROR JOBS_UJOB_ERROR
0x2008	jnwsv.wobsj.estop	WOBS job execution has stopped due to an error.	JNW_WOBSJOB_ERROR_STOP JOBS_UJOB_ESTOP
0x2005	jnwsv.wobsj.ovt	Execution of WOBS job has exceeded the scheduled time.	JNW_WOBSJOB_TIME_EXCEEDED JOBS_UJOB_OVERTIME
0x200a	jnwsv.wobsj.cri	Critical point warning time set in a WOBS job has been exceeded.	JNW_WOBSJOB_CRITICAL_POINT_CHECK JOBS_UJOB_CRITICALPOINT_ALERT
0x200b	jnwsv.wobsj.warn	Execution of WOBS job has ended receiving warning.	JNW_WOBSJOB_WARNING JOBS_UJOB_WARNING

0x2012	jnwsv.waittime.notstart	Start status does not take place at the time specified by parts waiting time.	JNW_WAITTIME_NOT_START JOBS_WAITTIME_NOSTART
0x0151	notice.daemon.startup	JobCenter has started.	NODE_DAEMON_START JOBS_NODE_START
0x0152	notice.daemon.shutdown	JobCenter has ended.	NODE_DAEMON_STOP JOBS_NODE_END
0x2033	jnwsv.que.ustart	User has started queue.	User start the queue(<queue name>).
0x2034	jnwsv.que.ustop	User has stopped queue.	User stop the queue(<queue name>).
0x2035	jnwsv.que.sstop	JobCenter has stopped queue.	Since abnormalities occurred, the queue (<queue name>:status=<status>) was stopped(<detail>). Please check the state of queue, job, system, etc. And start queue after resolving the problem.
0x2036	jnwsv.release.start	Release plan has started.	RELEASE_START (HostName=<hostname>, User=<user name>, EstimateTime=<expected release time>).
0x2037	jnwsv.release.end	Release plan has ended.	RELEASE_END (HostName=<hostname>, User=<user name>, EstimateTime=<expected release time>).
0x2038	jnwsv.release.err	Release plan has ended due to an error.	RELEASE_ERROR (HostName=<hostname>, User=<user name>, EstimateTime=<expected release time>).

> ⚠ ■In the messages, % (except for macro definition) must not be used.
>
> ■Consecutive macros (% to %) must not be described.
>
> ■Event of notice.* cannot use macros (except for the OPCMSG tag parameter).
>
> ■If a failure occurs in the transmission destination, events that have not yet been transmitted may be deleted in some cases.
>
> ■If the configuration file does not have the above entries, they need to be added.
>
> ■The event output settings must be performed on the send destination machine retaining the event.
>
> ■Because the event summary is shared for events from jnwsv.uj.start to jnwsv.uj.cri, events from jnwsv.sapj.start to jnwsv.sapj.ovt, events from jnwsv.sbwj.start to jnwsv.sbwj.ovt, and events from jnwsv.ucxsj.start to jnwsv.ucxsj.cri, such events must be able to distinguish each other by using the event message contents.
>
> ■Custom jobs are handled in the same way as the unit job both when they are executed and when an event is output. When a custom job is used for event linkage, specify the event type name of jnwsv.uj.*.

11.3. Event Linkage in Windows Version

The Windows version can perform the following event linkage operations:

■To output a JobCenter event to the specified event log file, refer to Section 11.3.1, "Method of Outputting an Event to the Event Log File".

■To output a JobCenter event to the Windows event log and notify the ESMPRO/Integrated Viewer (AlertManager) of this event via ESMPRO/SA, refer to Section 11.3.2, "ESMPRO/Integrated Viewer".

■To send an event to the HP OpenView Operations message viewer via the API, refer to Section 11.3.3, "HP Operations Manager".

11.3.1. Method of Outputting an Event to the Event Log File

This section describes how to output a JobCenter event to the event log file.

1. Enable output setting of the event log file.

   1. Log on to Windows using the administrator account and launch Environment Settings.

   2. Select [Sites] in the left pane.

   3. In the right pane, double-click the site for which to set the event setting.

   4. Select the [Log] tab, and check the [Output the log file] check box.

   5. Specify the settings related to log files.
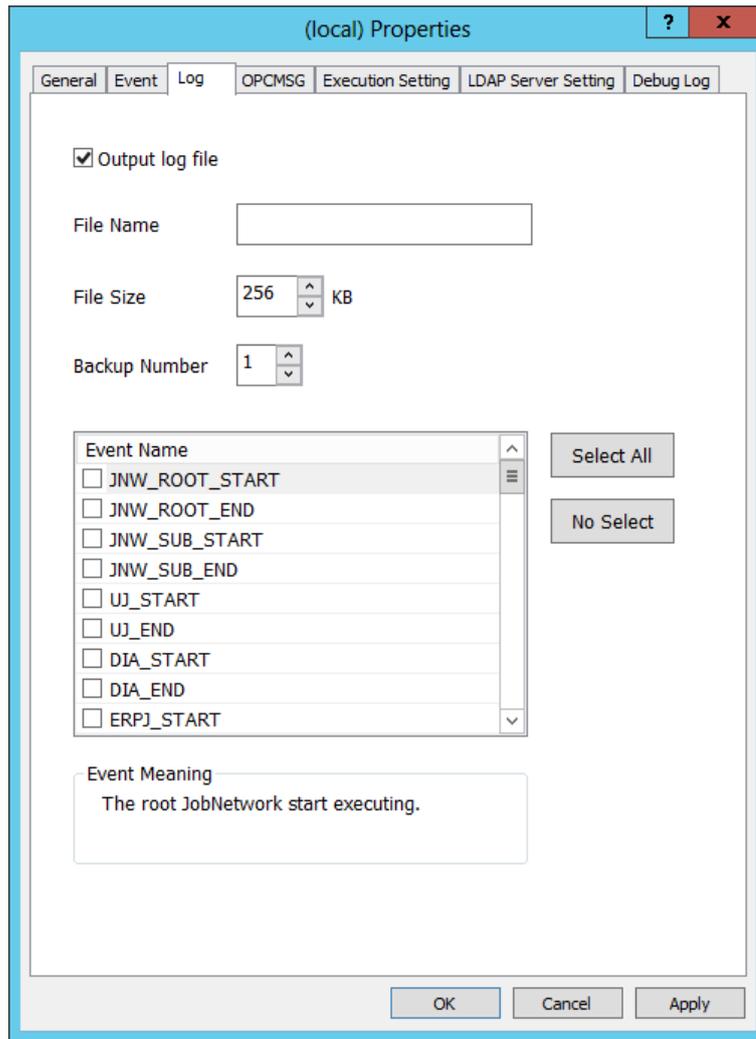
Figure 11.3. Example of log tab screen

■File name

An absolute path or a relative path is available to specify a log file. The following shows a path specification example.

Absolute path	d:\mywork\me\jnwenginevent.log
Relative path	\aaa\bbb\event.log

The starting folder when specifying a relative path for a local site or cluster environment is shown below.

Local site	%InstallDirectory%\spool
Cluster site	<JobCenterDB-path>\spool

%InstallDirectory% is the installation directory of JobCenter. By default, C:\JobCenter\SV.

<JobCenterDB-path> is on the shared disk that was specified when running cjcmksit.

■File size

The valid range of the file size is 64 to 4096 KB.

■Backups

The valid range of the number of backups is 1 to 10

6. Check the check box for the name of the JobCenter event to be output.

For event details, refer to Section 11.3.5, "Event Type".

■ [Select All] button

Checks all the event names.

■ [No Select] button

Clears all check boxes.

2. Press the [OK] or [Apply] button to enable the settings.

The following dialog box appears. After the site restarts, the above settings are enabled.
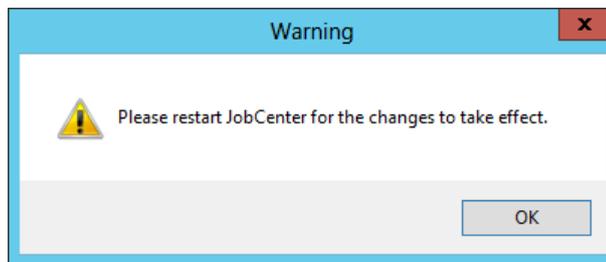
Figure 11.4. Example of restart screen

| ⚠ | The log is output in SJIS code regardless of the character code setting. |

11.3.2. ESMPRO/Integrated Viewer

Job execution status can be notified to the operation manager.

In the NCE Express 5800 series (this indicates the server of Windows2000, 2003, here), ESMPRO/ServerAgent and ESMPRO/ServerManager, playing the basic role of operation management, is attached to the standard server by NEC's proprietary software generically called "ESMPRO."

In the basic management and operation of the Express server, ESMPRO/ServerAgent and ESMPRO/ServerManager are used first to monitor and manage failure states that may occur in hardware components of the Express server.

If JobCenter MG/SV is constructed in an Express server having this mechanism, job execution status can be notified to ESMPRO/integrated viewer (ESMPRO/ServerManager) constructed in a management PC. The operation manager can view the execution status notified by the alert viewer/data viewer.

11.3.2.1. Installation Procedure

It is recommended to install in the following order.

1. Installing and setting ESMPRO/ServerAgent

Install ESMPRO/ServerAgent in the Express server.

For details on the installation and settings of ESMPRO/ServerAgent, refer to the "ESMPRO/ServerAgent Installation Guide" bundled in EXPRESSBUILDER CD-ROM.

2. Installing and setting ESMPRO/ServerManager

Install ESMPRO/ServerManager in a management PC. ESMPRO/ServerManager can also be installed in the main unit of Express server/workstation.

For details on the installation and settings of ESMPRO/ServerManager, refer to the "ESMPRO/ServerManager Installation Guide" bundled in EXPRESSBUILDER CD-ROM.

3. Message test between ESMPRO/ServerAgent and ESMPRO/ServerManager

Before installing JobCenter SV, check the notification test between ESMPRO/ServerAgent installed in step 1 and ESMPRO/ServerManager.

■Configuration on the Agent Side

When Windows 2000 and ESMPRO/ServerAgent Version 3.8 are installed on the Agent side, make settings following the procedure below:

a. On Windows desktop, select [Start], [Settings], [Control Panel], and then [NEC ESMPRO Agent].

b. Double-click [NEC ESMPRO Agent].
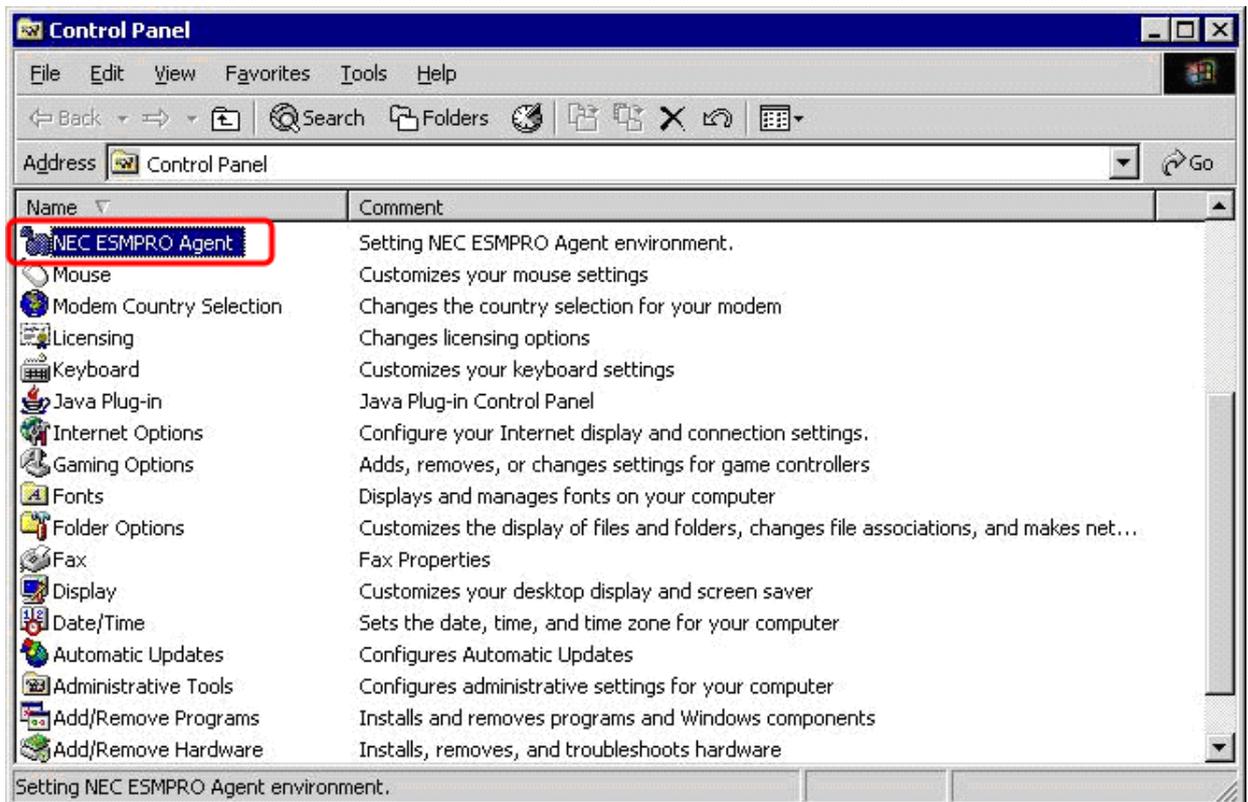
Figure 11.5. Screenshot that shows [NEC ESMPRO Agent] is selected

c. The [NEC ESMPRO Agent Ver.x.xx Properties] dialog box opens. Select the [General] tab and then click [Report Setting].
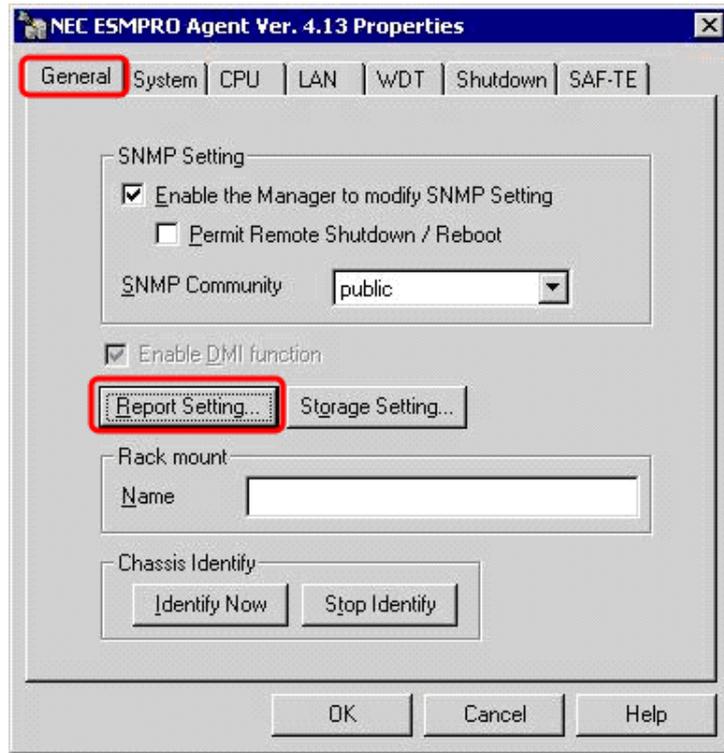
Figure 11.6. Screenshot of the [NEC ESMPRO Agent Ver.x.xx Properties] dialog box

d. The [Alert Manager] window opens. On the menu bar, select [Set] and then click [Destination Setting].
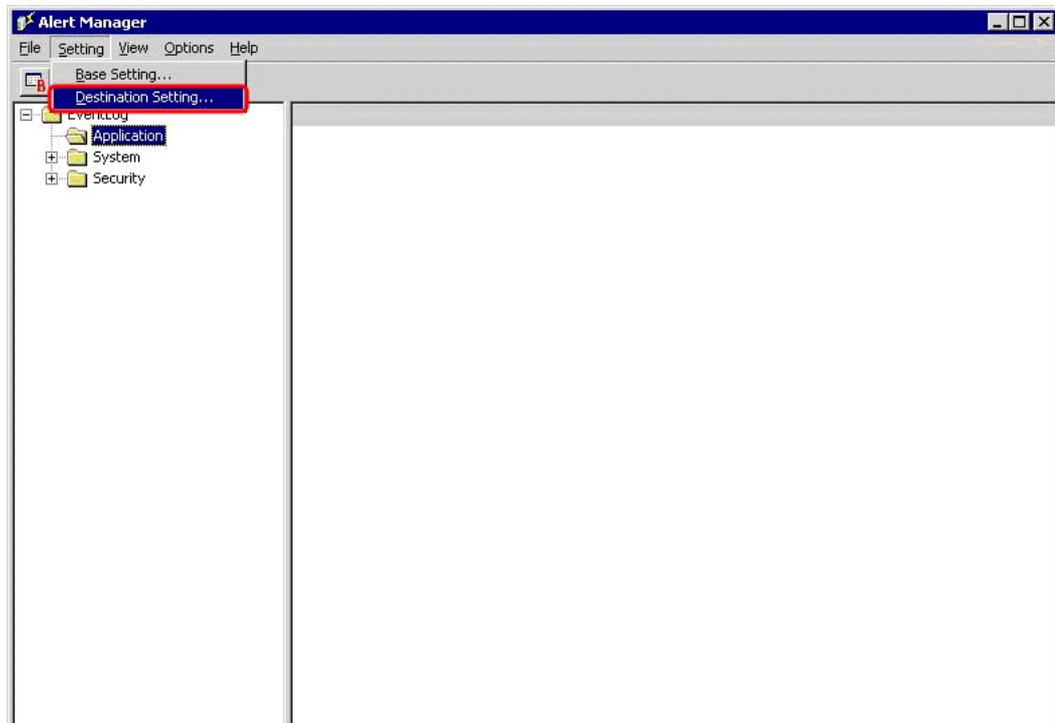
Figure 11.7. Screenshot of the [Alert Manager] window

e. This description uses a model that adopts [Manager (TCP/IP In-Band)] for the method to transfer messages. In the ID area of the [Destination Setting] dialog box, select [Manager (TCP/IP In-Band)] in the [Method] column and then click [Modify ID].
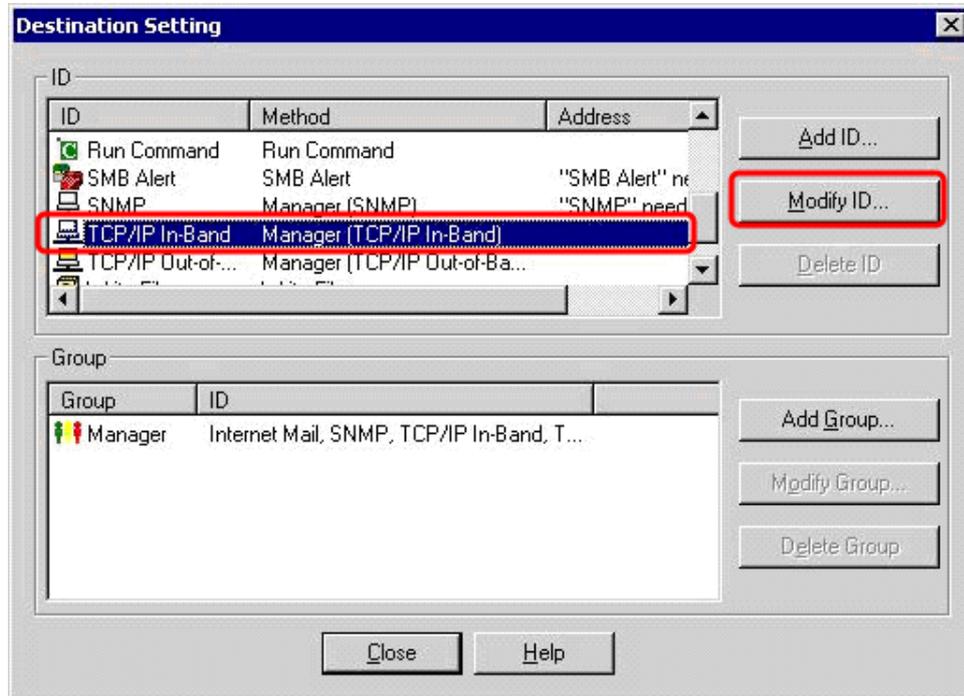
Figure 11.8. Screenshot of the [Destination Setting] dialog box

f. The [ID Setting] dialog box opens. Click [Address].
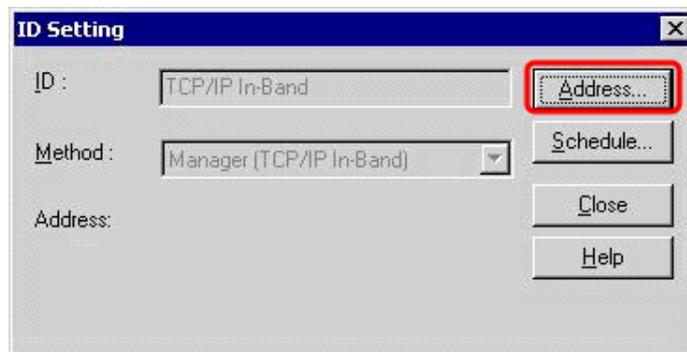
Figure 11.9. Screenshot of the [ID Setting] dialog box

g. The [Manager (TCP/IP In-Band) Setting] dialog box opens. Click [Report Test]. An alert is sent to ESMPRO/Integrated viewer "ESMPRO/ServerManager".

Figure 11.10. [Manager (TCP/IP In-Band) Setting] dialog box

■Configuration on the Manager Side

When Windows 2000 and ESMPRO/Integrated viewer (ESMPRO/ServerManagerVersion3.8) are installed on the Manager side, make settings following the procedure below:

a. On Windows desktop, select [Start], [All Programs], [ESMPRO], and [Integrated Viewer] to open the Operation Window.

b. The Operation Window opens. Select [Tools] and then click [Alert Viewer].
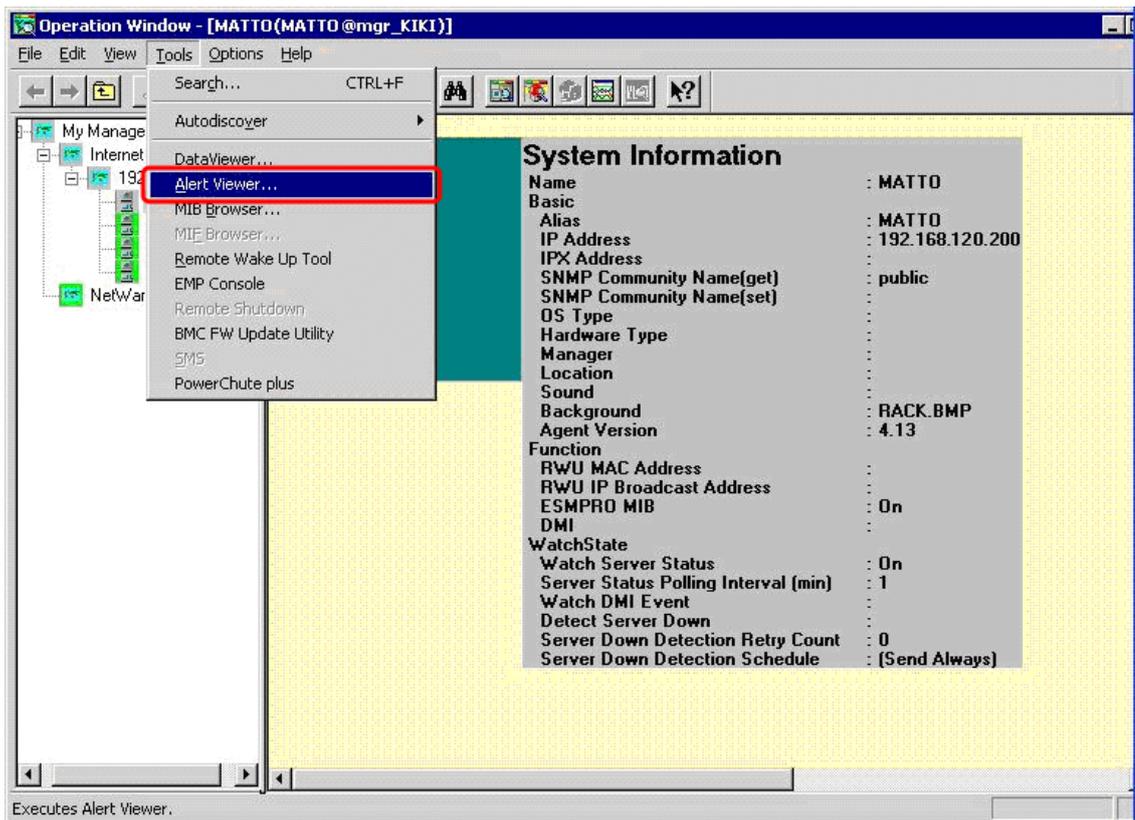
Figure 11.11. Screenshot of [Operation Window]

c. The [Alert Viewer] dialog box opens. Double-click [TEST_TRAP_NAME] in the alert list.
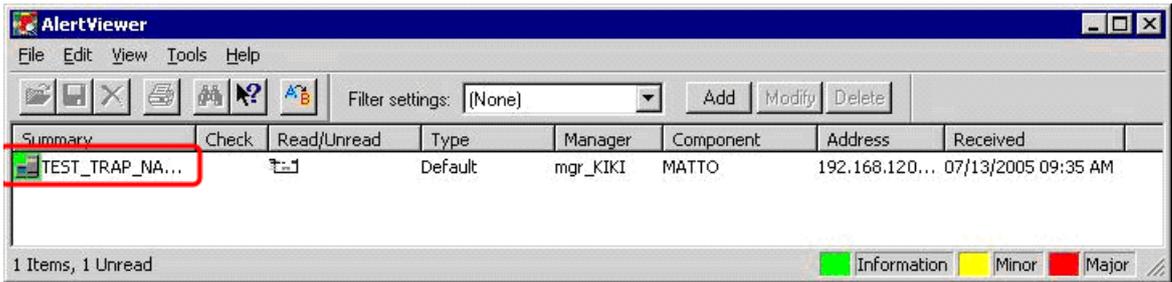
Figure 11.12. Screenshot of the [Alert Viewer] window

d. The [General] tab of the [Details] dialog box opens. Check the message test for normalcy.
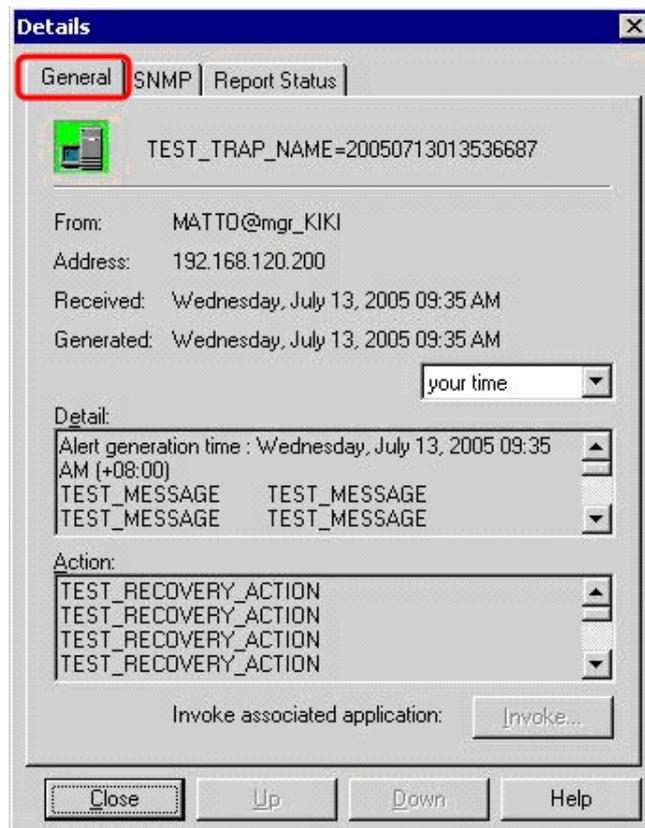
Figure 11.13. Screenshot of the [General] tab of the [Details] dialog box

4. Installing and setting JobCenter SV

Install JobCenter SV in the Express server. Install ESMPRO/ServerAgent and ESMPRO/ServerManager before JobCenter SV and CL/Win.

For details on the installation and setting of JobCenter SV, refer to the "JobCenter SV Installation Guide."

> For the Windows version of JobCenter, MG and SV are in the same installation package.

5. Monitor event message test between ESMPRO/ServerAgent and ESMPRO/ServerManager

After installing JobCenter SV, check the notification test between ESMPRO/ServerAgent and ESMPRO/ServerManager related to the notification of JobCenter monitoring events as described below.

■Configuration on the Agent Side

The setup method when the agent side is Windows 2000 ESMPRO/ServerAgent Version 3.8 is as follows. Steps a to e are the same as the steps in "Agent-side settings" in "3. Testing the Communication Between ESMPRO/ServerAgent and ESMPRO/ServerManager" above. When Windows 2000 and ESMPRO/ServerAgent Version 3.8 are installed on the Agent side, make settings following the procedure below. Steps a to e are the same as described in the "Configuration on the Agent side" of "3. Message test between ESMPRO/ServerAgent and ESMPRO/ServerManager."

a. On Windows desktop, select [Start], [Settings], [Control Panel], and then [NEC ESMPRO Agent].

b. Double-click [NEC ESMPRO Agent].

c. The [NEC ESMPRO Agent Ver.x.xx Properties] dialog box opens. [General] tab is selected and then click [Report Setting].

d. The [Alert Manager] window opens. On the menu bar, select [Setting] and then click [Destination Setting]. This description uses a model that adopts [Manager (TCP/IP In-Band)] for the method to transfer messages.

e. Open the layer of the [Event Log] tree and then check for [Event Source Name] JNWEXE under the Application type of the [Event Log].

f. Right-click an [Event ID] in [Event Source Name] JNWEXE, and then select [Test] from the shortcut menu.
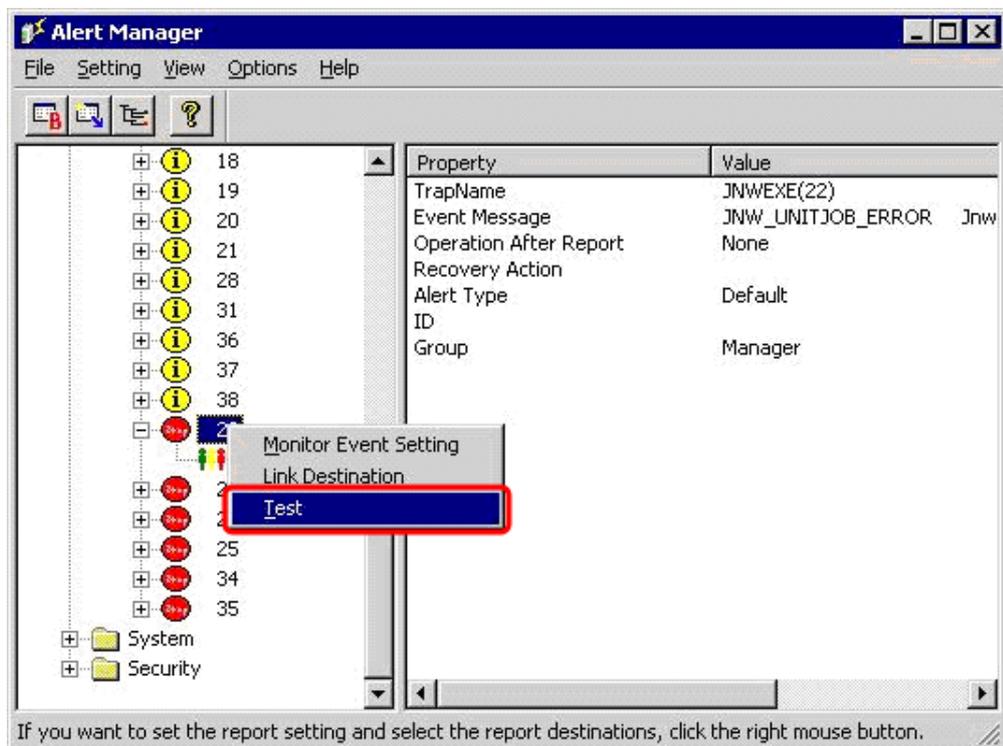
Figure 11.14. Screenshot of the [Alert Manager] window

g. An alert to ESMPRO/Integrated viewer [ESMPRO/ServerManager] is sent.

■Configuration on the Manager Side

When Windows 2000 and ESMPRO/Integrated viewer (ESMPRO/ServerManager Version3.8) are installed on the Manager side, make settings following the procedure below:

a. On Windows desktop, select [Start], [All Programs], [ESMPRO], and then [Integrated Viewer] to open the Operation Window.

b. The Operation Window opens. Select [Tools] and then click [Alert Viewer].

c. The [Alert Viewer] dialog box opens. Double-click [TEST_TRAP_NAME] in the alert list.
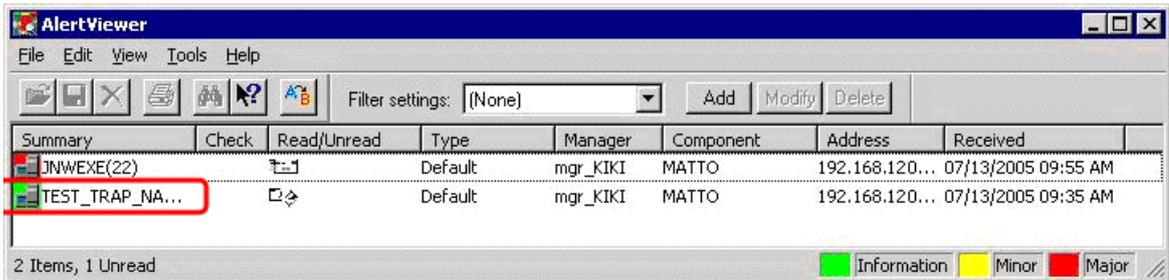
Figure 11.15. Screenshot of the [Alert Viewer] window

d. The [General] tab of the [Details] dialog box opens. Check whether the message test was conducted normally.
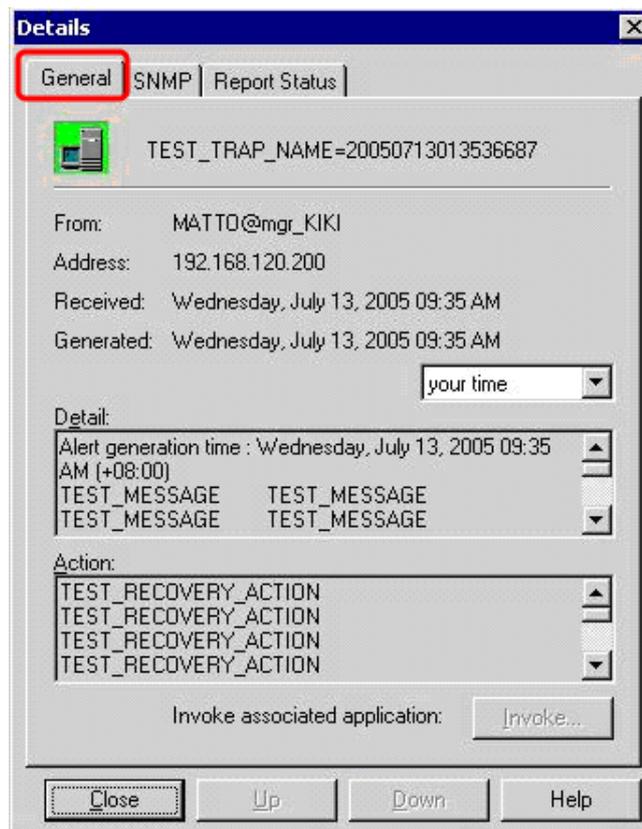
Figure 11.16. Screenshot of the [General] tab of the [Details] dialog box

11.3.2.2. Select the Event to be Notified

Events to report and settings for outputting the log file can be specified on each tab in the [Detail settings] dialog box.

1. After logging on to Windows with the administrator account, select [All Programs], [JobCenter], [SV], and then [Environment Setting] from the Windows [Start] menu to open the [Environment Setting] window.

2. Click [Site] in the left pane.
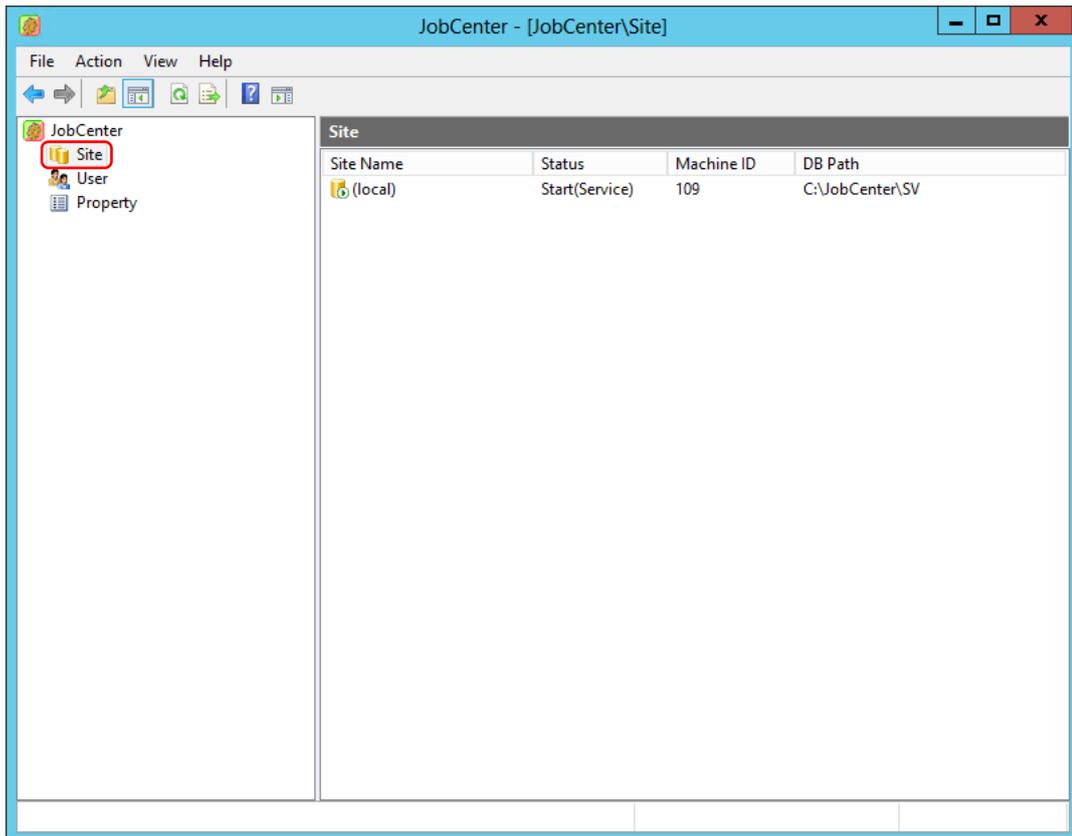
Figure 11.17. Site in the [Environment Setting] window

3. In the right pane, double-click a site for which to set up an event to open the [Properties] dialog box for the site, and then select the [Event] tab.

4. Specify events to report. Select whether to transmit each event. To report an event, select the check box to the left of that event in the list.
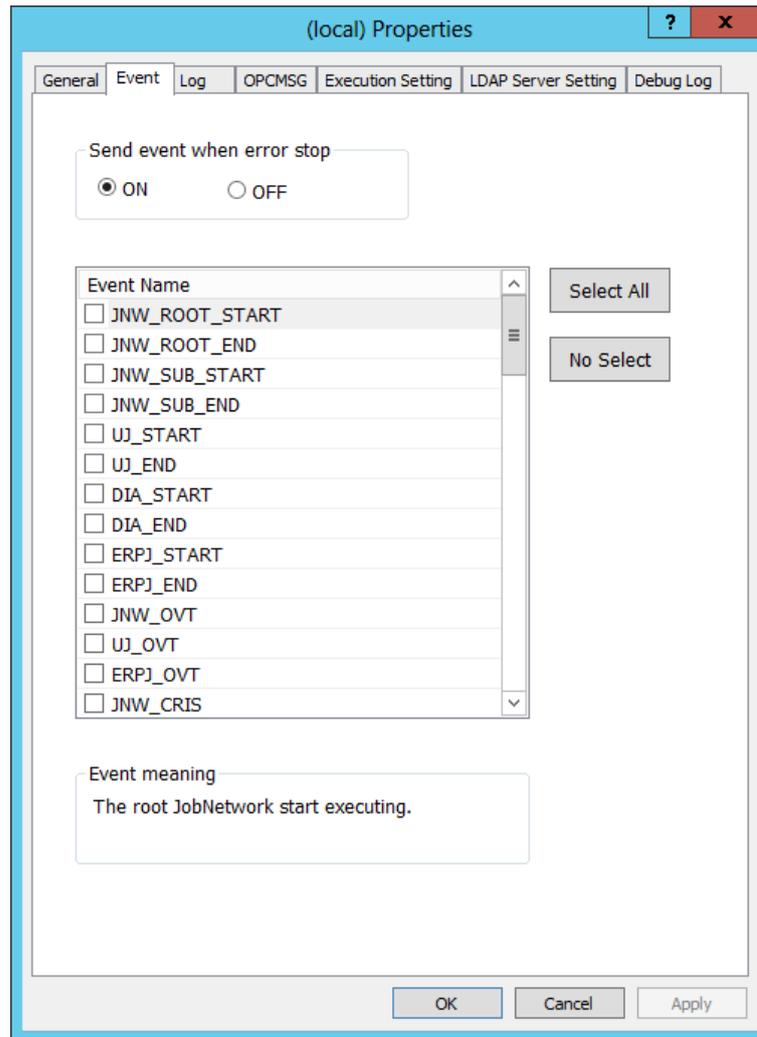
Figure 11.18. [Event] tab in the [Properties] dialog box

The setting items in the [Event] tab are described below:

■Send event when error stop

Specify whether to output a time-exceeded warning event when an event indicating that the job network tracker stopped due to an error is output.

Normally, if an error stop event (XXX_ESTOP) is selected from the above EVENT settings, a JNW_ERROR_STOP event is output when the job network tracker stops due to an error.

If the flow includes job waiting parts for which warnings have not arrived or parts for which settings with excessive warnings or critical point warnings are specified in the job network, and a time exceeded warning event (XXX_OVT) is selected, when the job network tracker stops due to an error, the result is that the time is exceeded and two error events are output: an error stop event and a time-exceeded event.

The related time-exceeded settings are as follows.

- End time excess of job network

- Critical point of job network

- End time excess of unit job

- Critical point of unit job

- Behind Schedule Alarm of Time Waiting part

Table 11.3. Details About [Send event when error stop]

[Send event when error stop] setting	Job network parameter [Behavior on failure] setting	Operation
ON	Enable/Disable	Outputs all events that are set to be output. (as in earlier versions)
OFF	Enable	Does not output time excess warning event if job network stops due to an error. Do not output an error event twice or more.
	Disable	Outputs all events that are set to ON for time excess warning.

■Event log selection

To obtain an event message for an event, select the check box to the left of that event in the list.

For event details, refer to Section 11.3.5, "Event Type".

■[Select All] button

Selects all check boxes.

■[No Select] button

Clears all check boxes.

■[Cancel] button

Cancels the settings and closes the [Properties] dialog box.

■[OK] and [Apply] buttons

Apply the settings specified in the [Properties] dialog box. The following message appears if [OK] or [Apply] is clicked. The specified settings are applied after the JobCenter site is restarted.
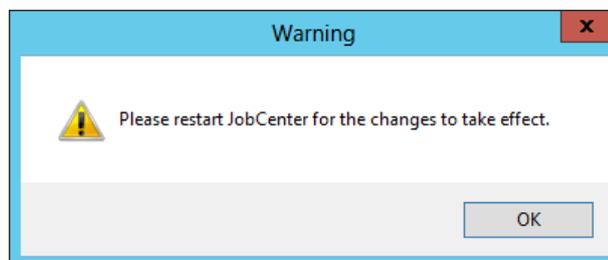
Figure 11.19. Restart Dialog Box

11.3.2.3. Windows Event Viewer Application Log

By associating events in the "Select Event" in the "Server Environment Setting", you can set a desired event to [Application Log] in [Event Viewer]:

■Job execution and its status by using the source name of "jnwexe"

■Status of a queue by using the source name of "NetShepherd"

The output format differs from that of the messages displayed in Alert Viewer of ESMPRO/ServerManager. Refer to the following table. Under Description message format in the table, %n indicates a line feed and %t indicates a tab.

Table 11.4. Events (Windows Event Viewer)

ID	Type	Description message format	Variables in message format	Cause of output
1	Information	JNW_START%n %tJnwName%t%t%1%n %tJnwUser%t%t%2%n %tStartTime%t%t%3	%1: Job network name %2: Job network owner name %3: Actual start time	A root JNW (not a sub-JNW) started.
2	Information	JNW_END%n %tJnwName%t%t%1%n %tJnwUser%t%t%2%n %tEndTime%t%t%3%n %tJnwStat%t%t%4	%1: Job network name %2: Job network owner name %3: Actual end time %4: Job network end status (Normal, Error)	A root JNW (not a sub-JNW) ended.
3	Information	SUBJNW_START%n %tJnwName:SubJnwName%t%1%n %tJnwUser%t%t%2%n %tStartTime%t%t%3	%1: Job network name: Sub-job network name %2: Job network owner name %3: Actual start time	A sub-JNW started.
4	Information	SUBJNW_END%n %tJnwName:SubJnwName%t%1%n %tJnwUser%t%t%2%n %tEndTime%t%t%3%n %tJnwStat%t%t%4	%1: Job network name: Sub-job network name %2: Job network owner name %3: Actual end time of the sub-job network %4: Sub-job network end status (Normal, Error)	A sub-JNW ended.
5	Information	JNW_UNITJOB_START%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3	%1: Job network name %2: Unit job name %3: Job network owner name	A unit job started.
6	Information	JNW_UNITJOB_END%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime-EndTime%t%4 - %5%n	%1: Job network name %2: Unit job name %3: Job network owner name %4: Actual start time	A unit job ended.

			%5: Actual end time	
7	Information	JNW_DIALOG_START%n %tJnwName%t%t%1%n %tJnwUser%t%t%2%n %tDIALOG:UjName%t%3%n %tDIALOG:Dialog-Msg%t%4	%1: Job network name %2: Job network owner name %3: Dialog job name %4: Value specified in the [Message in the Dialog setting] dialog box	A dialog job started.
8	Information	JNW_DIALOG_END%n %tJnwName%t%t%1%n %tJnwUser%t%t%2%n %tDIALOG:UjName%t%3%n %tDIALOG:Dialog-Msg%t%4	%1: Job network name %2: Job network owner name %3: Dialog job name %4: Value specified in the [Message in the Dialog setting] dialog box	A dialog job ended.
9	Information	JNW_ERPJOB_START%n %tJnwName:ERPjName%t%1:%2%n %tJnwUser%t%t%3	%1: Job network name %2: ERP job name %3: Job network owner name	An ERP job started.
10	Information	JNW_ERPJOB_END%n %tJnwName:ERPjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime-EndTime%t%4 - %5%n	%1: Job network name %2: ERP job name %3: Job network owner name %4: Actual start time %5: Actual end time	An ERP job ended.
11	Warning	JNW_TOTAL_TIME_EXCEEDED%n %tJnwName%t%t%1%n %tJnwUser%t%t%2%n %tStartTime%t%t%3%n %tWarning Time%t%4%n %tAction%t%t%5%n	%1: Job network name %2: Job network owner name %3: Actual start time %4: Expected execution end time %5: Operation (forcestop,off,skip)	The JNW job execution time was longer than the specified expected execution time.
12	Warning	JNW_UNITJOB_TIME_EXCEEDED%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n %tWarning Time%t%5%n %tAction%t%t%6%n	%1: Job network name %2: Unit job name %3: Job network owner name %4: Actual start time %5: Expected execution end time %6: Operation (forcestop,off,skip)	The unit job execution time was longer than the specified expected execution time.
13	Warning	JNW_ERPJOB_TIME_EXCEEDED%n	%1: Job network name	The ERP job

				execution time was longer than the specified expected execution time.
		%tJnwName:ERPjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime%t%t%4	%2: ERP job name %3: Job network owner name %4: Actual start time	
14	Warning	JNW_CRITICAL_POINT START%n %tJnwName%t%t%1%n %tJnwUser%t%t%2%n %tWarning Time%t%3%n %tAction%t%t%4%n	%1: Job network name %2: Job network owner name %3: Expected execution start time %4: Operation (off,skip,hold)	The JNW job execution did not start at the expected execution start time.
15	Warning	JNW_CRITICAL_POINT END%n %tJnwName%t%t%1%n %tJnwUser%t%t%2%n %tWarning Time%t%3%n %tAction%t%t%4%n	%1: Job network name %2: Job network owner name %3: Expected execution end time %4: Operation (off,skip,hold,forcestop)	The JNW job execution did not end at the expected execution end time.
16	Warning	UNITJOB_CRITICAL_POINT START%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n %tAction%t%t%5%n	%1: Job network name %2: Unit job name %3: Job network owner name %4: Expected execution start time %5: Operation (off,skip,hold)	The unit job execution did not start at the expected execution start time.
17	Warning	UNITJOB_CRITICAL_POINT END%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n %tAction%t%t%5%n	%1: Job network name %2: Unit job name %3: Job network owner name %4: Expected execution end time %5: Operation (off,skip,hold,forcestop)	The unit job execution did not end at the expected execution end time.
18	Warning	ERPJOB_CRITICAL_POINT START%n %tJnwName:ERPjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n %tAction%t%t%5%n	%1: Job network name %2: ERP job name %3: Job network owner name %4: Expected execution start time %5: Operation (off,skip,hold)	The ERP job execution did not start at the expected execution start time.

19	Warning	ERPJOB_CRITICAL_POINT END%n %tJnwName:ERPjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n %tAction%t%t%5%n	%1: Job network name %2: ERP job name %3: Job network owner name %4: Expected execution end time %5: Operation (off,skip,hold,forcestop)	The ERP job execution did not end at the expected execution end time.
20	Warning	JNW_UNITJOB_WARNING%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n WarningMessage: %5	%1: Job network name %2: Unit job name %3: Job network owner name %4: Actual start time %5: Error output result	The exit code of the unit job is within the range of warning exit codes set in Unit Job Parameter setting.
21	Warning	JNW_WAITTIME_NOT_START%n %tJnwName%t%t%1%n %tJnwUser%t%t%2%n %tWait Time%t%t%3%n	%1: Job network name %2: Job network owner name %3: Waiting time	The time waiting job execution did not start at the defined expected time.
22	Error	JNW_UNITJOB_ERROR%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: Unit job name %3: Job network owner name %4: Actual start time %5: Error output result	The unit job caused an error.
23	Error	JNW_ERROR_STOP%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: Unit job name %3: Job network owner name %4: Actual start time %5: Error output result	A job other than an ERP, BI, or UCXSingle job caused an error in an environment in which "STOP" is specified for "Behavior on failure" in Jnw Parameter.

24	Error	JNW_ERPJOB_ERROR%n %tJnwName:ERPjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: ERP job name %3: Job network owner name %4: Actual start time %5: Error output result	The ERP job caused an error.
25	Error	JNW_ERPJOB_ERROR_STOP%n %tJnwName:ERPjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: ERP job name %3: Job network owner name %4: Actual start time %5: Error output result	The ERP job caused an error in an environment in which "STOP" is specified for "Behavior on failure" in Jnw Parameter.
26	Information	JNW_EVENTSEND_START%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3	%1: Job network name %2: Event transmission job name %3: Job network owner name	An event transmission job started.
27	Information	JNW_EVENTSEND_END%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime-EndTime%t%4 - %5%n	%1: Job network name %2: Event transmission job name %3: Job network owner name %4: Actual start time %5: Actual end time	An event transmission job ended.
28	Warning	JNW_EVENTSEND_TIMEOUT%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n %tHostName%t%t%5	%1: Job network name %2: Event transmission job name %3: Job network owner name %4: Timeout time	The event transmission job execution time was longer than the specified expected execution time.
29	Information	JNW_EVENTRECV_START%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3	%1: Job network name %2: Event reception job name %3: Job network owner name	An event reception job started.

30	Information	JNW_EVENTRECV_END%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime-EndTime%t%4 - %5%n	%1: Job network name %2: Event reception job name %3: Job network owner name %4: Actual start time %5: Actual end time	An event reception job ended.
31	Warning	JNW_EVENTRECV_TIMEOUT%n %tJnwName:UjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n	%1: Job network name %2: Unit job name %3: Job network owner name %4: Timeout time	The event reception job execution time was longer than the specified expected execution time.
32	Information	JNW_BIJOB_START%n %tJnwName:BIjName%t%1:%2%n %tJnwUser%t%t%3	%1: Job network name %2: BI job name %3: Job network owner name	A BI job started.
33	Information	JNW_BIJOB_END%n %tJnwName:BIjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime-EndTime%t%4 - %5%n	%1: Job network name %2: BI job name %3: Job network owner name %4: Actual start time %5: Actual end time	A BI job ended.
34	Error	JNW_BIJOB_ERROR%n %tJnwName:BIjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: BI job name %3: Job network owner name %4: Actual start time %5: Error output result	The BI job caused an error.
35	Error	JNW_BIJOB_ERROR_STOP%n %tJnwName:BIjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: BI job name %3: Job network owner name %4: Actual start time %5: Error output result	The BI job caused an error in an environment in which "STOP" is specified for "Behavior on failure" in BI Job Parameter.
36	Warning	JNW_HOLDEVENT_OVERWRITE%n	%1: Host name	The event ID of a

		%tEvtHost:ObjName%t%1:%2.%3/%4%n %tEVENTID%t%5	%2: Job network name %3: Tracker ID %4: Event transmission job name %5: Event ID	new transmission job is the same as of an event transmission job in HoldList. The older event information was overwritten.
37	Warning	JNW_HOLDEVENT_MAX%n %tEvtHost:ObjName%t%1:%2.%3/%4%n %tEVENTID%t%5	%1: Host name %2: Job network name %3: Tracker ID %4: Event transmission job name %5: Event ID	The maximum HoldList number for transmission jobs was reached and the Top event was deleted.
38	Warning	JNW_HOLDEVENT_TIMEOUT%n %tEvtHost:ObjName%t%1:%2.%3/%4%n %tEVENTID%t%5	%1: Host name %2: Job network name %3: Tracker ID %4: Event transmission job name %5: Event ID	The event retention period of the transmission job timed out and the event was deleted.
39	Information	JNW_UCXSJOB_START%n %tJnwName:UCXSjName%t%1:%2%n %tJnwUser%t%t%3	%1: Job network name %2: UCXSingle job name %3: Job network owner name	A UCXSingle job started.
40	Information	JNW_UCXSJOB_END%n %tJnwName:UCXSjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime-EndTime%t%4 - %5%n	%1: Job network name %2: UCXSingle job name %3: Job network owner name %4: Actual start time %5: Actual end time	A UCXSingle job ended.
41	Error	JNW_UCXSJOB_ERROR%n %tJnwName:UCXSjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: UCXSingle job name %3: Job network owner name %4: Actual start time %5: Error output result	The UCXSingle job caused an error.

42	Error	JNW_UCXSJOB_ERROR_STOP%n %tJnwName:UCXSjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: UCXSingle job name %3: Job network owner name %4: Actual start time %5: Error output result	The UCXSingle job caused an error in an environment in which "STOP" is specified for "Behavior on failure" in Jnw Parameter.
43	Warning	JNW_UCXSJOB_TIME_EXCEEDED%n %tJnwName:UCXSjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime%t%t%4%n	%1: Job network name %2: UCXSingle job name %3: Job network owner name %4: Actual start time %5: Expected execution end time %6: Operation (forcestop,off,skip)	The UCXSingle job execution time was longer than the specified expected execution time.
44	Warning	UCXSJOB_CRITICAL_POINT START%n %tJnwName:UCXSjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n ErrorMessage: %5	%1: Job network name %2: UCXSingle job name %3: Job network owner name %4: Expected execution start time %5: Operation (off,skip,hold)	The UCXSingle job execution did not start at the expected execution start time.
45	Warning	UCXSJOB_CRITICAL_POINT END%n %tJnwName:UCXSjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n %tAction%t%t%5%n	%1: Job network name %2: UCXSingle job name %3: Job network owner name %4: Expected execution end time %5: Operation (off,skip,hold,forcestop)	The UCXSingle job execution did not end at the expected execution end time.
46	Information	JNW_PCJOB_START%n %tJnwName:PCjName%t%1:%2%n %tJnwUser%t%t%3	%1: Job network name %2: PC job name %3: Job network owner name	A PC job started.
47	Information	JNW_PCJOB_END%n% tJnwName:PCjName%t%1:%2%n %tJnwUser%t%t%3%n	%1: Job network name %2: PC job name %3: Job network owner name	A PC job ended.

		%tStartTime-EndTime%t%4 - %5%n	%4: Actual start time %5: Actual end time	
48	Error	JNW_PCJOB_ERROR%n %tJnwName:PCjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: PC job name %3: Job network owner name %4: Actual start time %5: Error output result	The PC job caused an error.
49	Error	JNW_PCJOB_ERROR_STOP%n %tJnwName:PCjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: PC job name %3: Job network owner name %4: Actual start time %5: Error output result	The PC job caused an error in an environment in which "STOP" is specified for "Behavior on failure" in PC Job Parameter.
50	Information	JNW_WOBSJOB_START%n %tJnwName:WOBSjName%t%1:%2%n %tJnwUser%t%t%3	%1: Job network name %2: WOBS job name %3: Job network owner name	A WOBS job started.
51	Information	JNW_WOBSJOB_END%n %tJnwName:WOBSjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime-EndTime%t%4 - %5%n	%1: Job network name %2: WOBS job name %3: Job network owner name %4: Actual start time %5: Actual end time	A WOBS job ended.
52	Error	JNW_WOBSJOB_ERROR%n %tJnwName:WOBSjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: WOBS job name %3: Job network owner name %4: Actual start time %5: Error output result	The WOBS job caused an error.
53	Error	JNW_WOBSJOB_ERROR_STOP%n %tJnwName:WOBSjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n ErrorMessage: %5	%1: Job network name %2: WOBS job name %3: Job network owner name %4: Actual start time %5: Error output result	The WOBS job caused an error in an environment in which "STOP" is specified for "Behavior on failure"

ID	Type	Description message format	Variables in message format	Cause of output
				in Jnw Parameter.
54	Warning	JNW_WOBSJOB_TIME_EXCEEDED%n %tJnwName:WOBSjName%t%1:%2%n %tJnwUser%t%t%3%n %tStartTime%t%t%4%n	%1: Job network name %2: WOBS job name %3: Job network owner name %4: Actual start time %5: Expected execution end time %6: Operation (forcestop,off,skip)	The WOBS job execution time was longer than the specified expected execution time.
55	Warning	WOBSJOB_CRITICAL_POINT START%n %tJnwName:WOBSjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n ErrorMessage: %5	%1: Job network name %2: WOBS job name %3: Job network owner name %4: Expected execution start time %5: Operation (off,skip,hold)	The WOBS job execution did not start at the expected execution start time.
56	Warning	WOBSJOB_CRITICAL_POINT END%n %tJnwName:WOBSjName%t%1:%2%n %tJnwUser%t%t%3%n %tWarning Time%t%4%n %tAction%t%t%5%n	%1: Job network name %2: WOBS job name %3: Job network owner name %4: Expected execution end time %5: Operation (off,skip,hold,forcestop)	The WOBS job execution did not end at the expected execution end time.
57	Warning	WOBSJOB_WARNING%n %tJnwName:WOBSjName%t%1:%2%n %tJnwUser%t%t%3%n %tSTART%t%t%4%n%n WarningMessage: %5	%1: Job network name %2: WOBS job name %3: Job network owner name %4: Actual start time %5: Error output result	The exit code of the WOBS job is within the range of warning exit codes set in WOBS Job Parameter setting.

⚠ Custom jobs are handled in the same way as the unit job both when they are executed and when an event is output. When a custom job is used for event linkage, refer to the messages of JNW_UNITJOB_*** and UNITJOB_***.

Table 11.5. Events (NetShepherd)

ID	Type	Description message format	Variables in message format	Cause of output

29	Warning	The queue (%1: status=%2) was stopped due to an error (O22). Check the status of the queue, job, and system to remove the cause of the error and then start the queue.	%1:Queue name %2:Queue Status ID	The same as in the Description
4103	Information	User stopped the queue (%1).	%1:Queue name	The same as in the Description
4104	Information	User started the queue (%1).	%1:Queue name	The same as in the Description

11.3.3. HP Operations Manager

The Windows version of JobCenter can report job execution, states, and other information as events by linking with HP Operations Manager (formerly HP OpenView Operation).

1. After logging on to Windows with the administrator account, select [All Programs], [JobCenter], [SV], and then [Environment Setting] from the Windows [Start] menu to open the [Environment Setting] window.

2. Click [Site] in the left pane.
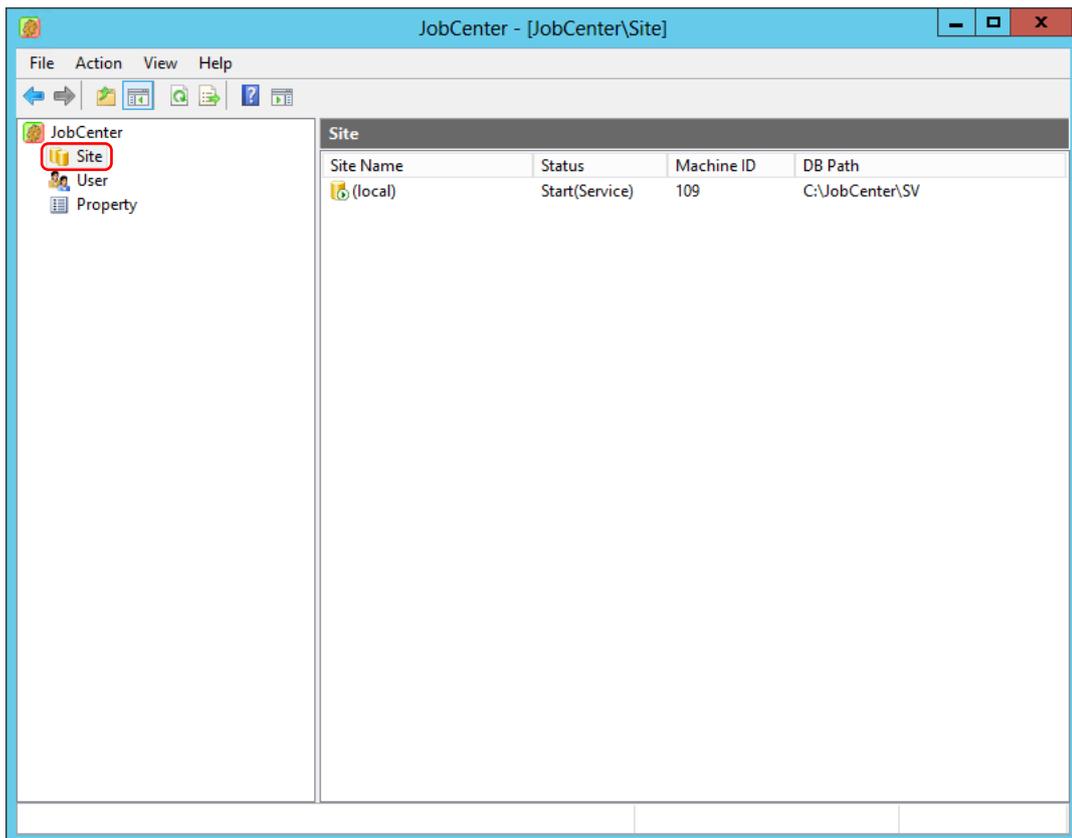
Figure 11.20. Site in the [Environment Setting] window

3. In the right pane, double-click a site for which to set up event linkage (OPCMSG linkage) to open the [Properties] dialog box for the site, and then select the [OPCMSG] tab.
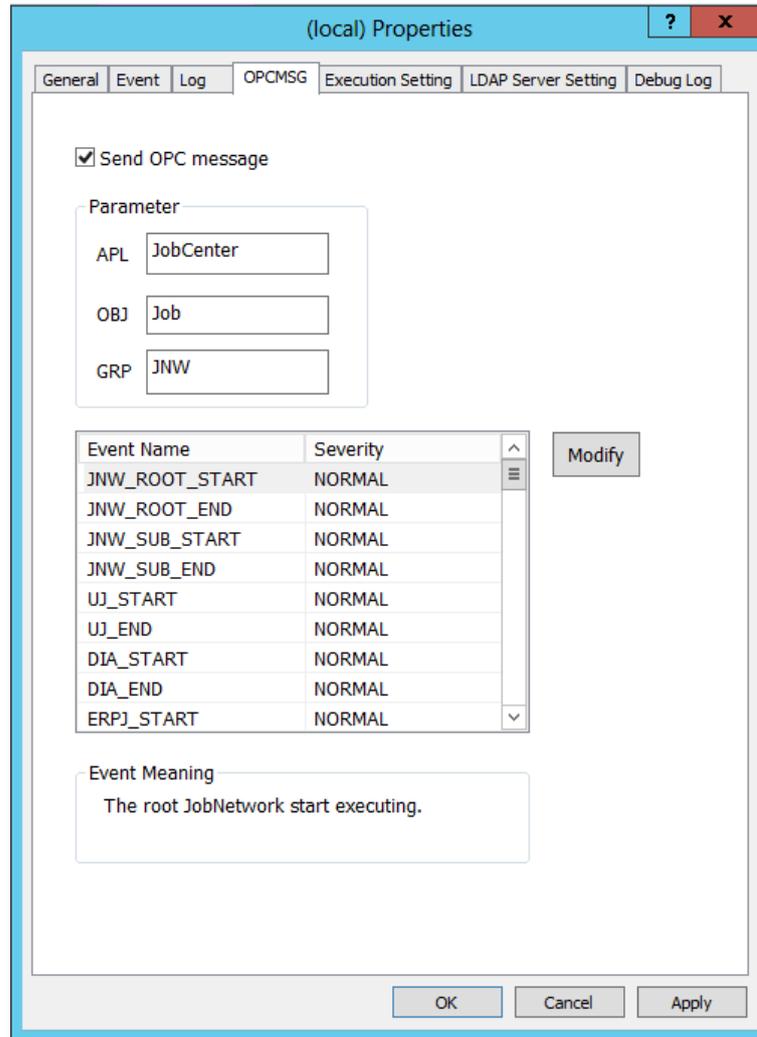
Figure 11.21. [OPCMSG] tab in the [Properties] dialog box

⚠ Because only the events whose check boxes are selected on the [Event] tab are reported, be sure to select the check boxes for the events to report before performing OPCMSG linkage.

The parameters on the [OPCMSG] tab are as follows.

■Send OPC message

Select whether to use the OPCMSG linkage.

If selected	Uses OPCMSG linkage function.
If not selected	Does not user OPCMSG linkage function.

■Parameter

Set the parameters of events notified to HP Operations Manager.

■APL

Specify the application name.

■OBJ

Specify the object name.

■GRP

Specify the message name.

■Event Name

Events that can be reported to HP Operations Manager are listed.

To actually report an event to HP Operations Manager, select the check box for the event on the [Event] tab in advance.

For event details, refer to Section 11.3.5, "Event Type".

■Severity

For events to report to HP Operations Manager, any one of the following severity attributes can be specified:

- NORMAL

- WARNING

- MINOR

- MAJOR

- CRITICAL

(The default is NORMAL.)

To change the severity of an event, double-click the event in the Event Name list or click the event and then click [Modify].

The following dialog box appears. Select a severity from the drop-down list.
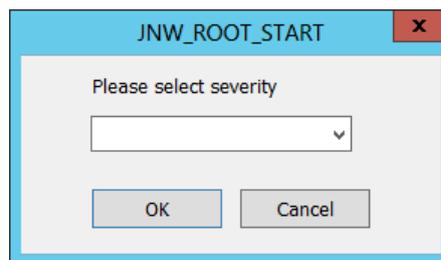
Figure 11.22. Severity Selection Dialog Box

■[Cancel] button

Cancels the settings and closes the [Properties] dialog box.

■[OK] and [Apply] buttons

Apply the settings specified in the [Properties] dialog box. The message below appears if [OK] or [Apply] is clicked. The specified settings are applied after JobCenter is restarted.
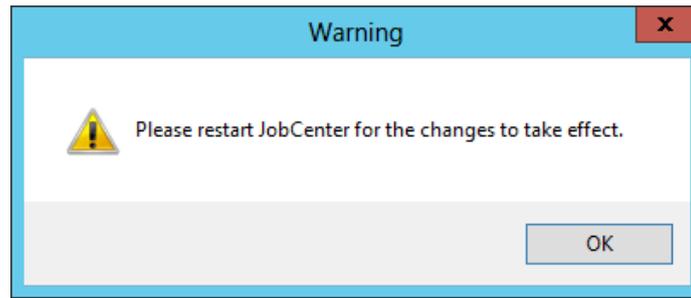
Figure 11.23. Restart Dialog Box

11.3.4. Event Definition File

■Path

Local site	%InstallDirectory%\spool\conf\jobexe.conf
Cluster site	<JobCenterDB-path>\spool\conf\jobexe.conf on the shared disk.

■Description

This file specifies the format of an event output to the event transmission destination. Note that the output format of an event log is fixed to that shown in Section 11.3.2.3, "Windows Event Viewer Application Log" and that the format specified in this file does not take effect.

The format is as follows:

```
EVENT <Event-Name> <Message-Body>
```

Event-Name	This is an event type name character string that indicates the type of event.
Message-Body	Specifies the message output pattern.

[Message output pattern]

Generally, a character string specified in Message-Body of the EVENT tag is output as is. However, a character string that is enclosed by % as shown in the table below is parsed as a macro character.

Macro characters are converted into a fixed pattern according to the content of the respective messages.

Up to 10 macros can be used in an event. If the number of macros in use exceeds this value, the excessive macro parts are ignored.

Macro	Conversion target	Specifiable event name
%jnwname%	This macro is converted into a job network name.	jnwsv.*
%starttime%	This macro is converted into a job network or unit job submission time in the format of "%H:%M:%S". In the case of jnwsv.*.cris, the macro is converted in the format of "%Y/%m/%d %H:%M:%S".	jnwsv.*
%endtime%	This macro is converted into a job network or unit job end time in the format of "%H:%M:%S". In the case of jnwsv.*.crie, the macro is converted in the format of "%Y/%m/%d %H:%M:%S".	jnwsv.*.end jnwsv.*.crie jnwsv.uj.err jnwsv.uj.estop

%ujname%	This macro is converted into a unit job name corresponding to the message.	jnwsv.dialog.* jnwsv.uj.* jnwsv.holdevent.*
%ujexecmac%	This macro is converted into the name of the machine that executes the unit job corresponding to the message.	jnwsv.uj.end jnwsv.holdevent.*
%ujerrmsg%	This macro is converted into an error message.	jnwsv.uj.err jnwsv.uj.estop
%dialog-msg%	This macro is converted into a dialog message.	jnwsv.*
%jnwuser%	This macro is converted into the name of the user who submitted the job network.	jnwsv.jnw.* jnwsv.uj.*
%jnwstat%	This macro is converted into the status of the job network (NORMAL or ERROR).	jnwsv.jnw.*.end
%trkid%	This macro is converted into a tracker ID.	jnwsv.holdevent.*
%evtid%	This macro is converted into an event ID.	jnwsv.holdevent.*
%sitename%	This macro is converted into the name of the host or cluster site where jnwcaster is running.	notice.daemon.* (OPCMSG tag only)
%trkpath%	This macro is converted into the path of the URL used to view the tracker for which an event has occurred by using CL/Web.	jnwsv.*
%partspath%	This macro is converted into the path of the URL used to view the tracker for which an event has occurred by using CL/Web.	jnwsv.uj.* jnwsv.sapj.* jnwsv.sbwj.* jnwsv.spcj.* jnwsv.ucxsj.* jnwsv.wobsj.*

11.3.5. Event Type

Refer to the following table for outputting to the Windows event log or the event log file and for the names and meanings of the events that should be selected when an event is notified via the API .

Table 11.6. Event names and meaning of each event

Selected event name	Output event message	Meaning of event
BIJ_END	JNW_BIJOB_END	BI job has ended.
BIJ_ERR	JNW_BIJOB_ERROR	BI job has ended due to an error.
BIJ_ESTOP	JNW_BIJOB_ERROR_STOP	BI job execution has stopped due to an error.
BIJ_START	JNW_BIJOB_START	BI job has started.
DIA_END	JNW_DIALOG_END	Restarted from the state of waiting for dialog.
DIA_START	JNW_DIALOG_START	Waiting for dialog.
EVTRCV_END	JNW_EVENTRECEIVE_END	Event reception has ended.

EVTRCV_OVT	JNW_EVENTRECEIVE_TIMEOUT	A time-out occurred in event reception.
EVTRCV_START	JNW_EVENTRECEIVE_START	Event reception has started.
EVTSND_END	JNW_EVENTSEND_END	Event transmission has ended.
EVTSND_OVT	JNW_EVENTSEND_TIMEOUT	A time-out occurred in event transmission.
EVTSND_START	JNW_EVENTSEND_START	Event transmission has started.
HLDEVT_MAX	JNW_HOLDEVENT_MAX	Number of events exceeded the number of reservable events.
HLDEVT_OVT	JNW_HOLDEVENT_TIMEOUT	Events disappeared after exceeding the validity period.
HLDEVT_OVW	JNW_HOLDEVENT_OVERWRITE	Event is overwritten.
JNW_CRIE	JNW_CRITICAL_POINT_CHECK_END	Critical point warning time (at end time) set in job network has been exceeded.
JNW_CRIS	JNW_CRITICAL_POINT_CHECK_START	Critical point warning time (at start time) set in job network has been exceeded.
JNW_OVT	JNW_TOTAL_TIME_EXCEEDED	Job network execution has exceeded the scheduled time.
JNW_ROOT_END	JNW_END	Parent job network execution has ended.
JNW_ROOT_START	JNW_START	Parent job network execution has started.
JNW_SUB_END	JNW_END	Sub job network execution has ended.
JNW_SUB_START	JNW_START	Sub job network execution has started.
ERPJ_CRIE	JNW_ERPJOB_CRITICAL_POINT	Critical point warning time (at end time) set in an ERP job has been exceeded.
ERPJ_CRIS	JNW_ERPJOB_CRITICAL_POINT	Critical point warning time (at start time) set in an ERP job has been exceeded.
ERPJ_END	JNW_ERPJOB_END	ERP job has ended.
ERPJ_ERR	JNW_ERPJOB_ERROR	ERP job has ended due to an error.
ERPJ_ESTOP	JNW_ERPJOB_ERROR_STOP	ERP job execution has stopped due to an error.
ERPJ_OVT	JNW_ERPJOB_TIME_EXCEEDED	ERP job execution has exceeded the scheduled time.
ERPJ_START	JNW_ERPJOB_START	ERP job has started.

UJ_CRIE	JNW_UNITJOB_CRITICAL_POINT_CHECK _END	Critical point warning time (at end time) set in a unit job has been exceeded.
UJ_CRIS	JNW_UNITJOB_CRITICAL_POINT_CHECK _START	Critical point warning time (at start time) set in a unit job has been exceeded.
UJ_END	JNW_UNITJOB_END	Unit job has ended.
UJ_ERR	JNW_UNITJOB_ERROR	Unit job has ended due to an error.
UJ_ESTOP	JNW_ERROR_STOP	Unit job execution has stopped due to an error.
UJ_OVT	JNW_UNITJOB_TIME_EXCEEDED	Unit job execution has exceeded the scheduled time.
UJ_START	JNW_UNITJOB_START	Unit job has started.
UJ_WARN	JNW_UNITJOB_WARNING	Unit job execution has ended receiving warning.
UCXSJ_CRIE	JNW_UCXSJOB_CRITICAL_POINT_CHECK _END	Critical point warning time (at end time) set in a UCXSJ job has been exceeded.
UCXSJ_CRIS	JNW_UCXSJOB_CRITICAL_POINT_CHECK _START	Critical point warning time (at start time) set in a UCXSJ job has been exceeded.
UCXSJ_END	JNW_UCXSJOB_END	UCXSJ job has ended.
UCXSJ_ERR	JNW_UCXSJOB_ERROR	UCXSJ job has ended due to an error.
UCXSJ_ESTOP	JNW_UCXSJOB_ERROR_STOP	UCXSJ job execution has stopped due to an error.
UCXSJ_OVT	JNW_UCXSJOB_TIME_EXCEEDED	UCXSJ job execution has exceeded the scheduled time.
UCXSJ_START	JNW_UCXSJOB_START	UCXSJ job has started.
PCJ_END	JNW_PCJOB_END	PC job has ended.
PCJ_ERR	JNW_PCJOB_ERROR	PC job has ended due to an error.
PCJ_ESTOP	JNW_PCJOB_ERROR_STOP	PC job execution has stopped due to an error.
PCJ_START	JNW_PCJOB_START	PC job has started.
WOBSJ_CRIE	JNW_WOBSJOB_CRITICAL_POINT_CHECK _END	Critical point warning time (at end time) set in a WOBS job has been exceeded.
WOBSJ_CRIS	JNW_WOBSJOB_CRITICAL_POINT_CHECK _START	Critical point warning time (at start time) set in a WOBS job has been exceeded.
WOBSJ_END	JNW_WOBSJOB_END	WOBS job has ended.
WOBSJ_ERR	JNW_WOBSJOB_ERROR	WOBS job has ended due to an error.

WOBSJ_ESTOP	JNW_WOBSJOB_ERROR_STOP	WOBS job execution has stopped due to an error.
WOBSJ_OVT	JNW_WOBSJOB_TIME_EXCEEDED	WOBS job execution has exceeded the scheduled time.
WOBSJ_START	JNW_WOBSJOB_START	WOBS job has started.
WOBSJ_WARN	JNW_WOBSJOB_WARNING	WOBS job execution has ended receiving warning.
WT_NSTA	JNW_WAITTIME_NOT_START	Start status does not take place at the time specified by parts waiting time.
QUE_USTART	-	The user has started a queue.
QUE_USTOP	-	The user has stopped a queue.
QUE_SSTOP	-	JobCenter has stopped a queue.

⚠ Custom jobs are handled in the same way as the unit job both when they are executed and when an event is output. When a custom job is used for event linkage, select the event name of UJ_***.

12 Setting up the Server Environment (for Windows)

"Server Environment Setting" is a GUI program used to set up the environment for the Windows version of JobCenter (MG/SV).

Server Environment Setting can be used to specify the settings for running the Windows version of JobCenter, such as the JobCenter activation status, user management, and log settings.

12.1. Starting Server Environment Setting

1. From the Windows [Start] menu, select [All Programs], [JobCenter], [SV], and then [Environment Setting].

   > ⚠️ Only users who belong to the local Administrators group can start Server Environment Setting.

2. The following GUI window appears when Server Environment Setting starts.
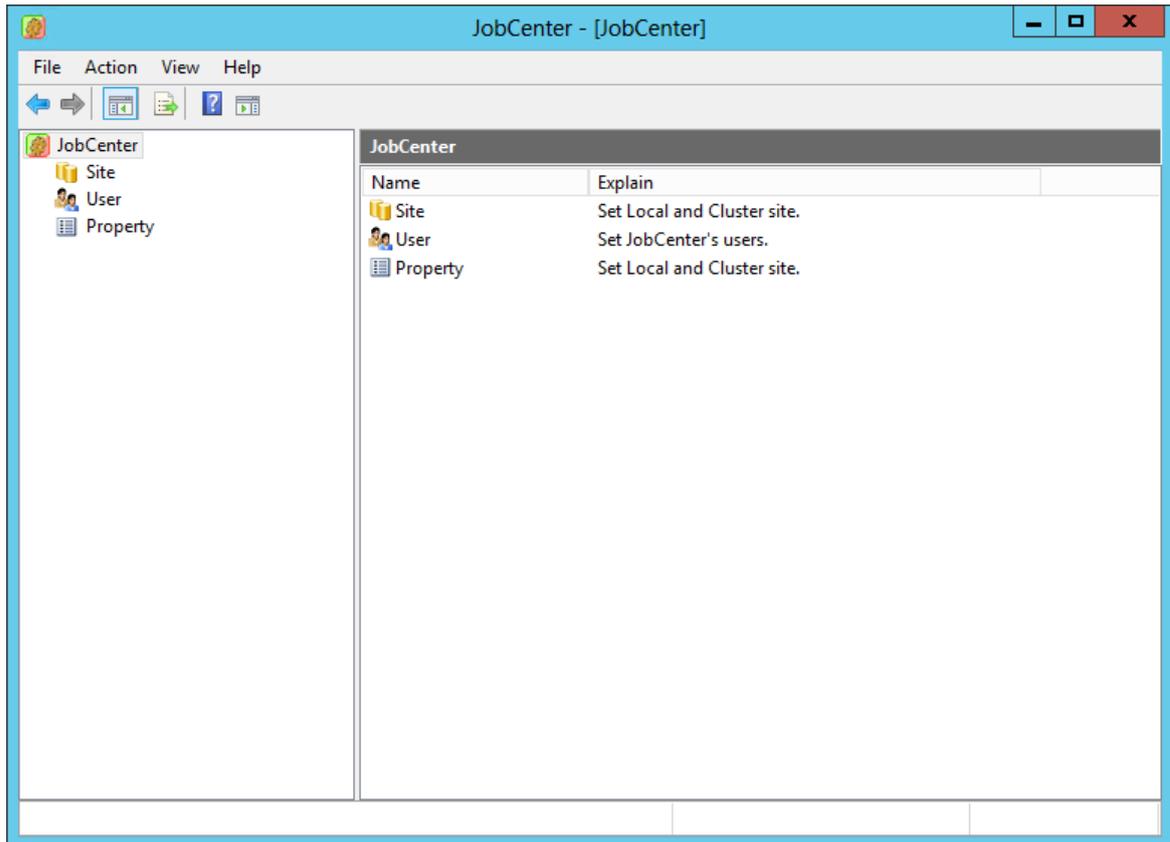
Figure 12.1. Server Environment Setting window

12.2. Displaying the Version

Select [Environment Settings] from the [Help] menu to open the following window.
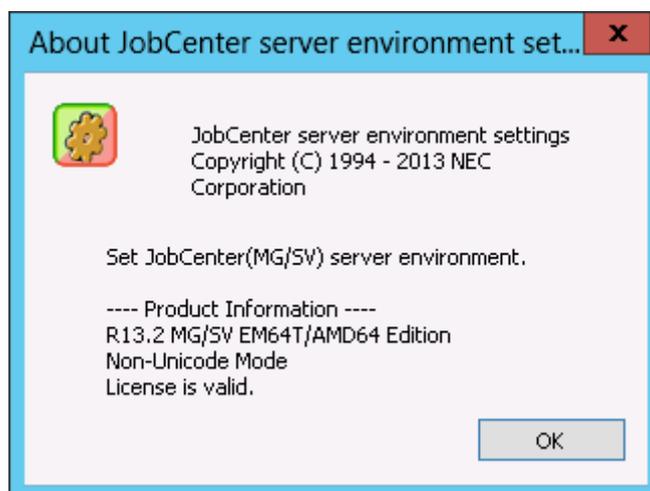
Figure 12.2. Displaying the Version

This window shows the following data.

■Installation data

Displays the version, architecture, and language of JobCenter.

Example: R13.2 MG/SV EM64T/AMD64 Edition Japanese

■UNICODE mode

Displays whether JobCenter was installed in UNICODE mode or non-UNICODE mode.

■License status

Displays whether the JobCenter license is valid.

> ■If this window shows that the license is invalid, refer to <JobCenter Installation Guide> to check whether the codeword is registered correctly.
>
> ■The license is valid during the trial period (the 60 days after installation) regardless of codeword registration.

12.3. Setting up a Site

Click "Site" in the left pane. The registered sites are displayed in the right pane.
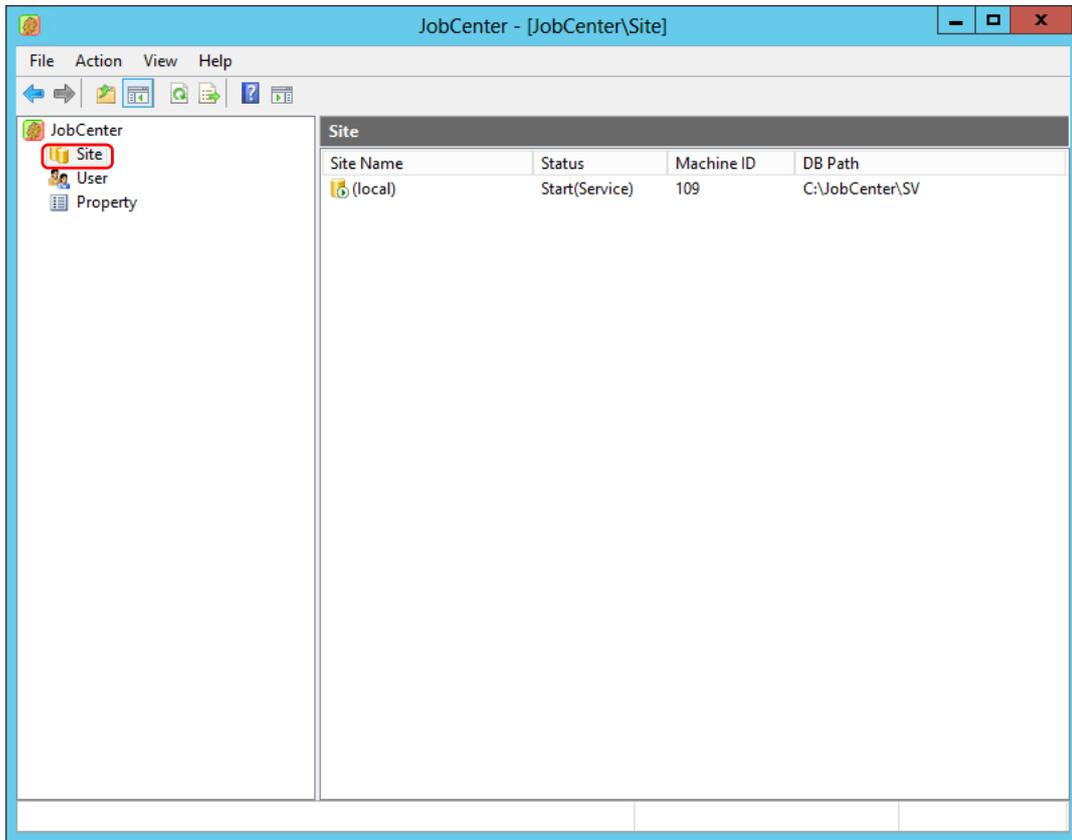
Figure 12.3. Site in the Server Environment Setting window

A site is a JobCenter execution environment. The local site (local) must exist after installation.

To build a cluster environment, create and register another site (cluster site). For details about how to build a cluster environment, refer to <JobCenter Guide for using Cluster function> (Japanese only).

The meaning of the site information displayed on the right pane of Figure 12.3, "Site in the Server Environment Setting window" is as follows.

Table 12.1. Column headings for sites in the right pane

Status	Description	Example
Site Name	Alias for identifying the site. The name of the local site is fixed to "(local)."	(local)
Status	Site status. For details about site statuses, refer to Table 12.2, "Site statuses".	Running (service)
Machine ID	Machine ID of the site. The machine ID is a number from 1 to 2,147,483,647 used to identify the site. For the local site, the machine ID specified during installation is displayed.	1000
DB Path	Site database path. (The JobCenter installation path for the local site)	C:\JobCenter\SV

Table 12.2. Site statuses

Status	Description
Start (service)	The site is running as a Windows service. Immediately after installation, the local site starts as a service.
Running (cjcpw)	The site is running using cjcpw. For details about cjcpw, refer to <JobCenter Guide for using Cluster function> (Japanese only).
Running (unmonitored)	The site is running in the unmonitored mode. For details about the unmonitored mode, refer to <JobCenter Guide for using Cluster function> (Japanese only).
Stop	The site has stopped.
Disconnected	The site database cannot be accessed. In a cluster environment, the site enters the disconnected status if the site database cannot be accessed due to disconnection of the common disk or other reasons.
Invalid	A site process is invalid. "Invalid" is the status that some processes necessary for the site are not running. The site might be in the invalid status temporarily while the site is starting or being stopped. In such case, update the status display by pressing the F5 key or by selecting [Update] from the [Operations] menu, and then check the status again.

12.3.1. Specifying site properties

In the right pane, double-click a site to show its properties or right-click a site and then select [Properties] from the shortcut menu to open the [Properties] dialog box for the site.
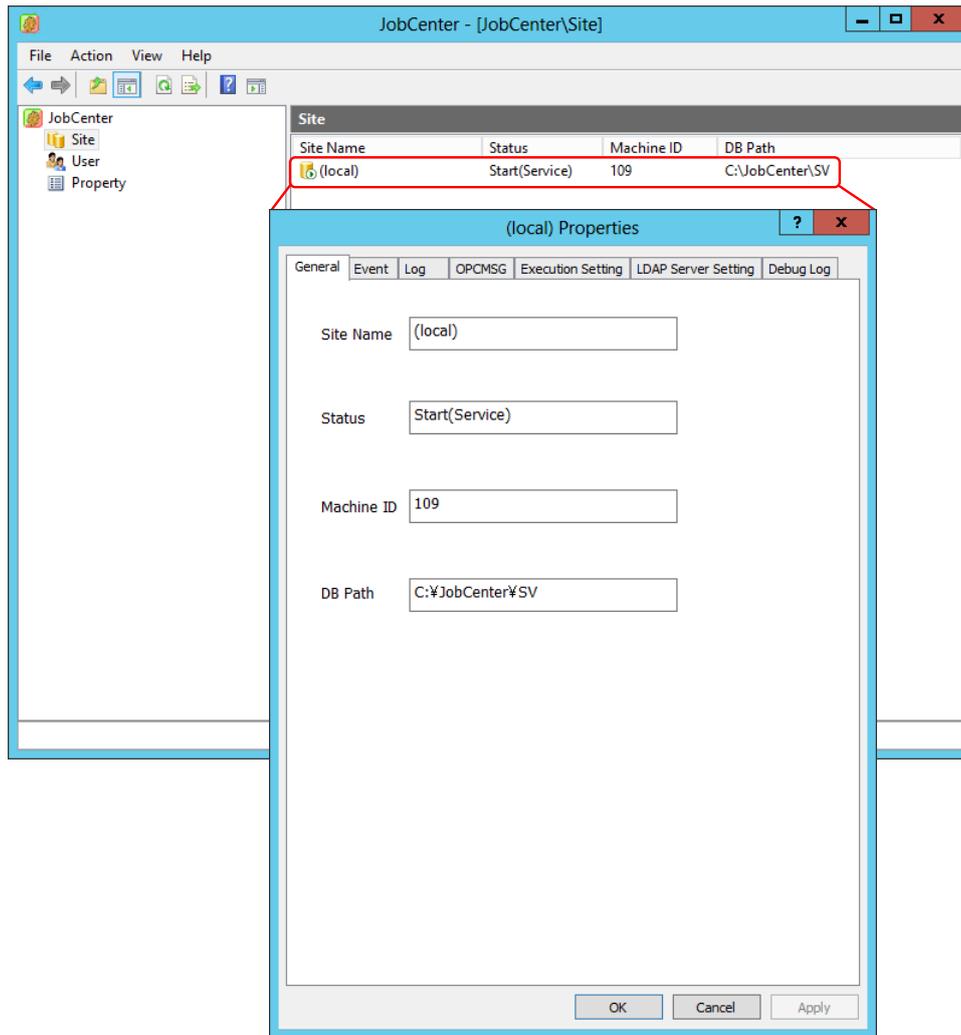
Figure 12.4. [Properties] dialog box for the site

■[General] tab

The [General] tab shows the same site properties that are displayed in the right pane.
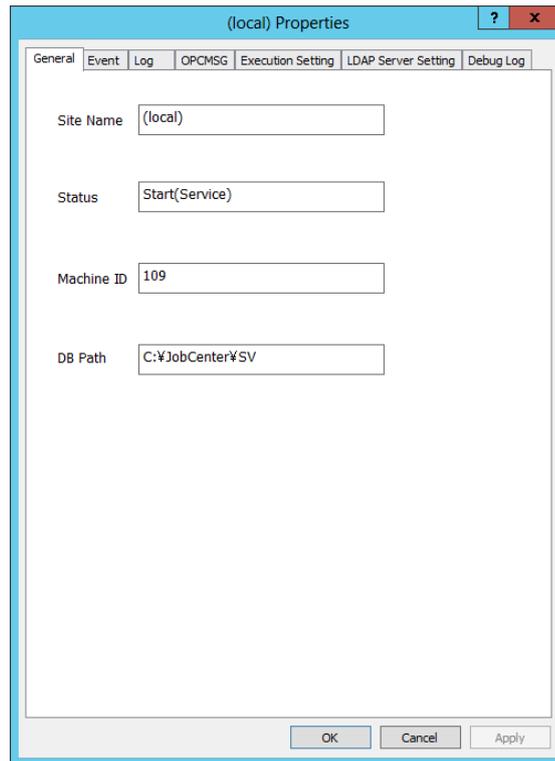
Figure 12.5. [General] tab in the [Properties] dialog box

■[Event] tab

The settings for event linkage can be specified on the [Event] tab. For details, refer to Section 11.3.2.2, "Select the Event to be Notified".
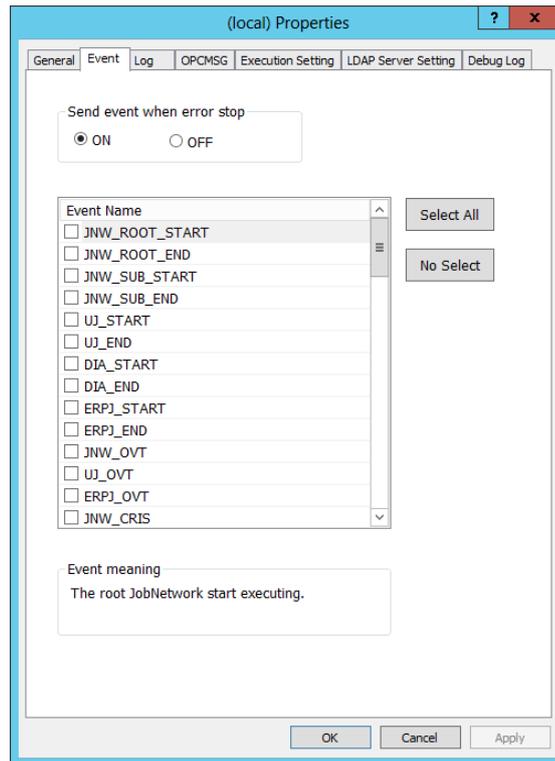
Figure 12.6. [Event] tab in the [Properties] dialog box

■[Log] tab

The settings for outputting a JobCenter event to a log file can be specified on the [Log] tab. For details, refer to Section 11.3.2.2, "Select the Event to be Notified".
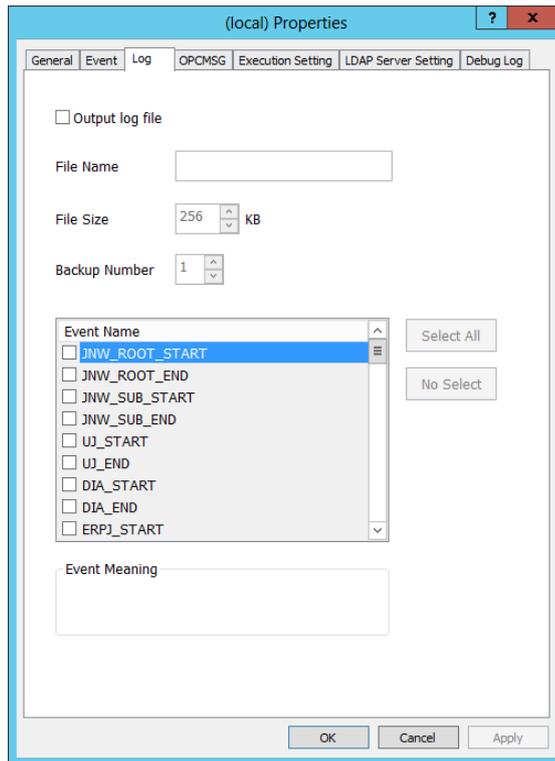
Figure 12.7. [Log] tab in the [Properties] dialog box

■[OPCMSG] tab

The settings for performing event linkage with OPCMSG can be specified on the [OPCMSG] tab. For details, refer to Section 11.3.3, "HP Operations Manager".
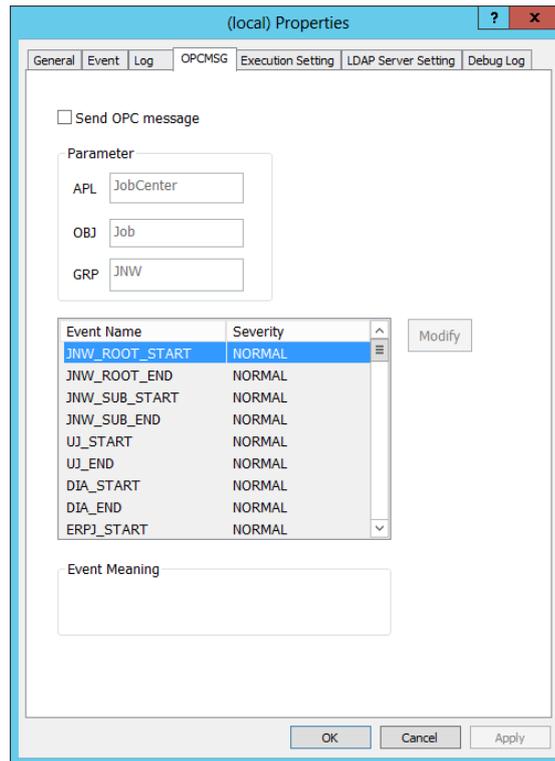
Figure 12.8. [OPCMSG] tab in the [Properties] dialog box

■[Execution Setting] tab

The unit job execution settings can be specified on the [Execution Setting] tab. For details, refer to Section 12.3.3, "Specifying job execution settings".
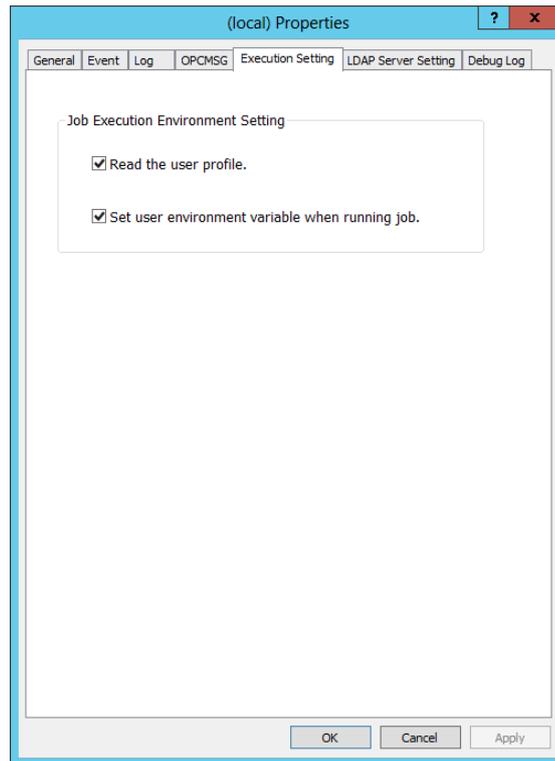
Figure 12.9. [Execution Setting] tab in the [Properties] dialog box

■[LDAP Server Setting] tab

The settings necessary to manage JobCenter user authorities using LDAP can be specified on the [LDAP Server Setting] tab. For details, refer to Chapter 10, 「LDAP (Active Directory) Linkage Function」.

Figure 12.10. [LDAP Server Setting] tab in the [Properties] dialog box

■[Debug Log] tab

The [Debug Log] tab sets the error logs and detail logs (debug logs) that JobCenter resident processes and internal commands output. For details, refer to Section 20.2, "Changing Error Log Files".
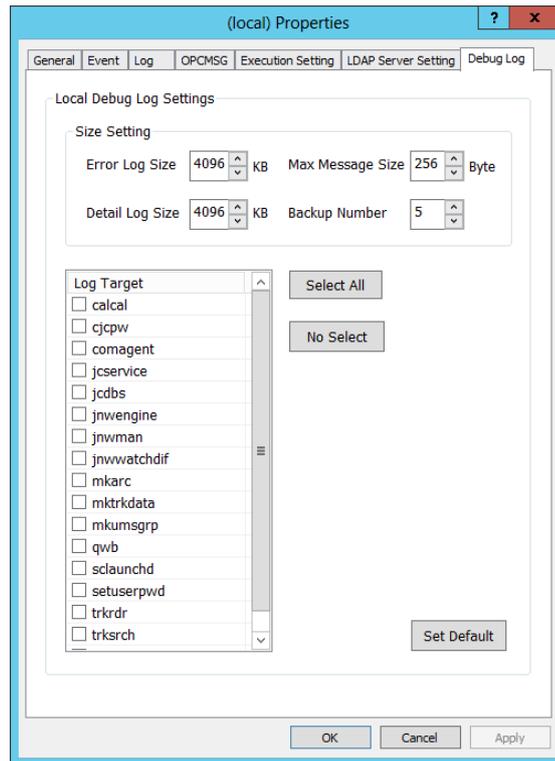
Figure 12.11. [Debug Log] tab in the [Properties] dialog box

12.3.2. Starting and stopping a site

Before starting a site, make sure that its status is "Stop". Next, right-click the site and select [Start (service)] to start the site.
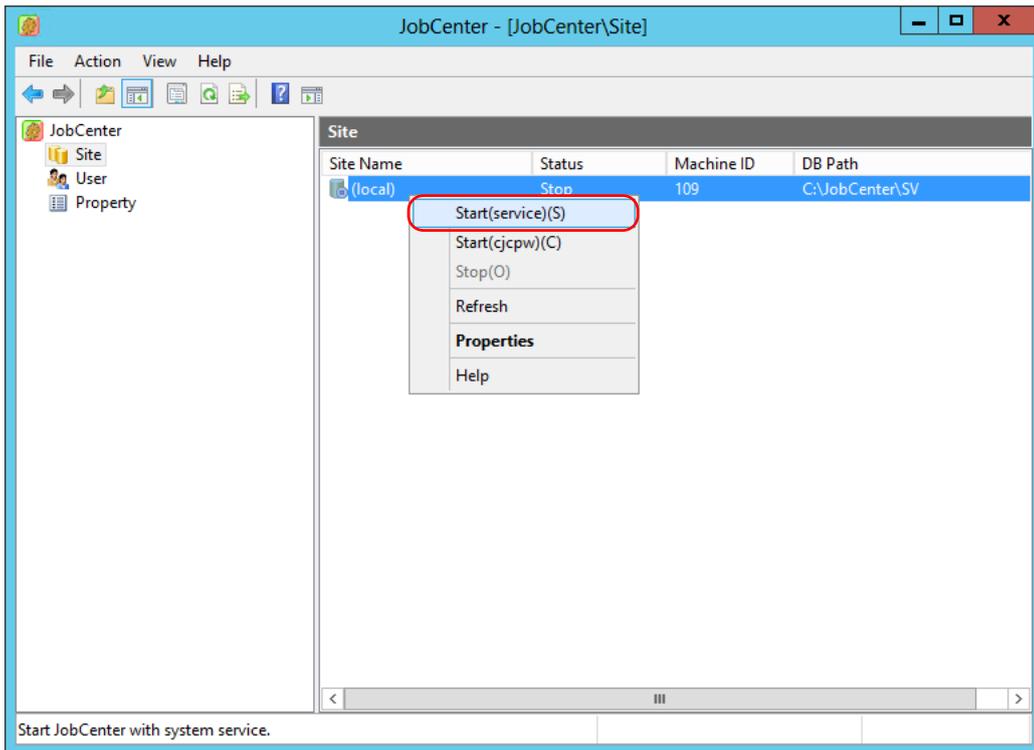
Figure 12.12. Starting a site

Before stopping a site, make sure that its status is "Start (service)" or "Start (cjcpw)."

Next, right-click the site and select "Stop" to stop the site.
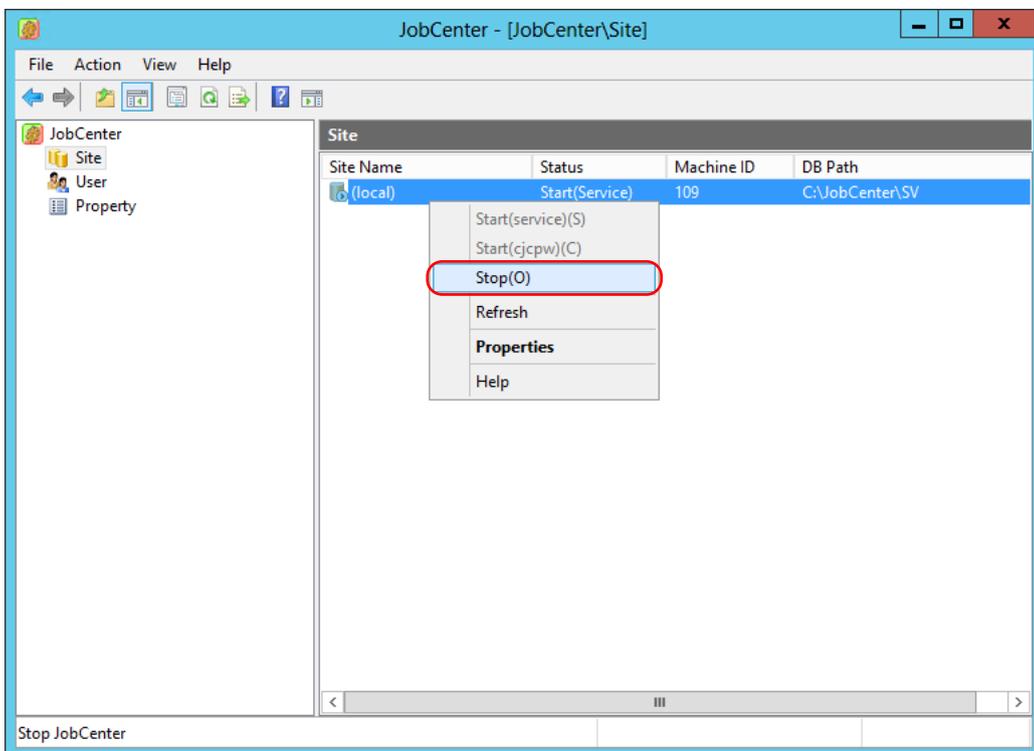
Figure 12.13. Stopping a site

> ⚠️ When site properties are changed, restarting the site might be required. In this case, stop the site according to the above procedure, and then restart it.

12.3.2.1. Start (Service) and Start (cjcpw)

There are two ways to start a site. One uses Start (service), and the other uses Start (cjcpw). The differences between these two methods are as follows.

■Start (service)

- JobCenter is started as a Windows service. You can start JobCenter by choosing the [Start (service)] menu of the JobCenter environment setting window, specifying the cjcpw command with -service option, or using the service operation of Windows such as the net or sc command.

- The local site is registered as a service when it is installed. While the cluster site is not registered, you can register and start it as a service as well. Note that, when you attempt to start the cluster site using [Start (service)] for the first time, a confirmation dialog box appears asking if you want to register it as a Windows service. If you select [No] in this dialog box, the startup of the cluster site itself is canceled.

- The top process of JobCenter is jcservice.exe, which checks the resident processes of JobCenter. To monitor the processes of JobCenter, select jcservice.exe as the target.

- To use the LSA queue, you need to have the site running as a service. For details of the LSA queue, refer to "6.1.3.8 LSA Queue Attribute" in <JobCenter Guide for using NQS function> (Japanese only).

■Start (cjcpw)

- JobCenter is started as a command (non-service). You can start JobCenter by choosing the [Start (cjcpw)] menu of the JobCenter environment setting window or using the cjcpw command. For information about cjcpw, refer to "JobCenter Guide for using Cluster function" and "JobCenter Command Reference" (Japanese only).

- cjcpw is a command. Therefore, if JobCenter is started from the server environment setting window and the user logs off from the desktop where the server environment setting window is started, cjcpw and all the processes of JobCenter started by this command are forced to stop (this is due to the specifications of Windows). For this reason, it is advisable that cjcpw of the server environment setting window be used to start the site only for such purposes as testing. In normal operation, the site should be started using the cjcpw command from a program that resides as a service, such as cluster management software or process management software.

- The top process of JobCenter is cjcpw.exe, which checks the resident processes of JobCenter. To monitor the processes of JobCenter, select cjcpw.exe as the target.

- For Start (cjcpw), the LSA queue cannot be used. If you use Start (cjcpw), the LSA queue is placed in the [DISABLED:STOPPED] state. Once the queue is changed to the [DISABLED:STOPPED] state, it is not automatically put back in the enabled state. Therefore, you need to set the queue state manually.

12.3.2.2. Notes on Shutting Down the OS

When you shut down Windows, Windows may force the JobCenter processes to end before the termination processing of JobCenter is complete. As a result, it may become impossible to guarantee the normal operation of JobCenter.

(Example) When there is machine linkage, the TCP connection remains in the linked machine.

To avoid this, you need to stop the JobCenter service before shutting down Windows. The easy and sure way of doing so is to stop JobCenter by using the shutdown script of Windows. Start the group policy editor (gpedit.msc), and add the script to stop JobCenter as follows.

Configure the computer. → Set Windows. → Script

As the script to stop JobCenter, create a normal batch file and write the following command in it.

```
net stop JobCenter
```

12.3.3. Specifying job execution settings

The operation settings for executing unit jobs in JobCenter can be specified on the [Execution Setting] tab.
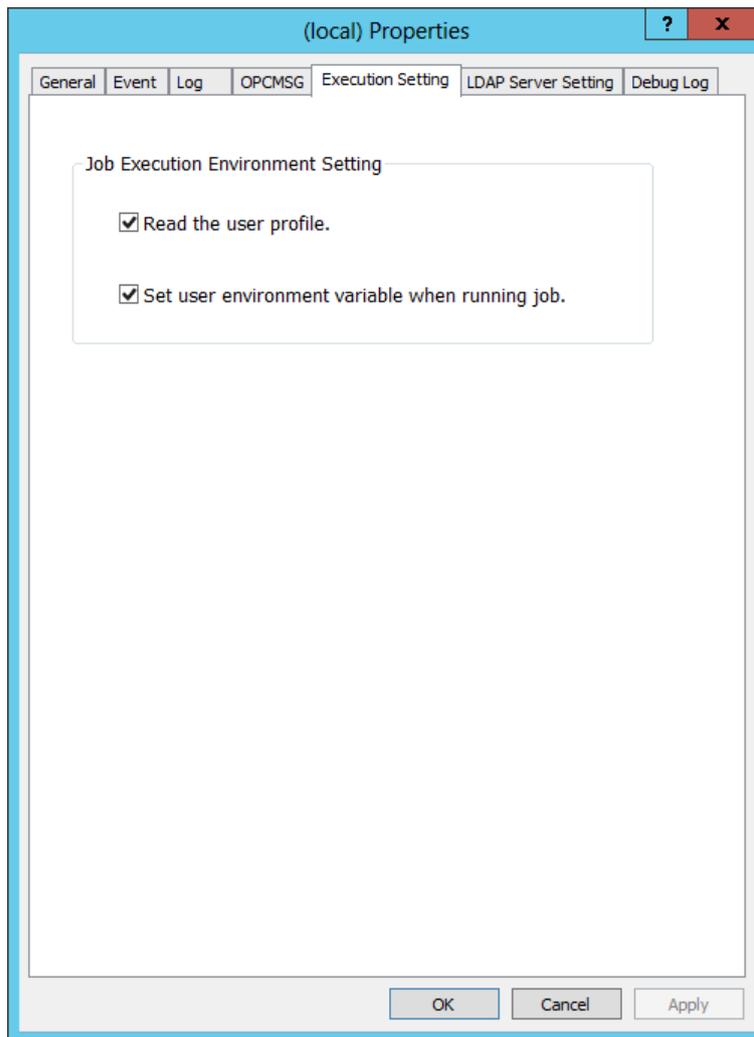
Figure 12.14. [Execution Setting] tab in the [Properties] dialog box

■Read the user profile

Specify whether to load the user profile when executing unit jobs. Select this check box to correctly execute commands that require the user profile to be loaded execute a unit job.

> ⚠ Loading the user profile affects the following. Specify appropriate settings according to the system environment.

▪ Processing performance

Because the user profile is loaded every time a job is executed, the processing performance may degrade if the profile data is large.

▪ Job execution may fail when an access conflict occurs.

If the user profile is loaded by the JobCenter process and another process at the same time, the NQS queue could stop. Because this phenomenon is likely to occur especially when anti-virus scan software scans profile data, some settings (such as excluding profile data from the scan target) must be specified by the system.

For details, refer to in <Installation Guide>Section 2.1, "Preparations for Installation".

■Set user environment variables when running job.

Select this check box to execute unit jobs in a process that has the same environment variable settings as when jobs are executed from the command prompt.

For details about the environment variables used when jobs are executed in JobCenter, refer to Section 14.2, "Environment Variables of JobCenter for Windows" .

⚠ If the "Read the user profile" check box is cleared, some of the user environment variables for the corresponding user cannot be acquired.

The settings on the [Execution Setting] tab are specified for each JobCenter site and the settings are applied at job execution by all users belonging to the JobCenter group.

To specify job execution settings for each user, create or edit the configuration file shown below.

| Local site | %InstallDirectory%\spool\users\%user name%\jobexe.conf |
| Cluster site | <JobCenterDB path> on shared disk\spool\users\%user name%\jobexe.conf |

The following parameters can be specified in the jobexe.conf execution configuration file.

user_profile,1	Load user profile
user_profile,0	Do not load user profile
user_env,1	Set user environment variables when running job
user_env,0	Do not set user environment variables when running job

⚠ If jobexe.conf (execution configuration file) for each user is created, this takes priority over the settings for each JobCenter site made on the [Execution Setting] tab.

12.4. Setting Up a User

The users registered in JobCenter are displayed in the right pane by selecting "User" in the left pan.
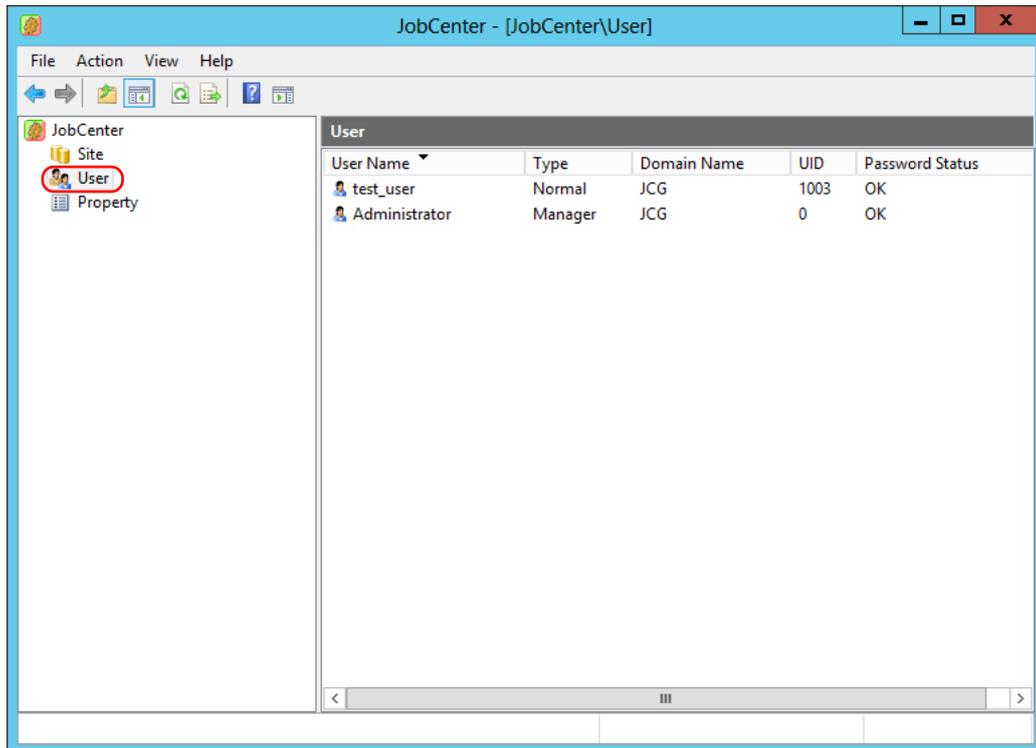
Figure 12.15. Users in Server Environment Setting window

For the Windows version of JobCenter (MG/SV), a user must be registered in advance to create or execute a job network.

The meaning of the information under the column headings on the right pane in Figure 12.15, "Users in Server Environment Setting window" is as follows.

Table 12.3. Column headings for the users in the right pane

Heading	Description
User Name	Displays the user name.
Type	Displays the JobCenter user type. There are two user types: the "Manager" and "Normal." Only one "Manager" can exist in a system in which JobCenter is installed. Some important settings can only be specified by the "Manager." When logging in to the system using CL/Win, the manager can log in to the UMS mode, while a normal user logs in to the EUI mode. For details about the UMS and EUI modes, refer to <JobCenter Basic Guide.>
Domain Name	Displays the Windows domain to which the user belongs. The computer name is displayed for the local user.
UID	This is the number used by JobCenter to identify the user. The UID is a number from 0 to 2,147,483,647. However, because the UID of a Windows administrator user is fixed to 0 regardless of the user name, it is not possible to assign 0 to a general user.

Password Status	Displays the status of the user password registered in JobCenter.

The meaning of the password check is shown in the table below. For NG or NOTSET, specify the correct password in the user properties described in the next section.

Table 12.4. Statuses in the Password Check column

Status	Description
OK	The specified password is correct.
NG	The password registered in the OS differs from the one JobCenter recognizes.
NOTSET	No password is specified.

12.4.1. Specifying properties of a user

In the right pane, double-click a user to show its properties, or right-click a user and then select [Properties] from the shortcut menu to open the [Properties] dialog box for the user. The following shows the [Properties] dialog box for "test_user" as an example.
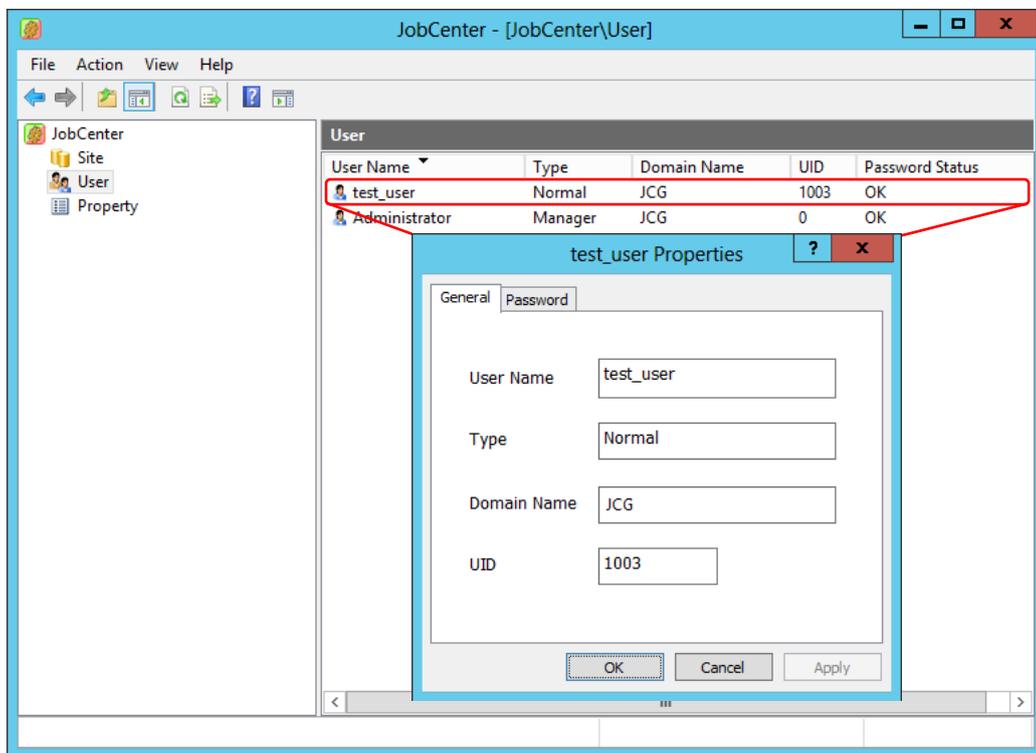
Figure 12.16. [Properties] dialog box for the user

■[General] tab

The [General] tab shows the same user properties that are displayed in the right pane.

The UID (user ID) can be changed on this tab. The UID is a number from 0 to 2,147,483,647 used to identify the user in JobCenter. Because the UID is independently controlled by JobCenter, changing the UID does not affect the OS or domain controller.

For a cluster configuration, it might be necessary to unify the UIDs among node machines so that the user mapping settings are uniquely enabled even after a failover. For details, refer to in <Guide for using Cluster function>Section 2.2.1, "Using the Same User ID".
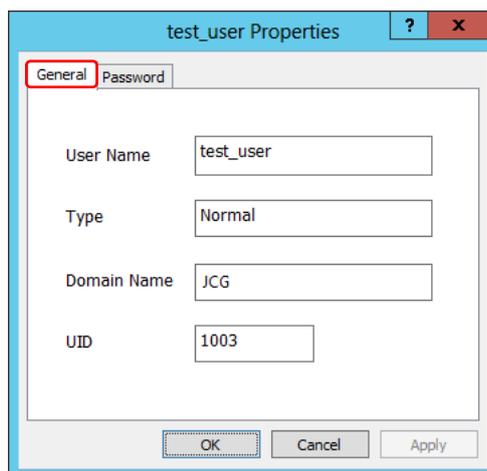
Figure 12.17. [General] tab in the [Properties] dialog box

> ⚠ Stop all the sites before changing the UID.
>
> Even when the UID is changed in the user's [Properties] dialog box, NQS user mapping, the access permission list set to the queue, and prohibited users (when uid is used for setting) are not changed at the same time. Therefore, after changing a UID in this [Properties] dialog box, perform the following operations as needed:
>
> - Set up user mapping again
>
> - Set up the access permission list for the queue again (qmgr subcommand ADd Users = $user $queue)
>
> - Set up users prohibited from using JobCenter (qmgr subcommand DIsable User = $user)

■[Password] tab

The user password can be specified on the [Password] tab.

The password specified here is used when logging on to or off from the OS in the background to execute jobs as a user who has the specified job execution user permissions.

If "NG" or "NOTSET" is displayed for the password check, correctly enter the password specified for the OS, and then click the [OK] or [Apply] button to apply it.

You do not have to stop the sites when changing the password. However, you need to restart the site after changing the password under either of the following conditions.

- When the password of the JobCenter administrator is changed

- When the user for which the password was changed executes jobs (scripts) that use processes that access remote machines (such as copying files to remote machines).
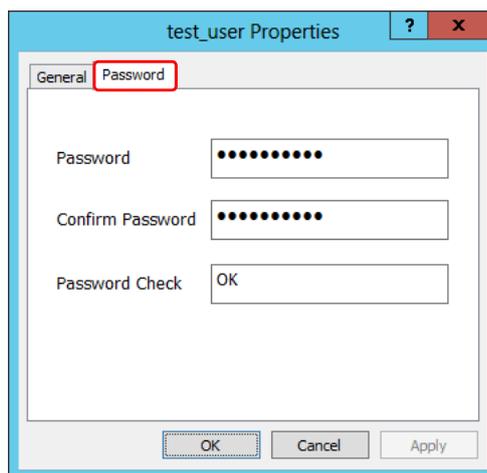
Figure 12.18. [Password] tab in the [Properties] dialog box

> ⚠️ ■ If the correct password is not specified, the job execution for the current user fails during job submission, and the queue stops. In this case, specify the correct password in the above [Properties] dialog box, make sure that the status is [OK], connect from CL/Win to MG/SV as the JobCenter administrator, display the machine frame of the target machine from the manager frame, and change the status of the stopped queue to "Start."
>
> ■ Note that, even if the correct password is specified, the queue is not automatically placed in the [Start] status just by restarting JobCenter.
>
> ■ If the password of a user registered to JobCenter is directly changed from the OS or domain controller, be sure to immediately specify the new password in JobCenter on the above [Password] tab as well.

12.4.2. Adding a user

To add a user, right-click [User] in the left pane, and then select [Add user] from the shortcut menu. The [Add User] dialog box appears.
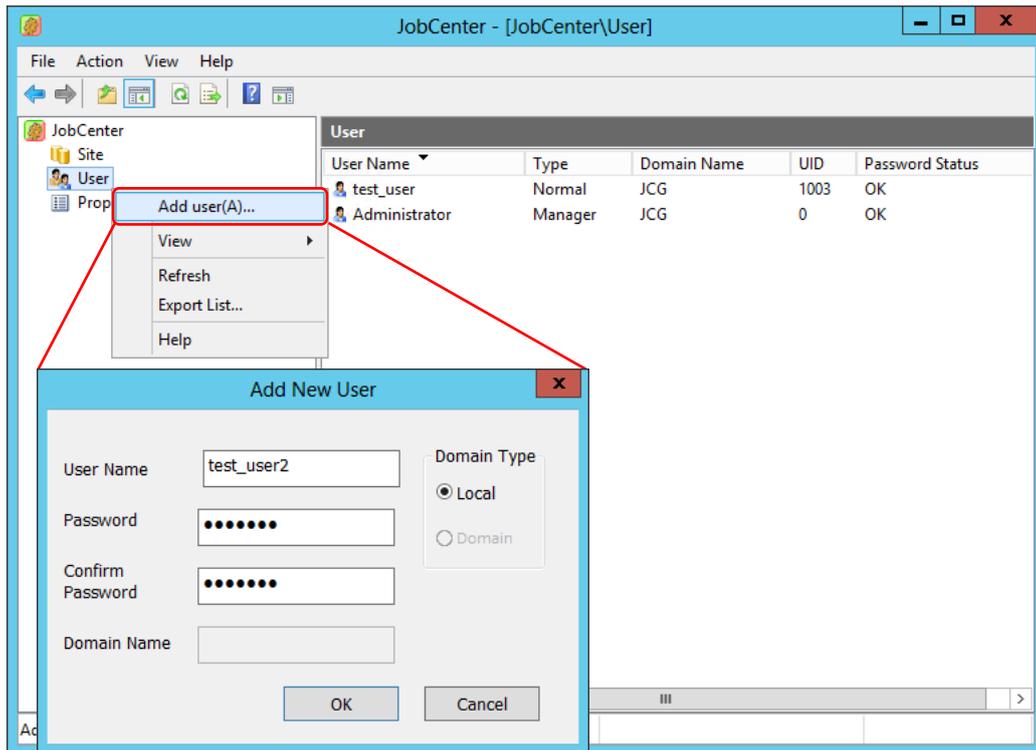
Figure 12.19. Adding a user

In this dialog box, enter the user name in the [User Name] text box and the password in the [Password] and [Confirm Password] text boxes. Next, select the [Local] or [Domain] option button in the [Domain Type] section and enter the domain name in the [Domain Name] text box. If a domain is selected, a trusted user in another domain can be specified. If the machine on which JobCenter is installed does not belong to a Windows domain, the option button in the [Domain Type] section is fixed to [Local] and the [Domain] option button and the [Domain Name] text box appear dimmed as shown in Figure 12.19, "Adding a user".

> ⚠ To add a user to the local site or a domain, the user who activated the server environment settings must have the OS permissions for adding a user. Note that, if the local account was set up as a JobCenter administrator instead of a domain user, the correct operation is not guaranteed even if [Add User] is used to add a domain user.

If the user being added already exists in the OS and the entered password is correct, the user is registered to JobCenter.

For a user who does not exist in the OS, the warning dialog box below is displayed. When [OK] is clicked, the user is created for the OS and then registered to JobCenter. When [Cancel] is clicked, no user is added. (Note that the user is added to the domain controller if [Domain] is selected for [Domain Type].)
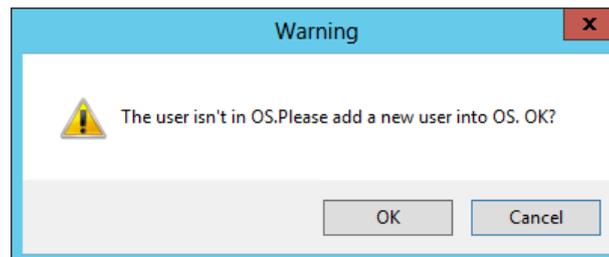
Figure 12.20. User Creation Dialog Box

12.4.3. Deleting a user

⚠ ■This operation cannot be undone. Be careful when performing the operation.

■You need to stop the site in advance. For information about how to stop the site, refer to Section 12.3.2, "Starting and stopping a site".

Right-click a user, and then select [Delete] from the shortcut menu to display the [Delete User] dialog box. The following shows an example in which "test_user" is deleted.
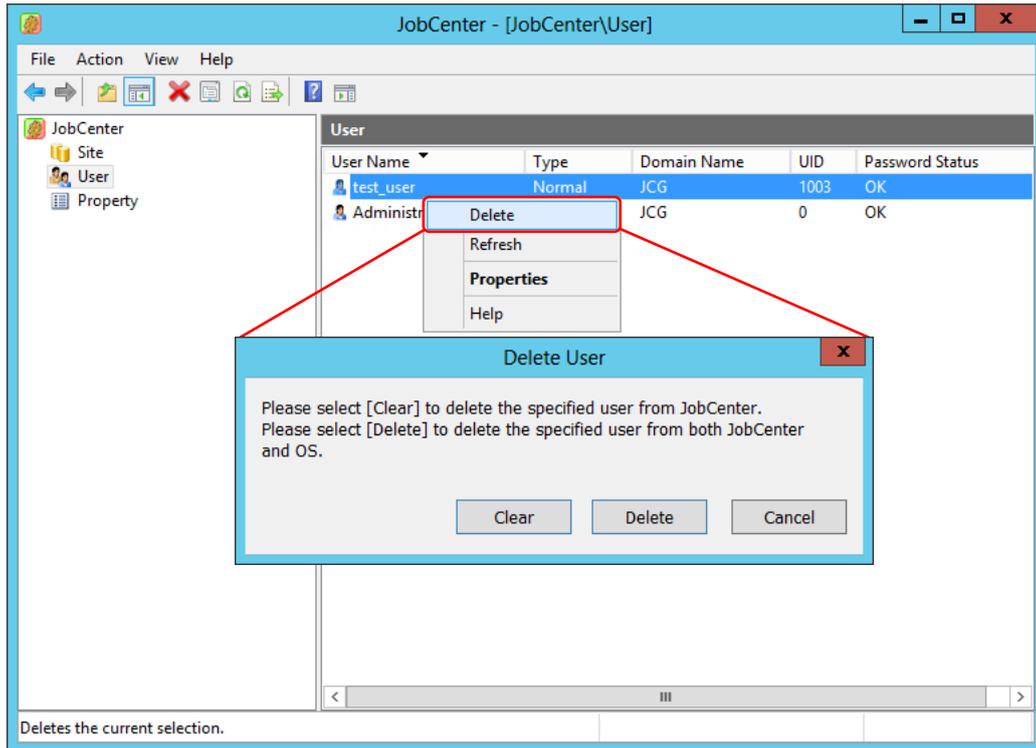
Figure 12.21. Deleting a user

If [Clear] is selected in the dialog box, the user is deleted from the registered JobCenter users, but there is no effect on the OS users.

Note that, if [Delete] is selected in the dialog box, the user is deleted from both the registered JobCenter users and the OS (or domain controller) users.

12.5. Setting up Properties

Click [Property] in the left pane. [General Settings] exists in the right pane.
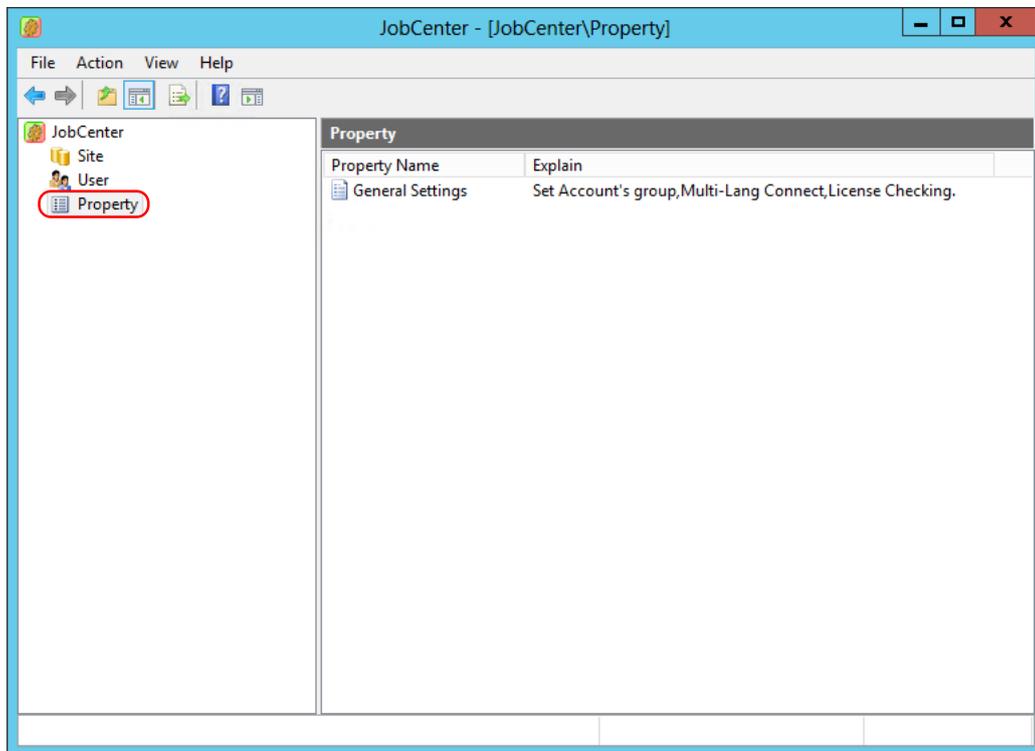
Figure 12.22. Property windows displaying General Settings

12.5.1. Specifying properties of General Settings

In the right pane, double-click [General Settings], or right-click [General Settings] and then select [Properties] from the shortcut menu to open the [General Settings Properties] dialog box.
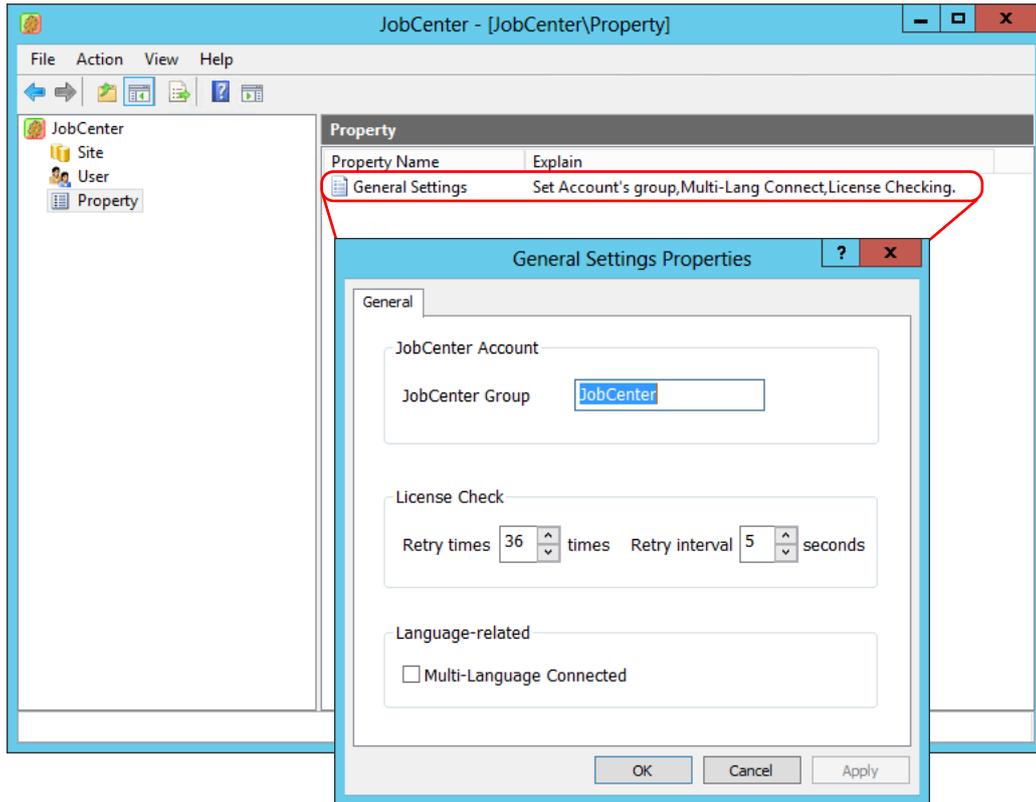
Figure 12.23. [General Settings Properties] dialog box

■To change the group to which the JobCenter registration user specified during installation belongs, specify the group for [JobCenter group]. Be sure to stop all JobCenter sites before changing the JobCenter group.

■For how to specify the parameters in the [License Check] section, refer to Section 5.5, "License Check at Startup of JobCenter".

■For details about the [Multi-Language Connected] check box in the [Language-related] section, refer to Chapter 8, 「Setting Up Connections Between Different Language Environments」.

13 Environment Migration

This chapter describes the environment migration method and the points to note.

13.1. Types of Environment Migration

This chapter describes the following two types of environment migration.

1. Migrating user definition data to another machine

   This is the case in which you migrate job network definition, schedule definition, trigger definition, target text log, operating day calendar definition, and custom job definition to another machine.
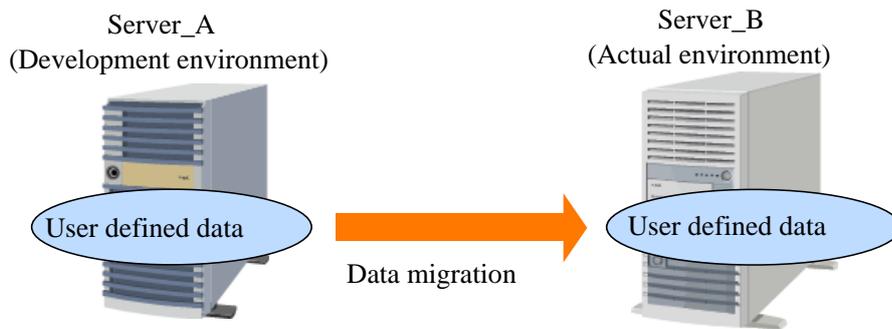
Figure 13.1. Migration to another machine

For example, the case is assumed in which you want to migrate definition data created and verified in the development environment, such as job networks and schedules, to another machine such as the one running in the actual environment. In this case, the migration destination may have a different host name or user name. However, if the host name is different, you need to change the host name in the definition data.

> ⚠️ This section describes migrating environments by using the upload/download function. When using a version in which the upload/download function is not available (R12.7.x or earlier), see Section 13.2.4, "Supplement: Migrating Data in Versions Without Upload/ Download Functions".

2. Changing the host name

   This is the case in which the host name of the physical server or the virtual host name of the cluster (cluster site name) is to be changed.
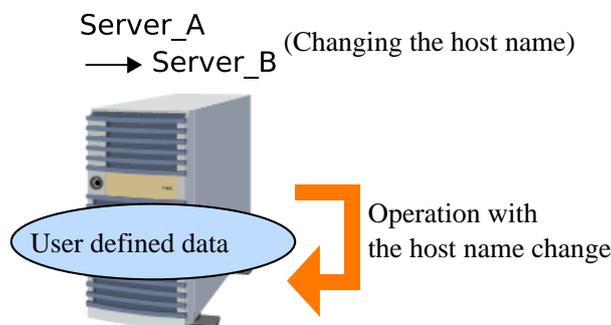
Figure 13.2. Changing the host name

For example, the case is assumed in which you need to change the host name because the server has been relocated or for some other reason. In this case, while the direct migration of user definition data is not involved, you need to change the machine name (and the machine ID in some cases), and the user definition data in line with the host name change.

> ⚠ Since JobCenter operates based on FQDNs, you need to perform the tasks described in this chapter, even if only the domain suffix should be changed due to, for example, a network change.

13.2. Migrating User Definition Data to Another Machine

The case is assumed in which you want to migrate definition data created and verified in the development environment, such as job networks and schedules, to another machine such as the one running in the actual environment.

You can migrate the following six types of user definition data:

■Job network definition

■Schedule definition

■Trigger definition

■Target text log

■Operating day calendar definition

■Custom job definition

■The configuration information, such as NQS-related settings, user environment settings, system environment settings, and permission settings, cannot be migrated. These settings need to be set separately on the migration destination machine.

■Tracker and tracker archive data cannot be migrated.

■The contents of this chapter describe migrations where the source JobCenter supports the Helper function. If the source JobCenter does not support the Helper function, transfer the definitions by using the import/export function.

■ When using the import/export function, see Section 13.2.1, "Downloading Definition Data" and Section 13.2.3, "Uploading Definition Data" replacing "download" and "upload" with "export" and "import," respectively.

■ Editing of the export files created by the import/export function is not supported, so there is no operation equivalent to Section 13.2.2.3, "Changing the host name manually".

■ If the environment variable name, environment variable value, and description of the environment variable of the parameter of the job network definition contain ",", the import and export functions are not available.

When you migrate data, the migration destination may have a different host name or user name. However, if the host name is different, you need to change the host name in the definition data.

The following figure shows the flow of work involved in migrating definition data to another machine.
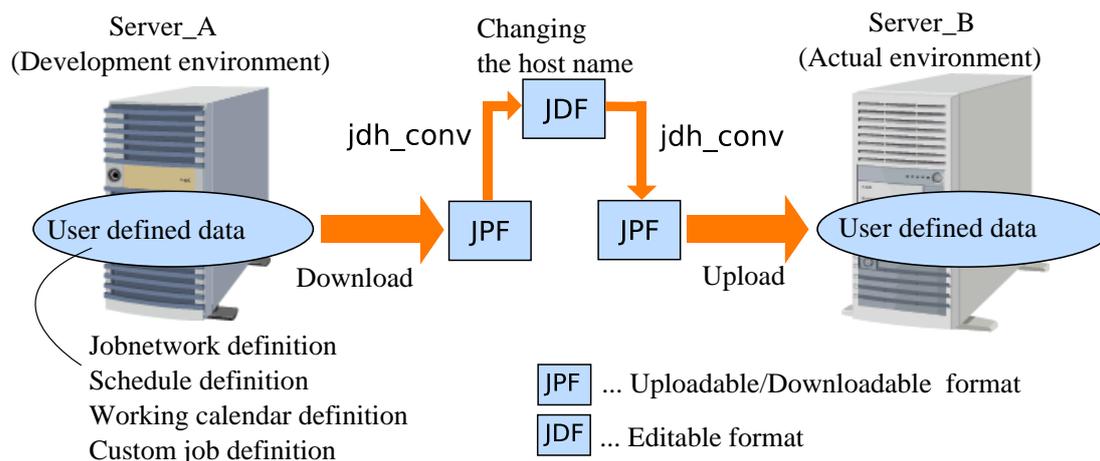
Figure 13.3. Migration to another machine

The actual migration procedures are described below.

13.2.1. Downloading Definition Data

Download definition data from the migration source machine. The downloaded data is saved in the JPF file format.

> ⚠️ ■Perform the download individually for each user who has definition data. Only administrators can batch download definitions for all users.
>
> ■The operating day calendar definitions and custom job definitions are the definition data common across the system and not specific to any single user. However, since only the JobCenter administrator can upload these definitions to the destination machine, make sure that you are a JobCenter administrator when uploading these two types of definitions.

For information about how to download definition data, refer to in <Basic Guide>Section 12.1, "Downloading Definition Information/Configuration Information/Tracker Archive Information (JPF File)".

13.2.2. Changing the Host Name in Definition Data (If the Host Name of the Migration Destination Is Different)

If the host name of the migration destination is different, you may need to update the downloaded data. If the host name of the migration destination is the same, this procedure is not necessary; in that case, skip it and go to Section 13.2.3, "Uploading Definition Data".

13.2.2.1. Parameters for which Host Names can be Automatically Converted

The parameters described below can have their host names converted automatically by specifying the host name conversion rules when uploading the JPF file upload. If changing only the host name used in the parameter below, skip this step and go to Section 13.2.3, "Uploading Definition Data". In this case, set the host name conversion rules when uploading the JPF file to the target server.

■Job network parameter - default submission queue

■Unit job parameter - submission queue

■Custom job parameter - submission queue

■WOBS job parameter - submission queue

■Event transmission parameter - destination host name

■Event reception parameter - source host name

■Custom job definition parameter - submission queue

13.2.2.2. Parameters for which Host Names must be Manually Converted

The parameters described below do not have their host names converted when JPF files are uploaded. When these parameters are used, the host names in the definition file might need to be manually converted. Check the descriptions of each parameter and, if updating is required, then follow the steps in Section 13.2.2.3, "Changing the host name manually".

■WOBS job parameter - batch domain agent: host name

This is the host name (or IP address) of the connected batch domain agent of the WOBS job. If the local host name is specified, it needs to be changed to ensure normal operation in the migration destination environment.

If a remote host name is specified, change it as necessary.

■UCXSingle job parameter - UCX server name

This is the server name (Universal Connect/X server name or IP address) of the destination to which the UCXSingle job is to be submitted. If the local host name is specified, it needs to be changed to ensure normal operation in the migration destination environment.

If a remote host name is specified, change it as necessary.

■ERP job parameter - execution host

The execution host name is specified in the format of "<host-name>_<SAP-system-name>_<SAP-system-number>". If the local host name is specified, it needs to be changed to ensure normal operation in the migration destination environment.

If a remote host name is specified, change it as necessary.

> ⚠ Other than the above, any item in which an arbitrary character string can be entered, such as a job network or schedule comment or a unit job script, may contain a host name. Such items are not mentioned here.
>
> In such cases as a job script, which is known to malfunction unless the host name is changed, you can change the host name, as necessary, using the data update procedure described in the subsequent section.

JPF is a format intended to exchange data with a server. Converting JPF data using the dedicated command (jdh_conv) creates a text format file (JDF) for each definition data file. Change the host name as necessary by updating the contents of these JDF files.

> ✏ The text definition function is detailed in <JobCenter Guide for Using Text Definition Function>. For details, refer to this guide.

13.2.2.3. Changing the host name manually

The following describes the procedure for changing the host name included in downloaded definition data.

1. Converting the JPF format to the JDF format

   To convert the JPF format to the JDF format, execute one of the commands shown below.

   ■UNIX version

   ```
   /usr/lib/nqs/gui/bin/jdh_conv -x [-o $output] [$JPFFile]
   ```

   ■Windows version

   ```
   %InstallDirectory%\bin\jdh_conv -x [-o $output] [$JPFFile]
   ```

   An example of executing the command in the UNIX environment is shown below.

   ```
   /usr/lib/nqs/gui/bin/jdh_conv -x def_jobmanager01_20170512180000.jpf ↵
   Output JDFs to "jpf_20170512183000/jpf".
   ```

   When successfully executed, the command creates a directory in the current directory and outputs JDF format files.

   > ■You can specify the directory to which to output the files. For details about the command and the configuration of the JPF file output directory, refer to section 3.20, "jdh_conv (Conversion between JDF files and JPF files)" in <Command Reference>.

2. Changing the host name

   The JDF files (xxxx.jdf) output in step 1 are text format files. Change the host name by updating these files with a text editor or other appropriate tool.

3. Converting the JDF format to the JPF format

   Compress the updated JDF files back to the JPF format so that they can be exchanged with the server.

   To convert the JDF format to the JPF format, execute one of the commands shown below.

   ■UNIX version

   ```
   /usr/lib/nqs/gui/bin/jdh_conv [-o $output] [$JDFFile ...]
   ```

   ■Windows version

   ```
   %InstallDirectory%\bin\jdh_conv [-o $output] [$JDFFile ...]
   ```

   > ⚠ Regardless of whether or not the JDF file was updated, be sure to specify all the JDF files when executing the jdh_conv command. If you do not specify any JDF file, the data of the JDF type is not included in the JPF data migrated to the destination.

   An example of executing the command in the UNIX environment is shown below.

   ```
   /usr/lib/nqs/gui/bin/jdh_conv jnw.jdf sched.jdf trg.jdf wkcal.jdf customjob_template.jdf
    operation.jdf ↵
   JPF file "jc_def_20170512190000.jpf" conversion successfully.
   ```

   When successfully executed, the command creates a directory in the current directory and outputs JDF format files.

> 🖊 You can specify the directory to which to output the files. For details, refer to section 3.20, "jdh_conv (Conversion between JDF files and JPF files)" in <Command Reference>.
>
> "operation.jdf" is required option to specify a JDF file.

13.2.3. Uploading Definition Data

Upload the definition data (JPF files) to the migration destination machine.

> ⚠ ■Perform the upload individually for each user whom you want to have the definition data in the migration destination machine.
>
> ■Be sure to upload the JPF files containing the operating day calendar and custom job definitions first, as the JobCenter administrator. The general user cannot update these two types of definition data (even if the JPF files contain the definitions, they are not uploaded to the migration destination server). Therefore, if the general user attempts to upload the job network or schedule definitions that are dependent on these two types of definition data, an error occurs because the migration destination server does not have the necessary data.
>
> Note that this does not apply when operating day calendars and custom jobs are not used.
>
> ■Specify the host name conversion rules when converting the host names of the parameters listed in Section 13.2.2.1, "Parameters for which Host Names can be Automatically Converted".

For how to upload definition data, refer to in <Basic Guide>Section 12.1, "Downloading Definition Information/Configuration Information/Tracker Archive Information (JPF File)".

13.2.4. Supplement: Migrating Data in Versions Without Upload/Download Functions

When migrating environments in versions R12.7.x and earlier that do not have upload/download functions, the descriptions in this section cannot be used. In such cases, use the import/export function. Versions R13.1 and later can also use the import/export function, but only from the command line.

However, if the transfer source and target use different platforms or the JobCenter character code settings are different, then the import/export function cannot be used. For example, if the source environment is Windows and the target is Linux. In this case, the data exported from the source environment must be converted to the JPF format that can be handled with the upload/download function. The upload/download function can handle different platforms and character codes during migration.

For details about this conversion command, refer to section 3.23, "jc_iedata_conv - Converting the import/export files to the JPF files" in <JobCenter Command Reference> (Japanese only).

After conversion, execute Section 13.2.2, "Changing the Host Name in Definition Data (If the Host Name of the Migration Destination Is Different)" and Section 13.2.3, "Uploading Definition Data".

13.3. Changing the Host Name

This section describes the tasks you need to perform to change the host name. In addition to the tasks necessary to change the host name, those that may be involved in changing the host name are also described.

> ⚠ ■In the following procedure, the OS host name is referred to as the "host name", and the site name of the local site and cluster site registered to JobCenter is referred to as the "machine name".
>
> ■Before changing the host name or cluster site name of a machine registered in the machine list of a different machine or a machine that has been added to a machine group, temporarily delete the machine from the scheduler-machine machine group and machine list.

■Changing the host name

To change the host name, it is necessary to reregister the target machine registered in the machine lists of the other linked MG/SV machines, in addition to changing the machine list of the local machine.

It is also necessary to convert user definition data.
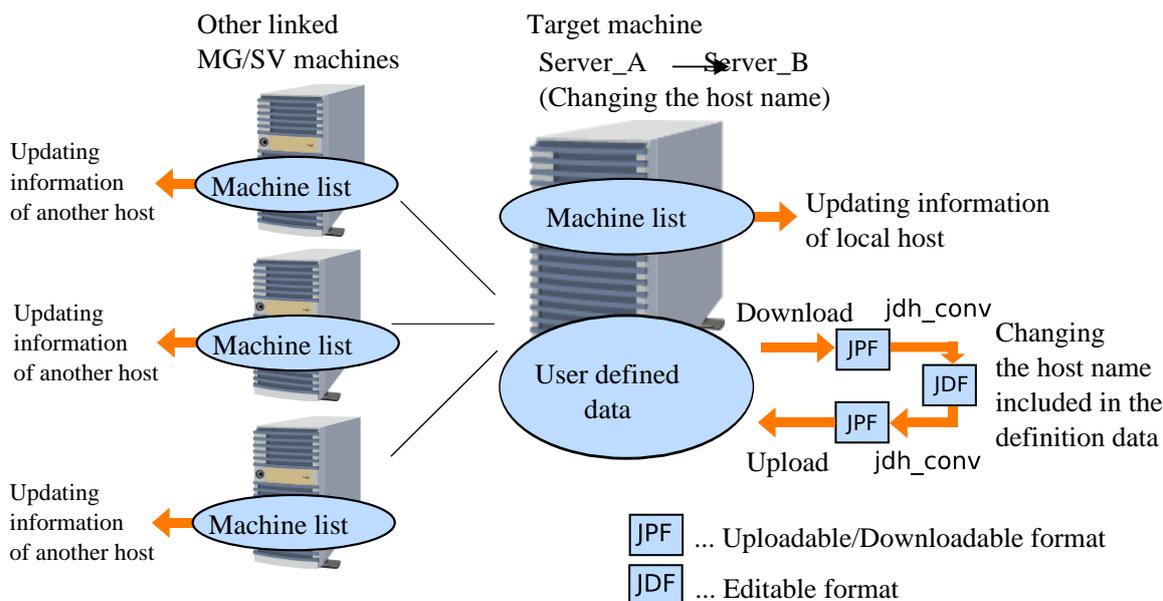
Figure 13.4. Changing the host name

■Changing the machine ID

To change the machine ID, it is necessary to reregister the target machine registered in the machine lists of the other linked MG/SV machines, in addition to changing the machine ID of the local machine.

It is also necessary to reconfigure the transfer destination for all the pipe queues that specify the queue of the changed machine as their transfer destination.

If only the machine ID is changed without changing the host name, it is not necessary to convert user definition data.
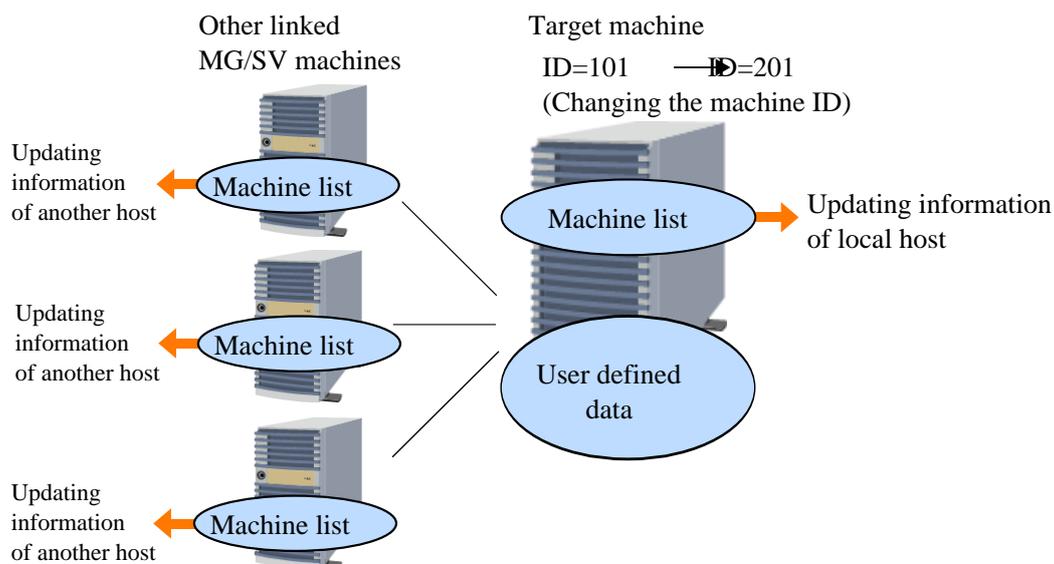
Figure 13.5. Changing the machine ID

■Changing the IP address

It is not necessary to change the settings on the JobCenter side when only changing the IP address. However, specify the OS network settings so that forward lookup/reverse lookup are available for name resolution.

In the following cases, adjust the IP address setting in each configuration file in accordance with the change.

- The IP address to be used is explicitly specified (ipaddress=xx.xx.xx.xx) in daemon.conf.

- The resolv.def file is set up to adjust name resolution in the Windows version of JobCenter.

The following sections detail the procedures for changing the host name and the machine ID, respectively.

13.3.1. Changing the Host Name

If the host name is changed, such as when moving a machine from a test environment to the actual environment, change the JobCenter machine name setting and convert the data as described below. Before making these changes, be sure to use the jc_check command to acquire the system information, and then save the current settings.

> ⚠️ ■If the machine name to which you want to change already belongs to the machine group, delete the name from the group before making the change, and then reregister the name in the group after making the change.
>
> ■If the machine to be changed is the machine-group manager (scheduler), temporarily delete all the member machines from the machine group, change the machine, and then set the machine group back up after making the change.

For details about nmapmgr, see "3.12 Managing the nmapmgr Network Configuration" in <JobCenter Command Reference> (Japanese only).

13.3.1.1. Changing the Registered Contents of Another Host Name

To change the machine name of another host registered to a machine icon on the local machine, perform the procedure below.

When a host name is changed, it must be possible to correctly resolve the new host name for all related machines in the system on which JobCenter is installed.

Example: Changing the host1 machine name registered to the local site as machine ID = 111 to host 2 by using a terminal you logged in to as a UNIX root user

```
# nmapmgr ↵
NMAPMGR>: change name 111 host2 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: exit ↵
#
```

Example: Changing the host1 machine name registered to the cluster site cluseter2 as machine ID = 1002 to host 2 by logging on to Windows as a JobCenter administrator and then using the command prompt

```
> set NQS_SITE=cluster2 ↵
> nmapmgr ↵
NMAPMGR>: change name 1002 host2 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: exit ↵
>
```

> For the cluster site, be sure to specify the cluster site name for the environment variable NQS_SITE before starting nmapmgr. When changing the settings for the local site, do not specify NQS_SITE.

13.3.1.2. Changing the Registered Contents of the Local Host Name

To change the local machine name, perform the procedure below.

When a host name is changed, it must be possible to correctly resolve the new host name for all related machines in the system on which JobCenter is installed.

> ■When changing the local machine name, make sure that JobCenter is stopped.
>
> ■When changing only another host name and not the local host name, doing the above work is not necessary.
>
> ■The work below cannot be interrupted after starting. Note that, if the work is interrupted, it might become impossible to correctly run JobCenter.

For JobCenter, the local machine NQS machine ID and machine name are saved in the localinfo file.

When the local host name is changed, it is necessary to also apply the change to a localinfo file for which JobCenter recognizes the local machine.

localinfo is on the path below. However, note that, when this is directly edited, such as by using a text editor, correct operation becomes impossible.

UNIX	/usr/spool/nqs/nmap/localinfo
Windows	%InstallDirectory%\spool\nmap\localinfo

> ✏️ For a cluster environment, read the /usr/spool or %InstallDirectory% portion as the <JobCenterDB path> value specified when using cjcmksite to set up the site.
>
> Note that %InstallDirectory% is the Windows JobCenter installation directory, and the default is C:\JobCenter\SV.

The following shows an example of changing the local host name and then applying the change to the localinfo file.

Example: Changing the local machine name of the local site host1, which is registered as machine ID = 100, to host 2 by logging in to a terminal as a UNIX root user

```
# nmapmgr ↵
NMAPMGR>: change name 100 host2 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: set local name host2 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: exit ↵
#
```

Example: Changing the local machine name of the cluster site cluster1.co.jp, which is registered as machine ID = 1001, to cluster2.co.jp by logging on to Windows as a JobCenter administrator and then using the command prompt

```
> set NQS_SITE=cluster1.co.jp ↵
> nmapmgr ↵
NMAPMGR>: change name 1001 cluster2.co.jp ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: set local name cluster2.co.jp ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: exit ↵
>
```

> ✏️ For the cluster site, be sure to specify the cluster site name for the environment variable NQS_SITE before starting nmapmgr. When changing the settings for the local site, do not specify NQS_SITE.

After changing the local host name, restart JobCenter, and then use CL/Win to make sure you can connect by using the new machine name.

13.3.1.3. Work After Changing the Host Name

If the machine name contents registered to JobCenter are changed after changing a host name, all related setting contents must be changed. Make the appropriate changes according to the conditions below.

■If the machine for which the machine name was changed does not belong to the machine group

For the nmapmgr settings on all the other machines linked using the machine for which the host name was changed and remote job submission, the work described above in Section 13.3.1.1, "Changing the Registered Contents of Another Host Name" must be performed.

If there is a job network for which jobs are directly submitted to the queue on the machine for which the machine name was changed, each job network submission destination must be set up again at the same time.

User mapping must also be set up again.

■ If the machine for which the machine name was changed is managed by the manager (a member machine)

Because the change-target machine name is deleted from the machine group before changing the host name, in addition to the processing in "When the machine for which the host name is changed does not belong to a group" above, the new machine name must be registered to the machine group.

■ When the machine for which the host name is changed is the machine-group manager (scheduler)

If there are .rhosts files specified in the home directories of the nsumsmgr users of all member machines managed by the manager, in addition to the processing in "When the machine for which the host name is changed does not belong to the machine group" and "When the machine for which the host name is changed is managed by the manager (a member machine)", change the machine name specified in .rhosts to the new name.

When changing the local host name, the work described below in Section 13.3.1.4, "Updating definition data" must also be done.

13.3.1.4. Updating definition data

If you have changed the host name, you need to convert the host names included in the definition data. These include not only the host names contained in parameters but also those stored in the internal database of JobCenter. Therefore, host name conversion is necessary even if values that explicitly contain host names (for example, default submission queue) are not set in the job network parameters. (If host names are not explicitly specified, you need to perform only Steps 1 and 3 below; Step 2 is not necessary.)

For information about changing the host name in the definition data, see the linked section below. While the linked section describes the procedure for migration to another machine, it is assumed here that you are changing the host name when the migration source and destination servers are the same one physical machine.

1. Downloading definition data

   From the server, download all definition data in the JPF format. Perform the download for all the users who have definition data. Only administrators can batch download definitions for all users.

2. Changing the host name in the definition data

   Change the host name in the definition data, as necessary. This is not necessary when a value containing the host name is not set in any parameter. For information about which parameters are applicable, see the linked section above.

3. Uploading the definition data

   Upload JPF files to update the definition data in the server. Perform the upload for all users. The data is updated in overwrite mode according to the changed host name.

13.3.2. Machine ID Changing Work

If a machine ID is accidently registered or the ID of another machine is duplicated and you want to change the machine ID assignment, perform the procedure below.

If a machine ID is changed, for all pipe queues specified as transfer destinations on the machine for which the ID was changed, the transfer destination must be specified again by using CL/Win or the set destination sub-command of qmgr.

If only a machine ID is changed and no host name is changed, it is not necessary to update the definition data.

> ⚠️ ■If the machine for which the machine ID is to be changed belongs to the machine group, delete the machine group before doing the work, and then reregister the machine to the group after the change.
>
> ■If the machine for which the machine ID is to be changed is the machine-group manager (scheduler), temporarily delete all the member machines from the machine group, do the work, and then set the machine group back up after the change.

For details about nmapmgr and qmgr, see "3.12 Managing the nmapmgr Network Configuration" and "3.13 Managing the qmgr Configuration and Operations", which are in <JobCenter Command Reference> (Japanese only).

13.3.2.1. Changing the Registered Contents of Another Machine ID

To change the machine ID of another host registered to a machine icon on the local machine, perform the procedure below.

Example: Changing the machine ID of the machine name host1, which is registered to the local site as machine ID=110, to 200 by using a terminal you logged in to as a UNIX root user

```
# nmapmgr ↵
NMAPMGR>: delete mid 110 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: add mid 200 host1 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: exit ↵
#
```

Example: Changing the machine ID of host1, which is registered to the cluster site cluseter1 as machine ID = 110, to 200 by logging on to Windows as a JobCenter administrator and then using the command prompt

```
> set NQS_SITE=cluster1 ↵
> nmapmgr ↵
NMAPMGR>: delete mid 110 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: add mid 200 host1 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: exit ↵
>
```

> ✏️ For the cluster site, be sure to specify the cluster site name for the environment variable NQS_SITE before starting nmapmgr. When changing the settings for the local site, do not specify NQS_SITE.

13.3.2.2. Changing the Registered Contents of the Local Machine ID

To change the machine ID of the local host registered to a machine icon on the local machine, stop JobCenter, and then perform the procedure below.

> ⚠️ In this case, it is necessary to apply the change to the localinfo file and initialize the machine group at the same time. In addition, the work cannot be interrupted after starting. Note that, if the work is interrupted, it might become impossible to correctly run JobCenter.

Example: Changing the local machine ID, which is registered to the local site host2.co.jp as machine ID = 101, to 201 by using a terminal you logged in to as a UNIX root user

```
# nqsstop ↵
# nmapmgr ↵
NMAPMGR>: delete mid 101 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: add mid 201 host2.co.jp ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: set local name host2.co.jp ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: exit ↵
# nqsstart ↵
# qmgr ↵
Mgr: set machine_group=(host2.co.jp) ↵
NQS manager[TCML_COMPLETE  ]: Transaction complete at local host.
Mgr: set manager nsumsmgr:m ↵
NQS manager[TCML_COMPLETE  ]: Transaction complete at local host.
Mgr: exit ↵
#
```

Example: Changing the local machine ID, which is registered to the cluster site cluster2.co.jp as machine ID = 1001, to 2001 by logging on to Windows as a JobCenter administrator and then using the command prompt

```
> cjcpw -stop cluster2.co.jp ↵
> set NQS_SITE=cluster2.co.jp ↵
> nmapmgr ↵
NMAPMGR>: delete mid 1001 ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: add mid 2001 cluster2.co.jp ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: set local name cluster2.co.jp ↵
NMAP_SUCCESS: Successful completion.
NMAPMGR>: exit ↵
> cpcpw cluster2.co.jp d:\jcdb ↵
> qmgr ↵
Mgr: set machine_group=(cluster2.co.jp) ↵
NQS manager[TCML_COMPLETE  ]: Transaction complete at local host.
Mgr: exit ↵
>
```

> For the cluster site, be sure to specify the cluster site name for the environment variable NQS_SITE before starting nmapmgr. When changing the settings for the local site, do not specify NQS_SITE.
>
> Note that, after initializing the machine group by using qmgr, the sub-command "set manager nsumsmgr:m" which is used to specify the NQS administrator user, is only to be executed in UNIX. This user does not have to be specified in Windows.

After changing the local host name, restart JobCenter, and then use CL/Win to make sure that you can connect by using the new machine name.

13.3.2.3. Work after Changing the Machine ID

If a machine ID is changed, for all pipe queues specified as transfer destinations on the machine for which the ID was changed, the transfer destination must be specified again by using CL/Win or the set destination sub-command of qmgr. IF the pipe queue transfer destinations are not specified again, it will become impossible to correctly transfer job requests, so be sure to check the destinations and specify them.

Note that the machine ID setting conditions can be referenced using the show state sub-command of nmapmgr.

Example: Specifying the settings again because, as a result of the machine ID of the remote machine host1 changing from 110 to 200, the transfer destination of the remote transfer pipe queue remoteq, which is for the UNIX local site host2, switches to the [Old ID] display and the [Transfer destination machine name unknown] status

```
# qmgr ↵
Mgr: show long queue remoteq ↵
remoteq@host2.co.jp;  type=PIPE;  [ENABLED, INACTIVE];  pri=10
  0 depart;  0 route;  0 queued;  0 wait;  0 hold;  0 arrive;
  Run_limit = 1;
  User run_limit : Unlimited
  Group run_limit : Unlimited
  Cumulative system space time = 0.00 seconds
  Cumulative user space time = 0.00 seconds
  Unrestricted access
  Queue server: C:\JobCenter\SV\bin\NSpipecl.exe
  Destset = {batch1@[110]};
  Reboot mode=RESTART
Mgr: set destination=batch1@host1 remoteq ↵
NQS manager[TCML_COMPLETE  ]: Transaction complete at local host.
Mgr: exit ↵
#
```

Example: Specifying the settings again because, as a result of the local machine ID changing from 1001 to 2001, the transfer destination of the default queue guilb_def, which is for the Windows cluster site cluster1.co.jp, switches to the guitp_1@[Old ID] display and the [Transfer destination machine name unknown] status

```
> qmgr ↵
Mgr: show long queue guilb_def ↵
guilb_def@cluster1.co.jp; type=PIPE; [ENABLED, INACTIVE]; pri=10
  0 depart;  0 route;  0 queued;  0 wait;  0 hold;  0 arrive;
  Run_limit = 6;
  User run_limit : Unlimited
  Group run_limit : Unlimited
  Reserved_run_limit = 5;
  Destination_retry_wait= 3600;
  Cumulative system space time = 0.00 seconds
  Cumulative user space time = 0.00 seconds
  Unrestricted access
  Load_balance
  Queue server: C:\JobCenter\SV\bin\NSpipecl.exe
  Destset = {guitp_1@[1001]};
  Reboot mode=RESTART
Mgr: set destination=guitp_1@cluster1.co.jp guilb_def ↵
NQS manager[TCML_COMPLETE  ]: Transaction complete at local host.
Mgr: exit ↵
>
```

> For the cluster site, be sure to specify the cluster site name for the environment variable NQS_SITE before starting nmapmgr. When changing the settings for the local site, do not specify NQS_SITE.

The above settings can be respecified by logging in to CL/Win as a JobCenter administrator and then performing GUI operations in the queue list for each machine icon in the manager frame.

13.4. Verifications in Actual Use Environment

Perform immediate execution of the job network and schedule submission, and confirm that operations are smooth.

If the host name and user name become illegal, operations may not be implemented normally or schedule submission may not be performed. Use the jc_check command for acquiring the setting contents to make sure that there are no consistency problems with the setting contents.

For details about the jc_check command, refer to Section 6.1, "jc_check - Checking JobCenter Configuration" in <JobCenter Command Reference> (Japanese only).

14 Handling Environment Variables at Job Execution

When jobs are submitted and executed from JobCenter, JobCenter basically does not succeed the environment variables of the user environment of the submit source when executing the jobs.

This is because if the environment of the platform, etc. differs between the submit source of the job and environment of the side executing the job, an error state may result if the environment variables of the submit source are applied as they are to the environment of the executing side.

In addition, the environment variables of the user environment on the execution server of the submit destination of jobs are different between the UNIX and Windows versions.

In the UNIX version, these environment variables are basically invalid. This is because when JobCenter starts the designated shell during job execution, the shell is not started as a "login shell."

However, of environment variables on the execution server, a limited number can be referenced because they are reset inside JobCenter based on system information such as /etc/passwd.

While the environment variables are invalid in the Windows version of R12.9 or earlier, they are valid by default in R12.10 or later. The environment variables can be disabled, as in the UNIX version, by changing the relevant setting.

For this reason, when executing jobs from JobCenter, environment variables required in job execution need to be set separately explicitly by the following method.

14.1. Environment Variables of JobCenter for UNIX

14.1.1. Environment Variables of JobCenter MG Side

When jobs are submitted from the UNIX version of JobCenter, JobCenter MG basically does not hand over the environment variables of the job transfer source JobCenter MG to the transfer destination JobCenter SV. However, the environment variables set in the following files are handed over to the transfer destination.

1. /etc/profile

2. ~/.nsifrc (set up in the job network submission user's home directory)

Example:

```
VAR1=VAL1
export VAR1
```

If different values are specified under the same environment variable name in /etc/profile and .nsifrc, the setting in ~/.nsifrc takes priority.

In addition, basic environment variables of the JobCenter MG side are saved in the unique environment variables of JobCenter described in Section 14.3, "Environment Variables Individually Set at Job Submission" and exported at the beginning of job execution. By referring to these environment variables, their values can be extracted.

> ⚠ As an exception, note that, if /etc/profile or ~/.nsifrc is installed in MG and LANG is specified there, the LANG value is overwritten with the language setting specified when setting up MG, and then the result is transferred to SV.

> ⚠ If you hold, skip or otherwise operate the scheduled tracker of another user (such as root) on the "Tracker List@all_machine" or other screen in MG as nsumsmgr (JobCenter administrator), the display changes to the scheduled (confirmed) tracker.
>
> In an environment in which the LANG environment variable does not exist when the operation target user (such as root) logs onto the OS, the LANG variable will not be recognized when the tracker is executed, which might generate an illegal variable error during job execution in SV, causing job execution to fail.
>
> To avoid this problem, set up ~/.nsifrc for the operation target user and specify export LANG=xxxx in this file.

> ⚠ JobCenter internally switches the user execution permissions when executing jobs in the batch queue. Therefore, environment variables specified in .nsifrc are not handed over to SV and become NULL in some OS specifications (For example, LIBPATH is not handed over in AIX). In this case, take one of the following countermeasures.
>
> ■Explicitly define the environment variable at the top of the unit job script rather than in /etc/profile or .nsifrc.
>
> ■Set the necessary value to an arbitrary environment variable other than the desired one and then set that value to the desired environment variable in the unit job script or the user command shell executed from it during execution.

14.1.2. Environment Variables of JobCenter SV Side

When jobs are submitted to the UNIX version of JobCenter SV, JobCenter SV starts the shell for job execution in the environment executed in. However, as the shell is not started as a "login shell", configuration files such as ".login" and ".profile" are not read. Consequently, the environment variables described in these configuration files cannot be referenced from jobs executed by JobCenter.

Environment variables required at job execution must explicitly be set separately again as described below.

For the csh system, the contents of ".cshrc" are valid, however. This is because csh reads ".cshrc" at startup according to the specification.

14.1.2.1. Environment variables required when executing jobs

Of the environment variables of the job transfer destination JobCenter SV side, JobCenter SV resets the following to values according to the system environment of the JobCenter SV side before job execution and then exports them.

1. HOME

2. LOGNAME

3. MAIL

4. SHELL

5. TZ

6. USER

7. NQS_SITE

8. QUEUENAME

14.1.2.2. Setting value of the environment variables "ENVIRONMENT"

JobCenter sets the environment variable "ENVIRONMENT" to fixed values before job execution, and then exports them.

General users	BATCH
Root users	BATCH

14.1.2.3. Setting value of the environment variables "PATH"

JobCenter sets the environment variable "PATH" to following fixed values respectively before job execution, and then exports them.

■HP-UX

General users	/bin:/usr/bin
Root users	/bin:/etc:/usr/bin

■Linux

General users	/bin:/usr/bin
Root users	/bin:/etc:/usr/bin

■AIX

General users	/bin:/usr/bin
Root users	/bin:/etc:/usr/bin

14.1.3. Setting Environment Variables

To set environment variables to jobs started from JobCenter, use one of the following methods, from Section 14.1.3.1, "In a unit job script" to Section 14.1.3.5, "For setting on JobCenter SV (environment variable "PATH" only)".

The setting methods have the following priority (including setting environment variables in the job network parameter).

Setting method	Priority
Section 14.1.3.1, "In a unit job script"	High
Section 14.1.3.2, "For a unit job for exporting environment variables"	↑
Section 14.1.3.3, "For the [Environment Variable] tab of the job network parameter"	|
Section 14.1.3.4, "For setting on JobCenter MG"	↓
Section 14.1.3.5, "For setting on JobCenter SV (environment variable "PATH" only)"	Low

> ⚠️ Notes on setting environment variables
>
> ■ When the UNIX and Windows versions of SVs are used, also refer to Section 14.2, "Environment Variables of JobCenter for Windows".
>
> ■ The functions related to environment variables "NQS_PATH_UNIX" and "NQS_PATH_WIN" are enabled only when the version of the job transfer destination SV is R12.5.5 or later.
>
> ■ The function related to "NQSDAEMON_PATH_ EXPORT" is enabled only when the version of the SV is R12.6 or later.
>
> ■ The following notes apply to each version as shown below.
>
> R12.8.2 or earlier
>
> ▪ Up to 400 environment variables can be used for one request. If the maximum number is exceeded by submitting jobs, the request causes an error.
>
> ▪ For job requests submitted to the Windows version of SV, character strings consisting of a variable name (including =) and a value specified as an environment variable must be no longer than 8,189 bytes.
>
> R12.8.3 or later
>
> ▪ The total size of environment variables that can be passed during job startup depends on the environment variable size limit, which can be specified at process generation for each OS and PF (and which is determined by the total size of environment variables (envp) and argument list (argv) when the execve system call is executed).
>
> ▪ Standard environment variable size for each OS
>
> | HP-UX | 2 MB |
> |---|---|
> | Linux | 128 KB |
> | AIX | 24 KB (default) |

* The above values differ depending on the version of the OS. For details about the size of environment variables in your system, refer to the OS specifications.

- The following JobCenter-specific limit of the total size and number of environment variables only applies when the jnwengine option :-A is used in the HP-UX version.

Maximum number of environment variables	2400
Maximum total size of environment variables	120 KB

14.1.3.1. In a unit job script

■In the unit job script, directly set the environment variable required for executing the job and export.

■At the head of the script of the unit job, describe #!/bin/sn, prepare a separate script for setting the required environment variables, and include this script near the head of the job script using . (dot) command.

■At the head of the script of the unit job, describe #!/bin/csh, and set all environment variables required for job execution using .cshrc.

The set environment variables are valid only within the unit job script in which they are set.

14.1.3.2. For a unit job for exporting environment variables

■You can use the EXPORTVAR function of a unit job to set desired environment variables. To use this function, set [STDOUT] for [Variable export] in the [Result] tab in the Unit Job parameter setting dialog box for the unit job created.

For details about the setup method, cautions, and restrictions, see in <Basic Guide>Section 4.2.3, "Passing Information Between Unit Jobs".

■Environment variable [PATH] cannot be exported as it is in such a case where the Windows version of MG is used or where there are the UNIX and Windows versions of SVs in the environment. In this case, you can set the value of PATH to environment variable "NQS_PATH_UNIX" to export it to environment variable "PATH" for the SV at the job execution.

Example of defining environment variable "NQS_PATH_UNIX" in the unit job script

```
echo EXPORTVAR
echo NQS_PATH_UNIX=/usr/local/bin:/bin:/usr/bin:/home/jobcenter/bin
echo EXPORTVAR
```

In the created unit job, write only the variable export setting.

If the variable export setting and job processing are contained in a unit job, the environment variable is not exported to the subsequent unit job when an error occurs in job processing.

14.1.3.3. For the [Environment Variable] tab of the job network parameter

You can use the [Environment Variable] tab of the job network parameter to specify the environment variables assigned when a unit job is executed.

For details about the setup method, cautions, and restrictions, see in <Basic Guide>Section 3.3.4.3, "Environment Variable tab".

14.1.3.4. For setting on JobCenter MG

■For the UNIX version of MG and SV

When the UNIX version is used as JobCenter MG, you can set desired environment variables in the following shell scripts and export them to set environment variables used at job execution for each server or user. For environment variable "PATH," however, environment variable "NQS_PATH_UNIX" must be set.

1. /etc/profile

2. ~/.nsifrc (set up in the job network submission user's home directory)

Example:

```
VAR1=VAL1
export VAR1
```

If different values are specified under the same environment variable name in /etc/profile and .nsifrc, the setting in ~/.nsifrc takes priority.

When environment variables are set in ~/.nsifrc and operation is performed with schedule submission for the user, be sure to change the schedule definition to reflect the environment variable setting to JobCenter.

When the schedule is not required to be changed, create, save, and delete a temporary schedule.

When a job network of another user is executed or a schedule of another user is set, the environment variables set by the owner of the job network are used.

When environment variables are set in /etc/profile or ~/.nsifrc, be sure to log in with the user who owns the job network and change the schedule as described above. This operation is required because environment variables used at the execution of a job network are set only by changing login user's own schedule.

> ⚠️ For trackers for which the [PREPARE] status is displayed, the ~/.nsifrc setting contents are not applied even if the above operations are performed, so trackers that have this status must temporarily be deleted.

■For the Windows version of MG and the UNIX version of SV

When the Windows version is used as MG, you can define system environment variables on the MG side to set environment variables used at job execution.

However, because the environment variable PATH cannot be inherited as is, the setting for the environment variable NQS_PATH_UNIX must be separately specified.

> ⚠️ After changing system environment variables, restart JobCenter. The OS may be required to be restarted depending on the OS.

14.1.3.5. For setting on JobCenter SV (environment variable "PATH" only)

■When the UNIX version is used for both JobCenter MG and SV, you can set NQSDAEMON_PATH_EXPORT=1 in the daemon configuration file (daemon.conf) to export environment variable "PATH" on JobCenter MG at the job execution.

■For the specification method, refer to Section 5.2.3, "For UNIX".

14.1.4. Notes When Different LANG Values Are Set for MG and SV

When a job is transferred from MG to SV, the value of the environment variable LANG is passed from MG to SV as is. Therefore, if the language environment differs between MG and SV, or if the value set in LANG (set character string) is different even when they use the same language, you need to set the value of this environment variable. For information about how to set the value, refer to Chapter 8, 「Setting Up Connections Between Different Language Environments」.

If you want to set the environment variable LANG for each job individually, you need to set it as shown below.

At the beginning of the script of the job to be transferred, explicitly describe the setting of LANG that you want to run on the SV side.

Sample script description (when LANG on the SV side is "ja_JP.SJIS")

```
LANG=ja_JP.SJIS
export LANG
#
command1
command2
...
```

> ⚠️ Even after the above setting is made, the following warning may be recorded as the standard error output result when a unit job is transferred.
>
> (Example) When MG is AIX SJIS (Ja_JP) and SV is HP-UX SJIS (ja_JP.SJIS)
>
> ```
> Warning! One or more of your selected locales are not available.
> Please invoke the commands "locale" and "locale -a" to verify your
> selections and the available locales.
>
> Continuing processing using the "C" locale.
> ```

> ⚠️ ■Note that, if /etc/profile or ~/.nsifrc is installed in MG and LANG is specified there, the LANG value is overwritten with the language setting specified when setting up MG, and then the result is transferred to SV.

14.1.5. Notes on the Environment Variable TZ (Linux and AIX Versions)

■Notes on the Linux version of JobCenter

If using JobCenter on the Linux machine whose environment variable "TZ" is not set by default, "TZ" for a unit job is set to "JST-9JDT (or JST-9JST or the like, which depends on the environment on the OS side)." Therefore, the time zone of the unit job becomes different from "JST-9," and the display may show the wrong time for one hour when date command is executed, for example. In this case, use JobCenter after setting the environment variable "TZ."

- Setting environment variable "TZ" and restarting JobCenter

  1. Stop JobCenter.

```
# /usr/lib/nqs/nqsstop ↵                         (local site example)
# /usr/lib/nqs/cluster/cjcpw -stop cluster.co.jp ↵   (cluster site example)
```

2. Edit the nqs startup file /usr/lib/nqs/rc/nqs.sh.

Append the two lines for specifying TZ immediately before "/usr/lib/nqs/nqsdaemon $NQSDAEMON_OPT >/dev/null2>&1".

```
case $1 in
'start')
     if [ -x /usr/lib/nqs/nqsdaemon ]
     then
          TZ=JST-9
          export TZ
          /usr/lib/nqs/nqsdaemon $NQSDAEMON_OPT >/dev/null 2>&1
          status=$?
```

3. Edit the jnwengine startup file /usr/lib/nqs/rc/jnwengine.sh.

Write the following two lines immediately before "/usr/lib/nqs/gui/bin/jnwengine":

```
case $1 in
'start')

    if [ -x /usr/lib/nqs/gui/bin/jnwengine ]
    then
        TZ=JST-9
        export TZ
        /usr/lib/nqs/gui/bin/jnwengine $JNWENGINE_OPT >/dev/null
        status=$?
```

4. Start JobCenter.

```
# /usr/lib/nqs/nqsstart                          (local site example)
# /usr/lib/nqs/cluster/cjcpw cluster.co.jp /jcdb   (cluster site example)
```

5. Specify the environment variable TZ in /etc/profile or ~/.nsifrc in the same way as 2.3 above.

■Notes on the Linux and AIX versions

With the Linux and AIX version JobCenter, if the [Schedule Viewing] tab in the [User Frame] window is displayed, its display might be incorrect, in that the beginning of the date is judged based on GMT by a calendar branch part and the processing appears to branch to a flow to which it should not. (At this time, however, the date is correctly judged at the calendar branch part.)

To correctly display information, add the TZ environment variable, which is described above in "Notes on the Linux version of JobCenter", to the /etc/profile or ~.nsifrc file. (Note that JobCenter does not have to be restarted.) For details about the ~/.nsifrc file, see Section 14.1.3, "Setting Environment Variables".

14.2. Environment Variables of JobCenter for Windows

14.2.1. Environment Variables of JobCenter MG Side

When jobs are submitted from JobCenter MG, of the environment variables of the submit source JobCenter MG, the following are succeeded before job execution at the executing side

■Environment variables set to "System Environment Variables"

In contrast, because the environment variables listed below are not inherited, they cannot be referenced.

■Environment variables set to "User Environment Variables"

■Environment variables set to the envvars of JobCenter MG

However, of the environment variables at the JobCenter MG side, for those reset at the JobCenter SV side (refer to Section 14.2.2, "Environment Variables of JobCenter SV Side"), values set at the MG side cannot be referenced for job execution. However, basic environment variable values of the MG side can be referenced according to environment variables unique to JobCenter like the UNIX version. Refer to Section 14.3, "Environment Variables Individually Set at Job Submission".

> ⚠ After changing the system environment variables, restart JobCenter. The OS may be required to be restarted.

> ⚠ Windows versions have restrictions on inheritance of environment variables. In some UNIX versions, the number of environment variables that can be inherited is limited. For details, refer to the notes in Section 14.2.3, "Setting Environment Variables".

14.2.2. Environment Variables of JobCenter SV Side

In R12.9 or earlier, the environment variables that the job execution user has are not used when a job is executed. In R12.10 or later, a change has been made so that, by default, a job is executed using the environment variables that the job execution user has.

> ⚠ By clearing the [Set user environment variables when executing jobs] check box in the [Submit Parameters] tab in the [Environment Setting] window, you can have JobCenter behave in the same way as in R12.9 or earlier. Refer to Section 12.3.3, "Specifying job execution settings".

The following sections describe the points to note when using the environment variables in each of the above-mentioned cases.

14.2.2.1. Environment variables required when executing jobs

Regarding the following environment variables on JobCenter SV to which jobs are transferred, you need to keep in mind the notes contained in the table below.

1. ComSpec

2. NetShepherdUserName

3. NQS_SITE

4. Os2LibPath

5. STANDARD_ERROR

6. STANDARD_OUTPUT

7. SystemRoot

8. SystemDrive

9. USERNAME

10. USERPROFILE

11. windir

Applicable version and condition	Note
When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is selected (default)	cmd.exe is started using the environment variables that the job execution user has. Therefore, care needs to be exercised to prevent these environment variables from being overwritten inadvertently by the environment variables of the job execution user.
R12.9 or earlier When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is not selected	cmd.exe is started using the environment variables that are reconfigured according to the JobCenter settings and SV-side system settings. Therefore, any environment variable that requires a command-specific value when a job is executed needs to be changed individually as instructed in Section 14.2.3, "Setting Environment Variables".

14.2.2.2. Set value of the environment variable "ENVIRONMENT"

JobCenter sets environment variable "ENVIRONMENT" to the following fixed value at job execution:

```
BATCH
```

Therefore, keep in mind the notes contained in the table below.

Applicable version and condition	Note
When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is selected (default)	Care needs to be exercised to prevent the environment variable from being overwritten by the job execution user's environment variable "ENVIRONMENT".
R12.9 or earlier When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is not selected	Since the value shown above is set unconditionally, no arbitrary value can be set.

14.2.2.3. Set value of the environment variable "PATH"

JobCenter sets environment variable "PATH" to one of the values shown below at job execution:

Applicable version and condition	Value
When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is selected (default)	Value of the job execution user's environment variable "PATH"
R12.9 or earlier	Windows-system-directory;Windows-directory

Applicable version and condition	Value
When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is not selected	

14.2.2.4. Setting value of the environment variables "TMP" and "TEMP"

JobCenter sets environment variable "TMP" to one of the values shown below at job execution:

Applicable version and condition	Value
When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is selected (default)	Value of the job execution user's environment variable "TMP"
R12.9 or earlier When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is not selected	Value set for the value name "TMP" in the registry key "HKEY_USERS\.DEFAULT\Environment"

JobCenter sets environment variable "TEMP" to one of the values shown below at job execution:

Applicable version and condition	Value
When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is selected (default)	Value of the job execution user's environment variable "TEMP"
R12.9 or earlier When the version is R12.10 or later and the [Set user environment variables when executing jobs] check box is not selected	Value set for the value name "TEMP" in the registry key "HKEY_USERS\.DEFAULT\Environment"

Each of the above registry keys differs depending on the type of OS.

As an example, for Windows XP Pro, the [%USERPROFILE%\Local Settings\Temp] value is specified for both TMP and TEMP, and this is expanded to [C:\Documents and Settings\LocalService\Local Settings\Temp] during execution.

To check what the fixed value will actually be after expansion, specify the set command at the beginning of the job request, and then execute submission.

14.2.3. Setting Environment Variables

To set environment variables to jobs started from JobCenter, use one of the following methods, Section 14.2.3.1, "In a unit job script" to Section 14.2.3.7, "For setting on JobCenter MG (environment variables other than "PATH")".

The setting methods have the following priority (including setting environment variables in the job network parameter).

Setting method	Priority
Section 14.2.3.1, "In a unit job script"	High
Section 12.3.3, "Specifying job execution settings"	↑
Section 14.2.3.2, "For setting on JobCenter SV (envvars file)"		
Section 14.2.3.3, "For a unit job used to export environment variables"		

	|
	|
	↓
	Low

> ⚠️ ■When the UNIX and Windows versions of SVs are used, also refer to Section 14.1, "Environment Variables of JobCenter for UNIX".
>
> ■After changing system environment variables, restart JobCenter. The OS may be required to be restarted depending on the OS.
>
> ■The functions related to environment variables "NQS_PATH_UNIX" and "NQS_PATH_WIN" are enabled only when the version of the job transfer destination SV is R12.5.5 or later.
>
> ■The function related to "NQSDAEMON_PATH_ EXPORT" is enabled only when the version of the SV is R12.6 or later.
>
> ■Up to 400 environment variables can be used for one request in R12.8.2 or earlier or in R12.9. If the maximum number is exceeded when submitting a job, the request causes an error. There is no limit to the number of environment variables in R12.8.3 or later and in R12.9.1 or later.
>
> ■There are the following restrictions on job requests submitted to the Windows version of SV. (There are no restrictions in the UNIX version.)
>
> - Character strings consisting of a variable name (including =) and a value specified as an environment variable must be no longer than 8,189 bytes. However, when specifying the envvars file described below for the Windows version of SV, the character strings specified in envvars must be no longer than 1,023 bytes.
>
> - The following notes apply to some versions.
>
>   R12.8.2 or earlier and R12.9
>
>   - The maximum total size of environment variables that can be passed during job startup is 10 KB (or 8 KB for a version earlier than R12.5.4). If the total size of the environment variables in the system (system variables, variables used by JobCenter, and variables passed between unit jobs) exceeds this limit, an error occurs for the subsequent job.
>
>   - The maximum total size of environment variables that can be passed during job startup can be increased as described below in R12.5.4 or later. (However, the resulting limit must not exceed the total size of environment variables in the whole OS system as described in the next section.)
>
>   Example: Increasing the upper limit to 15 KB
>
>   1. Set the variable name "NQS_ENVIRONMENT_BUFFER" and the variable value "15000" to the OS system environment variable for the SV that inherits the environment variable (executes job requests).
>
>   2. Restart JobCenter in SV.
>
>   - JobCenter cannot operate normally if the total size of environment variables for the whole OS system exceeds 29 KB. Therefore, when expanding the size of environment variables passed between the unit jobs in JobCenter by setting NQS_ENVIRONMENT_BUFFER, assume that the actual upper limit is 16 KB.

> R12.8.3 or later and R12.9.1 or later (excluding R12.9)
>
> • The setting parameter NQS_ ENVIRONMENT_BUFFER (set to "System Environment Variables") in the Windows version of JobCenter, which increases the size of environment variables that can be inherited, is ignored and the total size of environment variables that can be passed during job startup is 32 KB. This value is limited by the API (environment variable block of the CreateProcess function).

14.2.3.1. In a unit job script

Set the environment variables required at job execution using the set command in a unit job script. In this case, the environment variables are valid only within the unit job script in which they are set.

14.2.3.2. For setting on JobCenter SV (envvars file)

Create a text file named envvars under %InstallDirectory%\spool\private\root and write required environment variables, which enables the environment variables to be collectively defined.

%InstallDirectory% is the installation directory of JobCenter. By default, C:\JobCenter\SV.

Format of envvars file

```
Environment variable name 1=value
Environment variable name 2=value
....
```

⚠️ ■In the envvars file, note that the %PATH% portion is replaced with a macro if the following sort of setting is specified.

```
BATCHPATH=c:\jobcenter\SV\lib;%PATH%
```

■The environment variables set to the envvars file are valid in all users.

■In the envvars file, one environment variable that is within 1,023 bytes can be specified on each line in the environment variable name = value format.

14.2.3.3. For a unit job used to export environment variables

■You can use the EXPORTVAR function of a unit job to set the desired environment variables. To use this function, set [STDOUT] for [Variable export] on the [Result] tab in the [Unit Job parameter setting] dialog box for the unit job created.

For details about the setup method, cautions, and restrictions, see in <Basic Guide>Section 4.2.3, "Passing Information Between Unit Jobs".

■Environment variable "PATH" cannot be exported as it is in such a case where the UNIX version of MG is used or where there are the UNIX and Windows versions of SVs in the environment. In this case, you can set environment variable "NQS_PATH_WIN" to export it to environment variable "PATH" for the SV at the job execution.

Example: Defining environment variable "NQS_PATH_WIN" in the unit job script

```
echo off
echo EXPORTVAR
echo NQS_PATH_WIN=C:\Windows;C:\Windows\System32;
```

```
echo EXPORTVAR
```

> ⚠️ In the created unit job, write only the variable export setting.
>
> If the variable export setting and job processing are contained in a unit job, the environment variable is not exported to the subsequent unit job when an error occurs in job processing.

14.2.3.4. For the [Environment Variable] tab of the job network parameter

You can use the [Environment Variable] tab of the job network parameter to specify the environment variables assigned when a unit job is executed.

For details about the setup method, cautions, and restrictions, see in <Basic Guide>Section 3.3.4.3, "Environment Variable tab".

14.2.3.5. For setting on JobCenter MG (environment variable "PATH" only)

■For the UNIX version of MG and the Windows version of SV

When the UNIX version is used as MG, you can set environment variable "NQS_PATH_WIN" in the following shell scripts and export it to set it to SV environment variable "PATH" at job execution for each server or user.

1. /etc/profile

2. ~/.nsifrc (set up in the job network submission user's home directory)

Example:

```
VAR1=VAL1
export VAR1
```

If different values are specified under the same environment variable name in /etc/profile and .nsifrc, the setting in ~/.nsifrc takes priority.

When environment variables are set in ~/.nsifrc and an operation is performed by the user submitting a schedule, the user must change the schedule definition to apply the environment variable setting to JobCenter.

If the schedule is not required to be changed, create and save a temporary schedule, and then delete it when the operation is finished.

When the job network of another user is executed or the schedule of another user is set, the environment variables set by the owner of the job network are used.

When environment variables are set in /etc/profile or ~/.nsifrc, be sure to log in as the user who owns the job network and change the schedule as described above. This operation is required because environment variables used for the execution of a job network are set only by changing the login user's own schedule.

> ⚠️ For trackers for which the [PREPARE] status is displayed, the ~/.nsifrc setting contents are not applied even if the above operations are performed, so trackers that have this status must be temporarily deleted.

■For the Windows version of MG and SV

When the Windows version is used as MG, you can set environment variable "NQS_PATH_WIN" as an MG system environment variable to set it to SV environment variable PATH at job execution.

14.2.3.6. For setting in JobCenter SV (environment variable "PATH" only)

■When the Windows version is used for both JobCenter MG and SV, you can set NQSDAEMON_PATH_EXPORT=1 as an SV system environment variable to export environment variable PATH on the MG side at the job execution.

Variable name	NQSDAEMON_PATH_EXPORT
Variable value	1

> ⚠️ ■In this version, the function is also valid even when a value other than 1 is specified for NQSDAEMON_PATH_EXPORT. Specify 1, however, since the specification method may be changed in future.
>
> ■To disable this function, delete "NQSDAEMON_PATH_EXPORT" from the set of system environment variables.

14.2.3.7. For setting on JobCenter MG (environment variables other than "PATH")

■For the UNIX version of MG

When the UNIX version is used as MG, you can set desired environment variables in the following shell scripts and export them to set SV environment variables for each server or user at job execution:

1. /etc/profile

2. ~/.nsifrc (set up in the job network submission user's home directory)

Example:

```
VAR1=VAL1
export VAR1
```

If different values are specified under the same environment variable name in /etc/profile and .nsifrc, the setting in ~/.nsifrc takes priority.

When environment variables are set in ~/.nsifrc and an operation is performed by the user submitting a schedule, the user must change the schedule definition to apply the environment variable setting to JobCenter.

If the schedule is not required to be changed, create and save a temporary schedule, and then delete it when the operation is finished.

When the job network of another user is executed or the schedule of another user is set, the environment variables set by the owner of the job network are used.

When environment variables are set in /etc/profile or ~/.nsifrc, be sure to log in as the user who owns the job network and change the schedule as described above. This operation is required because environment variables used for the execution of a job network are set only by changing the login user's own schedule.

> ⚠️ For trackers for which the [PREPARE] status is displayed, the ~/.nsifrc setting contents are not applied even if the above operations are performed, so trackers that have this status must be temporarily deleted.

■For the Windows version of MG

When the Windows version is used as MG, you can set any environment variable as an MG system environment variable to set it to SV environment variable at job execution.

After changing system environment variables, restart JobCenter. The OS may be required to be restarted.

14.3. Environment Variables Individually Set at Job Submission

JobCenter sets the following environment variables individually when jobs are submitted. These environment variables can be referenced during job execution. JobCenter does not export environment variables of the submission source to the transfer destination, but the values of basic environment variables of the submission source can be referenced by fetching them.

14.3.1. For UNIX

With the UNIX version, the following environment variables are individually set when a job request is submitted to a queue.

Table 14.1. Environment variables set with the UNIX version

Environment variable	Description
QSUB_HOME	Value of environment variable HOME when job request is submitted
QSUB_HOST	Name of job request submission machine (site)
QSUB_LOGNAME	Value of environment variable LOGNAME when job request is submitted (some systems)
QSUB_MAIL	Value of environment variable MAIL when job request is submitted
QSUB_PATH	Value of environment variable Path when job request is submitted
QSUB_REQID	Job request ID
QSUB_REQNAME	Unit job name assigned within the job network (when submitted from the job network) Shell script name when the job request is submitted (when directly submitted by qsub)
QSUB_SHELL	Value of environment variable SHELL when job request is submitted
QSUB_TZ	Value of environment variable TZ when job request is submitted
QSUB_USER	Job request submission user
QSUB_WORKDIR	Directory path assigned to the tracker to which the job request belongs (when submitted from the job network) or current directory at the time of job request execution (when directly submitted by qsub)

When CL/Win is executed immediately or on schedule or when a job network is submitted using a command, the following environment variables are also set.

Table 14.2. Environment variables set with the UNIX version (when a job network is submitted)

Environment variable	Description
NSJNW_BASEDATE	Expected Start Time (in local time) of job network (operation date of submission with Windows version)
NSJNW_BASETIME	Expected Start Date (in local time) of job network(date after correction when Base time is set)
NSJNW_DIR	Directory path assigned to tracker
NSJNW_HOST	Job network submission machine (site) name
NSJNW_JNWNAME	Job network name
NSJNW_JNWTIME	Character string differentiating tracker ((scheduled) start time in GMT format)
NSJNW_PARAM	Parameter specified during job network submission

NSJNW_UJNAME	Unit job name assigned within the job network
NSJNW_UJERREC	Minimum value of error code taken as abnormal end
NSJNW_USER	Job network submission user name

14.3.2. For Windows

The following table lists the environment variables that are set individually when a job request is submitted to a queue in the Windows version.

Note that, under the default setting of R12.10 or later, if the job execution user has any environment variable having an identical name, the value of the corresponding environment variable is overwritten by the value of the job execution user's environment variable.

Table 14.3. Environment variables set with the Windows version

Environment variable	Description
QSUB_ComSpec	Path of cmd.exe of job request submission machine (site)
QSUB_HOMEDRIVE	Value of environment variable HOMEDRIVE when job request is submitted
QSUB_HOMEPATH	Value of environment variable HOMEPATH when job request is submitted
QSUB_HOST	Name of job request submission machine (site)
QSUB_Os2LibPath	Value of environment variable Os2LibPath when job request is submitted
QSUB_Path	Value of environment variable PATH when job request is submitted
QSUB_REQID	Job request ID
QSUB_REQNAME	Unit job corresponding to job request
QSUB_SystemDrive	Value of environment variable SystemDrive when job request is submitted
QSUB_SystemRoot	Value of environment variable SystemRoot when job request is submitted
QSUB_temp	Value of environment variable TEMP when job request is submitted
QSUB_tmp	Value of environment variable TMP when job request is submitted
QSUB_USERNAME	Value of environment variable USERNAME when job request is submitted
QSUB_windir	Value of environment variable windir when job request is submitted
QSUB_WORKDIR	Directory path assigned to the tracker to which the job request belongs

When CL/Win is executed immediately or on schedule or when a job network is submitted using a command, the following environment variables are also set.

As described earlier, under the default setting of R12.10 or later, if the job execution user has any environment variable having an identical name, the value of the corresponding environment variable is overwritten by the value of the job execution user's environment variable.

Table 14.4. Environment variables set with the Windows version (when a job network is submitted)

Environment variable	Description
NSJNW_BASEDATE	Submission time of job network (date of submission with Windows version)
NSJNW_DIR	Directory path assigned to tracker
NSJNW_HOST	Job network submission machine (site) name
NSJNW_JNWNAME	Job network name
NSJNW_JNWTIME	Character string differentiating tracker ((scheduled) start time in GMT format)
NSJNW_PARAM	Parameter specified during job network submission
NSJNW_UJNAME	Unit job name assigned within the job network

NSJNW_UJERREC	Minimum value of error code deemed abnormal end
NSJNW_USER	Job network submission user name

14.4. Modules for Which Environment Variables "NQS_SITE" and "NQS_SITEDB" Must Be Set

List of module which must be set with environment variables "NQS_SITE" and "NQS_SITEDB."

Table 14.5. Modules

Module	Function
cal_export.exe	Exports calendar
cal_import.exe	Imports calendar
calcal.exe	Acquires schedule operating days
cjcls.exe	Displays machine information in the cluster environment
cjcmksite.exe	Constructs cluster environment
cjcpw.exe	Starts, monitors, and stops cluster process
comagent.exe	JobCenter SV communication agent
gethost.exe	Acquires host name
jemgr.exe	jnwengine management interface
jnw_export.exe	Exports a job network according to the specified parameters
jnw_import.exe	Imports a job network from a data file of an exported job network
jnwengine.exe	Executes or controls jnw and monitors nqs execution results
jnwenvfile.exe	Creates jnwengine environment variable file
jnwman.exe	SV/NT command transfer center. Processes various commands
jnwop.exe	Performs tracker control, etc.
jnwreset.exe	Restores JNW link file
jnwschprt.exe	Reports schedule information
jnwsubmitcmd.exe	External command inputting jnw
jnwsummary.exe	Displays tracker information
nmapmgr.exe	Manages MG user mapping
netdaemon.exe	Processes request from the remote machine
nqsdaemon.exe	Processes various requests
shepherd.exe	Processes various requests
mkarc.exe	Archives tracker data
mktrkdata.exe	Saves flow and unit job parameters
mkumsgrp.exe	Manages machine group such as add and delete
packetapi.exe	Transfers control message to jnwengine
qdel.exe	Deletes request
qmgr.exe	nqs management interface
qrls.exe	Releases held request
qstatx.exe	Displays nqs queue status information
qsub.exe	Input job to the specified queue
qwait.exe	Waits for request to end
qwatch.exe	Monitors changes in request status
qwb.exe	Transfer nqs data to jnwengine

sch_export.exe	Exports a schedule
sch_import.exe	Imports a schedule from an exported data file
sclaunchd.exe	Inputs jnw to specified time
setuserpwd.exe	Sets the password
trkcheck.exe	Check if flow and trkdata are matching
trkrdr.exe	Reads job status from NQS and transfers to jnwengine
trksrch.exe	Searches for tracker satisfying conditions
umsclient.exe	SV side remote request program

15 Usage in a Non-Japanese Time Zone

This chapter describes the settings that are required when using JobCenter in a non-Japanese time zone or transferring jobs to an environment that has a different time zone, as well as functions that are useful when using JobCenter in such an environment.

15.1. Settings Required After Setting Up JobCenter

When using JobCenter with a non-Japanese time zone, after installing JobCenter, specify the settings in this section according to the platform you are using.

■Settings required when using the UNIX version of JobCenter

When using JobCenter with a non-Japanese time zone, the schedule_timezone parameter must be specified in daemon.conf.

Use an editor to add the following line to the daemon.conf file, and then restart JobCenter:

```
schedule_timezone=OFF
```

For details about daemon.conf and other parameters that can be specified in daemon.conf, see Chapter 5, 「Changing Startup Settings for JobCenter」 .

■Settings required when using the Linux and AIX versions of JobCenter

Specify an appropriate value for the environment variable TZ, as described in Section 14.1.5, "Notes on the Environment Variable TZ (Linux and AIX Versions)". (In the example, this environment variable is set to JST-9. Specify the value according to the time zone you are using.)

15.2. Usage in an Environment That Has Multiple Different Time Zones (Calendar Time Zone Setting Function)

Normally, the schedule execution time uses the manager time zone as a reference, but there are times when you might want to transfer a job to a server in a different time zone, such as Japan or America, and then perform JobCenter schedule execution at a time based on a time zone that differs from that of the manager.

By using the calendar time zone setting function, it is possible to, for example, enable schedule execution based on a Japanese or American time zone, and, even if your system includes servers running in different time zones, it is possible to perform operations according to the time zones of the different servers.

> ⚠ To use this function, the manager (which refers to the machine that has the calendar and schedule definitions in this document) OS time zone must not be using daylight saving time. JobCenter schedule execution is performed using the server that has the schedule definitions, but, for an environment in which that server OS is running in a time zone that uses daylight saving time, because OS time adjustment is performed when switching between daylight saving time and normal time, this function does not operate correctly.
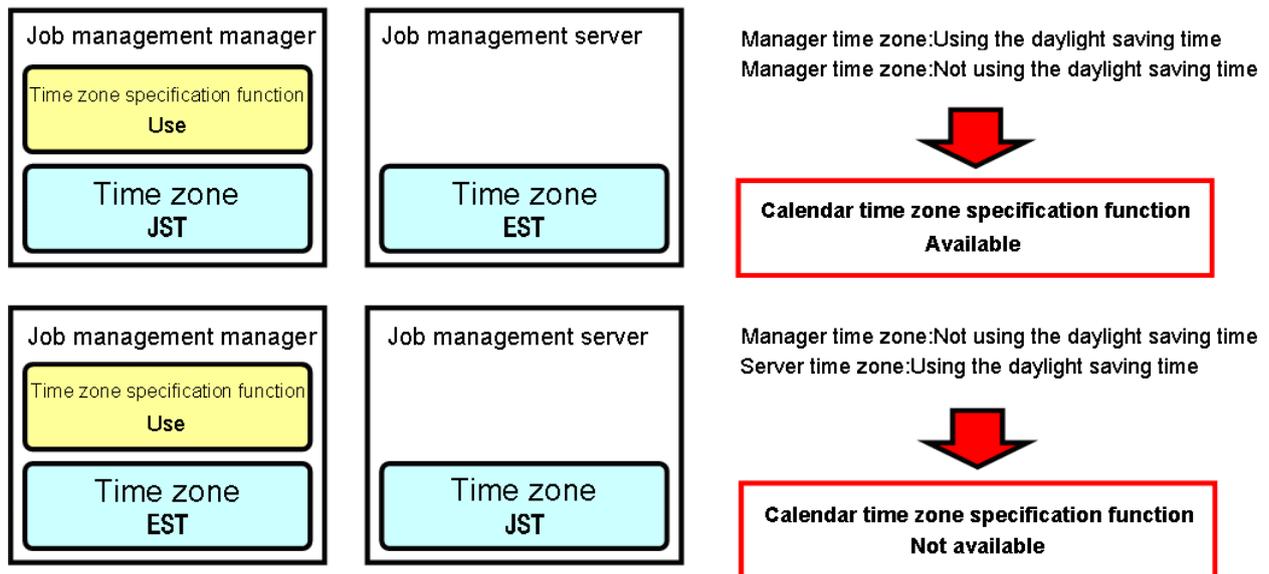
Figure 15.1. Example Usage Conditions for the Calendar Time Zone Setting Function

15.2.1. Operation Overview

The following figure shows an operation overview of the calendar time zone setting function.
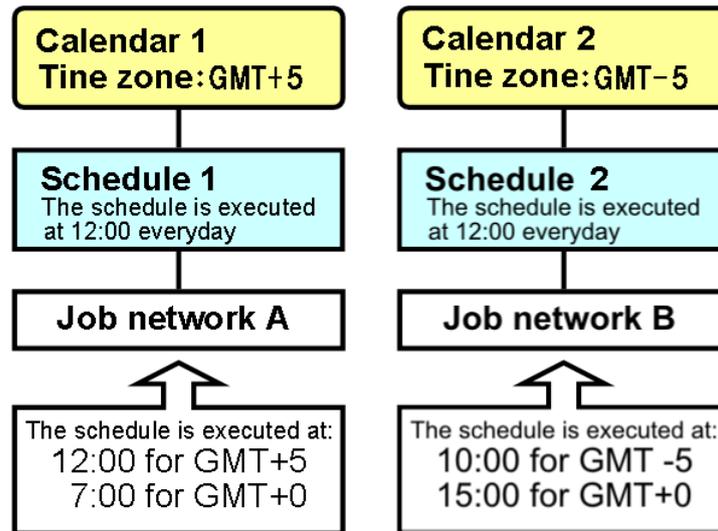
Figure 15.2. Operation Overview of the Calendar Time Zone Setting Function

When specifying a time zone for a calendar, the schedule that is to reference the calendar operates according to the specified time zone. When the schedule is associated with the target job network, the job network operates in a time zone that differs from that of the manager machine.

For the above operation overview,

1. because schedule 1 references calendar 1 as the basis for operating days, job network A, which is associated with schedule 1, is started at a time based on GMT+5.

2. Similarly, because schedule 2 references calendar 2 as the basis for operating days, job network B, which is associated with schedule 2, is started at a time based on GMT-5.

3. If the settings are changed so that calendar 2 is used as the basis of the operating days for schedule 1, job network A, which is associated with schedule 1, is executed based on GMT-5.

Schedules that reference calendars for which no time zone is specified and schedules that do not reference operating day calendars operate using times based on the time zone of the OS on which JobCenter is installed, as before.

15.2.2. Enabling the Calendar Time Zone Setting Function

Immediately after installation, this function is disabled, and it is not possible to specify a time zone for a calendar. To use this function, first enable the calendar time zone setting function.

The calendar time zone setting function can be enabled or disabled in the [System Config] dialog box on the [Time Config] tab. Doing this requires JobCenter administrator permissions.
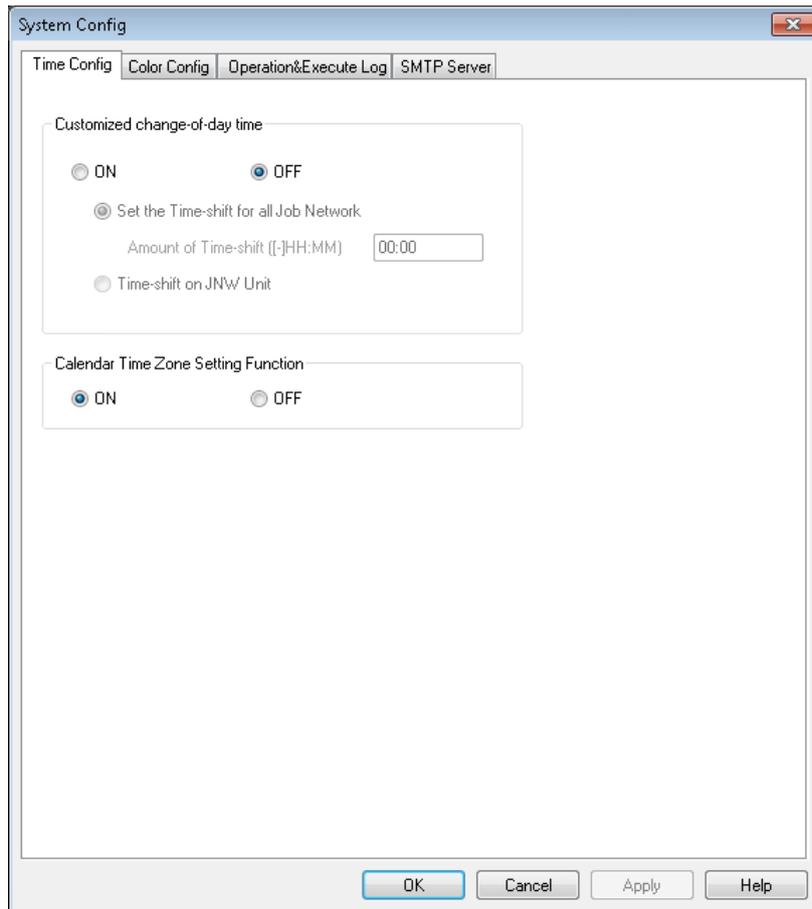
Figure 15.3. System Config

■Calendar Time Zone Setting Function

Item	Meaning
ON	The calendar time zone setting function is enabled.
OFF	The calendar time zone setting function is disabled.

15.2.3. Specifying a Time Zone for the Calendar

When a calendar definition is right-clicked after enabling the calendar time zone setting function, the "Time Zone Setting" item is added to the menu. When "Time Zone Setting" is selected, the following time zone setting dialog box is displayed.
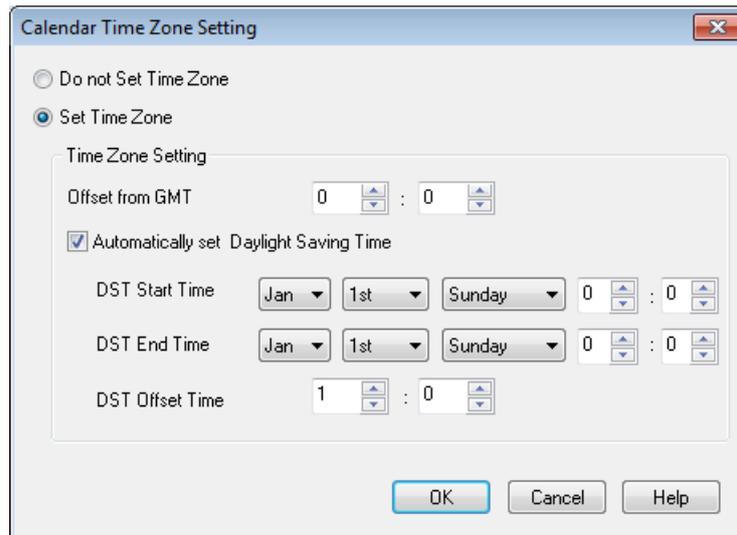
Figure 15.4. Calendar Time Zone Setting Dialog Box

■Calendar Time Zone Setting

Select whether to specify a time zone for the selected calendar.

Item	Meaning
Do not Set Time Zone	The schedule that uses this calendar as the basis for operating days operates based on the time zone of the OS on the machine where JobCenter is installed.
Set Time Zone	It becomes possible to specify which time zone the calendar bases its time on.

[Time Zone Setting]

■Offset from GMT

Specify the time zone for the calendar as an offset from GMT+0. Specify a value in the range from -12:59 to 12:59.

■Automatically set Daylight Saving Time

Select whether to specify daylight saving time for the calendar.

If "Specify daylight saving time" is selected, it becomes possible to specify the daylight saving time start time, end time, and offset below.

■DST Start Time/DST End Time

Specify the daylight saving time start time and end time. The specifiable range is shown below.

Item	Setting range
Month	1 to 12 months
Week	1st to 4th or final week
Day	Monday to Saturday
Time	0:00 to 23:59

■DST Offset Time

Specify the offset value used during the daylight saving time period. Specify a value in the range from -12:59 to 12:59.

During the daylight saving time period, the time is adjusted by the amount of time specified as the daylight saving time offset.

15.2.4. Specifying a Calendar for which a Time Zone Has Been Specified for the Schedule

It is possible to specify a calendar for which a time zone has been specified as the basis for the schedule operating days.

The specification method is the same as that described in in <Basic Guide>Section 6.1.3.3, "Creating a Schedule Based On a Separate Operating Day Calendar".

If "ON" is specified for the calendar time zone setting function, the calendar selection fields in the schedule setting dialog box change as shown below.

Calendar Selection

Calendar Name	calbranch
Time Zone Setting	GMT-5:00
DST Offset	+1:00

Figure 15.5. Calendar Selection Fields

Item	Meaning
Calendar Name	The name of the calendar specified as the operating day basis is displayed.
Time Zone Setting	The time zone specified for the calendar is displayed. If no time zone is specified, "Undefined" is displayed.
DST Offset Time	The offset value used during the daylight saving time period is displayed. If the daylight saving time setting is not specified, "Daylight saving time not used" is displayed.

If the above settings are specified and then a job network is associated with the schedule by specifying the job network for [Linking JNW], job network schedule execution is performed at a time based on the time zone specified for the calendar.

15.2.5. Effects on Job Networks And Part Objects

When the calendar time zone setting function is used to perform schedule execution, the job network and part object parameters are affected as follows.

> ⚠ Note that the effects in the case of schedule execution and immediate submission of a job network associated with the schedule are the same.

■Parameters for which the time zone specified for the calendar is used as the reference time

If the following parameters are specified as absolute times, the specified time is based on the time zone specified for the calendar.

- Job network parameter critical point warning execution start time and end time

- Unit job, ERP job, BI job, PC job, UCSXSingle job, and WOBS job parameter critical point warning execution start time and end time

- External file wait update reference time and timeout time

- Time wait time

- Event transmission reception confirmation and timeout time

- Event reception timeout time

As an example, if a schedule for which a calendar with GMT+3 set is specified as the operating day basis is associated with a job network for which 10:00 is specified as the critical point warning execution end time, warning operations are performed using the 10:00 time based on GMT+3.

■Calendar branch

The judgment basis of the execution day for the schedule selected for the calendar branch depends on the time zone of the calendar specified as the operating day basis for the schedule.

15.2.6. Operation When Specifying Daylight Saving Time

For the calendar time zone setting function, the time specified for the schedule rule is converted to a time based on the time zone specified for the calendar and submitted as the planned tracker.

The following shows an example of operation when a time zone setting that considers daylight saving time is specified for the calendar.

■Example of schedule execution when daylight saving time is specified

When an eastern daylight saving time time zone is specified for a calendar by using the eastern daylight saving time (GMT-5 March, 2nd week, Sunday 2:00 to November, 1st week, Sunday 2:00 daylight saving time offset +1:00) condition, the operation is as follows.

1. If the schedule execution time is during the standard time (not the daylight saving time period), schedule registration is performed by converting to a GMT-5-equivalent time.

2. If the execution time is during the daylight saving time period, schedule registration is performed by converting to a GMT-4-equivalent time.

The following shows an example of the operation when a schedule for which processing is executed every day at 12:00 is specified and a calendar with an eastern daylight saving time time zone set is specified as the operating day basis.
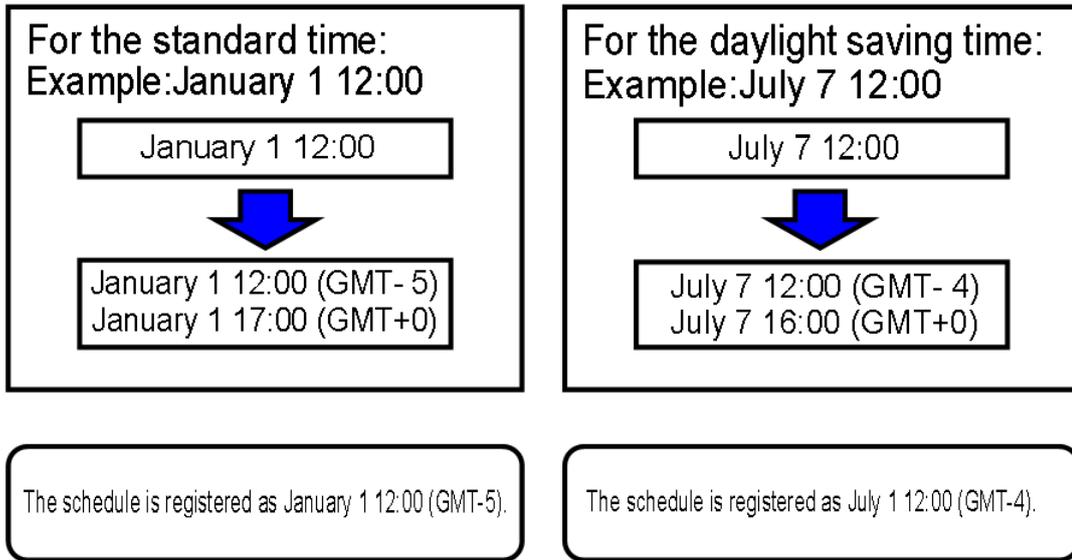
Figure 15.6. Daylight Saving Time Operation Example

■Schedule execution time near the daylight saving time start time

For the eastern daylight saving time, because the daylight saving time start time is 2:00, schedules from before 2:00 (1:59 or earlier) are registered as standard time schedules, and schedules from 2:00 or later are registered as daylight saving time schedules.

However, if creating schedules executed at 1:30, 2:30, and 3:30, because the 1:30 and 2:30 schedules are calculated using 1:30 (GMT-5) and 2:30 (GMT-4), these schedules end up using the same time.

If schedule execution times are duplicated in this way, processing is executed assuming a standard time schedule. Note that operations such as for the critical point warnings of parts in job networks are also based on a standard time time zone.
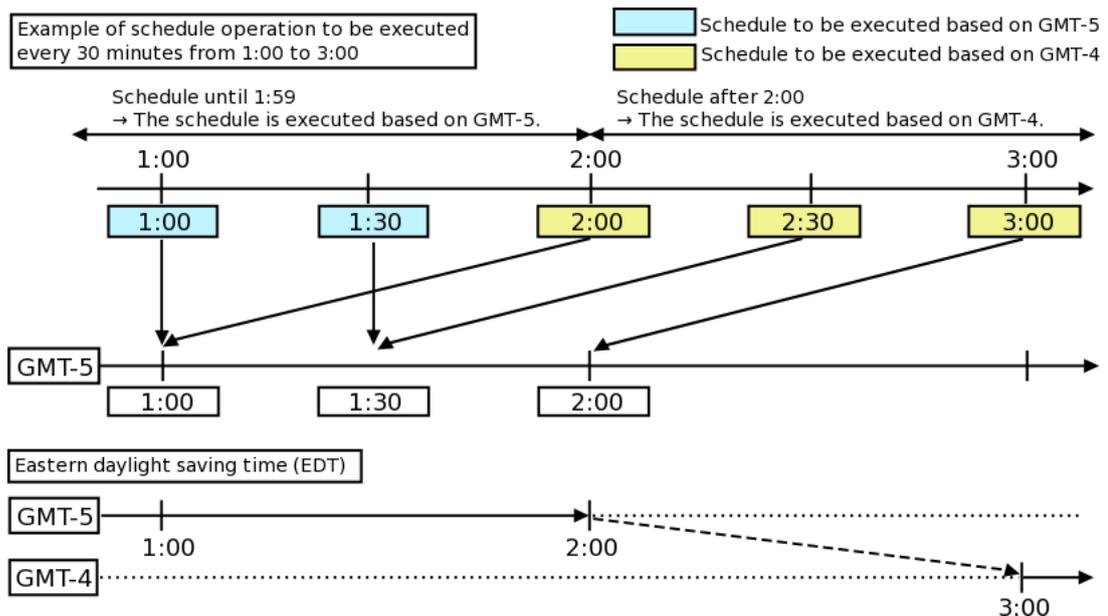
Figure 15.7. Example of Operation Near the Start of Daylight Saving Time

■Schedule execution time near the daylight saving time end time

For the eastern daylight saving time, the daylight saving time end time is 2:00, but, for the period of time from 1:00 to 1:59, the daylight saving time period and standard time period overlap.

For this function, a schedule for which a time from 1:00 to 1:59 on the last daylight saving time day is specified is calculated as a time in a schedule that uses a standard time period time zone. No schedule execution is performed during the daylight saving time period from 1:00 to 1:59.
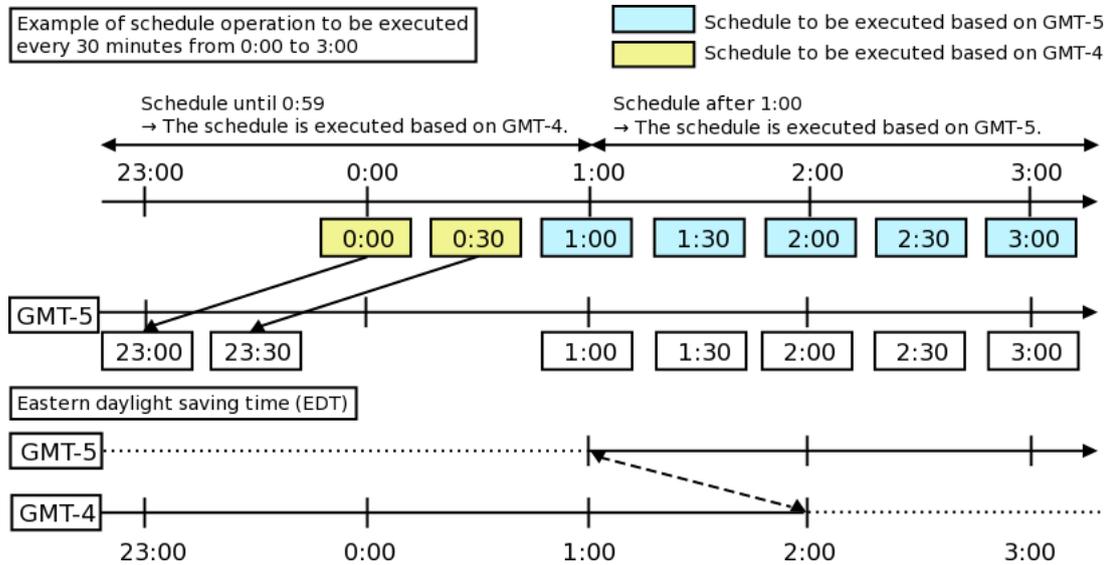
Figure 15.8. Example of Operation at the End of Daylight Saving Time

15.2.7. Performing Monitoring According to the Time Zone

By default, CL/Win displays settings such as the tracker prediction start and end time by using the time zone of the OS on which CL/Win is installed.

In order for the OS to install JobCenter on a machine running in a foreign time zone, perform monitoring, and use the calendar time zone setting function to execute a schedule using a time based on the foreign time zone, it is possible to change the reference time zone for time display by using the CL/Win display time zone changing function.

As an example, when monitoring a tracker of a JobCenter instance running in the GMT+1 time zone from Japan (GMT+9), it is possible to change the displayed time zone to "GMT+1" in order to monitor the tracker running in GMT+1 using the appropriate time zone.

Similarly, for a time zone that uses daylight saving time, it is possible to perform monitoring by switching the displayed CL/Win time zone between the daylight saving time period and standard time period.
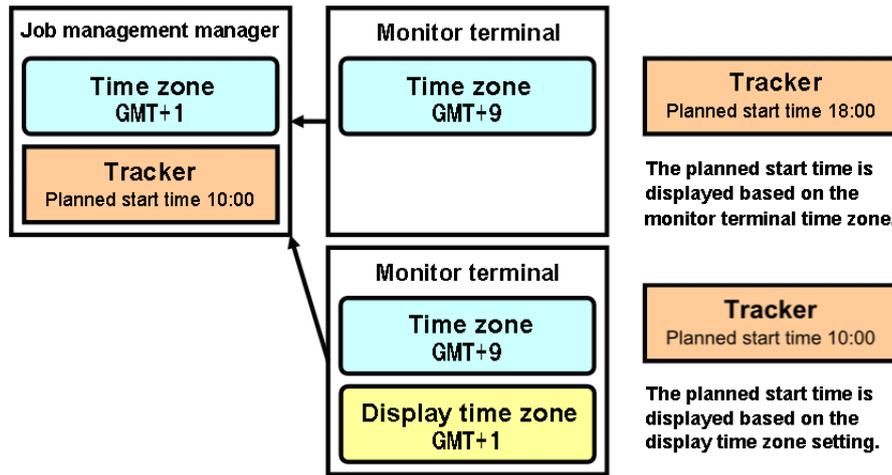
Figure 15.9. Example of Using the Displayed Time Zone Modification Function

The procedure for changing the displayed CL/Win time zone is as follows.

1. Select "View" in the main menu and then "Set Time Zone for Displaying".

2. In the "Display Time Zone Setting" dialog box, select "Change the Time Zone for Displaying", and then specify the time zone you want to display. Specify a time in the range from -12:59 to 12:59.
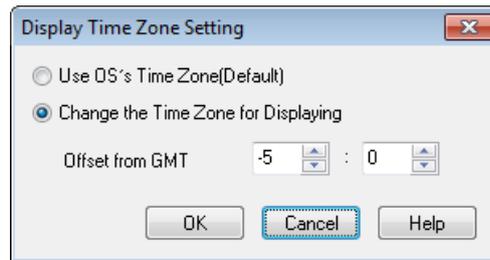
Figure 15.10. Display Time Zone Setting Dialog Box

When the displayed time zone changing function of CL/Win is used, the time for each window item below is changed to a time based on the time zone specified above.

Window name	Setting (displayed) items to which the time zone change is applied
Tracker List (text mode)	Expected Start Time, Expected End time, Start Time, End Time
Tracker List (Gantt mode)	Gantt chart period
Tracker list print setup dialog	Printing period
Tracker flow window (during part list display)	Expected Start Time, Expected End Time, Start Time, End Time
Tracker details window	Expected Start Time, Expected End Time, Start Time, End Time
Job Searching Dialog	Search start day in the search period settings
Job Searching Frame	Expected Start Time, Expected End Time, Start Time, End Time
Schedule Setting dialog	Schedule execution time list
Calendar Setting dialog	Time, Term(rule applied to)

Schedule Viewing	Expected Start Time, Expected End Time, Start Time, End Time
Schedule Print Setting Dialog	Output range
JNW immediate submission dialog	Submission time
ERP Frame	Planning Start Time
ERP Job Search dialog	Start condition date and time
Tracker flow window	Time displayed for the actual wait time of a time wait part
Calendar branch part setting dialog	Schedule execution time
Event List	Timeout time

In particular, because the submission time in the job network immediate submission dialog box is based on the specified time zone, a PREPARE tracker can be created according to any time zone.

15.2.8. Notes

■Effects on the environment variable TZ

This function adjusts the schedule execution time according to the time zone specified for the calendar. The time zone specified for the calendar is not related to the environment variable TZ, which is used during job execution.

For the UNIX version, because the environment variable TZ, which is specified on the management machine, is also specified for jobs to be executed, for an environment in which jobs are remotely transferred to a machine operated using a different OS time zone and then executed and in which TZ is affected by script-internal commands, care is required when, for example, changing the value of TZ in a script.

■Items that are not affected by the calendar time zone setting function

Items such as the schedule execution time and job-network-internal part wait time are affected by the calendar time zone setting function, but the items below are not affected by this function and are displayed and recorded using times based on the time zone of the OS on which JobCenter is installed.

- Job network tracker log (contents of the "Log" tab in the tracker flow window)

- Operation/execution log, event log

- Various JobCenter commands provided by the CUI (such as jnwsummary and jnwschprt)

■Changing settings during operation

After starting system operation, only enable or disable the calendar time zone setting function or change calendar time zone setting values after either disabling the schedule rules or removing associations between the job network and schedule.

When these settings are changed, because schedule execution times are calculated based on the new settings, unexpected schedule execution might start.

Therefore, after changing these settings, be sure to check the PREPARE trackers in the tracker list.

16 Backing Up and Restoring JobCenter Configuration Information

This chapter describes how to back up and restore JobCenter configuration information such as the JobCenter configuration files, queue information, and user mapping information.

16.1. Configuration Information Backup and Restore Function

The following two types of information are necessary for JobCenter to operate.

Configuration information	Information about the JobCenter MG/SV queues, user mappings, machine lists, machine groups, etc. For details, refer to Section 16.2, "Backup and Restoration Target Configuration Information".
Definition information	Data and parameters defined in relation to the JobCenter MG job networks, schedules, and calendars

This chapter describes the backup and restore function for configuration information. For information about the backup and restore function for definition information, refer to "JobCenter Guide for using Helper function".

> ⚠️ This function assumes that backed up configuration information is restored to the server from which the information was backed up (or to a host that physically differs but has the same platform name). This function does not currently support purposes such as distributing configuration information to another machine as a template and changing portions of the information.

16.1.1. Operational Overview

The figure below shows an operational overview of the configuration information backup and restore function.
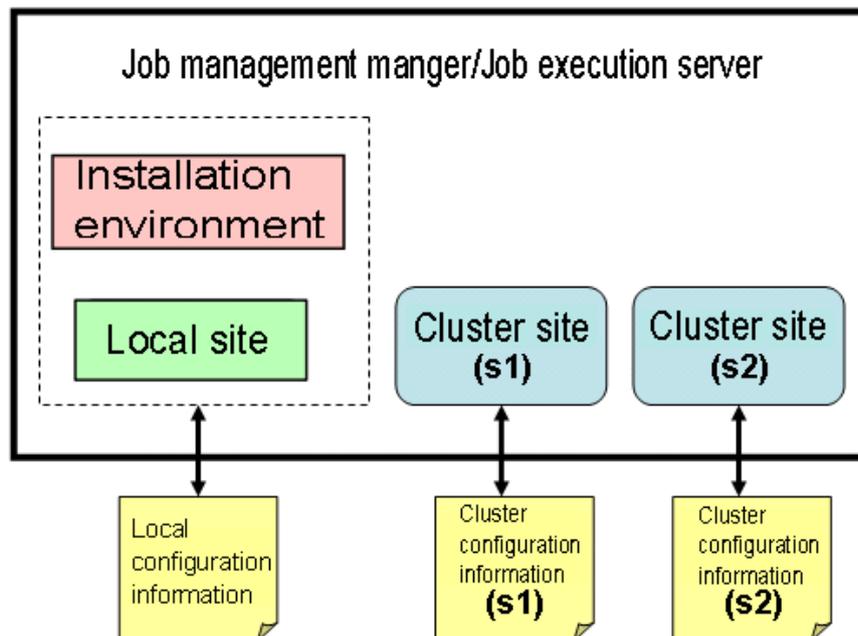
Figure 16.1. Operational Overview of the Configuration Information Backup and Restore Function

The JobCenter configuration information exists in the installation environment, at the local site, and at the cluster site. The installation environment is the machine environment in which JobCenter is installed. The local site is the job network execution environment created by default when JobCenter is installed. The cluster site is the site environment created using the JobCenter cluster function. For details about the site environment, see the <JobCenter Guide for using Cluster function> (Japanese only).

This function makes it possible to use the jc_backup command to obtain the configuration information from the installation environment, local site, and cluster site and then copy the information to a file. In addition, the jc_restore command can be used to restore the configuration information from the file.

There are two types of configuration information files: local configuration information and cluster configuration information. The installation environment and local site configuration information are saved in the local configuration information file. The cluster site configuration information is saved in the cluster configuration information file. Local configuration information files are backed up and restored separately for each machine in which JobCenter is installed. Cluster configuration information files must be backed up and restored on a cluster site basis. Note that configuration information must be backed up and restored for not only the job manager but also the job execution server.

To put the configuration information backup and restore procedure in simple terms using Figure 16.1, "Operational Overview of the Configuration Information Backup and Restore Function" as an example, in the initial environment after JobCenter is installed, cluster site s1 and cluster site s2 are created. In this case, to back up all the environment configuration information, use the jc_backup command to back up the following three types of information: the local configuration information, the cluster configuration information (s1), and the cluster configuration information (s2). To restore the environment, use the jc_restore command and the three configuration information files. Backing up and restoring can be performed in any order. Note that, of the backed up configuration information files, several can be selected and restored.

> ⚠️ When backing up configuration information, JobCenter can be either running or stopped, but, when restoring the information, JobCenter must be stopped. More specifically, when restoring the local configuration information, the local JobCenter instance must be stopped, and, when restoring the cluster configuration information, the corresponding cluster site must be stopped.

16.1.2. Backup and Restoration Procedure

■Local configuration information backup procedure

1. Preliminary check

   - Operation status of JobCenter

     JobCenter may be operating or stopped.

2. Backing up the local configuration information

   Back up the configuration information by executing the command below. This command needs to be executed by the root user in the case of UNIX or by the JobCenter administrator in the case of Windows. In the -o option, specify the output file name using either an absolute path or relative path. If this option is omitted, a file whose name format is jc_conf_local_YYYYMMDDhhmmss.jpf is created directly below the directory in which the command is executed.

   For UNIX

   ```
   /usr/lib/nqs/gui/bin/jc_backup conf [-o <output>]
   ```

   For Windows

   ```
   <installation directory>\bin\jc_backup conf [-o <output>]
   ```

3. Checking the backup file

   If the message "Backup successfully" is output, the backup was successful. Check that a local configuration information file has been created. If the -o option is specified, the created file has

the specified file name. If the option is not specified, a file with the default file name is created directly below the directory in which the command is executed.

■Local configuration information restoration procedure

1. Preliminary check

- Operation status of JobCenter

  JobCenter needs to be stopped.

- OS user account

  The users used in JobCenter at the time of backup need to exist in the restored environment as well. Check the information about the users existing at the time of backup by using the jpf_stat command, and register the necessary users with the restored environment. Not only user names but also UIDs need to match those existing at the time of backup. In the case of UNIX, user accounts can be added and changed using the relevant commands of the OS. In the case of Windows, refer to Section 12.4, "Setting Up a User".

- Creation of user information

  All JobCenter users need to log in from CL/Win in advance. When users log in, a configuration file is created for each of them. Therefore, make sure that all users log in.

2. Restoring the local configuration information

   Restore the configuration information by executing the command below. This command needs to be executed by the root user in the case of UNIX or by the JobCenter administrator in the case of Windows. Restoration requires the local configuration information file created with the jc_backup command. The location of the local configuration information file can be specified using either an absolute path or relative path.

   For UNIX

   ```
   /usr/lib/nqs/gui/bin/jc_restore conf <local configuration information file>
   ```

   For Windows

   ```
   <installation directory>\bin\jc_restore conf <local configuration information file>
   ```

3. Checking the restored contents

   If the message "Restore configuration successfully" is output at the end, the restoration operation was successful. Check the restored contents as described in Section 16.2, "Backup and Restoration Target Configuration Information".

   ⚠ Because, in the configuration information, the user mapping, machine group, machine list, and other settings must be consistent with those of the linkage-destination machine, perform backup and restore operations with the linkage-destination machine as a set whenever possible.

■Cluster configuration information backup procedure

1. Preliminary check

- Operation status of JobCenter

  The target cluster site may be operating or stopped.

    ▪ Status of the cluster-related resources

    When performing this procedure, you need to make sure that the relocatable IP address for JobCenter is enabled and that JobCenter is allowed to access the cluster database.

2. Backing up cluster configuration information

    Back up the configuration information by executing the command below. This command needs to be executed by the root user in the case of UNIX or by the JobCenter administrator in the case of Windows. In the -c option, specify either the absolute path or relative path of the cluster database. In the -o option, specify the output file name using either an absolute path or relative path. If this option is omitted, a file whose name format is jc_conf_cluster_YYYYMMDDhhmmss.jpf is created directly below the directory in which the command is executed.

    For UNIX

```
/usr/lib/nqs/gui/bin/jc_backup conf -c <cluster database path> [-o <output>]
```

    For Windows

```
<installation directory>\bin\jc_backup conf -c <cluster database path> [-o <output>]
```

3. Checking the backup file

    If the message "Backup successfully" is output, the backup was successful. Check that a cluster configuration information file has been created. If the -o option is specified, the created file has the specified file name. If the option is not specified, a file with the default file name is created directly below the directory in which the command is executed.

■Cluster configuration information restoration procedure

1. Preliminary check

    ▪ Operation status of JobCenter

    The target cluster site must be stopped. Note that the cluster site needs to have been started at least once in the past. For information about how to start and stop a cluster site, refer to one of the following manuals:

      · For UNIX

      in <Guide for using Cluster function>Section 2.3.7, "Checking Startup of the Site (Active and Standby Servers)"

      · For Windows

      in <Guide for using Cluster function>Section 2.4.7, "Checking Startup of the Site (Active and Standby Servers)"

    ▪ Status of the cluster-related resources

    When performing this procedure, make sure that the relocatable IP address for JobCenter is enabled and that JobCenter is allowed to access the cluster database.

    ▪ OS user account

    The users used in JobCenter at the time of backup need to exist in the restored environment as well. Check the information about the users existing at the time of backup by using the jpf_stat command, and register the necessary users with the restored environment. Not only

user names but also UIDs need to match those existing at the time of backup. In the case of UNIX, user accounts can be added and changed using the relevant commands of the OS. In the case of Windows, refer to Section 12.4, "Setting Up a User". For information about UIDs in the cluster environment, refer also to in <Guide for using Cluster function>Section 2.2.1, "Using the Same User ID".

- Creation of user information

  All JobCenter users need to log in from CL/Win in advance. When users log in, a configuration file is created for each of them. Therefore, make sure that all users log in.

2. Restoring cluster configuration information

Restore the configuration information by executing the command below. This command needs to be executed by the root user in the case of UNIX or by the JobCenter administrator in the case of Windows. Restoration requires the cluster configuration information file created with the jc_backup command. The location of the cluster configuration information file can be specified using either an absolute path or relative path. In the -c option, specify either the absolute path or relative path of the cluster database.

For UNIX

```
/usr/lib/nqs/gui/bin/jc_restore conf -c <cluster database path> <cluster configuration
 information file>
```

For Windows

```
<installation directory>\bin\jc_restore conf -c <cluster database path> <cluster configuration
 information file>
```

3. Checking the restored contents

If the message "Restore configuration successfully" is output at the end, the restoration operation was successful. Check the restored contents as described in Section 16.2, "Backup and Restoration Target Configuration Information".

> ⚠️ Because, in the configuration information, the user mapping, machine group, machine list, and other settings must be consistent with those of the linkage-destination machine, perform backup and restore operations with the linkage-destination machine as a set whenever possible.

16.2. Backup and Restoration Target Configuration Information

The configuration information backup and restore function is used to back up and restore the information below.

Table 16.1. Backup Target Configuration Information

Location	Configuration information	Description
Local site/cluster site[Note 1]	Queue	The created queue information, settings, and important NQS settings are backed up and restored. For details about the queue, see Chapter 4, 「Creating Queues」 and in <Basic Guide>Chapter 10, 「Usage of Network Queuing System (NQS)」 .
	User mapping	The user mapping information is backed up and restored. For details about user mapping, see Section 3.2, "Associating Users (User Mapping)".
	Machine list	The registered contents of the machine list screen are backed up and restored. For details about the machine list screen, see Chapter 4, 「Creating Queues」 and in <Basic Guide>Section 10.1.1, "Adding a Machine to Machine List".
	Machine group	The machine group information is backed up and restored. For details, see Section 3.1.3, "Machine Group Configuration (Registering Another Machine from JobCenter CL/Win)" and related information.
	Permissions	The permission setting information is backed up and restored. For details, see Chapter 9, 「User Authority (Permission)」 and related information.
	Event linkage settings	The event linkage setting information is backed up and restored. For details about the event linkage settings, see Chapter 11, 「Event Linkage」 and related information.
	System environment settings	The system environment setting information is backed up and restored. For details about system environment settings, see Section 6.5, "Changing System Environment Settings" and related information.
	User environment settings	The user environment settings are backed up and restored. For details about the user environment settings, see in <Basic Guide>Section 8.9, "Displaying the Tracker List with the Display Start Time Specified" and related information.
	Default parameters	The information about the default parameter settings for each user is backed up and stored. For details of the default parameters, refer to Section 6.1, "Defining Default Parameter Values for JobCenter Parts".
	Other	The configuration files other than those from queues to user environment settings are backed up and restored. Details are given below[Note 2].
		For UNIX ■Daemon configuration file (Refer to Chapter 5, 「Changing Startup Settings for JobCenter」 .)

		■SAP RFC system configuration file (Refer to "1.1.1 SAP connection file setting" in <JobCenter Guide for SAP Function> (Japanese only).
		■WebOTX Batch Server linkage configuration file (Refer to "2.1.2 Creating WOBS configuration file" in <JobCenter Guide for WOBS Function< (Japanese only).
		■Log configuration file (Refer to Section 20.2, "Changing Error Log Files".)
		For Windows
		■Daemon configuration file (Refer to Chapter 5, 「Changing Startup Settings for JobCenter」.)
		■jnwschprt command configuration file (Refer to "3.2.2.1 Configuration file" in <JobCenter Command Reference> (Japanese only).
		■Job execution configuration file (Refer to Section 12.3.3, "Specifying job execution settings".)
		■SAP RFC system configuration file (Refer to "1.1.1 SAP connection file setting" in <JobCenter Guide for SAP Function> (Japanese only).
		■WebOTX Batch Server linkage configuration file (Refer to "2.1.2 Creating WOBS configuration file" in <JobCenter Guide for WOBS Function> (Japanese only).
		■Site configuration file (Refer to Section 5.6.3, "Creating a site configuration file (site.conf)".)
		■Server environment mapping information (HOSTS.NQS)
		■Log setup information (Refer to Section 20.2, "Changing Error Log Files".)
		■envvars file (refer to Section 14.2.3.2, "For setting on JobCenter SV (envvars file)")[Note 3]
Installation environment[Note 1]		The configuration files other than those from queues to user environment settings are backed up and restored. Details are given below[Note 2].
		For UNIX
		■Daemon configuration file (Refer to Chapter 5, 「Changing Startup Settings for JobCenter」.)
		■SAP connection destination configuration file (Refer to "1.1.1 SAP connection file setting" in <JobCenter Guide for SAP Function> (Japanese only)
		■Language environment file (Refer to Section 20.1, "Troubleshooting Q&A".)
		■Start scripts (comagent.sh, jnwcaster.sh, jnwengine.sh, nqs.sh)
		■Daemon parameter file (nqsstart.param)
		■jcdbs configuration file (jcdbs.conf)
		■~/.nsifrc file (refer to Section 14.1.3.4, "For setting on JobCenter MG")[Note 3]
		For Windows

		■Daemon configuration file (Refer to Chapter 5, 「Changing Startup Settings for JobCenter」.)
		■Name resolution configuration file (Refer to Section 2.3, "Resolving Names in Windows".)
		■SAP connection destination configuration file (Refer to "1.1.1 SAP connection file setting" in <JobCenter Guide for SAP Function> (Japanese only).
		■WebOTX Batch Server linkage configuration file (Refer to "2.1.2 Creating WOBS configuration file" in <JobCenter Guide for WOBS Function> (Japanese only).
		■Site configuration file (Refer to Section 5.6.3, "Creating a site configuration file (site.conf)".)
		■Server environment mapping information (HOSTS.NQS)
		■jcdbs configuration file (jcdbs.conf)

Note 1   Refer to Figure 16.1, "Operational Overview of the Configuration Information Backup and Restore Function".

Note 2   Only those files that you need to set or change yourself are listed. The internal files to be set or changed automatically by JobCenter are not included. To find out about all the configuration files that have been backed up, use the jpf_stat command (as described in 3.17, "jpf_stat - Checking the JPF files" in <JobCenter Command Reference> (Japanese only)).

Note 3   The data can be backed up and stored in R14.1.1 or later. If you are using this file, apply the accumulated patches of R14.1.1 or later.

16.3. Notes

■The backup and restore function is intended to back up and restore configuration data when the JobCenter environment is normal. If there is an unexplained failure, do not use this function.

■Backing up and restoring are not possible between different platforms (operating systems).

■The backup and restore function also restores JobCenter machine IDs. When linking MGs or SVs, check the local and partner machine lists, as well as the machine group settings, and make sure there are no problems with linkage.

■The backup and restore function cannot back up or restore the user profiles of Windows. If the content of the backed up user profiles differs from that of the restored user profiles, the operation of JobCenter may be affected. Make sure that the user profile settings remain the same.

17 Using jcres

This chapter describes how to use HTTP daemon jcres, a specialized HTTP daemon for JobCenter MG/SV.

For details of the jcres command, refer to Section 3.29, "jcres - JobCenter MG / SV dedicated HTTP daemon" in <JobCenter Command Reference > (Japanese only).

17.1. Starting jcres

To start jcres, execute one of the following commands:

■UNIX version

```
/usr/lib/nqs/gui/tools/jcres
```

■Windows version

```
%InstallDirectory%\tools\jcres.bat
```

To start jcres in the background, execute the following:

■UNIX version

```
/usr/lib/nqs/gui/tools/jcres &
```

■Windows version

```
start /b cmd /c %InstallDirectory%\tools\jcres.bat
```

> ⚠️ Execute the command as the root user for the UNIX version or using the JobCenter administrator account for the Windows version.

17.2. Stopping jcres

To stop jcres, execute one of the following commands:

■UNIX version

```
/usr/lib/nqs/gui/tools/jcres -e
```

■Windows version

```
%InstallDirectory%\tools\jcres.bat -e
```

> ⚠ Execute the command as the root user for the UNIX version or using the JobCenter administrator account for the Windows version.

17.3. Setting File

This file allows you to set operation of jcres. Use it if you want to change its operation from the defaults.

For details of the setting file, refer to Section 3.29.3, "jcres Setting Files" in <JobCenter Command Reference > (Japanese only).

17.4. Checking MG-SV Communication from the Browser

17.4.1. Usage

This section describes how to check communication between MG and SV from the browser.

For this check, jc_ping (the API of jcres) is used. For API details, refer toSection 3.29.6.2, "jc_ping" in <JobCenter Command Reference > (Japanese only).

The figure below shows an image of checking the communication when the MG is a cluster site.

After an HTTP request to check MG-to-SV communication in the client machine is issued to jcres of the active machine, the jc_ping command is executed via jcres from the active machine. If the jc_ping command is completed successfully, the result of checking MG-to-SV communication returns to the client machine. Using the same procedure, an HTTP request to check SV-to-MG communication is issued to jcres of the SV machine, and the bidirectional communication is checked.
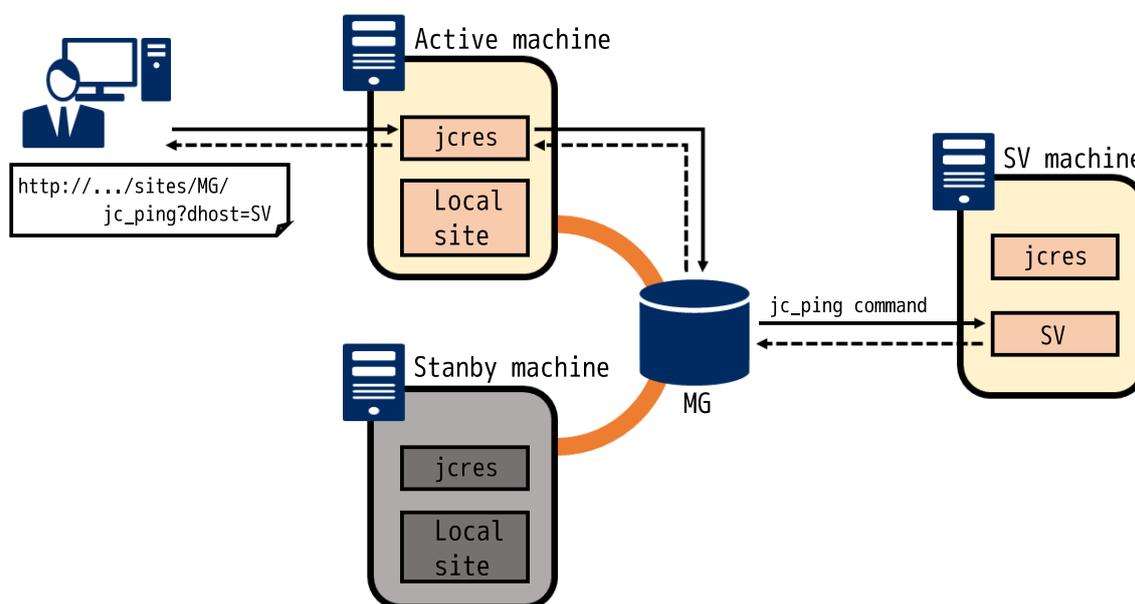
Figure 17.1. Configuration diagram for checking MG-to-SV communication

The sample values in the description are set on the assumption that the check is done in the environment below. Check these in addition to the above figure.

Name	Host name (IP address)
jcres of the active system	mgjcres
jcres of the SV machine	svjcres
MG	mgsite (192.168.1.1)
SV	svsite (192.168.1.2)

1. Starting jcres

   Start jcres in each machine on which to check the communication. For how to start jcres, refer to Section 17.1, "Starting jcres".

2. Checking MG-to-SV communication

   First, check MG-to-SV communication. Start the Web browser and enter the following URL.

■If the MG is at a local site:

```
http://<host name or IP address of MG machine>:< jcres port No. of MG machine>/jc_ping?
dhost=<SV site name>&af=<address family>&ctw=<time-out period>
```

■If the MG is at a cluster site:

```
http://< host name or IP address of MG machine>:<jcres port No. of MG machine>/sites/<MG site
 name>/jc_ping?dhost=<SV site name>&af=<address family>&ctw=<time-out period>
```

> ■The IP address and port number of jcres can be changed with the setting file. The jcres daemon initially starts with IP address 0.0.0.0 and port number 50080.
>
> ■The address family and time-out period may be omitted. If they are omitted, the IPv4 address will be used for the address family and 30 seconds will be assumed as the time-out period.

When taking the environment in Figure 17.1, "Configuration diagram for checking MG-to-SV communication" as an example, the MG is at a cluster site and a URL sample is therefore as follows:

```
http://mgjcres:50080/sites/mgsite/jc_ping?dhost=svsite
```

If the API is executed successfully, the readable result of execution of the jc_ping command is returned. For details of the jc_ping command, refer to Section 6.3, "jc_ping - Communication check for the specified site" in <JobCenter Command Reference> (Japanese only). An "<SV host name> is alive" message shown in the returned result indicates that the check of MG-to-SV communication has succeeded.

The following is a sample of the communication check result.

```
results :
 destination_host = svsite
 destination_ip   = 192.168.1.2
 source_host      = mgsite
 source_ip        = 192.168.1.1

connect :
 nqs       : [OK]
 jccombase : [OK]
 jcevent   : [OK]

svsite is alive.
```

> The result is returned in the "application/octet-stream" format. Thus, depending on the browser, you need to download the file to display in a text editor.

3. Checking SV-to-MG communication

Next, SV-to-MG communication is checked using the same procedure as "Checking MG-to-SV communication".

■If the SV is at a local site:

```
http://<host name or IP address of SV machine>:<jcres port No. of SV machine>/jc_ping?
dhost=<MG site name>&af=<address family>&ctw=<time-out period>
```

■If the SV is at a cluster site:

```
http://<host name or IP address of SV machine>:<jcres port No. of SV machine>/sites/<SV site
 name>/jc_ping?dhost=<MG site name>&af=<address family>&ctw=<time-out period>
```

When taking the environment in Figure 17.1, "Configuration diagram for checking MG-to-SV communication" as an example, the SV is at a local site and a URL sample is therefore as follows:

```
http://svjcres:50080/jc_ping?dhost=mgsite
```

An "<MG host name> is alive" message shown in the returned result indicates that the check of SV-to-MG communication has succeeded.

4. Stopping jcres

Stop jcres when it is unnecessary. Stop jcres on each machine that started it. For how to stop jcres, refer to Section 17.2, "Stopping jcres".

17.4.2. Troubleshooting

This section describes troubleshooting that should be performed when the MG-SV communication check fails, taking the environment in the figure below as an example.
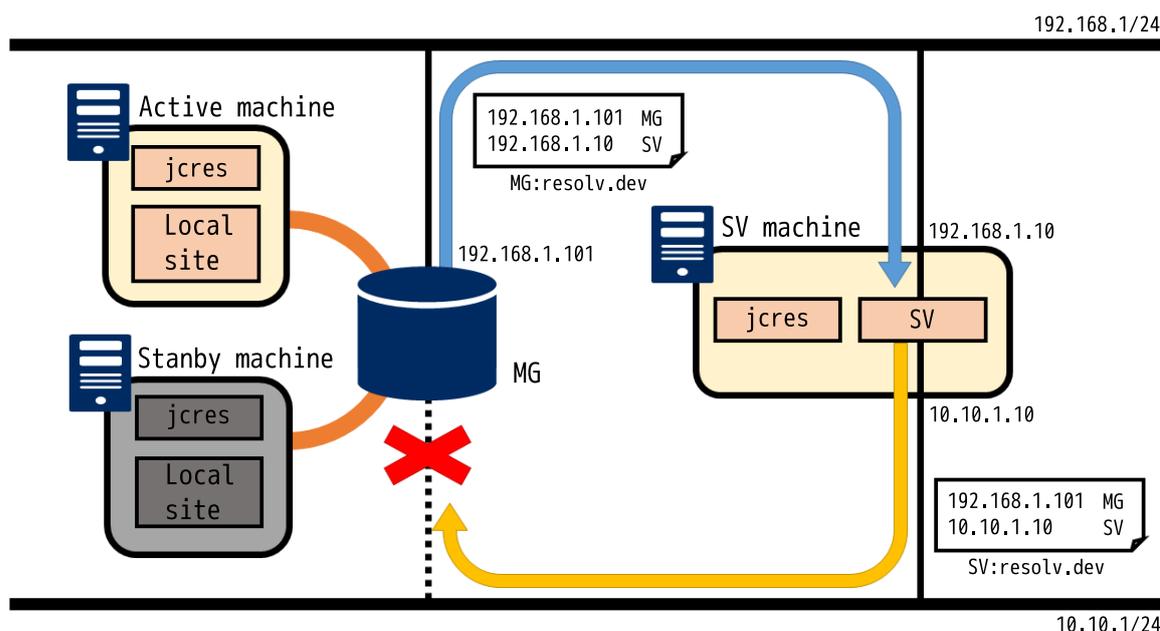
Figure 17.2. Configuration diagram of the failed MG-SV communication

The assumptions are as follows:

■The MG is at a Windows version JobCenter cluster site, and the SV at a Windows version JobCenter local site.

■For both the MG and SV, resolv.def is used for name resolution.

■The MG, which belongs to the 192.168.1/24 and 10.10.1/24 networks, is waiting only in the former.

■The SV, which belongs to the 192.168.1/24 and 10.10.1/24 networks, is waiting in both of these.

■Neither the MG nor SV performs IP forwarding between 192.168.1/24 and 10.10.1/24.

The sample values in the description are set on the assumption that the check is done in the environment below. Check these in addition to the above figure.

Table 17.1. Environment for MG

Site name	mgsite
IP address for which the MG is waiting	192.168.1.101
resolv.def setting	192.168.1.101 mgsite 192.168.1.10 svsite

Table 17.2. Environment for SV

Site name	svsite
IP address for which the MG is waiting	10.10.1.10, 192.168.1.10
resolv.def setting	192.168.1.101 mgsite 10.10.1.10 svsite

1. Checking MG-to-SV communication

   First, check MG-to-SV communication. For the checking procedure, refer to Section 17.4.1, "Usage".

   In this example, there are no problems with the MG-to-SV network configuration, and the result of the communication check is therefore shown as follows:

```
results :
 destination_host = svsite
 destination_ip   = 192.168.1.10
 source_host      = mgsite
 source_ip        = 192.168.1.101

connect :
 nqs       : [OK]
 jccombase : [OK]
 jcevent   : [OK]

svsite is alive.
```

2. Checking SV-to-MG communication

   Next, SV-to-MG communication is checked. For the checking procedure, refer to Section 17.4.1, "Usage".

   The communication check results in failure, and the result is shown as follows:

```
results :
 destination_host = mgsite
 destination_ip   = 192.168.1.101
 source_host      = svsite
 source_ip        = 10.10.1.10

connect :
```

```
 nqs       : [NG]
   Unable to make connection with NQS daemon at transaction peer. Retry later. (
E$nqs_ping(): failed to connect.(errno=10051, r-adr[192.168.1.101] r-port[607] l-adr[10.10.1.10]
 l-port[996]))
 jccombase : [OK]
 jcevent   : [OK]

Communication Failure.
```

> ✏️ In some cases, results of "results" or "connect" shown above are not displayed in your environment with only an error message displayed. This indicates that the failure occurred before the communication check. This may occur when the URL parameter contains an error or when MG or SV name resolution fails.
>
> Solve the problem by referencing Section 6.3.6, "Main Messages" in <Command Reference>(Japanese only), and then perform the SV-to-MG communication check again.

3. Examining the problem

   If the communication check fails, first check the "connect" result. Since the NQS communication check has failed, check whether the NQS port number (default 607) has been blocked by the firewall or others. Assume that in this example, the firewall settings have no problem.

   Next, check the "results". Since source_ip is 10.10.1.10 and destination_ip is 192.168.1.101, it is shown that the communication check was executed from IP address 10.10.1.10 of SV to IP address 192.168.1.101 of MG. This caused failure of the communication check.

   The JobCenter protocol specifies that spjccombase and jcevent perform communication with INADDR_ANY, whereas the NQS of the Windows-version JobCenter is designed so that, by default, it performs communication using the IP address obtained from the own site name. For details, refer to Section 5.3, "Setting daemon.conf When Multiple IP Addresses Are Used".

   To achieve proper communication in this environment, you need to set the SV's own site to be resolved to 192.168.1.10 or set "NQSDAEMON_OPT=-x wildcard=ON" in daemon.conf.

4. Solving the problem

   a. If the name resolution is set so that the SV's own site name will be resolved to 192.168.1.10:

   Change the name resolution settings so that the SV's own site name will be resolved to 192.168.1.10 Since in this example, the name resolution is performed with resolv.dev, modify resolv.def of the SV to the following:

resolv.def setting	192.168.1.101 mgsite
	192.168.1.10 svsite

   b. If "NQSDAEMON_OPT=-x wildcard=ON" is set in daemon.conf:

   Set the NQS so that INADDR_ANY will be used for communication. Add the following setting to daemon.conf of the SV.

   ```
   NQSDAEMON_OPT=-x wildcard=ON
   ```

   In addition, daemon.con of the MG requires "ipcheck=OFF" if more than one IP address has been set for the NIC of 192.168.1/24 of the SV.

   ```
   ipcheck=OFF
   ```

For details of "NQSDAEMON_OPT=-x wildcard=ON", refer to Section 5.3, "Setting daemon.conf When Multiple IP Addresses Are Used".

> To reflect the daemon.conf setting, you need to restart JobCenter.

5. Confirming the modifications

Check the SV-to-MG communication again to check that the problem has been solved. The communication check results in one of the following, according to the problem-solving method:

a. If the name resolution is set so that the SV's own site name will be resolved to 192.168.1.10:

```
results :
 destination_host = mgsite
 destination_ip   = 192.168.1.101
 source_host      = svsite
 source_ip        = 192.168.1.10

connect :
 nqs       : [OK]
 jccombase : [OK]
 jcevent   : [OK]

mgsite is alive.
```

You can confirm that the result of the NQS of "connect" is "OK".

In addition, you can confirm that the IP address obtained from the own site name by SV name resolution has been modified to "192.168.1.10" by checking the value of the "source_ip" of "results",

b. If "NQSDAEMON_OPT=-x wildcard=ON" was set in daemon.conf:

```
results :
 destination_host = mgsite
 destination_ip   = 192.168.1.101
 source_host      = svsite
 source_ip        = 10.10.1.10

connect :
 nqs       : [OK]
   wildcard=ON
 jccombase : [OK]
 jcevent   : [OK]

mgsite is alive.
```

You can confirm that the "wildcard=ON" message is displayed in the NQS result of "connect" and the result is "OK".

17.5. Setting Automatic Start and Stop

This section describes how to set jcres so that it will stop or start when the OS starts or stops.

17.5.1. RedHat Linux 6

This section describes an example of setting the automatic start and stop by using the Linux init process.

Perform the steps of this procedure as a root user.

17.5.1.1. Setting Procedure

1. Creating the rc script

   Create the jcres rc script.

   The following is an rc script sample:

```
#!/bin/sh
#
# JobCenter jcres statr-up
#
# For Linux chkconfig
# chkconfig: 2345 99 00
# description: JobCenter jcres statr-up

case $1 in
start)
    if [ ! -x /usr/lib/nqs/gui/tools/jcres ]
    then
        exit 0
    fi
    touch /var/lock/subsys/jcres 1>&- 2>&-
    /usr/lib/nqs/gui/tools/jcres &
    exit $?
    ;;

stop)
    if [ ! -x /usr/lib/nqs/gui/tools/jcres ]
    then
        exit 0
    fi
    rm -f /var/lock/subsys/jcres 1>&- 2>&-

    ps -ef|grep -v grep|grep jcres > /dev/null
    if [ $? -eq 0 ] ; then
        /usr/lib/nqs/gui/tools/jcres -e
        exit $?
    fi
    exit 0
    ;;

*)
    exit 1
esac
```

> The rc script file name may be specified as desired.

After editing the rc script, set the file authority using the following command:

```
/bin/chmod 755 <rc script path>
```

Finally, save the completed rc script under /etc/init.d/.

2. Registering the service

Register the jcres service using the following command:

```
/sbin/chkconfig --add <rc script name>
```

Using the following command, check that the jcres service has been registered:

```
/sbin/chkconfig --list <rc script name>
```

If the result is displayed as in the following line, the service has been registered normally.

```
<rc script name>          0:off   1:off   2:on    3:on    4:on    5:on    6:off
```

17.5.1.2. Procedure for Deleting the Settings

1. Deleting the service

Delete the jcres service using the following command:

```
/sbin/chkconfig --del <rc script name>
```

2. Deleting the rc script

Delete the rc script located under /etc/init.d/, which was created in Section 17.5.1.1, "Setting Procedure".

17.5.2. RedHat Linux 7

This section provides an example of setting automatic start and stop by using Linux systemd.

Perform the steps of this procedure as a root user.

17.5.2.1. Setting Procedure

1. Creating the rc script

Create the jcres rc script.

The following is an rc script sample:

```
#!/bin/sh
#
# JobCenter jcres statr-up
#
# For Linux chkconfig
# chkconfig: 2345 99 00
# description: JobCenter jcres statr-up
```

```
case $1 in
start)
    if [ ! -x /usr/lib/nqs/gui/tools/jcres ]
    then
        exit 0
    fi
    touch /var/lock/subsys/jcres 1>&- 2>&-
    /usr/lib/nqs/gui/tools/jcres &
    exit $?
    ;;

stop)
    if [ ! -x /usr/lib/nqs/gui/tools/jcres ]
    then
        exit 0
    fi
    rm -f /var/lock/subsys/jcres 1>&- 2>&-

    ps -ef|grep -v grep|grep jcres > /dev/null
    if [ $? -eq 0 ] ; then
        /usr/lib/nqs/gui/tools/jcres -e
        exit $?
    fi
    exit 0
    ;;

*)
    exit 1
esac
```

The rc script file name may be specified as desired.

After editing the rc script, set the file authority using the following command:

```
/bin/chmod 755 <rc script path>
```

Finally, save the completed rc script under /etc/init.d/.

2. Creating the service file

   Create the jcres service file.

   The following is a service file sample where the rc script name is jcresd. If your rc script name differs from this, change "/etc/init.d/jcresd" on the ExecStart and ExecStop lines to the proper path.

```
[Unit]
Description=JobCenter jcres
Requires=NetworkManager-wait-online.service
After=NetworkManager-wait-online.service syslog.target

[Service]
Type=oneshot
RemainAfterExit=yes
ExecStart=/etc/init.d/jcresd start
ExecStop=/etc/init.d/jcresd stop
```

```
[Install]
WantedBy=multi-user.target
```

> ✏️ The service file name may be specified as desired but must be saved under an extension of ".service" (e.g., jcres.service).

> ⚠️ In the above example, the NetworkManager service must be enabled. Enable this service if it is disabled now.

After editing the service file, set the permission of the file using the following command:

```
/bin/chmod 644 <service file path>
```

Finally, save the completed service file under /usr/lib/systemd/system.

3. Enabling automatic start and stop

Enable automatic start and stop of jcres using the following command:

```
/bin/systemctl enable <service file name>
```

4. Starting the service

Start the jcres service using the following command:

```
/bin/systemctl start <service file name>
```

Using the following command, check that the jcres service is active:

```
/bin/systemctl status <service file name>
```

The following is an output result sample where the rc script name is jcresd and the service file name is jcres.service:

```
jcres.service - JobCenter jcres
   Loaded: loaded (/usr/lib/systemd/system/jcres.service; enabled)
   Active: active (exited) since Wed 2015-12-02 16:11:30 JST; 1min 7s ago
  Process: 5033 ExecStart=/etc/init.d/jcresd start (code=exited, status=0/SUCCESS)
 Main PID: 5033 (code=exited, status=0/SUCCESS)

Dec 02 16:11:30 hostname systemd[1]: Started JobCenter jcres.
```

17.5.2.2. Procedure for Deleting the Settings

1. Disabling automatic start and stop

Disable the automatic start and stop of jcres using the following command:

```
/bin/systemctl disable <service file name>
```

2. Deleting the rc script and service file

Delete the rc script located under /etc/init.d/ and service file located under /usr/lib/systemd/system, which were created in Section 17.5.2.1, "Setting Procedure".

3. Reloading systemd

Reload the systemd service file using the following command:

```
/bin/systemctl daemon-reload
```

> 🖉 If you have not reloaded systemd, the following warning message appears when you check the status of the jcres service using the systemctl command: "Warning: Unit file changed on disk, 'systemctldaemon-reload' recommended".

17.5.3. Windows Server 2012 R2

This section provides an example of setting automatic start and stop by using the Task Scheduler.

17.5.3.1. Setting Procedure

1. Creating the vbs script

   Create vbs script that starts jcres.

   The following is a vbs script sample where the JobCenter installation directory is "C:\JobCenter\SV". If your installation directory differs from this, change "C:\JobCenter\SV" to the proper path.

   ```
   CreateObject("WScript.Shell").Run "C:\JobCenter\SV\tools\jcres.bat",0
   ```

   > 🖉 The vbs script file name may be specified as desired but must be saved under an extension of ".vbs" (e.g. jcres.vbs).

   Finally, save the completed vbs script under a desired folder. This example saves it as "C:\JobCenter\SV\tools\jcres.vbs".

2. Starting the Task Scheduler

   Start the Task Scheduler from the Control Panel.

   If the Control Panel view has been sorted by category, the Task Scheduler can be started by selecting [Control Panel], [System and Security], [Management Tools], and then [Task Scheduler].
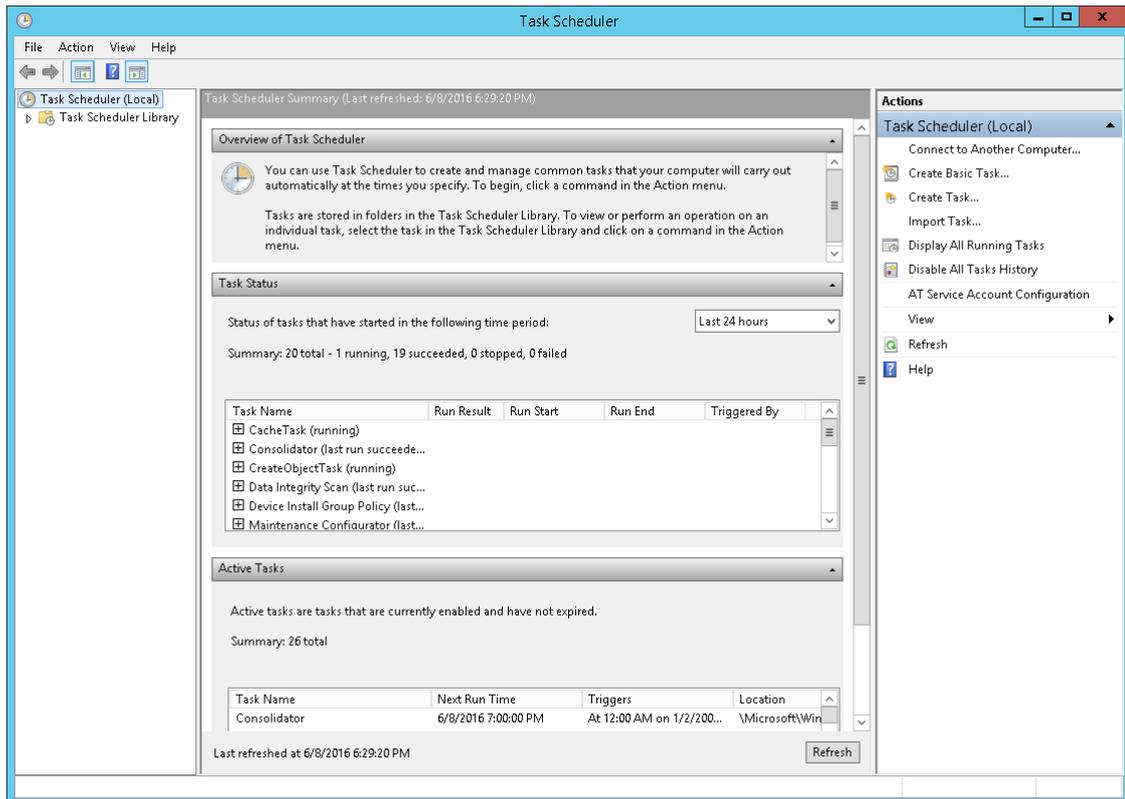
Figure 17.3. Task Scheduler

3. Setting the Task Scheduler

a. In the left-hand pane, right-click [Task Scheduler Library], and click [New Folder].
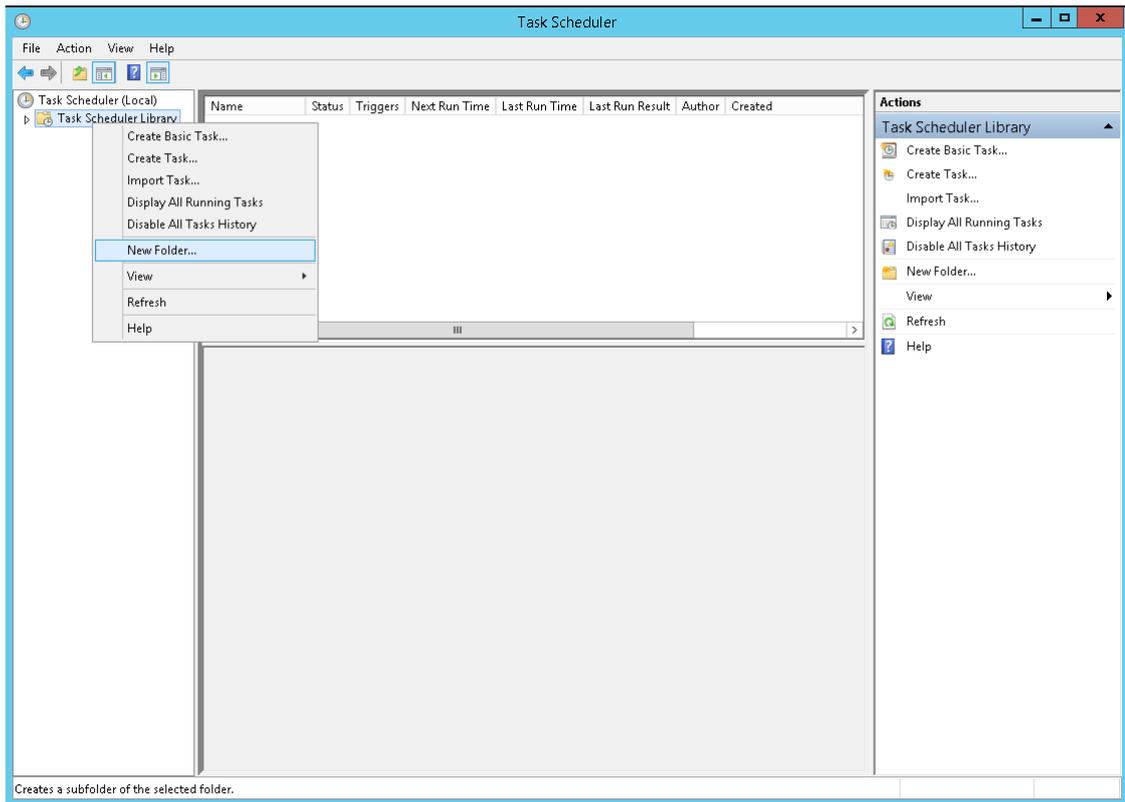
Figure 17.4. [New Folder] menu of Task Scheduler

The [Enter name of the new folder] dialog box appears. Specify the desired folder name. This example specifies "jcres" for the folder name.

b. Right-click the created folder in the left-hand pane, and click [Create Task].
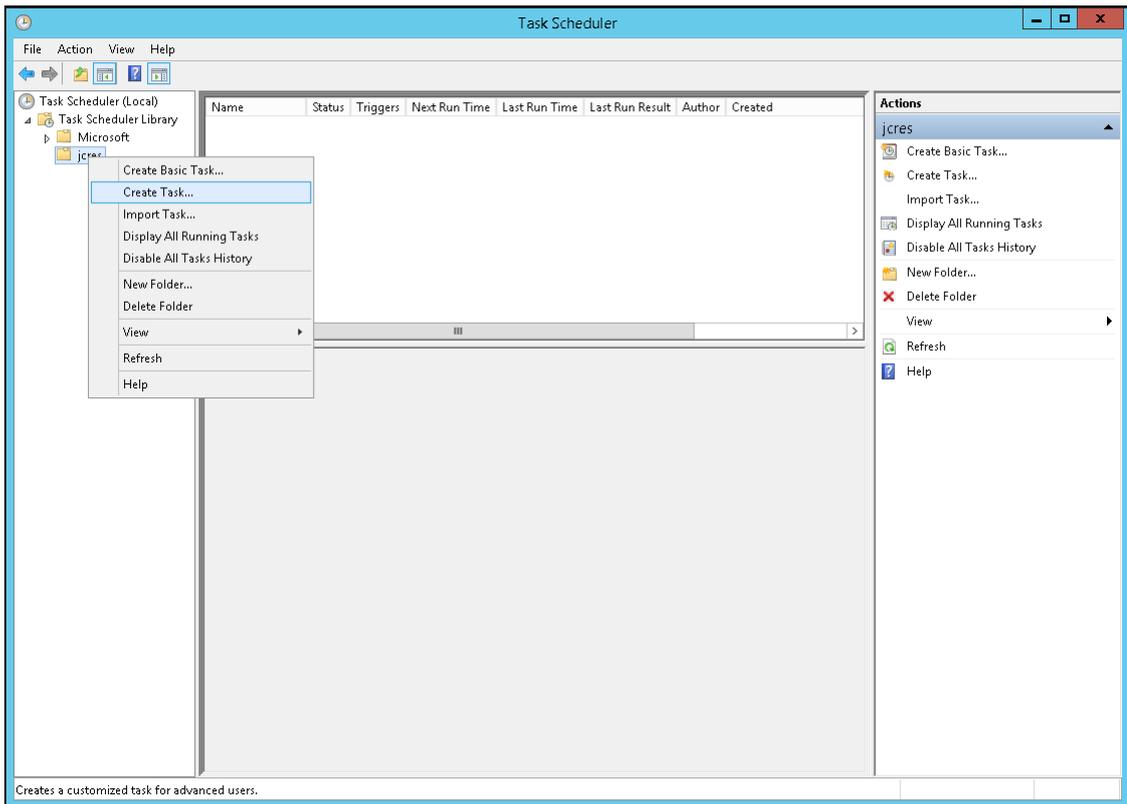
Figure 17.5. [Create Task] of Task Scheduler

c. Configure settings in the [General] tab.
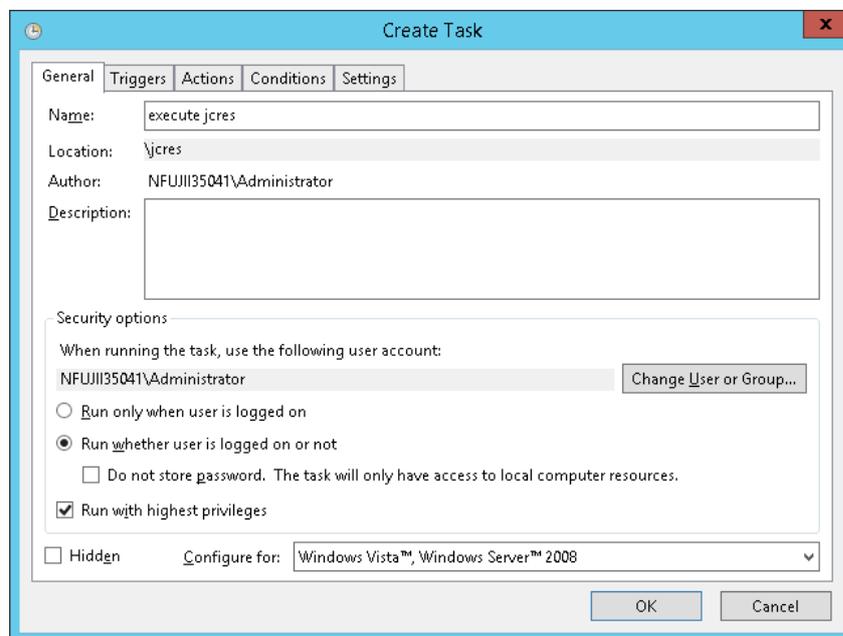
Figure 17.6. [General] tab of Task Scheduler

■Specify the desired name in [Name]. This example specifies "Execute jcres" for this name.

■Specify the JobCenter administrator in [User account for task execution].

■Select [Execute whether the user is logged on or not].

■Check [Execute as the most privileged user].

d. Configure settings in the [Trigger] tab.
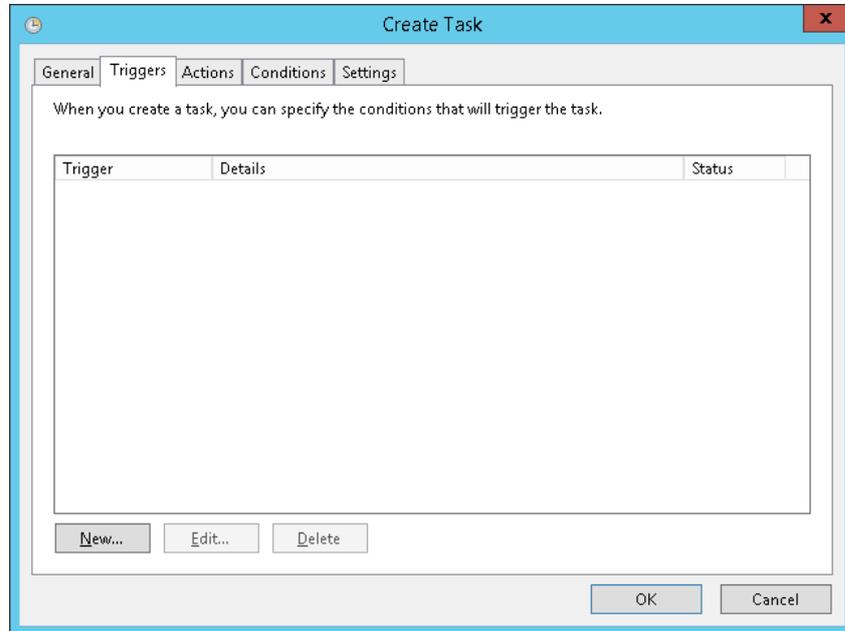
Figure 17.7. [Trigger] tab of Task Scheduler

On the [Trigger] tab, click the [New] button to display the [New Trigger] dialog box.
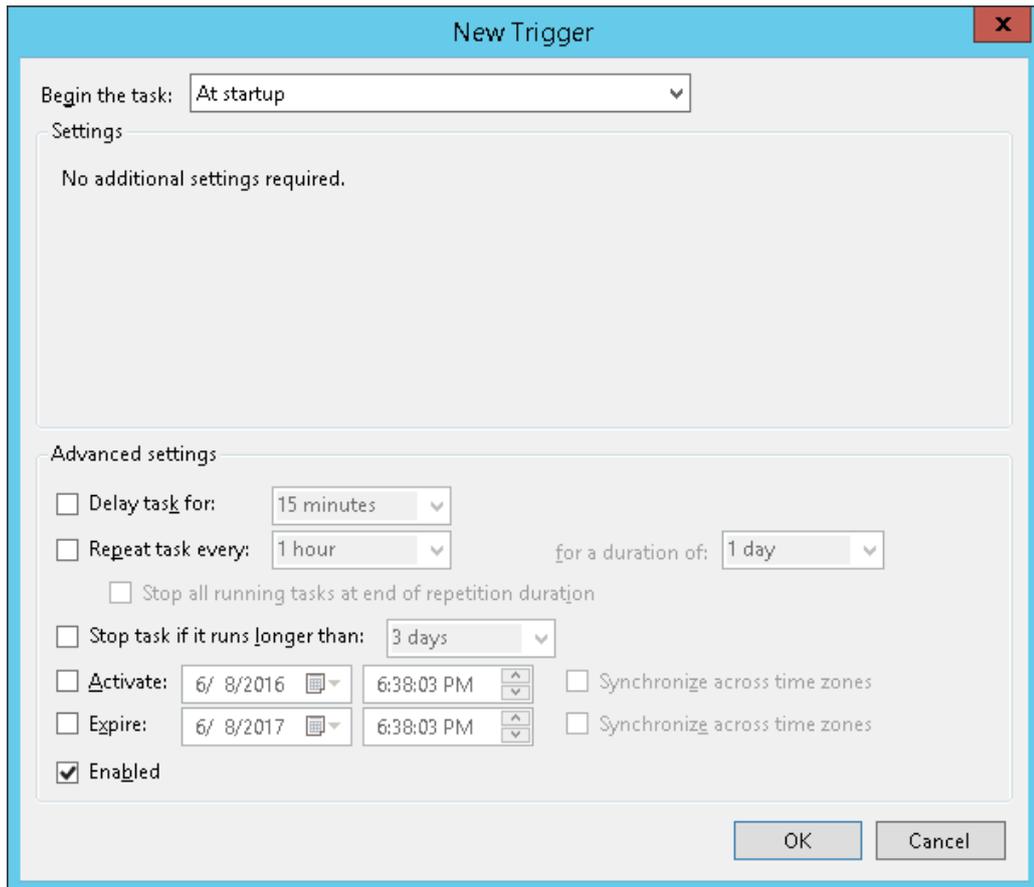
Figure 17.8. [New Trigger] dialog box on Task Scheduler

■Change [Start of Task] to [At startup].

After completing the settings, click the [OK] button. The trigger at startup is registered in the list.

e. Set up the [Operation] tab.
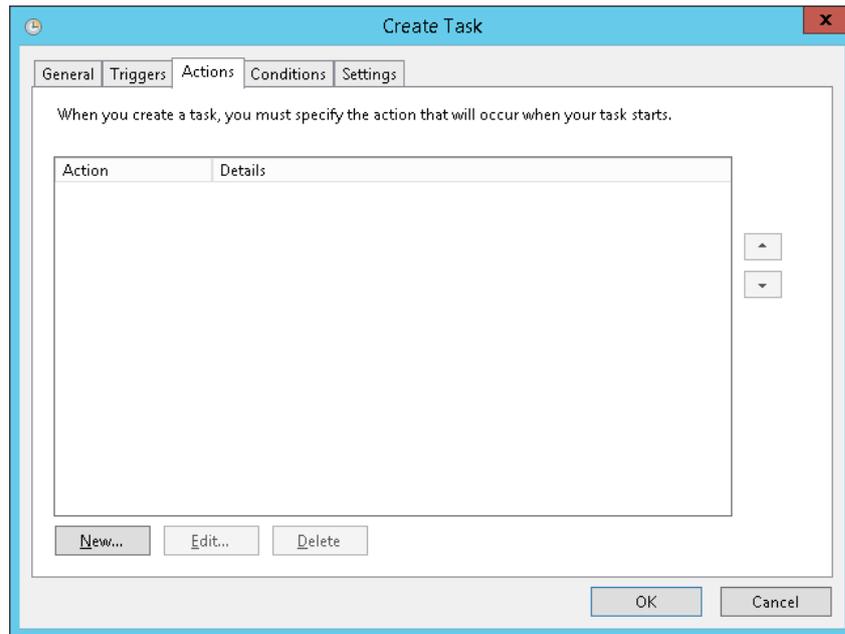
Figure 17.9. [Operation] tab of Task Scheduler

On the [Operation] tab, click the [New] button to display the [New Operation] dialog box.
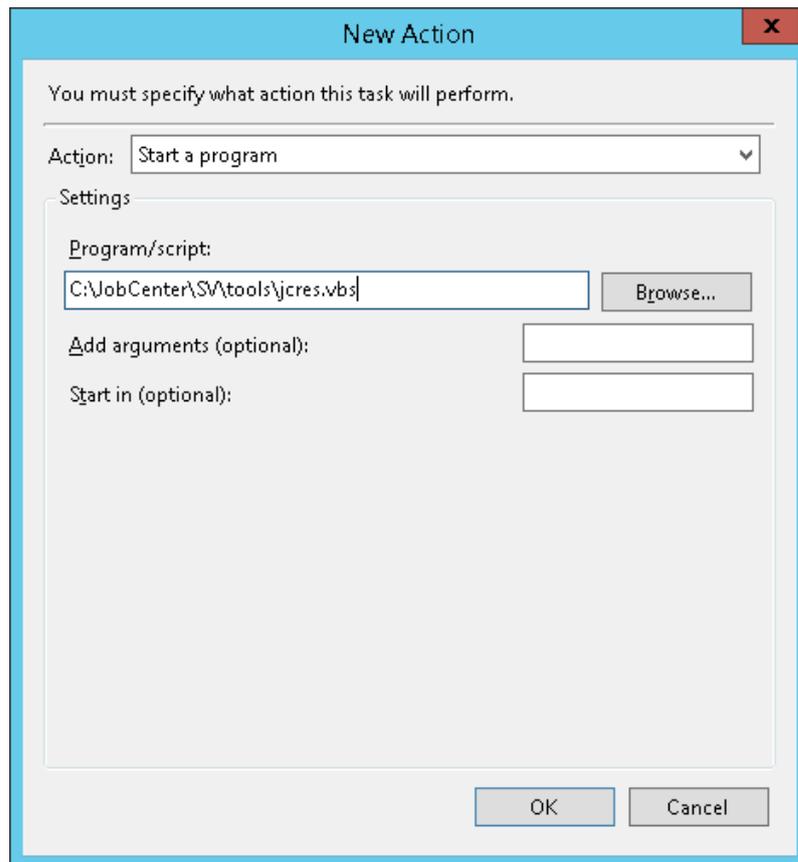
Figure 17.10. [New Operation] dialog box of Task Scheduler

■In the [Program/Script] section, click the [Browse] button and select the created vbs script. This example specifies "C:\JobCenter\SV\tools\jcres.vbs".

After completing the settings, click the [OK] button. The vbs script operation is registered in the list.

f. Configure settings in the [Setting] tab.
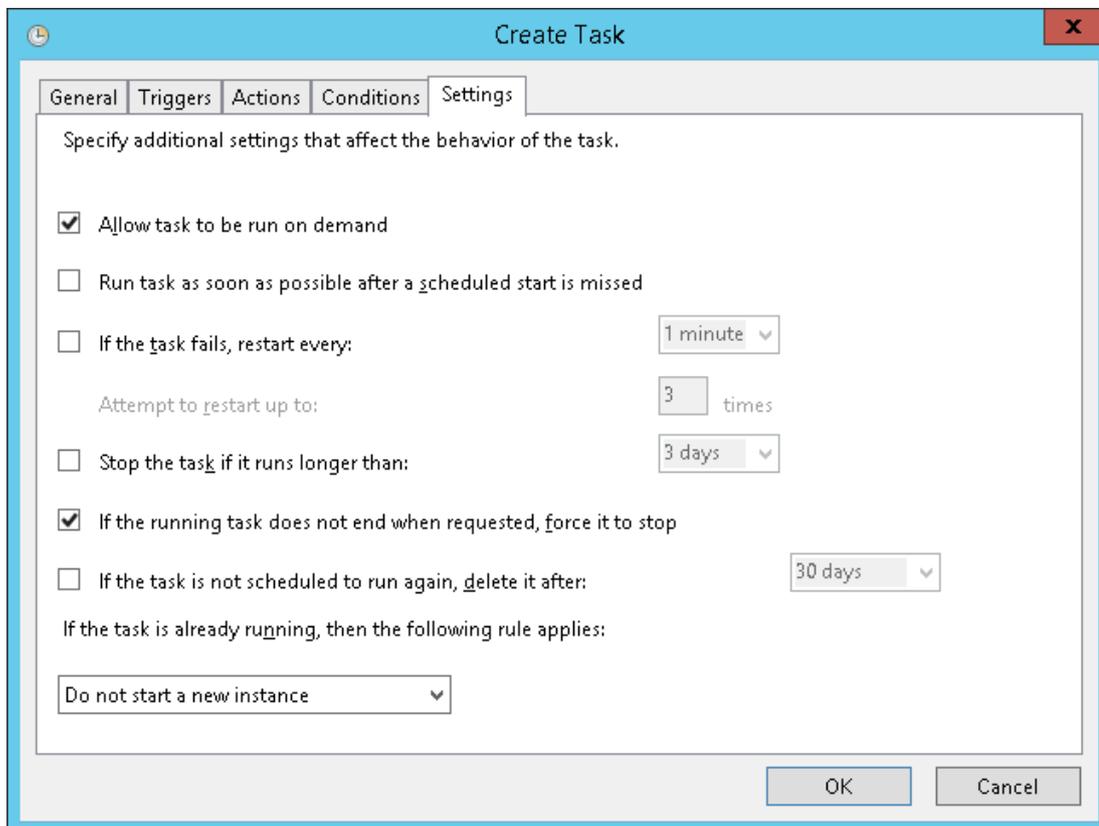
Figure 17.11. [Setting] tab of Task Scheduler

■Clear the [Time to stopping the task] checkbox.

g. After completing all the settings, click the [OK] button.

You are asked to enter the password of the user for which to execute the task. Enter the password of the JobCenter administrator.

> The process from the start of OS to the start of jcres may require much time, depending on the environment.

17.5.3.2. Procedure for Deleting the Settings

1. Starting the Task Scheduler

Start the Task Scheduler from the Control Panel.

For the starting procedure, refer to Subsection 2, "Starting the Task Scheduler" in Section 17.5.3.1, "Setting Procedure".

2. Deleting the task

Select the jcres folder in the left-hand pane. In the task list in the middle, right-click the jcres task and click [Delete].
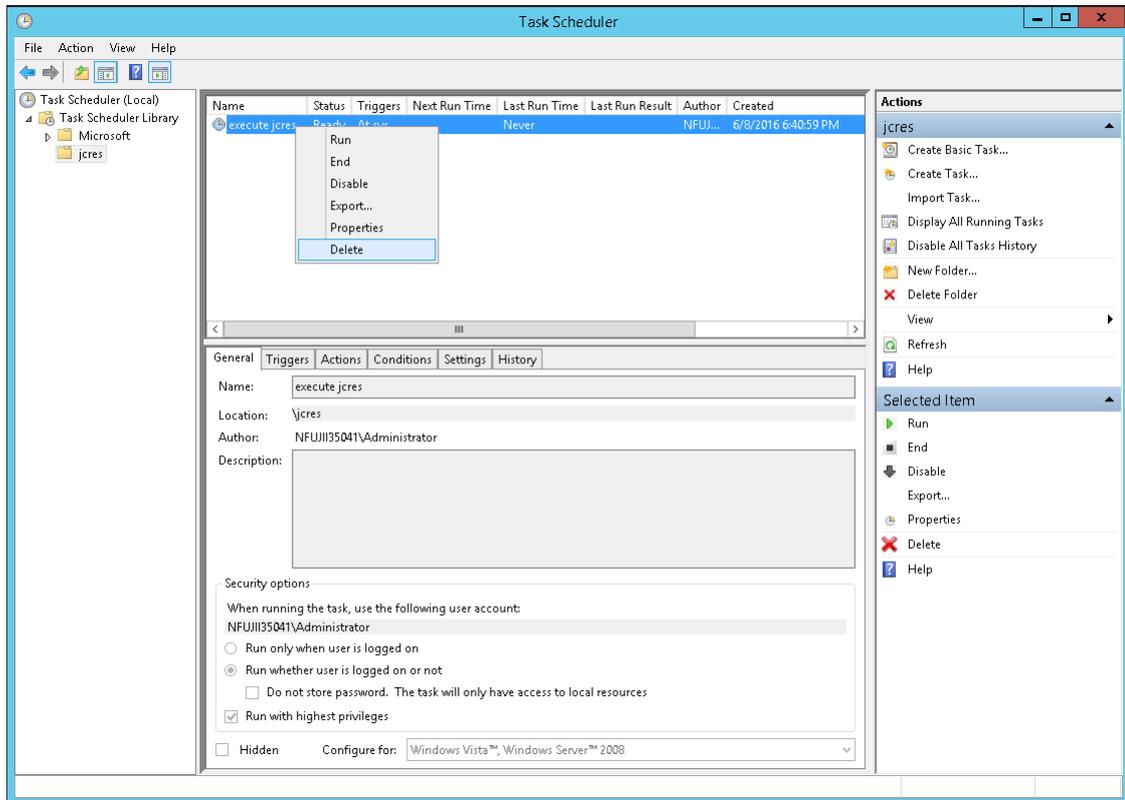
Figure 17.12. Deleting the task from the Task Scheduler

3. Deleting the folder

In the left-hand pane, right-click the jcres folder, and click [Delete Folder].
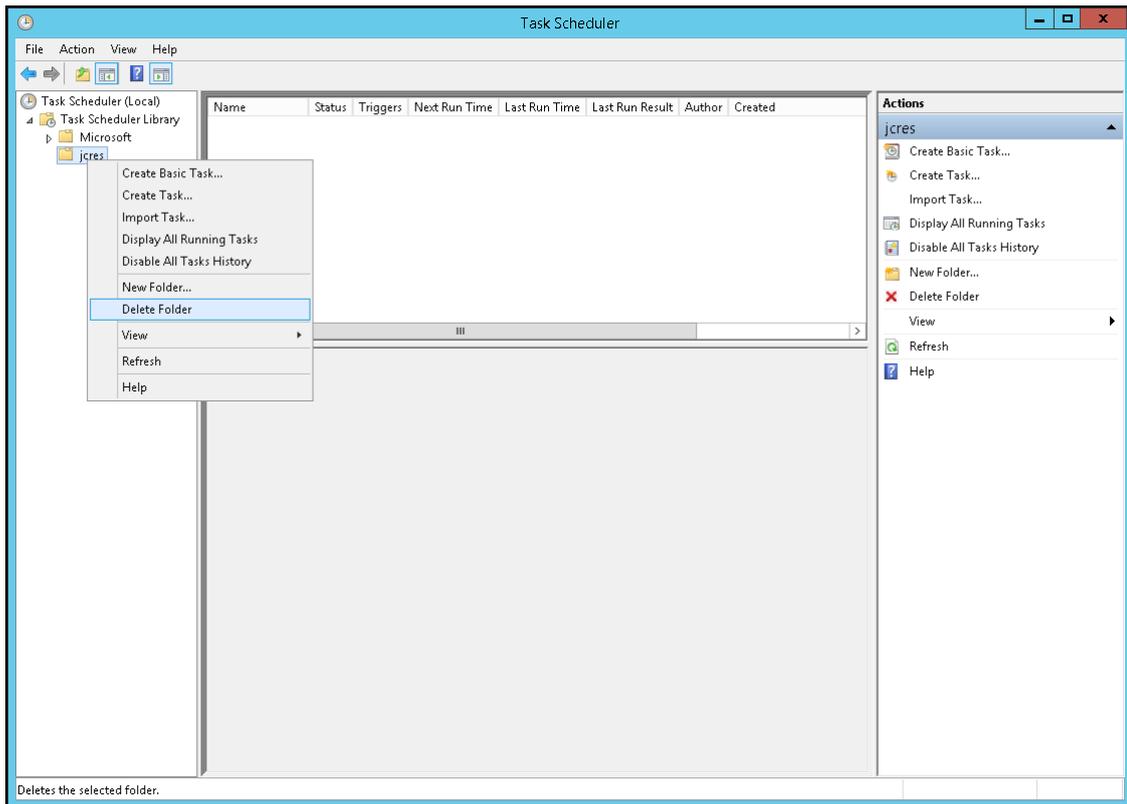
Figure 17.13. Deleting the folder from the Task Scheduler

4. Deleting the vbc script

Delete the vbs script that was created in Section 17.5.3.1, "Setting Procedure".

18 Monitoring the JobCenter Process

This chapter explains how to monitor the JobCenter process using the monitoring tool.

18.1. In Windows

Monitor the process as described below when monitoring JobCenter of the Windows version.

Starting up from the service	%InstallDirectory%\bin\jcservice.exe
Starting up from the cjcpw command	%InstallDirectory%\bin\cluster\cjcpw.exe

The jcservice process and cjcpw process monitor the JobCenter resident process. If a failure in JobCenter occurs and either of the resident processes stops, the resident process receives a command to stop JobCenter and stops it. In this case, the process itself stops. Therefore, this function can monitor not only this process but also the JobCenter process.

Check the details of the cjcpw command in "chapter 4.2, cjcpw (Starting, monitoring and stopping the daemon process)" in <Command Reference>.

The resident processes of the Windows version are listed below.

Process	Description
%InstallDirectory%\bin\jcservice.exe	This process is executed when JobCenter is started up from the service to start up, stop, and monitor the JobCenter resident process.
%InstallDirectory%\bin\nqsdaemon.exe	This process plays a general role related to NQS, and executes jobs.
%InstallDirectory%\bin\netdaemon.exe	This process prepares for reception of communication related to NQS from the remote server.
%InstallDirectory%\bin\logdaemon.exe	This process write down the log information output by the process related to NQS.
%InstallDirectory%\bin\jnwengine.exe	This process controls the job network.
%InstallDirectory%\bin\qwb.exe	This process enables nqsdaemon to notify jnwengine of the status of the job executed by NQS.
%InstallDirectory%\bin\trkrdr.exe	This process enables the database to notify of the status of the target job in response to a request from jnwengine.
%InstallDirectory%\bin\sclaunchd.exe	This process starts up the schedule of the job network.
%InstallDirectory%\bin\comagent.exe	This process receives communication in accordance with the connection or operation from CL/Win, and executes the command in accordance with the operation on the server.
%InstallDirectory%\bin\jcdbs.exe	This is the process of the database that manages the metadata of the definition information or tracker execution status.
%InstallDirectory%\bin\jnwlauncher.exe	This process starts up, stops, and monitors the process related to the trigger.
%InstallDirectory%\bin\jl_logmonitor.exe	This process monitors the text log set for the trigger.
%InstallDirectory%\bin\jl_submit.exe	This process submits the job network in response to a request from the process related to the trigger.

18.2. In UNIX

Start up JobCenter using the cjcpw command and monitor the process as described below when monitoring JobCenter of the UNIX version.

```
/usr/lib/nqs/cluster/cjcpw
```

The cjcpw process monitors the JobCenter resident process. If a failure in JobCenter occurs and either of the resident processes stops, the resident process receives a command to stop JobCenter and stops it. In this case, the process itself stops. Therefore, this function can monitor not only this process but also the JobCenter process.

Check the details of the cjcpw command in "chapter 4.2, cjcpw (Starting, monitoring and stopping the daemon process)" in <Command Reference>.

The resident processes of the UNIX version are listed below.

Process	Description
/usr/lib/nqs/nqsdaemon	This process plays a general role related to NQS, and executes jobs.
/usr/lib/nqs/netdaemon	This process prepares for reception of communication related to NQS from the remote server.
NQSlogdaemon	This process write down the log information output by the process related to NQS.
/usr/lib/nqs/gui/bin/jnwengine	This process controls the job network.
jnwengine-qwb	This process enables nqsdaemon to notify jnwengine of the status of the job executed by NQS.
jnwengine-trkrdr	This process enables the NQS database to notify of the status of the target job in response to a request from jnwengine.
jnwengine-spawn	This process submits the job required by jnwengine. This process exists only in JobCenter of the HP-UX version and Linux version.
/usr/lib/nqs/gui/bin/sclaunchd	This process starts up the schedule of the job network.
/usr/lib/nqs/jnwcaster	This process sends an event to CL/Win or another monitoring product.
/usr/lib/nqs/combase/comagent	This process receives communication in accordance with the connection or operation from CL/Win, and executes the command in accordance with the operation on the server.
/usr/lib/nqs/gui/bin/jcdbs	This is the process of the database that manages the metadata of the definition information or tracker execution status.
/usr/lib/nqs/gui/bin/jnwlauncher	This process starts up, stops, and monitors the process related to the trigger.
/usr/lib/nqs/gui/bin/jl_logmonitor.exe	This process monitors the text log set for the trigger.
/usr/lib/nqs/gui/bin/jl_submit.exe	This process submits the job network in response to a request from the process related to the trigger.

19 System Usage Resources

This section describes the concept of resources used at JobCenter.

Depending on the processing, JobCenter operates while instantaneously opening multiple files or executing sub-processes. Use the following as reference information.

> ⚠️ When generating and executing a large number of job requests in JobCenter in a short period of time, the upper limit values of various OS kernel parameters might be exceeded. (Examples include nproc, maxuprc, nfile, and ninode in HP-UX.)
>
> Tune the kernel parameters of the resources consumed to intensively execute job requests, referring to the resource usage described in this chapter.

19.1. Resources Used in Processes of JobCenter for UNIX

The following describes resources used in processes of JobCenter for UNIX.

In the description below, HP-UX 11i v2 is used as an example. Specify the appropriate kernel parameters according to your OS and kernel version.

Meaning of kernel parameters used in this section is the following.

Table 19.1. Meaning of kernel parameters used in this section

Parameter name	Meaning of parameter
maxfiles	Number of file opens per process
nproc	Number of processes which can be executed simultaneously in system
maxuprc	Number of user processes
nfile	Number of file opens of overall system
ninode	Number of opens of i node
nflocks	Number of file/record locks in system

The calculating formulas for kernel parameters related to JobCenter for UNIX are as follows.

This value is the least required value when JobCenter is operating alone. As the overall setup value of the system, resources used by applications executed as jobs must also be taken into consideration.

Table 19.2. Kernel parameters and calculating formulas

Parameter name	Calculating formulas (X : Number of jobs executed simultaneously Y: Number of CL/Win connected simultaneously)
maxfiles	Take the maximum in the calculation of the maxfiles of each process as reference.
nproc, maxuproc	(4 x X) + 2 + 2 + Y + 1 + 2 + 1
nfile, ninode	(21 x X) + 40 + 41 + (20 x Y) + 16 + 48 + 19
nflocks	6 x X

Process configuration of the JobCenter for UNIX can broadly be divided into 4 as follows.

Process name	Processing
nqsdaemon	Executes requests
jnwengine	Controls job network executions
sclaunchd	Schedules executions
comagent	Communicates with other machines
jnwlauncher	Manages daemons of triggers
jl_submit	Manages submitting job networks of triggers
jl_logmonitor	Monitors text logs of triggers

19.1.1. nqsdaemon (Executes requests)

Job requests are submitted to the queue when unit jobs are executed and then used. As an example, if sleep is executed with csh in a unit job, the four processes below are generated.

Process name	Processing
nqsdaemon	Request processing process
shell	login shell
shell	Job script execution shell
sleep	User command process

<Resources Used>

Parameter	Number used per request
maxfiles	21
nproc, maxuproc	4
nfile, ninode	21

19.1.2. jnwengine (Controls job network executions)

When a job request is submitted to NQS during unit job execution, the qsub command is issued. As qsub commands are executed serially, resources used are not affected by the number of jobs.

maxfiles is the value of the qsub command consuming considerable resources.

nfile and ninode are the total number of files opened by jnwengine and files used by the qsub command respectively.

<Resources Used>

Parameter	Number used per request	Remark
maxfiles	24	qsub command usage amount
nproc, maxuproc	2	jnwengine usage amount = 1, qsub command usage amount = 1
nfile, ninode	40	jnwengine usage amount = 16, qsub command usage amount = 24

> ⚠️ The jnwengine process expands and retains data on unarchived trackers in the process-internal memory. Therefore, if a large number of trackers are retained, normal operation may become impossible as the upper limit process memory value of 2 GB cannot be exceeded because of the restriction on OS memory space allocation in a 32-bit HP-UX environment (Although this 2 GB restriction does not apply to the IPF version or other 64-bit environments, the process memory usage is the same as in the 32-bit environment.)
>
> Therefore, tune the retention period (number) of archive files and the interval at which files are saved so as to not leave a lot of trackers unarchived.

19.1.3. sclaunchd (Schedules executions)

The subprocess is started during job network submission by schedule start. As the job network submission processing is executed serially, resources used are not affected by the number of job networks.

maxfiles is the value of the subprocess consuming considerable resources.

nfile and ninode are the total number of files opened by sclaunchd and files used by the subprocess (jnwman) respectively.

<Resources Used>

Parameter	Number used per JNW submission process	Remark
maxfiles	28	jnwman command usage amount
nproc, maxuproc	2	sclaunchd usage amount = 1, jnwman command usage amount = 1
nfile, ninode	41	sclaunchd usage amount = 13, jnwman command usage amount = 24

19.1.4. comagent (Communicates with other machines)

Used when collecting the execution status from JobCenter CL/Win and performing various settings (not used for job transfer and execution). Resources therefore depend on the number of JobCenter CL/Win running simultaneously.

The subprocess (comagent, others) is started every time communication is received and ends when the processing ends.

The following resources are communication only (excludes processing which is called after receiving communication).

<Resources Used>

Parameter	Number used per communication process
maxfiles	20
nproc, maxuproc	1
nfile, ninode	20

19.1.5. jnwlauncher (Manages each daemon of the trigger)

This is used when each daemon of the trigger is started up, monitored, and stopped. Resources used are not affected by the number of trigger definitions.

<Resources Used>

Parameter	Number of parameters to be used
maxfiles	16
nproc, maxuproc	1
nfile, ninode	16

19.1.6. jl_submit (Manages submitting job networks of triggers)

The subprocess is started during job network submission by monitoring of each trigger. As the job network submission processing is executed serially, resources used are not affected by the number of job networks.

maxfiles is the value of the subprocess consuming many resources.

nfile and ninode are the total number of files opened by jl_submit and files used by the subprocess (jnwman), respectively.

<Resources Used>

Parameter	Number of parameters used per JNW submission process	Remark
maxfiles	28	jnwman command usage amount
nproc, maxuproc	2	jl_submit usage amount = 1, jnwman command usage amount = 1
nfile, ninode	48	jl_submit usage amount = 24, jnwman command usage amount = 24

19.1.7. jl_logmonitor (Monitors text logs of triggers)

This is used when monitoring text logs of triggers. As the text log monitoring processing is executed serially, resources used are not affected by the number of text logs monitored.

<Resources Used>

Parameter	Number of parameters to be used
maxfiles	19
nproc, maxuproc	1
nfile, ninode	19

19.1.8. Others

19.1.8.1. Locking Files during Execution of a Request

Some files are locked during request execution. This depends on the number of jobs executed simultaneously.

<Resources Used>

Parameter	Number used per job request
nflocks	6

19.1.8.2. Processes Supported by the 64-bit Version

In the Linux version of JobCenter, the following processes were changed from 32-bit to 64-bit.

■jnwengine

■jcdbs

■jnwman

19.2. Estimating the Memory Amount Used (For UNIX)

The following section describes the method of estimating the amount of memory required for JobCenter for UNIX.

The same amount of memory is required on platforms (such as Linux) other than Windows.

The amount of memory used changes greatly during the following two processes:

■jnwengine

■jcdbs

The following sections describe how to estimate the amount of memory to be used by these two processes.

19.2.1. Amount of Memory Required by jnwengine

jnwengine controls job network flow execution. When it is executed, this process loads the target job network information to memory.

The estimated amount of memory required for a job network to operate once is equal to the total of the memory usage amounts described in Section 19.2.1.1, "Example of Memory Usage" and Section 19.2.1.2, "Estimating Method". Considering the margin of error and safety factor, a smooth operation can be ensured when twice as much memory as the estimated amount of memory used is provided.

If insufficient, as insufficient memory errors may occur, change the kernel parameter (for example maxdsiz on HP-UX) as required or expand the memory.

19.2.1.1. Example of Memory Usage

Memory use region of job network (JNW)	<Header>: Approximately 40 KB <Information area> (Job network name/ Parameter/Comment/submit queue name/ environment variable/status): Approximately 4 KB The environment variable is assumed to be 2 KB.
Memory use region of sub job network (SubJNW) 1 Memory use region of SubJNW 2 . . . Memory use region of SubJNW j	<Header>: Approximately 0.6 KB <Information area> (SubJNW name): Approximately 0.25 KB SubJNW name is in the format of [ROOTJNW:SubJNW1:...:JNWNAME]
Memory use region of job part 1 Memory use region of job part 2 . . . Memory use region of job part k	<Header>: Approximately 3.5 KB <Information area> (job name/parameter/script/ job name@parent JNW name): Approximately 2 KB Division JNW name is in the format of [ROOTJNW:SubJNW1:...:JNWNAME]
Memory use region of branch node 1 Memory use region of branch node 2	<Header>: Approximately 0.1 KB <Information area>: Approximately 0.125 KB

. . . Memory use region of branch node m	The branched flows in Condition branch/Calendar branch/Parallel processing are each added as 1.
Memory use region of Job Network Waiting, Job Waiting, or Time Waiting 1 Memory use region of Job Network Waiting, Job Waiting, or Time Waiting 2 . . . Memory use region of Job Network Waiting, Job Waiting, or Time Waiting o	\<Header\>: Approximately 0.7 KB \<Information area\>: Approximately 0.1 KB
Memory use region for File Waiting 1 Memory use region for File Waiting 2 . . . Memory use region for File Waiting p	\<Header\>: Approximately 1.4 KB \<Information area\> (path length): Approximately 0.25 KB The path length is assumed to be 0.125 KB.
Memory use region of Event Transmission/Reception 1 Memory use region of Event Transmission/Reception 2 . . . Memory use region of Event Transmission/Reception q	\<Header\>: Approximately 1.5 KB \<Information area\>: Approximately 0.5 KB

19.2.1.2. Estimating Method

Estimated values are calculated by using the following equations from Section 19.2.1.1, "Example of Memory Usage". Equations are created using the conditions shown in Section 19.2.1.1, "Example of Memory Usage".

■Memory use region of job network (JNW) block

Approximately 44 KB ... \<1\>

■Total memory used for sub job network (SubJNW) object block

Number of SubJNW objects (j) x (Approximately 0.85 KB) ... \<2\>

■Total memory used for job part object block

Number of job part objects (k) x (Approximately 5.5 KB) ... \<3\>

■Total memory used for branch node block

Number of branch nodes (m) x (Approximately 0.225 KB) ... \<4\>

■Total memory used for wait parts block

- JNW Waiting/Job Waiting/Time Waiting

  Number of waiting objects (o) x (Approximately 0.8 KB) ... <5>

- File Waiting

  Number of waiting objects (p) x (Approximately 1.65 KB) ... <6>

■Total memory used for Event Transmission/Reception parts block

Number of Event Transmission/Reception objects (q) x (Approximately 2 KB) ... <7>

Consequently, the memory required for one job network to operate can be estimated as follows.

Memory used for one job network to operate smoothly = 2 x (<1> + <2> + <3> + <4> + <5> + <6> + <7>)

19.2.2. Amount of Memory Required by jcdbs

jcdbs serves as a database used to manage various JobCenter data in memory.

The types of data to be stored in memory and the amounts of memory used by them are summarized below.

Data name	Memory usage
System environment setting	0.75 KB
Tracker display color	0.75 KB
Permission setting	0.5 KB
Custom job definition (per definition)	0.5 KB
Operating day calendar definition (per definition)	0.5 KB
User environment setting	1 KB
Environment variable data	(Size of the environment variable data that the target user has)
Default parameter	8 KB
JNW group	Header information: 1 KB 0.1 KB per node
JNW definition (per JNW)	JNW information: 1.4 KB Part information: 0.1 KB per part
Schedule group	Header information: 1 KB 0.1 KB per node
Schedule definition (per schedule)	1.2 KB
Trigger (text log monitoring) (per definition)	3.1 KB

Target text logs	1.9 KB
(per definition)	
Running tracker data	JNW information: 3.6 KB
(per tracker)	Part information: 0.4 KB per part

Of the data listed above, the JNW definition and tracker data greatly vary in the amount of memory used, depending on the configuration or operation. Therefore, the amounts of memory to be used by these two types of data need to be estimated in advance.

19.3. Estimating the Disk Space Used (For UNIX)

The following section describes the method of estimating the amount of DISK required for JobCenter for UNIX.

The same disk space is usually required on platforms (such as Linux) other than Windows. (The disk space displayed by the OS might vary slightly depending on the sector size of the file system.)

■When setting and defining a job network on your machine and submitting it to your machine for execution, estimate the total disk space used from Section 19.3.1, "Disk Space Required by One Job Network" to Section 19.3.3, "Estimating the Disk Space Used for Executing NQS of Job Request"below.

■When a job network definition exists on another machine and you remotely transfer a job request from that machine to your machine for execution, estimate the disk space used in Section 19.3.3, "Estimating the Disk Space Used for Executing NQS of Job Request" below.

19.3.1. Disk Space Required by One Job Network

The following describes how to estimate the disk space required for one job network to operate n times to create n trackers.

The amount required is the sum of DISK used described in the following Section 19.3.1.1, "Example of Disk Usage (for one tracker)" and Section 19.3.1.2, "Estimating Method". By securing this DISK space, operations will be possible. The operation is possible if this amount is allocated.

If the free DISK space is insufficient, an error may occur. Increase the DISK space.

The amount used greatly depends on the complexity of the job processing created in the job network and how much data is included in the job output and error output results obtained through unit job execution. Be sure to specify the job execution parameters in accordance with actual services when estimating the disk space.

19.3.1.1. Example of Disk Usage (for one tracker)

Amount of DISK used for job network (JNW)-related flow	Unit job part definition 1	Approximately 3,000 KB Assuming 2,000 serial unit jobs including 1 KB job scripts are defined.
	Unit job part definition 2	
	. .	
	Unit job part definition m	
Amount of DISK used for JNW log and JNW START/END log		Approximately 0.4 KB
Amount of DISK used for JNW log, unit job 1, and START/END log		Approximately 0.4 KB
Amount of DISK used for JNW log, unit job 2, and START/END log		Approximately 0.4 KB
. . .		. . .
Amount of DISK used for JNW log, unit job m, and START/END log		Approximately 0.4 KB

Amount of DISK used for detailed JNW information	Approximately 0.4 KB
Amount of DISK used for detailed unit job information 1	Approximately 0.4 KB
Amount of DISK used for detailed unit job information 2	Approximately 0.4 KB
. . .	. . .
Amount of DISK used for detailed unit job information m	Approximately 0.4 KB
Amount of DISK used for unit job output result 1	Depends on the shell script
Amount of DISK used for unit job output result 2	Depends on the shell script
. . .	. . .
Amount of DISK used for unit job output result m	Depends on the shell script (Calculate the amount of disk space used for the standard output results of the script by yourself because it depends on the actual services.)
Amount of DISK used for unit job error output result 1	Depends on the shell script
Amount of DISK used for unit job error output result 2	Depends on the shell script
. . .	. . .
Amount of DISK used for unit job error output result m	Depends on the shell script (Calculate the amount of disk space used for the standard error output results of the script by yourself because it depends on the actual services.)

19.3.1.2. Estimating Method

Estimated values for one tracker are calculated by using the following equations from Section 19.3.1.1, "Example of Disk Usage (for one tracker)". Equations are created using the conditions shown in Section 19.3.1.1, "Example of Disk Usage (for one tracker)" (Note that the area to store the definitions and settings for the job network used for creating the tracker must also be allocated.)

■Disk space used for job network (JNW) flows (same amount as that used for definitions and settings)

Approximately 3,000 KB ... <1>

■Total amount of DISK used for job network (JNW) log

Approximately 0.4 KB + Number of unit job objects (m) x (Approximately 0.4 KB) ... <2>

■Total amount of DISK used for job network (JNW) detailed information

Approximately 0.4 KB + Number of unit job objects (m) x (Approximately 0.4 KB) ... <3>

■Total amount of DISK used for unit job output results

  Number of unit job objects (m) x (Estimated average output results size) ... <4>

■Total amount of DISK used for unit job error output results

  Number of unit job objects (m) x (Estimated average error output results size) ... <5>

In addition, the amount equivalent to <1> is required for the area to store the definitions of the job network used for creating the tracker.

Therefore, the disk space necessary to execute one job network n times is estimated as follows.

Disk space necessary to execute one job network n times =

<1> + n x (<1> + <2> + <3> + <4> + <5>)

When one job network is executed n times to create n trackers, the amount of (n x (<1> + <2> + <3> + <4> + <5>)) is allocated in the JobCenter working area. This is released if all trackers are executed and archived after the archive wait time has elapsed.

19.3.2. Estimating the Disk Space Used for Tracker Archive

The disk space used for the tracker archives can be estimated by estimating the space used for the respective job networks submitted during the retention period of the tracker archive (described in Section 19.3.1.2, "Estimating Method"), multiplying the number of times each job network is submitted during the retention period, and totaling them.

■Total disk space used for job networks (JNWs) submitted during the retention period of the tracker archive

  Number of JNWs (i) x [(JNW n DISK amount used) x (Number of times JNWs are submitted during tracker archive retention period)]

19.3.3. Estimating the Disk Space Used for Executing NQS of Job Request

During job network execution, unit jobs included in a flow are submitted to the NQS queues and executed. The disk space used for executing NQS can be estimated by estimating the amount used for the NQS spool, multiplying the number of job requests that are executed simultaneously, and totaling them.

■Estimating the disk space used for controlling NQS of job request

  Number of job requests executed simultaneously (m) x (Approximately 10 KB) ... <1>

■Total disk space used by job script spool files

  Number of job requests executed simultaneously (m) x (Estimated average of job scripts) ... <2>

■Disk space used for controlling job request IDs

  Approximately 12 MB max. ... <3>

■Total disk space used by command standard output result spool files of job requests

  Number of job requests executed simultaneously (m) x (Estimated average of standard output results) ... <4>

■Total disk space used by command standard error output result spool files of job requests

Number of job requests executed simultaneously (m) x (Estimated average of standard error output results) ... <5>

Therefore, the disk space used by the spool area required for multiple job requests to be executed simultaneously in NQS queues is estimated as follows.

Disk space used for NQS area = (<1> + <2> + <3> + <4> + <5>)

The disk space <3> increases if jobs are remotely submitted from multiple remote machines (sites) and many job requests are executed in a short time and place a high load on the system. Consider the amount shown here as a guide.

The size for unit job scripts and the size for spool files used to temporarily hold standard output results and standard error output results output by commands specified in the unit job scripts by NQS greatly vary depending on the services. Fully consider the services when estimating the sizes.

19.3.4. Estimating the Disk Space Used for jcdbs

The estimated DISK space that jcdbs requires is 3 times larger than the memory space of jcdbs.

The jcdbs memory space is calculated from Section 19.2.2, "Amount of Memory Required by jcdbs". If the jcdbs memory space is smaller, the DISK space to be used is 64 MB at least.

If the free DISK space is insufficient, an error may occur. Increase the DISK space.

19.4. Resources Used in Processes of JobCenter for Windows

The following describes resources used in processes of JobCenter for Windows.

The meaning of the kernel parameters used in this section is as follows:

Table 19.3. Meaning of kernel parameters used in this section

Parameter	Meaning of parameter
maxThreads	Maximum number of threads that concurrently open while processes are running
nProcesses_const	Number of processes that can concurrently be executed and do not change as the number of jobs changes
nProcesses_var	Number of processes that can concurrently be executed and may change as the number of jobs changes

Since only comagent and netdaemon are designed for multithread processing, calculate the value of the maxThreads parameter only for comagent and netdaemon.

The calculating formulas for kernel parameters related to JobCenter for Windows are as follows.

This value is the least required value when JobCenter is operating alone. As the overall setup value of the system, resources used by applications executed as jobs must also be taken into consideration.

Table 19.4. Kernel parameters and calculating formulas

Parameter	Calculating formulas nProcesses: Total number of processes on JobCenter execution X: Number of job requests executed simultaneously Y: Number of CL/Win connected simultaneously Z: Number of remote job requests arrived simultaneously)
maxThreads	comagent (1 x Y) + netdaemon (1 x Z)
nProcesses	1 + 4 x X + 1 + 1 + 2 + 1 + 1 + 2 + 1 + 1 x Y + 1 + 2 + 1 = 4 x X + 1 x Y + 14

Process configuration of the JobCenter for Windows can broadly be divided into 8 as follows.

Process name	Processing
nqsdaemon	Request processing process
logdaemon	Logs for nqsdaemon and netdaemon
netdaemon	Receives and processes job requests transferred from remote machines
jnwengine	Controls job network execution
qwb	Monitors job status transition in NQS and notifies to jnwengine
trkrdr	Waits jnwengine commands and obtains job information from NQS
sclaunchd	Schedules job execution
comagent	Communicates with other machines
jnwlauncher	Manages daemons of triggers
jl_submit	Manages submitting job networks of triggers
jl_logmonitor	Monitors text logs of triggers

19.4.1. nqsdaemon (executes requests)

Requests are used in unit job executions. As an example, execution of Notepad by cmd in unit jobs is described below.

The following four processes are generated.

Process name	Processing
nqsdaemon	Request processing process
shepherd	Request execution process
cmd	Job request execution command
notepad	User command process

<Resources Used>

Parameter	Number used per request	Remark
nProcesses_const	1	nqsdaemon usage amount
nProcesses_var	4	

19.4.2. logdaemon (Logs for nqsdaemon and netdaemon)

Used when logging information for nqsdaemon and netdaemon. Resources used are not affected by the number of jobs.

<Resources Used>

Parameter	Number used
nProcesses_const	1
nProcesses_var	0

19.4.3. netdaemon (Receives and processes job requests transferred from remote machines)

Resources used depend on the number of requests transferred from remote machines.

The following example shows resources used when one request is processed.

<Resources Used>

Parameter name	Number used per request	Remark
maxThreads	1	Considering only threads generated when one request is processed
nProcesses_const	1	
nProcesses_var	0	

19.4.4. jnwengine (controls job network execution)

qsub commands are issued in job submission. As qsub commands are executed serially, the resources used are not affected by the number of jobs.

<Resources Used>

Parameter name	Numerical quantity

nProcesses_const	2
nProcesses_var	0

19.4.5. qwb (Monitors job status transition in NQS and notifies to jnwengine)

Resources used by qwb are not affected by the number of jobs.

<Resources Used>

Parameter name	Numerical quantity
nProcesses_const	1
nProcesses_var	0

19.4.6. trkrdr (Waits jnwengine commands and obtains job information from NQS)

Resources used by trkdr are not affected by the number of job.

<Resources Used>

Parameter name	Numerical quantity
nProcesses_const	1
nProcesses_var	0

19.4.7. sclaunchd (schedules execution)

The subprocess is started during job network submission by schedule start. As the job network submission processing is executed serially, resources used are not affected by the number of job networks.

The following two processes are generated.

Process name	Processing
sclaunchd	Schedule management process
jnwman	Executes JNW submission processing.

<Resources Used>

Parameter	Number used per JNW submission process
nProcesses_const	2
nProcesses_var	0

19.4.8. comagent (communicates with other machines)

Used when collecting the execution status from JobCenter CL/Win and performing various settings (not used for job transfer and execution). Resources therefore depend on the number of JobCenter CL/Win connecting simultaneously.

Each time a communication request is received, jnwman, nmapmgr, and other subprocesses must be started. The average number of handles used while these subprocesses are running alone is assumed to be 8.

The following example shows resources used when one communication request is processed.

<Resources Used>

Parameter	Number used per communication process	Remark
maxThreads	1	Considering only threads generated when one request is processed
nProcesses_const	1	
nProcesses_var	1	Sub-process usage amount

19.4.9. jnwlauncher (Manages each daemon of the trigger)

This is used when each daemon of the trigger is started up, monitored, and stopped. Resources used are not affected by the number of trigger definitions.

<Resources Used>

Parameter name	Quantity
nProcesses_const	1
nProcesses_var	0

19.4.10. jl_submit (Manages submitting job networks of triggers)

The subprocess is started during job network submission by monitoring of each trigger. As the job network submission processing is executed serially, resources used are not affected by the number of job networks.

The following two processes are generated.

Process name	Description
jl_submit	Management process of submitting job networks of triggers
jnwman	Executes JNW submission processing

<Resources Used>

Parameter	Number used per JNW submission process
nProcesses_const	2
nProcesses_var	0

19.4.11. jl_logmonitor (Monitors text logs of triggers)

This is used when monitoring text logs of triggers. As the text log monitoring processing is executed serially, resources used are not affected by the number of text logs monitored.

<Resources Used>

Parameter name	Quantity
nProcesses_const	1
nProcesses_var	0

19.5. Estimating the Memory Amount Used (For Windows)

The following section describes the method of estimating the amount of memory required for JobCenter for Windows.

⚠️ Desktop heap used by JobCenter

The desktop heap size may affect the operation of JobCenter in a Windows OS. For details about how to adjust the desktop heap, refer to Microsoft KB184802 (User32.dll or Kernel32.dll fails to initialize) or other documentation.

■If the OS desktop heap has run out and a new desktop cannot be created, the JobCenter service (local site) can no longer start. In this case, decrease the non-interactive heap size to increase the number of desktops that can be created.

■If the desktop created by the JobCenter service does not have many available heaps and a new object cannot be created, the process to execute a job from a job request can no longer start. In this case, increase the non-interactive heap size to increase the number of objects that can be created on the JobCenter service desktop.

The desktop heap must satisfy the following conditions for JobCenter to operate.

■The free space of the desktop heap in the window station for non-interactive services must be 5 KB or more.

■One or more new non-interactive desktops (of 256 KB or more) can be created.

■The interactive desktop heap must have a free space of at least 256 KB. (The size required differs depending on the command executed from the unit job or the application.)

The amount of memory used changes greatly during the following two processes:

■jnwengine

■jcdbs

The following sections describe how to estimate the amount of memory to be used by these two processes.

19.5.1. Amount of Memory Required by jnwengine

jnwengine controls job network flow execution. When it is executed, this process loads the target job network information to memory.

The estimated amount of memory required for a job network to operate once is equal to the total of the memory usage amounts described in Section 19.5.1.1, "Example of Memory Usage" and Section 19.5.1.2, "Estimating Method". Considering the margin of error and safety factor, a smooth operation can be ensured when twice as much memory as the estimated amount of memory used is provided.

If insufficient, as insufficient memory errors may occur, change the kernel parameter as required or expand the memory.

19.5.1.1. Example of Memory Usage

Memory use region of job network (JNW)	<Header>: Approximately 86 KB
	<Information area> (Job network name/Parameter/Comment/submit queue name/environment variable/status): Approximately 4 KB

	The environment variable is assumed to be 2 KB.
Memory use region of sub job network (SubJNW) 1 Memory use region of SubJNW 2 . . . Memory use region of SubJNW j	<Header>: Approximately 0.2 KB <Information area> (SubJNW name): Approximately 0.1 KB SubJNW name is in the format of [ROOTJNW:SubJNW1:...:JNWNAME]
Memory use region of job part 1 Memory use region of job part 2 . . . Memory use region of job part k	<Header>: Approximately 6.5 KB <Information area> (job name/parameter/script/ job name@parent JNW name): Approximately 2 KB The Division JNW name is in the format of [ROOTJNW:SubJNW1:...:JNWNAME]
Memory use region of branch node 1 Memory use region of branch node 2 . . . Memory use region of branch node m	<Header>: Approximately 0.1 KB <Information area>: Approximately 0.125 KB The branched flows in Condition branch/Calendar branch/Parallel processing are each added as 1.
Memory use region of Job Network Waiting, Job Waiting, or Time Waiting 1 Memory use region of Job Network Waiting, Job Waiting, or Time Waiting 2 . . . Memory use region of Job Network Waiting, Job Waiting, or Time Waiting o	<Header>: Approximately 0.8 KB <Information area>: Approximately 0.1 KB
Memory use region for File Waiting 1 Memory use region for File Waiting 2 . . . Memory use region for File Waiting p	<Header>: Approximately 2.2 KB <Information area> (path length): Approximately 0.25 KB The path length is assumed to be 0.125 KB.
Memory use region of Event Transmission/Reception 1 Memory use region of Event Transmission/Reception 2 . . .	<Header>: Approximately 2.5 KB <Information area>: Approximately 0.5 KB

Memory use region of Event Transmission/Reception q	

19.5.1.2. Estimating Method

Estimated values are calculated by using the following equations from Section 19.5.1.1, "Example of Memory Usage". Equations are created using the conditions shown in Section 19.5.1.1, "Example of Memory Usage".

■Memory use region of job network (JNW) block

Approximately 90 KB ... <1>

■Total memory used for sub job network (SubJNW) object block

Number of SubJNW objects (j) x (Approximately 0.3 KB) ... <2>

■Total memory used for job part object block

Number of job part objects (k) x (Approximately 8.5 KB) ... <3>

■Total memory used for branch node block

Number of branch nodes (m) x (Approximately 0.225 KB) ... <4>

■Total memory used for wait parts block

- JNW Waiting/Job Waiting/Time Waiting

  Number of waiting objects (o) x (Approximately 0.9 KB) ... <5>

- File Waiting

  Number of waiting objects (p) x (Approximately 2.45 KB) ... <6>

■Total memory used for Event Transmission/Reception parts block

Number of Event Transmission/Reception objects (q) x (Approximately 3 KB) ... <7>

Consequently, the memory required for one job network to operate can be estimated as follows.

Memory required for one job network to operate smoothly = 2 x (<1> + <2> + <3> + <4> + <5> + <6> + <7>)

19.5.2. Amount of Memory Required by jcdbs

jcdbs serves as a database used to manage various JobCenter data in memory.

The types of data to be stored in memory and the amounts of memory used by them are summarized below.

Data name	Memory usage
Memory for reconstructing database	1 GB[note1]
System environment setting	0.8 KB
Tracker display color	0.8 KB
Permission setting	0.6 KB

Custom job definition (per definition)	1 KB
Operating day calendar definition (per definition)	1.8 KB
User environment setting	1.5 KB
Environment variable data	(Size of the environment variable data that the target user has)
Default parameter	8 KB
JNW group	Header information: 1 KB 0.1 KB per node
JNW definition (per JNW)	JNW information: 2.5 KB Part information: 0.1 KB per part
Schedule group	Header information: 1 KB 0.1 KB per node
Schedule definition (per schedule)	1.8 KB
Trigger (text log monitoring) (per definition)	2.9 KB
Target text logs (per definition)	2.1 KB
Running tracker data (per tracker)	JNW information: 2.5 KB Part information: 0.4 KB per part

[note1]This data is used at the timing of database reconstruction but not used at the other timing. 1 GB is set by default, and can be changed. For details of how to change, refer to Section 5.6.4, "Changing the Database Memory Usage".

Of the data listed above, the JNW definition and tracker data greatly vary in the amount of memory used, depending on the configuration or operation. Therefore, the amounts of memory to be used by these two types of data need to be estimated in advance.

19.6. Estimating the Disk Space Used (For Windows)

The following section describes the method of estimating the amount of DISK required for JobCenter for Windows. (The displayed disk space might vary slightly depending on the sector size of the file system.)

■When setting and defining a job network on your machine and submitting it to your machine for execution, estimate the total disk space used from Section 19.6.1, "Disk Space Required by One Job Network" to Section 19.6.3, "Estimating the Disk Space Used for Executing NQS of a Job Request" below.

■When a job network definition exists on another machine and you remotely transfer a job request from that machine to your machine for execution, estimate the disk space used in Section 19.6.3, "Estimating the Disk Space Used for Executing NQS of a Job Request" below.

> ⚠ In Windows, a disk size larger than the size actually used may be needed depending on the cluster size of the HDD. Note this point when creating a job network that includes a lot of unit jobs.

19.6.1. Disk Space Required by One Job Network

The following describes how to estimate the disk space required for one job network to be executed n times to create n trackers.

This space is the total of the space indicated in the following Section 19.6.1.1, "Example of Disk Usage (for one tracker)" and Section 19.6.1.2, "Estimating Method". Job networks can be executed smoothly as long as the this much memory can be allocated.

If the free DISK space is insufficient, an error may occur. Increase the DISK space.

The amount used greatly depends on the complexity of the job processing created in the job network and how much data is included in the job output and error output results obtained through unit job execution. Be sure to specify the job execution parameters in accordance with actual services when estimating the disk space.

19.6.1.1. Example of Disk Usage (for one tracker)

Amount of DISK used for job network (JNW)-related flow	Unit job part definition 1	Approximately 3,000 KB Assuming 2,000 serial unit jobs including 1 KB job scripts are defined.
	Unit job part definition 2	
	. .	
	Unit job part definition m	
Amount of DISK used for JNW log and JNW START/END log		Approximately 0.4 KB
Amount of DISK used for JNW log, unit job 1, and START/END log		Approximately 0.4 KB
Amount of DISK used for JNW log, unit job 2, and START/END log		Approximately 0.4 KB
. .		. .

. Amount of DISK used forJNW log, unit job m, and START/END log	. Approximately 0.4 KB
Amount of DISK used for detailed JNW information	Approximately 0.4 KB
Amount of DISK used for detailed unit job information 1	Approximately 0.4 KB
Amount of DISK used for detailed unit job information 2	Approximately 0.4 KB
. . .	. . .
Amount of DISK used for detailed unit job information m	Approximately 0.4 KB
Amount of DISK used for unit job output result 1	Depends on the batch script
Amount of DISK used for unit job output result 2	Depends on the batch script
. . .	. . .
Amount of DISK used for unit job output result m	Depends on the batch script (Calculate the amount of disk space used for the standard output results of the script by yourself because it depends on the actual services.)
Amount of DISK used for unit job error output result 1	Depends on the batch script
Amount of DISK used for unit job error output result 2	Depends on the batch script
. . .	. . .
Amount of DISK used for unit job error output result m	Depends on the batch script (Calculate the amount of disk space used for the standard error output results of the script by yourself because it depends on the actual services.)

19.6.1.2. Estimating Method

Estimated values are calculated by using the following equations from Section 19.6.1.1, "Example of Disk Usage (for one tracker)". Equations are created using the conditions shown in Section 19.6.1.1, "Example of Disk Usage (for one tracker)"(Note that the area to store the definitions and settings for the job network used for creating the tracker must also be allocated.)

■Disk space used for job network (JNW) flows (same amount as that used for definitions and settings)

Approximately 3,000 KB ... <1>

■Total amount of DISK used for job network (JNW) log

Approximately 0.4 KB + Number of unit job objects (m) x (Approximately 0.4 KB) ... <2>

■Total amount of DISK used for job network (JNW) detailed information

Approximately 0.4 KB + Number of unit job objects (m) x (Approximately 0.4 KB) ... <3>

■Total amount of DISK used for unit job output results

Number of unit job objects (m) x (Estimated average output results size) ... <4>

■Total amount of DISK used for unit job error output results

Number of unit job objects (m) x (Estimated average error output results size) ... <5>

In addition, the amount equivalent to <1> is required for the area to store the definitions of the job network used for creating the tracker.

Therefore, the disk space necessary to execute one job network n times is estimated as follows.

Disk space necessary to execute one job network n times =

<1> + n x (<1> + <2> + <3> + <4> + <5>)

When one job network is executed n times to create n trackers, the amount of (n x (<1> + <2> + <3> + <4> + <5>)) is allocated in the JobCenter working area. This is released if all trackers are executed and archived after the archive wait time has elapsed.

19.6.2. Estimating the Disk Space Used for Tracker Archives

The disk space used for the tracker archives can be estimated by estimating the space used for the respective job networks submitted during the retention period of the tracker archive (described in Section 19.6.1.2, "Estimating Method"), multiplying the number of times each job network is submitted during the retention period, and totaling these values.

■Total amount of DISK used for JNWs submitted during the retention period of the tracker archive

Number of JNWs (i) x [(JNW n DISK amount used) x (Number of times JNWs are submitted during tracker archive retention period)]

19.6.3. Estimating the Disk Space Used for Executing NQS of a Job Request

During job network execution, unit jobs included in a flow are submitted to the NQS queues and executed. The disk space used for executing NQS can be estimated by estimating the space used for the NQS spool, multiplying the number of job requests that are executed simultaneously, and totaling them.

■Estimating the disk space used for controlling NQS of a job request

Number of job requests executed simultaneously (m) x (Approximately 10 KB) ... <1>

■Total disk space used by job script spool files

Number of job requests executed simultaneously (m) x (Estimated average of job scripts) ... <2>

■Disk space used for controlling job request IDs

Approximately 24 MB max. (MG) ... <3>

Approximately 12 MB max. (SV) ... <3>

■Total disk space used by command standard output result spool files of job requests

Number of job requests executed simultaneously (m) x (Estimated average of standard output results) ... <4>

■Total disk space used by command standard error output result spool files of job requests

Number of job requests executed simultaneously (m) x (Estimated average of standard error output results) ... <5>

Therefore, the disk space used by the spool area required for multiple job requests to be executed simultaneously in NQS queues is estimated as follows.

Disk space used for NQS area = (<1> + <2> + <3> + <4> + <5>)

The disk space <3> increases if jobs are remotely submitted from multiple remote machines (sites) and many job requests are executed in a short time and place a high load on the system. Consider the amount shown here as a guide.

The size for unit job scripts and the size for spool files used to temporarily hold standard output results and standard error output results output by commands specified in the unit job scripts by NQS greatly vary depending on the services. Fully consider the services when estimating the sizes.

19.6.4. Estimating the Disk Space Used for jcdbs

The estimated DISK space that jcdbs requires is the total amount of the DISK space 3 times larger than the memory space of jcdbs and the DISK space for the database reconstruction data.

The jcdbs memory space is calculated from Section 19.5.2, "Amount of Memory Required by jcdbs". If the jcdbs memory space is smaller, the DISK space to be used is 64 MB at least.

The DISK space of the data for reconstruction is set to 1 GB by default. You can change this value. For details of how to change, refer to Section 5.6.4, "Changing the Database Memory Usage".

If the free DISK space is insufficient, an error may occur. Increase the DISK space.

19.7. Estimating the Memory Amount Used for Uploads and Downloads

The following section describes the method of estimating the amount of memory required for JobCenter MG/SV at file uploading or downloading destination.

If an error occurs because of insufficient memory in the JobCenter MG/SV at file uploading or downloading destination, divide the definition to be uploaded or downloaded, and then transfer it again.

> ⚠ To assure smooth uploads and downloads, approximately two times the estimated necessary memory should be allocated in consideration of measurement errors and safety.

19.7.1. Estimating the Memory Amount Used by JobCenter MG/SV (for Windows) for Uploads and Downloads

■Estimating the Memory Amount Used for Uploads

The approximate memory required for one upload is as below. For the amount of memory used for uploading the various definitions, see Table 19.5, "Memory used for uploading various definitions".

Memory required during uploads = [1] + [2] + [3] + [4] + [5] + [6] + [7]

- [1]: Number of job networks x Amount of memory used per job network

- [2]: Number of parts x Amount of memory used per part

- [3]: Number of schedules x Amount of memory used per schedule

- [4]: Number of triggers (text log monitoring) x Amount of memory used per trigger (text log monitoring)

- [5]: Number of target text logs x Amount of memory used per target text log

- [6]: Number of calendars x Amount of memory used per calendar

- [7]: Number of custom job templates x Amount of memory used per custom job template

Table 19.5. Memory used for uploading various definitions

Definition type	Amount of memory used per definition
Job network	20 KB
Part (such as unit job)	25 KB
Schedule	20 KB
Trigger (text log monitoring)	10 KB
Target text logs	8 KB
Calendar	40 KB
Custom job template	4 KB

■Estimating the Memory Amount Used for Downloads

The approximate memory required for one download is as below. For the amount of memory used for downloading the various definitions, refer to Table 19.6, "Memory used for downloading various definitions".

Memory required during downloads = [1] + [2] + [3] + [4] + [5] + [6] + [7]

- [1]: Number of job networks x Amount of memory used per job network

- [2]: Number of parts x Amount of memory used per part

- [3]: Number of schedules x Amount of memory used per schedule

- [4]: Number of triggers (text log monitoring) x Amount of memory used per trigger (text log monitoring)

- [5]: Number of target text logs x Amount of memory used per target text log

- [6]: Number of calendars x Amount of memory used per calendar

- [7]: Number of custom job templates x Amount of memory used per custom job template

Table 19.6. Memory used for downloading various definitions

Definition type	Amount of memory used per definition
Job network	60 KB
Part (such as unit job)	38 KB
Schedule	9 KB
Trigger (text log monitoring)	10 KB
Target text logs	7 KB
Calendar	4 KB
Custom job template	8 KB

19.7.2. Estimating the Memory Amount Used by JobCenter MG/SV (for UNIX) for Uploads and Downloads

■Estimating the Memory Amount Used for Uploads

The approximate memory required for one upload is as below. For the amount of memory used for uploading the various definitions, refer to Table 19.7, "Memory used for uploading various definitions".

Memory required during uploads = [1] + [2] + [3] + [4] + [5] + [6] + [7]

- [1]: Number of job networks x Amount of memory used per job network

- [2]: Number of parts x Amount of memory used per part

- [3]: Number of schedules x Amount of memory used per schedule

- [4]: Number of triggers (text log monitoring) x Amount of memory used per trigger (text log monitoring)

- [5]: Number of target text logs x Amount of memory used per target text log

- [6]: Number of calendars x Amount of memory used per calendar

- [7]: Number of custom job templates x Amount of memory used per custom job template

Table 19.7. Memory used for uploading various definitions

Definition type	Amount of memory used per definition
Job network	10 KB
Part (such as unit job)	10 KB
Schedule	10 KB
Trigger (text log monitoring)	7 KB
Target text logs	5 KB
Calendar	30 KB
Custom job template	6 KB

■Estimating the Memory Amount Used for Downloads

The approximate memory required for one download is as below. For the amount of memory used for downloading the various definitions, refer to Table 19.8, "Memory used for downloading various definitions".

Memory required during downloads = [1] + [2] + [3] + [4] + [5] + [6] + [7]

- [1]: Number of job networks x Amount of memory used per job network

- [2]: Number of parts x Amount of memory used per part

- [3]: Number of schedules x Amount of memory used per schedule

- [4]: Number of triggers (text log monitoring) x Amount of memory used per trigger (text log monitoring)

- [5]: Number of target text logs x Amount of memory used per target text log

- [6]: Number of calendars x Amount of memory used per calendar

- [7]: Number of custom job templates x Amount of memory used per custom job template

Table 19.8. Memory used for downloading various definitions

Definition type	Amount of memory used per definition
Job network	30 KB
Part (such as unit job)	10 KB
Schedule	10 KB
Trigger (text log monitoring)	7 KB
Target text logs	5 KB
Calendar	8 KB
Custom job template	8 KB

20 Troubleshooting

The following describes information about troubleshooting of JobCenter.

20.1. Troubleshooting Q&A

Q.1	The copied definition file is not displayed on the list screen.
A.1	You cannot use the definition file only by copying it. If you want to migrate the environment form another machine or user, migrate the definitions by using the jdh_download and jdh_upload commands. If it is necessary to change the machine name and user name, change them when migrating the definitions. For details, refer to Chapter 13, 「Environment Migration」.

Q.2	Job processes started from JobCenter are sometimes forced-terminated.
A.2	If the command is background-started in the shell, and processes remain even when the shell is ended, background-started processes may be forcibly terminated in some cases. JobCenter manages job processes in units of process groups. When the end of a job is detected (=end of shell), it sends SIGKILL to the process group of the job, and forcibly ends the remaining process.

Q.3	Ends normally when executed from the command prompt, but error occurs when implemented as JobCenter job.
A.3	This phenomenon may be due to the following reasons. ■The job execution user is different. 　The job execution user is normally the same as the job submit user, and when the user mapping function is used, the job submit user and executing user may differ. ■The environment variable set during job execution is different. 　The process started may require specific environment variable settings. Before starting the concerned process, insert the set command to display the environment variable, and check that the required environment variable is set. ■The current directory during job execution is different. 　If the command and file paths are described by relative paths, they may not be referenced in some cases. In such cases, check the current directory during job execution, or describe using the absolute path. ■Process using standard input As JobCenter starts the job with the standard input in the closed state, processes to be executed with the standard input in the open state may not operate in some cases. 　In this case, it is necessary to perform one of the following. For details of the setting method, refer to <JobCenter Guide for using NQS function> (Japanese only). 　▪ Do not read the standard input 　▪ Set Shell Strategy of JobCenter to FREE.

Q.4	Even if the job started from JobCenter is forcibly stopped and skip, etc. are performed, processes started from the job do not end.
A.4	JobCenter manages job processes in units of process groups. When forced stop, skip, etc. are performed, JobCenter sends SIGKILL to the process group of the job, and forcibly ends all processes in the process group.

	However, if executing processes generating new process groups, these will be outside the management scope of JobCenter, therefore that process cannot be ended.

Q.5	To execute the command for stopping the system from JobCenter.
A.5	At the default setting, JobCenter re-executes jobs that were being executed before the machine stopped when the machine is rebooted. When commands such as the shutdown command are executed as JobCenter jobs, there is a risk of the system never completely starting up because a job that includes the shutdown command is executed from JobCenter every time an attempt is made to start the machine, so such commands cannot normally be executed as JobCenter jobs. If such execution is required, it is necessary to at least take actions 1 to 3 below. 1. Set the restart attribute of the unit job parameters to DISABLE so that the same job is not re-executed after the OS is rebooted. 2. Generate a new process group, and execute the shutdown command with this process group. After starting the shutdown command, end the job swiftly. 3. Specify the script so that, after executing the shutdown command, there is sufficient standby time before the shutdown stop processing is actually started.

Q.6	When the system is stopped using the reboot command, the job status becomes abnormal when rebooted.
A.6	The reboot command may forcibly end the process currently being executed and reboot the system without performing the normal system stop process in some cases. In such cases, as JobCenter is forcibly terminated without performing stop processing, the job status file cannot be updated, and therefore abnormal status may be displayed at reboot.

Q.7	The correct script specification method is not understood.
A.7	Scripts started from unit jobs are not interpreted by JobCenter, instead they are structure analyzed by shell (command interpreter) and executed. For details on the description method and grammar of script, refer to the respective manuals of each shell and command interpreter.

Q.8	Environment variable set during job execution (.profile, .cshrc, etc.)
A.8	JobCenter starts shell at the start of job execution, but this is not the login shell. If .csh is used, ~/.cshrc is read, but if .sh is used, ~/.profile is not read. This difference is due to the shell program specifications, but such behavior cannot be changed by JobCenter settings. Change the shell for executing jobs by unit job parameter setting or describe the details directly required for job script.

Q.9	Environment variable set in schedule submit
A.9	When a job network is started according to schedule, the environment variables of each user stored in JobCenter are restored and set when a job is executed. JobCenter saves the environment variables of a user in the following cases: ■When a user logs in from CL/Win or CL/Web

■When a schedule is created or updated through a GUI operation

■When a schedule is created or updated using the upload function

Q.10	Job linkage is attempted between ACOS, SX and JobCenter, but job submit to NQS at the ACOS or SX side from JobCenter cannot be carried out smoothly.
A.10	To enable job linkage between JobCenter and ACOS or SX, there is a need to change the NQS mode at the JobCenter side from NEC expansion mode to COSMIC mode Use the nmapmgr command on the machine installing JobCenter to change the machine type of the host (ACOS or SX) subject to linkage registered at NMAPLIST of JobCenter. echo "set type <machine-ID> cos" | nmapmgr ✏️ <machine-ID> is ACOS (or SX) machine ID. For details, refer to "3.12 Managing the nmapmgr Network Configuration" in <JobCenter Command Reference> (Japanese only).

Q.11	To execute a job depending on the group authority on HP-UX
A.11	Job execution from JobCenter uses system call initgroups, and on HP-UX, this system call references not /etc/group, but /etc/logingroup Therefore, when executing jobs, preparations such as the following are necessary to apply the contents of /etc/group: ■Copying /etc/group and creating /etc/logingroup ■Creating a symbolic link to /etc/logingroup -> /etc/group

Q.12	CL/Win screen drawing is slow in Windows Vista and later.
A.12	When Aero is enabled for Windows Vista and later, drawing will be slow. Fix slow CL/Win screen drawing as follows: 1. Right-click CL/Win Nscl.exe and select [Properties]. 2. On the [Compatibility] tab, in the [Settings] area, select the [Disable desktop composition] check box. 3. Click the [OK] or [Apply] button to save the property setting.

20.2. Changing Error Log Files

Logs are recorded at many times, such as when JobCenter is started or terminated, and when warnings or errors are generated. This section describes how to change the size of this error log file and the number of backups.

Error log files are recorded by JobCenter resident processes and internal commands. Depending on the type of inquiry, you may be asked to collect the error log file when making inquiries to the support desk. However, there is no need to collect individual error log file, because and error log files can be downloaded in a batch by executing the information collection command. For details, refer to "7.1 jc_getinfo - Collecting all necessary information for investigation when JobCenter system failed" in <JobCenter Command Reference> (Japanese only).

Please note that the log format is not public.

20.2.1. For Windows

In Windows, the server environment settings window is used.

1. Log on to Windows as a JobCenter administrator user.

2. Click [Start], point to [All Programs], [JobCenter], [SV], and then select [Environment Setting].

3. The [Environment setting] window appears. Click [Site] in the left pane, and then double-click the site subject to configure in the right pane.
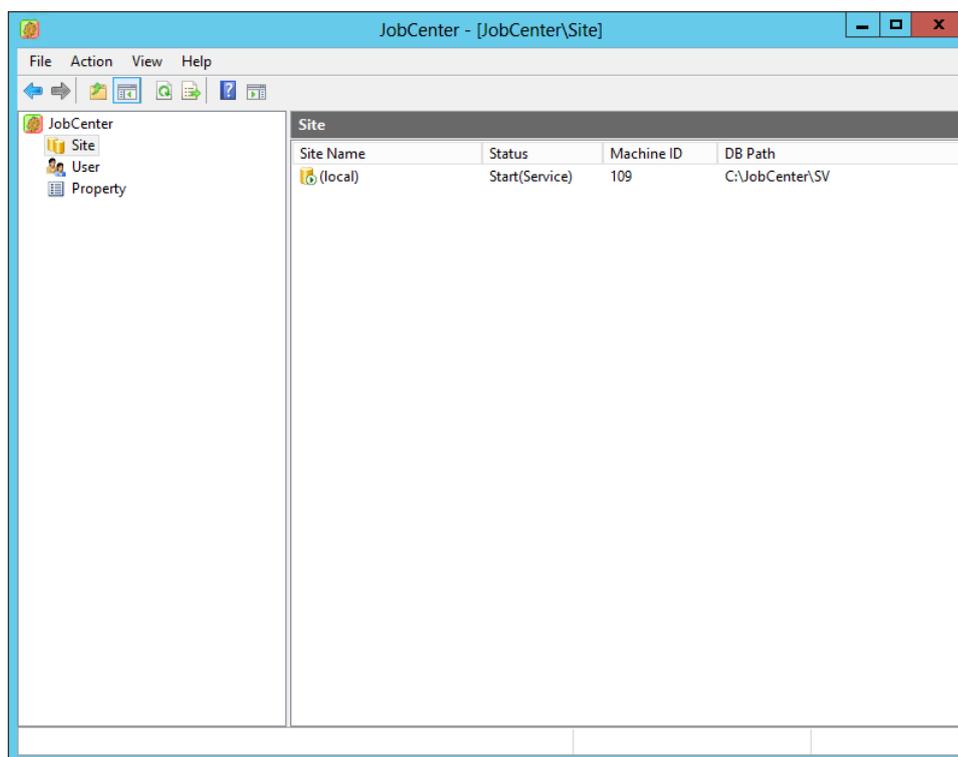
Figure 20.1. Screenshot of Environment Setting

4. Click [Property] for the site, and then select the [Debug Log] tab.
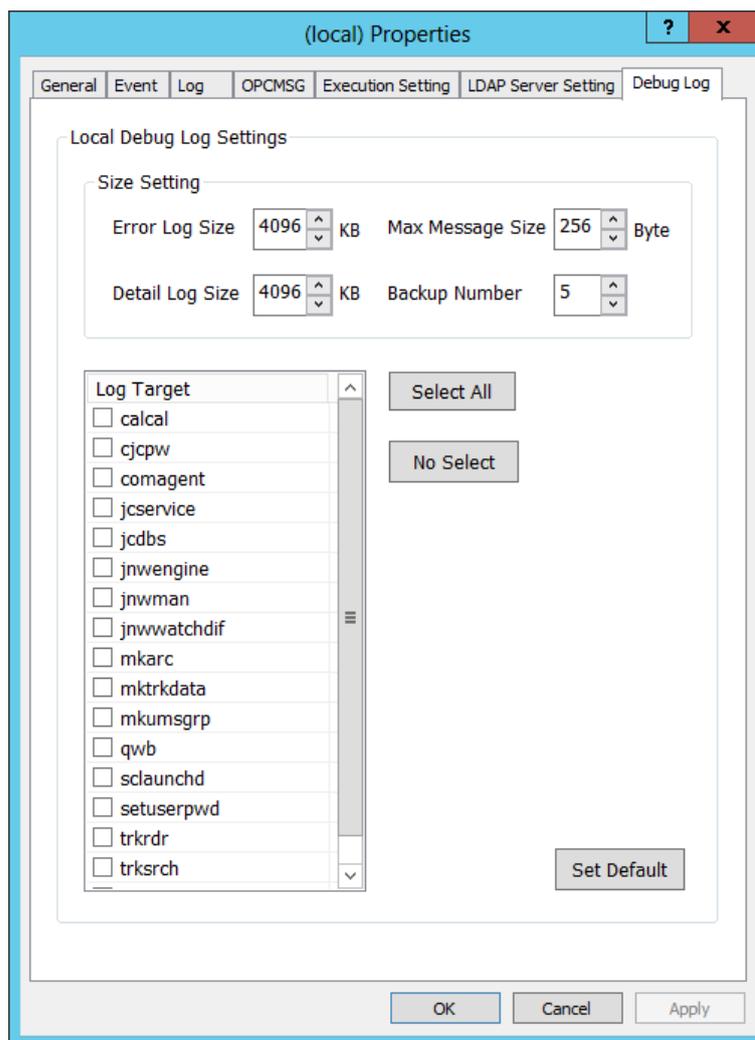
Figure 20.2. Screenshot of the [Debug Log] tab

The following describes the parameters.

[Size Setting]

■Error Log Size

Sets the error log file size.

Table 20.1, "Error log names and their file paths" lists error logs of which file size is to be set. Set a size within the following range:

Default	4096 KB
Setting range	64 to 4096 KB

Table 20.1. Error log names and their file paths

Log name	File path
calcalErr.log	%InstallDirectory%\spool\log\error\calcalErr.log
cjcpwErr.log	%InstallDirectory%\spool\log\error\cjcpwErr.log
comagentErr.log	%InstallDirectory%\spool\log\error\comagentErr.log

jcserviceErr.log	%InstallDirectory%\spool\log\error\jcserviceErr.log
jcdbsErr.log	%InstallDirectory%\spool\log\error\jcdbsErr.log
jnwengineErr.log	%InstallDirectory%\spool\log\error\jnwengineErr.log
jnwmanErr.log	%InstallDirectory%\spool\log\error\jnwmanErr.log
jnwwatchdifErr.log	%InstallDirectory%\spool\log\error\jnwwatchdifErr.log
mkarcErr.log	%InstallDirectory%\spool\log\error\mkarcErr.log
mktrkdataErr.log	%InstallDirectory%\spool\log\error\mktrkdataErr.log
mkumsgrpErr.log	%InstallDirectory%\spool\log\error\mkumsgrpErr.log
qwbErr.log	%InstallDirectory%\spool\log\error\qwbErr.log
sclaunchdErr.log	%InstallDirectory%\spool\log\error\sclaunchdErr.log
setuserpwdErr.log	%InstallDirectory%\spool\log\error\setuserpwdErr.log
trkrdrErr.log	%InstallDirectory%\spool\log\error\trkrdrErr.log
trksrchErr.log	%InstallDirectory%\spool\log\error\trksrchErr.log
umsclientErr.log	%InstallDirectory%\spool\log\error\umsclientErr.log
jnwlauncherErr.log	%InstallDirectory%\spool\log\error\jnwlauncherErr.log
jl_submitErr.log	%InstallDirectory%\spool\log\error\jl_submitErr.log
jl_logmonitorErr.log	%InstallDirectory%\spool\log\error\jl_logmonitorErr.log

> %InstallDirectory% is the installation directory of JobCenter. By default, C:\JobCenter\SV. In a cluster environment, read %InstallDirectory% as <JobCenterDB-Path>.

■Detail Log Size

Sets the detail log (debug log) file size.

Table 20.2, "Debug log names and their file paths" lists error logs of which file size is to be set. Set a size within the following range:

Default	4096 KB
Setting range	64 to 4096 KB

Table 20.2. Debug log names and their file paths

Log name	Log file name
calcalDbg.log	%InstallDirectory%\spool\log\debug\calcalDbg.log
cjcpwDbg.log	%InstallDirectory%\spool\log\debug\cjcpwDbg.log
comagentDbg.log	%InstallDirectory%\spool\log\debug\comagentDbg.log
jcserviceDbg.log	%InstallDirectory%\spool\log\debug\jcserviceDbg.log
jcdbsDbg.log	%InstallDirectory%\spool\log\debug\jcdbsDbg.log
jnwengineDbg.log	%InstallDirectory%\spool\log\debug\jnwengineDbg.log
jnwmanDbg.log	%InstallDirectory%\spool\log\debug\jnwmanDbg.log
jnwwatchdifDbg.log	%InstallDirectory%\spool\log\debug\jnwwatchdifDbg.log
mkarcDbg.log	%InstallDirectory%\spool\log\debug\mkarcDbg.log
mktrkdataDbg.log	%InstallDirectory%\spool\log\debug\mktrkdataDbg.log
mkumsgrpDbg.log	%InstallDirectory%\spool\log\debug\mkumsgrpDbg.log

qwdDbg.log	%InstallDirectory%\spool\log\debug\qwdDbg.log
sclaunchdDbg.log	%InstallDirectory%\spool\log\debug\sclaunchdDbg.log
setuserpwdDbg.log	%InstallDirectory%\spool\log\debug\setuserpwdDbg.log
trkrdrDbg.log	%InstallDirectory%\spool\log\debug\trkrdrDbg.log
trksrchDbg.log	%InstallDirectory%\spool\log\debug\trksrchDbg.log
umsclientDbg.log	%InstallDirectory%\spool\log\debug\umsclientDbg.log
jnwlauncherDbg.log	%InstallDirectory%\spool\log\debug\jnwlauncherDbg.log
jl_submitDbg.log	%InstallDirectory%\spool\log\debug\jl_submitDbg.log
jl_logmonitorDbg.log	%InstallDirectory%\spool\log\debug\jl_logmonitorDbg.log

> %InstallDirectory% is the installation directory of JobCenter. By default, C:\JobCenter\SV.
>
> In a cluster environment, read %InstallDirectory% as <JobCenterDB-Path>.

■Maximum Message Size

Sets the maximum length of one message written in log files. Set a length within the following range:

Default	256 B
Setting range	128 to 10240 B

■Number of backup files

Sets the number of backup files for error and debug logs.

Default	5 generations
Setting range	1 to 10 generations

■Log Target

Select a detailed log to obtain. Select the check box of the log to obtain.

> ⚠ Depending on the type of inquiry, you may be asked to collect the detailed log (debug log) when making inquiries to the support desk.
>
> When collecting a detailed log, JobCenter internal processes including normal operations will be traced, so that the execution speed will slow down. Therefore, do not collect the detailed log unless there is a request from the support desk.

■[Select All]

Selects all check boxes.

■[No Select]

Clears all check boxes.

■[Set Default]

Applies the default settings.

■[OK] or [Apply]

Apply the specified settings. There is no need to restart JobCenter at this time.

20.2.2. For UNIX

For UNIX, change the following setting files.

Local site	/usr/spool/nqs/gui/log.conf
Cluster site	<JobCenterDB path>/nqs/gui/log.conf

The following is an example of the log.conf file.

```
#
# JobCenter log configuration
#
#   XXXX_LOG_SIZE: log size (KB)
#   XXXX_LOG_NUM:  number of backup log files
#

JNWENGINE_LOG_SIZE=4096
JNWENGINE_LOG_NUM=5

JNWCASTER_LOG_SIZE=4096
JNWCASTER_LOG_NUM=5

COMAGENT_LOG_SIZE=4096
COMAGENT_LOG_NUM=5

SCLAUNCHD_LOG_SIZE=4096
SCLAUNCHD_LOG_NUM=5

JCDBS_LOG_SIZE=4096
JCDBS_LOG_NUM=5

CJCPW_LOG_SIZE=4096
CJCPW_LOG_NUM=5

JNWMAN_LOG_SIZE=4096
JNWMAN_LOG_NUM=5

JNWLAUNCHER_LOG_SIZE=4096
JNWLAUNCHER_LOG_NUM=5

JL_SUBMIT_LOG_SIZE=4096
JL_SUBMIT_LOG_NUM=5

JL_LOGMONITOR_LOG_SIZE=4096
JL_LOGMONITOR_LOG_NUM=5
```

The following settings can be specified for each module.

Parameter	Description	Default	Range
<module name>_LOG_SIZE	Log size (KB)	4096	64 to 10240
<module name>_LOG_NUM	Number of backup generations	5	1 to 10

> ⚠ ■After changing the settings, restart JobCenter.

> ■If an invalid value is specified, the default value is used.

The log files for each module are located in the following directories.

Local site	/usr/spool/nqs/log/
Cluster site	<JobCenterDB path>/nqs/log/

The log file names for the modules are as follows.

Table 20.3. Log file name

Module name	Log file name
jnwengine	jeerr.log
jnwcaster	jnwcsterr.log
comagent	comagerr.log
sclaunchd	sclerr.log
jcdbs	jcdbserr.log
cjcpw	cjcpw.log
jnwman	jnwmanerr.log
jnwlauncher	jnwlaunchererr.log
jl_submit	jl_submiterr.log
jl_logmonitor	jl_logmonitorerr.log

20.2.3. NQS Related Logs

NQS related log file settings differ from those of other modules and must be specified in the NQS-unique format. The setting method is the same for both Windows and UNIX, and the qmgr command is used.

■For UNIX

```
/usr/bin/qmgr
```

■For Windows

```
%InstallDirectory%\bin\qcmd\qmgr
```

> ■The qmgr command must be executed by a JobCenter administrator.
>
> ■In a cluster environment, the environmental variable NQS_SITE must be set first.
>
> ■For details about the qmgr command, refer to "3.13 qmgr - Configuration and Operations" in <JobCenter Command Reference> (Japanese only).

Execute the following subcommands to set up the log.

```
SEt ERRor_log [Size=($logfile_size)] [Backup=$backup_number]
```

The setting items are as follows.

Parameter	Description	Default	Range
logfile_size	Set the log size. Bytes are used if the unit is not set. Units (kb, mb) can also be specified.	1048576 (1mb)	65536 (64kb) to 4194304 (4mb)
backup_number	Specify the number of backups.	10	1 to 10

Example: Change to 4 MB log size and 5 backups.

```
Mgr: set error_log size=(4mb) backup=5
NQS manager[TCML_COMPLETE  ]: Transaction complete at local host.
```

Execute the show parameters subcommand to check the current log settings.

```
Mgr: show parameters

  Maximum global batch run_limit = 1000
  Maximum global network run_limit = 1000
  Maximum global pipe run_limit = 1000
  Debug level =  0
  Default batch_request priority = 31
  Default batch_request queue = NONE
  Default destination_retry time = 16 seconds
  Default destination_retry wait = 300 seconds
  Default device_request priority = 31
  No default print forms
  Default print queue = NONE
  (Pipe queue request) Lifetime = 0 hours
  Default network_retry time = 16 seconds
  Default network_retry wait = 0 seconds
  Default network_retry time_out = 300 seconds
  Default stage_retry time = 259200 seconds
  Default stage_retry wait = 300 seconds
  Default expire time = 259200 seconds
  Log_file = /dev/null
  Error_log size = 4194304 bytes
  Error_log backup number = 5
  Mail account = root
  Maximum number of print copies = 2
  Maximum failed device open retry limit = 2
  Maximum print file size = 1000000 bytes
  Netdaemon = /usr/lib/nqs/netdaemon
  Netclient = NONE
  Netserver = /usr/lib/nqs/netserver
  (Failed device) Open_wait time = 5 seconds
  NQS daemon is not locked in memory
  Next available sequence number = 1400
  Batch request shell choice strategy = FREE
  Mapping mode = TYPE3
  Maximum batch request priority = 0
  Maximum global group submit limit = Unlimited
  Maximum global user submit limit = Unlimited
  Maximum global group run limit = Unlimited
  Maximum global user run limit = Unlimited
  Maximum IDC connection number = 32
  Qwatch event spool size = 2097152
  Qwatch event expier time = 3600
```

```
Inter Queue Scheduling mode = TYPE0
```

"Error_log size" shows the size and "Error_log backup number" shows the number of backups.