

**Job Management Partner 1 Version 10**

**Job Management Partner 1/Automatic Job  
Management System 3 System Design  
(Configuration) Guide**

**3021-3-319-20(E)**

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## Notices

### ■ Relevant program products

For details about the applicable OS versions, and the service packs and patches required for Job Management Partner 1/Automatic Job Management System 3, see the *Release Notes*.

*Job Management Partner 1/Automatic Job Management System 3 - Manager (For Windows):*

P-2W12-3KAL Job Management Partner 1/Automatic Job Management System 3 - Manager version 10-50

The above product includes the following:

P-CC2A12-3KAL Job Management Partner 1/Automatic Job Management System 3 - Manager: version 10-50 (For Windows Server 2012 and Windows Server 2008)

P-CC2412-3KAL Job Management Partner 1/Automatic Job Management System 3 - Manager version 10-50 (For Windows Server 2003 and Windows Server 2003(x64))

*Job Management Partner 1/Automatic Job Management System 3 - Manager (For UNIX):*

P-1J12-27AL Job Management Partner 1/Automatic Job Management System 3 - Manager version 10-50 (For HP-UX(IPF))

P-9312-27AL Job Management Partner 1/Automatic Job Management System 3 - Manager version 10-50 (For Solaris 11 (SPARC) and Solaris 10 (SPARC))

P-1M12-27AL Job Management Partner 1/Automatic Job Management System 3 - Manager version 10-50 (For AIX)

P-8112-27AL Job Management Partner 1/Automatic Job Management System 3 - Manager version 10-50 (For Linux 6.1 (x86) or later, Linux 6.1 (x64) or later, Linux 5.1 (x86) or later, and Linux 5.1 (AMD/Intel 64) or later)

*Job Management Partner 1/Automatic Job Management System 3 - Agent (For Windows):*

P-2W12-33AL Job Management Partner 1/Automatic Job Management System 3 - Agent version 10-50

The above product includes the following:

P-CC2A12-33AL Job Management Partner 1/Automatic Job Management System 3 - Agent version 10-50 (For Windows Server 2012 and Windows Server 2008)

P-CC2412-33AL Job Management Partner 1/Automatic Job Management System 3 - Agent version 10-50 (For Windows Server 2003 and Windows Server 2003(x64))

*Job Management Partner 1/Automatic Job Management System 3 - Agent (For UNIX):*

P-1J12-29AL Job Management Partner 1/Automatic Job Management System 3 - Agent version 10-50 (For HP-UX(IPF))

P-9312-29AL Job Management Partner 1/Automatic Job Management System 3 - Agent version 10-50 (For Solaris 11 (SPARC) and Solaris 10 (SPARC))

P-1M12-29AL Job Management Partner 1/Automatic Job Management System 3 - Agent version 10-50 (For AIX)

P-8112-29AL Job Management Partner 1/Automatic Job Management System 3 - Agent version 10-50 (For Linux 6.1 (x86) or later, Linux 6.1 (x64) or later, Linux 5.1 (x86) or later, and Linux 5.1 (AMD/Intel 64) or later)

*Job Management Partner 1/Automatic Job Management System 3 - View (For Windows):*

P-2W12-34AL Job Management Partner 1/Automatic Job Management System 3 - View version 10-50

The above product includes the following:

P-CC2A12-34AL Job Management Partner 1/Automatic Job Management System 3 - View version 10-50 (For Windows 8.1, Windows 8, Windows Server 2012, Windows 7, Windows Server 2008 and Windows Vista)

P-CC2412-34AL Job Management Partner 1/Automatic Job Management System 3 - View version 10-50 (For Windows Server 2003, Windows Server 2003(x64), and Windows XP Professional)

*Job Management Partner 1/Base# (For Windows):*

P-2W2C-6LAL Job Management Partner 1/Base# version 10-50

The above product includes the following:

P-CC2A2C-6LAL Job Management Partner 1/Base# version 10-50 (For Windows Server 2012 and Windows Server 2008)

P-CC242C-6LAL Job Management Partner 1/Base# version 10-50 (For Windows Server 2003 and Windows Server 2003(x64))

*Job Management Partner 1/Base# (For UNIX):*

P-1J2C-6LAL Job Management Partner 1/Base# version 10-50 (For HP-UX(IPF))

P-9D2C-6LAL Job Management Partner 1/Base# version 10-50 (For Solaris 11 (SPARC) and Solaris 10 (SPARC))

P-1M2C-6LAL Job Management Partner 1/Base# version 10-50 (For AIX)

P-812C-6LAL Job Management Partner 1/Base# version 10-50 (For Linux 6.1 (x86) or later, Linux 6.1 (x64) or later, Linux 5.1 (x86) or later, and Linux 5.1 (AMD/Intel 64) or later)

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## ■ Microsoft product name abbreviations

This manual uses the following abbreviations for Microsoft product names.

Abbreviation		Full name or meaning
Excel		Microsoft(R) Excel
		Microsoft(R) Office Excel
Exchange Server		Microsoft(R) Exchange 2000 Enterprise Server
		Microsoft(R) Exchange 2000 Server
		Microsoft(R) Exchange Server
IE	Internet Explorer	Microsoft(R) Internet Explorer(R)
		Windows(R) Internet Explorer(R)
Microsoft Mail		Microsoft(R) Mail
Microsoft SQL Server		Microsoft(R) SQL Server
		Microsoft(R) SQL Server Enterprise Edition
MSCS		Microsoft(R) Cluster Server
MSMQ		Microsoft(R) Message Queue Server
Outlook	Outlook 2003	Microsoft(R) Outlook(R) 2003
	Outlook 2007	Microsoft(R) Outlook(R) 2007
	Outlook 2010	Microsoft(R) Outlook(R) 2010
Outlook Express		Microsoft(R) Outlook(R) Express
Windows 7		Microsoft(R) Windows(R) 7 Enterprise
		Microsoft(R) Windows(R) 7 Professional
		Microsoft(R) Windows(R) 7 Ultimate
Windows 8		Windows(R) 8 Enterprise
		Windows(R) 8 Pro
Windows 8.1		Windows(R) 8.1 Enterprise
		Windows(R) 8.1 Pro
Windows Server 2003	Windows Server 2003	Microsoft(R) Windows Server(R) 2003, Enterprise Edition
		Microsoft(R) Windows Server(R) 2003, Standard Edition
	Windows Server 2003 R2	Microsoft(R) Windows Server(R) 2003 R2, Enterprise Edition
		Microsoft(R) Windows Server(R) 2003 R2, Standard Edition
	Windows Server 2003 (x64)	Microsoft(R) Windows Server(R) 2003, Enterprise x64 Edition
		Microsoft(R) Windows Server(R) 2003, Standard x64 Edition

Abbreviation		Full name or meaning
Windows Server 2003	Windows Server 2003 R2 (x64)	Microsoft(R) Windows Server(R) 2003 R2, Enterprise x64 Edition
		Microsoft(R) Windows Server(R) 2003 R2, Standard x64 Edition
Windows Server 2008	Windows Server 2008	Microsoft(R) Windows Server(R) 2008 Datacenter
		Microsoft(R) Windows Server(R) 2008 Enterprise
		Microsoft(R) Windows Server(R) 2008 Standard
	Windows Server 2008 R2	Microsoft(R) Windows Server(R) 2008 R2 Datacenter
		Microsoft(R) Windows Server(R) 2008 R2 Enterprise
		Microsoft(R) Windows Server(R) 2008 R2 Standard
Windows Server 2012	Windows Server 2012	Microsoft(R) Windows Server(R) 2012 Datacenter
		Microsoft(R) Windows Server(R) 2012 Standard
	Windows Server 2012 R2	Microsoft(R) Windows Server(R) 2012 R2 Datacenter
		Microsoft(R) Windows Server(R) 2012 R2 Standard
Windows Vista		Microsoft(R) Windows Vista(R) Business
		Microsoft(R) Windows Vista(R) Enterprise
		Microsoft(R) Windows Vista(R) Ultimate
Windows XP Professional		Microsoft(R) Windows(R) XP Professional Operating System

*Windows* is sometimes used generically, referring to Windows 8.1, Windows 8, Windows Server 2012, Windows 7, Windows Server 2008, Windows Vista, Windows Server 2003, and Windows XP Professional.

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Dec. 2014: 3021-3-319-20(E)



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## Summary of amendments

The following table lists changes in the manuals (3021-3-318-20(E), 3021-3-319-20(E), 3021-3-320-20(E), 3021-3-321-20(E), 3021-3-322-20(E), 3021-3-323-20(E), 3021-3-324-20(E), 3021-3-325-20(E), 3021-3-326-20(E), 3021-3-327-20(E), 3021-3-328-20(E), 3021-3-329-20(E), and 3021-3-330-20(E)) and product changes related to these manuals.

Changes	Location
A virtual machine on which JP1/AJS3 has been installed and configured can now be duplicated.	System Design (Configuration) Guide: <i>F</i> Configuration Guide 1: <i>2.2, 3.1, 3.2, 12.2, 13.1, 13.2, H</i> Troubleshooting: <i>2.14</i> Messages 2: <i>KFPS00615-W, KFP00219-E</i>
Functionality was expanded so that a disaster recovery environment can be set up with the main and remote hosts whose logical host names are the same.	Configuration Guide 1: <i>9.1, 9.2.1, 9.2.2, 9.2.3, 9.3, 18.1, 18.2.1, 18.2.2, 18.2.3, 18.3</i> Administration Guide: <i>12.1.2, 12.1.3, 12.1.4, 12.2.1, 12.2.2, 12.2.3, 12.3.1, 12.4.1, 12.4.2</i> Command Reference 2: <i>2. jajs_rpenvexport, 2. jajs_rpenvimport, 2. jajs_rpsite</i> Messages 1: <i>1.3.3, 1.3.9, 1.4.1, KAVS3702-E, KAVS3710-I, KAVS3711-E, KAVS3754-E</i> Messages 2: <i>KNAD3994-E</i>
A setting for shifting the start day by a number of days (counting both open and closed days) was added.	Overview: <i>3.3.2</i> System Design (Work Tasks) Guide: <i>3.5.5</i> Operator's Guide: <i>15.3.17</i> Command Reference 1: <i>2. ajschgnet, 2. ajsprint</i> Command Reference 2: <i>4.2.4</i> Messages 1: <i>KAVS0188-E</i> Messages 2: <i>KAVV455-E</i>
A function that holds jobnet execution during immediate execution registration was added.	Overview: <i>3.4.2, 4.1.1</i>

Changes	Location
<p>A function that holds jobnet execution during immediate execution registration was added.</p>	<p>System Design (Work Tasks) Guide: 2.2.3</p> <p>Operator's Guide: 15.3.1, 15.3.22, 15.3.38, 15.3.47, 15.10.1</p> <p>Command Reference 1: 2. <i>ajsentry</i></p>
<p>A function that can execute some commands from JP1/AJS3 - View to JP1/AJS3 - Manager was added.</p>	<p>System Design (Configuration) Guide: 4.5.4</p> <p>Configuration Guide 1: C.1</p> <p>Administration Guide: 2.2.2, 2.2.4, 2.3.5, 13.1, 13.1.8</p> <p>Troubleshooting: A.1, A.3</p> <p>Operator's Guide: 10.4, 11.1.1, 11.3.9, 11.3.18, 15.3.2, 15.3.3, 15.3.52, 15.3.53, 15.3.54, 15.4.2, 15.4.3, 15.7.2, 15.7.3, 15.8.2, 15.8.3, 15.9.2, 15.9.3, 15.10.2, 15.10.3</p> <p>Command Reference 1: 2. <i>ajslogprint</i>, 2. <i>ajsprint</i>, 2. <i>ajsshow</i>, 2. <i>ajsstatus</i></p> <p>Command Reference 2: 2. <i>jajs_setup_cluster</i></p> <p>Messages 1: 1.3.3, <i>KAVS0901-E</i>, <i>KAVS0538-I</i>, <i>KAVS0539-I</i></p> <p>Messages 2: <i>KAVV263-E</i>, <i>KAVV269-E</i>, <i>KAVV385-E</i>, <i>KAVV418-E</i>, <i>KAVV419-E</i>, <i>KAVV2507-E</i>, <i>KAVV3900-Q</i> to <i>KAVV3910-E</i>, <i>KAVV3912-E</i> to <i>KAVV3919-E</i>, <i>KAVV3922-E</i> to <i>KAVV3929-E</i>, <i>KAVV3931-E</i>, <i>KAVV3932-E</i>, <i>KAVV3934-E</i> to <i>KAVV3936-Q</i></p>
<p>The files <i>jajs_log.bat</i> and <i>jajs_log</i>, which have the same functionality as the data collection tool (<i>_04.bat</i> and <i>_04</i>), are now available. In addition, an option was added to the Windows version of the data collection tools that allows you to specify the location to which data is output.</p>	<p>System Design (Configuration) Guide: 5.1.1, 9.4</p> <p>Configuration Guide 1: 2.2.1, 2.2.2, 7.1.1, 7.1.2, 12.2.1, 16.1.1, 16.1.2</p> <p>Administration Guide: 2.2.5, 2.3.6</p> <p>Troubleshooting: 1.4.1, 1.4.2, 2.7.2</p> <p>Command Reference 1: 1.5.8, 1.6, 2. <i>jajs_log</i> or <i>_04</i> (UNIX only), 2. <i>jajs_log.bat</i> or <i>_04.bat</i> (Windows only)</p> <p>Command Reference 2: 1.5.8, 1.6</p> <p>Messages 2: <i>KAVU5287-E</i>, <i>KAVU5501-E</i></p>
<p>An option was added to the <i>ajsprint</i> command so that relation line information can be output in order of the unit name.</p>	<p>Configuration Guide 2: 2.2.1, 2.2.2</p>

Changes	Location
An option was added to the <code>ajsprint</code> command so that relation line information can be output in order of the unit name.	Administration Guide: <i>13.1, 13.1.8</i> Command Reference 1: <i>2.ajsprint</i>
The procedure for changing the IP address of an agent host was changed.	Configuration Guide 1: <i>6.3.19, 15.3.19</i> Configuration Guide 2: <i>2.4.1, 2.4.2</i> Administration Guide: <i>8.9.2</i> Messages 1: <i>1.3.4, KAVT0198-E, KAVT0199-E, KAVT0528-E, KAVT0658-E to KAVT0661-E, KAVT0664-E</i>
UTF-8 was added to the list of character encodings that can be used in AIX, HP-UX, and Solaris 10.	Overview: <i>10.1.1</i> System Design (Configuration) Guide: <i>2.4.3, 7.2.2, 8.2.2</i> Configuration Guide 1: <i>13.4.1, 15.1.9, C.2, D.2</i> Configuration Guide 2: <i>2.2.2, 2.7.1, 2.8.2</i> Administration Guide: <i>4.4.2</i> Operator's Guide: <i>15.3.6</i> Command Reference 1: <i>1.4.1</i> Command Reference 2: <i>1.4.1, 2.ajsembdbsetup, 2.jajs_setup, 2.jajs_setup_cluster</i> Messages 2: <i>KAVV179-E, KAVV503-E, KAVV601-E, KAVV882-E, KAVV883-E, KAVV1503-E, KAVV2119-E</i>
The number of characters that can be used when specifying a logical host name for the command <code>jajs_killall.cluster</code> was increased.	Administration Guide: <i>11.6.1</i> Command Reference 1: <i>2.jajs_killall.cluster</i>

**Legend:**

Overview: *Job Management Partner 1/Automatic Job Management System 3 Overview*

System Design (Configuration) Guide: *Job Management Partner 1/Automatic Job Management System 3 System Design (Configuration) Guide*

System Design (Work Tasks) Guide: *Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*

Configuration Guide 1: *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*

Configuration Guide 2: *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*

Administration Guide: *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*

Troubleshooting: *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*

Operator's Guide: *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*

Command Reference 1: *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*

Command Reference 2: *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*

Linkage Guide: *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide*

Messages 1: *Job Management Partner 1/Automatic Job Management System 3 Messages 1*

Messages 2: *Job Management Partner 1/Automatic Job Management System 3 Messages 2*

In addition to the above changes, minor editorial corrections were made.

# Preface

This manual describes system design based on Job Management Partner 1/Automatic Job Management System 3 (abbreviated hereafter to *JP1/AJS3*). Read this manual in conjunction with the manual *Job Management Partner 1/Automatic Job Management System 3 Overview*, which describes the functionalities of JP1/AJS3.

## ■ Intended readers

This manual is intended for:

- Those who wish to operate an automatic job execution system with JP1/AJS3 and those who design automatic job execution systems.
- Those who operate an automatic job execution system with JP1/AJS3.

## ■ Organization of this manual

This manual organized into the following chapters. The manual is a common reference for all supported operating systems. Any platform-dependent differences in functionality are noted in the manual.

### *1. Overview of System Design*

Chapter 1 describes the design flow and points to consider when deploying JP1/AJS3.

### *2. Designing the System Configuration*

Chapter 2 describes how to configure a system based on JP1/AJS3.

### *3. Estimates*

Chapter 3 describes how to estimate the JP1/AJS3 processing performance and system performance, and the size of the database area and output log files.

### *4. Installation and Setup Considerations*

Chapter 4 explains the settings required when installing and setting up JP1/AJS3.

### *5. Contingency Planning*

Chapter 5 discusses matters to consider when planning backup and recovery measures in case of failures.

### *6. Maintenance Planning*

Chapter 6 describes the database maintenance tasks to be considered, and discusses when to schedule them.

### *7. Special Modes of Operation*

Chapter 7 discusses matters to consider when using QUEUE jobs and submit jobs, or when using queueless jobs.

### *8. Migration from a Previous Version*

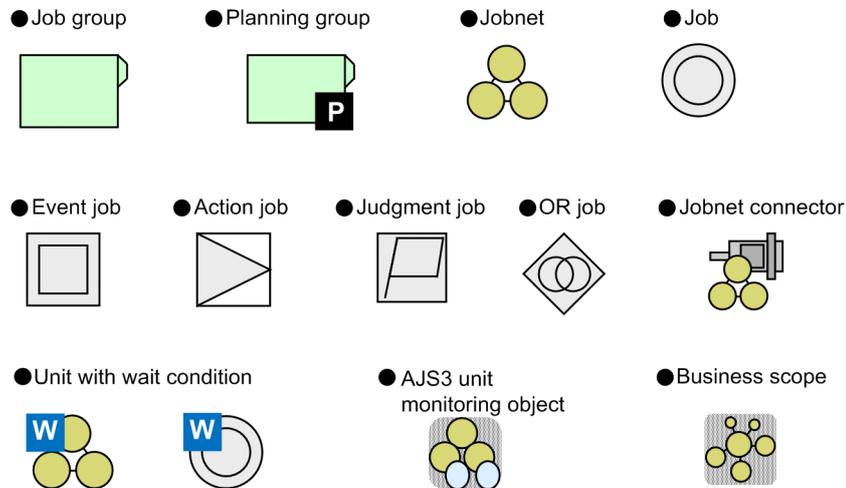
Chapter 8 describes how to migrate from JP1/AJS2, and provides cautionary notes when upgrading.

### *9. Notes on System Design*

Chapter 9 summarizes points to note when designing a JP1/AJS3 system.

## ■ Conventions: Diagrams

This manual uses the following conventions in diagrams:



## ■ Conventions: Fonts and symbols

The following table explains the text formatting conventions used in this manual:

Text formatting	Convention
<b>Bold</b>	<p>Bold characters indicate text in a window, other than the window title. Such text includes menus, menu options, buttons, radio box options, or explanatory labels. For example:</p> <ul style="list-style-type: none"> <li>From the <b>File</b> menu, choose <b>Open</b>.</li> <li>Click the <b>Cancel</b> button.</li> <li>In the <b>Enter name</b> entry box, type your name.</li> </ul>
<i>Italic</i>	<p>Italic characters indicate a placeholder for some actual text to be provided by the user or system. For example:</p> <ul style="list-style-type: none"> <li>Write the command as follows: <code>copy <i>source-file</i> <i>target-file</i></code></li> <li>The following message appears: A file was not found. (file = <i>file-name</i>)</li> </ul> <p>Italic characters are also used for emphasis. For example:</p> <ul style="list-style-type: none"> <li>Do <i>not</i> delete the configuration file.</li> </ul>
Monospace	<p>Monospace characters indicate text that the user enters without change, or text (such as messages) output by the system. For example:</p> <ul style="list-style-type: none"> <li>At the prompt, enter <code>dir</code>.</li> <li>Use the <code>send</code> command to send mail.</li> <li>The following message is displayed: <code>The password is incorrect.</code></li> </ul>

The following table explains the symbols used in this manual:

Symbol	Convention
	In syntax explanations, a vertical bar separates multiple items, and has the meaning of OR. For example:

Symbol	Convention
	A   B   C means A, or B, or C.
{ }	In syntax explanations, curly brackets indicate that only one of the enclosed items is to be selected. For example: {A   B   C} means only one of A, or B, or C.
[ ]	In syntax explanations, square brackets indicate that the enclosed item or items are optional. For example: [A] means that you can specify A or nothing. [B   C] means that you can specify B, or C, or nothing.
. . .	In coding, an ellipsis (...) indicates that one or more lines of coding have been omitted. In syntax explanations, an ellipsis indicates that the immediately preceding item can be repeated as many times as necessary. For example: A, B, B, . . . means that, after you specify A, B, you can specify B as many times as necessary.
x	Multiplication sign
/	Division sign
↑ ↑	The calculation result is rounded up to the next whole number. Example: The result of ↑ 34 / 3 ↑ is 12.
~ (tilde)	The item shown before this symbol must be specified in accordance with the conventions shown for angle brackets, double parentheses, and double angle brackets (below).
<> (angle brackets)	Indicates the characters and lexical elements that can be specified. <characters> One or more Kanji characters, katakana characters, upper-case alphabetic characters, lower-case alphabetic characters, or numeric characters <numeric> 0, 1, 2, 3, 4, 5, 6, 7, 8, or 9 <alphabetic character> A, B, C, D, E, F, G, H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z, \, #, or @ <alphanumeric character> Alphabetic or numeric character <symbolic name> No more than eight alphanumeric characters beginning with an alphabetic character <unsigned integer> One or more numeric characters <hexadecimal character> 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, B, C, D, E, or F <file name> A system-determined name assigned to a file <path> The directories contained in the path, with each name separated by a forward slash (/) or backslash (\). The path notation is OS-dependent.
(( (double parentheses)	Indicates the range of specifiable values.
<< >>	Indicates the default assumed by the system when a value is unspecified.

Symbol	Convention
(double angle brackets)	Example: If you do not specify <i>days-to-keep-form</i> ~<numeric> ((0 to 365)) <<365>>, 365 is assumed as the number of days to keep the form.
MAX	Choose the largest of the calculation results. Example: The result of MAX (3 x 6, 4 + 7) is 18.

## ■ Conventions: Version numbers

The version numbers of Hitachi program products are usually written as two sets of two digits each, separated by a hyphen. For example:

- Version 1.00 (or 1.0) is written as 01-00.
- Version 2.05 is written as 02-05.
- Version 2.50 (or 2.5) is written as 02-50.
- Version 12.25 is written as 12-25.

The version number might be shown on the spine of a manual as *Ver. 2.00*, but the same version number would be written in the program as *02-00*.

## ■ JP1 program reorganization in version 8

The following are the major changes that have been made to the JP1 product suite in version 8:

- JP1/AJS2 - Advanced Manager was eliminated, and the database provided by JP1/AJS2 - Advanced Manager was integrated into JP1/AJS2 - Manager in JP1 Version 8.
- JP1/AJS2 - Client Toolkit was eliminated.
- JP1/AJS2 - View products for platforms other than Windows were eliminated.

## ■ Organization of JP1/AJS3 manuals and choosing the right manuals

There are 13 JP1/AJS3 manuals. The following table summarizes their contents.

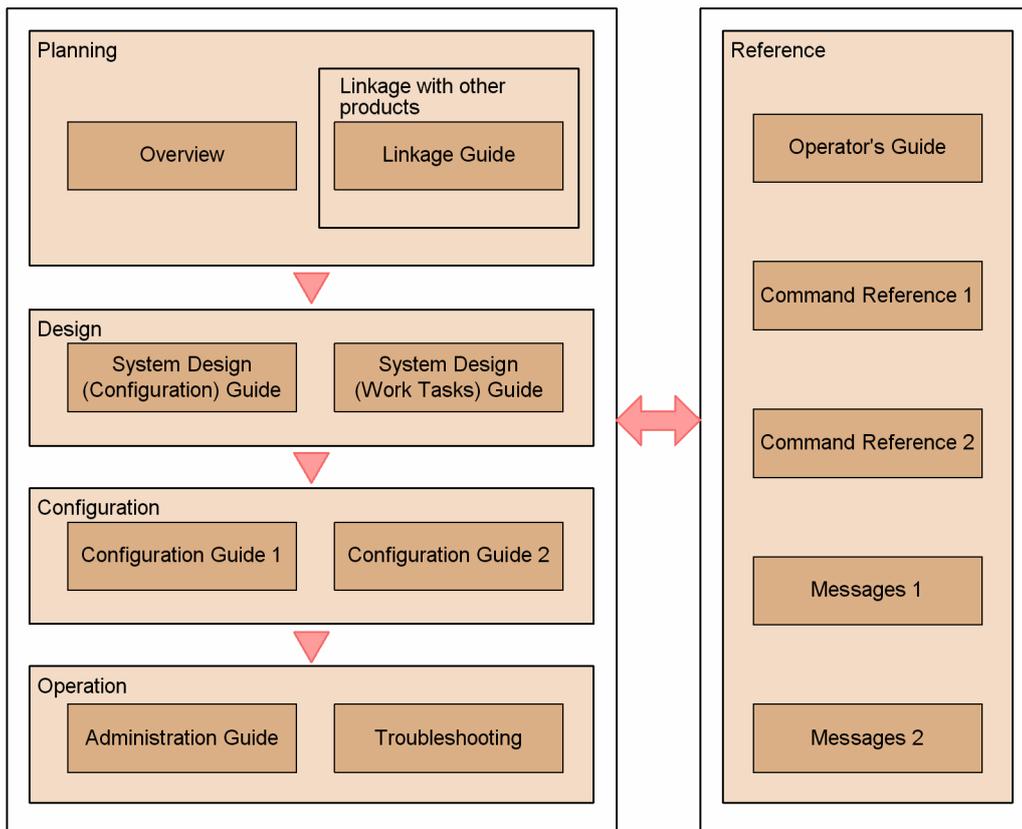
Note that *Job Management Partner 1/Automatic Job Management System 3* has been omitted from the manual titles in the table.

No.	Manual	Contents
1	<i>Overview</i> (3021-3-318(E))	<ul style="list-style-type: none"> <li>• JP1/AJS3 features</li> <li>• Description of functions</li> </ul>
2	<i>System Design (Configuration) Guide</i> (3021-3-319(E))	<ul style="list-style-type: none"> <li>• Information that must be considered when designing a system</li> <li>• Cautionary notes on designing a system</li> </ul>
3	<i>System Design (Work Tasks) Guide</i> (3021-3-320(E))	<ul style="list-style-type: none"> <li>• Information that must be considered when constructing jobs and jobnets</li> <li>• Cautionary notes on designing jobs and jobnets</li> </ul>
4	<i>Configuration Guide 1</i> (3021-3-321(E))	<ul style="list-style-type: none"> <li>• Installation and setup procedures</li> <li>• Environment setup procedure by operation type</li> </ul>

No.	Manual	Contents
5	<i>Configuration Guide 2</i> (3021-3-322(E))	<ul style="list-style-type: none"> <li>• Description of environment setting parameters</li> <li>• Description of operation profiles</li> </ul>
6	<i>Administration Guide</i> (3021-3-323(E))	<ul style="list-style-type: none"> <li>• Information required to operate a system</li> <li>• Know-how useful for JP1/AJS3 operation</li> </ul>
7	<i>Troubleshooting</i> (3021-3-324(E))	<ul style="list-style-type: none"> <li>• How to troubleshoot errors</li> <li>• Data required when an error occurs</li> </ul>
8	<i>Operator's Guide</i> (3021-3-325(E))	<ul style="list-style-type: none"> <li>• How to operate JP1/AJS3 - View</li> <li>• How to operate JP1/AJS3 Console View</li> <li>• Description of windows and dialog boxes</li> </ul>
9	<i>Command Reference 1</i> (3021-3-326(E))	<ul style="list-style-type: none"> <li>• Command syntax</li> </ul>
10	<i>Command Reference 2</i> (3021-3-327(E))	<ul style="list-style-type: none"> <li>• Syntax of commands used for setup and special operations</li> <li>• Syntax and coding examples of information definition files</li> </ul>
11	<i>Linkage Guide</i> (3021-3-328(E))	<ul style="list-style-type: none"> <li>• Description of functions that can be used when linked with other products and the setup method</li> </ul>
12	<i>Messages 1</i> (3021-3-329(E))	<ul style="list-style-type: none"> <li>• Messages output by JP1/AJS3 (messages beginning with KAJA to KAVT)</li> </ul>
13	<i>Messages 2</i> (3021-3-330(E))	<ul style="list-style-type: none"> <li>• Messages output by JP1/AJS3 (messages beginning with KAVU to KNAD)</li> </ul>

Use the following illustration and table as a guide to determine the manuals you need to read.

Organization of JP1/AJS3 manuals



Purpose	Required reading	Read as necessary
To learn about JP1/AJS3's functionalities	<ul style="list-style-type: none"> <li>• <i>Overview</i> (3021-3-318(E))</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Linkage Guide</i> (3021-3-328(E))</li> </ul>
To configure a system (including installation and setup) that automatically runs jobs	<ul style="list-style-type: none"> <li>• <i>System Design (Configuration) Guide</i> (3021-3-319(E))</li> <li>• <i>Configuration Guide 1</i> (3021-3-321(E))</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Configuration Guide 2</i> (3021-3-322(E))</li> <li>• <i>Linkage Guide</i> (3021-3-328(E))</li> </ul>
To design work tasks that will be automated (including job definitions and schedule definitions)	<ul style="list-style-type: none"> <li>• <i>System Design (Work Tasks) Guide</i> (3021-3-320(E))</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Operator's Guide</i> (3021-3-325(E))</li> </ul>
To learn about monitoring and maintaining a running system	<ul style="list-style-type: none"> <li>• <i>Administration Guide</i> (3021-3-323(E))</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Troubleshooting</i> (3021-3-324(E))</li> <li>• <i>Messages 1</i> (3021-3-329(E))</li> <li>• <i>Messages 2</i> (3021-3-330(E))</li> </ul>
To learn about what action you need to take for problems that occur during operation	<ul style="list-style-type: none"> <li>• <i>Troubleshooting</i> (3021-3-324(E))</li> </ul>	<ul style="list-style-type: none"> <li>• <i>Messages 1</i> (3021-3-329(E))</li> <li>• <i>Messages 2</i> (3021-3-330(E))</li> </ul>
To learn about operating JP1/AJS3	<ul style="list-style-type: none"> <li>• <i>Operator's Guide</i></li> </ul>	<ul style="list-style-type: none"> <li>• <i>Command Reference 1</i></li> </ul>

Purpose	Required reading	Read as necessary
To learn about operating JP1/AJS3	(3021-3-325(E))	(3021-3-326(E)) <ul style="list-style-type: none"><li>• <i>Command Reference 2</i> (3021-3-327(E))</li></ul>

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# 1

## Overview of System Design

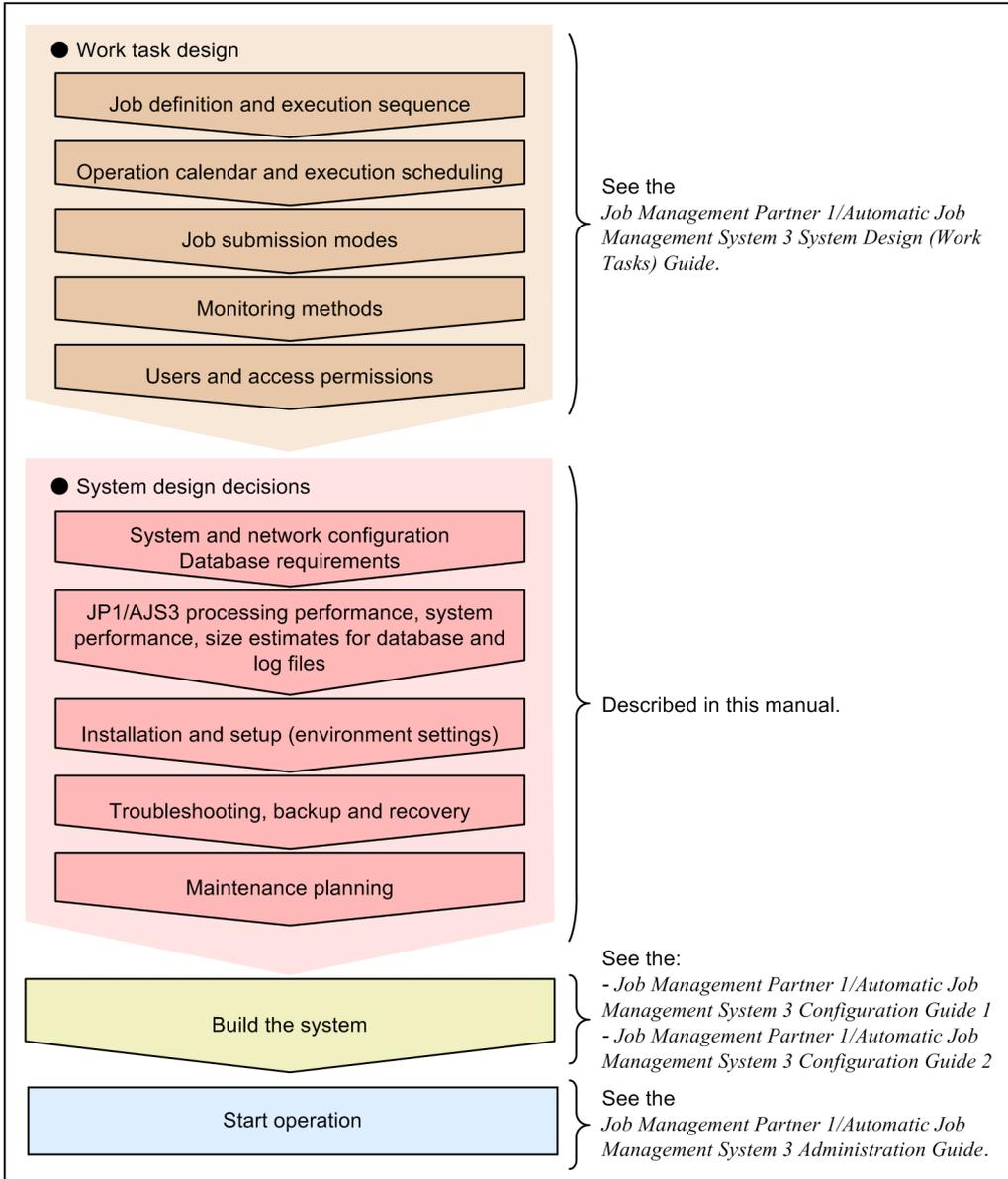
This chapter describes the design flow and points to consider when deploying JP1/AJS3.

# 1.1 Design flow

The design flow when deploying JP1/AJS3 can be broadly categorized as a work-task design for automating job execution under JP1/AJS3, and a system design for installing and running JP1/AJS3 efficiently.

The following figure shows the basic design steps when you deploy JP1/AJS3.

Figure 1-1: JP1/AJS3 design steps



Note: The sequence may differ depending on the customer's environment.

This manual describes system design. It covers decisions you need to make during the system life-cycle design phase to install and operate JP1/AJS3 efficiently. You will need to determine the system and network configuration, estimate disk space requirements, and work out backup and troubleshooting measures.

For details about work task design, see the *Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*. For details about changing settings after starting operation, see the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## 1.2 Key decisions in the system design stage

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The following table lists the key decisions in the system design stage, and the relevant chapters in this manual.

Table 1–1: System design decisions and relevant chapters

No.	Key decisions	Relevant chapter
1	System configuration, network configuration, job execution environment, and database requirements	<i>2. Designing the System Configuration</i>
2	Estimates: <ul style="list-style-type: none"><li>• Computer performance</li><li>• System resources</li><li>• Sizes of database area and log files</li><li>• Kernel parameters</li></ul>	<i>3. Estimates</i>
3	Required JP1/AJS3 environment settings (parameters) for building the system	<i>4. Installation and Setup Considerations</i>
4	Contingency measures such as backups and redundancy	<i>5. Contingency Planning</i>
5	Database maintenance	<i>6. Maintenance Planning</i>
6	Use of QUEUE jobs, submit jobs, and queueless jobs	<i>7. Special Modes of Operation</i>
7	Migration and version compatibility	<i>8. Migration from a Previous Version</i>
8	Other matters related to system design	<i>9. Notes on System Design</i>

## 1.3 Design considerations

This section covers the following system design considerations:

- Preparatory estimates and settings for running JP1/AJS3
- Operations that might affect JP1/AJS3 system operation

### 1.3.1 Preparatory estimates and settings for running JP1/AJS3

The following describes items you will need to estimate or set in advance for running JP1/AJS3, and points to consider when doing so.

Table 1–2: Preparatory estimates and settings for running JP1/AJS3

Item		Considerations	Action	Further information
Jobs	Total number of jobs per day	Estimate whether the system can handle the total number of jobs. As a general rule, keep the number of jobs executed per day to no more than 10,000. Even a well-designed system would be unable to process more than 50,000 to 100,000 jobs per day.	Reduce the number of jobs. We recommend no more than 10,000 jobs per day. Allow for reruns in case of job execution errors.	<a href="#">3.1.1 Job throughput</a>
	Number of jobs per hour at peak times	Estimate whether the system can handle the number of jobs at peak times. The limit is 5,000 per hour.	Reduce the number of jobs. We recommend no more than 500 to 1,000 jobs per hour. Allow for reruns in case of job execution errors.	<a href="#">3.1.1 Job throughput</a>
	Number of jobs when automatic retries are specified for jobs	Estimate the number of jobs, including the number of retry executions. For example, if a maximum of five retries is set for a job, estimate the number of jobs as six (the original execution plus five retry executions).	Take the number specified for <b>Maximum retry times</b> into account. We recommend no more than 500 to 1,000 jobs per hour, and no more than 10,000 jobs per day.	<a href="#">3.1.1 Job throughput</a>
	Whether to use the standard output file, standard error output file, and file transfer	This affects the CPU load, memory usage, and job execution performance.	Try to keep the standard output file, standard error output file, and transferred files as small as possible.	<a href="#">7.8.1 Notes on the standard output file and standard error output file in the Job Management Partner 1/ Automatic Job Management System 3 System Design (Work Tasks) Guide</a>
	Whether to append data to the standard output file and standard error output file as	Appending data will increase the size of the files as each job is executed, causing problems such as	If data is to be appended at each job execution, we recommend some measure such as periodically deleting the output files.	<a href="#">7.8.1 Notes on the standard output file and standard error output file in the Job Management Partner 1/ Automatic Job Management</a>

Item		Considerations	Action	Further information
Jobs	each job is executed	increased CPU load when files are transferred.	If data is to be appended at each job execution, we recommend some measure such as periodically deleting the output files.	<i>System 3 System Design (Work Tasks) Guide</i>
	Maximum number of concurrently executable jobs	In Windows, be careful of jobs that take a long time to execute.	Due to the limitations of the desktop heap, the maximum number of executable jobs cannot be increased significantly in Windows. If jobs take a long time to execute and the maximum number is reached, you will need to take measures such as distributing the processing among multiple agents.	<i>2.5.4 Maximum number of concurrently executable jobs, and 4.2.3 Changing the JPI/AJS3 service settings (Windows only)</i>
Jobnets	Number of root jobnets executed per day	As a general rule, register no more than 4,000 jobnets for execution per day.	If the maximum is exceeded, allocate the root jobnets among multiple scheduler services.	<i>4.3.5 Activating multiple scheduler services concurrently</i>
	Number of defined jobnets	Reduce the number of root jobnets.	When a large number of root jobnets contain only a few lower units, combine them into a single root jobnet wherever possible.	<i>7.1 Notes on the number of root jobnets registered for execution in the Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide</i>
		Job group hierarchies	As a general rule, keep the number of root jobnets in a job group to no more than 500.	
		Jobnet hierarchies	Create 2 or 3 levels of hierarchy, including the root jobnet, because more complex hierarchies result in reduced visibility.	
		Jobnet structure	Allow no more than 50-100 nested jobnets and jobs to be defined in one root jobnet or nested jobnet. Make sure that no more than approximately 500 nested jobnets and jobs are located below one root jobnet.	
	Number of logs to keep	Generations of execution results exceeding the set limit will be deleted when a root jobnet is executed. This affects the root jobnet's start performance.	Reduce the number of root jobnets that can be registered, bearing in mind that saved generations exceeding the limit will be deleted when the root jobnet is executed.	<i>7.2 Relationship between number of logs to keep and performance in the Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide</i>
This affects the database size, response time, and resources.		Keep as few generations of data as your system will allow.		
Jobnet and job operation	Continuous operation	If performed continuously, operations that place a high load on the scheduler service will further increase the system load, which could affect system operations.	Avoid continuous operations that entail jobnet or job execution. Pause for 2-3 seconds between each operation.	<i>1.3.2 Operations that might affect JPI/AJS3 system operation, and 1.2 Notes on using commands in the manual Job Management Partner 1/Automatic Job Management System 3 Command Reference 1</i>

Item		Considerations	Action	Further information
Jobnet and job operation	Number of lower units	The amount of information to be processed increases in proportion to the number of lower units. This could affect system operations.	When the number of lower units exceeds 500, execute the jobnet when the work-load is low.	<p><a href="#">1.3.2 Operations that might affect JP1/AJS3 system operation</a>, and</p> <p><a href="#">1.2 Notes on using commands in the manual Job Management Partner 1/Automatic Job Management System 3 Command Reference 1</a></p>
	Wildcard characters in commands	If a command is executed with wildcard characters, the number of information items to process might increase, which might affect system operations.	Restrict the number of units targeted by the command before executing the command, such as by directly specifying the units that would be targeted by executing the command with wildcard characters.	
	Number of logs to keep	Operating on a jobnet that has many generations of execution results increases the amount of information to be processed. This could affect system operations.	If the target jobnet has a large number of generations, perform the operation when the work-load is low. Specify options to limit the time period and number of generations. When canceling registration of a jobnet, you can also specify an option that deletes generations one by one.	
Start conditions	Whether to use start conditions	Jobs with start conditions are used for transaction processing purposes and have a significant effect on the number of jobs being executed.	Accurately estimate the number of events issued and the peak traffic.	<a href="#">3.1.4 Event monitoring performance</a>
	Timeout periods for start conditions	Unless an unlimited timeout period has been specified, a jobnet with a start condition might time out, or enter <i>Skipped so not executed</i> status and fail to execute, after running continuously into the next day.	Specify an unlimited timeout period to constantly monitor for start conditions.	<a href="#">3.4.3 Valid range of a start condition in the manual Job Management Partner 1/Automatic Job Management System 3 Overview</a>
	<i>Skipped so not executed</i> status for a jobnet with a start condition	When <b>Concurrent exec.</b> is set to <b>Disable</b> for a registered jobnet with a start condition, it might enter the status <i>Skipped so not executed</i> .	Consider solutions such as creating and updating a separate file from the file that was last updated.	<a href="#">7.6.2 Notes on the Monitoring Files job in the Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide</a>
Event jobs	Timing of monitoring JP1 event reception monitoring jobs	The status of the JP1 event-reception monitoring job must be <i>Monitoring</i> to receive JP1 events.	To link jobnets using a JP1 event, register the JP1 event-reception monitoring job at a set time before the JP1 event is sent.	<a href="#">7.6.1 Notes on the Receive JP1 Event job in the Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide</a>
	Number of Monitoring Files jobs	This has a significant effect on CPU performance and the response time for Monitoring Files jobs.	Determine the file monitoring interval, using the equation in <a href="#">3.1.5 Monitoring interval set when using the Monitoring Files job</a> , and extend the monitoring interval accordingly.	<a href="#">3.1.5 Monitoring interval set when using the Monitoring Files job</a>

Item		Considerations	Action	Further information
Event jobs	Monitoring frequency	This has a significant effect on CPU performance and the response time for Monitoring Files jobs.	Extend the monitoring interval as appropriate.	<a href="#">3.1.5 Monitoring interval set when using the Monitoring Files job</a>
	Number of files monitored by Monitoring Files jobs			
	Timing of updates to files monitored by Monitoring Files jobs	Monitoring Files jobs cannot monitor files that are frequently opened and closed to append data.	Consider solutions such as creating and updating a separate file from the file that was last updated.	<a href="#">7.6.2 Notes on the Monitoring Files job in the Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide</a>
JP1/AJS3 - View	Automatic update	By default, displayed contents are updated automatically, and a database access request is generated on the manager host at every update.	The update interval is 300 seconds for the JP1/AJS3 - View window and Daily Schedule window, and 30 seconds for the Jobnet Monitor window. If performance is paramount, set a larger update interval or disable automatic update.	<a href="#">4.5.5 Setting the window display</a>
	Monthly Schedule window and Daily Schedule window	The number of display items and the amount of data transferred to the Monthly and Daily Schedule windows increases with the number of jobnets being monitored and the number of schedules.	Make sure that you complete the performance estimates in advance.	<a href="#">3.2.1 Estimating the data flow on the network</a>
	Number of connections	The load on JP1/AJS3 - Manager and on the network increases when more than 63 instances of JP1/AJS3 - View are connected.	Set a larger update interval or disable automatic update.	<a href="#">B. List of Limits</a>

## 1.3.2 Operations that might affect JP1/AJS3 system operation

The following table gives details about the job and jobnet operations in [Table 1-2](#) that might affect the JP1/AJS3 system.

Table 1-3: List of operations that might affect JP1/AJS3 system operation

Operation		Type of operation			
Command	JP1/AJS3 - View	Continuous operation	Number of lower units	Wildcard characters specification <sup>#1</sup>	Number of logs to keep
ajsbackup	Backup	--	Yes	Yes	--
ajscalendar	Calendar	Yes	--	Yes	--
ajschange	Editor	Yes <sup>#2</sup>	--	Yes	--
ajschgjob	Editor	--	--	Yes	--
ajschgnet	Editor	Yes <sup>#2</sup>	--	Yes	--

Operation		Type of operation			
Command	JP1/AJS3 - View	Continuous operation	Number of lower units	Wildcard characters specification <sup>#1</sup>	Number of logs to keep
ajschgstat	Change status	Yes	--	Yes	--
ajscopy	Copy	--	Yes	Yes	--
ajsdefine	New	--	Yes	--	--
ajsdelete	Delete	--	Yes	Yes	--
ajsentry	Register	Yes	Yes	Yes	--
ajsexport	Package	--	Yes	--	--
ajsimport	Package	--	Yes	--	--
ajsintrpt	Interrupt	Yes	--	Yes	--
ajskill	Kill	Yes	--	Yes	--
ajsleave	Cancel registration	Yes	Yes	Yes	Yes
ajsname	(N/A)	--	--	Yes	--
ajsplan	Change plan	Yes	--	Yes	--
ajsprint	Execute the command from JP1/AJS3 - View	--	Yes	Yes	--
ajsrelease	Release entry	Yes	Yes	--	--
	Release cancel	Yes	Yes	--	--
ajsrerun	Rerun	Yes	Yes	Yes	--
ajsrestore	Restore	--	Yes	--	--
ajsergexport	(N/A)	--	Yes	Yes	--
ajsergimport	(N/A)	Yes	Yes	--	--
ajsschedule	(N/A)	--	Yes	--	Yes
ajsshow	<ul style="list-style-type: none"> <li>Daily schedule; Monthly schedule</li> <li>Execute the command from JP1/AJS3 - View</li> </ul>	--	Yes	Yes	Yes

**Legend:**

(N/A): No applicable operations

Yes: The operation might affect JP1/AJS3 operation.

--: Not applicable.

#1: Limited to command operations.

#2: When changing a schedule.

# 2

## Designing the System Configuration

This chapter describes how to configure a system for using JP1/AJS3.

Based on where jobs and jobnets will be executed and other such considerations, decide which of the JP1/AJS3 series programs to install on which computers.

## 2.1 Checking the operating environment

This section describes the operating environments and prerequisites required by each of the programs and components that comprise the JP1/AJS3 suite.

### 2.1.1 JP1/AJS3 series programs

This subsection describes the JP1/AJS3 series programs.

- JP1/AJS3 - Manager

This program manages jobnet definition information and schedule information, and requests agents (JP1/AJS3 - Agent or JP1/AJS3 - Manager) to execute processing. JP1/AJS3 - Manager can also execute processes itself.

A maximum of 1,024 agent hosts can be connected to one JP1/AJS3 - Manager (or to one logical host in a cluster configuration). This maximum includes an agent on the local host.

Two JP1/AJS3 - Managers can be inter-connected, allowing execution of jobs by another JP1/AJS3 - Manager, and execution of work tasks linked to a job executed by another JP1/AJS3 - Manager. Using JP1/AJS3 Console, you can also monitor the work tasks running in JP1/AJS3.

- JP1/AJS3 - Agent

This program executes processing in response to execution requests from JP1/AJS3 - Manager.

JP1/AJS3 - Agent functionality includes job execution in an agent role, event job monitoring, and action job execution.

- JP1/AJS3 - View

This program enables you to operate JP1/AJS3 - Manager through a graphical user interface.

A maximum of 128 JP1/AJS3 - View programs can be connected to one JP1/AJS3 - Manager at the same time.

### 2.1.2 JP1/AJS3 prerequisites

This subsection indicates the OSs and programs that are prerequisites for the JP1/AJS3 series programs.

#### (1) Prerequisite operating systems

The following table lists the OSs that can run JP1/AJS3 series programs.

Table 2-1: OSs that can run JP1/AJS3 series programs

OS	JP1/AJS3 - Manager	JP1/AJS3 - Agent	JP1/AJS3 - View
Windows 8.1	--	--	Yes
Windows 8	--	--	Yes
Windows Server 2012	Yes	Yes	Yes
Windows 7	--	--	Yes
Windows Server 2008	Yes	Yes	Yes
Windows Vista	--	--	Yes
Windows Server 2003	Yes	Yes	Yes
Windows XP Professional	--	--	Yes

OS	JP1/AJS3 - Manager	JP1/AJS3 - Agent	JP1/AJS3 - View
HP-UX (IPF)	Yes	Yes	--
Solaris	Yes	Yes	--
AIX	Yes	Yes	--
Linux	Yes	Yes	--

Legend:

Yes: Can run

--: Cannot run

## (2) Prerequisite programs

The following table lists the programs that are required for using JP1/AJS3 programs.

Table 2-2: Prerequisite programs

JP1/AJS3 series program	Prerequisite program
JP1/AJS3 - Manager	JP1/Base
JP1/AJS3 - Agent	JP1/Base
JP1/AJS3 - View	--

Legend:

--: Not necessary

## (3) Other prerequisites

For details about restrictions such as limit values in a JP1/AJS3 system configuration and supported characters, see [B. List of Limits](#).

## 2.2 Determining the system configuration

---

With JP1/AJS3, you can use a whole range of system configurations, from systems where jobs can be managed and executed on a single host to large-scale systems that execute a large number of jobs on multiple hosts. JP1/AJS3 can also be deployed on multi-platform systems.

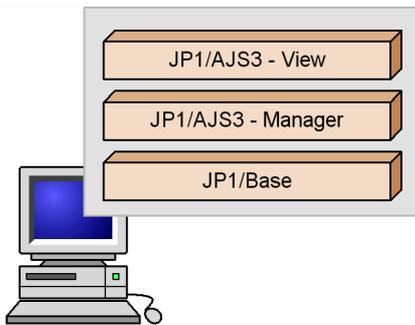
### 2.2.1 Example of a system configuration for executing work tasks on a single host

Work tasks can be centrally managed and executed on a single host on which JP1/AJS3 - Manager is installed.

JP1/AJS3 - View can also be installed on the manager host, allowing jobs to be managed, executed, and monitored using the GUI. Alternatively, jobs can be managed, executed, and monitored by connecting to the manager host from JP1/AJS3 - View on another host.

The following figure shows an example of a standalone system with JP1/AJS3 - Manager and JP1/AJS3 - View installed on a single host.

Figure 2-1: Example of a standalone system configuration



### 2.2.2 Examples of manager/agent system configurations

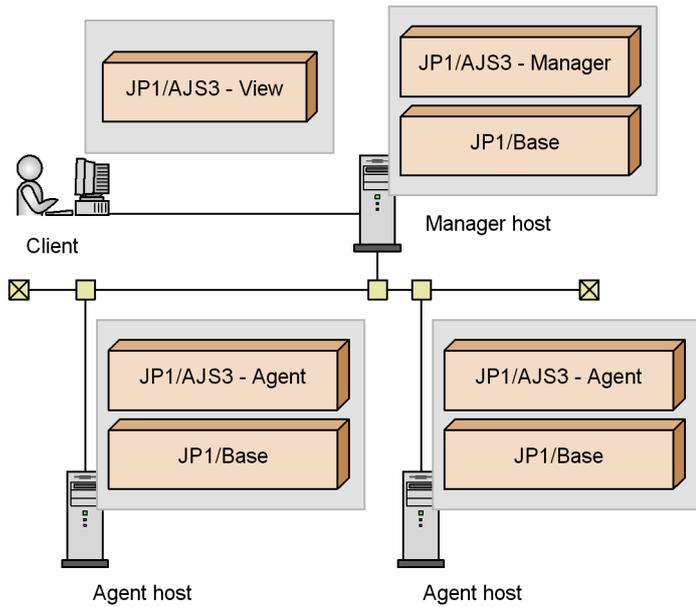
Jobs can be distributed among multiple hosts. Install JP1/AJS3 - Manager on the hosts on which jobs will be managed (one or more manager hosts) and JP1/AJS3 - Agent on the hosts on which the jobs will be executed (agent hosts). JP1/AJS3 - Manager can be used instead of JP1/AJS3 - Agent. Install JP1/AJS3 - View on the hosts that will perform job monitoring.

#### (1) Operation with a single manager host

Install JP1/AJS3 - Manager on the manager host, and JP1/AJS3 - Agent on the agent hosts. Set up a dedicated JP1/AJS3 - View host as required.

The following figure shows an example of a manager/agent system configuration with one manager host.

Figure 2-2: Example of a manager/agent system configuration (one manager host)

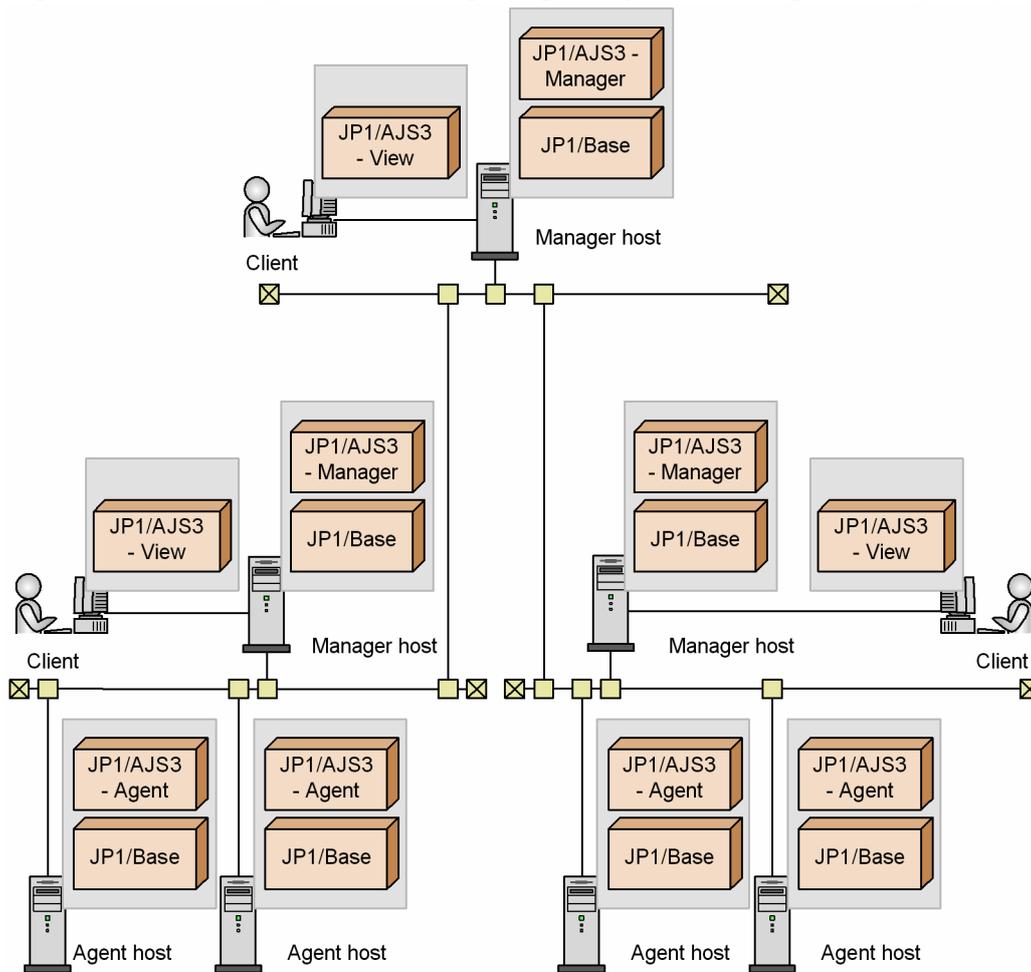


## (2) Operation with multiple manager hosts

Prepare multiple hosts on which to install JP1/AJS3 - Manager, and multiple hosts on which to install JP1/AJS3 - Agent. Set up a dedicated JP1/AJS3 - View host as required.

The following figure shows an example of a manager/agent system configuration with multiple manager hosts.

Figure 2-3: Example of a manager/agent system configuration (multiple manager hosts)



Use JP1/AJS3 in an environment where the IP address can be resolved from the local host name. JP1/AJS3 can only operate in an environment where the IP address can be resolved from the local host name.

When executing jobs on multiple agent hosts, you must also specify settings that allow resolution of the IP addresses for the manager hosts, agent hosts, and the hosts in other systems. When DNS is used, specify settings that allow resolution of host names in the FQDN format. Note, however, that host names in the FQDN format cannot be used for logical host names.

### (3) Using a single agent host as multiple execution hosts

To execute jobs in JP1/AJS3, you must register agent host information in the manager host. The required information consists of the execution agent (the logical name of the agent host), together with its physical host name.

By creating multiple execution agents (logical names) for a single agent host, you can set up a job execution environment in which a single agent host can be used as multiple execution hosts. For details, see [2.5 Setting the job execution environment](#).

### (4) Centrally monitoring work tasks

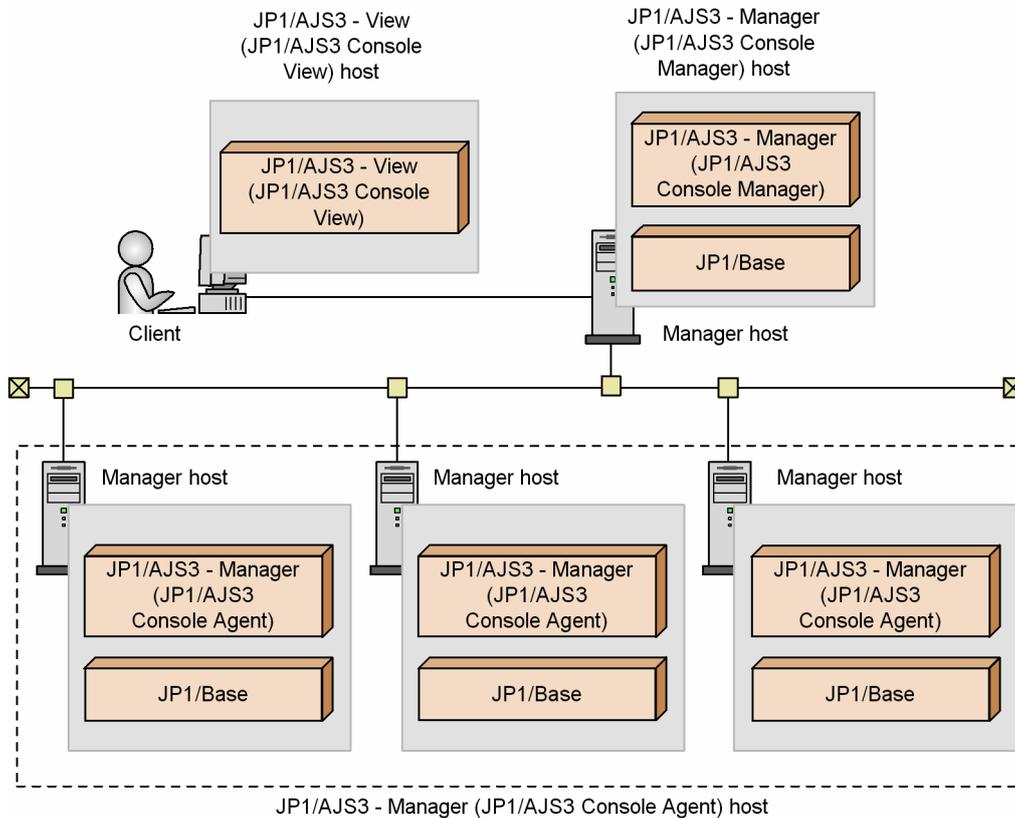
Using JP1/AJS3 Console, you can centrally monitor from one window all the work tasks being managed by multiple manager hosts, or under different scheduler services, or in different job groups.

The following discusses example system configurations in which work tasks are monitored using JP1/AJS3 Console, and examples of how such configurations can be used.

### (a) Monitoring work tasks managed by multiple manager hosts

The following figure shows an example of a system configuration for centrally monitoring work tasks that are executed and managed by multiple manager hosts.

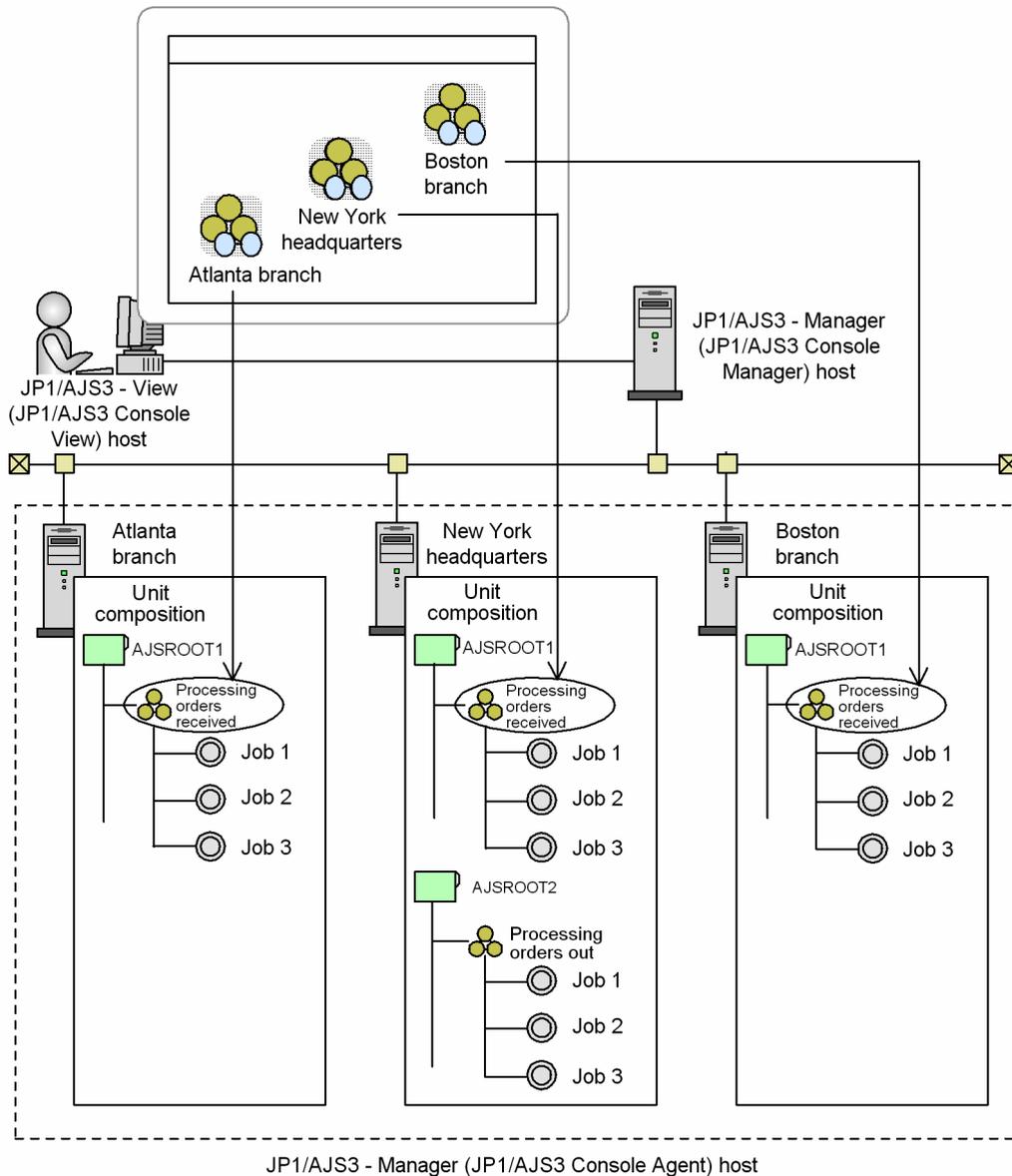
Figure 2-4: System configuration for monitoring work tasks managed by multiple manager hosts



Note:  
 Entries in parentheses are components.

The following figure shows an example of a system configuration in which JP1/AJS3 Console is used to centrally monitor work tasks that are executed and managed by multiple manager hosts.

Figure 2-5: Example of using JP1/AJS3 Console to monitor work tasks managed by multiple manager hosts



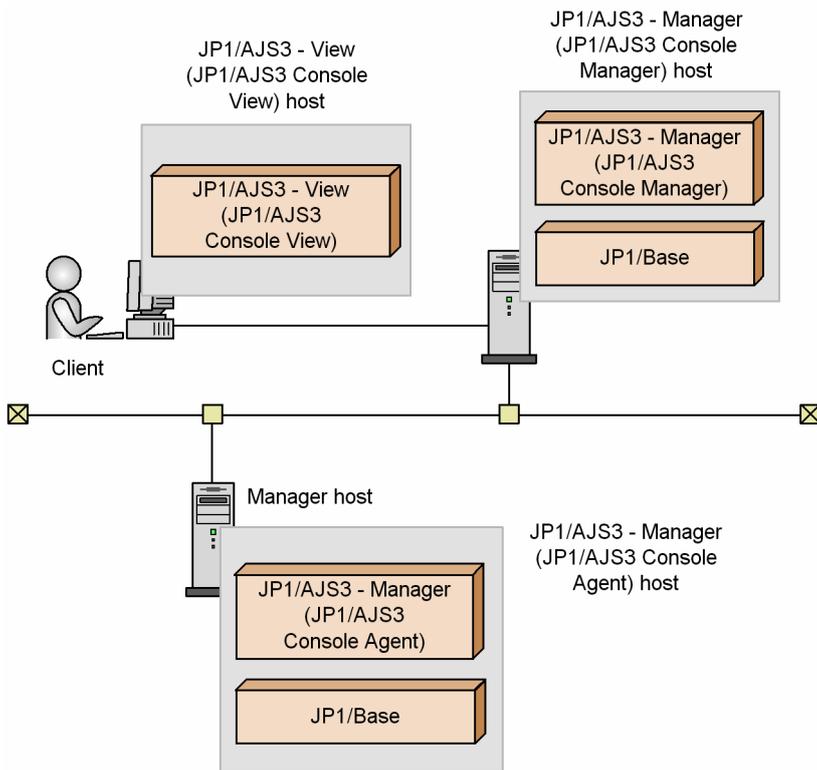
Note:  
 Entries in parentheses are components.

Work tasks executed by different manager hosts can be centrally monitored in the same window.

### (b) Monitoring work tasks managed by one manager host

The following figure shows an example of a system configuration for centrally monitoring work tasks running under different scheduler services and managed by a single manager host.

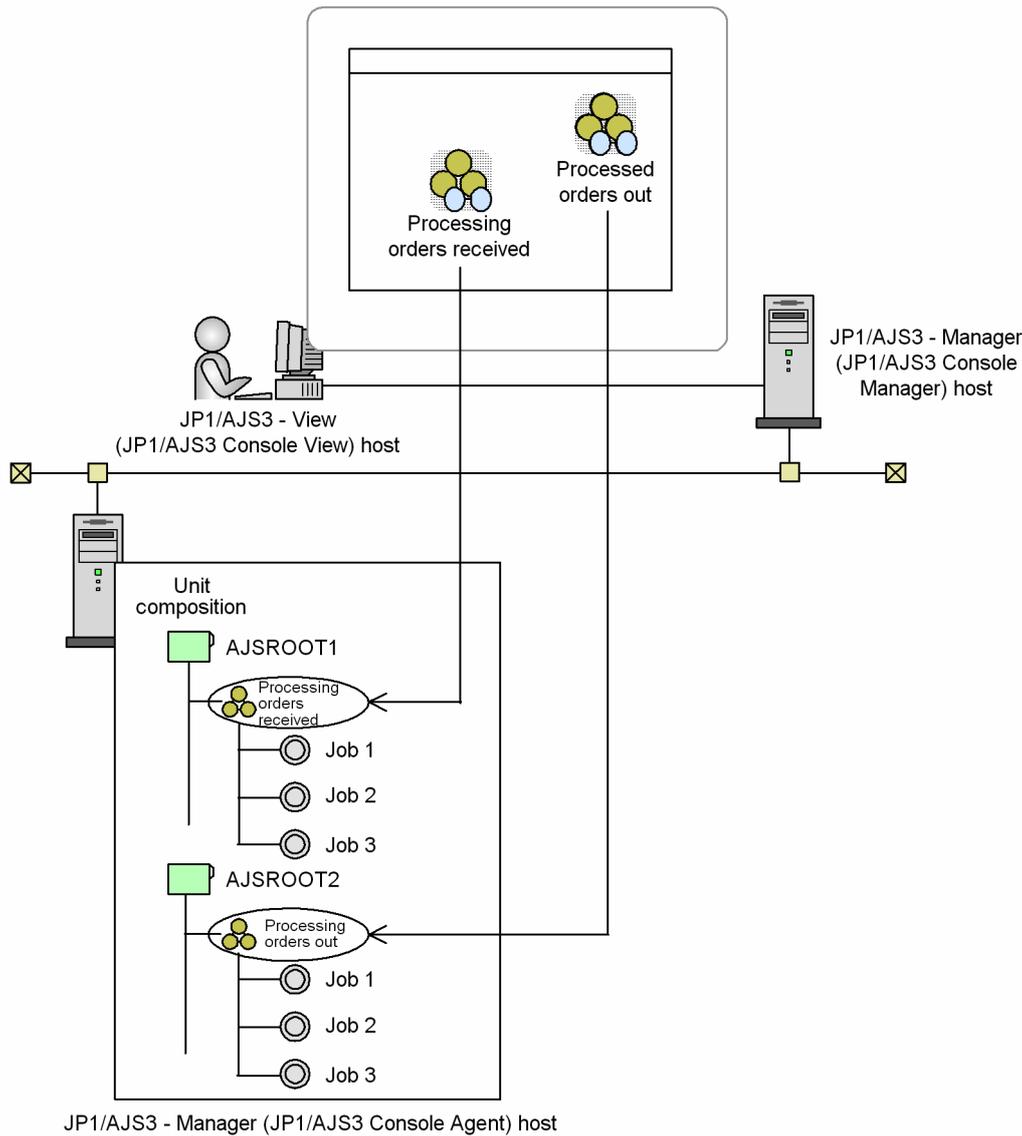
Figure 2-6: System configuration for monitoring work tasks managed by one manager host



Note:  
Entries in parentheses are components.

The following figure shows an example of a system configuration in which JP1/AJS3 Console is used to centrally monitor work tasks running under different scheduler services and managed by a single manager host.

Figure 2-7: Example of using JP1/AJS3 Console to monitor work tasks managed by one manager host



Note:  
Entries in parentheses are components.

Work tasks managed by different scheduler services can be centrally monitored in the same window.

## (5) Notes on manager/agent system configurations

Some cautions on manager/agent configurations are listed below.

- Communication between manager and agent hosts is based on the host names of the hosts. Specify the settings so that the manager host name can be correctly resolved on the agent hosts and the agent host names can be correctly resolved on the manager host.

Hereafter, *Host names* refers to names that can be checked by using the methods below.

Physical host:

The name found by executing the `hostname` command on a JP1/AJS3 host

## Logical host (Windows)

On the host on which JP1/AJS3 is running, in **Control Panel**, by choosing **Services** or **Administrative Tools**, and then **Services**. In the Services dialog box that opens, the host name is displayed in the `xxxxx` portion of JP1/AJS3\_XXXX.

## Logical host (UNIX)

Executing the `ps` command. The host name is displayed after the `jajs_spm` process.

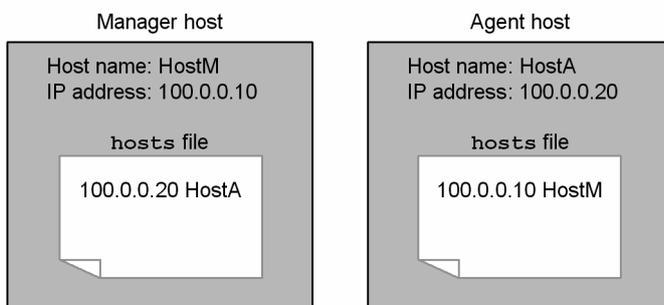
- Depending on the manager/agent configurations, the *now queuing* status of standard jobs, action jobs, custom jobs, or event jobs might not change. If this problem occurs, check whether any of conditions below are satisfied. If any are satisfied, review the system settings.

- When an agent host name cannot be resolved on a manager host, or a manager host name cannot be resolved on an agent host

Configure the `hosts` file, DNS server, `jplhosts` information, or `jplhosts2` information on each manager host and agent host so that each manager host can resolve the host names of agent hosts and each agent host can resolve the host names of manager hosts. For details about how to define the `jplhosts` information and `jplhosts2` information, see the *Job Management Partner 1/Base User's Guide*.

The following shows an example of specifying the `hosts` file settings.

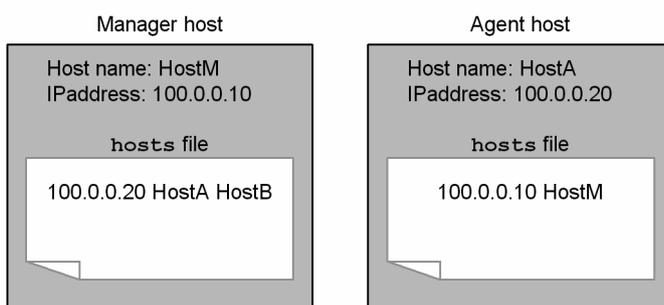
Figure 2-8: Example of hosts file entries that enable hosts to resolve each other's host names



- An alias for an agent host name is defined on the manager host. For this reason, the IP address obtained from the host name displayed by the `hostname` command executed on the agent host is not the same as the IP address obtained from the host name specified in the alias definition.

The following shows an example of specifying `hosts` file entries.

Figure 2-9: Example of specifying the hosts file entries when an alias is used for a host name



- The agent host name is defined in FQDN format in the `hosts` file on the manager host, but the host name displayed by the `hostname` command executed on the agent host is a short name. Alternatively, the agent host name in the `hosts` file is defined with a short name, but the host name displayed by the `hostname` command is in FQDN format. In either case, the host name cannot be resolved on the manager host.

The following shows an example of a host name that cannot be resolved.

Figure 2-10: Example of a host name in FQDN format defined in the hosts file

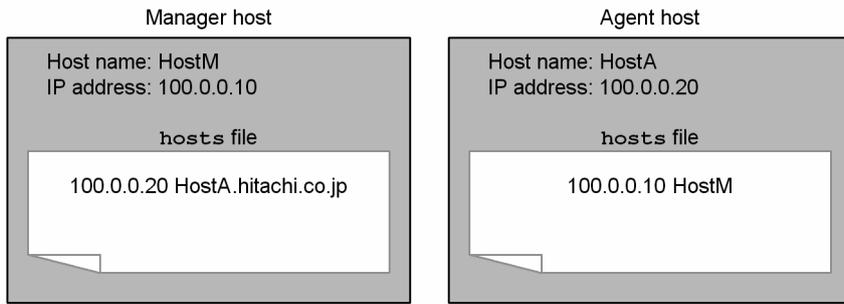
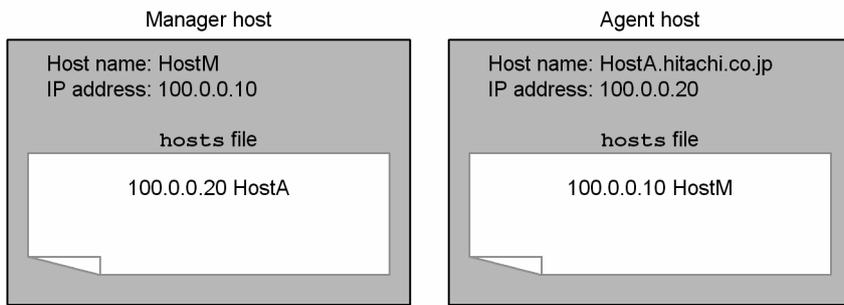


Figure 2-11: Example of a short host name defined in the hosts file



In the above cases, the communication sequence for the job between the manager and agent is not completed even if the job can be executed. As a result, a large amount of retry data, which could cause the following problems, might remain on the manager and agent:

- Load on the system becomes heavy. Jobs that the user attempted to execute might not be removed from the queue, event detection might be extremely delayed, or the system might be unable to detect events.
- When the JP1/AJS3 service is restarted on the agent host, events that were detected in the past are detected again.

The second problem occurs when the remaining retry data includes data that reports detection of an event since that report data is sent to the manager again when the agent is restarted.

If these problems occur, stop the JP1/AJS3 service between the manager host and the agent host, and then specify settings so that both the host name and the short name can be resolved mutually between the manager host and the agent host. Next, cold-start the JP1/AJS3 service on the manager host and on the agent host. If necessary, register the jobnet for execution again.

- Set name resolution so that an IP address other than the loopback address (127.0.0.1) is preferentially assigned to the physical host. However, if it is necessary to assign the loopback address due to operating requirements, configure the `jp1hosts` information or `jp1hosts2` information to assign an IP address that allows the physical host to communicate with other hosts. For details about how to define the `jp1hosts` information or `jp1hosts2` information, see the *Job Management Partner 1/Base User's Guide*.
- A manager and agent are connected via a network. The procedure for the retry process if a network error occurs while a job is being executed is indicated in the table below.

Table 2-3: Job retry process if a network error occurs

Job type	Retry processing
PC jobs, Unix jobs, QUEUE jobs, action jobs, custom jobs	<p>Retry from a manager to an agent The manager retries twice at a monitoring interval of 300 seconds<sup>#1</sup>.</p> <p>Retry from an agent to a manager The agent retries forwarding the job result file 288 times (in 24 hours) at a send retry interval of 300 seconds. <sup>#2</sup></p>

Job type	Retry processing
Event jobs	<p>Retry from a manager to an agent</p> <ul style="list-style-type: none"> <li>If the manager cannot connect to the agent host (a timeout error occurs), the manager retries 27 times (in 24 hours) at the send retry interval of 300 seconds, 600 seconds, 900 seconds, 1,800 seconds, and 3,600 seconds (and every 3,600 seconds after this).<sup>#3</sup></li> <li>For network errors other than those above, the manager retries 2,880 times (in 24 hours) at the send retry interval of 30 seconds.<sup>#4</sup></li> </ul> <p>Retry from an agent to a manager (retry at the establishment of an event)</p> <ul style="list-style-type: none"> <li>The agent retries 8,640 times (in 24 hours) at the send retry interval of 10 seconds.<sup>#4</sup></li> </ul>
Queueless jobs (PC jobs, Unix jobs, action jobs)	No retries

#1

This is the default for `ObserveInterval`, the environment setting parameter for job execution control, which sets the interval for monitoring the job execution agents.

#2

The send retry interval and maximum number of retries can be changed as needed for the operation. For details, with Windows hosts, see *6.2.5 Changing the interval and number of resend attempts for job result files* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*. For details with UNIX hosts, see *15.2.5 Changing the interval and number of resend attempts for job result files* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

#3

You can specify the setting so that if the manager is unable to connect to the agent host, a timeout error occurs and the manager retries the transfer at the interval defined for errors other than timeout errors. For details, see *6.3.12 Settings for ensuring that the sending of unreported information is retried at regular intervals* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or *15.3.13 Settings for ensuring that the sending of unreported information is retried at regular intervals* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

#4

You can change the retry interval and maximum number of retries to values that are best suited for system operation. For details, see *6.3.13 Changing the send retry interval and the number of retries for sending unreported information* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or *15.3.14 Changing the send retry interval and the number of retries for sending unreported information* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

When a network error has occurred, job execution is delayed by the monitoring time only, and operation continues. However, if a network error continues for longer than the monitoring time indicated above, `Failed to start` is output as the job execution result.

- When the error message `KAVU2227-E (A connection error occurred during TCP/IP communication.)` is output, all the socket ports might be busy in the entire system. If this happens, take the following corrective action.

On a Windows host:

Execute the `netstat -a` command to investigate the system's socket status, and check whether there are a lot of sockets placed in the `TIME_WAIT` status. If they are, there might be temporary shortages of available socket ports. If a communication error message is output, job execution and job status confirmation might have failed because it was not possible to make a socket connection. In this case, rerun the job when the number of sockets in the `TIME_WAIT` status has decreased.

Note that you can prevent communication errors from occurring by speeding up recovery of `TIME_WAIT` sockets managed in Windows. The procedure for this is as follows.

1. Execute the following command to start the Registry Editor:

```
C:\> regedt32.exe
```

2. Open the following TCP/IP registry key:

```
\\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters
```

3. Add the following registry values:

Name: `TcpTimedWaitDelay`

Data type: `REG_DWORD`

Data: Any value (decimal notation)

4. Restart Windows.

You can specify any required value for the `TcpTimedWaitDelay` parameter. Set a value that is appropriate for the operating environment.

The standard value is 240 seconds and the minimum value is 30 seconds.

On a UNIX host:

If there are a lot of sockets placed in the `TIME_WAIT` status, there might be temporary shortages of available socket ports. If a communication error message is output, job execution and job status confirmation might have failed because it was not possible to make a socket connection. In this case, rerun the job when the number of sockets in the `TIME_WAIT` status has decreased.

- JP1/AJS3 - Manager polls the status of PC jobs, Unix jobs, QUEUE jobs, action jobs, and custom jobs running on agent hosts in five-minute intervals.

When polling cannot be performed for 10 minutes or more because of a communication error or power outage at the executing host (agent), for example, the job status is changed. Jobs executed in a jobnet are placed in abnormal end status (return code: -1). Jobs executed by a `jpqjobs` command change their status as specified in the command's `-rs` option.

- If the agent stops while an event job is running, the status of the event job depends on how the agent was stopped and whether the option to continue execution of active event jobs is being used.

If an event job is registered for execution while the agent is stopped, the system retries the job start request at predetermined intervals. For the job statuses for each agent termination status, see *7.2.1(4) Job statuses on the manager host when an agent host is restarted* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

For details about the option to continue execution of active event jobs, see *9.2.1 Continuing the execution of event jobs if the JP1/AJS3 service stops* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*. For details about the event job retry process, see *Table 2-3*.

- If multiple IP addresses are assigned to an agent host, the event/action control manager can manage a maximum of four IPv4 addresses and four IPv6 addresses per host. Make sure that each host has four or fewer IPv4 addresses and four or fewer IPv6 addresses.

If more than four IPv4 addresses can be obtained from a host name, the event/action control manager manages only four of the obtained addresses. However, no rules exist about which addresses are managed. The situation is the same when more than four IPv6 addresses are obtained from a host name.

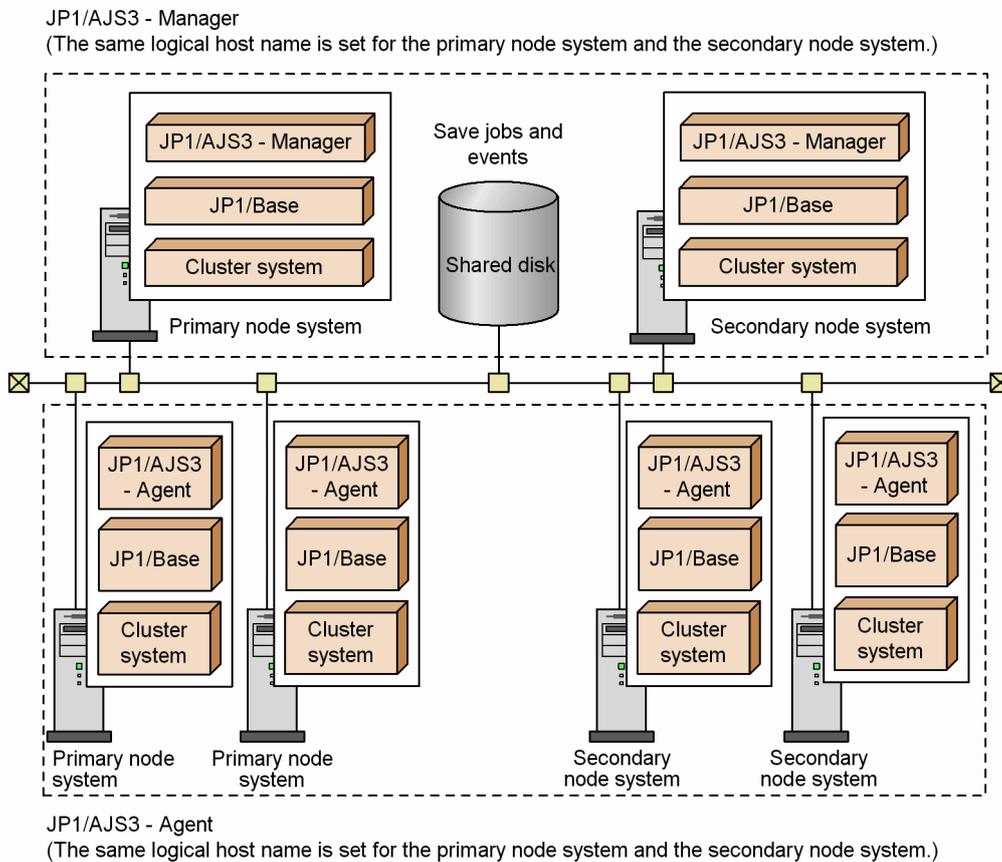
- When you define an alias `HostB` for an agent host with the real host name `HostA`, make sure that the same IP address is returned for both the real host name and the alias.

## 2.2.3 Example of a system configuration for creating a cluster system

A cluster system comprises multiple server systems linked to operate as a single system. Two servers with the same environment are set, and if a fault occurs in the server that executes work tasks (the primary node system) the processing is passed to another server (the secondary node server) and the work task is continued.

The following figure shows an example of a system configuration for creating a cluster system.

Figure 2-12: Example of a system configuration for creating a cluster system



When you are considering which system configuration to use for cluster operation, note that logical host names in FQDN format cannot be used in a cluster system.

For details about the setup for using a cluster system, see 8. *Setup for Operation in a Cluster System* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows hosts), or 17. *Setup for Operation in a Cluster System* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX hosts).

For details about operating a cluster system, see 11. *Operation in a Cluster System* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## 2.2.4 Configuration example for disaster recovery operation

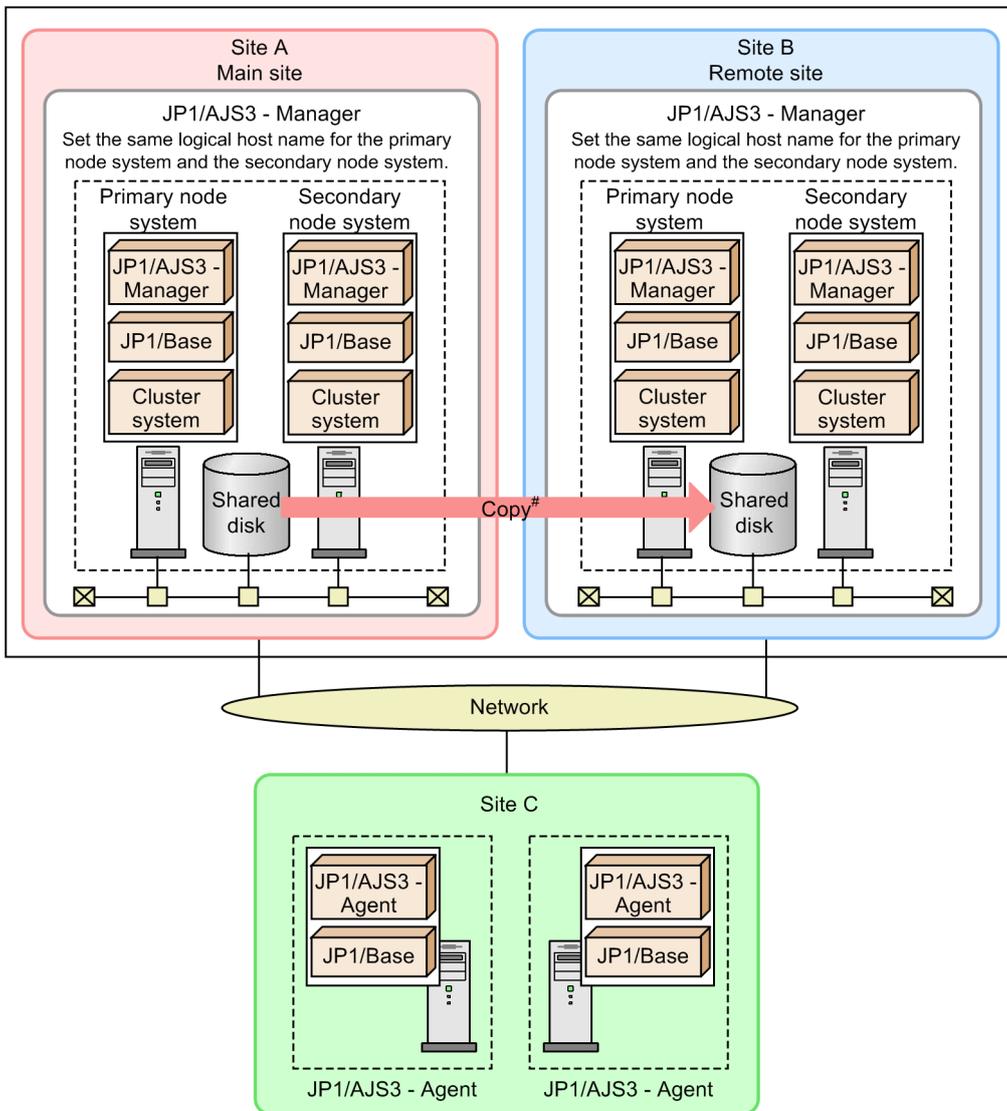
For the disaster recovery supported by JP1/AJS3, a system that has the same environment as the system that is operating regularly is set up at a remote site, and the updated contents of the shared disk for the regular system are copied to the shared disk at the remote site. This arrangement allows you to prepare for a large-scale disaster or other unexpected events. Use the disk copy and mirroring functionality of the hardware to copy data between the shared disks.

In JP1/AJS3 disaster recovery, the system that is operating regularly is called the *main site*, and the system located at a separate remote site is called the *remote site*.

The following figure shows an example of a system configuration for the disaster recovery supported by JP1/AJS3.

Figure 2-13: Example of a system configuration for disaster recovery supported by JP1/AJS3 (Cluster configuration, shared agent type)

Set different logical host names for the main site and the remote site.



#: Use the copy and mirroring functionality in the hardware to copy data between shared disks. This is not a JP1/AJS3 function.

For details about the system configuration or the procedure for performing disaster recovery operation, see 12. *Disaster Recovery in JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

For details about the disaster recovery setup, see 9. *Setup Required for Disaster Recovery Operation* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows) or 18. *Setup Required for Disaster Recovery Operation* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX).

Depending on the method of connection, a LAN connection might be required between the main-site host and remote-site host. Depending on the hardware you use, you might also need to install software before you can use the copy and

mirroring functionality between shared disks at the main and the remote sites. For details, see the documentation for the hardware.

## 2.3 Determining the network configuration

---

JP1/AJS3 supports the following network configurations:

- Multiple LAN connections
- Use of firewalls
- IPv6 addresses (Windows Server 2012, Windows Server 2008 R2, and Linux only)

Check the following when setting up the network configuration of a server running JP1/AJS3:

### MediaSense (in Windows)

We recommend that you disable the Windows MediaSense feature. This feature detects network problems such as the disconnection of a computer's network cable, and disables IP addresses. If MediaSense is enabled, IP addresses might be rendered inaccessible by what is only a temporary network problem, which will disrupt JP1 communication.

### NIC grouping

Many OSs provide the ability to group together two or more NICs, enabling you to fail over to a backup NIC when one NIC fails. Examples include NIC teaming in Windows, Multipath in Solaris, and EtherChannel in AIX. When you use these NIC grouping features on servers running JP1, their operation must be transparent to JP1 and have no effect on its operation.

JP1/AJS3 communication settings are based on the JP1/Base communication settings. JP1/Base is the prerequisite program for JP1/AJS3, and its communication settings can be changed to accommodate a variety of network configurations. To change the communication settings, use the `jplhosts` definition file or `jplhosts2` definition file, and the communication protocol settings file.

For details about the JP1/Base communication settings, see the chapter on JP1/Base communication protocols and the chapter on JP1/Base communication settings based on network configurations in the *Job Management Partner 1/Base User's Guide*.

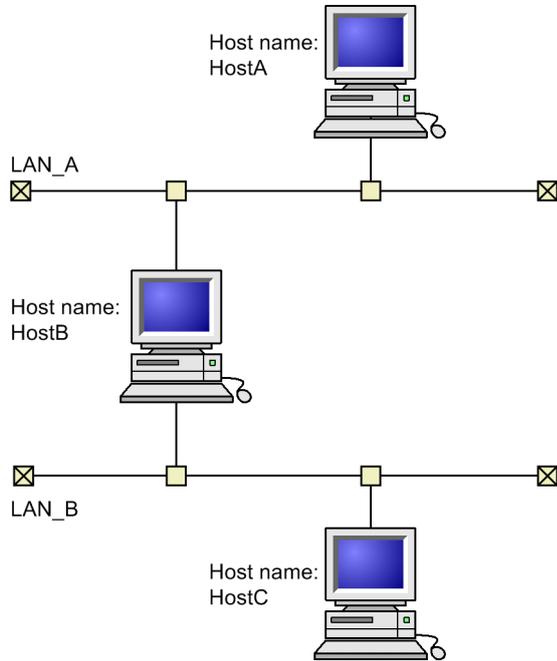
### Cautionary notes

1. The functions explained in this section are based on the functionality for changing the JP1/Base communication protocol settings, and allow JP1/AJS3 - Manager, JP1/AJS3 - Agent, and JP1/AJS3 - View to support that functionality. JP1/AJS3 - View cannot be used for communication using IPv6 addresses.
2. Note that when an OS allows multiple IP addresses to be resolved from a single host name, the event/action control function and the job execution control function operate differently depending on whether the communication protocol for multiple LAN connections has been set for JP1/Base.  
*When the communication protocol for multiple LAN connections has not been set for JP1/Base*  
Resolved IP addresses are used one after another until a connection is successfully established.  
*When the communication protocol for multiple LAN connections has been set for JP1/Base*  
A connection is attempted only to the resolved IP address at the beginning of the `jplhosts` definition file or the `jplhosts2` definition file.
3. JP1/AJS3 does not perform correctly in an environment where IP addresses are changed dynamically and the destination host changes. Run JP1/AJS3 in an environment where a unique host name and IP address can be determined.
4. Because embedded databases do not conform to the JP1/Base communication settings, you will need to use OS functionality to resolve the physical host name or logical host name to an IP address.
5. If JP1/AJS3 - Manager version 10-00 or later was used to set up the embedded database, use the loopback address (127.0.0.1) for communication within the embedded database and between the JP1/AJS3 - Manager and the embedded database.

6. JP1/AJS3 does not work properly in an environment where the same destination host name is duplicated on hosts that are connected to multiple networks. Make sure that the host names used for communication are unique, and that unique IP addresses can be obtained from the host names.

The following figure shows an example of an environment where the same destination host name is duplicated on hosts that are connected to multiple networks.

Figure 2-14: Example of a host name being duplicated on hosts that are connected to multiple networks



In the example above, the same host name, HostA, is used in LAN\_A and in LAN\_B. As a result, HostB is unable to determine whether HostA corresponds to LAN\_A or LAN\_B.

The following table shows the support status of communication settings for the functionalities provided by JP1/AJS3.

Table 2-4: Support status of communication settings for the functionality provided by JP1/AJS3

Functionality		Communication settings	
		jp1hosts definition file or jp1hosts2 definition file	Communication protocol settings file
JP1/AJS3 - View (job/jobnet operation)		Y#1	Y#1
Job execution		Y	Y
Job execution (queueless jobs)		Y	--
Job submission		Y	Y
Judgment jobs		NC	NC
OR jobs		NC	NC
Event jobs#2	Receive JP1 Event job	Y (NC)	Y (NC)
	Monitoring Files job	Y (NC)	Y (NC)
	Receive Mail job	Y (--)	Y (--)
	Receive MQ Message job	Y (NC)	Y (NC)

Functionality		Communication settings	
		jp1hosts definition file or jp1hosts2 definition file	Communication protocol settings file
Event jobs <sup>#2</sup>	Receive MSMQ Message job	Y (--)	Y (--)
	Monitoring Log Files job	Y (NC)	Y (NC)
	Monitoring Event Log job	Y (NC)	Y (NC)
	Interval Control job	Y (NC)	Y (NC)
Action jobs <sup>#3</sup>	Send JP1 Event job	--	Y <sup>#4</sup>
	Send Mail job	--	--
	Send MQ job	--	--
	Send MSMQ message job	--	--
	OpenView Status Report job	--	--
	Local Power Control job	NC	NC
	Remote Power Control job	--	Y <sup>#4</sup>
Remote jobnets		Y	Y
Schedule execution		NC	NC
Remote execution of commands		Y	Y
JP1/AJS3 Console		Y <sup>#5</sup>	Y <sup>#5</sup>

Legend:

Y: Supported

--: Not supported

NC: No communication

#1

Supported for the settings at the manager host.

#2

Y, --, and NC indicate whether the communication setting applies for communication between manager and agent hosts. Y (--) and Y (NC) indicate whether the communication setting with the linked program applies when an event job is executed.

#3

This indicates the support status for the communication settings for the linked program, when each action job is executed. The communication settings between the manager and agent follow the statuses shown in the table for the job execution functionality and job execution (queueless job) functionality.

#4

Depends on the communication settings of the event service. Change them using the event server setting (conf) file. For details, see the description of the communication settings of JP1/Base according to different network configurations in the *Job Management Partner 1/Base User's Guide*.

#5

Supported for JP1/AJS3 Console Manager and JP1/AJS3 Console Agent. JP1/AJS3 Console View does not use the functionality of JP1/Base, so is not applicable.

## 2.3.1 Connecting multiple LANs

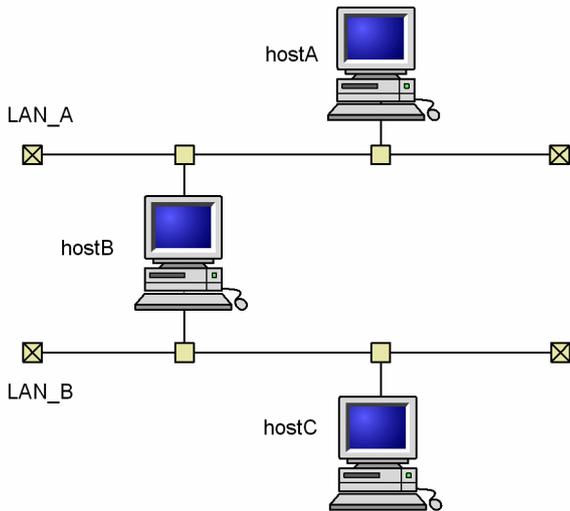
JP1/AJS3 supports system configurations where JP1/AJS3 - Manager, JP1/AJS3 - Agent, or JP1/AJS3 - View is installed in a server (host) and multiple LANs are connected to this server (host).

For details about the communication settings for using JP1/AJS3 with multiple LANs connected, see [2.3.4 Example configurations with multiple LANs and their communications settings](#).

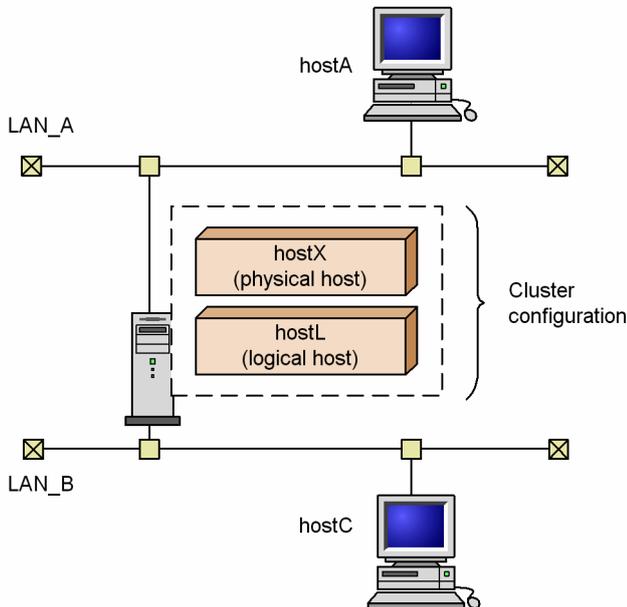
The following figure shows an example of a system configuration in which multiple LANs are connected.

Figure 2-15: Example of a system configuration with multiple LANs connected

When not performing cluster operation



When performing cluster operation



## 2.3.2 Working through a firewall

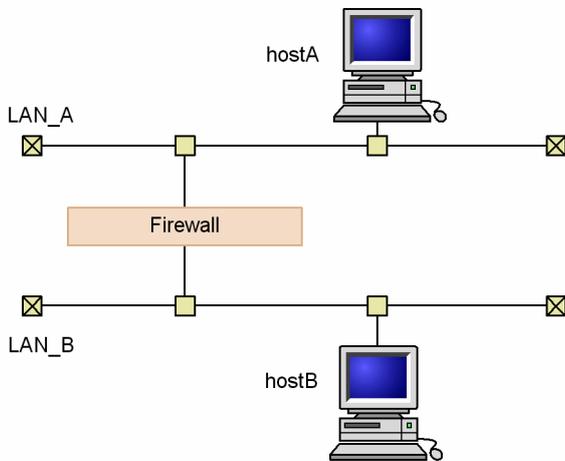
JP1/AJS3 can be used in system configurations in which JP1/AJS3 - Manager, JP1/AJS3 - Agent, or JP1/AJS3 - View is connected through a firewall.

For details about the communication settings when using JP1/AJS3 in an environment where a firewall is set, see [2.3.5 Example of configurations that include a firewall, and their communications settings](#).

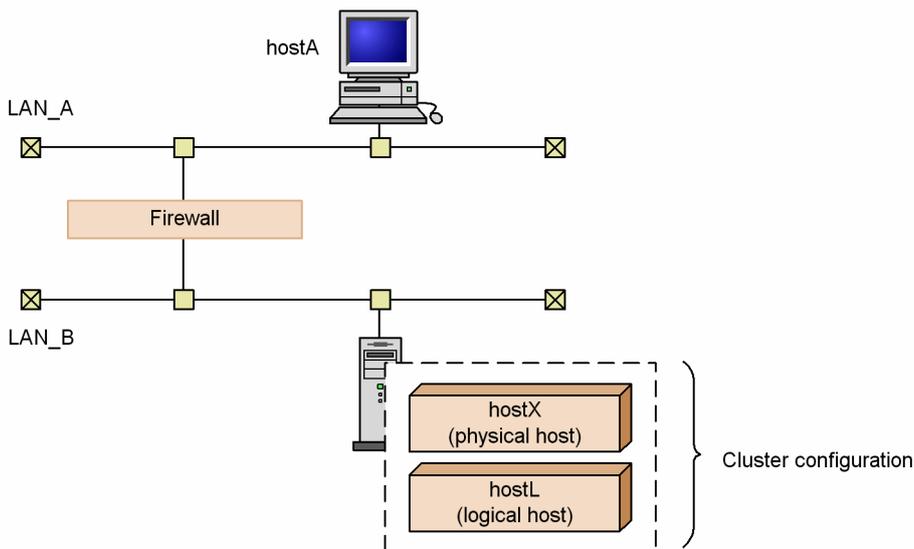
The following figure shows an example of a system configuration in which a firewall is set.

Figure 2-16: Example of a system configuration with firewall

When not performing cluster operation



When performing cluster operation



## (1) Firewall basics

When you use JP1 in a network environment that includes a firewall, you must consider the following two firewall functionalities:

- Access restriction (packet filtering)  
Allow only necessary communication, and prevent invalid communications.
- Network address translation (NAT)  
IP addresses are translated so that direct connections are not possible; connections are made to a network with a different address. The existence of the computer that translates IP addresses is concealed from outsiders.

To set an environment with these considerations, you must understand the method by which the firewall controls communications.

First, we will cover basic knowledge about packet filtering and NAT.

#### Supplementary note

The explanation given here is an overview to help you understand the basics of firewalls. You must read and properly understand the firewall documentation and reference works on security before attempting to plan and make the security settings for a firewall.

### (a) Packet filtering

Packet filtering restricts the communications that are allowed to pass through a firewall. By checking each of the communications packets that pass through the firewall one by one and destroying packets that do not match the predetermined data-passing conditions, invalid communications are prevented from passing through the firewall. This means that only the packets specified in the data-passing conditions will be available behind the firewall.

JP1/AJS3 supports packet filtering.

#### ■ Setting packet filtering

To set packet filtering:

1. Investigate the method of communications (the port number that the application uses and so on).  
Check the port number, IP address and data-passing direction to be set as firewall data-passing conditions.  
Check the communications conditions for JP1/AJS3 by referring to the explanation in this subsection and the explanation in *A. List of Port Numbers*.
2. Set data-passing conditions for the firewall.  
First block all data packets, and then set passing conditions to allow only specific packets to pass through the firewall.  
In JP1/AJS3, specify settings that will allow JP1 communications checked using the procedure described above to pass through the firewall.

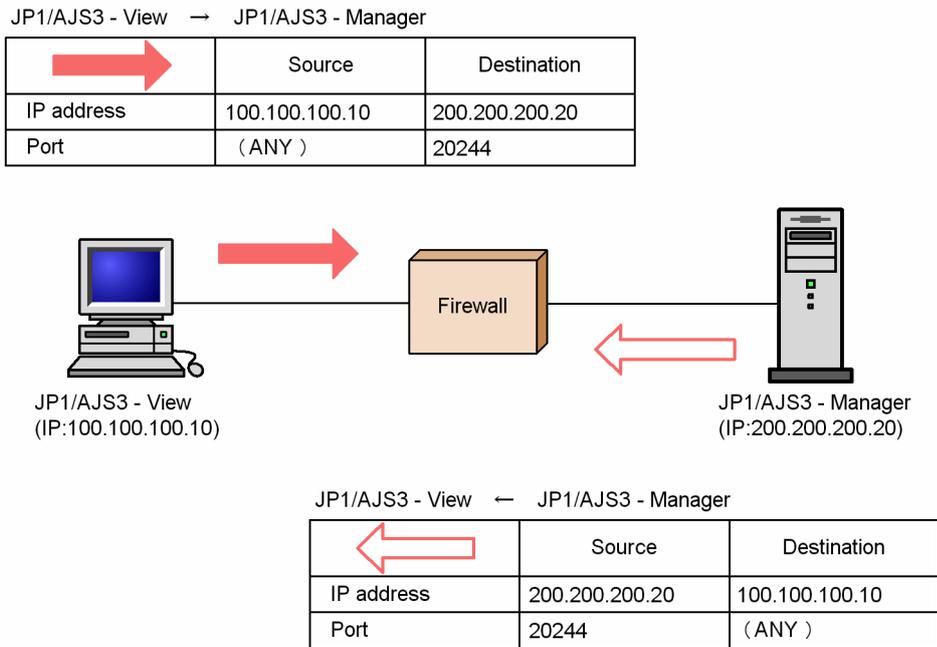
#### ■ Example of Settings for JP1/AJS3

This example shows how to set packet filtering in an environment in which a firewall is placed between JP1/AJS3 - View and JP1/AJS3 - Manager.

Example: Connect JP1/AJS3 - View to JP1/AJS3 - Manager through the firewall.

- JP1/AJS3 - Manager is operating in a non-cluster system.
- 100.100.100.10 is set as the IP address of the computer running JP1/AJS3 - View.
- 200.200.200.20 is set as the IP address of the computer running JP1/AJS3 - Manager.
- The default port number for JP1 is used.

Figure 2-17: Example of setting packet filtering with JP1/AJS3



1. Investigate the method of communications for JP1

First, find out the method of communications of JP1; this is required information for setting packet filtering. If you see (3) *JP1/AJS3 communications* below, you find see that the port numbers that JP1/AJS3 - View uses are explained in tables like the one below.

Table 2-5: Communications between JP1/AJS3 - View and JP1/AJS3 - Manager

JP1/AJS3 - View	Direction	JP1/AJS3 - Manager
ANY	>>	20244/tcp (jp1ajs2monitor)

This table indicates the following methods of communication:

- JP1/AJS3 - Manager accepts connections from JP1/AJS3 - View using port number 20244. In other words, JP1/AJS3 - View is connected to port number 20244 on the JP1/AJS3 - Manager side.
- Port number 20244 is defined with the service name `jp1ajs2monitor`. You can change the port number to a number other than 20244 in the environment settings.
- The port number at the JP1/AJS3 - View side is automatically assigned by the OS as any port number that is available at the time (ANY).
- The direction of the connection is from JP1/AJS3 - View to JP1/AJS3 - Manager. This direction setting is used when you want to restrict the direction in which data passes through the firewall, for example only permitting connections from network A to network B.
- The protocol is TCP.
- TCP involves bi-directional communication, and there are outward (JP1/AJS3 - View >> JP1/AJS3 - Manager) and return (JP1/AJS3 - View << JP1/AJS3 - Manager) communications. The outward and return communication packets are designated by the terms *Source* and *Destination*.

The available IP addresses depend on the communication settings in JP1/Base. For details, see the *Job Management Partner 1/Base User's Guide*.

2. Set packet filtering.

Based on the checked method of communications between JP1/AJS3 - View and JP1/AJS3 - Manager, configure the system so that only these communications can pass through the firewall.

The following table shows the data-passing conditions for packet filtering.

Table 2-6: Example filtering conditions (for JP1/AJS3 - View and JP1/AJS3 - Manager)

No.	SourceAddress	DestinationAddress	Protocol	SourcePort	DestinationPort	Control
1	100.100.100.10	200.200.200.20	TCP	(ANY)	20244	Accept
2	200.200.200.20	100.100.100.10	TCP	20244	(ANY)	Accept
3	(ANY)	(ANY)	(ANY)	(ANY)	(ANY)	Reject

This table shows the conditions for checking packets and the control if there is a match with the conditions. The *Control* column indicates whether passage through the firewall is accepted or rejected.

Set the packet filtering of the firewall in accordance with the filtering conditions in this table.

The details of the setting method differ for individual firewalls. See the documentation for your firewall.

## (b) NAT (Network Address Translator)

NAT translates private IP addresses to global IP addresses and vice versa. Translating the addresses conceals the private addresses from outsiders, increasing the internal security of the computer.

In addition to its use in firewalls, the NAT functionality is also used with routers.

JP1/Base and JP1/AJS3 support NAT in static mode (addresses are translated according to predetermined rules). The following description applies to address translation in static mode only.

Note that JP1/Base and JP1/AJS3 can be used only in an environment in which a unique host name or IP address can be resolved from the host name used for communication. Therefore, JP1/Base and JP1/AJS3 do not support NAT in the dynamic mode (an available number is dynamically assigned to set or change the rules automatically) or NAPT (IP Masquerade, NAT+) that includes the port-translation functionality.

### ■ Setting NAT

To set NAT:

#### 1. Check the IP address to be used.

First, check the IP address that the application uses. This is simple when dealing with a computer that only uses one IP address, but if multiple network adaptors are used (meaning that there is more than one IP address), or if a logical IP address is used in a cluster system, the IP address used differs depending on the application.

In the case of JP1/AJS3, the IP address used in a non-cluster system will be different from that in a cluster system with a logical host setting. For details, see the *Job Management Partner 1/Base User's Guide*.

#### 2. Determine and set the address translation rules.

Once you have checked the IP address that the application uses, decide the IP address after translation.

When you have decided the address translation rules, set them for NAT.

### ■ Example setting with JP1/AJS3

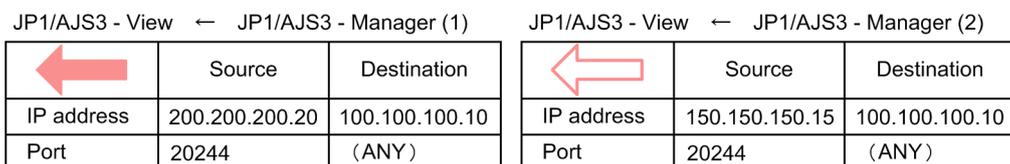
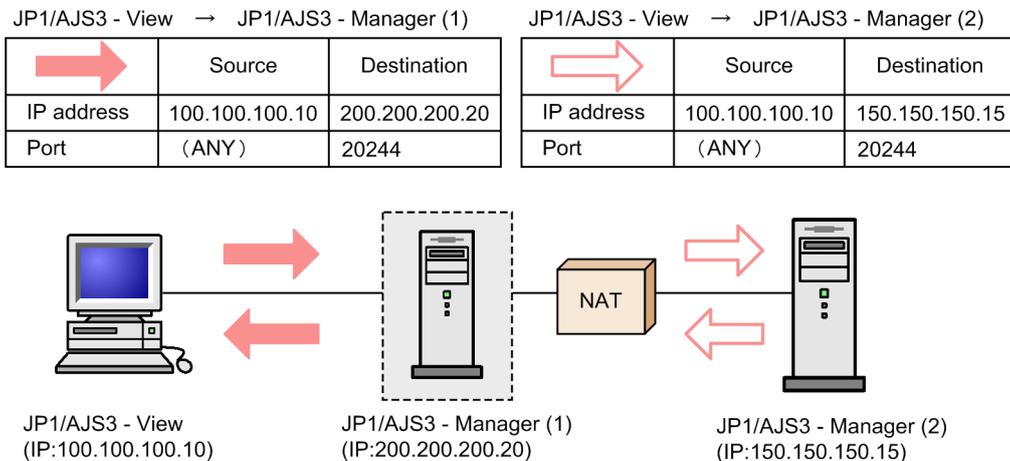
The following explains NAT setting for JP1 in a configuration with a firewall between JP1/AJS3 - View and JP1/AJS3 - Manager.

Example: Connecting from JP1/AJS3 - View to a JP1/AJS3 - Manager host with a translated address

- JP1/AJS3 - Manager operates in a non-cluster system.
- 100.100.100.10 is set as the IP address of the JP1/AJS3 - View computer .

- 150.150.150.15 is set as the IP address of the JP1/AJS3 - Manager computer .  
The IP address of this JP1/AJS3 - Manager is translated to 200.200.200.20.  
After translation, JP1/AJS3 - View connects to 200.200.200.20.

Figure 2-18: Example of setting NAT with JP1/AJS3



1. Check the IP address to be used.

Check the IP address used by JP1. This information is required for setting NAT.

Since the system in this example is non-cluster, communications are conducted using an IP address that corresponds to the host name (result of the hostname command).

2. Determine and set the address translation rule.

Decide the translation rule for translating the IP address of the JP1/AJS3 - Manager computer from 150.150.150.15 to 200.200.200.20 using NAT.

Table 2-7: Example of a translation rule (translating 150.150.150.15 to 200.200.200.20)

No.	SourceAddress	DestinationAddress	SourceAddress(Translated)	DestinationAddress(Translated)
1	(ANY)	200.200.200.20	(ANY)	150.150.150.15
2	150.150.150.15	(ANY)	200.200.200.20	(ANY)

This table shows the correspondence between the source packet and the packet after address translation.

Define this address translation rule in the NAT setting for the firewall.

The precise details of the setting method will differ depending on the firewall and router. See the documentation for the products you are using.

Now, JP1/AJS3 - View does not access the actual address of the computer where JP1/AJS3 - Manager is installed (150.150.150.15) but the address after translation (200.200.200.20).

From JP1/AJS3 - View, it appears as if a JP1/AJS3 - Manager host with the IP address 200.200.200.20 is being accessed.

## (c) Communication settings for using JP1 in a firewall environment

When using a network environment that goes through a firewall, consider the effects of setting "IP bind" as the JP1 communication method for setting multiple LAN connections.

To use JP1 in an environment with a firewall, you must set conditions for packet filtering and NAT in accordance with the IP address and port number, as explained previously. For that reason, use the IP bind method determined by the JP1 settings to clearly establish the JP1 IP addresses.

For example, when JP1 runs in a cluster system or on a server connected to multiple LANs, because the IP address is determined by the OS, an unintended IP address might be used. You can remedy this situation by setting the IP bind method as the JP1 communications method so that communications use the IP address specified in the JP1 environment settings.

## (2) JP1/Base communications

For details about JP1/Base communications, see the *Job Management Partner 1/Base User's Guide*.

## (3) JP1/AJS3 communications

The following explains the port numbers, IP addresses, and address translation (NAT) that can be used in JP1/AJS3 communications.

### (a) Port numbers

#### ■ JP1/AJS3 port numbers

JP1/AJS3 uses the following port numbers. In addition to these, the port numbers of JP1/Base, which must be used with JP1/AJS3, are also used.

For JP1/AJS3 port numbers, see *A.1 Tables of port numbers*.

#### ■ Major system configurations and communications

The following explains the port numbers and communications directions used in major system configurations.

Consult the following references in conjunction with the explanation given here.

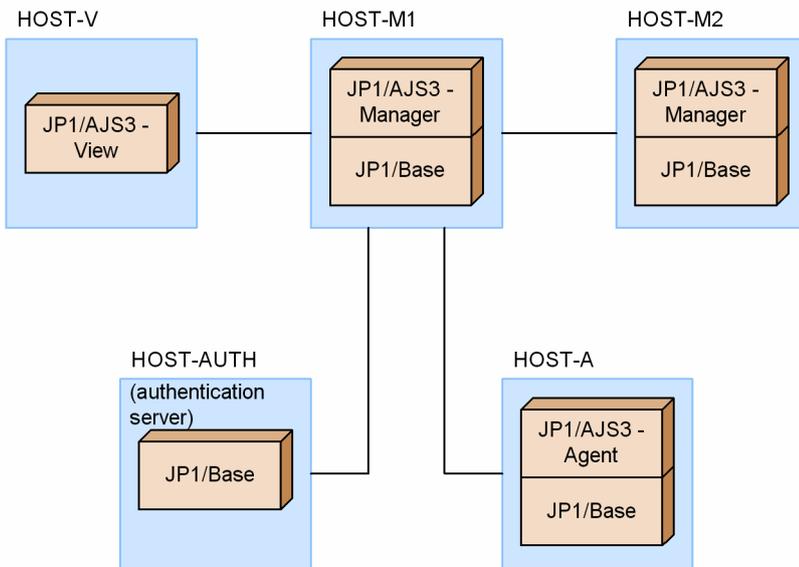
#### References

- Explanation of firewall data-passing directions in the *Job Management Partner 1/Base User's Guide*.
- *A.2 Directions of traffic through a firewall*

#### Cautionary note

When using JP1 on a firewalled host, set the firewall so that data can pass through all the ports that JP1 uses for communications within the local host. This allows JP1 processes within the local host to communicate using the ports.

Figure 2-19: Example system configuration



- JP1/AJS3 - View on HOST-V is used to connect HOST-M1.
- HOST-M1 and HOST-M2 execute jobs together.
- HOST-A is set as the agent of HOST-M1.
- HOST-AUTH is set as the authentication server for HOST-M1.

Table 2-8: Communications between JP1/AJS3 - View and JP1/AJS3 - Manager

JP1/AJS3 - View	Direction	JP1/AJS3 - Manager
(ANY)	>>	20244/tcp (jp1ajs2monitor)

(These correspond to HOST-V and HOST-M1 in the example system configuration.)

Table 2-9: Communications between JP1/AJS3 - Manager and JP1/AJS3 - Manager

JP1/AJS3 - Manager	Direction	JP1/AJS3 - Manager
(ANY)	>>	20241/tcp (jp1ajs2qman) 20242/tcp (jp1ajs2qagt) 20243/tcp (jp1ajs2qnfy) 20244/tcp (jp1ajs2monitor) 20245/tcp (jp1ajs2report) 20246/tcp (jp1ajs2eamgr) 20247/tcp (jp1ajs2eaagt) 20300/tcp (jp1ajs2qlagt) 20301/tcp (jp1ajs2qlftp) 23139/tcp (jp1ajs2chkagt) 23160/tcp (jp1ajs2gw)
20241/tcp (jp1ajs2qman) 20242/tcp (jp1ajs2qagt) 20243/tcp (jp1ajs2qnfy) 20244/tcp (jp1ajs2monitor) 20245/tcp (jp1ajs2report) 20246/tcp (jp1ajs2eamgr) 20247/tcp (jp1ajs2eaagt)	<<	(ANY)

JP1/AJS3 - Manager	Direction	JP1/AJS3 - Manager
20300/tcp (jp1ajs2qlagt) 20301/tcp (jp1ajs2qlftp) 23139/tcp (jp1ajs2chkagt) 23160/tcp (jp1ajs2gw)	<<	(ANY)

(These correspond to HOST-M1 and HOST-M2 in the example system configuration)

This is the communications between JP1/AJS3 - Manager and JP1/AJS3 - Manager.

**Table 2-10: Communications between JP1/AJS3 - Manager and JP1/AJS3 - Agent**

JP1/AJS3 - Manager	Direction	JP1/AJS3 - Agent
(ANY)	>>	20242/tcp (jp1ajs2qagt) 20247/tcp (jp1ajs2eaagt) 20300/tcp (jp1ajs2qlagt) 23139/tcp (jp1ajs2chkagt)
20241/tcp (jp1ajs2qman) 20243/tcp (jp1ajs2qnfy) 20246/tcp (jp1ajs2eamgr) 20301/tcp (jp1ajs2qlftp)	<<	(ANY)

(These correspond to HOST-M1 and HOST-A in the example system configuration)

**Table 2-11: Communications between JP1/AJS3 - Manager and JP1/Base (authentication server)**

JP1/AJS3 - Manager	Direction	JP1/Base
(ANY)	>>	20240/tcp (jp1bsuser)

(These correspond to HOST-M1 and HOST-AUTH in the example system configuration)

The following table describes the communications between JP1/AJS3 and a mail server for mail system linkage without using Outlook.

**Table 2-12: Communications between JP1/AJS3 and a mail server**

JP1/AJS3	Direction	Mail server
(ANY)	>>	25/tcp(smtp)
(ANY)	>>	110/tcp(pop3)
(ANY)	>>	587/tcp(Submission Port)

The communications used in other configurations that use other programs are indicated in the table below.

**Table 2-13: Communications between JP1/AJS3 - Manager and other programs**

JP1/AJS3 - Manager	Direction	Other program
(ANY)	>>	20241/tcp (jp1ajs2qman)
20241/tcp (jp1ajs2qman) 20245/tcp (jp1ajs2report)	<<	(ANY)

*Other program* here means user programs that use the functions of JP1/NQSEXEC and JP1/OJE for VOS3.

The following two tables describe the communications to be performed when JP1/AJS3 Console is used.

**Table 2-14: Communications between JP1/AJS3 Console View and JP1/AJS3 Console Manager**

JP1/AJS3 Console View	Direction	JP1/AJS3 Console Manager
(ANY)	>>	22275/tcp (jp1ajs2cm)

**Table 2-15: Communications between JP1/AJS3 Console Manager and JP1/AJS3 Console Agent**

JP1/AJS3 Console Manager	Direction	JP1/AJS3 Console Agent
(ANY)	>>	22276/tcp (jp1ajs2ca)

## (b) IP address

JP1/AJS3 uses the same IP addresses as JP1/Base. For details, see the *Job Management Partner 1/Base User's Guide*.

To ensure compatibility among versions, you can select whether the sending side IP address used when executing event jobs corresponds to the sending side IP address or the receiving side IP address used by JP1/Base.

## (c) Address translation (NAT)

JP1/AJS3 supports static mode network address translation (NAT).

### Cautionary note

If NAT is used for communication between the agent and the manager, the definition pre-check function cannot correctly check item that category is execution agent name.

## 2.3.3 Communication using IPv6 addresses

JP1/AJS3 accommodates communication using IPv6 addresses and communication using both IPv4 addresses and IPv6 addresses. When you migrate the communication environment from an IPv4 address environment to an IPv6 address environment, you can use JP1/AJS3 continuously without changing the system configuration.

For more information, see [2.3.4 Example configurations with multiple LANs and their communications settings](#).

## (1) Prerequisites for configuring an IPv6 environment

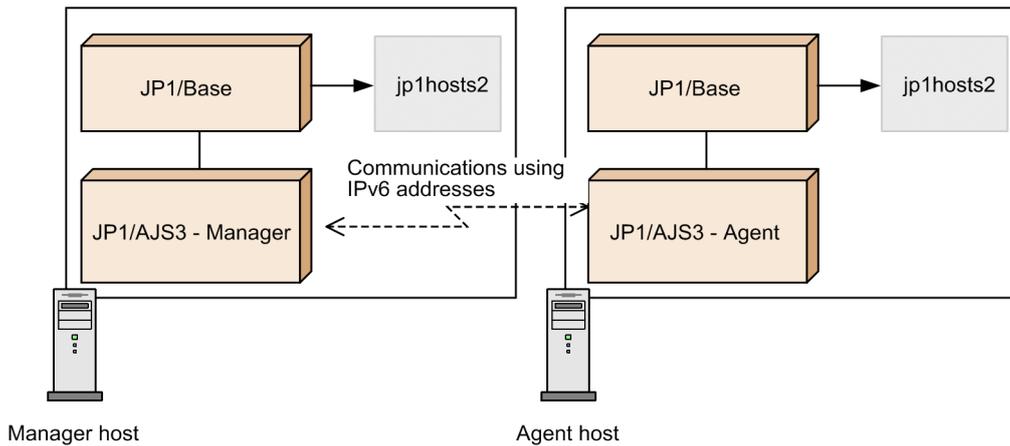
- Operation of JP1/AJS3 using IPv6 addresses requires version 10-00 or later of JP1/AJS3 - Manager and JP1/AJS3 - Agent.
- JP1/AJS3 - View does not support communication using IPv6 addresses.
- Windows Server 2012, Windows Server 2008 R2, and Linux are the only OSs that support communication that using IPv6 addresses.
- For hosts where JP1/AJS3 - Manager is installed, the IPv4 protocol must be installed and enabled in the system. If the JP1/AJS3 service is started in a system where the IPv4 protocol has not been installed or has been disabled, the KNAD3992-E message is output and the service cannot be started.
- Devices that convert IPv4 and IPv6 addresses (protocol translators) cannot be used.

## (2) Overview of communication using IPv6 addresses

JP1/AJS3 uses the communication base function of JP1/Base to obtain an IP address from a host name (normal lookup), to obtain a host name from an IP address (reverse lookup), and to determine the protocol type to be used for ANY binding addresses.

JP1/AJS3 - Manager and JP1/AJS3 - Agent, when needing to use IPv6 addresses to communicate, use the communication base function of JP1/Base to reference `jp1hosts2` for the resolution of host names. When host names are correctly resolved to IPv6 addresses, the IPv6 addresses are used to start communications.

Figure 2-20: Relationship between the communication base function of JP1/Base and JP1/AJS3 when IPv6 addresses are used for communication

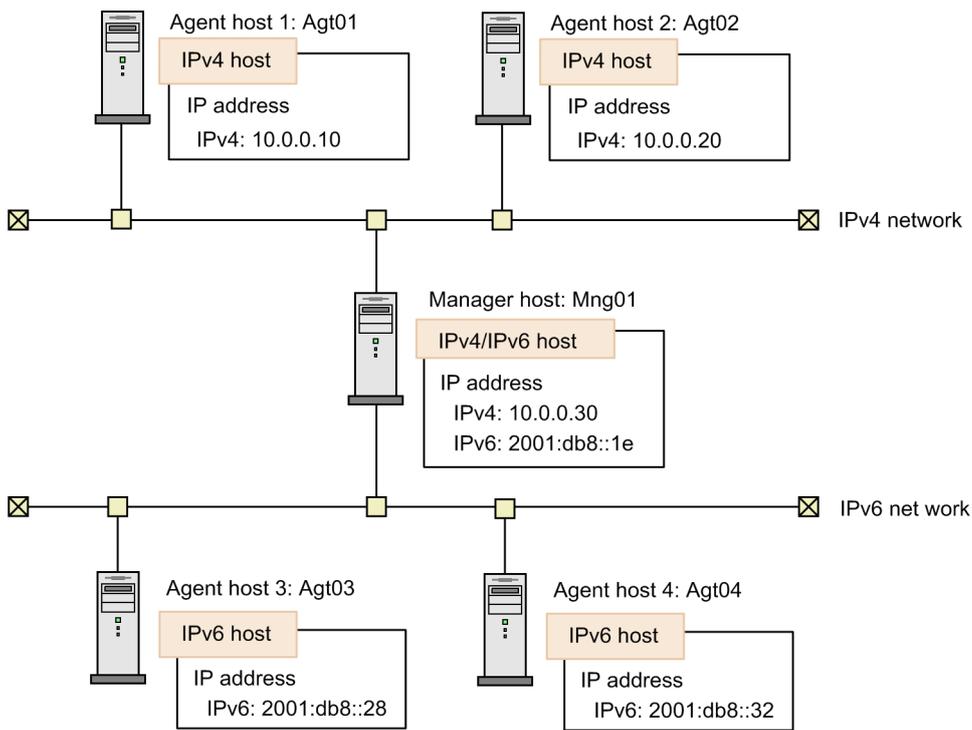


For details about the communication base function of JP1/Base, see the *Job Management Partner 1/Base User's Guide*.

## (3) System configuration of hosts using IPv6 addresses

As shown in the following figure, IPv6 environments are network environments that consist of both hosts that communicate with IPv4 addresses and hosts that communicate with IPv6 addresses.

Figure 2–21: Example system configuration of an IPv6 environment



#### IPv6 hosts

Hosts that set only the IPv6 address. These hosts cannot communicate using IPv4 addresses.

#### IPv4 hosts

Hosts that set only the IPv4 address. These hosts cannot communicate using IPv6 addresses.

#### IPv4/IPv6 hosts

Hosts that set both the IPv4 address and the IPv6 address. These hosts can communicate in either protocol environment.

To communicate using IPv6 addresses in JP1/AJS3, the source host and the destination host must use IP addresses of the same protocol type. Accordingly, when setting up `jp1hosts2` or ANY binding addresses, make sure that the IP addresses are the same protocol type and can communicate each other. Note that JP1/AJS3 does not allow communication between different protocols.

The following tables describe the connections between hosts.

Table 2–16: Connections between manager hosts

		Manager host		
		IPv4 host	IPv6 host	IPv4/IPv6 host
Manager host	IPv4 host	Possible (IPv4)	No	Possible (IPv4)
	IPv6 host	No	Possible (IPv6)	Possible (IPv6)
	IPv4/IPv6 host	Possible (IPv4)	Possible (IPv6)	Yes

#### Legend:

Yes: The hosts can communicate using both IPv4 addresses and IPv6 addresses.

Possible (IPv6): The hosts can communicate using only IPv6 addresses.

Possible (IPv4): The hosts can communicate using only IPv4 addresses.

No: No communication is possible.

**Table 2-17: Connections between a manager host and an agent host**

		Agent host		
		IPv4 host	IPv6 host	IPv4/IPv6 host
Manager host	IPv4 host	Possible (IPv4)	No	Possible (IPv4)
	IPv6 host	No	Possible (IPv6)	Possible (IPv6)
	IPv4/IPv6 host	Possible (IPv4)	Possible (IPv6)	Yes

Legend:

Yes: The hosts can communicate using both IPv4 addresses and IPv6 addresses.

Possible (IPv6): The hosts can communicate using only IPv6 addresses.

Possible (IPv4): The hosts can communicate using only IPv4 addresses.

No: No communication is possible.

**Table 2-18: Connections between a manager host and a JP1/AJS3 - View host**

		JP1/AJS3 - View host		
		IPv4 host	IPv6 host	IPv4/IPv6 host
Manager host	IPv4 host	Possible (IPv4)	No	Possible (IPv4)
	IPv6 host	No	No	No
	IPv4/IPv6 host	Possible (IPv4)	No	Possible (IPv4)

Legend:

Possible (IPv4): The hosts can communicate using only IPv4 addresses.

No: No communication is possible.

When you want IPv4/IPv6 hosts to communicate with each other, assign IP addresses of the same protocol to the hosts. The hosts cannot communicate if only an IPv4 address is assigned to one host and only an IPv6 address is assigned to the other host.

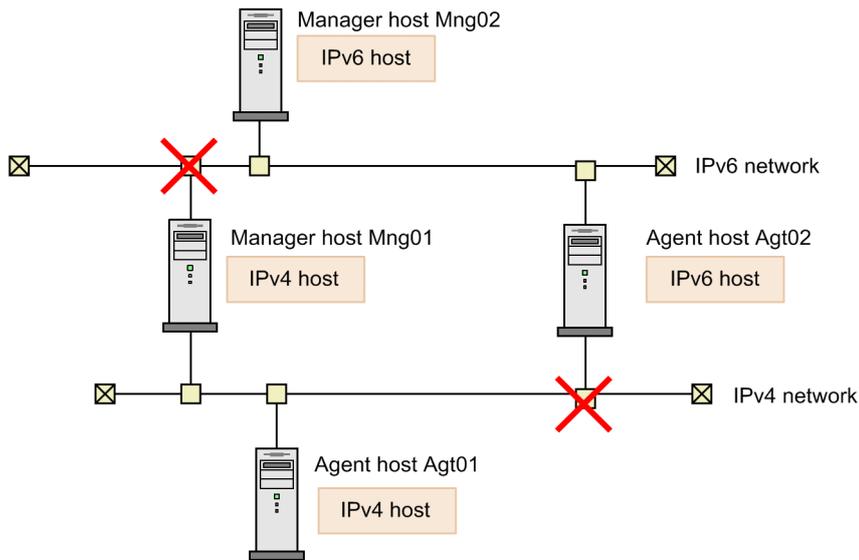
Supplementary note:

- Versions 09-50 and earlier of JP1/AJS3 - Manager and JP1/AJS3 - Agent can communicate using only IPv4 addresses. When a host needs to communicate with JP1/AJS3 - Manager or JP1/AJS3 - Agent of an older version, the host must treat the manager host or the agent host as an IPv4 host regardless of the protocol it supports.
- Although the IPv4 protocol must be installed and enabled on a host on which JP1/AJS3 - Manager is installed, an IPv4 address does not need to be assigned to the host. Therefore, you can assign only an IPv6 address, and use the host as an IPv6 host.

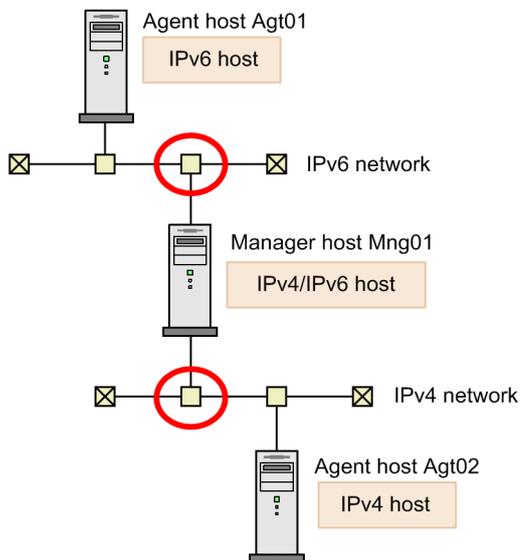
The following figure shows example system configurations for communication using IPv6 addresses.

Figure 2–22: Example of system configurations for communication using IPv6 addresses

■ Configuration example 1



■ Configuration example 2

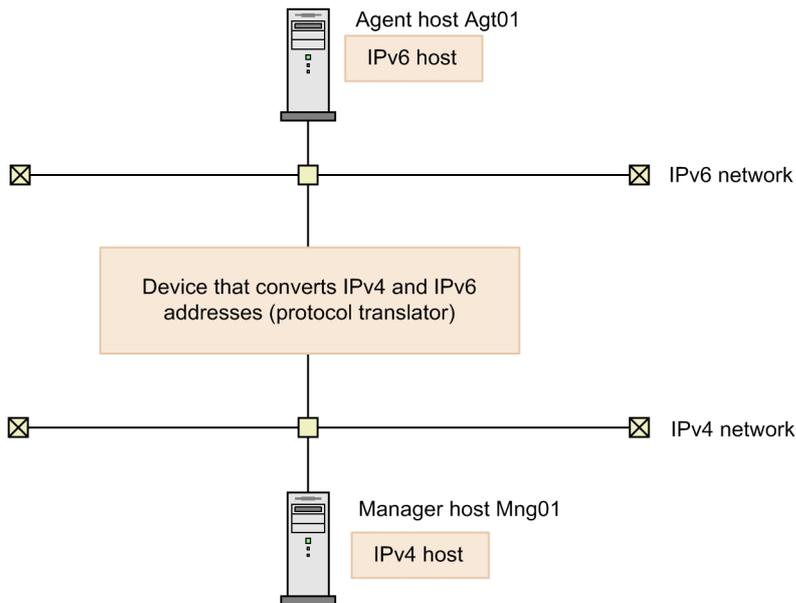


Configuration example 1 shows an example configuration where multiple manager hosts and agent hosts are connected. Because Mng02 and Agt02 are IPv6 hosts, communication between Mng01 and Mng02, between Mng01 and Agt02, and between Mng02 and Agt01 is not possible. In this configuration, only communication between Mng01 and Agt01 and between Mng02 and Agt02 is possible.

In configuration example 2, a manager host and agent hosts are connected. Mng01 is an IPv4/IPv6 host and can communicate with both Agt01 and Agt02.

Figure 2–23: Example of an unsupported configuration

■ Example of an unsupported configuration



Like the configuration above, configurations that have devices that convert IPv4 and IPv6 addresses (protocol translators) between hosts are not supported.

#### (4) IPv6 addresses that cannot be used

A JP1/AJS3 that uses IPv6 addresses cannot use the following special IPv6 addresses. Design a system configuration that does not use these IPv6 addresses.

Table 2–19: IPv6 addresses that cannot be used

No.	Type	Description	Example IPv6 address that cannot be used
1	Link-local unicast address	Link-local unicast addresses are valid only on the same subnet (link). The upper 16 bits are fe80. Link-local unicast addresses cannot be used for JP1/AJS3 IPv6 address communication.	fe80::0123:4567:89ab:cdef
2	IPv4-compatible address	IPv4-compatible addresses are used by IPv4/IPv6 hosts to communicate with one another over an IPv4 network. The upper 96 bits are 0 and the lower 32 bits are the IPv4 address of an IPv4/IPv6 host. IPv4-compatible addresses cannot be used for JP1/AJS3 IPv6 address communication.	::192.1.2.3
3	IPv4-mapped address	IPv4-mapped addresses are used to represent IPv4 addresses as IPv6 addresses when an IPv4 host communicates with an IPv6 host. The first 80 bits are 0, the next 16 bits are 1, and the remaining 32 bits are the IPv4 address of the IPv4 host. IPv4-mapped addresses cannot be used for JP1/AJS3 IPv6 address communication.	::ffff:192.1.2.3
4	Unspecified address	For this address, all bits are 0. The unspecified address is used as the source address in the DHCPv6 protocol, but is usually not used. The unspecified address cannot be used for JP1/AJS3 IPv6 address communication.	::

No.	Type	Description	Example IPv6 address that cannot be used
5	Anycast address	This address is used only as the destination. To enable anycast communication, assign the same address to multiple interfaces. That address is the anycast address. When a host sends a packet to an anycast address, the packet is sent to the interface nearest the source based on the metrics of the routing protocol. Anycast addresses cannot be differentiated from global unicast addresses. Anycast addresses cannot be used for JP1/AJS3 IPv6 address communication.	2001:db80::ffff:1 (when used as an anycast address)
6	Multicast address	This address is used only as the destination. The upper 8 bits are 1. To enable multicast communication, specify a group of interfaces. When a host sends a packet to a multicast address, the packet is sent to all the interfaces in the group. Multicast addresses cannot be differentiated from global unicast addresses. Multicast addresses cannot be used for JP1/AJS3 IPv6 address communication.	ff00:1001::abc1 (when used as a multicast address)
7	IPv6 address generated by the automatic stateless address generation function	The automatic stateless address generation function allows an IPv6 host to automatically generate unicast addresses. IPv6 addresses that are generated by the automatic stateless address generation function cannot be used for JP1/AJS3 IPv6 address communication.	2001:db80::ffff:1 (when generated by the automatic stateless address generation function)

## (5) Settings for communication using IPv6 addresses

### (a) JP1/Base settings for communication using IPv6 addresses

If you want hosts to communicate using IPv6 addresses, you need to specify ANY binding addresses and configure `jp1hosts2`. If you enable the `jp1hosts2` definition, the `jp1hosts` definition will be disabled. If you want to perform an upgrade installation of JP1/Base from version 09-50 or earlier to version 10-00 or later, you need to migrate the definitions used for version 09-50 or earlier from `jp1hosts` to `jp1hosts2`.

For details about how to specify ANY binding addresses and how to configure `jp1hosts2`, see the *Job Management Partner 1/Base User's Guide*.

### (b) JP1/AJS3 settings for communication using IPv6 addresses

The following describes the settings required by JP1/AJS3 - Manager and JP1/AJS3 - Agent to enable communication using IPv6 addresses.

#### Settings for JP1/AJS3 - Manager and JP1/AJS3 - Agent

Using IPv6 addresses in JP1/AJS3 is the equivalent of setting up a multiple-LAN configuration that combines IPv6 networks and IPv4 networks. See [2.3.4 Example configurations with multiple LANs and their communications settings](#), and then specify the settings required for operation in a multiple-LAN environment.

#### Settings for JP1/AJS3 - Manager

No settings are required when you initially install JP1/AJS3 - Manager.

If you perform an upgrade installation of JP1/AJS3 - Manager from version 09-50 or earlier to version 10-00 or later, the embedded database needs to be rebuilt. For details about the setup, see [3.5.3 Settings for communication using IPv6 addresses](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide*

1 (for Windows) or 13.4.6 *Settings for communication using IPv6 addresses* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX).

### Settings for JP1/AJS3 - Agent

When the version is 10-00 or later, settings are not required regardless of the installation method.

## (c) Configuring a firewall for communication using IPv6 addresses

When you use JP1/AJS3 in a network environment with a firewall, configure the firewall so that the IPv6 addresses used by JP1/AJS3 can pass through the firewall.

Note that JP1/AJS3 version 10 or later uses the loopback address. Configure the firewall so that the loopback address in IPv6 format can pass through the firewall.

## (6) Cautionary notes on communication using IPv6 addresses

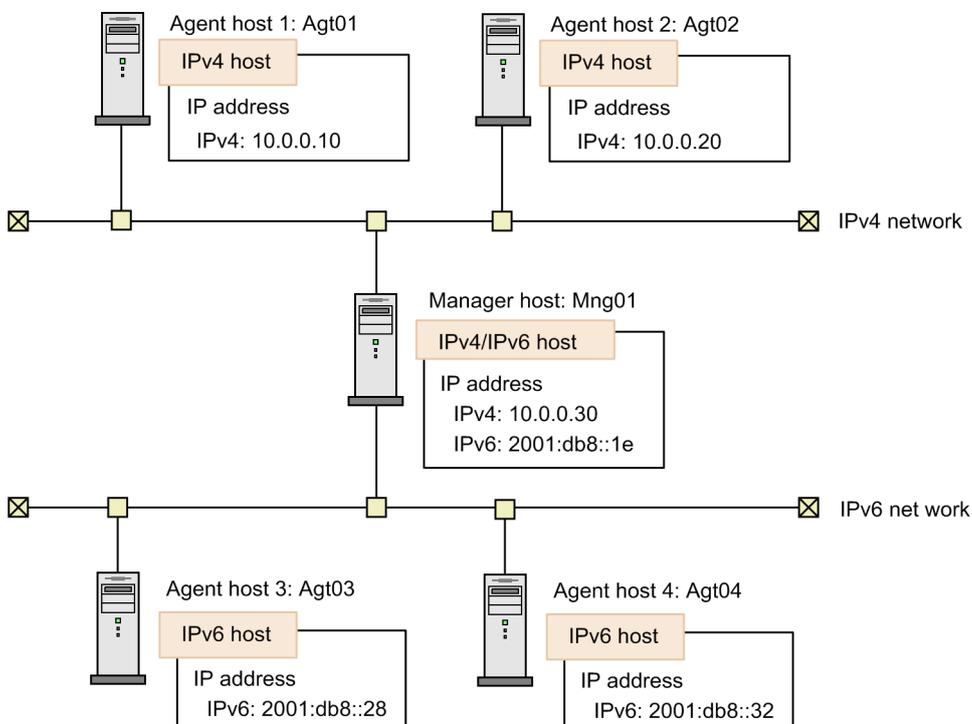
- Before you attempt installation or uninstallation, or attempt to enable or disable the IPv4 and IPv6 protocols on running hosts, stop the JP1/AJS3 services.
- The OpenView Status Report job cannot be used for communication using IPv6 addresses.

## (7) Examples of configurations for environments using IPv6 addresses and their communication settings

For JP1/AJS3 to be able to perform communication using IPv6 addresses, `jp1hosts2` must be defined so that the host names of connection target hosts can be resolved to IP addresses.

The following figure shows an example configuration for an environment using IPv6 addresses for communication.

Figure 2-24: Example of a configuration for an environment using IPv6 addresses



In this system configuration example, `jp1hosts2` is defined as follows on each host.

### jp1hosts2 on Mng01

```
Mng01 2001:db8::1e 10.0.0.30
Agt01 10.0.0.10
Agt02 10.0.0.20
Agt03 2001:db8::28
Agt04 2001:db8::32
```

### jp1hosts2 on Agt01

```
Agt01 10.0.0.10
Mng01 10.0.0.30
```

### jp1hosts2 on Agt02

```
Agt02 10.0.0.20
Mng01 10.0.0.30
```

### jp1hosts2 on Agt03

```
Agt03 2001:db8::28
Mng01 2001:db8::1e
```

### jp1hosts2 on Agt04

```
Agt04 2001:db8::32
Mng01 2001:db8::1e
```

For details about `jp1hosts2`, see the *Job Management Partner 1/Base User's Guide*.

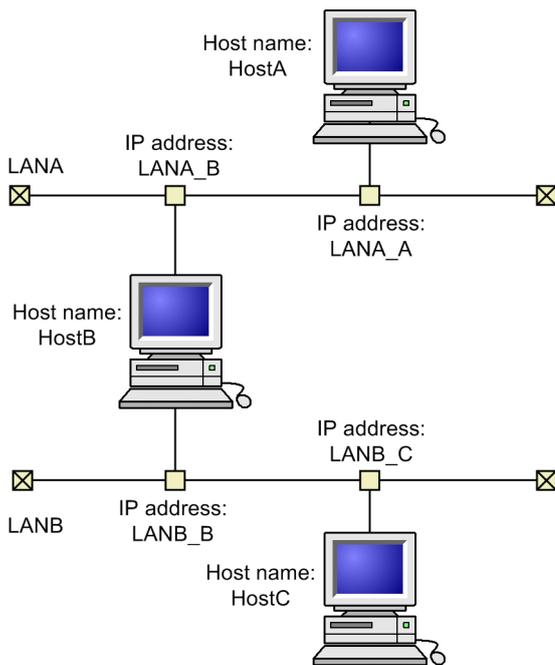
## 2.3.4 Example configurations with multiple LANs and their communications settings

To be able to use JP1/AJS3, you need to define one of the following in order to obtain IP addresses from the host names of the connection target hosts:

- DNS server
- `hosts` file
- `jp1hosts` file or `jp1hosts2` file

The following figure shows an example of a system configuration for communicating with a host connected to multiple LANs.

Figure 2–25: Example of a system configuration for communicating with a host connected to multiple LANs



In this configuration, you need to specify settings so that when `HostA` attempts to acquire the IP address of `HostB`, it acquires the `LANA_B` IP address. Similarly, specify settings so that when `HostC` attempts to acquire the IP address of `HostB`, it acquires the `LANB_B` IP address.

Assuming that the above prerequisites are met, the following are tips for using JP1/AJS3 on a host connected to multiple LANs.

- Whether the communication protocol for multiple LAN connections has been set for JP1/Base  
If the communication protocol for multiple LAN connections has been set for the JP1/Base communication setting, the JP1/AJS3 communication protocol is determined by this setting. See (1) *Communication protocols for sending or receiving data* and (2) *Methods for resolving host names* to make sure you can use JP1/AJS3 with the current settings.
- Whether to set multiple LAN connections if the communication protocol for multiple LAN connections for JP1/Base has not been set  
The following are important considerations regarding the JP1/Base communication settings:
  - Selection of the communication protocol for sending or receiving data
  - Host name resolution methods (defining `jp1hosts` information or `jp1hosts2` information)

For details about JP1/Base multiple LAN connections, see the description about using JP1/Base in a dissociated network environment in the *Job Management Partner 1/Base User's Guide*.

## (1) Communication protocols for sending or receiving data

The table below shows the communication protocols that are available after JP1/AJS3 has been set up. The communication protocol varies according to whether multiple LAN connections provided by JP1/Base have been set in advance. For details about how to check the current settings, see the description of the JP1/Base communication protocols in the *Job Management Partner 1/Base User's Guide*.

The following table explains communication protocols available after JP1/AJS3 has been set up.

Table 2-20: Communication protocols available after JP1/AJS3 has been set up

		Communication protocol for physical hosts		Communication protocol for logical hosts	
		Send	Receive	Send	Receive
Multiple LAN connections have not been set <sup>#1</sup>	Immediately after installation	ANY binding	ANY binding	--	--
	Immediately after cluster setup	IP binding	IP binding <sup>#2</sup>	IP binding	IP binding <sup>#2</sup>
Multiple LAN connections have been set <sup>#1</sup>	Immediately after installation	Same as JP1/Base	Same as JP1/Base <sup>#2</sup>	--	--
	Immediately after cluster setup	Same as JP1/Base	Same as JP1/Base <sup>#2</sup>	Same as JP1/Base	Same as JP1/Base <sup>#2</sup>

Legend:

--: Not applicable

#1

Note that when an OS that allows the user to acquire multiple IP addresses from a single host name is used, the event/action control function and the job execution control function operate differently as follows.

When the communication protocol for multiple LAN connections has not been set for JP1/Base

Acquired IP addresses are used one after another until a connection is successfully established.

When the communication protocol for multiple LAN connections has been set for JP1/Base

Of the obtained IP addresses, a connection is attempted only to the IP address at the beginning in the `jp1hosts` file or `jp1hosts2` file.

#2

ANY binding is used for the JP1/AJS3 Queueless Agent and JP1/AJS3 Check Agent services.

If IP binding is set for the transmission setting, data can be sent to only one LAN. In the configuration example shown in [Figure 2-25](#), if the `HostB` transmission setting is IP binding, `HostB` can communicate with either `LANA` or `LANB`. For this reason, use ANY binding for the transmission setting of a host connected to multiple LANs, irrespective of whether cluster operation is used. When only physical hosts are used, you do not need to specify the setting because ANY binding is set immediately after installation. In a cluster system, you must set the communication protocol for multiple LAN connections of JP1/Base because IP binding is set immediately after cluster setup.

When ANY binding is set for the receive setting in a cluster system, data sent to a physical host might be received by a logical host, or data sent to a logical host might be received by a physical host. As a result, jobs cannot be executed correctly. To avoid this problem, IP binding must be set for the receive setting, irrespective of whether the host is connected to multiple LANs. The setting cannot be changed to ANY binding.

When IP binding is set for the receive setting, only data from a single host can be received. In the configuration example shown in [Figure 2-25](#), if the `HostB` receive setting is IP binding, `HostB` can receive data from either `HostA` or `HostC`. When the communication protocol for multiple LAN connections of JP1/Base is specified, data from both `LANA` and `LANB` can be received as long as the receive setting is IP binding. Accordingly, if you want to set IP binding for the `HostB` receive setting, the communication protocol for multiple LAN connections of JP1/Base must be set on `HostB`.

The following table summarizes the above discussion.

Table 2-21: Whether changes in the communication protocol for JP1/AJS3 are required

	Connection to multiple LANs	
	No	Yes
Operation using physical hosts only	No problem occurs if the setting specified immediately after installation is used.	No problem occurs if the setting specified immediately after installation is used.
Cluster operation	No problem occurs if the setting specified immediately after cluster setup is used.	The communication protocol for multiple LAN connections of JP1/Base must be considered.

Even for the cases in the above table for which there is no problem, you can permanently assign the LAN to be used for JP1/AJS3 by setting the communication protocol for multiple LAN connections of JP1/Base as necessary.

When JP1/AJS3 - Manager, JP1/AJS3 - Agent, and JP1/AJS3 - View are used in an environment in which multiple LANs are connected, the necessary settings vary according to the host on the LAN where a product is used. For details about these settings, see *D. Communication Settings in Multiple-LAN Environments*.

## (2) Methods for resolving host names

For a host connected to multiple LANs, multiple IP addresses must be obtained from a single host name. In the configuration example shown in *Figure 2-25*, the LANA\_B and LANB\_B IP addresses must be acquirable as the IP addresses of HostB. However, depending on the OS, it might not be possible to acquire multiple IP addresses from a single host name. In addition, if the hosts use the same `hosts` file or DNS, and HostC attempts to acquire the IP address of HostB, the LANA\_B IP address might be acquired but the LANB\_B IP address might not be.

Even in these cases, you can obtain multiple IP addresses from a single host name for JP1/AJS3 communications by defining the `jp1hosts` information or `jp1hosts2` information provided by JP1/Base. As a result, when HostC obtains the IP address of HostB, HostC can also obtain the IP address of LANB\_B.

For details about `jp1hosts` and `jp1hosts2`, see the *Job Management Partner 1/Base User's Guide*.

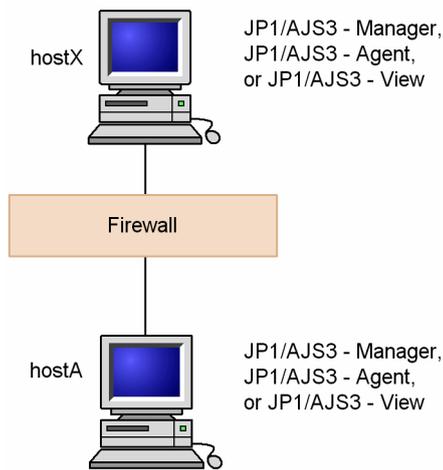
### 2.3.5 Example of configurations that include a firewall, and their communications settings

This subsection describes examples of configurations for cluster and non-cluster operation in environments that include a firewall, and their communication settings.

#### (1) Example configuration with a firewall for non-cluster operation, and its communications settings

The following explains a configuration for non-cluster operation in a firewall environment, and the communication settings. The following figure shows a configuration example.

Figure 2-26: Example of a configuration for setting a firewall in a non-cluster system

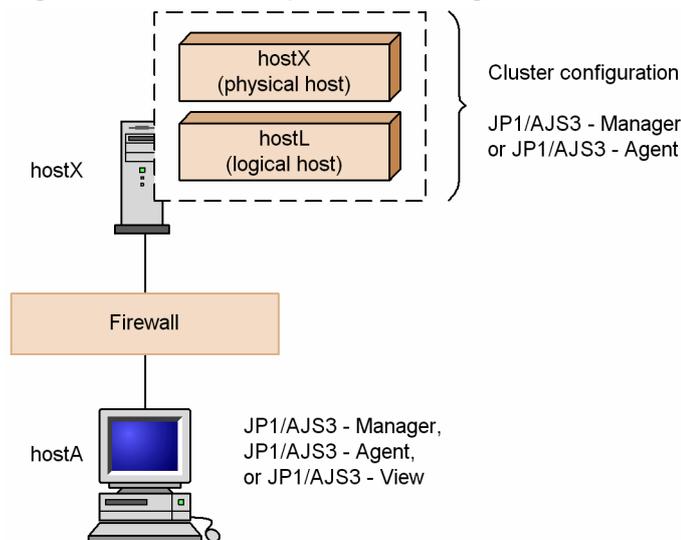


The firewall is configured so that data passes through it between `hostX` and `hostA`. In this system configuration, there is no need to make any special settings in JP1/AJS3 in addition to the settings for the firewall.

## (2) Example configuration with a firewall for cluster operation, and its communications settings

The following explains a configuration and communication settings for cluster operation in a firewall environment. The following figure shows a configuration example.

Figure 2-27: Example of a configuration for setting a firewall in a cluster system



When the firewall is configured so that data passes through it both between `hostX` and `hostA`, and between `hostL` and `hostA`, as in *(1) Example configuration with a firewall for non-cluster operation, and its communications settings* above, you do not have to make any special settings in JP1/AJS3.

In a system based entirely on logical hosts with no physical host services, if a firewall is set up only between `hostL` and `hostA`, you must set IP bind as the sending method. For details about how to set IP bind, see the chapter about communication settings in the *Job Management Partner 1/Base User's Guide*.

### Cautionary note

If a firewall has not been set to allow communication between `hostX` (physical host) and `hostA`, data cannot pass through the firewall when a queueless job is executed. If you are using queueless jobs, set the environment so that data from the physical host can pass through the firewall.

## 2.3.6 Communications used in a WAN

When using a WAN with JP1/AJS3, make sure you use them in a communications environment with secure communications and stable communication lines.

You can ensure secure communications in a communications environment by, for example, using a VPN.

If a communication line is unstable, job delays or errors whose causes are hard to identify might occur. To prevent such problems, use a communication line that has a stable data transfer rate.

When using a WAN for manager-agent communication, use JP1/AJS3 products of version 10-00 or later. Do not use a WAN for connections with products of version 09-50 or earlier.

The following table shows whether a WAN can be used with particular combinations of product versions.

Table 2-22: Manager host and agent host versions and whether a WAN can be used

		JP1/AJS3 - Manager	
		09-50 or earlier	10-00 or later
JP1/AJS3 - Manager	09-50 or earlier	N	N
	10-00 or later	N	Y
JP1/AJS3 - Agent	09-50 or earlier	N	N
	10-00 or later	N	Y

### Legend:

Y: Supported

N: Not supported

A WAN can be used for connections between the following programs and components whose version is 09-50 or earlier:

- Between JP1/AJS3 - Manager and JP1/AJS3 - View
- Between JP1/AJS3 Console View and JP1/AJS3 Console Manager
- Between JP1/AJS3 Console Manager and JP1/AJS3 Console Agent

We do not recommend using a network for which you are charged based on the amount of time or amount of data.

If you do use a WAN environment for which you are charged based on the amount of time or amount of data, you can reduce communication costs by, for example, disabling KeepAlive (which requires a continuous connection that checks connectivity with the destination) in the environment settings. Setting devices such as routers to disconnect automatically when inactivity is detected will also reduce costs. However, monitoring from JP1/AJS3 Console View requires an online environment. Monitoring cannot be performed if the line is automatically disconnected when inactivity is detected.

When you perform monitoring from JP1/AJS3 Console View in a WAN environment for which you are charged based on the amount of time or amount of data, note the following:

1. The line will remain connected.
2. Communication will be performed randomly when the status of the monitored object changes.

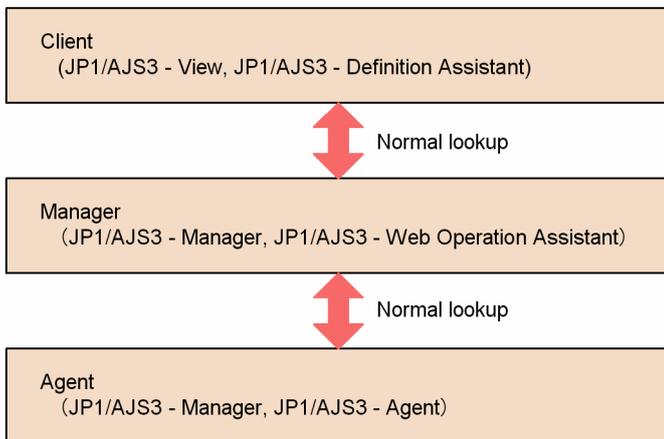
To reduce communications costs, therefore you must log out and terminate JP1/AJS3 Console View when not in use. Communication does not occur when no one is logged in.

## 2.3.7 Checking operation in a DNS environment

You can use JP1/AJS in a DNS environment. To use JP1/AJS in a manager/agent configuration, define normal lookup on the DNS.

The following figure shows the settings required for name resolution by using normal lookup for JP1/AJS3 products.

Figure 2-28: Settings required for name resolution by using normal lookup for JP1/AJS3 products



If you want to use a FQDN (Fully Qualified Domain Name) host name as the execution agent name for event jobs, you need to specify the settings described in this subsection. You do not need to specify these settings when using event jobs if there are no duplicated host names in the same network, in an environment that spans multiple domains, or if you do not plan to use event jobs.

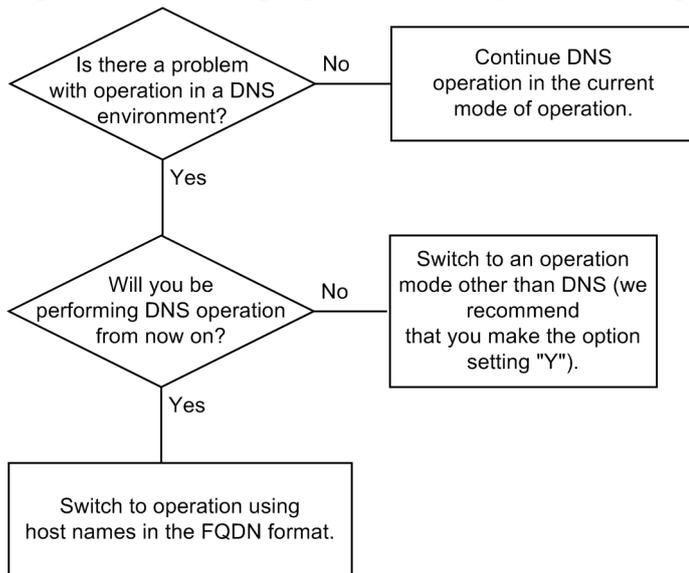
When the settings described in this section are specified, each host obtains an FQDN host name from the local host name and sends it to the other hosts during communication between the manager and agent hosts when event jobs are executed. This allows the manager and agent hosts to uniquely identify each other and to correctly process the communication data.

You do not need to switch to using FQDN hosts names if all the host names in the same network are unique and no problems occur.

### (1) When to switch to using FQDN host names for event jobs

You do not need to change the current settings if the event jobs use the DNS and host names that are unique in the same network. Follow the flowchart below to determine whether you need to switch to using FQDN host names for event jobs.

Figure 2-29: Judging the necessity of switching to operation with host names in the FQDN format



New settings are required if the flowchart above indicates that you need to switch to using FQDN host names. For the setting procedure, see *6.3.5 Using fully qualified domain names (FQDN) when using event jobs during DNS operation* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or *15.3.5 Using fully qualified domain names (FQDN) when using event jobs during DNS operation* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

Note that, by default, Receive JP1 event jobs, Monitoring log files jobs, and Monitoring event log jobs obtain the host name of the host on which they are executed. These jobs then operate using the JP1/Base event server that has the same name as the host name they obtained. Therefore, to execute these jobs on an agent host that performs operations with the event server by using the FQDN event server name, set the FQDN agent host name or FQDN event server name used by JP1/AJS3 on the agent host. For details about how to set the names, see *6.3.18 Setting the event server name in the system using DNS* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or *15.3.18 Setting the event server name in the system using DNS* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

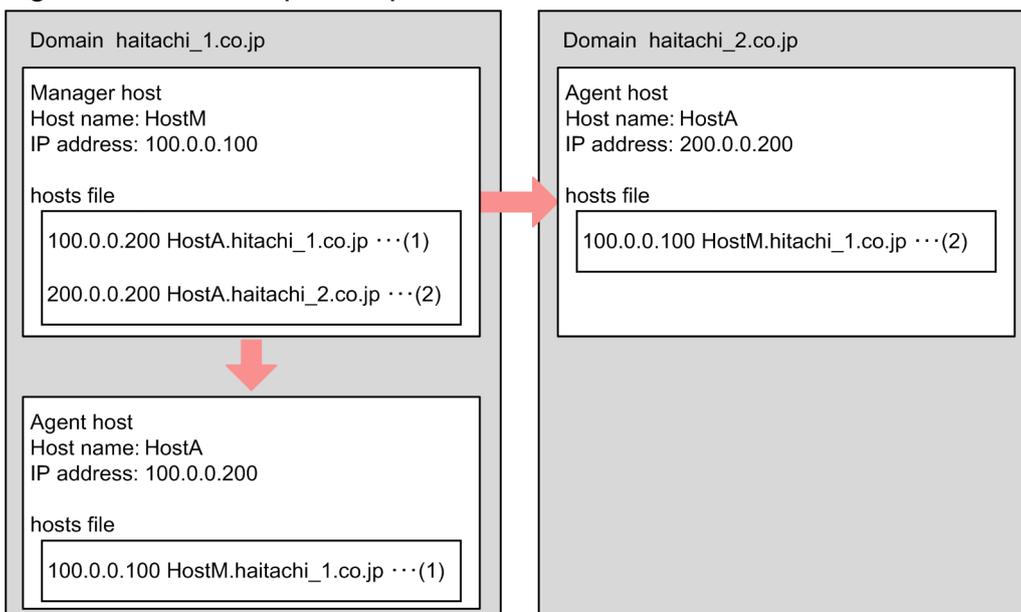
If necessary, see *6.6.1 Canceling and re-setting service dependencies* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* and then set the JP1/AJS3 service dependencies.

## (2) Example of using FQDN host names when the DNS is used

This subsection shows an example of using FQDN host names to execute a job for agent hosts that have the same host name `HostA`, but have different IP addresses (`100.0.0.200` and `200.0.0.200`). In this example, the job has been assigned the execution host names `HostA.hitachi_1.co.jp` and `HostA.hitachi_2.co.jp`, and is entered from the manager host with host name `HostM` and IP address `100.0.0.100`.

The example assumes that the `hostname` command executed on a manager host or agent host will return a host name in FQDN format. For details about the required setting when changing to FQDN host names, see *(1) When to switch to using FQDN host names for event jobs* above.

Figure 2-30: Example of operation with FQDN host names



For this example, set the `hosts` files on the manager and the agent hosts in the local domain as follows (see (1) in the figure).

Note that the settings take effect in UNIX, but are not required in Windows Server 2003 SP1 or later.

- The `hosts` file at the manager:

Specify the following setting so that the name `HostA` can be resolved:

```
100.0.0.200 HostA.hitachi_1.co.jp
```

- The `hosts` files at the agent (`HostA` on `Hitachi_1.co.jp`):

Specify the following setting so that the name `HostM` can be resolved:

```
100.0.0.100 HostM.hitachi_1.co.jp
```

In an environment in which neither of the DNS servers is able to resolve the host name of the other server, set the `hosts` files for both the manager and agent hosts as follows (see (2) in the figure).

- The `hosts` file of the manager server on `hitachi_1.co.jp`:

```
200.0.0.200 HostA.hitachi_2.co.jp
```

- The `hosts` file of the agent server on `hitachi_2.co.jp`:

```
100.0.0.100 HostM.hitachi_1.co.jp
```

When you specify the above settings, manager host name `HostM.hitachi_1.co.jp` is sent to each agent host when the job is executed, and the agent hosts send a reply to `HostM.hitachi_1.co.jp`.

#### Cautionary notes

- Use the manager host in an environment in which it can resolve the name of each agent host in FQDN format. Use the agents in an environment in which they can resolve the manager's name in FQDN format.

- For host name resolution in a UNIX environment, the DNS must be searched before the `hosts` file. Otherwise, correct FQDN host names might not be acquired.
- If you switch to FQDN host names, host names in FQDN format are used for the communication between manager hosts and agent hosts when event jobs are executed. If short local host names are defined in the `jp1hosts` information or `jp1hosts2` information, the settings in the `jp1hosts` information or `jp1hosts2` information take precedence over the DNS server. In that case, short host names are used for communication between manager hosts and agent hosts when event jobs are executed. If you define a short local host name in the `jp1hosts` information or `jp1hosts2` information on an agent host, define the short agent host name in the `jp1hosts` information or `jp1hosts2` information on the manager host. If you define a short local host name in the `jp1hosts` information or `jp1hosts2` information on the manager host, define the short manager host name in the `jp1hosts` information or `jp1hosts2` information on the agent hosts. For details about how to define `jp1hosts` information or `jp1hosts2` information, see the *Job Management Partner 1/Base User's Guide*.
- As long as the manager and agents operate within the same domain (`hitachi_1.co.jp`), it does not matter whether the value of `DNSEstablish` is Y or N. However, the manager host and agent hosts must operate in an environment in which the manager host and each agent host can resolve the name of the other hosts.

### (3) Notes on operation in a DNS environment

Note the following when using JP1/AJS3 in a DNS environment:

- In a DNS environment, FQDN host names cannot be used for logical host names. Therefore, specify the settings so that IP addresses can be resolved from logical host names that are not in FQDN format. If you are considering using a cluster configuration for a system consisting of multiple domains, specify unique logical host names.
- Run JP1/AJS3 in an environment in which the host names of agent hosts can be resolved as follows.
  - When you specify Y for the environment setting parameter `DNSEstablish`, the host names of agent hosts are in the FQDN format.
  - If you do not use DNS or you specify N for the environment setting parameter `DNSEstablish`, the host names of agent hosts are the ones that are output when you execute the `hostname` command.
- When you set an alias host name as the execution agent for event jobs, make sure that the execution host name from which the alias has been defined can also be resolved on the manager host.
- If a job has already been registered and the IP address cannot be resolved, job retry processing is performed. For details about this processing, see *Table 2-3 Job retry process if a network error occurs* in *2.2.2(5) Notes on manager/agent system configurations*.
- When you execute jobs on multiple hosts, specify settings that allow for the resolution of the IP addresses for the manager hosts, agent hosts, and the hosts in other systems.
- Define normal lookup. You do not need to define reverse lookup.
- When you obtain FQDN host names in an environment that uses the DNS, the case (upper or lower) of alphabetic characters in the host name might change each time it is obtained. The JP1/AJS manager used in such an environment is handled as another manager because the manager host name viewed from the agent has changed. This situation can lead to the following problems when an event job is executed.
  - When the JP1/AJS3 service on the manager is restarted while a jobnet with a start condition is running, any monitored event that was detected after the restart is detected again.
  - When the option to continue execution of active event jobs is enabled, if the JP1/AJS3 service on the manager is restarted in hot-start mode while an event job is running, multiple events are incorrectly detected as one event.

To prevent such problems, before you start operating JP1/AJS3 in a DNS environment, set a fixed manager name that will be used for communication between the manager and agent hosts. For details, see *6.3.16 Settings for*

ensuring that a fixed manager host name is used when event jobs are executed in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or *15.3.17 Settings for ensuring that a fixed manager host name is used when event jobs are executed in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX). However, a fixed manager name is not necessary if you execute the `jpagoec` command on the agent host on which event jobs are executed and the manager host names remembered by the agent are unique regardless of case.

- To switch to operation that uses FQDN host names, use the procedure in *8.9.5 Changing to FQDN host names for event jobs in a DNS environment* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.
- If you have switched to operation using FQDN host names, use the `jp1ping` command to make sure that the manager host is able to resolve agent host names and that the agent hosts are able to resolve the manager host name. For details about the `jp1ping` command, see the *Job Management Partner 1/Base User's Guide*.

## 2.3.8 Restricting access to JP1/AJS3

*Connection source restriction* refers to functionality that limits the hosts that are able to access JP1/AJS3. Restricting access to JP1/AJS3 - Manager or JP1/AJS3 - Agent can prevent unintended hosts from performing operations or executing jobs.

To use the connection source restriction function, specify a value for the environment setting parameter `CONNECTIONRESTRICTION`, and create a connection permission configuration file for each manager host or agent host (logical host in the case of a logical host). If you specify the IP addresses of hosts for which access is to be permitted, then only the hosts that have one of the specified IP addresses are given access. An access attempt by any other host will be rejected. For details about the environment setting parameter `CONNECTIONRESTRICTION`, see *2.9.2(5) CONNECTIONRESTRICTION* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

There are two connection permission configuration files: a manager connection permission configuration file (`permitted_host_manager.conf`) and an agent connection permission configuration file (`permitted_host_agent.conf`).

For details about how to restrict access to JP1/AJS3, see *4.4 Settings for restricting connections to JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows) or *14.4 Settings for restricting connections to JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX).

### Cautionary notes

- If there is no connection permission configuration file that corresponds to the value of the environment setting parameter `CONNECTIONRESTRICTION` in the environment setting file storage folder, the JP1/AJS3 service or the JP1/AJS3 Queueless Agent service terminates abnormally.
- The connection source restriction function is not available in compatible ISAM configurations.

## (1) Operations subject to access restrictions

The connection source restriction function can prohibit the following operations from accessing JP1/AJS3:

- Logins to JP1/AJS3 - Manager
- Executions of various types of units
- Connections from related products

- Remote executions of commands that start with `ajs`
- Remote executions of commands that start with `jpg`

Each of these cases are described below.

### (a) Restricting logins to JP1/AJS3 - Manager

You can limit the hosts that are able to log in to JP1/AJS3 - Manager.

To do so, specify the IP addresses whose connection you want to permit in the manager connection permission configuration file.

The following describes connection source restriction as it applies to logins from JP1/AJS3 - View:

#### JP1/AJS3 - View

You can restrict logins by specifying the IP addresses of the JP1/AJS3 - View hosts that will be able to access JP1/AJS3 - Manager in the manager connection permission configuration file.

If you change the settings to deny access by specifying the IP address of a JP1/AJS3 - View host after the host has already connected to JP1/AJS3 - Manager, operations such as execution registration and kill can be performed from the already connected JP1/AJS3 - View. Restrictions of the JP1/AJS3 - View connection take effect only at the next login.

Note that you cannot prohibit JP1/AJS3 Console View from accessing JP1/AJS3. To prohibit JP1/AJS3 Console View from accessing JP1/AJS3 Console Manager, or to prohibit JP1/AJS3 Console Manager from accessing JP1/AJS3 Console Agent, set the environment setting parameter `ENABLEOPERATION` to `no`. Setting this parameter to `no` prohibits JP1/AJS3 Console View from accessing JP1/AJS3 regardless of the settings in the connection permission configuration file. For details about the environment setting parameter `ENABLEOPERATION`, see 2.8.2(13) *ENABLEOPERATION* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

### (b) Restricting executions of various types of units

You can prohibit unintended hosts from executing various types of units.

When JP1/AJS3 - Manager requests that JP1/AJS3 - Agent execute, re-execute, kill, or check the status of jobs, JP1/AJS3 - Agent checks whether the IP address of the requester host is set in the agent connection permission configuration file.

For a unit such as a remote jobnet that connects to another manager host, the destination JP1/AJS3 - Manager checks whether the IP address of the requester host is set in the manager connection permission configuration file.

The request will be rejected if the IP address is not found in the connection permission configuration file.

The following table shows which connection permission configuration file is used to restrict access for each unit type.

Table 2-23: Files used to restrict connection source restriction by unit

No	Unit type	Files used for connection source restriction
1	Remote jobnet	M
2	Manager job group	M
3	Manager jobnet	M
4	Planning group	--
5	Start condition	--

No	Unit type	Files used for connection source restriction
6	Standard job	Unix job
7		PC job
8		QUEUE job
9	Jobnet connector	--
10	OR job	--
11	Judgment job	--
12	Event job	A
13	Action job	A
14	Custom job	A
15	Passing information settings job	--

Legend:

M: Manager connection permission configuration file

A: Agent connection permission configuration file

--: Connection source restriction is not possible.

#

When a QUEUE job is registered in the queue, the manager connection permission configuration file on the manager host that owns the queue determines whether the connection (registration) is permitted.

When a QUEUE job is executed, the agent connection permission configuration file on the agent host that is connected to the queue determines whether the connection (job execution) is permitted.

### (c) Restricting connections from related products

You can prohibit related products from accessing JP1/AJS3 - Manager.

In the connection permission configuration file, specify the IP addresses of those hosts to which you want to permit connections and on which related products are installed.

You can restrict access to JP1/AJS3 - Manager from the following products:

- JP1/AJS3 - Definition Assistant
- JP1/AJS3 - Web Operation Assistant
- JP1/NQSEXEC (for receiving job execution requests)

### (d) Restricting remote executions of commands that start with ajs

You can restrict connections to JP1/AJS3 - Manager to be used for remote executions of commands that start with ajs.

If you remotely execute commands that start with ajs, specify the IP address of the manager host initiating command execution in the manager connection permission configuration file on the manager host where the commands are to be executed.

For details about commands that can be executed remotely, see *1.1.7 Remote execution of a command* in the *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

### (e) Restricting remote executions of commands that start with jpq

You can restrict connections to JP1/AJS3 - Manager to be used for remote executions of commands that start with jpq.

When you remotely execute commands that start with `jpq`, specify the IP address of the manager host initiating command execution in the manager connection permission configuration file on the manager host where the commands are to be executed.

## (2) Setting the connection permission configuration file

In the connection permission configuration file, specify the IP addresses of the hosts whose connection to JP1/AJS3 - Manager or JP1/AJS3 - Agent you want to permit. Also make sure that the IP address of the local host is specified in the connection permission configuration file when you enable the connection source restriction function in JP1/AJS3 - Manager.

For details about the connection permission configuration file, see *4.4 Settings for restricting connections to JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows) or *14.4 Settings for restricting connections to JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX).

Note that caution is necessary if you set IP addresses for the following cases:

- If remote jobnets are executed
- If the `ajschkdef` command is used to check the jobnet connector
- In a NAT environment
- In an environment that uses the ANY binding communication method and uses multiple NICs or alias IP addresses

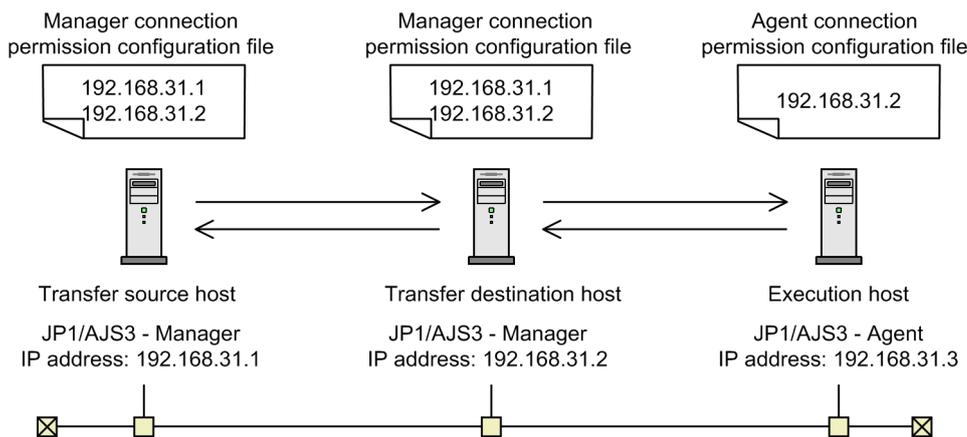
The following describes the IP addresses you need to specify for each case:

### (a) If remote jobnets are executed

If remote jobnets are executed, the IP addresses of the transferring host and the destination host must be set in the connection permission configuration files on both hosts.

The following figure shows an example of executing a remote jobnet in an environment in which connection source restriction is enabled.

Figure 2-31: Example configuration when a remote jobnet is executed



In this example, the transferring host, the destination host, and the execution host are as follows:

Transfer source host

- Local IP address (192.168.31.1)
- IP address of the destination host (192.168.31.2)

Transfer destination host

Local IP address (192.168.31.2)

IP address of the transferring host (192.168.31.1)

Execution host

IP address of the destination host (192.168.31.2)

Note

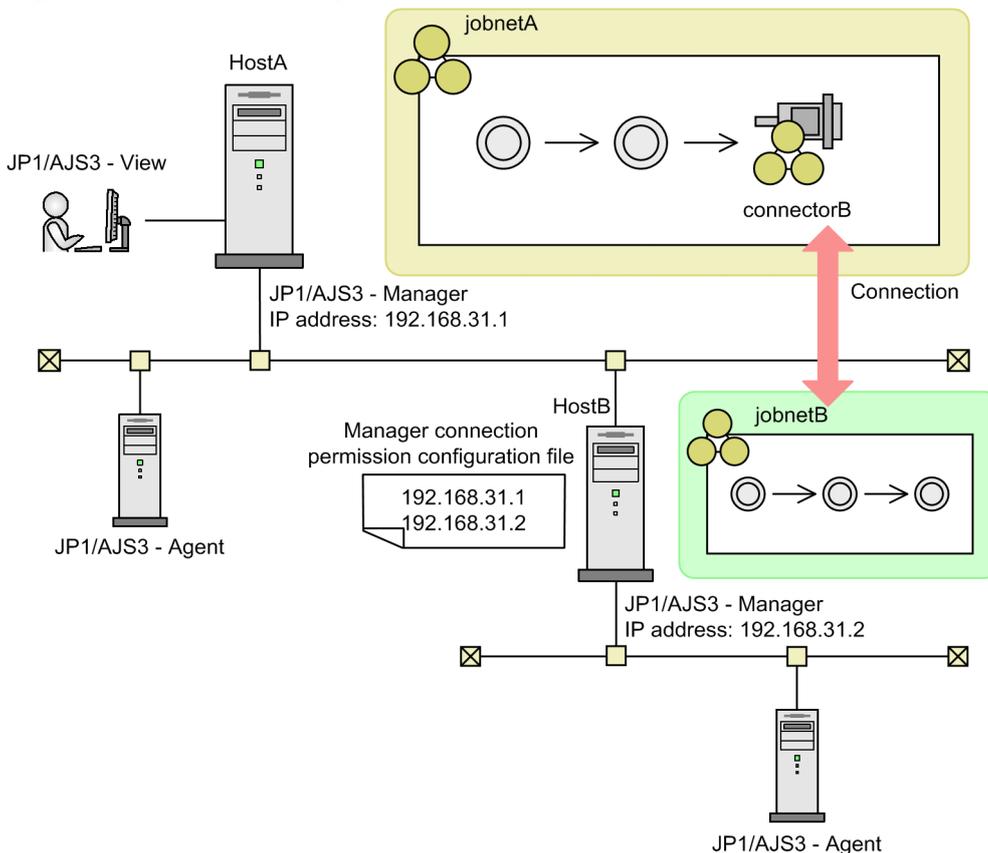
Do not change the connection-source restriction settings on a host while execution of a remote jobnet is being registered. If the connection source restriction function prohibits a connection after the remote jobnet is executed, operations such as status notification, kill, and deletion of the execution host cannot be performed.

## (b) If the `ajschkdef` command is used to check the jobnet connector

If you use the `ajschkdef` command with the `-M` option specified to perform a definition pre-check and if a jobnet connector whose **Connection range** is set to **Other service** is included as an object to be checked, you need to specify the IP address of the host on which the jobnet connector is defined in the manager connection permission configuration file on the destination host.

The following figure shows an example jobnet connector.

Figure 2-32: Example jobnet connector



In this example, the IP address of HostA, which is the host on which the jobnet connector is defined, is specified in the manager connection permission configuration file on the destination host HostB. If you execute the `ajschkdef` command without this specification, the "number of checked units" displayed for `NUMBER OF CHECKUNITS` in the check results is decreased by the number of units for which connection was denied, and the message `KAVS3431-I` is output to the integrated trace logs.

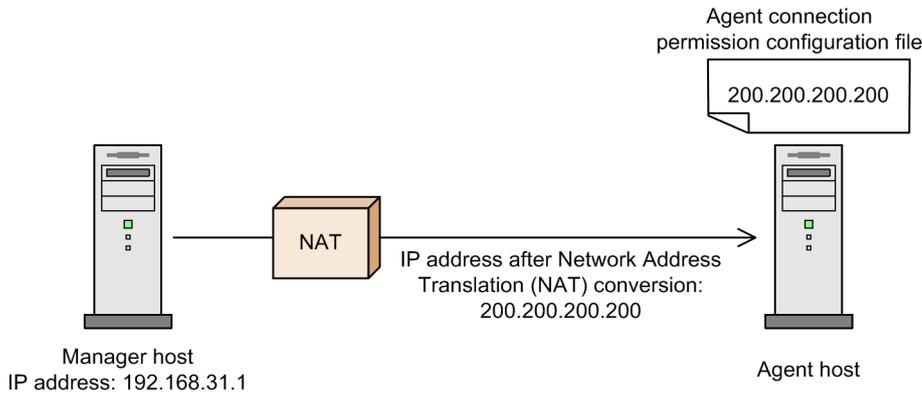
For details about `ajschkdef` command, see `ajschkdef` in 2. *Commands* in the manual *Job Management Partner 1/ Automatic Job Management System 3 Command Reference 1*.

### (c) In a NAT environment

In a NAT environment, the IP address of the host and the IP address used as the communication source differ. Specify the IP address after network address translation (NAT).

The following figure shows an example of restricting access in a NAT environment.

Figure 2-33: Example of restricting accesses in a NAT environment



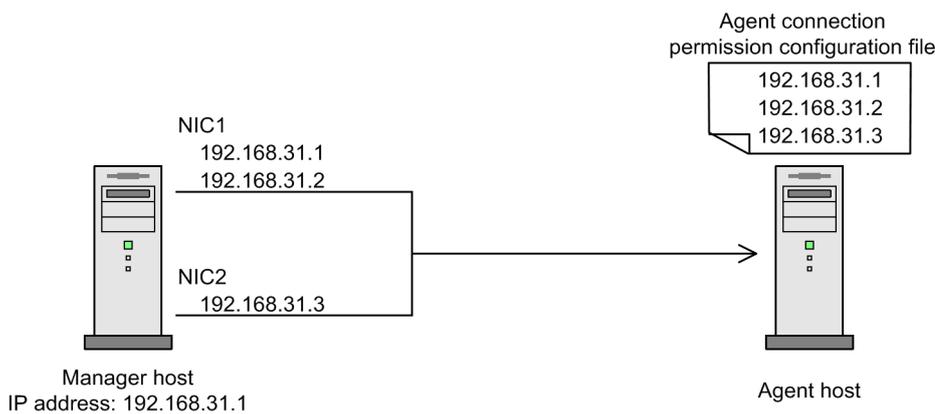
In this example, `200.200.200.200` is specified in the agent connection permission configuration file.

### (d) In an environment that uses the ANY binding communication method and uses multiple NICs or alias IP addresses

Specify all the addresses that can become actual communication sources.

The following figure shows an example of restricting access in a multiple-NIC environment.

Figure 2-34: Example of restricting access in a multiple-NIC environment



In this example, `192.168.31.1`, `192.168.31.2`, and `192.168.31.3`, which can be used by the manager host as the source IP addresses, are specified in the agent connection permission configuration file.

## 2.4 Determining the system environment settings

---

This section describes matters you need to consider in regard to the system environment settings.

### 2.4.1 Time zones

When you use JP1/AJS3 - View to log in to JP1/AJS3 - Manager, and you check the jobnet execution statuses and execution results, the time displayed obeys the time zone set in the OS of the computer where JP1/AJS3 - View is installed.

In Windows:

When running JP1/AJS3 - Manager in Windows, you cannot set time zones for individual processes (a manager host cannot handle more than one time zone). If your system operates across time zones, set up manager hosts and JP1/AJS3 - View hosts separately for each time zone.

In UNIX:

UNIX allows you to set time zones in process units, so you can set a TZ environment setting variable for each registered user to execute jobnets registered for execution at JP1/AJS3 - Manager (you can use multiple time zones at a single manager host).

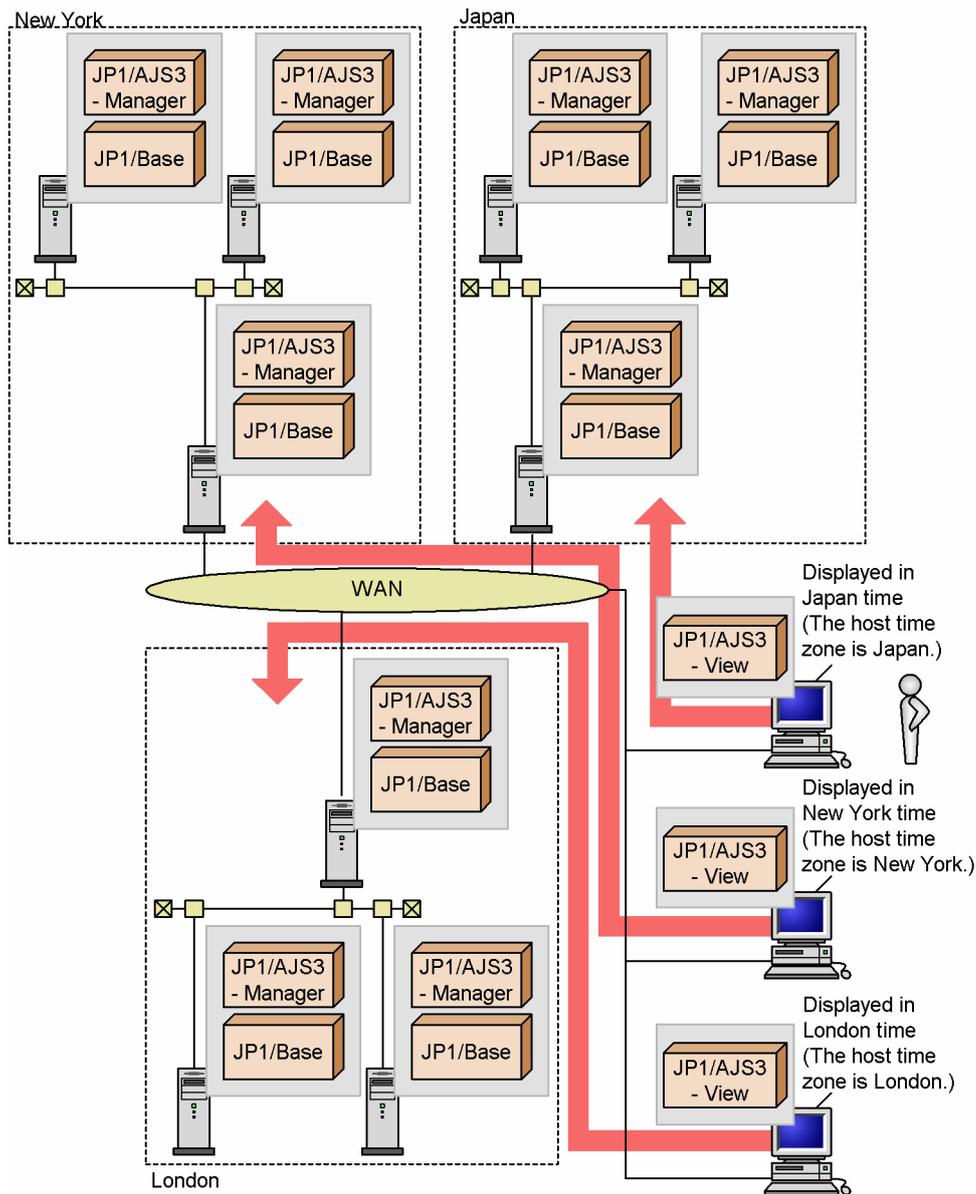
However, the following restrictions apply to operations on units:

- When working from JP1/AJS3 - View, since you can only handle one time zone, prepare unit definitions for each time zone and start JP1/AJS3 - View separately for each of these time zones.
- When you register jobs for execution, use the `ajsentry` command in an environment where a TZ environment variable is set for each time zone.
- Only relative specifications can be made for times (e.g. time changes).
- If you want to use a command to check the jobs registered for execution, use the `ajsshow` command in the environment with the same TZ environment variable that was used when the jobs were registered for execution.

When JP1/AJS3 - View is set up to display Japanese time for execution statuses and execution results, even if the jobnet is actually executed in another country, the time displayed will be Japan time, not the local time in that country. In Windows, to check jobnet execution statuses and execution results from a region with a different time zone in the local time, you have to prepare a computer set to the local time and running JP1/AJS3 - View. For example, to display the execution statuses from New York in New York time, prepare a JP1/AJS3 - View computer with its clock set to New York time.

The following figure shows a system configuration that allows you to check execution statuses on multiple hosts for administrative tasks in different time zones.

Figure 2-35: Example of a system configuration for checking jobnet execution status on manager hosts in different time zones



See the following cautionary notes when manager hosts and agent hosts operate in different time zones.

These cautionary notes apply when a scheduled job is executed, not when defining a jobnet execution schedule.

Jobnets are scheduled for execution based on the manager's time zone setting.

#### Cautionary notes

- Jobs are executed based on the agent's time zone setting. Times logged in the standard output file and standard error output file are based on the agent's time zone setting.
- The job timeout period is governed by the elapsed time, and does not conform to the time zone.
- Time data included in the event job passing information (EVDATE, EVTIME, FLCTIME, and MLRCVTIME) has the time zone of the agent host on which the event occurred. When a JP1 event reception monitoring job detects a JP1 event that has been transferred from another host, the time data included in the passing information

(EVDATE and EVTIME) is expressed in the time zone of the transfer source. It is not expressed in the manager host's time zone or in the time zone used for other jobs that use the passing information.

- When **Set next power-on time** is set to **Change next power-on time** for the remote power control job, the next specified power-on time operates according to the time specified in the time zone of the execution user on the host that is executing the job.
- The time set in the **Valid range of start condition** operates according to the time zone on the manager host.

## 2.4.2 Character code set of the system

The JP1/AJS3 host and JP1/Base host must use the same character code set.

See [2.4.3 Language type of the system](#) in regards to the configuration of the manager and agent hosts and how to combine JP1/AJS products in an environment using domestic and overseas versions.

When the manager and agent use different character code sets, the character code set used in some kinds of transmitted data is converted into the character code set used at the destination. That is, if data is transmitted from the manager to the agent, the data is converted to the character code set used at the agent. If data is transmitted from the agent to the manager, the data is converted to the character code set used at the manager. This conversion of the character code set occurs for the following definitions, input files, and execution results.

For PC jobs, Unix jobs, and QUEUE jobs

### Definitions

- Name of executable file
- Command statement
- Parameter
- Script file name
- Environment variable
- Environment variable filename
- Name of the work directory used during agent process execution
- Standard input filename
- Standard output filename
- Standard error output filename
- Transfer filename
- Job name (for QUEUE job)
- Values of macro variables defined in jobs

### Input files

- Contents of transfer files 1 to 4<sup>#</sup>

### Execution results

- Contents of the standard output file
- Contents of the standard error output file (execution result details)<sup>#</sup>

## Action jobs and custom jobs

### Definitions

- Information defined for jobs
- Values of macro variables defined in jobs

### Execution results

- Contents of the standard error output file (execution result details)

## Event jobs

### Definitions

- Information defined for jobs

### Execution results

- Contents of the standard error output file (execution result details)
- Inherited information (values of macro variables defined in jobs)

#

When queueless jobs are executed by agent of 07-00-/B (JP1/AJS2 - Agent or JP1/AJS2 - Manager) from 07-00, the relevant data is not converted to the character code that is used at a communication destination.

## 2.4.3 Language type of the system

You can display messages either in English or Japanese. Consider which language should be used for the language to display according to the usage.

The following table shows which version combinations are supported in an environment in which both domestic and overseas versions of JP1/AJS products are being used.

Table 2-24: Supported combinations of domestic and overseas JP1/AJS products

			JP1/AJS - View				JP1/AJS - Agent			
			Domestic		Overseas		Domestic		Overseas	
			Japanese	English	Japanese	English	Japanese	English	Japanese	English
<b>JP1/AJS - Manager</b>	<b>Domestic</b>	<b>Japanese</b>	Yes	--	Yes	--	Yes	(Yes)2 <sup>#</sup>	Yes	Yes <sup>#</sup>
		<b>English</b>	(Yes)1 <sup>#</sup>	--	(Yes)1 <sup>#</sup>	(Yes)1	--	(Yes)1, (Yes)2	--	(Yes)1
	<b>Overseas</b>	<b>Japanese</b>	Yes	--	Yes	--	Yes	(Yes)2 <sup>#</sup>	Yes	Yes <sup>#</sup>
		<b>English</b>	Yes <sup>#</sup>	--	Yes <sup>#</sup>	Yes	--	(Yes)2	--	Yes

Legend:

Yes: Supported

(Yes)1: Supported only for the UNIX version of JP1/AJS - Manager.

Set C (English) in the LANG environment variable applied when the JP1/AJS service in JP1/AJS - Manager starts.

(Yes)2: Supported only for the UNIX version of JP1/AJS - Agent.

Set C (English) in the LANG environment variable applied when the JP1/AJS service in JP1/AJS - Agent starts.

--: Not supported

#

Set alphanumeric characters (ASCII) for all text and information used in JP1/AJS, including unit names, file names, characters used in files, messages in jobs being executed, monitoring conditions for event jobs, and information inherited by event jobs.

## (1) Values that can be specified in the LANG environment variable

In UNIX, to set the systems language environment, use the LANG environment variable. The table below lists the values that can be specified in the LANG environment variable. Use this table to select a value. If you do not use a value listed in this table, C (English) will be set. Operation is not guaranteed if Unicode (UTF-8) is specified for the LANG environment variable of a product that does not support Unicode (UTF-8).

In Windows, the system language environment cannot be changed.

Table 2-25: Values that can be specified in the LANG environment variable

OS	Language and code		LANG environment variable
HP-UX	Japanese	Shift-JIS	<ul style="list-style-type: none"> <li>ja_JP.SJIS<sup>#1</sup></li> <li>japanese</li> </ul>
		EUC	<ul style="list-style-type: none"> <li>ja_JP.eucJP</li> <li>japanese.euc</li> </ul>
		UTF-8 <sup>#2</sup>	<ul style="list-style-type: none"> <li>ja_JP.utf8</li> </ul>
	English	ASCII	<ul style="list-style-type: none"> <li>C</li> </ul>
Solaris	Japanese	Shift-JIS	<ul style="list-style-type: none"> <li>ja_JP.PCK</li> </ul>
		EUC	<ul style="list-style-type: none"> <li>ja<sup>#1</sup>,<sup>#3</sup></li> <li>ja_JP.eucJP<sup>#3</sup></li> </ul>
		UTF-8 <sup>#2</sup>	<ul style="list-style-type: none"> <li>ja_JP.UTF-8</li> </ul>
	English	ASCII	<ul style="list-style-type: none"> <li>C</li> </ul>
AIX	Japanese	Shift-JIS	<ul style="list-style-type: none"> <li>Ja_JP<sup>#1</sup></li> <li>Ja_JP.IBM-932</li> </ul>
		EUC	<ul style="list-style-type: none"> <li>ja_JP</li> <li>ja_JP.IBM-eucJP</li> </ul>
		UTF-8 <sup>#2</sup>	<ul style="list-style-type: none"> <li>JA_JP</li> <li>JA_JP.UTF-8</li> </ul>
	English	ASCII	<ul style="list-style-type: none"> <li>C</li> </ul>
Linux	Japanese	Shift-JIS	Cannot be used.
		EUC	Cannot be used.
		UTF-8	<ul style="list-style-type: none"> <li>ja_JP.UTF-8<sup>#1</sup></li> <li>ja_JP.utf8</li> </ul>
	English	ASCII	<ul style="list-style-type: none"> <li>C</li> </ul>

#1

This value is specified in `jp1ajs_env.conf` when you install or set up JP1/AJS3 for the first time. For details about the locations where you need to specify a character encoding, see (3) *Changing the character code set*.

#2

UTF-8 cannot be used for compatible ISAM configurations.

#3

For Solaris 11, `ja` and `ja_JP.eucJP` can be used.

For Solaris 10, only `ja` can be used.

## (2) Available characters

If the language type is Japanese, you can use the following characters with JP1/AJS3:

- ASCII and JIS characters
- Single-byte katakana characters
- JIS X 0208-1990

Some characters cannot be used with the following character encodings:

- If the encoding is SJIS, EUC, or UTF-8:  
External characters and machine-dependent characters cannot be used.
- If the encoding is EUC:  
If the character encoding used in JP1/AJS3 - Manager is EUC, the following characters cannot be used:  
~ || ¢ £ — ▯
- If the character encoding is UTF-8:  
If the character encoding used in JP1/AJS3 - Manager is UTF-8, the following characters cannot be used:  
~ || - ¢ £ ▯ \

The 3rd level and 4th level Kanji characters added in JIS 2004 cannot be used.

If unsupported characters are used in definition items such as a unit name, the problems below might occur. Unsupported characters cannot be used even in a stand-alone configuration.

- Characters are garbled.
- A standard job is placed in the *Ended abnormally* status or operates incorrectly.
- An event job is placed in the *Ended abnormally* status, cannot be detected, or is detected incorrectly.
- A JP1/AJS3 process terminates abnormally.

Make sure that the data or files listed below do not contain unsupported characters. If there are any unsupported characters, the same problems as when unsupported characters are used in definition items might occur.

- Data stored in the passing information<sup>#1</sup>
- Data that is output to the standard error output and standard output<sup>#2</sup>
- Standard input file, environment variable file, or transfer file<sup>#3</sup>
- Text file or list file specified for sending an email<sup>#4</sup>

#1

Applicable when *passing information* is specified in the event job definition for passing the event information received by an event job to a succeeding job or jobnet. For details about how to pass the information received by an event job, see 2.4.4(6) *Passing information received by an event job* in the *Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*.

#2

Applicable when the data is in the job execution results specified for a PC job or Unix job. For details about the standard error output and Standard output, see 15.4.6 *Define Details - [UNIX Job] dialog box* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*, or 15.4.7 *Define Details - [PC Job] dialog box* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

#3

Applicable when the file is specified for a PC job or Unix job. For details about the standard input file, environment variable file and transfer file, see 15.4.6 *Define Details - [UNIX Job] dialog box* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*, or 15.4.7 *Define Details - [PC Job] dialog box* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

#4

Applicable when **PC** is specified as the platform in the definition items. For details about the mail linkage, see 2. *Linking Mail Systems* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide*.

### (3) Changing the character code set

In UNIX, you must set the same character encoding for the definition files, environment variables, and environment setting parameters listed in the following table.

Table 2–26: Settings you must specify when changing the character code set

Settings (definition files, environment variables, and environment setting parameters)	What the change affects
The LANG environment variable applied when the JP1/AJS3 service starts	The character code set for messages output from the JP1/AJS3 service
JP1/AJS3 environment definition file <ul style="list-style-type: none"> <li>For a physical host: /etc/opt/jplajs2/conf/jplajs_env.conf</li> <li>For a logical host: The LANG environment variable in: <i>shared-directory</i>/jplajs2/conf/jplajs_env.conf</li> </ul>	<ul style="list-style-type: none"> <li>Value of the LANG environment variable to be applied when the JP1/AJS3 service starts</li> <li>Character encoding of the information to be output to integrated trace logs and internal logs by schedule control, event/action control, and job execution control</li> <li>When the user profile does not contain the LANG environment variable, the default for LANG during job execution.</li> </ul>
JP1/Base parameter definition file <ul style="list-style-type: none"> <li>For a physical host: /etc/opt/jplbase/conf/jplbs_param.conf</li> <li>For a logical host: The LANG environment variable in: <i>shared-directory</i>/jplbase/conf/jplbs_param.conf</li> </ul>	<ul style="list-style-type: none"> <li>The character code set of the data to be exchanged between the JP1/AJS3 manager host and agent host when standard jobs, event jobs, action jobs, and custom jobs are executed</li> <li>The character code set of the data to be exchanged between the jobnet connector and the connected jobnet when the jobnet connector is used to control the execution order of root jobnets</li> </ul>
AJSCHARCODE parameter in the scheduler service environment definition	The character code set for the information that will be stored in the scheduler database.
SYSLOGCODE parameter in the scheduler service environment definition	<ul style="list-style-type: none"> <li>The character code set for messages output by the scheduler services to SYSLOG.</li> </ul>

Settings (definition files, environment variables, and environment setting parameters)	What the change affects
SYSLOGCODE parameter in the scheduler service environment definition	<ul style="list-style-type: none"> <li>The value of the LANG environment variable used at the start of the service when a value other than C (English) is specified.</li> </ul>
CHARCODE parameter in the JP1/AJS3 Console Manager environment definition	The character code set for information that will be stored in the user definition data.
SYSLOGCODE parameter in the JP1/AJS3 Console Manager environment definition	<ul style="list-style-type: none"> <li>The character code set of messages output by the JP1/AJS3 Console Manager service to SYSLOG.</li> <li>The value of the LANG environment variable used at the start of the service when a value other than C (English) is specified.</li> </ul>
The LANG environment variable when the JP1/AJS3 Console Manager service is active	The character code set for messages output from the JP1/AJS3 Console Manager service
SYSLOGCODE parameter in the JP1/AJS3 Console Agent environment definition	<ul style="list-style-type: none"> <li>The character code set for messages output by the JP1/AJS3 Console Agent service to SYSLOG.</li> <li>The value of the LANG environment variable used at the start of the service when a value other than C (English) is specified.</li> </ul>
The LANG environment variable when the JP1/AJS3 Console Agent service is active	The character code set for messages output from the JP1/AJS3 Console Agent service
The LANG environment variable when the queueless agent service is active	The character code set for messages output from the queueless agent service
The AJSQL_CHARCODE <sup>#1</sup> environment setting parameter used by the queueless agent service	<ul style="list-style-type: none"> <li>Data accepted from the scheduler service</li> <li>Transfer file data</li> <li>Result file data</li> <li>Reply data to the scheduler service</li> </ul>
The LANG environment variable <sup>#3</sup> when a command <sup>#2</sup> for unit operation is executed	<ul style="list-style-type: none"> <li>The values stored in the scheduler database by the command that operates on the unit</li> <li>The log data and character code set for messages that are output by the command that operates on the unit</li> </ul>

#1

If the manager and agent hosts use different character code sets, the AJSQL\_CHARCODE environment setting parameter must be set for character code conversion.

For details about character code conversion for queueless jobs, see [7.2.2 Environment settings for executing queueless jobs](#).

#2

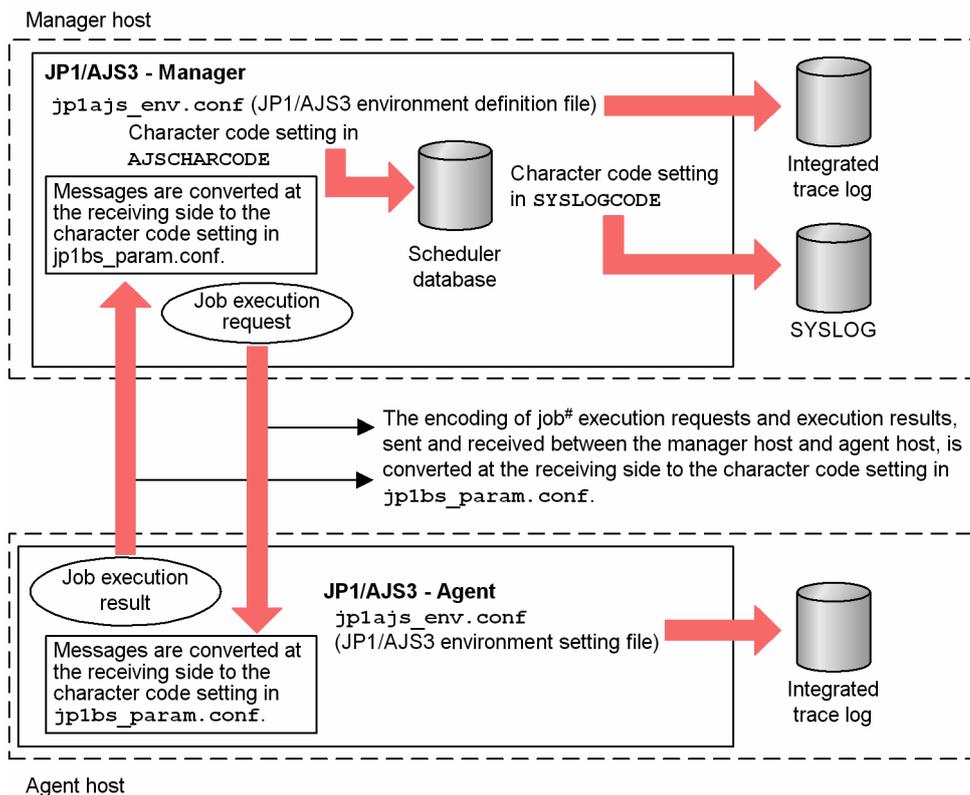
For details about the commands for manipulating units, see [1.5 Commands](#) in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

#3

Specify the character encoding that is specified in the AJSCHARCODE environment setting parameter of the scheduler service where the unit to be manipulated by the command is defined.

The following figure shows what is affected by changing the character code set from the default one.

Figure 2-36: What is affected by changing the character code set



Agent host

Note:

We recommend that you specify the same character code set in `jplbs_param.conf` and `jplajs_env.conf`.

# Job refers to a standard job, action job, custom job, or event job.

In Windows, the system language environment cannot be changed. In UNIX, for details about how to change the system language environment, see *13.4.1 Setting the language environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

You must redefine any unit names containing Kana characters or two-byte characters that are already being used in JP1/AJS3.

#### (4) Notes on an environment where more than one character code set is used

When applications are executed by two or more linked hosts working together, text that includes Japanese character codes cannot be displayed in an English environment. Set the same language type for all hosts. For details about the language types that can be combined in heterogeneous JP1/AJS products, see *Table 2-24*.

The following restrictions apply to combining different types of Japanese character codes.

- Remote execution of commands

When a command is remotely executed, the same character code set must be set for the host where the command is entered and for the host where the command is executed.

If the character encoding on the host where the command is executed is UTF-8, you can remotely execute the command by setting EUC as the character encoding of the host where the command is entered.

For details about remote execution of commands, see *1.1.7 Remote execution of a command* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

The *character code set of the host where the command is entered* is the character code set specified in the OS by using the LANG environment variable, for example.

The *character code set of the host where the command is executed* refers to one of the following:

- Character encoding specified in the AJSCHARCODE environment setting parameter
  - Setting of the OS used when the JP1/AJS3 service is started
- Remote jobnet
- When a remote jobnet is executed, the character code sets of the host where the remote job is defined and the host where the remote job is executed must match.

The *character code set of the host where the remote job is defined* and the *character code set of the host where the remote job is executed* refer to one of the following:

- Character encoding specified in the AJSCHARCODE environment setting parameter on each host
  - Setting of the OS used when the JP1/AJS3 service is started
- Unix job, action job, and event job

For JP1/AJS3 - View or a command, if the definition items for a job executed on the agent host in a UTF-8 environment contain Japanese characters, assume that one Japanese character requires 4 bytes. Based on this assumption, define the job so that the maximum value for each item is not exceeded. If `sjis` is specified for the DEFLENTYPE environment setting parameter, the maximum number of characters that can be specified for the following items is the same as in a Shift-JIS environment:

- **Unit name** in the detailed unit definition
- **Comment** in the detailed unit definition
- **Exclusive jobnet** in the schedule settings

A Unix job, action job, or event job can be executed in a system configuration where the manager host operates in a Shift-JIS or EUC environment and the agent host operates in a UTF-8 environment. In this case, the number of bytes converted to the character code set of the agent host is checked as the size of the information defined for the job. As a result, a job execution error might occur even if the definition in JP1/AJS3 - View or a command does not exceed the maximum number of bytes that can be entered for job items.

- Event job
- If the sum of the size of the event job passing information and the size of the macro variable name exceeds 4,096 bytes on the agent host, the excess data is truncated.
- To pass information containing Japanese characters in a UTF-8 environment, assume that one Japanese character requires 4 bytes.

To use JP1/AJS3 that does not support UTF-8 to receive JP1 events issued from a UTF-8 environment, configure JP1/Base to run in character code compatibility mode. If you do not use character code compatibility mode, a JP1 event might not be detected correctly or another kind of error might occur.

For details on the character code compatibility mode, see *Job Management Partner 1/Base User's Guide*.

- Character encoding of the JP1/AJS3 Console Manager data directory
- When the character encoding of the JP1/AJS3 Console Manager data directory is English, you can only specify the AJS3 unit names in alphanumeric characters (ASCII). If you want to use both English and Japanese to monitor applications, specify a Japanese character encoding for the JP1/AJS3 Console Manager data directory.
- When you use the function for automatically creating the monitored objects for a unit to be monitored whose full unit name contains Japanese, and C (English) is specified as the character encoding in the environment settings of JP1/AJS3 Console Manager, an error message (KAVC4635-E The automatically created monitored object information is not saved.) appears. Also note that the function might not work for units whose full unit names do not contain Japanese if multiple units are to be automatically created.
- If you use the function, select only units whose full unit names do not include Japanese.

- Commands used for executing submit jobs

If a command is executed from a host in a Shift-JIS or EUC environment for a manager host in a UTF-8 environment, an error might occur on the manager host even when the values of the options do not exceed the maximum number of bytes on the command execution host. The reason for the error is that the number of bytes in the option values containing Japanese characters increases due to character code conversion when the command execution host transfers data to the manager host.

Therefore, when you specify option values containing Japanese characters for commands executed on the manager host in the UTF-8 environment, assume that one Japanese character require 4 bytes. Based on this assumption, specify the options so that the value of each option is within the maximum number of specifiable bytes.

Commands:

```

jppqjobsub, jppqjobcan, jppqjobalt, jppqjobmove, jppqjobget, jppqjobshow, jppqendjobshow,
jppqjobdel, jppqqueueopen, jppqqueueclose, jppqqueueadd, jppqqueuealt,
jppqagtlink, jppqagtunlink, jppqagtshow, jppqagtadd, jppqagtdel, jppqagtalt, jppqresshow,
jppqresadd, jppqresdel

```

## (5) Notes on using UTF-8 encoding

- If a command entered from a host that uses UTF-8 encoding is remotely executed on a host for which UTF-8 is specified as the character encoding in `AJSCHARCODE`, you must specify `no` for the `AJS_CONVERT_UTF8` environment variable. If the `AJS_CONVERT_UTF8` environment variable is not specified or if the command is remotely executed with `yes` specified, characters in the display results might be garbled or processing on the unit might not be performed correctly.

For details about the `AJS_CONVERT_UTF8` environment variable, see *1.4 Environment variables* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

- For details about the characters that you can use in a UTF-8 environment, see *(2) Available characters*.
- If a queueless job entered from the manager host that uses UTF-8 encoding is executed on an agent host that does not support UTF-8 encoding, you must specify the `QLMANCHARCODE` environment setting parameter on the manager host. For details about the `QLMANCHARCODE` environment setting parameter, see *2.7 Setting up the queueless job execution environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.
- If UTF-8 encoding is used and `sjis` is specified for the `DEFLENTYPE` environment setting parameter, the number of characters that can be specified for the following items is the same as in a Shift-JIS environment:
  - **Unit name** in the detailed unit definition
  - **Comment** in the detailed unit definition
  - **Exclusive jobnet** in the schedule settings

Note, however, that the maximum number of nested units (maximum number of levels) is 10 (the default is 30).

- For a version of JP1/AJS3 - View earlier than 09-50, if `sjis` is specified for the `DEFLENTYPE` environment setting parameter, a scheduler service and its lower units are not displayed. If `sjis` is specified for the `DEFLENTYPE` environment setting parameter for all scheduler services, the KAVV187-E message is output and none of the scheduler services or their lower units are displayed. If you use the `ajs` command, manager jobnet, or JP1/AJS3 Console View to access the scheduler service for which `sjis` is specified for the `DEFLENTYPE` environment setting parameter, the KAVV455-E message is output. The scheduler service and its lower units are not displayed.
- UTF-8 can be used only in Linux for compatible ISAM configurations.

## 2.5 Setting the job execution environment

---

The JP1/AJS3 job execution environment consists of manager hosts, which manage job definitions and distribute jobs to execution hosts, and agent hosts, which execute the distributed jobs.

To execute jobs, information about the agent hosts must be registered in the manager host. In JP1/AJS3, the agent hosts that execute jobs are managed by logical names, referred to as *execution agent names*. To determine where to distribute each job, the manager host maps the execution agent name defined in the job with the physical host name in the registered agent host information.

### 2.5.1 Defining execution agents

Consider the following points when defining the agent host information to be registered in the manager hosts.

#### (1) Assigning execution agent names and execution host names

The agent host information to be registered in a manager host consists of the logical names of the agent hosts (execution agent names) and the physical name of the execution host. Assign each execution host an execution agent. A maximum of 1,024 execution agents can be registered in one manager host.

When defining a job or jobnet, specify the execution agent name as the host on which the job is to be executed. The manager host references the registered execution agent information, and sends the job to the execution host corresponding to the execution agent name defined in the job or jobnet. Thus, when the agent host configuration needs to be changed due to an increase or decrease in work volume, rather than having to change the job or jobnet definition, you can simply change the execution agent information registered on the manager host without disrupting JP1/AJS3 operations.

#### (2) Maximum number of concurrently executable jobs

The number of concurrently executable jobs on an agent host can be restricted according to the resources available for that host. The setting applies to Unix jobs (other than queueless jobs), PC jobs (other than queueless jobs), action jobs, custom jobs, and Passing information settings jobs.

The maximum number of concurrently executable jobs can be specified for particular time periods (set in 30-minute units). The default setting is 00:00–00:00=5 (maximum of five concurrent jobs, 24 hours a day).

For example, if you specify 08:00–17:30=5, a maximum of five jobs can be executed concurrently during the time period 8:00 to 17:30. By adjusting the maximum number of concurrent jobs in this way, you can distribute the processing load at certain times of the day.

When the number of jobs to be executed reaches the maximum number of concurrently executable jobs, additional jobs are queued on the manager host.

##### Cautionary notes

- If you do not specify the maximum number of concurrently executable jobs when adding an execution agent, the default (*maximum of five concurrent jobs, 24 hours a day*) is used. This setting does not affect operation if you execute jobs with short execution times or register only a few jobs for execution at the same time. However, if you execute jobs with long execution times or register many jobs at the same time, the number of concurrent jobs will quickly reach the maximum, and remain there for an extended period of time. This might affect the execution of subsequent jobs.

When the maximum number of concurrently executable jobs is reached on an agent host, subsequent jobs are made to wait in the *queuing* status until the active jobs finish. In such cases, the time the jobs end is later than the scheduled time. Taking the job execution time and the number of jobs executed per unit of time into consideration, in addition to considering resources on the agent host, consider setting a large value for the maximum number of concurrently executable jobs.

- The maximum number of concurrently executable jobs you specify applies to each execution agent. If an execution host is connected by using different execution agent names, jobs equal to the total of the maximum number of concurrently executable jobs specified for these execution agents will be executed concurrently on that execution host.

For example, suppose that the same execution host is specified for an execution agent with 00:00-00:00=10 (*maximum of 10 concurrent jobs, 24 hours a day*) set, and an execution agent with 00:00-00:00=5 (*maximum of five concurrent jobs, 24 hours a day*) set. In this case, a maximum of 15 jobs can be executed concurrently.

When you specify a maximum number of concurrently executable jobs, specify a value appropriate for the execution host.

### (3) Default execution agent

By default, the local host is set as an agent host in the information registered in the manager host. This agent is referred to as the *default execution agent*.

The agent host information defined as the default execution agent is as follows:

Table 2-27: Information defined as the default execution agent

No.	Item	Setting
1	Execution agent name	@SYSTEM
2	Execution host name	Manager host name
3	Maximum number of concurrently executable jobs	5 (00:00-00:00=5)
4	Restricting job transfer	Jobs can be accepted and transferred to the execution host.

This default execution agent can be used to execute jobs on a manager host. It is also used when no execution agent is specified in the job or jobnet definition.

To change the default execution agent definition, use the `ajsagtalt` command. For details about the command, see *ajsagtalt* in 2. *Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

#### Cautionary note

In JP1/AJS2, when the manager host name was specified, jobs were automatically executed on the default manager host. In JP1/AJS3, if you want to specify the local host name to execute jobs, you need to add an execution agent, other than the default execution agent, that has the same name as the local host name. Note, however, that if you migrate the unit definition to another manager host when the local host name is specified, you need to change the **Exec-agent** setting to the destination host name. For this reason, we recommend that you use the default execution agent to execute jobs on the local host.

### (4) Adding a execution agent

Execution agents must be added for the number of agent hosts on which you want to execute jobs because only the default execution agent is created on the manager host immediately after setup.

Use the `ajsagtadd` command to add an execution agent. You can also add multiple execution agents in one operation. For details about the procedure, see *4.1 Execution agent settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*. To add multiple execution agents collectively, see the description of the `-f` option in `ajsagtadd` in *2. Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

## (5) Defining an agent automatically

When the setting for automatically defining an agent is enabled, the execution agent (assigned execution agent name and execution host name) that has the same name as the execution agent name specified in the job's Define Details dialog box is automatically added to the manager host.

For details about the agent automatic definition function, see *2.3 Setting up the job execution environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

Cautionary notes

- We recommend that the system administrator set the agent automatic definition function when setting up JP1/AJS3. When this function is enabled to execute jobs, make sure that only users who have both `JP1_JPQ_User` and `JP1_JPQ_Admin` permissions can execute jobs.
- When you use the agent automatic definition function and the execution agent restriction function, an execution agent that is automatically defined during job execution needs to be set in the execution agent profile before execution of the job. If the execution agent has not been set, the job is placed in the *Failed to start* status, in which case the execution agent will not be added.

## (6) Execution agent restriction

You can use the execution agent restriction functionality to set an execution agent that is permitted to execute jobs for each unit.

By setting permitted execution agents in an operation profile called the *execution agent profile*, you can prevent jobs from being executed on the wrong execution agents.

For details, see *4.3.1 Procedure for setting up an execution agent profile* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or *14.3.1 Procedure for setting up an execution agent profile* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

### (a) Overview of execution agent restriction

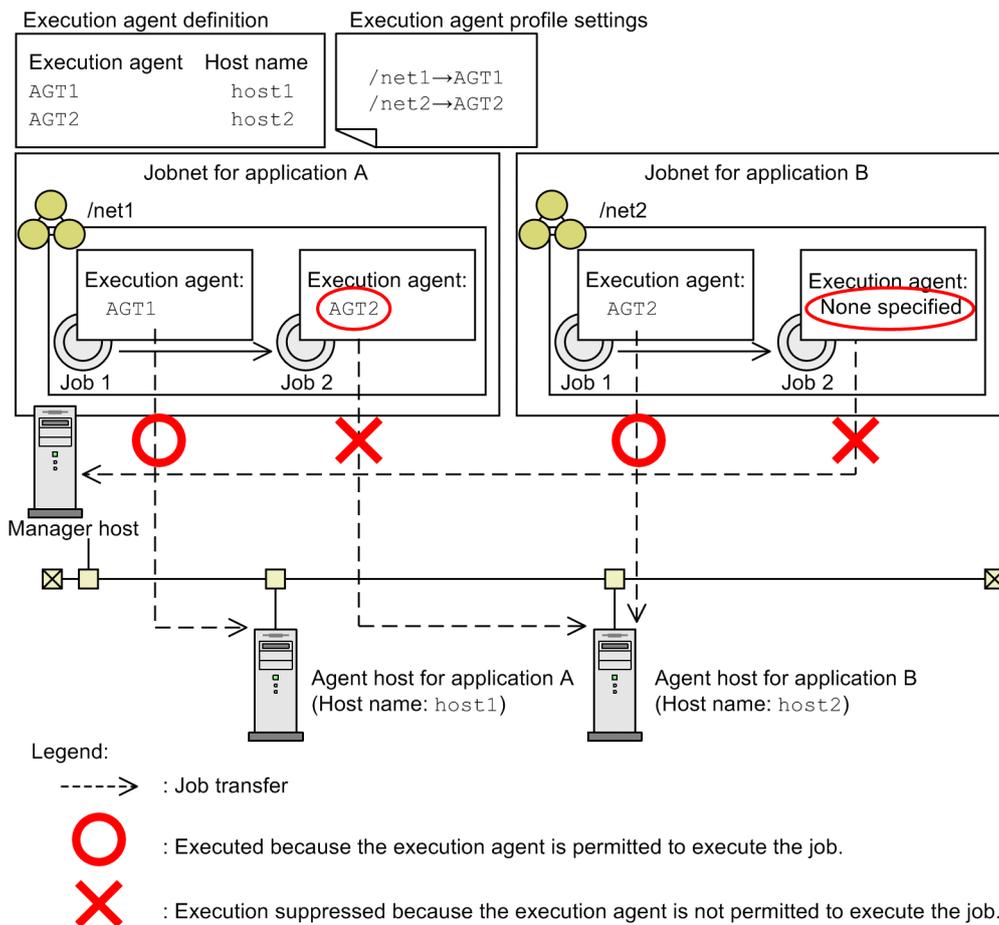
When the execution agent profile is enabled, whether the execution agent specified in the job's Define Details dialog box has been set in the execution agent profile is checked when:

- A unit is defined in JP1/AJS3 - View
- A definition pre-check is performed by using the `ajschkdef` command
- A job is executed

If the specified execution agent is not set in the execution agent profile, a definition error occurs or the job is placed in the *Failed to start* status if execution is attempted.

The following figure shows an example of using the execution agent restriction functionality.

Figure 2-37: Example of using the execution agent restriction functionality



In this example, execution agent AGT1, which is permitted to execute jobs in jobnet net1, and execution agent AGT2, which is permitted to execute jobs in jobnet net2, are set in the execution agent profile. Jobs /net1/job1 and /net2/job1 are executed because permitted execution agents are specified. In the case of job /net1/job2, execution is suppressed because execution agent AGT2, which is not permitted to execute the job, is specified. In the case of job /net2/job2, because no execution agent is specified, an attempt is made to execute the job on the manager host (default execution agent), but the attempt is suppressed. If you want to execute jobs on the manager host without specifying the execution agent during definition of the unit, you need to set the default execution agent name in the execution agent profile.

Note that the execution agent is not checked for units that are not set in the execution agent profile.

### ■ Applicable units

You can check whether the execution agent specified in the Define Details dialog box for the unit is set in the execution agent profile for the following units:

- Root jobnet#
- Nested jobnet#
- Unix job
- PC job
- Event job
- Action job

- Custom job

#

Checking is performed only if the execution agent was specified before the unit was defined in JP1/AJS3 - View.

### ■ How to check the execution agent

If execution agent restriction is used, the execution agent is checked when a unit is defined in JP1/AJS3 - View, when a definition pre-check is performed by using the `ajschkdef` command, and when a job is executed.

The following describes how the check is performed for each case.

When a unit is defined in JP1/AJS3 - View

In the Define Details dialog box for the unit, the **Exec-agent** combo box displays the execution agents set in the execution agent profile. You can either select a displayed execution agent or type an agent name in the combo box. Click the **OK** button to check whether the specified execution agent is set in the execution agent profile.

You can also specify that checking is to be performed only when a unit is defined, and suppress checking when a job is executed.

When a definition pre-check is performed by using the `ajschkdef` command

When a definition pre-check is performed, the execution agent profile is checked to see whether the execution agent has been set. If an execution agent that has not been set, the check result information is output to the check result file.

Note that the `ajschkdef` command with the `-C` and `-p` options specified allows you to check the execution agent irrespective of whether the execution agent profile is enabled or disabled.

When a job is executed

When a job is executed, the execution agent profile is checked to see whether the execution agent is set. If an attempt is made to execute the job on an execution agent that has not been set, the job is placed in the *Failed to start* status. Note, however, that when one of the event jobs defined in the start conditions causes an error during the execution agent check, jobs are placed in one of the following statuses:

- Monitoring generation of the jobnet with start conditions:  
*Monitor terminated* status
- The job causing the error during the execution agent check:  
*Failed to start* status
- Jobs defined in the start conditions other than the job described above:  
*Not executed + Ended* status

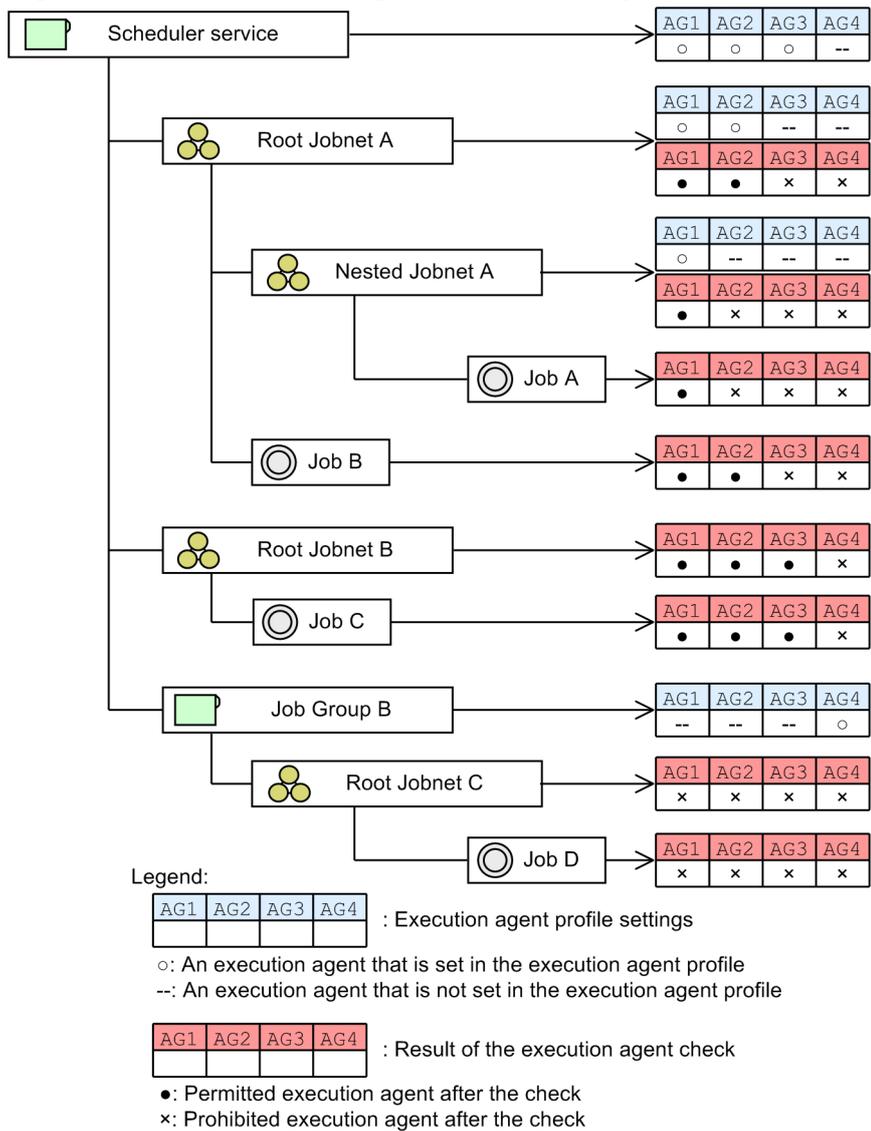
You can also specify that checking is performed only when a job is executed, and that checking is suppressed when a unit is defined.

### (b) Permitted execution agents

When you specify units on multiple levels in the execution agent profile, the execution agent specified for a lower-level unit must be permitted for all upper-level units.

The following figure shows the relationship between the execution agent profile settings and the permitted execution agents.

Figure 2-38: Execution agent profile settings and permitted execution agents



In this example, Job A can be executed only on execution agent AG1, which is permitted for the scheduler service, Root Jobnet A, and Nested Jobnet A. Job D can neither be defined nor executed because an execution agent is not permitted for any of the upper-level units of Job D. Execution agent profiles with such settings will be handled as a syntax error when an attempt is made to enable the execution agent restriction.

To prevent the execution agent check process from affecting tasks when a permitted execution agent is specified for units in multiple levels, we recommend that the execution agent be specified for no more than the following levels:

- Scheduler service
- Units directly under the scheduler service

### ■ When permitting execution on the local host

@SYSTEM must be specified. Note, however, that if you want to permit an execution agent that has the same name as the local host name, specify the execution agent name.

If you want to permit execution of queueless jobs on the local host, specify the local host name. Hereafter, *local host name* refers to names that can be checked by using the following methods.

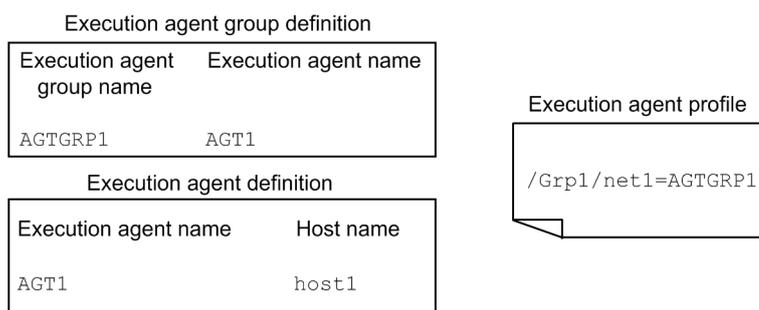
- Physical host:  
The host name determined by executing the `hostname` command
- Logical host (Windows):  
On the host where JP1/AJS3 is running, in **Control Panel**, either choose **Services**, or choose **Administrative Tools** and then **Services**. In the Services dialog box that opens, the host name is displayed as `xxxxx` in `JP1/AJS3_xxxxx`.
- Logical host (UNIX):  
Execute the `ps` command. The host name is displayed after the `jaajs_spm` process.

■ **When specifying an execution agent group as the unit execution agent**

To specify an execution agent group as the execution agent for units, set the name of the execution agent group name that will be permitted to execute jobs in the execution agent profile.

The following figure shows an example of setting an execution agent group in the execution agent profile.

Figure 2–39: Setting an execution agent group in the execution agent profile



In this example, when either `AGTGRP1` or `AGT1` is specified as the execution agent for the jobs in `/Grp1/net1/`, the jobs will actually be executed on execution agent `AGT1` (execution host `host1`). However, because `AGT1` is not specified in the execution agent profile, specifying `AGT1` as the execution agent for the jobs result in an error during the execution agent check.

■ **When specifying a macro variable name for the unit execution agent**

To specify a macro variable name for the unit execution agent, set the name of an execution agent or a macro variable name permitted to execute in the execution agent profile, depending on the point at which execution agent restriction is to be checked.

The following table describes the information that needs to be set in the execution agent profile when a macro variable name is specified.

Table 2–28: Execution agent profile settings when a macro variable name is specified

No.	Restriction checked when a unit is defined (View)	Restriction checked when a job is executed (JobExec)	Definition or execution is permitted for:
1	No (off)	Yes (on)	Execution agent name
2	Yes (on)	No (off)	Macro variable name
3	Yes (on)	Yes (on)	<ul style="list-style-type: none"> <li>• Macro variable name</li> <li>• Execution agent name</li> </ul>

We recommend you use a combination of Nos. 1 and 2 to set the execution agent profile.

## ■ For queueless jobs

To use the execution agent restriction functionality for a queueless job, set the name of the host on which the queueless job will be executed in the execution agent profile.

If the target host with a class name is specified in **Exec-agent** in the Define Details dialog box, you do not need to set the `!class-name` portion in the execution agent profile.

If a logical host that has not been attached is specified as the execution host for the queueless job, the queueless job is executed on the physical host corresponding to the logical host when the following conditions exist:

- The logical host specified for the queueless job has been set in the execution agent profile.
- `exec` is set in the `AJSQL_NOATTACHREQ` environment setting parameter.

Whether the physical host is set in the execution agent profile does not matter. Even if the physical host is not defined in the execution agent profile, the queueless job can be executed on the physical host.

## (c) Cautionary notes

- The execution agent restriction functionality can be used when the version of JP1/AJS3 - Manager and JP1/AJS3 - View is 09-50 or later.
- The system does not check the execution agent when a unit is created by using one of the methods below. If you want to check the execution agent, you will need to perform a pre-check.
  - Copying and pasting a unit, or cutting and pasting a unit
  - Restoring a backed-up unit
  - Distributing a unit by using JP1/Software Distribution or JP1/FTP
- Before executing a job, make sure that the execution agent or the execution agent group that has been set in the execution agent profile is defined in JP1/AJS3 - Manager. If they are not defined in JP1/AJS3 - Manager, no error occurs when the unit is defined, but an error occurs when pre-check is performed or when a job is executed.
- When you use the agent automatic definition function and the execution agent restriction function, an execution agent that is automatically defined during job execution needs to be set in the execution agent profile before execution of the job. If the execution agent has not been set in the execution agent profile, the job is placed in the *Failed to start* status, in which case the execution agent will not be added.
- An execution agent specified for a remote jobnet and subordinate units must be in JP1/AJS3 - Manager to which the remote jobnet is to be transferred. Therefore, the execution agent is not checked when a unit is defined or when a pre-check is performed. When a job is executed, if the execution agent profile is enabled in the JP1/AJS3 - Manager to which the remote jobnet is to be transferred, the execution agent is checked according to the profile settings.

## 2.5.2 Load distribution

When application servers configure load distribution by using load balancing or a similar technique, load distribution for batch jobs is also possible in JP1/AJS3.

Load distribution can be supported by grouping execution agents and setting the execution agent group name as the execution agent name for jobs. Points to consider when distributing the load in this way are discussed below.

For examples of how to distribute processing loads, and the order in which the execution agent hosts are determined, see *2.3.1 Processing with a distributed load* in the *Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*.

## (1) Grouping execution agents

Decide which execution agents to group together and the group name.

A maximum of 1,024 execution agents can belong to a group, and a maximum of 1,024 groups can be registered in one manager host.

The manager host references the registered execution agent group information, and determines which execution agent to forward the job to based on the priority of the agents within the execution agent group, and the maximum number of concurrently executable jobs.

## (2) Execution agent priority

When you use an execution agent group to support load distribution, you can specify the job distribution priority for each execution agent in the group.

For an execution agent, you can specify a priority in the range from 1 to 16. The lowest priority is 1, and the default is 16 (highest priority).

### 2.5.3 OS user environment when a job is executed

Note the following when considering the job execution environment.

#### (1) User account at job execution

In JP1/AJS3, jobs are executed under the OS user account of the destination agent host. The destination agent host has a user mapping definition, which is used to convert the JP1 user who registered the job for execution to the OS user. The job is then executed under the OS user's permissions. The resources referenced or updated by the job process are dependent on the OS security control.

The user account is referenced each time a job is executed. Any changes to the definitions affect jobs executed after the changes are made.

In the Windows version of JP1/AJS3, when a job is executed under a user account other than the account from which the JP1/AJS3 service was started, JP1/AJS3 acquires the user information needed to start the job process. To acquire information about a user, an *access token* is required. The access token contains user information such as the security groups to which the user belongs and the user's access permissions.

Using Win32 API functions, JP1/AJS3 obtains an access token each time it starts a job, and releases the access token when the job completes execution. When an error occurs in one of these functions, the job is placed in the *Failed to start* status if the access token could not be acquired, or in the *Ended abnormally* status if the access token could not be released.

You can keep and reuse an access token if the domain name, user name, and password remain the same.

By reusing access tokens, you can minimize the number of times tokens are acquired and released, thus avoiding the temporary errors caused by the Win32 API functions. This results in fewer jobs ending abnormally. For details, see *6.2.17 Reusing access tokens for job execution* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

#### (2) OS user environment used for job execution

The OS user environment used to execute jobs is platform-dependent.

When a job is executed on a Windows agent host, the system environment variable normally takes precedence over the user profile information. However, you can enable the user profile information by specifying the environment setting for job execution control. For details, see *6.2.16 Executing a job that requires a user profile* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

When a job is executed on a UNIX agent host, JP1/AJS3 reads the local login script of the OS user mapped from the JP1 user. The OS user's login shell is set as the execution shell of the job, unless otherwise specified in the first line of the script file or command statement.

The OS user environment is read each time a job is executed. Any changes to a definition affects jobs executed after the changes are made.

### **(3) HP-UX OS user groups**

When an OS user who executes jobs belongs to more than one group, and you want to enable access to all these groups, you must set `/etc/logingroup`; otherwise, only the group ID defined in `/etc/passwd` can be used.

To enable access to multiple groups, you must copy the `/etc/group` group definition into `/etc/logingroup`, or make a symbolic link between `/etc/logingroup` and `/etc/group`. For details, see your OS documentation.

#### **Cautionary note**

To enable access to multiple groups when the process of a JP1/AJS3 service accesses a job result file or temporary file, see the setting described in *15.2.18 Enabling the file access permission check for the ACL and secondary group settings during job execution* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

If you do not perform this setting, access from a secondary group based on the entries in `/etc/logingroup` is possible only for a job process. Entries in `/etc/logingroup` do not apply to a JP1/AJS3 service process accessing a job result file or temporary file. If a JP1/AJS3 service process is unable to access a result file, either change the permission of the directory containing the result file to a permission that will allow access from a secondary group, or change the group that owns the directory or the specified result file from the secondary group to the primary group of the user executing the job. In the case of a temporary file, change the permission of the work directory to a permission that will allow access from a secondary group.

For details, see *2.7.2(2) Executing a standard job, action job, or custom job results in an abnormal end* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

### **(4) Access permission to job executable files and script files**

For a job executed on a Windows agent host, set the access permission for the executable file in the JP1/AJS3 service account. You do not need to grant access permission to the OS user executing the job.

For a job executed on a UNIX agent host, grant access permission to the executable script file to the OS user.

### **(5) Login shell at job startup (Unix jobs and action jobs)**

When a job is started, the operating system executes the login shell (contents of the `/etc/passwd` file) of the OS user at the destination agent host. If no login shell is defined, `/bin/sh` is executed. In JP1/AJS3, `sh`, `ssh`, and `ksh` can be used as login shells. See the following precautions on using shells other than these three.

#### **(a) Precautions for Unix jobs**

If you use a login shell other than `sh`, `ssh`, or `ksh`, the login script might not be executed under certain OSs. Consequently, because the environment variable settings for the user executing the job are not applied, jobs might

terminate abnormally, or return unexpected results. To avoid such problems, specify the environment variable settings required for executing a job script.

To check whether the environment variables needed for job execution are set properly, create a shell script that writes the execution results returned by the `env` command to a file, and then look at the contents of the file that is output when you execute this script as a job.

## (b) Common precautions for Unix jobs and action jobs

Some shells, such as `bash`, do not initialize signal processing to the default status. As a result, jobs might terminate abnormally, or return unexpected execution results. In this case, use the `sh`, `csh`, or `ksh` shell instead. In the Linux, use the `cs` shell instead.

Signal processing can be initialized to the default status by changing a setting as described in *15.2.17 Applying SIG\_DFL (setting for receiving the SIGCHLD signal) to a child process started from JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*. If you are performing a new installation of JP1/AJS3 or JP1/AJS2 version 08-00 or later, there is no need to change the setting because jobs are executed in these versions with the default setting (`SIG_DFL`) which allows child processes to receive `SIGCHLD` signals.

## 2.5.4 Maximum number of concurrently executable jobs

In JP1/AJS3, you can set the maximum number of jobs that an agent host can execute concurrently. When this maximum is reached, subsequent jobs are placed in a wait status. By setting a maximum number of concurrently executable jobs, you can distribute the load during set time periods, or among multiple agent hosts when more than one agent host is connected.

The maximum number of concurrent jobs must be specified per execution agent. You cannot perform this setting for an execution agent group. The setting applies to Unix jobs (other than queueless jobs), PC jobs (other than queueless jobs), action jobs, custom jobs, and Passing information settings jobs.

For the procedure and notes on setting a maximum number of concurrently executable `QUEUE` jobs and submit jobs, see *7.1.1(4) Notes on the execution environment required for QUEUE jobs and submit jobs*.

### (1) Notes on setting a maximum number of concurrently executable jobs

The following provides notes on setting a maximum number of concurrently executable jobs:

- You can set and change the maximum number of concurrently executable jobs using the `ajsagtadd` command or `ajsagtalt` command. To check the current setting, use the `ajsagtshow` command.  
If you add an execution agent using the `ajsagtadd` command, but do not specify a maximum number of concurrently executable jobs, the default setting `00:00-00:00=5` (maximum of five concurrent jobs, 24 hours a day) is assumed.  
The default setting will suffice if only short jobs are executed, and no more than a few jobs will be registered for execution simultaneously. However, if you execute jobs with long execution times or register many jobs at the same time, the number of concurrent jobs will quickly reach the maximum, and remain there for extended periods of time. This might affect the execution of subsequent jobs.  
When the maximum number of concurrently executable jobs is reached on an agent host, subsequent jobs are made to wait in the *queuing* status until the active jobs finish. In such cases, jobs will take longer than expected to execute. Take the job execution time and the number of jobs executed per unit time into consideration when you set the maximum number of concurrently executable jobs.

- The maximum number of concurrently executable jobs you specify applies to each execution agent. If different execution agents are mapped to the same execution host, the sum of the maximum number of concurrently executable jobs specified for these execution agents is set for the jobs that will be executed on that execution host.

As an example, take the addition of an execution agent that uses the local host name and whose maximum number of concurrently executable jobs is set to 00:00-00:00=10 (maximum of 10 concurrent jobs, 24 hours a day). In this case, because the maximum number of concurrently executable jobs for the default execution agent is 00:00-00:00=5 (maximum of five concurrent jobs, 24 hours a day), a maximum of 15 jobs could be executed concurrently.

When you specify a maximum number of concurrently executable jobs, specify a value appropriate for the execution host.

## (2) Checking whether the maximum number of concurrent jobs has been reached when jobs remain in queuing status

When the number of active jobs on an agent host reaches the maximum number of concurrently executable jobs, subsequent jobs might remain in the *queuing* status for a long time before being executed. To check whether the maximum number of concurrently executable jobs has been reached, execute the `ajsagtshow` command and compare the number of active jobs (JOB) against the maximum number of concurrently executable jobs (CON-EXE). For details about the `ajsagtshow` command, see *ajsagtshow* in 2. *Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

By setting up JP1/AJS3 to output the following message to the integrated trace log when the maximum number of concurrent jobs is reached and no more jobs can be registered for execution, you can check whether this is the reason for execution delays.

```
KAVU4310-I The number of executing jobs reaches the
concurrently-executable-job-limit (maximum-number-of-concurrently-
executable-jobs) at the agent. (agent-host-name) (host name: host-name, job
number: job-number)
```

For details about how to perform this setting, see the following descriptions:

In Windows:

*6.2.13 Outputting a message that reports that the maximum number of concurrently executable jobs has been reached in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*

In UNIX:

*15.2.13 Outputting a message that reports that the maximum number of concurrently executable jobs has been reached in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*

## 2.6 Determining the JP1/AJS3 database configuration

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JP1/AJS3 - Manager uses a relational database to manage data for controlling job execution.

The following table lists JP1/AJS3 functions and the location of the data used by each function.

Table 2–29: JP1/AJS3 functions and databases

Function	Stored data	Location
Scheduler control Job execution control	Schedule definition Execution schedules Jobnet definitions Jobnet statuses	Embedded database
Agent management control	Execution agent information	Embedded database
Event/action control	Status of received events and executed actions	Standard files (No database is used.)
JP1/AJS Console control	Business scope and AJS3 unit monitoring Object definition information	Standard files (No database is used.)
Queueless job execution control (queueless agent function)	Executed job information	Standard files (No database is used.)
Submit job control (execution control of QUEUE jobs and submit jobs)	Queue/agent configuration Job execution status	ISAM

### 2.6.1 Types of JP1/AJS3 databases

You can configure different types of databases in a JP1/AJS3 system, depending on how the system is to be used.

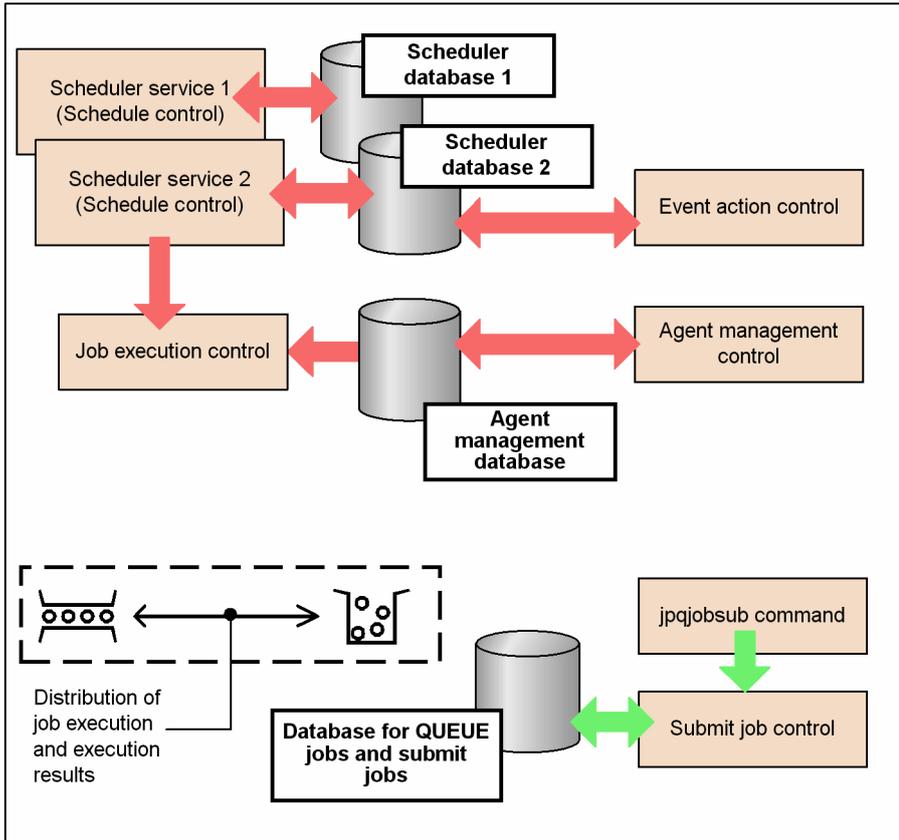
For the types of databases supported by JP1/AJS3 and how to set up a database, see *1.4 JP1/AJS3 database configurations* in the manual *Job Management Partner 1/Automatic Job Management System 3 Overview*.

### 2.6.2 JP1/AJS3 database configuration

The following figure shows the JP1/AJS3 database configuration.

Figure 2-40: JP1/AJS3 database configuration

JP1/AJS2 - Manager



The following table lists the types of JP1/AJS3 databases and the information stored in each type.

Table 2-30: JP1/AJS3 database types and stored information

Database type	Information stored in the database
Scheduler database	<ul style="list-style-type: none"> <li>Definition information for:                             <ul style="list-style-type: none"> <li>- Jobs and jobnets</li> <li>- Calendars and schedules</li> </ul> </li> <li>Execution results and execution statuses (jobs and jobnets)</li> </ul>
Agent management database	<ul style="list-style-type: none"> <li>Definition information for:                             <ul style="list-style-type: none"> <li>- Execution agents</li> <li>- Execution agent groups</li> </ul> </li> </ul>
Database for QUEUE jobs and submit jobs <sup>#</sup>	<ul style="list-style-type: none"> <li>Execution results and execution statuses for:                             <ul style="list-style-type: none"> <li>- Jobs submitted by the <code>jqjobsub</code> command</li> <li>- QUEUE jobs requested for execution by a scheduler service</li> </ul> </li> <li>Configuration definition information for agents, queues, and resources that can be locked for exclusive use</li> </ul>

#

Use an ISAM database. ISAM is supplied as standard with JP1/Base.

JP1/AJS3 incorporates a range of functions that request job execution (execution of PC jobs, Unix jobs, and QUEUE jobs). These functions include scheduler services, and commands such as the `jqjobsub` command for controlling submit job execution.

For jobs executed from a scheduler service, the jobnet definition information, execution statuses, and execution results are managed in a scheduler database. To execute a job in a jobnet (PC job, Unix job, or QUEUE job), the scheduler service sends a job execution request to the job execution control. The job's execution status and result are managed in the scheduler database (for QUEUE jobs, the job status and execution result are also managed in the database for QUEUE jobs and submit jobs). The scheduler database is updated when the job's status changes.

When the `jpqjobsub` command is used to request job execution, the request is sent directly to the submit job control without going through a scheduler service. The job's execution status and result, together with configuration definition information about the agent, queue, and execution-locked resources, are managed in the database for QUEUE jobs and submit jobs. For details about this database, see [7.1.3 Database for QUEUE jobs and submit jobs](#).

## 2.6.3 JP1/AJS3 database tables

This subsection describes the databases used by the scheduler control, job execution control, and agent management control.

For details about the database for QUEUE jobs and submit jobs used by the submit job execution control, see [7.1.3 Database for QUEUE jobs and submit jobs](#).

### (1) Scheduler database

The following table describes the information stored in the scheduler database used by the scheduler control and job execution control.

Table 2-31: Tables in a scheduler database

Table name <sup>#1</sup>		Contents	Row length <sup>#2</sup> (bytes)	Variable-length rows <sup>#2</sup> (bytes)	Number of indexes	Index length <sup>#2</sup> (bytes)
Definition table	AJSUNIT	Unit management	408 (640) <sup>#3</sup>	None	2	Primary keys: 4 Sub-keys: 36
	AJSARROW	Unit relationship definition	52	None	1	12
	AJSBODY	Unit definition	1,024	4 to 64,000	1	4
	AJSSCH	Schedule definition	148 (208) <sup>#3</sup>	4 to 8,192	1	8
	AJSCAL	Calendar definition	1,540	None	1	8
	AJSRELS	Release definition	1,180	None	3	Primary keys: 36 Sub-keys: 8 Sub-keys: 8
Execution table	AJSSTAT	Unit status	1,540 (1,720) <sup>#3</sup>	None	1	12
	AJSENTRY	Registration for execution	764	None	1	8
	AJSGEN	Generation management	124	4 to 32,000 <sup>#4</sup> , 4 to 64,000 <sup>#4</sup>	1	8
	AJSPERF	Statistics	120	None	2	Primary keys: 4

Table name#1		Contents	Row length#2 (bytes)	Variable-length rows#2 (bytes)	Number of indexes	Index length#2 (bytes)
Execution table	AJSPERF	Statistics	120	None	2	Sub-keys: 8
	AJSID	ID management	76	None	1	8

#1

Default names in the JP1/AJS3 environment settings.

For an embedded database, the index has a table name followed by INDEX1 for the primary key (including tables with no sub-keys), and INDEX2 and INDEX3 for the sub-keys.

#2

The row length given for a variable-length table is the size of the fixed-length portion at the beginning of each record. Note that in addition to this size, the table region on the disk includes a management area and therefore does not match the table size given above.

A JP1/AJS3 database has a maximum variable-row length of 64,000 bytes, and contains one field for data plus another variable-length field. The variable-length field (maximum 64,000 bytes) has two VARCHAR fields. If the variable-length data to be stored in one of the two fields does not exceed 32,000 bytes, zero-length data (SQLLEN = 1) is set in the second VARCHAR field.

#3

The value enclosed in parentheses is used when the scheduler database has been set up by using the `ajsembdbsetup` command with the `-e sjis` option specified. For details, see *ajsembdbsetup* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

#4

Two variable-length areas are defined in the generation management table.

The following describes the number of records in each table and how the variable-length records are used.

The tables in the scheduler database can be divided into tables for storing unit definitions (*definition* tables) and tables for storing job and jobnet schedules and results (*execution* tables).

## (a) Definition tables

The following describes the record count and variable-length records for each type of definition table.

*Unit management* table (AJSUNIT)

The number of records is the number of JP1/AJS3 units (total number of job groups, jobnets, and jobs).

*Unit relationship definition* table (AJSARROW)

The number of records is the number of relationships established among jobnets.

*Unit definition* table (AJSBODY)

The number of records is the total number of job definitions and jobnet definitions.

Except for schedule information and calendar information, unit definition information including command statements and script file names is stored.

*Schedule definition* table (AJSSCH)

Multiple information items are stored in the schedule definition.

The number of stored records is equivalent to the number of records containing the following information:

- Schedule information

The number of records is the total number of jobnets plus the total number of scheduling rules defined for them. The table stores the common schedule information and scheduling rule information.

The common schedule information (names of units referencing the calendar) and scheduling rule information (scheduling rules) are stored as variable-length data in the same format as the parameters in the unit definition file.

- Jobnet connector information

The number of records is equivalent to the number of jobnet connectors plus the number of connection-destination jobnets. The full path name of the connection-destination jobnets, the connection-destination host names, and the connection-destination scheduler service names are saved as variable-length data.

- Wait information

The number of records is equivalent to the total number of units with wait conditions plus the total number of wait conditions set for all units. Both common wait information and information about units targeted for waiting are saved.

For the information about units targeted for waiting, the unit complete names of the units targeted for waiting are saved as variable-length data in the same format as the parameters in the unit definition file

#### *Calendar definition table (AJSCAL)*

The number of records is the number of job groups plus the number of years defined in the calendar.

#### *Release definition table (AJSRELS)*

The number of records is the number of jobnets registered for release plus the number of times each jobnet has been registered for release. As JP1/AJS3 automatically deletes these records depending on the status of the jobnet registered for release, the number of records might be different from the calculated figure.

## **(b) Execution tables**

The following describes the record count and variable-length records for each execution table.

#### *Unit status table (AJSSTAT)*

The number of records necessary for each registered root jobnet is *root-jobnet-and-total-number-of-nested-jobnets-and-jobs* x (*number-of-logs-to-keep* + *number-of-scheduled-generations-registered-for-fixed-execution* + 1), where the number of logs to keep includes sub-generations created when start conditions are satisfied.

Calculations are made for all registered root jobnets, and the sum becomes the total number of records.

#### *Registration for execution table (AJSENTRY)*

The number of records necessary for each registered root jobnet is *number-of-logs-to-keep-for-the-root-jobnet* + *number-of-scheduled-generations-registered-for-fixed-execution*, where the number of logs to keep includes sub-generations created when start conditions are satisfied. Calculations are made for all registered root jobnets, and the sum + 1 becomes the total number of records.

#### *Generation management table (AJSGEN)*

The number of records and amount of information stored as variable-length data differs depending on whether start conditions are used for the registered root jobnets and whether wait conditions are used.

For a root jobnet without a start condition, an item of information with a length of ((*number-of-logs-to-keep* + *number-of-scheduled-generations-registered-for-fixed-execution*) + 1) x 8 bytes is stored as variable-length data (4 to 64,000).

*number-of-release-IDs-release-registered-for-root-jobnets* x 4 bytes of information is stored as variable-length data (4 to 32,000).

In the same way, for a root jobnet that has a start condition, an item of data with a length of ((*number-of-logs-to-keep* + *number-of-scheduled-generations-registered-for-fixed-execution*) + 1) x 8 bytes is stored as variable-length data. In addition, information about the number of sub-generations, calculated as *number-of-sub-generations-created-every-time-a-start-condition-is-satisfied* x 8 bytes is stored as variable-length data (4 to 64,000).

If a unit with wait conditions is already registered, records equivalent to *number-of-registered-units-with-wait-conditions* x *number-of-logs-to-keep* are added. For each record, information equivalent to *number-of-set-wait-conditions* x 56 bytes is stored as variable-length data (4 to 32,000).

Calculate the number of records for all the registered root jobnets and all the registered units with wait conditions. The total is the total number of records.

*Statistics* table (AJSPERF)

The number of records is the total number of units registered for execution.

*ID management* table (AJSID)

The number of records is the number of records in all the active units.

**(c) Supplementary notes about the scheduler database**

If the scheduler service does not stop as planned due to a power failure or other reason, processing resumes when the service next starts, and the KAVS0211-W message is output to the Windows event log or `syslog`. Check the job status as jobs might have stopped before completion.

**(2) Agent management database**

The agent management database is used by the agent management control. This database manages definition information about execution agents and execution agent groups. The following table describes the database tables in an agent management database.

Table 2-32: Tables in an agent management database

Table name	Contents	Row length (bytes)	Variable-length rows (bytes)	Number of keys	Number of indexes	Index length (bytes)
AJSEEXECAGT	Execution agent definition	952	None	1	1	4
AJSAGTEXECCNT	Maximum concurrent jobs definition	20	None	1	1	8
AJSEEXECAGTGRP	Execution agent group definition	696	None	1	1	4
AJSLINKAGT	Connected execution agents definition	20	None	1	1	8

The number of records in each table is as follows:

*Execution agent definition* (AJSEEXECAGT)

The number of records is the number of defined execution agents.

*Maximum concurrent jobs definition* (AJSAGTEXECCNT)

The number of records is *number-of-defined-target-agents* x 48.

*Execution agent group definition* (AJSEEXECAGTGRP)

The number of records is the number of defined execution agent groups.

*Connected execution agents definition* (AJSLINKAGT)

The number of records is the total number of execution agents connected to each execution agent group.

## 2.6.4 Database settings that are set up in JP1/AJS3

When you perform a new installation of JP1/AJS3 - Manager, an embedded database environment is automatically configured during setup processing. The embedded database environment is also automatically configured when a setup command is executed.

However, the embedded database environment is not configured when the `-S` option is specified for the `jajs_migrate`, `jajs_setup` and `jajs_setup_cluster` commands.

The following table provides an overview of embedded databases that are created during the extended setup process.

Table 2–33: Overview of embedded databases that are created during the extended setup process

Settings	When a new installation is performed	When the <code>jajs_setup</code> command is executed	When the <code>jajs_setup_cluster</code> command is executed	When the <code>jajs_migrate</code> command is executed
Database model	Small-scale <sup>#1</sup>	Medium-scale <sup>#1</sup>	Small-scale <sup>#1</sup>	Small-scale <sup>#1</sup>
Embedded database practical directory	Windows: <i>JP1/AJS3-installation-folder\embdb\_JF0</i> UNIX: <i>/opt/jplajs2/embdb/_JF0</i>	Windows: <i>JP1/AJS3-installation-folder\embdb\setup-identifier</i> UNIX: <i>/opt/jplajs2/embdb/setup-identifier</i>	Windows: <i>JP1/AJS3-installation-folder\embdb\setup-identifier</i> UNIX: <i>/opt/jplajs2/embdb/setup-identifier</i>	Windows: <i>JP1/AJS3-installation-folder\embdb\setup-identifier</i> UNIX: <i>/opt/jplajs2/embdb/setup-identifier</i>
Data area storage directory	Windows: <i>JP1/AJS3-installation-folder\embdb\_JF0\dbarea</i> UNIX: <i>/var/opt/jplajs2/embdb/_JF0/dbarea</i>	Physical host environment Windows: <i>JP1/AJS3-installation-folder\embdb\setup-identifier\dbarea</i> UNIX: <i>/var/opt/jplajs2/embdb/setup-identifier/dbarea</i> Logical host environment Windows: <i>folder-specified-in-the-D-option\jplajs2\embdb\setup-identifier\dbarea</i> UNIX: <i>directory-specified-in-the-D-option/jplajs2/embdb/setup-identifier/dbarea</i>	Windows: <i>folder-specified-in-the-d-option\jplajs2\embdb\setup-identifier\dbarea</i> UNIX: <i>directory-specified-in-the-d-option/jplajs2/embdb/setup-identifier/dbarea</i>	Windows: <i>JP1/AJS3-installation-folder\embdb\setup-identifier\dbarea</i> UNIX: <i>/var/opt/jplajs2/embdb/setup-identifier/dbarea</i>
System file area storage directory	Windows: <i>JP1/AJS3-installation-folder\embdb\_JF0\dbarea</i>	Physical host environment Windows: <i>JP1/AJS3-installation-folder\embdb\setup-identifier\dbarea</i>	Windows: <i>foder-specified-in-the-d-option\jplajs2\embdb\setup-identifier\dbarea</i>	Windows: <i>JP1/AJS3-installation-folder\embdb\setup-identifier\dbarea</i>

Settings	When a new installation is performed	When the jajs_setup command is executed	When the jajs_setup_cluster command is executed	When the jajs_migrate command is executed
System file area storage directory	UNIX: /var/opt/ jplajs2/embdb/ _JF0/dbarea	UNIX: /var/opt/ jplajs2/embdb/ setup-identifier/ dbarea  Logical host environment Windows: folder-specified-in-the-D-option \jplajs2\embdb \setup-identifier \dbarea  UNIX: directory-specified-in-the-D-option/ jplajs2/embdb/ setup-identifier/ dbarea	UNIX: directory-specified-in-the-d-option/ jplajs2/embdb/ setup-identifier/ dbarea	UNIX: /var/opt/ jplajs2/embdb/ setup-identifier/ dbarea
Work area directory	Windows: JP1/AJS3-installation-folder\embdb \_JF0\dbarea  UNIX: /var/opt/ jplajs2/embdb/ _JF0/dbarea	Windows: JP1/AJS3-installation-folder\embdb\setup-identifier\dbarea  UNIX: Physical host environment /var/opt/ jplajs2/embdb/ setup-identifier/ dbarea  Logical host environment /opt/jplajs2/ embdb/setup-identifier/dbarea	Windows: JP1/AJS3-installation-folder\embdb\setup-identifier\dbarea  UNIX: /opt/jplajs2/ embdb/setup-identifier/dbarea	Windows: JP1/AJS3-installation-folder\embdb\setup-identifier\dbarea  UNIX: /var/opt/ jplajs2/embdb/ setup-identifier/ dbarea
Setup identifier	_JF0	_JF0-_JFZ#2, #3	The value of the -I option	_JF0-_JFZ#2
Port number	22220	22220-22239#2, #4	The value of the -P option	22220-22239#2
Database area auto-increment	Enabled	Enabled	Enabled	Enabled
System log auto-increment	Enabled	Enabled	Enabled	Enabled
Automatic log unload functionality	Disabled	Disabled	Disabled	Disabled
Duplication of system logs	Disabled	Disabled	Disabled	Disabled
Reuse start points for the reuse free space functionality	Small-scale#1	Small-scale#1	Small-scale#1	Small-scale#1

#1

When the `-M` option of the `jajs_setup` and `jajs_setup_cluster` commands or the `-s` option of the `jajs_migrate` command is specified, the database is configured with the size specified by the option.

#2

A value in this range is automatically assigned.

#3

When you add a scheduler service and specify the setup identifier of a configured embedded database in the `-I` option, a scheduler service database is created in the embedded database configured with the specified setup identifier. If a setup identifier that has not been configured is specified in the `-I` option, a new embedded database is configured and the scheduler service database is created.

#4

If you specify the `-P` option, the value specified in the `-P` option will be set.

If you want to configure an embedded database environment with settings other than those listed above, see the description of the setup in *C. Advanced Setup of an Embedded Database* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* or *D. Advanced Setup for the Embedded Database (in a Cluster Configuration)* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*, and then configure an embedded database environment.

If you want to change the settings of an embedded database that has automatically been configured during a new installation, you need to set up the embedded database environment again. For details, see *C.2(7) Setting up an embedded database again* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

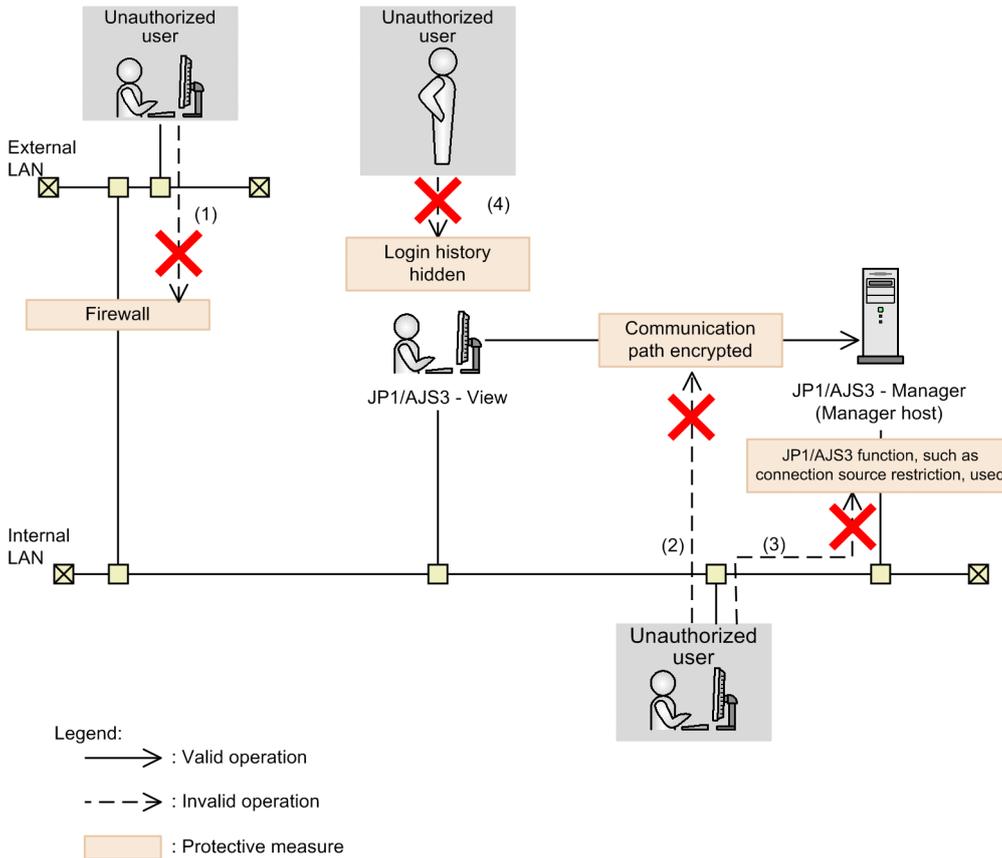
## 2.7 JP1/AJS3 security considerations

This section describes security measures for the safe use of JP1/AJS3.

As security measures, we recommend that you use firewalls and JP1/AJS3 functions that prevent access from unauthorized users and prevent the execution of jobs from unintended hosts.

The following figure shows an example of measures taken to prevent access by unauthorized users.

Figure 2-41: Measures preventing access by unauthorized users



The following table describes the security measures shown in the figure. The numbers in the table correspond to the numbers in the figure.

Table 2-34: Measures to prevent access by unauthorized users

No	Operation from unauthorized user	Protective measure
1	Access from outside the company	Firewall <sup>#1</sup>
2	Eavesdropping on communication data flowing between JP1/AJS3 - View and JP1/AJS3 - Manager	Encryption of communication paths
3	Login from inside the company	<ul style="list-style-type: none"> <li>• Restrictions on physical access to machines</li> <li>• Proper management of OS users<sup>#2</sup></li> <li>• Proper management of JP1 users<sup>#3</sup></li> <li>• Connection source restrictions in JP1/AJS3<sup>#4</sup></li> <li>• Proper management of embedded database administrators<sup>#5</sup></li> </ul>
4	Unauthorized use of the JP1/AJS3 - View login history	Preventing the login history from being displayed <sup>#6</sup>

#1

For details about the firewall, see [2.3.2 Working through a firewall](#).

#2

We recommend that you manage OS users so that general users without administrator permissions are not permitted to log in to manager hosts. Do not assign OS users permissions other than those necessary for executing a job.

#3

Change the initial password for the JP1 user *jp1admin*. Add JP1 users only when necessary, and set appropriate permissions for each JP1 user.

#4

Using a JP1/AJS3 function, you can limit the hosts that are able to access manager hosts or agent hosts. For details see, [2.3.8 Restricting access to JP1/AJS3](#).

#5

You can change the passwords used by embedded database administrators. For details about how to do this, see *B. Notes on Using the Embedded-Database Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

#6

Using a JP1/AJS3 function, you can prevent the previously used JP1 login user names and the names of previously connected hosts from appearing on the Login screen of JP1/AJS3 - View. By hiding previously used login information, you can prevent unauthorized users from logging in to the system by using valid JP1 user names. For details, see [11.2.6 Preventing the history of previously used login user and connected host names from appearing on the Login screen](#) in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

We recommend that you disable the predictive conversion functionality of character input software such as IMEs. If this functionality is enabled, suggestions might be displayed when a user is inputting information in **User name**, **Password**, or **Host to connect**, even though previously used login information is set to be hidden.

# 3

## Estimates

This chapter explains how to make estimates for JP1/AJS3.

Before actually building a system using JP1/AJS3, you must estimate approximate values for the system resources and the kernel parameters.

You might have to consult this chapter again once the system is in operation to revise the estimates and change the values you originally calculated.

## 3.1 Estimating the processing performance of JP1/AJS3

This section explains how to estimate the processing performance of JP1/AJS3. Follow the explanations given here to achieve the most efficient operation of the work tasks to be automated in a system that uses JP1/AJS3.

### 3.1.1 Job throughput

When calculating the throughput of a JP1/AJS3 system, you need to consider job execution time as distinct from the JP1/AJS3 processing performance. The execution time of a job runs from the time JP1/AJS3 starts a job execution process until the job has actually ended. Thus, when estimating how many jobs can be executed per unit time, bear in mind both the JP1/AJS3 processing performance and job execution times. You will also need to consider transfer times if large quantities of data are output to the standard error output, or if a large number of files are transferred.

#### (1) Job processing performance

JP1/AJS3 processing capacity is estimated as the number of job executions per unit of time. You can consider light load conditions, where many "jobs that do nothing" are executed, as giving the peak performance for JP1/AJS3. Check that the number of jobs to be executed is comfortably below this peak performance.

Most jobs tend to be concentrated in particular time periods, so for a balanced performance estimate you have to ensure that the system remains within its peak performance during the period when the concentration of jobs is highest.

When estimating throughput, allow some latitude for the possibility of execution errors and recovery processing.

We recommend, for the sake of simplicity, that you base your estimates on the assumption that 10 times the average number of jobs will be executed during the most concentrated period, and that the daily volume of jobs will use about one tenth of the peak system performance. The following table describes performance estimates for a system that runs jobs 12 hours per day.

Note that the peak performance will vary depending on the hardware you use and other factors.

Table 3-1: Example estimate for JP1/AJS3 job throughput

Peak performance (number of jobs executed per second)	Peak performance (number of jobs executed per hour)	Recommended number of jobs executed per day with 12 hours' operation
0.5	1,800	2,160
1.0	3,600	4,320
2.0	7,200 <sup>#2</sup>	8,640
3.0 <sup>#1</sup>	10,800 <sup>#2</sup>	12,960
4.0 <sup>#1</sup>	14,400 <sup>#2</sup>	17,280
5.0 <sup>#1</sup>	18,000 <sup>#2</sup>	21,600

#1

When using queueless jobs.

#2

In practice, we recommend that you keep the number of jobs started to no more than 5,000.

For example, suppose that 0.5 jobs are executed per second at peak times.

The number of jobs executed per hour in this case will be:

$$(0.5 \text{ jobs}) \times (3,600 \text{ seconds}) = 1,800 \text{ jobs}$$

Operating 12 hours per day, and at peak performance throughout the day, the number of jobs executed per day would be:

$$(1,800 \text{ jobs}) \times (12 \text{ hours}) = 21,600 \text{ jobs}$$

Consequently, the recommended number of job executions would be:

$$(21,600 \text{ jobs}) / 10 = 2,160 \text{ jobs}$$

## (2) Event job processing performance

The discussion in *(1) Job processing performance* above does not apply to event jobs (including those within a start condition) because they have a different execution process from standard jobs.

Certain restrictions apply to event jobs, such as the maximum number of event jobs that can be registered for execution at the same time. Use event jobs judiciously, referring to *B.8 Limits for the event/action control*.

First estimate the number of events likely to be generated, and keep them to within the system's processing capacity. See *3.1.4 Event monitoring performance*.

## (3) Activating multiple scheduler services concurrently

When a manager host has two or more CPUs, there are limits to fully utilizing those resources if just one scheduler service is used. We recommend running multiple scheduler services in this situation. For details about using multiple scheduler services, see *4.3.5 Activating multiple scheduler services concurrently*.

On a host with only one CPU, running multiple scheduler services within the limits of the CPU's processing capacity might still be an efficient use of resources. We recommend that you consider this option.

## (4) Distributing job execution among multiple agent hosts

To utilize the manager host's processing capacity to its fullest extent, we recommend a system configuration in which jobs are executed on multiple agent hosts, thereby helping to reduce the load at the manager host.

For details about configurations that distribute the processing load among multiple agent hosts, see *2.5.2 Load distribution*.

## (5) OS tuning

### (a) TCP/IP parameters

When a JP1/AJS3 system has a large number of jobs to execute, the number of socket ports used for communication between internal processes and between the manager and agent hosts might exceed the OS limit. This can result in job execution delays and abnormal termination of jobs, scheduler services, and commands.

For this reason, you must adjust the OS's TCP/IP parameters to avoid insufficient socket ports at peak loads. Adjust the following parameters:

- Number of socket ports

- Socket port `TIME_WAIT` interval

The following table lists the defaults for these parameters in each OS.

Table 3-2: OS defaults for TCP/IP parameters

OS	Number of socket ports that can be used	TIME_WAIT interval (seconds)
Windows Server 2008	16,383	120
Windows Server 2003	3,976	120
HP-UX (IPF)	16,383	60
Solaris	32,768	60
AIX	32,768	15
Linux	28,233	60

The number of socket ports and the value of the `TIME_WAIT` interval might vary according to the OS version and service pack. See the latest documentation for your OS.

In Windows, you can change the TCP/IP parameters by changing the following registry setting, and then restarting Windows. For the setting procedure, or if using an OS other than Windows, see your OS documentation.

- Registry key  
`\\HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Tcpip\Parameters`
- Parameters
  - `MaxUserPort`
  - `TcpTimedWaitDelay`

Estimate the maximum number of jobs that can be executed per `TIME_WAIT` interval as described below, and adjust the TCP/IP parameters as needed.

Note that these adjustments might increase usage of OS resources. For details, see the documentation for your OS.

#### Estimation

Use the following formula:

$$\text{Maximum number of jobs that can be executed per } \text{TIME\_WAIT} \text{ interval}^{\#1} \\ = \text{number-of-available-socket-ports}^{\#1,\#2} / \text{number-of-ports-used-by-JP1/AJS3}^{\#3}$$

#1

Check the actual value set in the OS's TCP/IP parameter.

#2

The value of the OS's TCP/IP parameter is the total number of socket ports available to the system. Therefore, subtract the number used by OS services and by software products other than JP1/AJS3.

#3

This is the number of ports used by JP1/AJS3 to execute one job. The maximum is 11, but a maximum of 12 ports might be used when the agent-monitoring interval (default 5 minutes) is less than the `TIME_WAIT` interval.

#### Estimation example

This example is for Windows Server 2003, using the OS defaults.

- Number of socket ports available to the OS  
3,796<sup>#</sup>
- `TIME_WAIT` interval  
120 seconds
- Maximum number of jobs that can be executed per `TIME_WAIT` interval  
 $3,796 / 11 = \text{approx. } 345$

#

This assumes that other software products are not using socket ports. In practice, the number used by OS services and by software products other than JP1/AJS3 needs to be subtracted from this figure.

In this example, if more than 345 jobs are executed within 120 seconds, the socket ports will run out, causing delays and other potential problems. If this could occur in your system, you will need to change the TCP/IP parameter settings to adjust the maximum number of jobs that can be executed.

### 3.1.2 Response of JP1/AJS3 - View

When using JP1/AJS3 - View, you can calculate an approximate value for the response time from JP1/AJS3 - Manager with the following formula.

Response time =

*Processing-time-at-JP1/AJS3 - Manager*  
+ *data-transfer-time*  
+ *drawing-time*

#### (1) JP1/AJS3 - Manager processing time

If the processing performance of the computer in which JP1/AJS3 - Manager is installed is low, the processing time will be long. The processing at JP1/AJS3 - Manager is shown below:

- Connection (user authentication)
- Updating user definition information and acquiring actual schedule and actual result data
- Operations on units

##### (a) Connection (user authentication)

When you connect from JP1/AJS3 - View to JP1/AJS3 - Manager, the authentication server is accessed to authenticate the user. If the computer running the authentication server has not been started, or multiple authentication servers are used, there will be a corresponding increase in processing time.

##### (b) Updating unit definition data and acquiring actual schedule and actual result data

The processing at JP1/AJS3 - Manager differs according to the type of request from JP1/AJS3, but since in the main it will be searching for, referencing, and updating definitions and statuses stored in the disk, it tends to be affected by disk performance.

Processing will take time particularly if there are many component elements in the Monthly Schedule window, the Daily Schedule window, or the JP1/AJS3 - View window (Summary Monitor window), and jobnets with many execution generations are displayed, or when job group statuses are displayed in the JP1/AJS3 - View window (Main window). The performance of the CPU also affects calculation of execution schedules.

To increase stability of performance, you must estimate the entire load on the server, taking into account the frequency of disk access by other applications, the circumstances of CPU use, and so on.

### (c) Operations on units

When a lengthy fixed-execution registration is done for a jobnet with many component elements, or the registration of a jobnet with a very large *number of logs to keep* setting is canceled, the processing time at JP1/AJS3 - Manager will be long. Under conditions such as these, communications processing might time out at JP1/AJS3 - View, and the message KAVV402-E (A timeout occurred while waiting for the response from the connection-destination) might be displayed. Consider reviewing operations to avoid long processing times in JP1/AJS3 by shortening the fixed registration period, setting a smaller number of logs to keep, and so on. If you cannot review operations, change the timeout value by following the corrective action advised for the error message KAVV402-E. The default for this timeout value is 30 minutes. The appropriate timeout value will differ depending on the nature of the processing at JP1/AJS3 - Manager, the condition of the network, and the performance of the computer. Measure the response time in the environment you are using and estimate an appropriate value. After measuring a sufficiently large response time, set a value larger than the measured value as the timeout value (there should be some leeway).

## (2) Data transfer time

The data transfer time is affected by the network performance between JP1/AJS3 - View and JP1/AJS3 - Manager.

The data transfer time also lengthens as the number of units displayed and number of executed generations increase. If the network you are using is a slow one, consider the following measures.

- Do not automatically refresh screens, or lengthen the update interval.
- Reduce the number of elements (jobs, jobnets, etc.) displayed on one screen.

## (3) Drawing time

The main influence on the display performance of JP1/AJS3 - View is the performance of the JP1/AJS3 - View host. If the processing speed of the JP1/AJS3 - View host is slow, drawing takes time. If the number of displayed units and relation lines and the number of logs to keep increase and you feel that the drawing speed is slower than before, consider upgrading the computer on which JP1/AJS3 - View is installed.

Display will take time and the memory area used will increase particularly if the schedule settings in the Monthly Schedule window and the Daily Schedule window call for the display of tens of thousands of execution generations or job groups consisting of hundreds of jobnets. Accordingly, when performing operations using the Monthly Schedule window or Daily Schedule window, consider upgrading the computer on which JP1/AJS3 - View is installed.

### 3.1.3 Response of JP1/AJS3 Console View

You can calculate an approximate value for the JP1/AJS3 Console View response time using the formula below.

Response time =

*Processing-time-at-JP1/AJS3-Console-Manager*  
+ *data-transfer-time*  
+ *drawing-time*

## (1) JP1/AJS3 Console Manager processing time

If the computer in which it is installed has low processing performance, JP1/AJS3 Console Manager will exhibit long processing times.

The processing at JP1/AJS3 Console Manager is as follows:

- Connection (user authentication)
- Acquisition and updating of definition data

### (a) Connection (user authentication)

When you connect to JP1/AJS3 Console Manager from JP1/AJS3 Console View, the authentication server is accessed to authenticate the user.

If the computer running the authentication server has not been started, or if multiple authentication servers are used, there is a corresponding lengthening of processing time, communications processing might time out at JP1/AJS3 Console View and the error message KAVC4506-E (A timeout occurred while waiting for the response from the connection-destination) might be displayed.

The default value for this timeout is 300 seconds. You can customize this value. However, the appropriate timeout value differs considerably depending on factors including the network conditions and computer performance. Measure the response time in the environment you are using and estimate an appropriate value.

For details about customizing the timeout value, see *14.2.4 Specifying communication options* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

### (b) Acquiring and updating definition data

When you acquire definition data in JP1/AJS3 Console Manager from JP1/AJS3 Console View, or update definition data, the main processing performed at JP1/AJS3 Console Manager is referencing and updating the definitions stored in the disk, and the disk I/O performance necessarily affects this processing.

When communications processing times out at JP1/AJS3 Console View, the error message KAVC4506-E (A timeout occurred while waiting for the response from the connection-destination) might be displayed.

The default value for this timeout is 300 seconds. You can customize this value. However, the appropriate timeout value differs considerably depending on factors including the network conditions and computer performance. Measure the response time in the environment you are using and estimate an appropriate value.

To increase stability of performance, you must estimate the entire load on the server, taking into account the frequency of disk access by other applications, the circumstances of CPU use, and so on.

For details about customizing the timeout value, see *14.2.4 Specifying communication options* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

## (2) Data transfer time

Data transfer time is affected by the network performance between JP1/AJS3 Console View and JP1/AJS3 Console Manager. Note also that when many objects are displayed on a screen, it takes a correspondingly long time to display the screen.

## (3) Drawing time

The main influence on the display performance of JP1/AJS3 Console View is the performance of its host. If this host has a low processing speed, the drawing time will be long.

### 3.1.4 Event monitoring performance

If you intend to monitor events using JP1/AJS3 event jobs and jobnets with start conditions, you must first estimate the number of event jobs that will be executed and the number of generated events, and keep monitoring to within the JP1/AJS3 processing performance.

This subsection describes how to estimate and set the processing performance of JP1/AJS3 in regard to monitoring events.

Processing performance estimates for event monitoring are based on how long it takes an event job or a jobnet with a start condition to be ready to process the next event after a preceding event occurs. If events occur at shorter intervals than the estimated length of time, a bottleneck of event jobs and jobnets with start conditions might occur, potentially delaying the processing of other jobnets. In cases where you can predict how frequently events will be generated, we recommend setting monitoring conditions that will not result in events occurring at shorter intervals than predicted.

Bottlenecks might also occur when a number of events are being monitored and two or more occur at roughly the same time. Avoid monitoring types of events that are likely to occur at the same time.

The processing time for monitoring one event is approximately 0.6 seconds, depending on the hardware and other factors.

You can also estimate the processing capacity for monitoring events by a scheduler service, based on how many events are generated at the scheduler service per unit time. We recommend a system design that will keep the number of events reported to the scheduler service at a level well below the value calculated using the following formula:

At jobnet registration

$$\text{Length of time until the jobnet can be executed (seconds)} = \text{number of event jobs}^{\#} \times 0.8$$

#

Total number of event jobs (including jobnets with start conditions) registered for execution at the same time

At event occurrence

$$\text{Number of events that can be processed} = \text{unit of time (seconds)} / 0.6$$

Example: Calculate the number of events that can be processed in 60 seconds.

$$\text{Number of events that can be processed} = 60 / 0.6 = 100$$

Thus, 100 jobs can be processed in 60 seconds.

This formula gives the peak processing performance (that is, the processing capacity when only event jobs and jobnets with start conditions are processed).

Keep the number of events to no more than 1,000 per hour per scheduler service, even at peak times.

Performance when the event order option is used

When the event order option is used, an agent that has sent an event to the manager does not send the next event until it receives a reply from the manager. Processing that checks for a reply from the manager is performed at regular intervals (every ten seconds), and the agent sends the next event only after a reply is received from the manager. Accordingly, the maximum number of events that can be processed per hour is 360. We recommend that

you estimate 180 events being processed per hour when the event order option is specified, although the actual value will depend on how often events occur in the particular system.

### 3.1.5 Monitoring interval set when using the Monitoring Files job

This subsection explains how to estimate the monitoring interval time to be set when using Monitoring Files jobs. If you execute many Monitoring Files jobs at the same time and with the same monitoring interval in JP1/AJS3, the processing for all the jobs might not finish within the set monitoring interval. If you continue operation under these circumstances, file updating will not be monitored correctly at the set interval time, so that a longer time than the monitoring interval might elapse between the updating of a monitored file and the generation of an event. You must therefore calculate the monitoring interval time to be set when multiple Monitoring Files jobs are executed by using the following estimation formula.

#### (1) Monitoring interval time estimation formula

Select the larger of the values obtained with the following estimation formulae as the monitoring interval time:

- Estimation formula 1 =  $(A \times \text{number-of-executed-jobs}) + (\text{sum-of-}B)$

- Estimation formula 2 =  $(C \times \text{number-of-executed-jobs}) + (\text{sum-of-}D) + (E \times \text{peak-number-of-event-occurrences}^\#) + (\text{sum-of-}F\text{-when-number-of-event-occurrences-is-at-peak})$

#

The *peak number of event occurrences* is the maximum number of events occurring per minute.

Table 3-3: Processing time per Monitoring Files job

	When the full name of the monitored file is specified	When a wildcard (*) is used in the specification of the monitored file
(at registration)	A Approx. 0.1 seconds	B 0.1 seconds + 0.2 seconds added for each multiple of 10 monitored files
(during monitoring)	C Approx. 0.02 seconds	D 0.02 seconds + 0.2 seconds added for each multiple of 10 files matching the wildcard <sup>#</sup>
(when events occur)	E Approx. 0.9 seconds	F 0.9 seconds + 0.2 seconds added for each monitored file matching the condition within the monitoring interval

#

Estimate the number of files matching the wildcard as the maximum number of files being monitored.

Note

Values vary depending on the hardware you use.

#### (2) Example estimation of monitoring interval time set for Monitoring Files jobs

This example is based on the following prerequisites.

- There are 97 Monitoring Files jobs in which the target files are specified by full name.
- There are three Monitoring Files jobs (X, Y, and Z) in which the target file names are specified by wildcard (\*).

- The peak number of events is 50 for the Monitoring Files jobs with target files specified by full name.
- A maximum of 35 files exist in the directory being monitored by job X, and 20 events occur within the monitoring interval.
- A maximum of five files exist in the directory being monitored by job Y, and two events occur within the monitoring interval.
- A maximum of nine files exist in the directory being monitored by job Z, and nine events occur within the monitoring interval.

When estimation formula 1 is applied:

$$(0.1 \times 97) +$$

$$(0.1 + 0.2 \times (35 / 10)) + (0.1 + 0.2 \times (5 / 10)) + (0.1 + 0.2 \times (9 / 10)) = 9.7 + 0.8 + 0.2 + 0.28 = 10.98 \text{ (seconds)}$$

Round up to 11 seconds.

When estimation formula 2 is applied:

$$(0.02 \times 97) + (0.02 + 0.2 \times (35 / 10)) + (0.02 + 0.2 \times (5 / 10)) + (0.02 + 0.2 \times (9 / 10)) + (0.9 \times 50) + (0.9 + (0.2 \times 20)) + (0.9 + (0.2 \times 2)) + (0.9 + (0.2 \times 9)) = 1.94 + 0.72 + 0.12 + 0.2 + 45 + 4.9 + 1.3 + 2.7 = 56.88 \text{ (seconds)}$$

Round up to 57 seconds.

In this example, estimation formula 2 gives the larger value, so you should set a value of 57 or higher for the monitoring interval time.

## 3.2 Estimating system performance

To ensure optimal performance of a system that uses JP1/AJS3, it is important to estimate the optimum values for the networks that make up the system, and the system resources, such as memory and the kernel parameters. This section explains how to estimate the system performance required to use JP1/AJS3.

### 3.2.1 Estimating the data flow on the network

We will explain how to estimate the following data volumes:

- Between JP1/AJS3 - Manager and JP1/AJS3 - Agent
- Between JP1/AJS3 - View and JP1/AJS3 - Manager
- Between JP1/AJS3 Console View and JP1/AJS3 - Manager

#### (1) Estimating the data volume between JP1/AJS3 - Manager and JP1/AJS3 - Agent

You need to estimate the data involved in job executions and the transferring of execution results.

The following table shows an estimate for the volume of data between JP1/AJS3 - Manager and JP1/AJS3 - Agent.

Estimate the same data volume when using queueless jobs too.

Table 3-4: Estimate of data volume between JP1/AJS3 - Manager and JP1/AJS3 - Agent

Type of information	Estimated volume of transferred data per job (units: bytes)
Job execution request transfers	<p>When a job is executed from a jobnet:</p> <p>2,300            + <i>contents-defined-in-the-UNIX-and-PC-job-definitions</i><sup>#1</sup>            + (8 x <i>number-of-specified-environment-variables</i>)            + <i>unit-full-name-length</i> x 2            + <i>agent-host-name-size</i> x 2            + <i>manager-host-name-size</i> x 3            + <i>transfer-file-size</i><sup>#2</sup></p> <p>When a job is executed by using the <code>jpqjobs</code> command:</p> <p>2,300            + <i>total-size-of-the-options-in-the-jpqjobs-command-and-the-values-specified-for-the-options</i>            + (8 x <i>number-of-specified-environment-variables</i>)            + <i>agent-host-name-size</i> x 2            + <i>manager-host-name-size</i> x 3            + <i>transfer-file-size</i><sup>#2</sup></p>
Job result transfers	<p>600            + <i>manager-host-name-size</i>            + <i>agent-host-name-size</i>            + <i>result-file-size</i> (standard output, standard error output)<sup>#3</sup></p>
Event job execution request transfers	<p>Minimum: 256            Maximum: 25,600</p>

Type of information	Estimated volume of transferred data per job (units: bytes)
Event job result transfers	Minimum: 512 Maximum: 7,168

#1

For contents defined in the UNIX and PC job definitions, see *ajsprint* in 2. *Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1* and 4.2.6 *UNIX/PC job definition* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

To pass the information sent from an event job to the target job, add the size of the macro variables in the above estimate. For details about the size of the information to be passed to each type of event job, see *B. Information Passed by Event Jobs* in the *Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*.

#2

The formula for estimating the size of the transfer file is as follows:

`file-count`

$$\Sigma (\text{file-name-length} + \text{file-size} + (12 \times \text{number-of-lines-in-file}) + 100)$$

#3

The formula for estimating the size of the result file is as follows:

`file-count`

$$\Sigma (\text{result-file-size} + (12 \times \text{number-of-lines-in-file}) + 116)$$

In cases where the system monitors an agent host where a problem not in the above table occurred, or where jobs registered for execution are monitored by polling, data is exchanged between JP1/AJS3 - Manager and JP1/AJS3 - Agent. The volume of data per polling in such cases is shown below. Note that polling cannot monitor queueless jobs.

Table 3-5: Estimated data volume between JP1/AJS3 - Manager and JP1/AJS3 - Agent when monitoring by polling

Type of data	Estimated volume of transferred data per polling (units: bytes)
Agent host status confirmation request transfers during trouble	300
Status confirmation request transfers for jobs being executed	350 + <i>size-of-agent-host-name</i>

## (2) Estimating the data volume between JP1/AJS3 - View and JP1/AJS3 - Manager

You need to estimate the volume of data relating to such items as the definition of jobnets. Since the data size for communications for operation and so on is relatively small, we will not estimate it here.

The estimated volume of data between JP1/AJS3 - View and JP1/AJS3 - Manager is shown in the table below.

Table 3-6: Estimated volume of data between JP1/AJS3 - View and JP1/AJS3 - Manager

Window displayed	Estimated volume of transferred data (units: bytes)
JP1/AJS3 - View (Main window)	<i>number-of-units</i> x 500
JP1/AJS3 - View (Summary Monitor window)	<i>total-number-of-schedules</i> <sup>#1</sup> x 400

Window displayed	Estimated volume of transferred data (units: bytes)
Jobnet Editor	$number-of-units \times 250 + number-of-relation-lines \times 50$
Jobnet Monitor	$number-of-units \times 300 + number-of-relation-lines \times 50$
Daily Schedule or Monthly Schedule	$total-number-of-schedules^{#1, #2} \times 150$
Search	$number-of-search-results \times 450$

#1

This is the number of execution schedules and execution results for all of the units under the root jobnet.

If a job group is specified for operation, this number is the number of execution schedules and execution results for all of the units under the root jobnet directly under the job group.

#2

This item also includes the number of schedules for unregistered units when the Monthly Schedule window displays execution schedules for unregistered units.

The following are some example estimates of data volumes:

- When a jobnet defined with 300 units and 100 relation lines is checked in the Jobnet Monitor window:  
 $300 \times 300 + 100 \times 50 = 95,000$  (units: bytes)
- When the execution schedule and execution results for an operation in which the daily execution of 100 jobnets with 100 jobs defined for them is planned is checked in the Daily Schedule window:  
 $100 \times 100 \times 150 = 1,500,000$  (units: bytes)

JP1/AJS3 - View acquires information from JP1/AJS3 - Manager automatically at regular intervals. The defaults are 30 seconds for the Jobnet Monitor window, and 300 seconds for other windows. Settings can be made from 30 seconds upward. When you have to estimate the volume of data flowing in the network, make the calculation based on the update interval of JP1/AJS3 - View and the data size required for each window.

### (3) Estimating the data volume between JP1/AJS3 Console View and JP1/AJS3 Console Manager

Here we explain how to estimate the volume of data between JP1/AJS3 Console View and JP1/AJS3 Console Manager

Table 3-7: Estimated volume of data between JP1/AJS3 Console View and JP1/AJS3 Console Manager

Type of data volume being estimated	Estimate (units: bytes)
Data flow when defining (newly creating, updating) AJS3 unit monitored objects, or when displaying definition information	$250 + (host-name-length^{#-specified-for-the-monitoring-destination-host-name} + unit-full-name-length-specified-for-the-AJS3-unit-monitored-objects^{#})$
Data volume when multiple objects are copied and pasted	$number-of-objects-pasted \times 150$
Data volume when multiple objects are deleted	$number-of-objects-deleted \times 100$
Data volume when displaying screens	$defined-number-of-monitored-objects \times 200 + 100$

#

If " or # occur in the specified character strings, estimate them as two bytes.

## 3.2.2 Estimating the amount of communications in line connections

For the amount of traffic in a WAN environment, see [2.3.6 Communications used in a WAN](#).

## 3.2.3 Estimating the size of memory used

For the JP1/AJS3 memory requirements, see the Release Notes.

## 3.2.4 Estimating disk capacity

For details about JP1/AJS3 disk capacity, see the *Release Notes*. However, to estimate the size of user-defined data that is not included in the embedded database in the estimation methods described in the *Release Notes*, use the procedure below.

There are two cases when estimating user-defined data. In one, the unit for estimation is logical hosts. In the other, the unit is scheduler services.

See the following for details.

### (1) Estimation on a logical host basis

When you add logical hosts, you need to estimate the size of user data for each logical host. Use the following formulas for estimating user data by logical host.

Table 3–8: Estimation of user data by logical host

User-defined data	Value or formula (units: megabytes)
Data for the execution environment for QUEUE jobs and submit jobs (such as queues) <sup>#1</sup>	4
Execution logs for QUEUE jobs and submit jobs (such as job information, the standard error output file, and the standard output file) <sup>#1, #2</sup>	$a \times (0.0095 + b + c)$
Files such as the standard output file or the standard error output file <sup>#3</sup>	$0.5 \times d$
Disk space required when using JP1/AJS3 Console Manager	$0.005 \times e \times f + g$

Legend:

*a*:

Number of job information items for QUEUE jobs and submit jobs

Use the following formula:

$number-of-QUEUE-jobs-and-submit-jobs-that-are-executed-per-day \times (number-of-days-job-information-retained + 1)$

*b*:

Environment variable size specified in the job execution definition for QUEUE jobs and submit jobs (the maximum is 20 KB; 0 is set when no environment variables are used)

- c*: Size of the data output to the standard error output file and the standard output file by submit jobs
- d*: Maximum number of concurrently executable jobs for an agent (standard: 5)
- e*: Total number of objects in the root business scope
- f*: Number of JP1 users who monitor tasks
- g*: Capacity required for the trace log file (standard: 3 megabytes)

#1

Estimation is required only when QUEUE jobs and submit jobs are used in the standard configuration. Estimation is not required for a standard configuration without ISAM or a compatible ISAM configuration.

For the execution environment and execution logs for QUEUE jobs and submit jobs, estimate the disk space requirements for the database directory in the execution environment for QUEUE jobs and submit jobs. If the directory has been changed, estimate the disk space requirements for the directory after the change.

#2

For a standard configuration, *a*, *b*, and *c* must be estimated for the number of QUEUE jobs and submit jobs. Each time a QUEUE job or submit job is executed, an execution log for that job is saved. Execution logs are deleted when their retention period (number of days) expires. Note, however, that the size of the database used for the execution environment for QUEUE jobs and submit jobs is not reduced at the moment execution logs are deleted. Accordingly, you need to perform periodic maintenance for the ISAM files used in this execution environment.

For details about how to perform maintenance, see 6.2.2 *How to check the unused area of the ISAM files used in the execution environment for QUEUE jobs and submit jobs, and when the database should be reorganized* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*. For details about how to change the number of days for retaining job information, see 2.3 *Setting up the job execution environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

#3

This item depends on the parameters used for job execution, such as the standard output file, the standard error output file, environment variables, and transfer files. As a rough estimate, a job requires 0.5 megabytes multiplied by the maximum number of concurrently executable jobs for an agent (standard: 5). However, if you can estimate an average value for the files described above, change the default value for calculation.

## (2) Estimation on a scheduler service basis

When you add scheduler services, you need to estimate the size of user data for each scheduler service. Use the following formulas to estimate the size of user data by scheduler service.

Table 3-9: Estimation of user data by scheduler service

User-defined data	Value or formula (units: megabytes)
Job information per root jobnet <sup>#1</sup>	<i>number-of-logs-to-keep</i> x <i>total-size-of-standard-output-and-standard-error-output-for-all-jobs-under-root-jobnet</i>
Disk space required for the information for each event job <sup>#1</sup>	<i>number-of-logs-to-keep</i> x <i>number-of-event-jobs-with- event-job-passing-information-set</i> x 0.004

User-defined data	Value or formula (units: megabytes)
Event job execution environment data (such as unreported information) <sup>#2</sup>	100 <sup>#3</sup>
Disk space to be used by the temporary change operation management function <sup>#4</sup>	0.001 + a
Data size of job execution environment (job information) <sup>#5</sup>	15.2 x <i>number-of-scheduler-services</i>

Legend:

a: The total size of the temporary change information

Calculate the total of the temporary change information size for each root jobnet. To do so, use the following equation:

$$0.002 \times A + 0.003 \times B$$

A: The number of the operations performed on the root jobnet and its lower units that are to be saved as temporary change information

B: The number of operations in A that are performed to add execution schedules by specifying passing information

Temporary change information increases every time you perform an operation that is saved as temporary change information on the root jobnet and its lower units. Note, that for a root jobnet and its lower units for which the expired temporary change information is stored, the expired temporary change information is automatically deleted when you perform an operation that is saved as temporary change information. For details about the operations that are saved as temporary change information and the expiration date of temporary change information, see *4.5.16(1) Displaying temporary change information* in the manual *Job Management Partner 1/Automatic Job Management System 3 Overview*.

#1

Estimate the total for all the registered root jobnets.

Because the data is stored in the directory for job error information, estimate the disk space for the new directory if the storage destination in the `JOBINFDIR` environment setting parameter is changed.

#2

When an event job (including one set in a start condition) is executed, the definition data of the executed event job and the information about the event when the monitoring condition is satisfied are exchanged between processes such as the event/action control manager and the event/action control agent. During that time, if communication fails because of a temporary network failure or because the destination process is busy, the information to be sent is temporarily stored in a file as unreported information and then re-sent after a preset interval.

The estimated size for unreported information is the maximum size needed to retain the information.

Note that unreported information is deleted when retransmission is successful.

#3

This value is calculated as follows:

Disk space for unreported information =  $(0.025 \times A) + (0.005 \times B)$  (units: megabytes)

A: Number of events one scheduler service can process per hour

B: Number of retained items of unreported information that is to be sent from event/action control to schedule control

If all the data to be transmitted between the event/action control manager and the event/action control agent becomes unreported information, the maximum for A becomes 1,000. For details about the number of events that one scheduler service can process per hour, see [3.1.4 Event monitoring performance](#).

If all the data to be sent from event/action control to schedule control becomes unreported information, the maximum for B becomes 15,000.

If all the unreported information is retained, the maximum disk space for unreported information is  $(0.025 \times 1,000) + (0.005 \times 15,000) = 100$  (units: megabytes).

#4

Estimated only when the temporary change operation management function is used.

Because this data is stored in the directory for job error information, estimate the disk space of the actual directory if you have changed the storage directory.

#5

The size of the data used by the job execution control manager process (`jpqman`) of each scheduler service to manage job information

Supplementary notes

- Of the user data used by scheduler services, jobnet definitions and job execution information are included in the embedded database.

For details about how to estimate the disk space used by the embedded database, see *B. Scheduler Database Estimates* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

- For details about how to estimate the disk space requirements after migration from a version 8 embedded database, see [8.5.1\(7\) Estimating the disk space requirements after migration from a version 8 embedded database](#).

## 3.2.5 Estimating the values for kernel parameters

When using JP1/AJS3 in a UNIX environment, adjust the OS's kernel parameters to allocate the resources needed to execute JP1/AJS3. For details about the kernel parameters that you need to adjust, see the Release Notes.

### 3.3 Estimating the database area

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The database area is constantly expanded little by little whenever there is insufficient space, limited only by the size of the disk drive that the data area is configured on.

To customize the size of the database area, see *B. Scheduler Database Estimates* in the *Job Management Partner 1/ Automatic Job Management System 3 Configuration Guide 1*.

## 3.4 Estimating log sizes

---

This section describes the formulae used to estimate the size of the log files that JP1/AJS3 outputs. When a problem occurs, log file information is used to identify the operation or processing that caused it. If there is insufficient information in the log file to do this, it takes some time to determine the cause. You should therefore make the best estimate you can for the appropriate log file size, considering the mode of operation used for the processing you are executing.

### 3.4.1 Estimating the size of scheduler log files

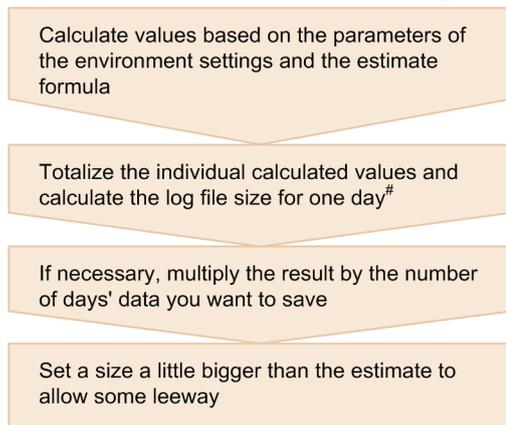
This subsection explains how to estimate the size of scheduler log files. The execution logs and operation logs of jobnets and jobs are output to the scheduler log, and this information is used mainly for monitoring the execution statuses of applications. The required size for scheduler log files differs greatly depending on the following considerations.

- The mode of the application's operations (jobnet structure)
- The number of JP1/AJS3 - View connections
- The nature of the operations
- The specifications for the environment setting parameters of the configuration definitions
  - AJSLOG
  - NETLOG
  - JOBLOG
  - OPELOG
  - REFLOG
  - INFOLOG
  - AJSLOGOUTPUTEXTEND
- The output destination of scheduler log file (per host or scheduler service)

You should therefore estimate an appropriate size for the scheduler log files and change the default disk capacity as required. For details about the default disk capacity and the maximum disk area used for the scheduler log, see *1.2.4 List of log files and directories* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

The flow for estimating scheduler log file size is shown below.

Figure 3–1: Flow for estimating scheduler log file size



# If logs are output on a host basis, calculate the daily volume of output log data for each scheduler service and sum the results.

## (1) Formula for estimating scheduler log file size

The number of formulas that are required for estimating the size of the scheduler log file by scheduler service differs depending on the values set for environment setting parameters. Select the required formulae based on the conditions listed in the following table.

Table 3–10: Formulas for estimating scheduler log file size

Settings for scheduler service configuration definitions	Estimation formula (size: kilobytes)
When <code>all</code> is set for the environment setting parameter <code>AJSLOG</code>	$A = \frac{80 \times (\text{scheduler-service-start-count} + \text{scheduler-service-end-count})}{1,024}$
When a setting other than <code>none</code> is set for the environment setting parameter <code>NETLOG</code>	$B = \frac{\{ (90 + \text{maximum-length-of-jobnet-name}) \times (\text{number-of-jobnets-started-per-day} + \text{number-of-jobnets-ended-per-day} + \text{number-of-start-condition-monitoring-processes-started} + \text{number-of-start-condition-monitoring-processes-ended} + \text{number-of-jobnets-with-hold-setting} + \text{number-of-jobnets-being-monitored-for-start-and-end-delays}) \}}{1,024}$
When a setting other than <code>none</code> is set for the environment setting parameter <code>JOBLOG</code>	$C = \frac{\{ (120 + \text{maximum-job-name-length} + \text{maximum-length-of-the-job-execution-agent-name}) \times (\text{number-of-jobs-under-the-root-jobnet-started-per-day} + \text{number-of-jobs-under-the-root-jobnet-ended-per-day} + \text{number-of-jobs-with-hold-setting}) \}}{1,024}$
When a setting other than <code>none</code> is set for the environment setting parameter <code>OPLOG</code> or <code>REFLOG</code>	$D = \frac{\{ (100 + \text{maximum-length-of-JPI-user-names-that-execute-commands} + \text{maximum-length-of-logical-host-names} + \text{maximum-length-of-options-specified-for-commands-that-operate-units-and-are-specified-for-output-to-a-log}) \times (\text{total-execution-count-of-commands-that-do-not-operate-units-and-have-been-specified-to-output-a-log} + \text{total-number-of-units-subject-to-commands-that-operate-units-and-have-been-specified-to-output-a-log}) \}}{1,024}$

Settings for scheduler service configuration definitions	Estimation formula (size: kilobytes)
When a setting other than none is set for the environment setting parameter INFOLOG	$E = \frac{\{ (100 + \text{maximum-length-of-JP1-user-names-that-execute-commands} + \text{maximum-length-of-logical-host-names} + \text{maximum-length-of-options-specified-for-commands}) \times (\text{total-execution-count-of-commands-that-do-not-operate-units-and-have-been-specified-to-output-a-log} + \text{total-number-of-units-subject-to-commands-that-operate-units-and-have-been-specified-to-output-a-log} \times 2) \}}{1,024}$

After calculating values with the formulae in this table, find the total of the values obtained.

- When no is specified in the environment setting parameter AJSLOGOUTPUTEXTEND  
Size of the scheduler log file for one day (units: kilobytes) =  $A + B + C + D + E$
- When yes is specified in the environment setting parameter AJSLOGOUTPUTEXTEND  
Size of the scheduler log file for one day (units: kilobytes) =  $A + B + C + (D \times 1.5) + E$

When log data is to be output for each host, calculate the above formula for each scheduler service, and then add up the results to find the total daily volume of log data. If necessary, multiply this by the number of days that you want to keep the log. Set a value a little larger than the estimate.

## (2) Example scheduler log file estimate

In this example the scheduler logs for five days are saved in a single file.

Table 3–11: Example scheduler log file estimate

Condition	Example estimation formula
Setting for the environment setting parameter AJSLOG all Scheduler service start count 1 Scheduler service end count 1	$A$ (kilobytes) = $80 \times (1 + 1) / 1,024 = \text{approx. } 0.16$
Setting for the environment setting parameter NETLOG all Maximum length of jobnet name 40 bytes Start count for jobnets executed during one day 1,000 End count for jobnets executed during one day 1,000 Number of jobnets with a hold setting 10 Number of jobnets for which start or end delay monitoring is set 20	$B$ (kilobytes) = $\{ (90 + 40) \times (1,000 + 1,000 + 10 + 20) \} / 1,024 = \text{approx. } 258$
Setting for the environment setting parameter JOBLLOG all	$C$ (kilobytes) = $\{ (120 + 50 + 10) \times (3,000 + 3,000 + 30) \} / 1,024 = \text{approx. } 1,060$

Condition	Example estimation formula
Maximum length of job name 50 bytes Maximum length of job execution destination host name 10 bytes Start count for the number of jobs executed during one day 3,000 End count for the number of jobs executed during one day 3,000 Number of jobs with a hold setting 30	$C \text{ (kilobytes)} = \{ (120 + 50 + 10) \times (3,000 + 3,000 + 30) \} / 1,024 = \text{approx. } 1,060$
Setting for the environment setting parameter OPELOG or REFLOG all Maximum length of names of JP1 users that execute commands 10 bytes Length of logical host name 11 bytes Length of options specified for commands that operate units (ajschchange, ajspplan, etc.) and are output to a log 300 bytes Total execution count of commands that operate units and are specified for output to a log 200 Total number of units subject to commands that operate units and are specified for output to a log 50	$D \text{ (kilobytes)} = \{ (100 + 10 + 11 + 300) \times (200 + 50) \} / 1,024 = \text{approx. } 103$
Setting for the environment setting parameter INFOLOG all Maximum length of names of JP1 users that execute commands 10 bytes Length of logical host name 11 bytes Length of options specified for commands that operate units (ajschchange, ajspplan, etc.) and are output to a log 300 bytes Total execution count of commands that operate units and are specified for output to a log 200 Total number of units subject to commands that operate units and are specified for output to a log 50	$E \text{ (kilobytes)} = \{ (100 + 10 + 11 + 300) \times (200 + 50 \times 2) \} / 1,024 = \text{approx. } 123$

Scheduler log file capacity for one day (units: kilobytes) =

$$A + B + C + D + E = 1,544 \text{ kilobytes}$$

Size of scheduler log file capacity for 6 days (units: kilobytes) =

$$1,544 \times 6 \text{ days} = \text{approximately } 9,264 \text{ kilobytes}$$

The initial size of a scheduler log file is 10,240 kilobytes. Two files are stored. When one week is six business days and the size of a scheduler log file is the initial size, for operation using the example estimates, one file can hold a week's worth of log data.

If the unit you have set for outputting log data is hosts, estimate the sizes of the scheduler log files for all the configured scheduler services for each physical host or logical host, and total the estimates. The result is the estimate for one day.

### (3) Expanding the scheduler log file size

To expand the size of the scheduler log file, use the `jaajs_config` command. In the environment setting parameter `LOGSIZE` (if outputting log files per scheduler service) or `HOSTLOGSIZE` (if outputting log files per host), set the value you calculated as described in (1) *Formula for estimating scheduler log file size*.

For details about the environment setting parameters, see 2.2 *Setting up the scheduler service environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

## 3.4.2 Estimating the size of the trace log file

This subsection explains how to estimate the size of the trace log file. The trace log file is set as follows in the initial status.

- Storage location

For Windows Server 2012 or Windows Server 2008, if the installation folder is in the default folder or a folder protected by the system:

```
%ALLUSERSPROFILE%\Hitachi\JP1\JP1_DEFAULT\JP1AJS2\log\tracelog
```

The default `%ALLUSERSPROFILE%` value is `system-drive\ProgramData`.

A *folder protected by the system* is the path to a folder in any of the following:

- `system-drive\Windows`

- `system-drive\Program Files`

- `system-drive\Program Files (x86)` (for 64-bit Windows)

For Windows Server 2012 or Windows Server 2008 in which an installation folder other than the above is used:

```
JP1/AJS3-installation-folder\log\tracelog
```

In Windows Server 2003:

```
JP1/AJS3-installation-folder\log\tracelog
```

In UNIX:

```
/var/opt/jplajs2/log/tracelog
```

- Size

A size that can accommodate the trace log from the execution of approximately 2,000 jobs (specifically, 20 megabytes (20,480 kilobytes))

The required trace log file size differs greatly depending on the jobnet structure, the number of JP1/AJS3 - View connections, and the nature of the operations. Estimate an appropriate size for the trace log file and expand the current size if necessary.

The formula for calculating the size of the trace log file is as follows:

Appropriate trace log file capacity (units: kilobytes) =  $3,072 \times (\text{number-of-jobs-executed-per-day} / 500 + \text{number-of-AJS3-operations}^{\#1} - \text{executed-per-day} / 1,000) \times \text{number-of-scheduler-services} \times 1.5 \times \text{number-of-days-to-save-trace-logs}^{\#2}$

#1

Refers to operations performed on units by commands or from JP1/AJS3 - View.

#2

Specify the number of days from the occurrence of the error to the collection of data.

Example: Saving the trace log for one day (only for a physical host with one scheduler service)

- 3,000 jobs are executed per day.
- 500 hold-release and other commands are executed per day.

Appropriate trace log file capacity = 3,072 x (3,000 / 500 + 500 / 1,000) x 1 x 1.5 x 1 = 29,952 kilobytes

For details about how to increase the size of the trace log file, see the following:

In Windows:

*3.5.1(1) Extending the JP1/AJS3 trace log file in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1.*

In UNIX:

*13.4.4(1) Extending the JP1/AJS3 trace log file in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1.*

### 3.4.3 Estimating the size of the log information output by event jobs

When you use event jobs, the size of the log output depends on the nature of the operation, including the number of event jobs executed and the number of satisfactions of monitoring conditions. As a guide, keep a log for at least 24 hours. You should estimate in advance a rough value for an output log size that will enable you to keep a log for 1 to 3 days, based on considerations like the number of event jobs executed.

Decide the size of the event log together with the number of log files. Define the estimated value using the configuration definition file. Create a text file in the following form as the log setting configuration definition file for event jobs.

```
[definition-key]
"environment-setting-parameter" = definition-details
"environment-setting-parameter" = definition-details
:
```

We will now explain the environment setting parameters of the log setting configuration definition file for event jobs. Then we will explain the formulae used to calculate rough values for the sizes of the logs set for each process.

For details on the default disk capacity and maximum disk area used, see *1.2.4 List of log files and directories* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

For details on the procedure for changing the event job log settings, see the following references.

In Windows:

*6.3.1 Changing the settings related to the size of the log for event jobs to match operational requirements in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*

In UNIX:

*15.3.1 Changing the settings related to the size of the log for event jobs to match operational requirements in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*

# (1) Log setting configuration definition parameters for event jobs

The following table shows the environment setting parameters.

Table 3-12: List of log setting configuration definition parameters for event jobs

Definition Key	Environment setting parameter	Definition details
<ul style="list-style-type: none"> <li>For scheduler service (common) [ {JP1_DEFAULT   <i>logical-host-name</i> } \JP1AJS2\SCHEDULER\EV\MANAGER\LOG]</li> <li>For scheduler service (individual) [ {JP1_DEFAULT   <i>logical-host-name</i> } \JP1AJSMANAGER\scheduler-service-name \EV\MANAGER\LOG]</li> <li>For a compatible ISAM configuration [ {JP1_DEFAULT   <i>logical-host-name</i> } \JP1AOMMANAGER\LOG]</li> </ul>	"LogSize"=	Log size (Common to all event job managers)
	"LogNumFiles"=	Number of log files (Common to all event job managers)
	"LogSize_jpomanager"=	Log size (Applies to individual event job manager processes)
	"LogSize_jpomgrsub"=	
	"LogNumFiles_jpomanager"=	Number of log files (Applies to individual event job manager processes)
	"LogNumFiles_jpomgrsub"=	
[ {JP1_DEFAULT   <i>logical-host-name</i> } \JP1AOMAGENT\LOG]	"LogSize"=	Log size (Common to all event job agents)
	"LogNumFiles"=	Number of log files (Common to all event job agents)
	"LogSize_jpoagent"=	Log size (Common to all event job agents)
	"LogSize_jpoagtsub"=	
	"LogSize_jpocwtflMain"=	
	"LogSize_jpoeventwatch"=	
	"LogSize_jpoevsearch"=	
	"LogSize_jpocwtmMain"=	
	"LogSize_jpocwtmMain"=	
	"LogSize_jpomldsk"=	
	"LogSize_jpomlsrv"=	
	"LogSize_jpomlapisend"=	
	"LogSize_jpomlapisend2"=	
	"LogSize_jpomlapirec"=	
	"LogSize_jpomlapirec2"=	
	"LogSize_jpomailrecv"=	
	"LogNumFiles_jpoagent"=	Number of log files (Applies to individual processes at event job agents)
	"LogNumFiles_jpoagtsub"=	
	"LogNumFiles_jpocwtflMain"=	
	"LogNumFiles_jpoeventwatch"=	
"LogNumFiles_jpoevsearch"=		
"LogNumFiles_jpocwtmMain"=		

Definition Key	Environment setting parameter	Definition details
[ {JP1_DEFAULT  <i>logical-host-name</i> } \JP1AOMAGENT\LOG]	"LogNumFiles_jpocwtlmain"=	Number of log files (Applies to individual processes at event job agents)
	"LogNumFiles_jpomldsk"=	
	"LogNumFiles_jpomlsrv"=	
	"LogNumFiles_jpomlapisend"=	
	"LogNumFiles_jpomlapisend2"=	
	"LogNumFiles_jpomlapirec"=	
	"LogNumFiles_jpomlapirec2"=	
	"LogNumFiles_jpomailrecv"=	

Details on each item in the table are given below.

"LogSize"=dword:*log-size*

Specify the size of one log file in byte units, in hexadecimal. Make the setting within the range 20,000 (128 kilobytes) to 40,000,000 (1 gigabyte).

The value specified here affects all event job manager processes or agent processes.

"LogNumFiles"=dword:*number-of-log-files*

Specify the file count that triggers a log wrap (number of log files) in hexadecimal. Make the setting within the range 2 to 10 (in decimal form, 2 to 16).

The value specified here affects all event job manager processes or agent processes.

"LogSize\_*process name*"=dword:*log-size*

Specify the size (in bytes, hexadecimal) of one log file when you want to change the log size for any single process at an event manager or agent. Make the setting within the range 20,000 (128 kilobytes) to 40,000,000 (1 gigabyte).

For details on the log sizes (rough values) set for each process, see [\(2\) Calculating the log size for each process](#) below.

"LogNumFiles\_*process name*"=dword:*number-of-log-files*

Specify the number of log files, in hexadecimal, when you want to change this number for any single process at an event manager or agent. Make the setting within the range 2 to 10 (in decimal form, 2 to 16).

When each event job process starts, the log size and number of files are determined according to the following order of priority.

1. Specification for each process

Value specified for LogSize\_*process-name* or LogNumFiles\_*process-name*

2. Event job common specification

Value specified for LogSize or LogNumFiles

3. Default values for each process

Process-specific default values like those shown in the table below

Table 3-13: Default values for event job processes and logs

Type	Process name	Platform		Default values for logs (values in parentheses are set at JP1/ AJS3 installation and setup)	
		Windows	UNIX	Log size	Number of log files
Manager	jpomanager	E	E	640 kilobytes (2,048 kilobytes)	8 (13)
	jpomgrsub	E	E	640 kilobytes (2,048 kilobytes)	6 (8)
Agent	jpoagent	E	E	384 kilobytes (1,024 kilobytes)	8 (8)
	jpoagsub	E	E	384 kilobytes (1,024 kilobytes)	8 (16)
	jpocwtfMain	E	E	1,280 kilobytes (2,048 kilobytes)	6 (13)
	jpoeventwatch	E	E	640 kilobytes (1,024 kilobytes)	4 (8)
	jpocwttMain	E	E	128 kilobytes (256 kilobytes)	2 (6)
	jpocwtmlmain	E	E	128 kilobytes (128 kilobytes)	2 (2)
	jpoevsearch	E	E		
	jpomldsk	E	--		
	jpomlsrv	E	--		
	jpomlapisend	E	--		
	jpomlapisend2	E	--		
	jpomlapirec	E	--		
	jpomlapirec2	E	--		
jpomailrecv	--	E			

Legend:

E: Process exists

--: No process

The filenames of event job logs are decided as follows.

```
process-name[1|2|3|...].log
```

The filenames of event job logs are decided as follows.

```

jpoagent1.log
jpoagent2.log
:
jpoagent8.log

```

For details about log types, see *1.2.4 List of log files and directories* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

## (2) Calculating the log size for each process

The calculations to determine rough values for the log size to set for each process are shown in the following table.

The values determined with these calculation formulae are for guidance only. They could change depending on the operating environment and other factors.

Table 3-14: Log size (rough values) for each event job process

Process name	Calculation formulae (units: bytes)
jpomanager	See <i>Table 3-15</i> .
jpomgrsub	See <i>Table 3-15</i> .
jpoagent	See <i>Table 3-16</i> .
jpoagsub	See <i>Table 3-16</i> .
jpocwtfMain	See <i>Table 3-17</i> .
jpoeventwatch	<ul style="list-style-type: none"> <li>• <i>number-of-executions-of-JP1-event-reception-monitoring-job</i> x 4,000</li> <li>• <i>number-of-JP1-events-that-occur-on-logical-host-running-JP1/AJS3</i> x 1,200</li> <li>• <i>number-of-monitoring-conditions-established-for-JP1-event-reception-monitoring-job</i> x 3,800</li> <li>• <i>number-of-monitoring-conditions-established-for-JP1-event-reception-monitoring-job</i> x (<i>number-of-macro-variables</i> x (<i>macro-variable-size</i> + <i>macro-variable-data-size</i> (the upper limit is 1,024)))</li> </ul>
jpoevsearch	<i>number-of-executions-of-a-JP1-event-reception-monitoring-job-using-the-event-search-functionality-before-execution</i> x 700
jpocwttmMain	See <i>Table 3-18</i> .
jpocwtmlmain (Windows only)	Only created when using mail system linkage for Windows. <i>number-of-satisfactions-of-email-reception-monitoring-job-monitoring-conditions</i> x 2,800
jpocwtmlmain (UNIX only)	Only created when using mail system linkage for UNIX. <i>number-of-satisfactions-of-email-reception-monitoring-job-monitoring-conditions</i> x 7,400
jpomldsk	Only created when using mail system linkage (on a desktop) for Windows. ( <i>number-of-executions-of-email-sending-jobs</i> x 200) + ( <i>each-mail-monitoring-interval</i> x 400)
jpomlsrv	Only created when using mail system linkage (at a service) for Windows. ( <i>number-of-satisfactions-of-email-reception-monitoring-job-monitoring-conditions</i> x 400) + ( <i>number-of-executions-of-email-sending-jobs</i> x 200)
jpomlapisend <sup>#1</sup>	Only created when using mail system linkage for Windows. <i>Number-of-executed-email-sending-jobs</i> x 2,800
jpomlapisend2 <sup>#2</sup>	Only created when using mail system linkage for Windows. <i>Number-of-executed-email-sending-jobs</i> x 2,800
jpomlapirec <sup>#1</sup>	Only created when using mail system linkage for Windows. 2,800 (if email reception monitoring jobs are executed, once per monitoring interval)
jpomlapirec2 <sup>#2</sup>	Only created when using mail system linkage for Windows. 2,800 (if email reception monitoring jobs are executed, once per monitoring interval)
jpomailrecv	Only created when using mail system linkage for UNIX. <i>number-of-mails-that-reach-the-mail-server</i> x 1,200

#1

When the mail system linkage function is used in the JP1/AJS3 Mail service

#2

When the mail system linkage function is used on the desktop

Table 3-15: Manager log output size

Phenomenon		Calculation formula (units: bytes)	
		jpomanager	jpomgrsub
Event job	Registration	3,350	2,300
	Occurrence	1,900	1,550
Start condition	Registration	$1,150 + (2,600 \times \text{number-of-events-in-the-start-condition}^\#)$	$750 + (750 \times \text{number-of-events-in-the-start-condition}^\#)$
	Occurrence	Start condition not satisfied	2,250
		Start condition satisfied	2,250

#

The number of events in the start condition is the number of event jobs defined within the start condition.

Table 3-16: Agent log output size (per job)

Phenomenon		Calculation formula	
		jpoagent	jpoagsub
Event job	Registration	2,104	1,285
	Occurrence	735	1,356
Start condition	Occurrence	2,104	1,285
	Start condition satisfaction	735	1,356

Table 3-17: File monitoring log output size (per job)

Phenomenon		Calculation formula (units: bytes)	
		When you specify the full name of the monitored file	When you specify a wildcard (*)
Event job	Registration	3,300	5,000
	Event occurrence	$4,500 + (\text{macro-variable-size} + \text{macro-variable-data-size (the upper limit is 1,024)})$	$4,500 + (\text{macro-variable-size} + \text{macro-variable-data-size (the upper limit is 1,024)})$
Start condition	Registration	3,300	5,000
	Event occurrence	$2,800 + (\text{macro-variable-size} + \text{macro-variable-data-size (the upper limit is 1,024)})$	$(2,800 + (\text{macro-variable-size} + \text{macro-variable-data-size (the upper limit is 1,024)})) \times \text{number-of-event-occurrences}$

Phenomenon		Calculation formula (units: bytes)	
		When you specify the full name of the monitored file	When you specify a wildcard (*)
Start condition	End	1,000	1,000

Table 3–18: Execution interval control log output size (per job)

Phenomenon		Calculation formula (units: bytes)
Event job	Registration	2,600
	Event occurrence	2,300
Start condition	Registration	2,600
	Event occurrence	2,300 x <i>number-of-event-occurrences</i>
	End	1,000
When a time-out period is specified for an event job <sup>#</sup>	Registration	1,200
	Event occurrence	2,300

#

If a time-out period is set for each event job including execution interval control jobs, a log of the values indicated above is output to the execution interval control log.

### (3) Estimating the log size of email sending jobs that do not use Outlook

The following table lists the environment setting parameter used to change the log size of email sending jobs that do not use Outlook:

Table 3–19: Environment setting parameter that defines log settings for email sending jobs that do not use Outlook

Definition key	Environment setting parameter	Definition
[{JP1_DEFAULT  <i>logical-host-name</i> }\JP1AOMAGENT\mail_link] <sup>#</sup>	"LogSize_EmbeddedMail"=	Log size (Applies to individual profiles)

#

Specify JP1\_DEFAULT for the physical host. For *logical-host-name*, specify the name of a logical host.

The following describes each of the environment setting parameters:

"LogSize\_EmbeddedMail"=dword:*log-size*

Specify the size of one log file in byte units, in hexadecimal. Make the setting within the range 80000 (512 kilobytes) to 9C3C00 (9,999 kilobytes).

The value specified for this environment setting parameter affects all of the log information of the email sending jobs that do not use Outlook.

The following table lists the formula for calculating the (estimated) log size of email sending jobs that do not use Outlook. Note that the value obtained by the formula is an approximation, and can vary depending on operating environment or other factors.

Table 3-20: Log size (estimated value) of email sending jobs that do not use Outlook

Job name	Calculation formula (units: bytes)
Send mail job	Created only when email sending jobs that do not use Outlook are used. <i>number-of-executions-of-send-mail-job</i> x 3,500

## (4) Changing the size of the common log for events and actions

To change the size of the common log for events and actions:

1. Create a size specification file (*jpocommonerr.dat*) for the common log for events and actions.

The save location is as follows:

For Windows Server 2012 or Windows Server 2008, if the installation folder is in the default folder or a folder protected by the system:

`%ALLUSERSPROFILE%\Hitachi\JP1\JP1_DEFAULT\JP1AJS2\log\jpocommonerr.dat`

The default `%ALLUSERSPROFILE%` value is *system-drive*\ProgramData.

A *folder protected by the system* is the path to a folder in any of the following:

- *system-drive*\Windows
- *system-drive*\Program Files
- *system-drive*\Program Files (x86) (for 64-bit Windows)

For Windows Server 2012 or Windows Server 2008 in which an installation folder other than the above is used:

JP1/AJS3 - Manager:

*JP1/AJS3-Manager-installation-folder*\log\jpocommonerr.dat

JP1/AJS3 - Agent:

*JP1/AJS3-Agent-installation-folder*\log\jpocommonerr.dat

In Windows Server 2003:

JP1/AJS3 - Manager:

*JP1/AJS3-Manager-installation-folder*\log\jpocommonerr.dat

JP1/AJS3 - Agent:

*JP1/AJS3-Agent-installation-folder*\log\jpocommonerr.dat

In UNIX:

`/var/opt/jp1ajs2/log/jpocommonerr.dat`

2. Define the log size in the size specification file (*jpocommonerr.dat*) for the common log for events and actions.

In the size specification file (*jpocommonerr.dat*) for the common log for events and actions, specify the log size according to the following format. The specified log size will be applied immediately.

LogSize: *log-size*

Specify the log size, in bytes, in decimal format between 8,388,608 and 2,147,483,647. If a value less than the lower limit (8,388,608 bytes) is specified, the default value (8,388,608 bytes) is used. If a value more than the upper limit (2,147,483,647 bytes) is specified, the upper limit (2,147,483,647 bytes) is used.

The following is an example for the common log for events and actions, for when the log size is 16,384 kilobytes.

LogSize: 16777216

Note that even in a cluster configuration, since the common log for events and actions is output to the log files on the physical hosts, you must set the size on both physical hosts. To revert the size setting to the default (8,192 kilobytes), delete the size specification file (`jpocommonerr.dat`). The changes will be applied immediately.

The following table shows formulas for estimating the output size of the common log for events and actions.

Table 3–21: Output size of the common log for events and actions (per processing item)

Phenomenon		Calculation formula (units: bytes)
Event job	Registration	1,024
	Event occurrence	512
	Forced termination	1,024
Start condition	Registration	$(3 + \text{number-of-event-jobs-defined-in-the-start-condition} \times 2) \times 512$
	Start condition formation	For AND: $(4 + \text{number-of-event-jobs-defined-in-the-start-condition} \times 2) \times 512$ For OR: 4,096
	Forced termination	2,048
JP1/AJS3 start and stop	Manager host restart	$(\text{number-of-scheduler-services} + \text{number-of-jobnets-with-all-start-conditions-being-registered} \times 6 + \text{number-of-all-event-jobs-being-registered} \times 2) \times 512$
Action job	Registration	1,024

#### Note

Even in a cluster configuration, output is performed to the default directory. As a result, for the output size of the common log for events and actions, use the sum of the values above for both the logical host and physical host.

### 3.4.4 Estimating the size of trace log files for JP1/AJS3 Console

This subsection explains how to estimate the size of the trace log files used with JP1/AJS3 Console.

#### (1) Estimating the size of the trace log file for JP1/AJS3 Console Manager

The settings for the JP1/AJS3 Console Manager trace log file in the initial status are as follows:

- Storage location

For Windows Server 2012 or Windows Server 2008, if the installation folder is in the default folder or a folder protected by the system:

```
%ALLUSERSPROFILE%\Hitachi\JP1\JP1_DEFAULT\JP1AJS2CM\log\tracelog.cm
```

The default `%ALLUSERSPROFILE%` value is `system-drive\ProgramData`.

A folder protected by the system is the path to a folder in any of the following:

- `system-drive\Windows`
- `system-drive\Program Files`
- `system-drive\Program Files (x86)` (for 64-bit Windows)

For Windows Server 2012 or Windows Server 2008 in which an installation folder other than the above is used:

```
JP1/AJS3-Console-installation-folder#\log\tracelog.cm
```

The file is installed at the following location as the default:

C:\Program Files\HITACHI\JP1AJS2CM

In Windows Server 2003:

*JP1/AJS3-Console-installation-folder*#\log\tracelog.cm

The file is installed at the following location as the default:

C:\Program Files\HITACHI\JP1AJS2CM

In UNIX:

/var/opt/jplajs2cm/log/tracelog.cm

- Size

Approximately 3 megabytes (3,072 kilobytes)

The capacity required for the trace log file differs greatly depending on the details of the definitions, the nature of the operations, and whether or not errors are encountered. Estimate an appropriate capacity for the trace log file and expand the current capacity if necessary.

The formula for estimating the size of the trace log file is as follows.

*Appropriate-trace-log-file-capacity* (units: kilobytes) =

$(5.0 + \textit{number-of-monitoring-destination-hosts-per-root-business-scope (for-each-JP1-user)} \times 0.5)$

$\times \textit{number-of-logins-from-the-occurrence-of-an-error-to-collection-of-data}$

Example: Saving a trace log for a 30-day period (for the physical host only)

- A single JP1 user monitors applications at 30 target hosts.
- There are 10 logins per day.

Appropriate trace log file capacity =  $(5.0 + 30 \times 0.5) \times (10 \times 30) = 6,000$  kilobytes

## (2) Estimating the size of the trace log file for JP1/AJS3 Console Agent

The settings for the JP1/AJS3 Console Agent trace log file in the initial status are as follows:

- Storage location

For Windows Server 2012 or Windows Server 2008, if the installation folder is in the default folder or a folder protected by the system:

%ALLUSERSPROFILE%\Hitachi\JP1\JP1\_DEFAULT\JP1AJS2\log\tracelog.ca

The default %ALLUSERSPROFILE% value is *system-drive*\ProgramData.

A *folder protected by the system* is the path to a folder in any of the following:

- *system-drive*\Windows
- *system-drive*\Program Files
- *system-drive*\Program Files (x86) (for 64-bit Windows)

For Windows Server 2012 or Windows Server 2008 in which an installation folder other than the above is used:

*JP1/AJS3-Manager-installation-folder*\log\tracelog.ca

In Windows Server 2003:

*JP1/AJS3-Manager-installation-folder*\log\tracelog.ca

In UNIX:

/var/opt/jplajs2/log/tracelog.ca

- Size

Approximately 3 megabytes (3,072 kilobytes)

The capacity required for the trace log file differs greatly depending on the details of the definitions, the nature of the operations, and whether or not errors are encountered. Estimate an appropriate capacity for the trace log file and expand the current capacity if necessary.

The formula for estimating the size of the trace log file is as follows.

*Appropriate-trace-log-file-capacity* (units: kilobytes) =

$(2.0 + (0.1 + (0.04 \times \textit{number-of-monitored-scheduler-services}))$

$\times (\textit{time-from-the-occurrence-of-an-error-to-collection-of-data}$  (units: seconds) /  $\textit{monitoring-interval}$  (units: seconds)))

$\times \textit{number-of-monitored-JP1/AJS3-Console-View-hosts}$

Example: Saving a trace log for a 10-day period (for the physical host only)

- Applications are monitored on the host using five JP1/AJS3 Console View hosts
- Twenty scheduler services are monitored.
- The monitoring interval is 300 seconds.

Appropriate trace log file capacity =  $(2.0 + (0.1 + (0.04 \times 20)) \times (864,000 / 300)) \times 5 = 12,970$  kilobytes

For details on the procedure for expanding the trace log file, see the following references:

In Windows:

*3.5.1 Extending trace log files* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*

In UNIX:

*13.4.4 Extending trace log files* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*

### 3.4.5 Estimating the size of log files for JP1/AJS3 - View

This subsection explains how to estimate the size of log files that are output by JP1/AJS3 - View and JP1/AJS3 Console View.

#### (1) Estimating the size of log files for JP1/AJS3 - View

The following log files for JP1/AJS3 - View are explained here:

- Storage location

In Windows 8.1, Windows 8, Windows Server 2012, Windows 7, Windows Server 2008, or Windows Vista:

`%ALLUSERSPROFILE%\Hitachi\JP1\JP1_DEFAULT\JP1AJS2V\log\ajs2view#nnnn_{1|2}.log#`

The default `%ALLUSERSPROFILE%` value is `system-drive\ProgramData`.

In Windows Server 2003 or Windows XP Professional:

`JP1/AJS3 - View-installation-folder\log\ajs2view#nnnn_{1|2}.log#`

#

When you start multiple instances of JP1/AJS3 - View, a value between 0001 and 9999 is assigned to *nnnn* of #*nnnn*\_. If you do not start multiple instances of JP1/AJS3 - View, #*nnnn*\_ is omitted.

- Size

You can specify a size from 1 to 512 in megabytes (the default is 1 megabyte).

To change the log file size, open the Preferences dialog box of JP1/AJS3 - View, click the **Other** tab, and use **Max. log file size**.

The required log file size depends on the trace level, operation details, and errors. The following tables show the guidelines for estimating the log file size when the trace level is 3 (default).

Add one megabyte for estimation because re-connections might be required when JP1/AJS3 - Manager is disconnected or more operations might fail than you expect.

Table 3-22: Estimating the log file size for JP1/AJS3 - View

Item	Log size (units: kilobytes)
Starting JP1/AJS3 - View	10
Ending JP1/AJS3 - View	10

Table 3-23: Estimating the log file size for windows (common)

Item	Log size (units: kilobytes)
Operations <sup>#</sup>	3 x <i>n</i>
Operation failures	4 x <i>m</i>

Legend:

*n*: Number of operations

*m*: Number of operation failures

#

Indicates menu operations and closing or opening dialog boxes. Operations also include the creation of new units and changing of icon positions in the Jobnet Editor window.

When you operate multiple units simultaneously, estimate the log file size in the same manner you estimate the log file size when you operate units individually.

Table 3-24: Estimating the log file size for each window

Window	Log size per operation (units: kilobytes)			
	View	Refresh	Automatic update	Selecting a tree node <sup>#1</sup>
JP1/AJS3 - View (Main window)	3 + 2 x <i>a</i>	2	2	2
JP1/AJS3 - View (Summary Monitor window)	5 x <i>b</i>	5 x <i>b</i>	5 x <i>b</i>	--
Jobnet Editor	4 + 0.5 x ( <i>c</i> - 1) + 5 x <i>a</i>	2	--	5
Jobnet Monitor	5 + 0.5 x ( <i>c</i> - 1) + 4 x <i>a</i>	3 + 0.5 x <i>d</i> + 0.5 x <i>e</i>	1 + 0.5 x <i>d</i> + 0.5 x <i>e</i>	4
Monthly Schedule	5 + 0.5 x ( <i>c</i> - 1) + <i>f</i>	2 + <i>f</i>	--	1
Daily Schedule <sup>#2</sup>	4 + 0.5 x ( <i>c</i> - 1) + <i>f</i>	2 + <i>f</i>	2 + <i>f</i>	1

Window	Log size per operation (units: kilobytes)			
	View	Refresh	Automatic update	Selecting a tree node <sup>#1</sup>
Calendar <sup>#3</sup>	5	3	--	--
Search	0.5	--	--	--

Legend:

*a:*

Number of the hierarchy level of the first unit to be selected in the tree area in the displayed window  
The level of the root is 0.

*b:*

Number of units to be monitored

*c:*

Number of the hierarchy level of the unit for which the window is displayed

*d:*

Number of Monitor Details dialog boxes to be displayed

*e:*

Number of Execution Result Details dialog boxes to be displayed

*f:*

Number of target root jobnets, or the number of root jobnets immediately under the target job group when 1 is displayed for the root jobnet

--:

Not applicable

#1

Indicates the selection or expansion of a unit in the tree area.

#2

Indicates the Daily Schedule (Hierarchy) window or the Daily Schedule (All Jobs) window.

#3

Indicates the Edit Monthly Calendar window or the Edit Annual Calendar window.

Examples:

To estimate the log file size required to keep a one-week log, use the following conditions:

- The period that JP1/AJS3 - View runs to monitor tasks is one week.
- The JP1/AJS3 - View window is automatically update every 300 seconds.
- The Daily Schedule (Hierarchy) window for the job groups (including 10 root jobnets below) in the root job group is displayed and automatically updated every 300 seconds.
- One operation is performed per hour.
- The rate of operation failure is 0.1.

The required log file size is as follows:

- For starting or ending JP1/AJS3 - View  
20 kilobytes
- For menu operations

$3 \times 24 \times 7 = 504$  kilobytes

- For operation failures  
 $4 \times 24 \times 7 / 10 = 68$  kilobytes
- For displaying the JP1/AJS3 - View window  
3 kilobytes
- For automatic update in the JP1/AJS3 - View window  
 $2 \times 3,600 \times 24 \times 7 / 300 = 4,032$
- For displaying the Daily Schedule (Hierarchy) window  
 $4 + 0.5 \times (1 - 1) + 10 = 14$
- For automatic update in the Daily Schedule (Hierarchy) window  
 $(2 + 10) \times 3,600 \times 24 \times 7 / 300 = 24,192$
- Total  
 $20 + 504 + 68 + 3 + 4,032 + 14 + 24,192 = 28,833$  (kilobytes) = 28.1 (megabytes)

When you round the above number and add 1 megabyte for leeway, the result is 30 megabytes.

## (2) Estimating the size of log files for JP1/AJS3 Console View

The following log files for JP1/AJS3 Console View are explained here:

- Storage location

In Windows 8.1, Windows 8, Windows Server 2012, Windows 7, Windows Server 2008, or Windows Vista:

`%ALLUSERSPROFILE%\Hitachi\JP1\JP1_DEFAULT\JP1AJS2V\log\ajs2coview#nnnn_{1|2}.log#`

The default `%ALLUSERSPROFILE%` value is `system-drive\ProgramData`.

In Windows Server 2003 or Windows XP Professional:

`JP1/AJS3 - View-installation-folder\log\ajs2coview#nnnn_{1|2}.log#`

#

When you start multiple instances of JP1/AJS3 Console View, a value between 0001 and 9999 is assigned to `nnnn` of `#nnnn_`. If you do not start multiple instances of JP1/AJS3 Console View, `#nnnn_` is omitted.

- Size

You can specify a size from 1 to 512 in megabytes (the default is 1 megabyte).

To change the log file size, open the Preferences dialog box of JP1/AJS3 Console View, click the **Other** tab, and use **Max. log file size**.

The required log file size depends on the trace level, operation details, and errors. The following table shows the guidelines for estimating the log file size when the trace level is 3 (default).

Add one megabyte for estimation because more operations might fail than you expect.

Table 3-25: Estimating the size of log files for JP1/AJS3 Console View

Item	Log size (units: kilobytes)
Starting JP1/AJS3 Console View	10
Ending JP1/AJS3 Console View	10
Operations <sup>#1</sup>	$3 \times n$

Item	Log size (units: kilobytes)
Operation failure	$4 \times m$
Acquisition of status	$0.5 \times \Sigma \ a + (0.5 \times b + 4 \times c) \times (1 + d)$
Operation on a monitored object <sup>#2</sup>	$5 \times n$
Connection check <sup>#3</sup>	$0.5 \times l$

Legend:

$\Sigma$  :

Total number of objects in the root business scope

$a$ :

Number of status updates for each root jobnet to be monitored<sup>#4</sup>

$b$ :

Number of objects in the root business scope

$c$ :

Number of AJS3 unit monitored objects whose status is unknown

$d$ :

Number of times to switch from the definition mode to the monitoring mode and the number of reconnections

$n$ :

Number of operations

$m$ :

Number of operation failures

$l$ :

Number of connection checks =  $JP1/AJS3 \text{ Console View-active-time/connection-check-interval}$  (default: 300 seconds)

#1

Indicates menu operations and opening or closing of dialog boxes. Operations also include the creation of new objects and changing of icon positions in the Main Scope window.

When you operate multiple objects simultaneously, estimate the log file size in the same manner you estimate the log file size when you operate objects individually.

#2

Indicates registration for execution or re-execution for AJS3 unit monitored objects.

#3

Operation automatically performed inside JP1/AJS3 Console View. JP1/AJS3 Console View periodically checks the connection with JP1/AJS3 Console Manager based on the communication option in JP1/AJS3 Console View, KEEP\_ALIVE value (default: 300 seconds).

For details about communication options, see *14.2.4 Specifying communication options* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

#4

For the number of status updates, use the smaller of the following:

- Number of root jobnet startups times 10
- Monitoring time of JP1/AJS3 Console divided by the monitoring interval

For the number of root jobnet startups, estimate the number of times the monitored jobnet is executed within the monitoring period of JP1/AJS3 Console.

When you monitor a jobnet with a start condition, for the number of startups, estimate the number of times the start condition is established.

Examples:

To estimate the required log file size for keeping a one-week log, use the following conditions:

- JP1/AJS3 Console View is used to monitor work tasks for one week.
- The monitoring interval of JP1/AJS3 Console is 300 seconds.
- There are 50 AJS3 unit monitored objects in the entire root business scope.
- All the monitored root jobnets are executed twice a day.
- One operation is performed per hour.
- The rate of operation failure is 0.1.
- One operation is performed on monitored objects every six hours.

The required log file size is as follows:

- For starting or ending JP1/AJS3 Console View  
20 kilobytes
- For menu operations  
 $3 \times 24 \times 7 = 504$  kilobytes
- For operation failures  
 $4 \times 24 \times 7 / 10 = 68$  kilobytes
- For acquiring status  
 $0.5 \times 50 \times (2 \times 7 \times 10) + (0.5 \times 50 + 4 \times 0) \times (1 + 0) = 3,525$  kilobytes
- For operations on monitored objects  
 $5 \times 24 \times 7 / 6 = 140$  kilobytes
- For checking connections  
 $0.5 \times 3,600 \times 24 \times 7 / 300 = 1,008$  kilobytes
- Total  
 $20 + 504 + 68 + 3,525 + 140 + 1,008 = 5,265$  (kilobytes) = 5.1 (megabytes)  
Round the above number and add 1 megabyte for leeway. The result is 7 megabytes.

### 3.4.6 Estimating the size of the logs output by execution

The number of the jobs except for queueless jobs and event jobs executed per days are less than 10,000. You do not need to estimate log size of job execution environment, you can use the default.

If the jobs except for queueless jobs and event jobs executed per days exceed 10,000, estimate log size.

Determine both the size and number of log files for each type of log. Then define the values you have estimated using the `jajs_config` command.

Execute following command and set for environment setting parameter, explained in (1) *Environment setting parameters in the log configuration definition for the execution environment of QUEUE jobs and submit jobs*, then restart JP1/AJS3.

```

jajs_config -k definition-key-name "environment setting parameter-
name"=definition-contents
["environment setting parameter-name-2"=definition-contents-2]

```

Only one definition key can be specified in *definition-key-name*. If you want to set environment setting parameter different in a definition keys, you must execute the `jajs_config` command for each definition key.

#### Supplementary notes

- If you set more than one environment setting parameter different in definition key at the same time, you can use `jbssetcnf` command. For details about `jbssetcnf` command, see the explanation for `jbssetcnf` command in the *Job Management Partner 1/Base User's Guide*.
- If you use `jajs_config` command, environment setting parameter name and definition are checked, but if you use `jbssetcnf` command, they do not be checked. We recommend using the `jajs_config` command to prevent the wrong contents being set.

Estimate the environment setting parameter as which a definition key can be set every scheduler service by the number of the jobs except for queueless jobs and event jobs by each scheduler service.

The following explains the environment setting parameters that you set in the log configuration definition file for the execution environment, and gives a rough guide to the log sizes you will need to set.

For details about the default disk space requirements and maximum disk space used, see *1.2.4 List of log files and directories* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

## (1) Environment setting parameters in the log configuration definition for the execution environment of QUEUE jobs and submit jobs

The following table lists the environment setting parameters.

Table 3–26: Environment setting parameters in the log configuration definition for the execution environment

Log file name	Definition key	Environment setting parameter	Definition contents
Job execution manager log <code>jpgmanexec{1 2 3 4 5 6 7 8 9 10 11 12 13 14 15}.log#1</code>	In scheduler service (common): <code>[{JP1_DEFAULT logical-host-name}\JP1AJS2\SCHEDULER\QUEUE\MANAGER\Log]</code>  In scheduler service (different): <code>[{JP1_DEFAULT logical-host-name}\JP1AJSMANAGER\scheduler-service-name\QUEUE\MANAGER\Log]</code>  In submit jobs and compatible ISAM configuration: <code>[{JP1_DEFAULT logical-host-name}</code>	<code>"ExecLogFileSize"</code> <code>=dword:size</code>  <code>"ExecLogFileCount"</code> <code>=dword:number-of-files</code>	<i>size</i> Specify the log file size in kilobytes. You can set 200 to 8,000 (in decimal form, 512 to 32,768).  <i>number-of-files</i> Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 10 (in decimal form, 2 to 16).

Log file name	Definition key	Environment setting parameter	Definition contents
Job execution manager log jppqmanexec{1 2 3 4 5 6 7 8 9 10 11 12 13 14 15}.log#1	\JP1NBQMANAGER \Log]	"ExecLogFileSize" =dword: <i>size</i> "ExecLogFileCount" =dword: <i>number-of-files</i>	<i>size</i> Specify the log file size in kilobytes. You can set 200 to 8,000 (in decimal form, 512 to 32,768). <i>number-of-files</i> Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 10 (in decimal form, 2 to 16).
Job execution agent log jppqagtexec{1 2 3 4 5 6 7 8}.log#2 jppqagtexecclld{1 2 3 4 5 6 7 8}.log jppqagtexecdmn{1 2 3 4 5 6 7 8}.log jppqagtexecmon{1 2 3 4 5 6 7 8}.log#3	[{JP1_DEFAULT  <i>logical-host-name</i> } \JP1NBQAGENT\Log]	"ExecLogFileSize" =dword: <i>size</i> "ExecLogFileCount" =dword: <i>number-of-files</i>	<i>size</i> Specify the log file size in kilobytes. You can set 200 to 8,000 (in decimal form, 512 to 32,768). <i>number-of-files</i> Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 10 (in decimal form, 2 to 16).
Job execution internal log jppqagt_{00 01 02 03 04 05 06 07}.log jppqmon_{00 01 02 03 04 05 06 07}.log jppqnjpagt_{00 01 02 03 04 05 06 07}.log	[{JP1_DEFAULT  <i>logical-host-name</i> } \JP1NBQAGENT\Log]	"TraceLogFileSize" =dword: <i>size</i> "TraceLogFileCount" =dword: <i>number-of-files</i>	<i>size</i> Specify the log file size in kilobytes. You can set 200 to 1,000 (in decimal form, 512 to 4,096). <i>number-of-files</i> Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 100 (in decimal form, 2 to 256).
Job execution internal log jppqnjpdata_{00 01}.log		"extTraceLogFileSize" =dword: <i>size</i> "extTraceLogFileCount" =dword: <i>number-of-files</i>	
Job execution internal log jppqclient_{00 01 02 03 04 05 06 07 08 09}.log jppqclientnjp_{00 01 02 03 04 05 06 07 08 09}.log	[{JP1_DEFAULT  <i>logical-host-name</i> } \JP1NBQCLIENT \Log]	"TraceLogFileSize" =dword: <i>size</i> "TraceLogFileCount" =dword: <i>number-of-files</i>	<i>size</i> Specify the log file size in kilobytes. You can set 200 to 1,000 (in decimal form, 512 to 4,096). <i>number-of-files</i> Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 100 (in decimal form, 2 to 256).
Job execution internal log jppqnjpdata_{00 01}.log		"extTraceLogFileSize" =dword: <i>size</i> "extTraceLogFileCount" =dword: <i>number-of-files</i>	
Job execution internal log jppqman_{00 01 02 03}.log jppqmandb_{00 01 02 03}.log jppqmannjp_{00 01 02 03}.log	In scheduler service (common): [ {JP1_DEFAULT  <i>logical-host-name</i> } \JP1AJS2\SCHEDULE R\QUEUE\MANAGER \Log]	"TraceLogFileSize" =dword: <i>size</i> "TraceLogFileCount" =dword: <i>number-of-files</i>	<i>size</i> Specify the log file size in kilobytes. You can set 200 to 1,000 (in decimal form, 512 to 4,096). <i>number-of-files</i> Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 100 (in decimal form, 2 to 256).
Job execution internal log jppqnjpdata_{00 01}.log	In scheduler service (different): [ {JP1_DEFAULT  <i>logical-host-name</i> } \JP1AJSMANAGER	"extTraceLogFileSize" =dword: <i>size</i> "extTraceLogFileCount" =dword: <i>number-of-files</i>	

Log file name	Definition key	Environment setting parameter	Definition contents
Job execution internal log jpnqjpdata_{00 01}.log	<p><i>\scheduler-service-name</i>  \QUEUE\MANAGER  \Log]</p> <p>In submit jobs and compatible ISAM configuration:  [ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1NBQMANAGER  \Log]</p>	<p>"extTraceLogFileSize"=dword:<i>size</i>  "extTraceLogFileCount"=dword:<i>number-of-files</i></p>	<p><i>size</i>  Specify the log file size in kilobytes. You can set 200 to 1,000 (in decimal form, 512 to 4,096).</p> <p><i>number-of-files</i>  Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 100 (in decimal form, 2 to 256).</p>
Job execution internal log jpnqnotify_{00 01}.log jpnqnotifynjp_{00 01}.log	<p>In scheduler service (common):  [ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1AJS2\SCHEDULER\QUEUE\notify  \Log]</p> <p>In scheduler service (different):  [ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1AJSMANAGER  <i>\scheduler-service-name</i>  \QUEUE\notify  \Log]</p> <p>In submit jobs and compatible ISAM configuration:  [ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1NBQNOTIFY  \Log]</p>	<p>"TraceLogFileSize"=dword:<i>size</i>  "TraceLogFileCount"=dword:<i>number-of-files</i></p> <p>"extTraceLogFileSize"=dword:<i>size</i>  "extTraceLogFileCount"=dword:<i>number-of-files</i></p>	<p><i>size</i>  Specify the log file size in kilobytes. You can set 200 to 1,000 (in decimal form, 512 to 4,096).</p> <p><i>number-of-files</i>  Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 100 (in decimal form, 2 to 256).</p>
Job execution internal log jpnqjpdata_{00 01}.log	<p>In scheduler service (different):  [ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1AJSMANAGER  <i>\scheduler-service-name</i>  \QUEUE\notify  \Log]</p> <p>In submit jobs and compatible ISAM configuration:  [ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1NBQNOTIFY  \Log]</p>	<p>"extTraceLogFileSize"=dword:<i>size</i>  "extTraceLogFileCount"=dword:<i>number-of-files</i></p>	<p>Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 100 (in decimal form, 2 to 256).</p>
Job execution client log jpnqcliexec{1 2}.log <sup>#4</sup>	<p>[ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1NBQCLIENT  \Log]</p>	<p>"ExecLogFileSize"=dword:<i>size</i>  "ExecLogFileCount"=dword:<i>number-of-files</i></p>	<p><i>size</i>  Specify the log file size in kilobytes. You can set 200 to 8,000 (in decimal form, 512 to 32,768).</p> <p><i>number-of-files</i>  Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 10 (in decimal form, 2 to 16).</p>
Job execution status report log jpnqfyexec{1 2}.log <sup>#5</sup>	<p>In scheduler service (common):  [ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1AJS2\SCHEDULER\QUEUE\notify  \Log]</p> <p>In scheduler service (different):  [ {JP1_DEFAULT   <i>logical-host-name</i> }  \JP1AJSMANAGER  <i>\scheduler-service-name</i>  \QUEUE\notify  \Log]</p>	<p>"ExecLogFileSize"=dword:<i>size</i>"ExecLogFileCount"=dword:<i>number-of-files</i></p>	<p><i>size</i>  Specify the log file size in kilobytes. You can set 200 to 8,000 (in decimal form, 512 to 32,768).</p> <p><i>number-of-files</i>  Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 10 (in decimal form, 2 to 16).</p>

Log file name	Definition key	Environment setting parameter	Definition contents
Job execution status report log jppqnfyexec{1 2}.log#5	In submit jobs and compatible ISAM configuration: [ {JP1_DEFAULT  <i>logical-host-name</i> } \JP1NBQNOTIFY \Log]	"ExecLogFileSize" =dword: <i>size</i> "ExecLog FileCount"=dword: <i>number-of-files</i>	<i>size</i> Specify the log file size in kilobytes. You can set 200 to 8,000 (in decimal form, 512 to 32,768). <i>number-of-files</i> Specify the number of log files before log records are wrapped around to the first file again. You can set 2 to 10 (in decimal form, 2 to 16).

#1

In a Windows cluster system, the file name of the job execution manager log is as follows:

jppqExecLog\_man{1|2|3|4|5|6|7|8|9|10|11|12|13|14|15}.log

#2

In a Windows cluster system, the file name of the job execution agent log is as follows:

jppqExecLog\_agt{1|2|3|4|5|6|7|8}.log

#3

In a Windows cluster system, the file name of the job execution agent log is as follows:

jppqExecLog\_agtmon{1|2|3|4|5|6|7|8}.log

#4

In a Windows cluster system, the file name of the job execution client log is as follows:

jppqExecLog\_cli{1|2}.log

#5

In a Windows cluster system, the file name of the job execution status report log is as follows:

jppqExecLog\_nfy{1|2}.log

The logs output in the execution environment are output to the following paths:

For Windows Server 2012 or Windows Server 2008, if the installation folder is in the default folder or a folder protected by the system:

%ALLUSERSPROFILE%\Hitachi\JP1\JP1\_DEFAULT\JP1AJS2\log

The default %ALLUSERSPROFILE% value is *system-drive*\ProgramData.

A *folder protected by the system* is the path to a folder in any of the following:

- *system-drive*\Windows
- *system-drive*\Program Files
- *system-drive*\Program Files (x86) (for 64-bit Windows)

For Windows Server 2012 or Windows Server 2008 in which an installation folder other than the above is used:

*JP1/AJS3-installation-folder*\log

In Windows Server 2003:

*JP1/AJS3-installation-folder*\log

In UNIX:

/var/opt/jplajs2/log

For details about the types of logs, see *1.2.4 List of log files and directories* in the manual *Job Management Partner 1/ Automatic Job Management System 3 Troubleshooting*.

## (2) Guide to the size of the logs output in the execution environment for QUEUE jobs and submit jobs

The following table gives a rough guide to the log sizes to set. These sizes might vary, depending on your system environment.

Table 3–27: Example of estimating the size of the logs output in the execution environment for QUEUE jobs and submit jobs

Log file name	Log size output per job (bytes)	Log size output per 10,000 jobs (bytes)	Calculation of the number of log files required to execute 10,000 jobs <sup>#1</sup>	Log capacity required to execute 10,000 jobs
jpgmanexec{1 2 3 4 5 6 7 8 9 10 11 12 13 14 15}.log <sup>#2, #3</sup>	400	3,997,696	4,800 KB / 1,024 KB	1,024 KB x 5 files
jpgagtexexec{1 2 3 4 5 6 7 8}.log <sup>#4</sup>	277	2,768,896	3,300 KB / 512 KB	512 KB x 7 files
jpgagtexeccld{1 2 3 4 5 6 7 8}.log	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgagtexecdms{1 2 3 4 5 6 7 8}.log	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgagtexecmon{1 2 3 4 5 6 7 8}.log <sup>#5</sup>	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgagt_{00 01 02 03 04 05 06 07}.log	330	3,302,400	4,000 KB / 512 KB	512 KB x 8 files
jpgmon_{00 01 02 03 04 05 06 07}.log	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgnjpgagt_{00 01 02 03 04 05 06 07}.log	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgnjpgdata_{00 01}.log	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgclient_{00 01 02 03 04 05 06 07 08 09}.log	767	7,667,712	9,200 KB / 1,024 KB	512 KB x 9 files
jpgclientnjp_{00 01 02 03 04 05 06 07 08 09}.log	2	16,384	20 KB / 1,024 KB	512 KB x 1 file
jpgnjpgdata_{00 01}.log	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgman_{00 01 02 03}.log <sup>#2</sup>	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgmandb_{00 01 02 03}.log <sup>#2</sup>	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgmannjp_{00 01 02 03}.log <sup>#2</sup>	105	1,048,576	1,250 KB / 512 KB	512 KB x 3 files
jpgnjpgdata_{00 01}.log	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgnotify_{00 01}.log <sup>#2</sup>	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgnotifynjp_{00 01}.log <sup>#2</sup>	52	524,288	630 KB / 512 KB	512 KB x 2 files
jpgnjpgdata_{00 01}.log <sup>#2</sup>	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgcliexec{1 2}.log <sup>#6</sup>	2	16,384	20 KB / 512 KB	512 KB x 1 file
jpgnfyexec{1 2}.log <sup>#7</sup>	2	16,384	20 KB / 512 KB	512 KB x 1 file

#1

Calculate a value with some leeway.

#2

This is not used with JP1/AJS3 - Agent, so no increase is necessary.

#3

In a Windows cluster system, the file name of the job execution manager log is as follows:

```
jpgExecLog_man{1|2|3|4|5|6|7|8|9|10|11|12|13|14|15}.log
```

#4

In a Windows cluster system, the file name of the job execution agent log is as follows:

```
jpgExecLog_agt{1|2|3|4|5|6|7|8}.log
```

#5

In a Windows cluster system, the file name of the job execution agent log is as follows:

```
jpgExecLog_agtmon{1|2|3|4|5|6|7|8}.log
```

#6

In a Windows cluster system, the file name of the job execution client log is as follows:

```
jpgExecLog_cli{1|2}.log
```

#7

In a Windows cluster system, the file name of the job execution status report log is as follows:

```
jpgExecLog_nfy{1|2}.log
```

### 3.4.7 Estimating the size of log files output by a flow control subprocess

A flow control subprocess outputs log files in an environment in which wait conditions are used. You do not need to estimate the log file size for an environment in which wait conditions are not used. For details about using wait conditions, see *6.1.7 Settings for using wait conditions* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

A flow control subprocess outputs two log files for each scheduler service. The default size of one file is 10,240 kilobytes.

The size of log data differs greatly depending on the execution count for units with wait conditions and the number of units whose end is being waited for. You should estimate an appropriate size for the log file so that logs for the number of days from the occurrence of an error to the collection of data can be saved.

#### (1) Formula for estimating the size of log files output by a flow control subprocess

The following table describes the variables required for estimating the size of log files output by a flow control subprocess.

Table 3–28: Variables required for estimating the size of log files output by a flow control subprocess

Variable	Description
<i>a</i>	Number of units with wait conditions executed per day <sup>#</sup>
<i>b</i>	Total number of waits per day
<i>c</i>	Size of the full name of the unit (units: bytes)
<i>d</i>	Number of units executed per day whose end is being waited for <sup>#</sup>
<i>e</i>	Number of temporary change operations performed for wait conditions per day
<i>f</i>	Number of root jobnets executed per day in a scheduler service that has units with wait conditions <sup>#</sup>

#  
If a unit is executed more than once per day, multiply the value by the execution count.

To estimate the log file size, replace these variables in the following formula with values:

$$\text{Log file size output by a flow control subprocess (units: kilobytes)} = \{300 + (a \times 7 + b \times 4 + d \times 3 + e \times 3 + f \times 3) \times (300 + c \times 2)\} / 1,024$$

For logs that are to be kept for more than one day, multiply the estimated log file size by the number of days the logs are to be kept. Because a maximum of two log files are output, if you want to estimate the size for one file, divide the result by two.

## (2) Example of estimating the size of log files output by a flow control subprocess

The following describes an example of estimating the size of log files output by a flow control subprocess.

The example uses the following values for the variables required to estimate the size.

Table 3–29: Variable values required for estimating the size of log files output by a flow control subprocess

Variable	Variable value	Description
<i>a</i>	300	300 units with wait conditions are executed per day (each unit is executed only once).
<i>b</i>	300	Waiting occurs 300 times per day.
<i>c</i>	50	The full unit name is specified with 50 bytes.
<i>d</i>	300	300 units whose ends are being waited for are executed per day (each unit is executed only once).
<i>e</i>	30	The temporary change operation for wait conditions is performed 30 times per day.
<i>f</i>	100	100 root jobnets are executed per day in a scheduler service that has units with wait conditions (each root jobnet is executed only once).

The formula for this example is as follows:

$$\text{Log file size output by a flow control subprocess (units: kilobytes)} = \{300 + (300 \times 7 + 300 \times 4 + 300 \times 3 + 30 \times 3 + 100 \times 3) \times (300 + 50 \times 2)\} / 1,024$$

= 1,794 (rounded up)

To keep this log data for ten days, you can estimate the size of one log file as follows:

$1,794 \times 10 \text{ days} / 2 = 8,970$  (units: kilobytes)

### **(3) Expanding the size of log files output by a flow control subprocess**

If the file size you estimated in *(1) Formula for estimating the size of log files output by a flow control subprocess* is greater than the default (10,240 kilobytes), you need to increase the log file size. To do so, execute the `jajs_config` command to set the `FLBDLOGSIZE` environment setting parameter to a value slightly greater than the estimated value.

For details about the environment setting parameters, see *2.2 Setting up the scheduler service environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

# 4

## Installation and Setup Considerations

This chapter discusses considerations related to JP1/AJS3 installation and setup.

When you have determined how to automate work tasks and configure the system, and have estimated the resources needed, the next step is to consider the installation and setup requirements.

## 4.1 Installation procedure

This section describes the things to remember when installing JP1/AJS3, and the decisions you will need to make beforehand.

### 4.1.1 Notes on installation

Note the following when installing JP1/AJS3.

#### (1) Upgrade installation from JP1/AJS2

When performing an upgrade installation from JP1/AJS2 to JP1/AJS3 version 8 or earlier, note the following:

- The JP1/AJS2 Monitor service will be deleted and its functionality integrated with JP1/AJS3 services.

#### (2) Operating JP1/AJS3 using an AJS administrator account

You can set up an AJS administrator account before you install JP1/AJS3 so that you can operate JP1/AJS3 using the AJS administrator account. An AJS administrator can perform the same operations as users with superuser privileges, including starting and stopping JP1/AJS3 services, creating backups, and maintaining the database. By setting up an AJS administrator account, the system management work for JP1/AJS3 can be divided between the AJS administrator and a user with superuser privileges.

For details about AJS administrator accounts, see *E. Operating JP1/AJS3 By Using an AJS Administrator Account (UNIX Only)*.

### 4.1.2 Pre-installation decisions

When installing JP1/AJS3 for Windows, you must specify or select the items shown in the following table. Determine these settings in advance, according to your operating environment.

Table 4-1: Pre-installation decisions

Item	Description
User information	Enter your user name and company name. These are mandatory.
Installation folders	Specify the folders in which to install the JP1/AJS3 programs. Change the defaults as required. The default installation folders of the products are: <ul style="list-style-type: none"><li>• JP1/AJS3 - Manager<sup>#1</sup>: <i>system-drive</i>\Program Files<sup>#2</sup>\HITACHI\JP1AJS2</li><li>• JP1/AJS3 - Agent: <i>system-drive</i>\Program Files<sup>#2</sup>\HITACHI\JP1AJS2</li><li>• JP1/AJS3 - View: <i>system-drive</i>\Program Files<sup>#2</sup>\HITACHI\JP1AJS2V</li></ul>
Program folders	If you install JP1/AJS3 - View in Windows Server 2003 or Windows XP Professional, specify a program menu name. You can change the program menu name as you prefer. The default program menu name is <b>JP1_Automatic Job Management System 3 - View</b> .

#1

JP1/AJS3 Console will be installed in a different folder. The default installation folder is:

*system-drive*\Program Files<sup>#2</sup>\HITACHI\JP1AJS2CM

#2

For 64-bit versions of Windows, replace Program Files with Program Files (x86).

## 4.2 JP1/AJS3 service settings

This section explains the types of JP1/AJS3 services and their default settings. Situations where you will need to change the settings are also described.

### 4.2.1 Types of JP1/AJS3 services

The following table describes JP1/AJS3 - Manager services.

Table 4-2: JP1/AJS3 - Manager services

Service name	Description
JP1/AJS3 service	Manages job and jobnet definitions and the execution of jobs and jobnets. Scheduler services are included within the JP1/AJS3 service.
JP1/AJS3 Database service	Manages commands for running and operating on a database.
JP1/AJS3 Mail service	Controls monitoring of email transmissions when linked to a Windows mail system.
JP1/AJS3 Console Manager service	Stores information defined in JP1/AJS3 Console View about the objects to be monitored, and acquires the status of monitored objects by issuing instructions to JP1/AJS3 Console Agent.
JP1/AJS3 Console Agent service	Periodically monitors target objects (root jobnets) in the local host on instruction from JP1/AJS3 Console Manager, and reports any changes back to JP1/AJS3 Console Manager.
JP1/AJS3 Check Manager service	Issues instructions to the JP1/AJS3 Check Agent service to perform pre-execution checks of jobs defined in JP1/AJS3, and receives the check status back from the JP1/AJS3 Check Agent service.
JP1/AJS3 Check Agent service	Performs execution pre-checks of jobs defined in JP1/AJS3, on instruction from JP1/AJS3 Check Manager.
JP1/AJS3 Queueless Agent service	Accepts queueless job execution requests from JP1/AJS3 - Manager, and executes queueless jobs.
JP1/AJS3 Queueless File Transfer service	Accepts file transfer requests from the queueless job manager process, and sends data from transfer files or the standard error output file to the queueless job manager process.

#### Note

If the type of the embedded database is one used for JP1/AJS3 - Manager before version 10-00, the JP1/AJS3 Database ClusterService service also starts. The JP1/AJS3 Database ClusterService service manages the operations of the database in a cluster environment.

The following table describes JP1/AJS3 - Agent services.

Table 4-3: JP1/AJS3 - Agent services

Service name	Description
JP1/AJS3 service	Executes work tasks.
JP1/AJS3 Mail service	Controls monitoring of email transmissions when linked to a Windows mail system.
JP1/AJS3 Queueless Agent service	Accepts queueless job execution requests from JP1/AJS3 - Manager, and executes queueless jobs.
JP1/AJS3 Check Agent service	Performs pre-execution checks of jobs defined in JP1/AJS3, on instruction from JP1/AJS3 Check Manager.

## Cautionary notes

1. For the service name of the JP1/AJS3 Database service, the setup identifier specified at installation is displayed. For the service name of the JP1/AJS3 Database ClusterService service that starts when the type of the embedded database is one used for JP1/AJS3 - Manager before version 10-00, the setup identifier specified at installation is also displayed. For details about the setup identifier, see the description of the `-id` option in *ajsembdbsetup* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.
2. In UNIX, a superuser must start the above services.
3. The JP1/Base service and JP1/AJS3 service need to be active to define or execute work tasks in JP1/AJS3. Start the JP1/Base service before starting the JP1/AJS3 service. Stop the JP1/Base and JP1/AJS3 services when you finish defining or executing work tasks.
4. In a manager/agent configuration, you need to start and end the JP1/AJS3 service on both JP1/AJS3 - Manager and JP1/AJS3 - Agent.
5. Do not change the system date and time after starting the JP1/AJS3 service as this will affect the jobnet execution schedule. For details about this issue, see 8.9.3 *Changing the date and time of the system* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.
6. When you start JP1/AJS3 - View to perform operations on a jobnet registered for execution from JP1/AJS3 - View, make the time zone of the JP1/AJS3 - View host the same as the time zone of the connected JP1/AJS3 service.  
  
When you perform operations on a jobnet from JP1/AJS3 - View, the time in the time zone in which the JP1/AJS3 service is running is displayed in JP1/AJS3 - View. Therefore, if the time zones are different, the time of actual operations and the time displayed in JP1/AJS3 - View will be out of sync by the difference between the two time zones. For details, see 2.4.1 *Time zones*.
7. When using the Windows mail system linkage functionality, you can choose whether to use the JP1/AJS3 Mail service or the desktop mail monitoring process. If you choose the mail monitoring process, the JP1/AJS3 Mail service is not started. For details, see 2.3.4 *Setting up the environment for the mail system linkage* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide*.
8. The JP1/AJS3 Database service is controlled by JP1/AJS3. During ordinary operations, you do not need to use the JP1/AJS3 Database service. When the type of the embedded database is one used for JP1/AJS3 - Manager before version 10-00, the JP1/AJS3 Database ClusterService service also starts. However, during ordinary operations, you do not need to use the JP1/AJS3 Database ClusterService service. Use the JP1/AJS3 Database ClusterService service only when you need to operate the embedded database manually.

## 4.2.2 Defaults for JP1/AJS3 services (Windows only)

This subsection explains the setup of the accounts used by the JP1/AJS3 services.

The table below lists the defaults set in the JP1/AJS3 - Manager and JP1/AJS3 - Agent services.

Note that you cannot select the **Allow Service to Interact with Desktop** option.

Table 4-4: Defaults for JP1/AJS3 - Manager and JP1/AJS3 - Agent services

Service name	Startup Type	Account
JP1/AJS3	Manual	System
JP1/AJS3 Database <i>identifier</i> <sup>#</sup>	Manual	System
JP1/AJS3 Mail	Manual	System

Service name	Startup Type	Account
JP1/AJS3 Console Manager <sup>#</sup>	Automatic	System
JP1/AJS3 Console Agent <sup>#</sup>	Automatic	System
JP1/AJS3 Check Manager <sup>#</sup>	Manual	System
JP1/AJS3 Check Agent	Manual	System
JP1/AJS3 Queueless Agent	Manual	System
JP1/AJS3 Queueless File Transfer <sup>#</sup>	Manual	System

#### Note

The following points differ when the type of the embedded database is one used for JP1/AJS3 - Manager before version 10-00:

- The startup type of JP1/AJS3 Database *identifier* is Automatic.
- JP1/AJS3 Database ClusterService *identifier* also starts.

For JP1/AJS3 Database ClusterService *identifier*, the startup type is Manual and the account is System.

#

This service does not exist in JP1/AJS3 - Agent.

## 4.2.3 Changing the JP1/AJS3 service settings (Windows only)

This subsection describes the types of situations where it might be advisable to change the JP1/AJS3 service settings from the defaults. The JP1/AJS3 service setting for linking to another program is also explained.

### (1) Changing the account for services provided by JP1/AJS3

Depending on the job execution environment, it might be better to change the account for the JP1/AJS3 services to a user account. Examine the user account settings in JP1/AJS3 services as needed.

The following describes the types of situations when you will need to change the account used by the following services:

- JP1/AJS3 service
- JP1/AJS3 Database service
- JP1/AJS3 Console Manager service
- JP1/AJS3 Console Agent service
- JP1/AJS3 Check Manager service
- JP1/AJS3 Check Agent service
- JP1/AJS3 Queueless Agent service
- JP1/AJS3 Queueless File Transfer service

When the type of the embedded database is one used for JP1/AJS3 - Manager before version 10-00, the account for the JP1/AJS3 Database ClusterService service also needs to be changed.

## (a) When executing more concurrent jobs than usual or when you want to avoid desktop heap shortages

JP1/AJS3 uses Windows desktop heap (system resource) space secured separately for each job that is executed. For this reason, if you execute many jobs simultaneously, the desktop heap available to the OS runs low, potentially causing jobs to enter the *Ended abnormally* status. Note that the size of the desktop heap used by each JP1/AJS3 service or job depends on the environment.

You can use the following procedure to decrease the frequency of OS desktop heap shortages. However, note that no procedure can completely prevent desktop heap shortages. In Windows Server 2012 or Windows Server 2008, the size of the desktop heap available to the OS expands so that desktop heap shortages are rare. Therefore, the following procedure is not necessary. For details, check the information posted on the Microsoft website.

1. Change the account for JP1/AJS3 services from the system account to a user account.

When you execute a job, if you use a user account that is not the same as the JP1/AJS3 services account, each job uses a different space in the desktop heap. This space is space that is not space in the desktop heap used by the JP1/AJS3 services. Accordingly, if you use a user account that is different from the JP1/AJS3 services account to execute many jobs simultaneously, desktop heap shortages might occur.

If the JP1/AJS3 services account and the user account for executing jobs match, you can share the space in the desktop heap secured for JP1/AJS3 services when they started, reducing the frequency of OS desktop heap shortages.

If you use a domain user, specify *domain-name\user-name* for both the user account for executing jobs and the JP1/AJS3 services account. Do not specify *.local* after *domain-name*.

Although you can specify *.\user-name* as the JP1/AJS3 services account on a host in the domain environment, the service control manager might start the JP1/AJS3 processes for the domain user.

2. Enable the setting for reusing an access token when a job is executed.

When **Standard** is selected in the **Exec. Service** box in a job definition, you can enable the setting for reusing access tokens to turn off the acquisition of desktop heap space for each job execution. By doing so, you can reduce the frequency of OS desktop heap shortages when many jobs are executed simultaneously. For details about this setting, see *6.2.17 Reusing access tokens for job execution* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

3. Change the desktop heap size.

You can change the desktop heap size by editing the Windows registry information. For details about how to edit the registry, go to Microsoft Support on the web for technical information about the desktop heap.

Usage of the desktop heap by JP1/AJS3 services and active jobs depends on your system environment. Note that changing the heap size without proper forethought could affect the entire system. Keep this in mind before you decide to change the desktop heap size.

## (b) When using network resources

If you use network resources (that is, shared jobs), change the account for the JP1/AJS3 services to a user account.

When a job batch file requires a connection to a network drive, making the account for the JP1/AJS3 services the same as the account for the user who starts the job will allow other jobs started from that user account to disconnect the network drive.

As the file name specified in the detailed definition of the job, instead of a path beginning with the network drive name, specify a path beginning with the computer name, as follows: *\\computer-name\shared-folder\file-name*

## **(c) When multiple scheduler services are activated and you want to avoid desktop heap shortages**

Depending on the system environment, an error might occur when more than a certain number of scheduler services are activated concurrently. In this case, an error message (event ID 26) is output to the Windows event log, reporting that the application was not initialized correctly. This occurs when there are insufficient system resources (desktop heap shortage).

In JP1/AJS3, many control processes are activated by each scheduler service. When multiple scheduler services are activated concurrently, usage of the desktop heap increases proportionately and shortages might occur. In such cases, change the account used by the JP1/AJS3 services from the system account to a user account. This will prevent use of the same desktop heap area by both JP1/AJS3 services and other service programs.

## **(d) Privileges for running JP1/AJS3 services under a user account**

The following describes the privileges you need to set when running the following services under a user account:

- JP1/AJS3 service
- JP1/AJS3 Database service
- JP1/AJS3 Console Manager service
- JP1/AJS3 Console Agent service
- JP1/AJS3 Check Manager service
- JP1/AJS3 Check Agent service
- JP1/AJS3 Queueless Agent service
- JP1/AJS3 Queueless File Transfer service

When the type of the embedded database is one used for JP1/AJS3 - Manager before version 10-00, privileges also need to be set for the JP1/AJS3 Database ClusterService service.

To run the above services under a user account, grant the following privileges to the user:

- Administrators privilege
- Allow log on locally
- Log on as a service
- Replace process level token
- Increase process memory quota

Operation is not guaranteed if the set user account does not have these privileges.

Set these privileges in the Local Security Policy.

When the account under which JP1/AJS3 services are activated is changed from the system account to a user account, the size of the available desktop heap also changes. This might affect the number of jobs (batch files and script files) that can be executed concurrently.

### Cautionary notes

1. Set the same user account for the JP1/AJS3 services on all logical hosts and physical hosts.
2. After setting the required privileges for the account used to activate JP1/AJS3 services, you must restart the services for the privileges to take effect.

3. In a domain environment that uses Active Directory, the setup procedure differs for the host that is the domain controller and for the hosts in the domain. For details, see the explanation in the *Job Management Partner 1/Base User's Guide* about how to grant user rights to an OS user in an Active Directory environment.

## (2) Account for linking to the mail service

The mail service account does not have to be the same as the JP1/AJS3 services account.

When mail system linkage is running in the JP1/AJS3 Mail service, set the account of a user for whom a mail profile has been defined in the JP1/AJS3 Mail service. Also, set the following privileges:

- Allow log on locally
- Log on as a service

Operation is not guaranteed if the set user account does not have these privileges.

Set these privileges in the Local Security Policy.

## (3) Required changes for linking to JP1/Power Monitor

To perform power control linked with JP1/Power Monitor, you must start JP1/AJS3 using the JP1/Base startup control. In this case, set the **Startup Type** of the JP1/AJS3 service to **Manual**.

## (4) Required changes for using the JP1/Base startup control

By default, the JP1/AJS3 service starts under the JP1/Base startup control.

When using the JP1/Base startup control:

Set the **Startup Type** of the JP1/AJS3 service to **Manual**.

If you have upgraded from JP1/Base version 8 to version 9 or later, comment-out the automatic startup parameter `Jp1AJS2MONITOR` in the JP1/Base start sequence definition file `Jp1svprm.dat`.

When not using the JP1/Base startup control:

The **Startup Type** of the JP1/AJS3 service can be set as **Manual** or **Automatic**.

## 4.2.4 Settings for starting and stopping JP1/AJS3 services automatically

The JP1/AJS3 services can be activated and terminated automatically at system startup and shutdown.

Do not enable automatic startup if you want the OS to start up quickly or when the operator needs to start JP1/AJS3 manually.

In Windows:

Because the JP1/Base startup control is enabled, by default, the JP1/AJS3 services will start automatically. If you do not want to use the JP1/Base startup control, disable it as explained in the section about setting the services start/stop sequence in the *Job Management Partner 1/Base User's Guide*.

Note that the start sequence definition file (`JP1SVPRM.DAT`), used to set the start and stop sequence for services, contains the following sections in which you can specify the settings for the JP1/AJS3 service and JP1/AJS3 Mail service. Although the default name is `JP1/AJS2`, the settings below take effect as JP1/AJS3 settings.

JP1/AJS3 service settings:

```
[Jp1AJS2]
Name=JP1/AJS2
ServiceName=JP1_AJS2
StopCommand=jajs_spmd_stop.exe
```

JP1/AJS3 Mail service settings:

```
[Jp1AJS2MAIL]
Name=JP1/AJS2 Mail
ServiceName=JP1_AJS2_Mail
```

In UNIX:

For details about the settings for automatically starting and stopping JP1/AJS3 services, see *15.7.1 Setting automatic startup and termination of the JP1/AJS3 service* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

Cautionary notes

- Windows shutdown does not wait for JP1/AJS3 termination to complete. Shutting down Windows while JP1/AJS3 is active might corrupt the JP1/AJS3 data files or cause other problems. To shut down Windows manually, execute the JP1/Power Monitor power control command (`aompwcon`). If JP1/Power Monitor is not installed, first stop the JP1/AJS3 services, and then shut down the system.
- Do not execute the OS shutdown command from a PC job. If you wish to shut down the OS using automatic job execution, consider installing JP1/Power Monitor and executing a Local Power Control job as an action job.

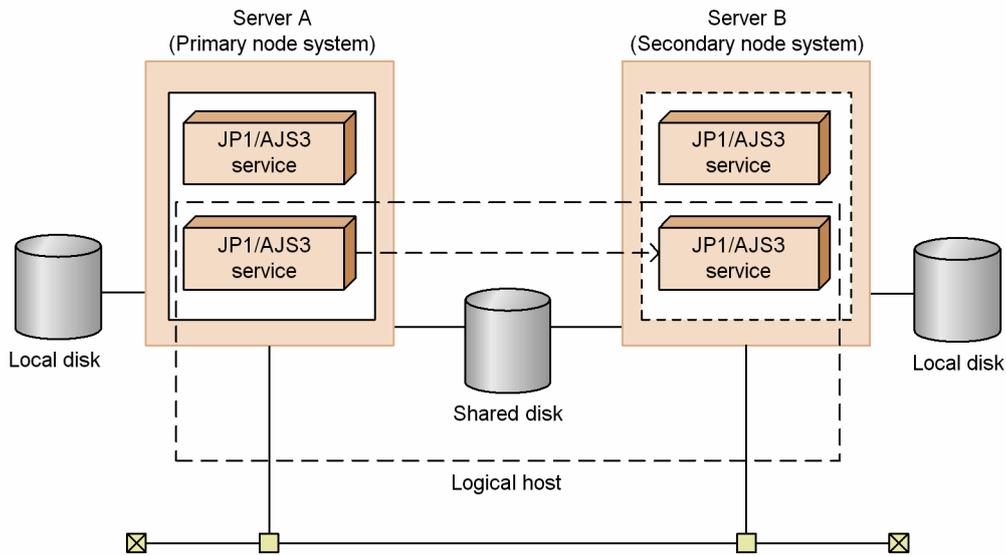
## 4.2.5 Starting multiple instances of the JP1/AJS3 services

The JP1/AJS3 services of JP1/AJS3 - Manager and JP1/AJS3 - Agent can be started as multiple instances in a single host, enabling operation in a cluster environment. To start multiple instances of the JP1/AJS3 services, define logical hosts that will allow the physical host to be used as multiple virtual hosts, and then set up the environment for services to start on a logical host basis.

To start multiple JP1/AJS3 services on a logical host basis, set up the environment for each logical host. Prepare sufficient system resources (semaphores, virtual memory, shared memory, disk space, and so on) for the number of instances of the JP1/AJS3 services that will be activated simultaneously.

The following figure shows the system operation with multiple instances of the JP1/AJS3 service.

Figure 4-1: Activating multiple instances of JP1/AJS3 services



## 4.3 Setup of JP1/AJS3 - Manager

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This section describes the settings involved in setting up a JP1/AJS3 - Manager host. Before you begin this task, decide whether to use the defaults or customized settings for JP1/AJS3 - Manager.

For details about performing these settings, see the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

### 4.3.1 Environment settings related to system management

For details about environment settings related to system management in a JP1/AJS3 - Manager host (environment setting parameters), see *2.1 Setting up the system management environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

For details about performing these settings, see *4.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *14.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

### 4.3.2 Environment settings for scheduler services

For details about environment settings for the scheduler services in a JP1/AJS3 - Manager host (environment setting parameters), see *2.2 Setting up the scheduler service environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

For details about performing these settings, see *4.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *14.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

### 4.3.3 Environment settings related to event job activation

For details about the environment settings (environment setting parameters) related to starting event jobs in a JP1/AJS3 - Manager host, see the following references.

- When using event jobs:  
*2.4 Setting up the event/action control environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*
- When linking with the mail system:  
*2.3.4(4) Environment setting parameters used by the mail system linkage function* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (for Windows systems) or *2.4.2(3) Environment setting parameters used for email reception monitoring jobs* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (for UNIX systems)

For details about performing these settings, see the following references as required:

- 4.2 *Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *14.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems)
- 2.3.4 *Setting up the environment for the mail system linkage* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (for Windows systems) or 2.4.2 *Setting up the environment for an email reception monitoring job* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (for UNIX systems)

### 4.3.4 Environment settings for JP1/AJS3 Console

For details about environment settings related to JP1/AJS3 - Console (environment setting parameters), see 2.8 *Setting up the JP1/AJS3 Console environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

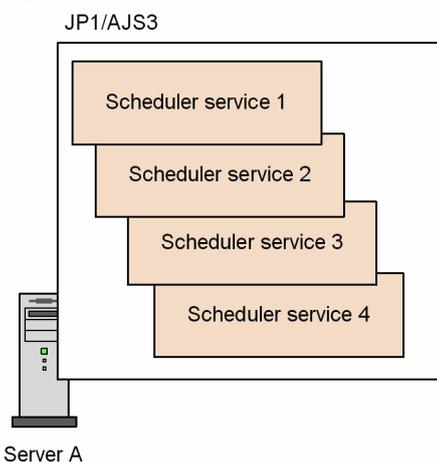
For details about performing these settings, see 4.2 *Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or 14.2 *Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

### 4.3.5 Activating multiple scheduler services concurrently

A *scheduler service* is a control unit for managing root job groups, and is configured within the JP1/AJS3 services on a manager host. One or more root job groups must be defined at the highest level of the scheduler service hierarchy. The name of a root job group is a forward slash (/).

The following figure shows a configuration with multiple scheduler services activated.

Figure 4-2: Using multiple scheduler services



When you use multiple scheduler services, the root job groups can be managed in different scheduler services. However, regardless of how many scheduler services are used, resources might be stretched in a system where more than 4,000 jobnets and jobs need to be managed (defined, registered for execution, and monitored) in one scheduler service. If your system has several CPUs, consider running multiple scheduler services concurrently.

For example, you could activate multiple scheduler services and divide work tasks among them. This would enable CPU resources to be utilized efficiently by each scheduler service, and each scheduler service would be able to execute

its own work tasks (jobnets and jobs) independently of the others. Test runs could also be performed without affecting other operations.

You must also consider running multiple scheduler services when a very large number of jobnets need to be registered for execution. Taking account of processing performance, divide the jobnets into about 4,000 per scheduler service. Splitting up jobnets per work task can also help to reduce jobnet size.

A maximum of 20 scheduler services can be activated concurrently on one computer, including both the physical host and the logical hosts. However, depending on the system environment, if you specify more than a certain number of concurrent scheduler services in the environment settings, some services might not start.

To activate multiple scheduler services concurrently, define each one separately in the environment settings for each logical host. For the required settings, see *6.1.1 Settings for starting multiple scheduler services* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.1.1 Settings for starting multiple scheduler services* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

To start or stop scheduler services individually, execute the `jajs_spm` or `jajs_spm_stop` command with the `-n jajs_schd` option specified. You can execute these commands while JP1/AJS3 services are active. For details, see *8.5 Starting and stopping only the scheduler service* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## **(1) Activating multiple scheduler services on a Windows host**

Depending on the system environment, an error might occur when more than a certain number of schedulers are activated concurrently. In this case, an error message reports that the application was not initialized correctly.

This error occurs when there are insufficient system resources (desktop heap shortage).

In JP1/AJS3, each scheduler service activates many control processes. When multiple scheduler services are activated concurrently, usage of the desktop heap increases proportionately and shortages might occur. In such cases, take the following measures.

### **(a) Use the desktop heap area specific to JP1/AJS3**

To use the desktop heap area specific to JP1/AJS3, change the JP1/AJS3 services account to a user account. The system account is set by default for JP1/AJS3 services.

For details about this setting, see *4.2.3(1) Changing the account for services provided by JP1/AJS3*.

### **(b) Adjust the desktop heap size by editing the registry**

Edit the Windows registry to adjust the desktop heap size. For details about the procedure, see the relevant articles on Microsoft's *Help and Support* website. Usage of the desktop heap depends on your system environment. Be sure to consider the consequences before changing the heap size.

## **(2) Activating multiple scheduler services on a UNIX host**

Increasing the number of scheduler services will increase system resource usage in direct proportion. If sufficient system resources cannot be allocated for the number of scheduler services you are using, an error might occur. Set the number of scheduler services to be activated concurrently once you have estimated the memory requirements, disk space requirements, kernel parameters, and other system resources needed, as described in *3. Estimates*.

## 4.3.6 Options related to job execution

This subsection describes the options you can set for executing jobs. Set these options according to your operating environment.

### (1) Defining the work path for job execution as a variable

If a different installation path is used for JP1/AJS3 at each agent host, or if the JP1/AJS3 installation path at an agent host is not defined in the environment variable `PATH`, by defining the installation path at the agent hosts as a variable, you can enable jobs to be executed regardless of where JP1/AJS3 is installed on the agent.

We recommend that you define the work path for job execution as a variable when JP1/AJS3 runs in different environments; for example, when the executable files for job execution reside on the C drive in one agent host, and on the D drive in another agent host.

For details about setting the work path as a variable, see *6.2.1 Defining variables for work paths used during job execution* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.2.1 Defining variables for work paths used during job execution* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

### (2) Executing jobs with long file names (Windows only)

When a job is executed, the name of the executable file is converted to a short file name recognized by NTFS (NT file system) volumes and FAT (file allocation table) volumes. We recommend that you enable this option if you want to run job executable files with long file names without converting them to short file names.

For details about this option, see *6.2.15 Executing a job by using a long file name* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

### (3) Defining the search path for transfer files

In JP1/AJS3, you can transfer the text files required for job execution from the manager host to an execution agent host. For example, you can transfer a settings file (`.ini` file) in which the environment (path and so on) of the executable file is defined.

You can pre-define a search path. When you specify the files to transfer from the manager host to the agent host, JP1/AJS3 will look for the files in that search path, and forward those found.

We recommend that you enable this option if you want to define the files to be transferred without specifying their paths.

For details about this option, see *6.2.2 Defining search paths for a file to be transferred* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.2.2 Defining search paths for a file to be transferred* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

### (4) Setting the pipe communication timeout value for an agent (UNIX only)

A timeout might occur during pipe communication between agent processes of the job execution control. Possible causes of this timeout are:

- A large number of jobs were executed at one time.
- The CPU has a high load.

- Due to insufficient real memory, the agent process of the job execution control was swapped out and not executed for 300 seconds or longer.

If these problems remain unresolved and pipe communication timeout errors are likely to recur, we recommend that you increase the timeout for pipe communication at the host on which the agent processes run.

### **Important note**

If the setting for pipe communication timeout is too long, job errors might take longer to be detected.

For details about setting the pipe communication timeout, see *15.2.15 Changing the timeout value for pipe communication of the agent* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

## **4.3.7 Options for using event jobs**

This subsection discusses the options you can set for event jobs. Determine which options to set according to your operating environment.

### **(1) Setting the event job log**

The size of the log file for event jobs depends on such things as the number of event jobs executed and the number of monitoring conditions satisfied. As a general guide, set a log size large enough for 24 hours' worth of entries as a minimum, or 1-3 days' worth preferably. To estimate the required log size, see *3.4.3 Estimating the size of the log information output by event jobs*.

### **(2) Processing events in order of occurrence**

When an event job has start conditions, events that trigger the job might occur in succession but be processed in a different order, depending on the communication conditions. You might want to preserve the actual order of events that satisfied the start conditions if, for example, the event information will be passed to a parameter. In this case, use the *event order option*. Set this option on all agent hosts that execute event jobs. For details, see *6.3.2 Setting the event order option* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.3.2 Setting the event order option* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

### **(3) Passing the status of a Monitoring Files job**

You can save information as needed while a Monitoring Files job is monitoring the target files. This allows the job status to be passed at restart if the JP1/AJS3 service temporarily stops. For example, in a cluster system, if the JP1/AJS3 service is stopped and restarted while a Monitoring Files job is running, the job can be resumed from its previous monitoring status. We recommend that you use this setting to maintain the consistency of a Monitoring Files job should the JP1/AJS3 service stop.

To pass the monitoring status, the Monitoring Files job needs to be continuously active. Whether the monitoring status can be passed depends on whether the Monitoring Files job continues running or is stopped.

For the conditions under which the monitoring status is passed, see the description of the status passing option for Monitoring Files jobs in *7.6.2 Notes on the Monitoring Files job* in the *Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*.

For the setting procedure, see *6.3.3 Setting the status passing option for the file monitoring job* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.3.3 Setting the status passing option for the file monitoring job* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

## **(4) Passing event data containing double quotation marks**

The information received by an event job can be passed to the parameters of standard jobs and action jobs. Any double quotation marks (") contained in the event data to be passed must be preceded by a backslash (\) when the event is issued. If the backslash is missing, the double quotation mark will be ignored or other issues might occur when the received event data is passed.

To prevent this, we recommend that you set an option to pass data containing double quotation marks exactly as in the issued event.

When you set this option, JP1/AJS3 inserts a backslash before each double quotation mark. This allows the information received by an event job to be passed to a job parameter regardless of whether it contains any double quotation marks.

If a backslash already precedes a double quotation mark in the information to be passed, this option adds a second backslash. Therefore, the string `AB\C`, for example, will be passed as `AB\C`, not `AB"C`. If you have already added backslashes intentionally, do not set this option.

### Cautionary note

The received event data, passed from an event job to a parameter in a standard job or action job, must fit within the maximum length of that parameter. Note that with this option specified, there will be an extra backslash before any double quotation mark.

Consider the effects of passing data containing double quotation marks when this option is enabled, with reference to the following example:

#### Example;

The maximum length of a command statement in a Unix job is 1,023 bytes. If there are 1,023 bytes of event data containing a double quotation mark, specifying this option will result in an error because the passed data will exceed 1,024 bytes when the backslash is inserted.

For details about setting this option, see *6.3.4 Passing event data containing double quotation marks* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.3.4 Passing event data containing double quotation marks* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

## **4.3.8 Options for using action jobs**

This subsection discusses the options you can set for action jobs. Determine which options to set according to your operating environment.

### **(1) Sending emails using the email sending job**

When you use the email sending job in Windows, you can choose either of the following:

- Email sending job without Outlook
- Email sending job with Outlook

The following table describes the advantages and disadvantages of each.

Table 4–5: Advantages and disadvantages of the email sending job with and without Outlook

Email sending job	Advantages	Disadvantages
Without Outlook	You can send emails without preparing Outlook.	<ul style="list-style-type: none"> <li>You cannot check the results of sending emails in the email software. (Instead, check the execution result for the email sending jobs.)</li> <li>You cannot specify the time for email transmission.</li> <li>You cannot receive read receipts for messages.</li> </ul>
With Outlook	<ul style="list-style-type: none"> <li>You can check the results of sending emails in Outlook.</li> <li>You can specify the delivery time by using the appropriate Outlook option.</li> <li>You can obtain read receipts by using the appropriate Outlook option.</li> </ul>	You need to prepare Outlook.

On the same host, you can choose either to use Outlook or not to use Outlook. You cannot choose both options. Select the option that is appropriate for operation of your system.

You can use email reception monitoring jobs even when you send emails without using Outlook. However, note that if you use email reception monitoring jobs, Outlook must still be installed.

Cautionary note

When you use the email sending job without Outlook to send emails, version 10-00 or later of JP1/AJS3 - Manager or JP1/AJS3 - Agent must be installed on the relevant agent.

For details about mail system linkage, see 2. *Linking Mail Systems* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide*.

The following table describes the differences when Outlook is not used and when it is used.

Table 4–6: Differences when Outlook is not used and used

No.	Item	Outlook not used	Outlook used
1	Mail system	SMTP#1	Exchange Server or SMTP and POP3
2	Logical host that sends emails	Multiple logical hosts can send emails.	Only one logical host can send emails.
3	Specification of display names or aliases as recipients	Not possible.	Same as Outlook and mail system
4	Automatic linefeed for messages	Not possible.	Same as the text wrapping option in Outlook if the <code>WrapTextWithOutlookOption</code> environment setting parameter is set to <code>Y</code> .#2
5	Time the email was delivered to the recipient	Not possible.	Same as the delivery time option in Outlook.
6	Read receipts for messages (Setting for sending a read receipt when a sent email is read by the recipient)	Not possible.	Same as the read receipt option in Outlook.
7	Retransmission of emails	Re-execute the email sending job.	Use Outlook to re-send emails.
8	Confirmation of sent emails	Check the execution result for the email sending jobs.	Check <b>Outbox</b> and <b>Sent Items</b> in Outlook.

No.	Item	Outlook not used	Outlook used
9	Transmission of emails without subjects	Emails are sent with one space as the subject.	Same as Outlook
10	Attachments exceeding 10 megabytes	Depends on the upper limit of the mail server. However, 10 megabytes is recommended as the upper limit.	Same as Outlook
11	Specification of only Cc or Bcc recipients	Not possible. To recipients must be specified.	Same as Outlook

#1

As the authentication method, POP before SMTP, SMTP-AUTH PLAIN, or SMTP-AUTH LOGIN can be specified. When POP before SMTP is used as the authentication method, POP3 is also required.

#2

For details about `WrapTextWithOutlookOption` environment setting parameter, see 2. *Linking Mail Systems* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide*.

### 4.3.9 Environment settings for other options

For details about environment settings common to JP1/AJS3 - Manager hosts (environment setting parameters), see 2.9 *Setting up JP1/AJS3 shared information* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

For details about performing these settings, see 4.2 *Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or 14.2 *Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

## 4.4 Setup of JP1/AJS3 - Agent

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This section describes the settings involved in setting up a JP1/AJS3 - Agent host. Before you begin this task, decide whether to use the defaults or customized settings for JP1/AJS3 - Agent.

For details about performing these settings, see the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

### 4.4.1 Environment settings related to system management

For details about environment settings related to system management in a JP1/AJS3 - Agent host (environment setting parameters), see *2.1 Setting up the system management environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

For details about performing these settings, see *4.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *14.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

### 4.4.2 Environment settings related to event job activation

For details about the environment settings (environment setting parameters) related to starting event jobs in a JP1/AJS3 - Agent host, see the following references.

- When using event jobs:  
*2.4 Setting up the event/action control environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*
- When linking with the mail system:  
*2.3.4(4) Environment setting parameters used by the mail system linkage function* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (for Windows systems) or *2.4.2(3) Environment setting parameters used for email reception monitoring jobs* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (for UNIX systems)

For details about performing these settings, see the following references as required:

- *4.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *14.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems)
- *2.3.4 Setting up the environment for the mail system linkage* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (for Windows systems) or *2.4.2 Setting up the environment for an email reception monitoring job* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (for UNIX systems)

### 4.4.3 Options related to job execution

This subsection describes the options you can set for executing jobs. Set these options according to your operating environment.

## (1) Defining the work path for job execution as a variable

If a different installation path is defined for JP1/AJS3 at each agent host, or if the JP1/AJS3 installation path at an agent host is not defined in the environment variable `PATH`, by defining the installation path at the agent hosts as a variable, you can enable jobs to be executed regardless of where JP1/AJS3 is installed on the agent.

We recommend that you define the work path for job execution as a variable when JP1/AJS3 runs in different environments; for example, when the executable files for job execution reside on the C drive in one agent host, and on the D drive in another agent host.

For details about setting the work path as a variable, see *6.2.1 Defining variables for work paths used during job execution* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.2.1 Defining variables for work paths used during job execution* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

## (2) Executing jobs with long file names (Windows only)

When a job is executed, the name of the executable file is converted to a short file name recognized by NTFS (NT file system) and FAT (file allocation table) volumes. We recommend that you enable this option if you want to run job executable files with long file names without converting them to short file names.

For details about this option, see *6.2.15 Executing a job by using a long file name* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

## (3) Setting the pipe communication timeout value for an agent (UNIX only)

A timeout might occur during the pipe communication between agent processes of the job execution control. Possible causes of this timeout are:

- A large number of jobs were executed at one time.
- The CPU has a high load.
- The agent process of the job execution control was swapped out for 300 seconds or longer due to insufficient real memory, and the job was not executed.

If these problems remain unresolved and pipe communication timeout errors are likely to recur, we recommend that you increase the timeout for pipe communication at the host on which the agent processes run.

### Important note

If the setting for pipe communication timeout is too long, job errors might take longer to detect.

For details about setting the pipe communication timeout, see *15.2.15 Changing the timeout value for pipe communication of the agent* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

## 4.4.4 Options for using event jobs

This subsection discusses the options you can set for event jobs. Determine which options to set according to your operating environment.

## (1) Setting the event job log

The size of the log file for event jobs depends on such things as the number of event jobs executed and the number of monitoring conditions satisfied. As a general guide, set a log size large enough for 24 hours' worth of entries as a minimum, or 1-3 days' worth preferably. To estimate the required log size, see [3.4.3 Estimating the size of the log information output by event jobs](#).

## (2) Processing events in order of occurrence

When an event job has start conditions, events that trigger the job might occur in succession but be processed in a different order. You might want to preserve the actual order of events that satisfied the start conditions if, for example, the event information will be passed to a parameter. In this case, use the event order option. Set this option on all agent hosts that execute event jobs. For details, see [6.3.2 Setting the event order option](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or [15.3.2 Setting the event order option](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

## (3) Passing the status of a Monitoring Files job

You can save information as needed while a Monitoring Files job is monitoring the target files. This allows the job status to be passed at restart if the JP1/AJS3 service temporarily stops. For example, in a cluster system, if the JP1/AJS3 service is stopped and restarted while a Monitoring Files job is running, the job can be resumed from its previous monitoring status. We recommend using this setting to maintain the consistency of a Monitoring Files job should the JP1/AJS3 service stop.

To pass the monitoring status, the Monitoring Files job needs to be continuously active. Whether or not the monitoring status can be passed depends on whether the Monitoring Files job continues running or is stopped.

For the conditions under which the monitoring status is passed, see the description of the status passing option for Monitoring Files jobs in [7.6.2 Notes on the Monitoring Files job](#) in the *Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*.

For the setting procedure, see [6.3.3 Setting the status passing option for the file monitoring job](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or [15.3.3 Setting the status passing option for the file monitoring job](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

## 4.4.5 Options for using action jobs

This subsection discusses the options you can set for action jobs. Determine which options to set according to your operating environment.

### (1) Sending emails using the email sending job

When you use the email sending job in Windows, you can choose either of the following:

- Email sending job without Outlook
- Email sending job with Outlook

The following table describes the advantages and disadvantages of each.

Table 4–7: Advantages and disadvantages of the email sending job with and without Outlook

Email sending job	Advantages	Disadvantages
Without Outlook	You can send emails without preparing Outlook.	<ul style="list-style-type: none"> <li>You cannot check the results of sending emails in the email software. (Instead, check the execution result for the email sending jobs.)</li> <li>You cannot specify the time for email transmission.</li> <li>You cannot receive read receipts for messages.</li> </ul>
With Outlook	<ul style="list-style-type: none"> <li>You can check the results of sending emails in Outlook.</li> <li>You can specify the delivery time by using the appropriate Outlook option.</li> <li>You can obtain read receipts by using the appropriate Outlook option.</li> </ul>	You need to prepare Outlook.

On the same host, you can choose either to use Outlook or not to use Outlook. You cannot choose both options. Select the option that is appropriate for operation of your system.

Cautionary note

When you use the email sending job without Outlook to send emails, version 10-00 or later of JP1/AJS3 - Manager or JP1/AJS3 - Agent must be installed on the relevant agent.

For details about mail system linkage, see 2. *Linking Mail Systems* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide*.

The following table describes the differences when Outlook is not used and when it is used.

Table 4–8: Differences when Outlook is not used and used

No.	Item	Outlook not used	Outlook used
1	Mail system	SMTP#1	Exchange Server or SMTP and POP3
2	Logical host that sends emails	Multiple logical hosts can send emails.	Only one logical host can send emails.
3	Specification of display names or aliases as recipients	Not possible.	Same as Outlook and mail system
4	Automatic linefeed for messages	Not possible.	Same as the text wrapping option in Outlook if the <code>WrapTextWithOutlookOption</code> environment setting parameter is set to <code>Y</code> .#2
5	Time the email was delivered to the recipient	Not possible.	Same as the delivery time option in Outlook.
6	Read receipts for messages (Setting for sending a read receipt when a sent email is read by the recipient)	Not possible.	Same as the read receipt option in Outlook.
7	Retransmission of emails	Re-execute the email sending job.	Use Outlook to re-send emails.
8	Confirmation of sent emails	Check the execution result for the email sending jobs.	Check <b>Outbox</b> and <b>Sent Items</b> in Outlook.
9	Transmission of emails without subjects	Emails are sent with one space as the subject.	Same as Outlook

No.	Item	Outlook not used	Outlook used
10	Attachments exceeding 10 megabytes	Depends on the upper limit of the mail server. However, 10 megabytes is recommended as the upper limit.	Same as Outlook
11	Specification of only Cc or Bcc recipients	Not possible. To recipients must be specified.	Same as Outlook

#1

As the authentication method, POP before SMTP, SMTP-AUTH PLAIN, or SMTP-AUTH LOGIN can be specified. When POP before SMTP is used as the authentication method, POP3 is also required.

#2

For details about `WrapTextWithOutlookOption` environment setting parameter, see 2. *Linking Mail Systems* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide*.

## 4.4.6 Environment settings for other options

For details about environment settings common to JP1/AJS3 - Agent hosts (environment setting parameters), see 2.9 *Setting up JP1/AJS3 shared information* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

For details about performing these settings, see 4.2 *Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or 14.2 *Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

## 4.5 Environment settings for JP1/AJS3 - View

This section describes what to consider when setting the environment for JP1/AJS3 - View. Determine the following so that JP1/AJS3 - View can be used in an appropriate manner for your system right from the start:

- Settings in the Preferences dialog box
- Use of common settings (common user profile)
- Use of the system common settings file
- Window display statuses and refresh interval
- Columns to display
- Defaults for radio buttons and check boxes

You can set the JP1/AJS3 - View environment on each host running the program, and for each JP1 user who will log in to JP1/AJS3 - View, according to how the program will be used. Alternatively, you can use a common user profile<sup>#</sup>, which allows all JP1 users to use JP1/AJS3 - View with the same settings. For details about setting user profiles, see [4.5.2 Common settings for JP1 users](#).

#

The common profile does not apply in JP1/AJS3 Console View. However, by setting the **Use JP1/AJS3 - View settings** option, you can specify the same display colors as in JP1/AJS3 - View.

For details about JP1/AJS3 - View settings other than in the Preferences dialog box, see *11.1.1 Types of customization methods* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

### 4.5.1 Settings in the Preferences dialog box

This subsection describes the items you can set in the Preferences dialog box of JP1/AJS3 - View. Decide your preferences for the following items beforehand, so that JP1/AJS3 - View can be used in line with your system operation right from the start.

Table 4-9: Items to set in the Preferences dialog box

Page	Item
<b>Login</b>	<b>Auto login</b>
	<b>Start mode</b>
<b>Main</b>	<b>Icon color</b>
	<b>Show color image in status and result</b>
	<b>Display status of a job group</b>
	<b>Double-click on jobnet</b>
	<b>Exclusive edit when Jobnet Editor starts</b>
	<b>Monitoring mode when Jobnet Monitor starts</b>
<b>Editor / Monitor</b>	<b>Unit name new line</b>
	<b>Display comments</b>
	<b>Highlighted display</b>

Page	Item
<b>Editor / Monitor</b>	<b>Double-click in unit</b>
<b>Schedule</b>	<b>First execution time</b>
	<b>Daily display time</b>
	<b>Simulation</b>
	<b>Order display by:</b>
	<b>Root jobnet with no schedule</b>
	<b>Planning group</b>
<b>General</b>	<b>Change icon color</b>
	<b>Priority of delay display color</b>
	<b>Hold plan</b>
<b>Other</b>	<b>Trace level</b>
	<b>Max. log file size</b>

## (1) Login page

Decide the following:

- Whether to log in to JP1/AJS3 - Manager automatically when JP1/AJS3 - View starts
- What display format to use in JP1/AJS3 - View

### Auto login

Decide whether to log in to JP1/AJS3 - Manager automatically when JP1/AJS3 - View starts. Set this option if you want to skip the login procedure in the Login screen. However, without the login procedure, anyone will be able to log in to JP1/AJS3 - Manager. If there are security issues, do not perform this setting. Note also that the values you specify on the **Login** page are saved to an insecure JP1/AJS3 local file. Use auto login only in an environment protected by the OS security feature.

Auto login is disabled when you log in to JP1/AJS3 - View from JP1/IM - View. Log in to JP1/AJS3 - View using the JP1 user name and password that you used for logging in to JP1/IM - View. This JP1 user name and password are set in the displayed Login screen.

### Start mode

Decide what display format to use in JP1/AJS3 - View. The display format in the JP1/AJS3 - View window is referred to as the *Start mode*. You can select any of these three options:

- **Normal**  
Displays only the target units and the available menu commands according to the purpose of the operation (definition, execution, or monitoring).  
This option is best for preventing mistakes, and when the JP1 users logging in to the system each perform different types of operations.
- **Monitoring**  
Displays a window customized for monitoring units. You can specify target units and monitor those units only.
- **Compatible**  
Enables the same operability as in JP1/AJS2 - View version 8 and earlier. The windows will be displayed in this mode if you have performed an upgrade installation to JP1/AJS3 - View version 9.

This mode is suitable for users who are familiar with operations in JP1/AJS2 - View version 8 or earlier, where the menu commands are not explicitly grouped by purpose (definition, execution, or monitoring).

## (2) Main page

Decide the following:

- How to display units in the list area of the JP1/AJS3 - View window
- Whether to open the Jobnet Editor window or Jobnet Monitor window from the JP1/AJS3 - View window, and what to display in the Jobnet Monitor window

### Icon color

You can select whether the color of icons displayed in the **Name** column of the list area should be based on the unit status or the operation result.

Select **Use status color** to show the status of the active generation.

For example, with **Use status color** selected, the jobnet icon will appear gray for a jobnet that ends abnormally and does not have a subsequent execution schedule (*not scheduled for execution* state). With **Use result color** selected, the jobnet icon will be light red.

### Show color image in status and result

You can display different colors in the **Status** and **Result** columns, based on the status indicated in the text display. This option is useful for visually checking statuses and execution results in the JP1/AJS3 - View window.

### Display status of a job group

The status of a job group can be represented by the background color of the job group icon in the list area. The status color represents the status of the jobnets in the job group. The **Status** and **Result** columns show the status and execution results of the job group.

When a job group has multiple jobnets, any of which has ended abnormally, the job group is shown in the abnormal end color. When a jobnet in a nested job group ends abnormally, the abnormal end color is applied to the upper-level job groups, and to the top-level job group. Thus, this option is useful for visually checking the status of jobnets in a job group in the JP1/AJS3 - View window. You can keep track of the status of each job group without having to open them by double-clicking the job group icons. Do not use this option if you have a considerable number of units, as the display performance declines when a job group contains many jobnets and jobs.

For details about the rules governing whether the status of a lower-level jobnet affects the upper-level job groups, see *15.3.42 Preferences dialog box* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

### Double-click on jobnet

You can select any of the following as the window to display when you double-click a jobnet in the list area:

- **Open jobnet monitor and show status**
- **Open jobnet monitor and show result**
- **Open jobnet editor**

On a host where JP1/AJS3 - View is used as a terminal for defining jobnets and jobs in a work flow, we recommend setting the Jobnet Editor window (for defining jobnet definition information) as the window to be displayed when a jobnet is selected.

On a host where JP1/AJS3 - View is used as a terminal for monitoring work tasks, not for editing jobnet definitions, we recommend setting the Jobnet Monitor window (for viewing jobnet statuses and results) as the window to be displayed.

### Exclusive edit when Jobnet Editor starts

To edit a jobnet in the Jobnet Editor window, the jobnet definition information needs to be locked so that it cannot be updated by anyone else. For JP1 users who will be editing jobnet definitions, we recommend setting this option to place a lock on the displayed information when the Jobnet Editor window opens.

### Monitoring mode when Jobnet Monitor starts

You can select the type of information displayed when the user opens the Jobnet Monitor window from the JP1/AJS3 - View window. Select either of the following:

#### Monitor the previous status

The Jobnet Monitor window shows only the generation displayed in the JP1/AJS3 - View window's list area. If the status of the jobnet changes after the Jobnet Monitor window opens, the information shown in the Jobnet Monitor window remains unchanged.

#### Monitor the latest status and results

The Jobnet Monitor window shows the latest status or result, regardless of the information displayed in the JP1/AJS3 - View window. With this option, the status or result of the most recent generation can be displayed when multiple generations are produced for the jobnet being monitored.

## (3) Editor / Monitor page

Decide how to display units in the map area in the Jobnet Editor window and Jobnet Monitor window.

### Unit name new line

Unit names in the map area of the Jobnet Editor window and Jobnet Monitor window are wrapped after the 10th character. This can make it difficult to see the unit status and operation result in the Jobnet Monitor window. By setting a different position for wrapping unit names, you can make them easier to read. Decide the wrap position as required, bearing in mind the naming conventions for unit names.

### Display comments

To display a comment under a unit name, specify the number of characters from the beginning of the comment. Comments are displayed in the specified number of characters.

If you do not want to display a comment, specify a control character at the beginning of the comment. Comments beginning with the control character do not appear in the map area.

Displaying rules such as the processing cycle of a job or jobnet as a comment makes units easier to manage. Also, entering Japanese processing names as multi-byte characters within the 80-byte limit is useful.

You can also check the contents of a comment without having to open the dialog box for defining a job or jobnet. If you select **No** on this page, you can still display comments using the tool tips.

### Highlighted display

When highlighting is specified in the Jobnet Editor window or Jobnet Monitor window, you can set the display colors for the base unit, preceding and subsequent units, and relationship lines.

### Double-click in unit

You can select either of the following as the behavior when you double-click a unit in the list area of the Jobnet Editor window or Jobnet Monitor window:

- Display the Define Details - [unit-conname] dialog box in the Jobnet Editor window, and the Monitor Details - [unit-conname] dialog box in the Jobnet Monitor window.
- Display the double-clicked unit in selected status in the middle of the map area.

## (4) Schedule page

Decide the following settings for calculating execution schedules and displaying the Daily Schedule window:

### First execution time

The first execution time is used to calculate the scheduled end time when a jobnet or job is executed for the first time. The scheduled end time of subsequent runs is calculated from the average of the previous execution times of the jobnets or jobs.

By entering the expected execution time in advance, you can check the scheduling behavior and results of a test run, using an execution time that simulates actual operation. You can specify a first execution time of between 1 and 86400 (seconds). The default is 1200.

### Daily display time

You can select whether to display schedules in the time area of the Daily Schedule window over a 24-hour period (today) or 48-hour period (today and tomorrow). When a schedule such as batch execution of mass data runs over a two-day period (across a date boundary), 48-hour display makes the execution schedule and results easier to see.

### Simulation

You can select whether to use the monthly execution simulation function. This function calculates the execution schedule of a jobnet registered for planned execution and displays the result in the Monthly Schedule window.

The next execution schedule of a jobnet registered for planned execution is normally calculated when the jobnet starts. When using the monthly execution simulation function, all the execution schedules are calculated when the jobnet is registered, based on the registration and execution information, and the definition information at that point in time. Set this option to check the start time and operation of an execution schedule in a manner that approximates actual operation.

### Order display by:

Select the order in which unit names are listed in the tree area of the Daily Schedule window and Monthly Schedule window. Units can be listed by name or by execution time.

When listed by name, the units appear in ascending order. The sorting order depends on the character code set specified for JP1/AJS3 - Manager. Select the **Name** option when unit names are assigned by work task, department, or process and you want to view execution schedules and results for a particular work task, department, or process.

When listed by execution time, the units appear in ascending order, starting from the oldest execution start time. Select the **Execution time** option when you want to view unit execution schedules in chronological order.

### Root jobnet with no schedule (Daily (hierarchy) / Monthly)

Select whether to display planning groups, and root jobnets without any schedule information, in the tree area of the Daily Schedule (Hierarchy) window and Monthly Schedule window.

By selecting the **Display** option, you can view all the root jobnets in a job group, even if not registered for execution.

The **Display** option also shows all the jobnets in a planning group, including those without any schedule information (not yet scheduled). Select **Display** when you want to check what kind of jobnets a planning group contains.

### Planning group

The schedule information of all units in a planning group can be merged when displayed in the schedule area of the Monthly Schedule window. Select the **Display** option when you want to view the jobnets in a planning group as if they were a single jobnet.

## (5) General page

Decide how to color-code the status of units displayed in the windows. There is no need to do so when using the default colors. Consider color mapping only if you want to change the colors from the defaults, or if you want to create your own colors and use them to display statuses.

### Change icon color

For details about how to create colors, see *11.3.3 Creating colors for execution status, execution results, and delays* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

## Priority of delay display color

You can prioritize the color display when a unit terminates with two or more end statuses (end abnormally, end with warning, and/or end delay). Select one of the following options:

- **Abend > Warning > Delay**

The color priority is abnormal end, end with warning, and end delay, in that order.

- **Abend > Delay > Warning**

The color priority is abnormal end, end delay, and end with warning, in that order.

- **Delay > Abend > Warning**

The color priority is end delay, abnormal end, and end with warning, in that order.

For example, with **Abend > Warning > Delay** selected, a jobnet that ends abnormally and with a delay will appear light red, the color for *abnormal end*. But with **Delay > Abend > Warning** selected, the jobnet will be orange, the color for *end with delay*.

Select an option according to how highly you want to prioritize end delays in monitoring the system. Select **Delay > Abend > Warning** if you want to give highest priority to monitoring for end delays, which affect work task execution as a whole.

## Hold plan

On the **General** page you can also specify whether to use the *Hold plan* color for the unit icon and in the **Status** and **Result** columns when a unit is in held status and its hold attribute has been set.

## (6) Other page

Decide the settings for JP1/AJS3 - View log files, which contain a history of operations performed in JP1/AJS3 - View. Set the trace level and the maximum file size.

### Trace level

Select the level of information to be output to a log file. You can select **1**, **3**, or **5**. Setting a higher level means that more detailed information and more log entries will be output. Log files might need to be swapped in and out frequently, reducing processing speed on the JP1/AJS3 - View host. Select **3** or **1** if you do not want processing to slow down.

The default is **3**.

Trace levels are as follows:

- Trace level **1**

Outputs error information.

- Trace level **3**

Outputs error information, and information identifying what operation the user was performing.

- Trace level **5**

Outputs error information, information identifying what operation the user was performing, and information about the content of sent and received data.

### Max. log file size

You can specify a maximum log file size, as a value from 1 to 512 (megabytes). When the log file reaches the specified size, a second log file is created automatically. The second log file will be the same maximum size. When the data in the second log file reaches the specified size, the first log file is overwritten.

For details about estimating the log file size, see [3.4.5 Estimating the size of log files for JP1/AJS3 - View](#).

## 4.5.2 Common settings for JP1 users

This subsection describes how to use common settings for JP users (common user profile).

JP1/AJS3 can save (upload) the configuration information set in JP1/AJS3 - View to the JP1/AJS3 - Manager in which the user is logged in. This configuration information is called the *common user profile*. The common user profile is information that is common to all JP1 users. The following information is saved as a common user profile:

- Settings in the Preferences dialog box
- Settings in the `ajs2view_opt.conf` file
- Default settings in dialog boxes

You can download the common user profile that is saved in JP1/AJS3 - Manager from JP1/AJS3 - View. If you download this profile, JP1/AJS3 - View is updated with the saved configuration information.

You can use the common user profile when:

- You log in to JP1/AJS3 - Manager as a new JP1 user, and you want to use JP1/AJS3 - View with the same settings that other JP1 users use.
- You want to customize the new JP1/AJS3 - View to use familiar settings.

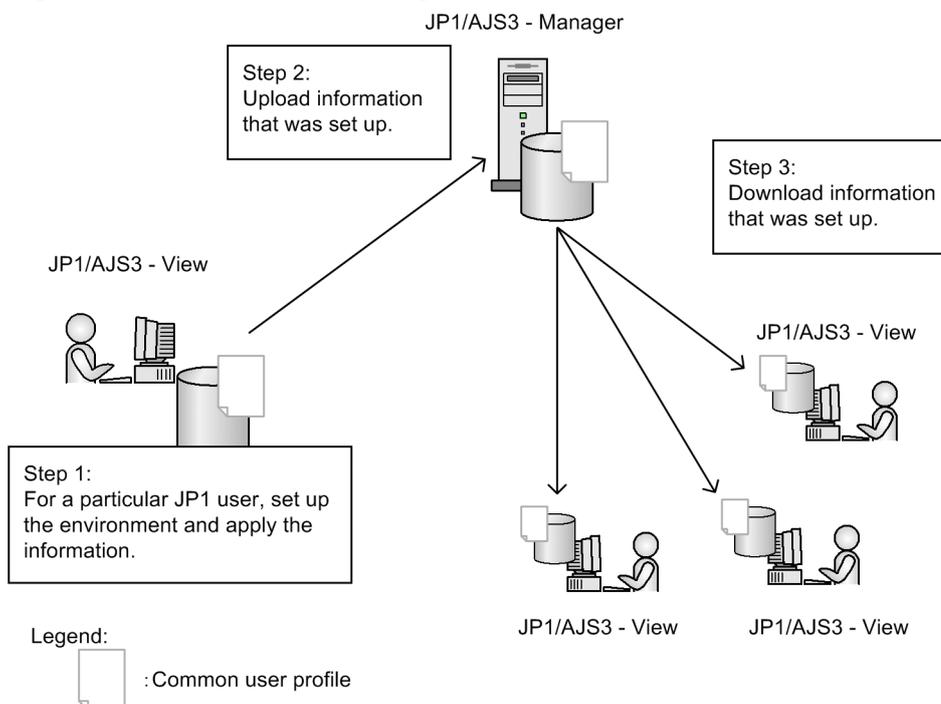
We recommend that you use a common user profile to set up the JP1/AJS3 - View environment if you need to ease the task of setting up the environment for each JP1 user.

For details about the common user profile, see *11.1.2 Using common user profiles* in the *Job Management Partner 1/ Automatic Job Management System 3 Operator's Guide*.

### (1) Setting the environment using common settings

The following figure shows the work flow when setting the environment using a common user profile.

Figure 4-3: Example of using a JP1/AJS3 - View common user profile



## (2) Notes on using common settings

Note the following when using common settings:

- Users can upload and download common settings, and change the common settings saved on a JP1/AJS3 - Manager host, regardless of their JP1 user privileges or the rights of the mapped OS user. To allow only certain users to upload or download a common user profile, deactivate the menu commands. For details about how to do so, see *11.3.9 Disabling menus* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.
- The OS user mapped to a JP1 user who uploads a common user profile requires the write privilege (permission to write to a file). Grant the write privilege to the following folders:

Physical host (Windows):

- *JP1/AJS3-Manager-installation-folder*\conf
- *Mgr\_Path*\conf\Profiles
- *Mgr\_Path*\conf\Profiles\ (common)

The default *Mgr\_Path* folder is as follows:

Windows Server 2012 or Windows Server 2008:

*system-drive*\ProgramData\HITACHI\JP1\JP1\_DEFAULT\JP1AJS2

Windows Server 2003:

*system-drive*\Program Files#\HITACHI\JP1AJS2

Physical host (UNIX):

- */etc/opt/jplajs2/conf*
- */etc/opt/jplajs2/conf/Profiles*
- */etc/opt/jplajs2/conf/Profiles/ (common)*

Logical host (Windows):

- *shared-folder*\jplajs2\conf
- *shared-folder*\jplajs2\conf\Profiles
- *shared-folder*\jplajs2\conf\Profiles\ (common)

Logical host (UNIX):

- *shared-directory*/jplajs2/conf
- *shared-directory*//jplajs2/conf/Profiles
- *shared-directory*//jplajs2/conf/Profiles/ (common)

#

For 64-bit versions of Windows, replace *Program Files* with *Program Files (x86)*.

- When multiple JP1 users update a common user profile, the JP1 user settings that were most recently uploaded take effect.
- The OS user who downloads a common user profile (starts JP1/AJS3 - View) requires the write privilege (permission to write to a file). Grant the write privilege to the following folders:

Windows 8.1, Windows 8, Windows Server 2012, Windows 7, Windows Server 2008, or Windows Vista:

*%ALLUSERSPROFILE%*\Hitachi\JP1\JP1\_DEFAULT\JP1AJS2V\conf\*JP1-user-name*  
*\ajs2view\_opt.conf*

(By default, *%ALLUSERSPROFILE%* resides in *system-drive*\ProgramData.)

Windows Server 2003 or Windows XP Professional:

`JP1/AJS3-View-installation-folder\conf\JP1-user-name\ajs2view_opt.conf`

### 4.5.3 Common settings for JP1/AJS3 - View hosts

This subsection describes how to use common settings for JP1/AJS3 - View hosts.

Settings information that is valid for a JP1/AJS3 - View host can be saved in a file and then applied to a host. This file is called the system common settings file.

For details about the system common settings file, see *11.1.1 Types of customization methods* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

### 4.5.4 JP1/AJS3 commands that can be executed from JP1/AJS3 - View

You can execute JP1/AJS3 commands not only from the manager host but also from JP1/AJS3 - View. Executing JP1/AJS3 commands from JP1/AJS3 - View allows you to collect the operating status and job definition information for JP1/AJS3 - Manager without logging in to the manager host. Before executing JP1/AJS3 commands from JP1/AJS3 - View, you need to determine some items and specify settings. This subsection describes points to consider when executing JP1/AJS3 commands from JP1/AJS3 - View.

#### (1) JP1/AJS3 commands for which execution from JP1/AJS3 - View is permitted

The following table lists the JP1/AJS3 commands executable from JP1/AJS3 - View.

Table 4-10: JP1/AJS3 commands executable from JP1/AJS3 - View

No.	Command	Description
1	<code>ajslogprint</code>	Extracts and outputs information from the scheduler log.
2	<code>ajsprint</code>	Outputs the definition of a unit.
3	<code>ajsshow</code>	Outputs information about a unit, including the execution history, current status, and next scheduled execution.
4	<code>ajsstatus</code>	Outputs the operating environment of the scheduler service.

Use JP1/AJS3 - Manager to specify which of the above JP1/AJS3 commands are commands that JP1/AJS3 - View users are permitted to execute. Based on your operation needs, consider which JP1/AJS3 commands require permission to be executed from JP1/AJS3 - View.

For details about commands, see *2. Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

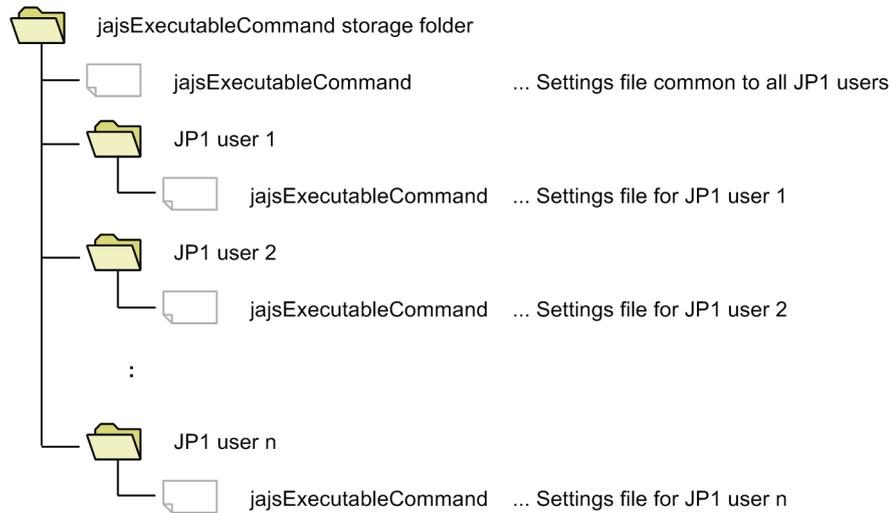
#### (2) JP1 users permitted to execute JP1/AJS3 commands

Consider which JP1 users should be permitted to execute which JP1/AJS3 commands. JP1/AJS3 commands to be executed from JP1/AJS3 - View must be defined in advance in an executable command settings file (`jajsExecutableCommand`) on the manager host. Creating this executable command settings file allows JP1/AJS3

commands to be executed from JP1/AJS3 - View. Depending on where the executable command settings file is stored, the settings in the file apply to all JP1 users or to an individual user.

The following figure shows how to store the executable command settings file.

Figure 4-4: Storing the executable command settings file



If both the files for individual JP1 users and the common file for all JP1 users are stored, the files for individual JP1 users have precedence. The following figures show examples of setting executable command settings files.

Figure 4-5: Example of setting executable command settings files (if a common file for all JP1 users has not been created)

Common executable command settings file for all JP1 users

(No file)

Executable command settings file for JP1 user 1

ajsshow



Executable commands  
ajsshow  
JP1 user 1

Executable command settings file for JP1 user 2

ajsprint  
ajsshow  
ajsstatus



Executable commands  
ajsprint  
ajsshow  
ajsstatus  
JP1 user 2

Executable command settings file for JP1 user 3



Executable commands  
None  
JP1 user 3

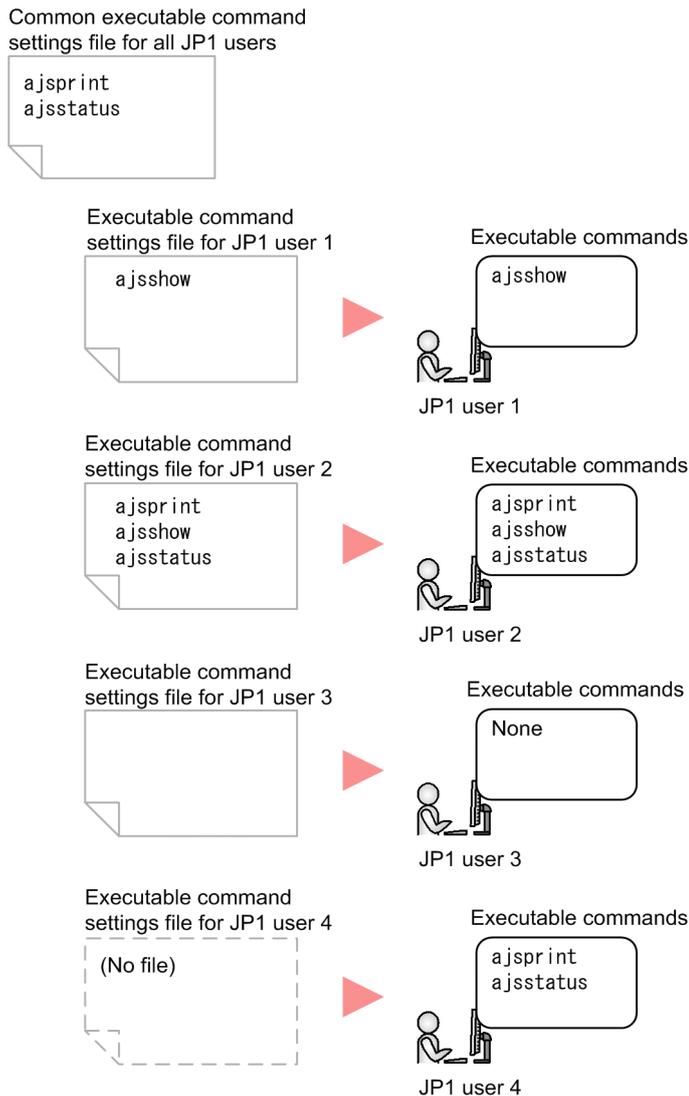
Executable command settings file for JP1 user 4

(No file)



Executable commands  
None  
JP1 user 4

Figure 4-6: Example of setting executable command settings files (if a common file for all JP1 users has been created)



### Cautionary note

If many JP1 users are permitted to execute JP1/AJS3 commands, multiple users might execute commands at the same time. This might increase the load on the manager host and affect JP1/AJS3 operations. Therefore, we recommend that you examine each JP1 user, and then specify commands for which execution from JP1/AJS3 - View is permitted.

For details about how to set executable command settings files, see *11.1.1 Types of customization methods* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

## (3) JP1 user permissions

JP1/AJS3 commands are executed (from JP1/AJS3 - View) under the JP1 user's permissions that were used when the user logged in to the manager host from JP1/AJS3 - View. Therefore, confirm that the JP1 users who want to execute JP1/AJS3 commands from JP1/AJS3 - View have the permissions necessary to execute those commands.

For details about permissions necessary for executing JP1/AJS3 commands, see *2. Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

## (4) JP1/AJS3 commands to be registered

To execute JP1/AJS3 commands from JP1/AJS3 - View, you need to register command arguments and execution-result output destinations in advance in JP1/AJS3 - View.

Registered information can be shared with other JP1 users by using a common user profile. Therefore, we recommend the following operation: First, the system administrator registers command arguments and execution-result output destinations, and then uploads the common user profile to the JP1/AJS3 - Manager host. Next, JP1 users download the common user profile.

Do not use wildcard characters or the `-R` option to specify a unit name. If you use them, many units are subject to processing and command execution might take a long time. If you need to use wildcard characters or the `-R` option, also use the `-E`, `-L`, or `-T` option to narrow down the target units.

For details about how to register commands, see *10.4.1 Registering JP1/AJS3 commands* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

## 4.5.5 Setting the window display

Decide after how many seconds you want to auto-refresh the JP1/AJS3 - View windows, and the timing for auto-saving information.

### (1) Refresh interval

Decide whether to automatically refresh the unit status information displayed in the JP1/AJS3 - View windows.

You can specify auto-refresh for the JP1/AJS3 - View window, Daily Schedule window, and Jobnet Monitor window. The refresh interval can be set separately for each window. For example, you can set the refresh interval to 300 seconds for the JP1/AJS3 - View window, and 30 seconds for the Jobnet Monitor window. Set the refresh interval as a value from 30 to 3600 (seconds).

For details about setting the window refresh interval, see *11.4.2 Setting the window refresh interval* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

Refreshing windows increases the load on JP1/AJS3 - Manager. If the increased load is likely to affect the execution of work tasks, disable auto-refreshing or set a longer refresh interval, whichever is operationally appropriate.

If you prefer to refresh windows manually, choose **View**, and then **Refresh** to display the latest information.

### (2) Save status setting

Decide whether to display the active window and current unit the next time JP1/AJS3 - View is started. This is the *save status* setting.

When the *save status* setting is enabled, the window and unit you are working on will be displayed the next time you start JP1/AJS3 - View. If you are creating a large-scale work task, this setting will save time in searching for the unit you want to work on.

For example, suppose you are using a terminal for monitoring work tasks. With the target unit displayed in the Jobnet Monitor window or Daily Schedule window, choose **Options**, **Save Status**, and then **Save**. The next time you log in, the saved status (active Jobnet Monitor window or Daily Schedule window) will be displayed, so you can monitor the target unit from the active window as soon as you log in. The displayed execution status and result, however, will be the unit's current status and result at the time JP1/AJS3 - View started.

When the *save status* setting is disabled, only the JP1/AJS3 - View window is displayed at startup, and only the root jobnet and the job groups directly under the root job group appear in the window.

Notes on enabling the save status setting

- Information in dialog boxes and calendar information are not saved.
- The item display widths in the list area of the JP1/AJS3 - View window are not saved.
- The column width representing one day in the schedule area of the Monthly Schedule window is not saved.
- The column width representing one hour in the schedule area of the Daily Schedule window is not saved.
- The selected hierarchical view is saved in the JP1/AJS3 - View window, Jobnet Editor window, and Jobnet Monitor window, but not in other windows.
- Information about a manager job group, manager jobnet, or remote jobnet displayed in the Jobnet Monitor window is not saved.
- The minimized or maximized status of the displayed window is not saved.
- Information about which window is active among the open windows is not saved.
- When multiple instances of JP1/AJS3 - View are active, only the JP1/AJS3 - View in which the save status setting was enabled is displayed in saved status.
- If you delete a unit displayed in a window, an error will occur when you next open the JP1/AJS3 - View window.
- If you log in to a host other than the host where the window information was saved, the window is not displayed in the saved state.

## 4.5.6 Changing the dialog box defaults

In JP1/AJS3 - View, you can change the defaults for radio buttons and check boxes in the dialog boxes (except when the default is an empty text field or job type).

We recommend that you change the defaults in the following situations.

Table 4-11: Examples of changing the defaults

Item and changed default	Reason for changing the default
In the Register of Execution dialog box, change the default of <b>Planned time passed when daemon starts</b> and <b>Planned time passed when reg. for exe.</b> from <b>Execute immediately</b> to <b>Execute from next time</b> .	To prevent the user from mistakenly executing the jobnet immediately by clicking the <b>OK</b> button when registering a jobnet for scheduled execution.
Change the jobnet's <b>Priority</b> default from <b>None</b> to <b>5</b> (nice value: -20).	To prioritize and finish the JP1/AJS3 process as soon as possible.

For details about how to change the defaults in a dialog box, see *11.3.6 Changing default values in dialog boxes* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

For details about the display items and defaults in each dialog box, see *15. Windows and Dialog Boxes* in the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

## 4.5.7 Adding display items to a window

You can add display items (columns) to the following areas in JP1/AJS3 - View:

- List area in the JP1/AJS3 - View window (Main window)

- Execution result list in the Daily Schedule window
- Execution result list in the Monthly Schedule window
- Search result list area in the Search window
- List area in the Jobnet Editor window
- List area in the Jobnet Monitor window

You can add items to these windows that you would otherwise have to check in another window or in the Monitor Details dialog box. This makes monitoring work more efficient.

The following figure shows an example of display items added in each area.

Figure 4-7: Example of a window with additional display items

Start time(Status)	Start time(Result)	Rerun start time(Status)	Rerun start time(Result)
2006/10/29 02:00:00	2006/10/28 08:28:17		2006/10/28 08:29:17

end time(Status)	end time(Result)	Execution type(Status)	Execution type(Result)
	2006/10/28 08:30:06	Immediate execution	Planned execution

Start Condition(Status)	Start Condition(Result)	Processing time(Status)	Processing time(Result)
4times, Until2006/10/29 03:00:00	4times, Until2006/10/29 02:00:00		0011:01:49

Time when start delayed(Status)	Time when start delayed(Result)	Time when end delayed(Status)	Time when end delayed(Result)
2006/10/29 02:03:00	2006/10/28 02:03:00	2006/10/28 02:23:00	2006/10/28 02:23:00

execution ID(Status)	execution ID(Result)	Change Plan(Status)	Change Plan(Result)
@A555	@A553	None	Yes (Shift schedule date and time)

For details about how to change the display items, see *11.4.6 Specifying the columns displayed in the list area in the Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

For details about the display items that can be added and the dialog boxes, see *15.3.46 Display Item Setup dialog box in the Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

## 4.5.8 Environment settings for JP1/AJS3 Console View

This subsection describes the environment settings for JP1/AJS3 Console View. Determine the following so that JP1/AJS3 - Console View can be used in an appropriate manner for your system right from the start:

- Settings in the Preferences dialog box
- Settings in the Color Settings dialog box

As with JP1/AJS3 - View, you can set up the JP1/AJS3 - Console View environment on each host running the program, and for each login JP1 user, according to how the program will be used.

## (1) Settings in the Preferences dialog box

The following describes the items you can set in the Preferences dialog box of JP1/AJS3 Console View. Decide your preferences for the following items beforehand, so that you can begin using JP1/AJS3 - Console View in line with your system operation right from the start.

### Cautionary note

The Preferences dialog box items are different in JP1/AJS3 - View and JP1/AJS3 Console View.

Table 4-12: Items to set in the Preferences dialog box

Page	Item
<b>Login</b>	<b>Auto login</b>
<b>Operations</b>	<b>Double-click an AJS3 unit monitoring object</b>
	<b>When JP1/AJS3 - View starts</b>
	<b>Double-click a business scope (Monitoring Mode)</b>
<b>Window</b>	<b>Name new line</b>
	<b>Display comments</b>
	<b>Display tooltip (Monitoring Mode)</b>
<b>Other</b>	<b>Trace level</b>
	<b>Max. log file size</b>

### (a) Login page

Decide whether to log in to JP1/AJS3 Console Manager automatically when JP1/AJS3 Console View starts. Set this option if you want to skip the login procedure in the Login screen. However, without the login procedure, anyone will be able to log in to JP1/AJS3 Console Manager. If there are security issues, do not perform this setting. Note also that the values you specify on the **Login** page are saved to an insecure local file on the JP1/AJS3 - View computer. Use auto login only in an environment protected by the OS security feature.

Auto login is disabled when you start JP1/AJS3 Console View from JP1/IM - View, or when you start JP1/AJS3 Console view by specifying login information in the start command.

### (b) Operations page

Consider the behavior of the system when you double-click on an icon in the map area and when you start JP1/AJS3 - View from JP1/AJS3 Console View.

#### Double-click an AJS3 unit monitoring object

Select what the system does when you double-click the monitored object icon for an AJS3 unit in the map area. You can display the Define Details (Definition mode) dialog box or Detailed Information (Monitoring mode) dialog box, or start and display JP1/AJS3 - View for the jobnet being monitored.

#### When JP1/AJS3 - View starts

You can select whether to display the JP1/AJS3 - View window or the Jobnet Monitor window when you start JP1/AJS3 - View from JP1/AJS3 Console View.

#### Double-click a business scope (Monitoring Mode)

Select where to display the business scope when you double-click a business scope icon in the map area. You can display the business scope in the active window or in a new window.

This option is valid only in monitoring mode. In definition mode, the business scope always appears in the active window.

## (c) Window page

Consider how object names and comments are to be displayed in the map area, and the tool tip that appears when you point to an object.

### Name new line

Object names displayed in the map area are wrapped to fit within the icon width. Long names might be difficult to read sometimes. If so, decide the wrap position (number of characters per line) as required, bearing in mind the naming conventions for object names.

### Display comments

To display a comment under a name in the map area, specify the number of characters from the beginning of the comment. Comments are displayed in the specified number of characters.

If you want to display only one particular comment, insert a hide control character at the beginning of the comments you do not want to display.

You can also use a control character to display a comment on a new line.

### Display tooltip (Monitoring Mode)

You can specify whether to display a comment or status name as the tool tip displayed when the cursor is placed near an object.

Displaying a status name is a useful way of quickly checking the status of an object without opening the Detailed Information dialog box.

This option is valid only in monitoring mode. In definition mode, the displayed tool tip is a comment.

## (d) Other page

Decide the settings for JP1/AJS3 Console View log files.

### Trace level

Select the level of information to be output to a log file. You can select **1**, **3**, or **5**. Setting a higher level means that more detailed information and more log entries will be output. Log files might need to be swapped in and out frequently, reducing processing speed on the JP1/AJS3 Console View host. Select **3** or **1** if you do not want processing to slow down.

The default is **3**.

Trace levels are as follows:

- Trace level **1**  
Outputs error information.
- Trace level **3**  
Outputs error information, and information identifying what operation the user was performing.
- Trace level **5**  
Outputs error information, information identifying what operation the user was performing, and information about the content of sent and received data.

### Max. log file size

You can specify a maximum log file size, as a value from 1 to 512 (megabytes). When the log file reaches the specified size, a second log file is created automatically. The second log file will be the same maximum size. When the data in the second log file reaches the specified size, the first log file is overwritten.

For details about estimating the log file size, see [3.4.5 Estimating the size of log files for JP1/AJS3 - View](#).

## **(2) Items in the Color Settings dialog box**

Decide how to color-code the status icons in the map area. You can set the following two items:

- Colors of AJS3 units (display colors associated with JP1/AJS3-specific statuses)
- Other colors (display colors associated with JP1/AJS3 Console-specific statuses)

If you use the defaults, you do not need to consider the colors. However, if you want JP1/AJS3 Console View to display the same non-default colors as in JP1/AJS3 - View, follow the settings for JP1/AJS3 - View.

## 4.6 Settings for the user environment

---

This section describes what to consider in regard to setting user preferences.

### 4.6.1 Modifying the login script (UNIX only)

In the UNIX version of JP1/AJS3, the shell executes the following login script before execution of a standard job, action job, or custom job:

- sh and ksh shells

```
/etc/profile
$HOME/.profile
```

- csh shell

```
/etc/csh.login
$HOME/.cshrc
$HOME/.login
```

Text other than job execution results is output to the standard output file if the login script includes a command such as `echo` or `cat` that outputs data to the standard output. Also, if the `stty`, `tty`, `tset`, `script`, or other interactive command is executed in a batch file, the job might terminate abnormally. In this case, modify the login script so that such commands are not executed. For details about modifying a login script, see *13.4.2 Changing the login scripts* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

# 5

## Contingency Planning

This chapter discusses the preventive measures required in JP1/AJS3.

JP1/AJS3 requires backups and redundancy as preventive measures. It is vital to plan such measures in advance so that the system can be restored with little impact should an unpredictable event occur.

## 5.1 Preparing for failures

Problems might arise for a variety of reasons (JP1/AJS3, user program, OS, operator error, and so on).

In case such problems occur, we recommend that you complete the following preparation before you start running JP1/AJS3.

- Prepare a data collection tool
- Check the JP1/Base, JP1/AJS, and OS versions

### 5.1.1 Preparing a data collection tool

JP1/AJS3 provides data collection tools for collecting information when a problem occurs.

The following table lists the data collection tools provided by JP1/AJS3.

Table 5–1: JP1/AJS3 data collection tools

OS	Data collection tool	Customization
Windows	jajs_log.bat	N
	_04.bat	Y
UNIX	jajs_log	N
	_04	Y

Legend:

Y: Can be customized.

N: Cannot be customized.

If the default output destination of, for example, log files has not been changed, you can use `jajs_log.bat` or `jajs_log` to collect data. If the default output destination has been changed, customize `_04.bat` or `_04` to collect data.

If a problem occurs in Windows, a dump file might be necessary for troubleshooting. Before you start operation, we recommend that you specify a setting so that a dump file is output if a problem occurs. For details about how to customize the Windows data collection tool (`_04.bat`) and how to set up output of dump files, see *7.1 Collecting log data* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*. For details about how to customize the UNIX data collection tool (`_04`), see *16.1 Collecting log data* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

If you cannot run the data collection tool, you can collect data manually. For the data that needs to be collected, see *1.3 Data to be collected when a problem occurs* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

Before any problems occur, make sure that you can collect data successfully using the data collection tool.

## 5.1.2 Check the JP1/Base, JP1/AJS, and OS versions

To investigate the cause of a failure, you will need version information for JP1/Base, JP1/AJS, and the OS. When using support services, resolving the issue quickly depends on having a good understanding of the environment in which the problem occurred.

## 5.2 Backups and recovery

One of the system administrator's important responsibilities is to perform backup in case the system is damaged or an unexpected event occurs, such as the following:

- The disk is damaged and JP1/AJS3 does not work.
- A jobnet is mistakenly deleted and the original settings are lost.
- A JP1/AJS3 file is inadvertently erased by an OS operation.

These sorts of situations can occur in any system. By backing up JP1/AJS3 information in advance, you can minimize their effects. Prepare and implement a backup plan. As well as deciding on some backup procedures, you must also consider recovery methods and make sure the system can actually be restored.

This section describes how to back up and restore a system that uses JP1/AJS3. Based on the following descriptions, consider what JP1/AJS3 backup and recovery procedures to implement as part of a system-wide backup plan.

### 5.2.1 Backup and recovery methods

To perform backup and recovery for JP1/AJS3, you need to back up and restore the settings information needed to run JP1/AJS3. The files to be backed up and the timing of a backup differ according to the purpose of the backup and recovery. *Table 5-2* describes the types of backup and recovery and their characteristics.

Two methods for backup and recovery are available:

- Backing up and restoring specific settings information according to the update time.
- Backing up and restoring the entire system, the shared disk in a cluster configuration, or the entire database (embedded database) in one operation.

After considering the advantages and disadvantages of each type of backup and recovery for the intended purpose, consider the time required for performing backup and recovery and the scope of backup and recovery.

Table 5-2: Types of JP1/AJS3 backup and recovery and the characteristics of each

Type of backup and recovery	Main purpose	When backup is created	Advantages	Disadvantages
JP1/AJS3 environment settings information	Recovery from a failure such as a disk failure, a corrupted file, or files that are no longer available	When a setting is changed	<ul style="list-style-type: none"> <li>• JP1/AJS3 operation does not need to stop.</li> <li>• The time at which the backup is created and its scope can be set appropriately as needed.</li> </ul>	<ul style="list-style-type: none"> <li>• For definition information and schedule information that is changed often, the timing of backups and the number of backups must be considered.</li> <li>• Because jobnets must be registered again, resuming work task takes a long time.</li> </ul>
JP1/AJS3 definition information: <ul style="list-style-type: none"> <li>• Definition information for jobs and jobnets</li> <li>• Calendar and schedule information</li> <li>• Execution agent information</li> <li>• Execution environment for QUEUE jobs and submit jobs</li> </ul>	<ul style="list-style-type: none"> <li>• Recovery from a failure such as a disk failure, a corrupted file, or files that are no longer available</li> <li>• Distribution to other computers or</li> </ul>			

Type of backup and recovery	Main purpose	When backup is created	Advantages	Disadvantages
JP1/AJS3 definition information: <ul style="list-style-type: none"> <li>• Definition information for jobs and jobnets</li> <li>• Calendar and schedule information</li> <li>• Execution agent information</li> <li>• Execution environment for QUEUE jobs and submit jobs</li> </ul>	scheduler services	When a setting is changed	<ul style="list-style-type: none"> <li>• JP1/AJS3 operation does not need to stop.</li> <li>• The time at which the backup is created and its scope can be set appropriately as needed.</li> </ul>	<ul style="list-style-type: none"> <li>• For definition information and schedule information that is changed often, the timing of backups and the number of backups must be considered.</li> <li>• Because jobnets must be registered again, resuming work task takes a long time.</li> </ul>
Registered execution-schedule information for jobnets <sup>#1</sup>	Recovery from a failure such as a disk failure, a corrupted file, or files that are no longer available	When a jobnet is registered	Because the registration status of jobnets can be restored in one operation after recovery, the re-registration of individual jobnets is not required, reducing the workload before operation starts.	Jobnets registered for immediate execution are not included.
Entire system	Maintenance or migration of the entire system	When the entire system is migrated <sup>#2</sup>	Information can be backed up or restored in one operation.	<ul style="list-style-type: none"> <li>• JP1/AJS3 must be stopped during maintenance.</li> <li>• After recovery, JP1/AJS3 must be cold-started.<sup>#3</sup></li> <li>• Because the jobnets must be registered again, time is required before work tasks resume.</li> </ul>
Shared disk in a cluster configuration	<ul style="list-style-type: none"> <li>• Maintenance such as replacing the shared disk</li> <li>• Migration of a cluster system or reconstruction of an environment</li> <li>• Recovery from a shared disk failure</li> </ul>	When cluster system maintenance is performed		
Database (embedded database)	<ul style="list-style-type: none"> <li>• Recovery from a failure such as a failure on the disk containing the database, a corrupted file, or files that are no longer available</li> </ul>	When the scheduler service stops		

Type of backup and recovery	Main purpose	When backup is created	Advantages	Disadvantages
Database (embedded database)	<ul style="list-style-type: none"> <li>Migration of a system or reconstruction of the environment</li> </ul>	When the scheduler service stops	Information can be backed up or restored in one operation.	required before work tasks resume.

#1

To back up and restore the registered execution-schedule information, you also need to back up and restore the unit definition information.

#2

When an entire system is migrated via backup and recovery, JP1/AJS3 - Manager cannot be migrated to a host that has a different host name. JP1/AJS3 - Manager can only be migrated to the same host or to another host that has the same host name. JP1/AJS3 - Agent can be migrated to a host that has a different host name.

In either case, as a prerequisite, JP1 must back up the entire system while maintaining the integrity of all file information, including the information registered in the OS, and then must restore all the backed up files.

If you intend to back up and restore an entire system using OS commands and backup tools, first verify the environment that is being used.

#3

When JP1/AJS3 is cold-started, the registered execution-schedule information for jobnets and the execution information for jobnets and jobs are initialized, and can no longer be restored.

## (1) Backing up and restoring JP1/AJS3 environment settings information and definition information

### (a) What needs to be backed up and restored

You should back up files containing JP1/AJS3 environment settings information and definition information, and the settings information output by using a JP1/AJS3 command. The JP1/AJS3 environment settings and definition information includes information about JP1/AJS3 - Manager, JP1/AJS3 - Agent, and JP1/AJS3 - View. For details about the information that must be backed up in JP1/AJS3, see *Table 5-3* in *5.2.2 Target files and backup timing*.

Note that the definition information for jobnets and jobs, calendar and schedule information, and execution agent definition information are stored in an embedded database. Determine the unit and the best time to perform backup and recovery according to operational needs.

### (b) Backup and recovery procedures

For details about the backup procedure, see *2.1.1(1) Backup procedure* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

When you perform recovery, restore the backed up information to the system as needed according to the state of the system after a failure. Because only the settings information needed to run JP1/AJS3 is backed up, you will need to re-register jobnets for execution after this information is restored. For details about the recovery procedure, see *2.1.2(1) Recovery procedure* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

### (c) Backup and recovery methods

For details about how to back up and restore only settings information, see *2.2 Backing up the setup information for a system that uses JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Administration*

Guide and 2.3 Restoring the setup information for a system that uses JP1/AJS3 in the Job Management Partner 1/Automatic Job Management System 3 Administration Guide.

## **(2) Backing up and restoring registered execution-schedule information for jobnets**

You can use the functions for exporting and importing registered execution-schedule information to back up and restore the execution registration status for jobnets. If a failure occurs in the JP1/AJS3 system or if you need to cold-start the JP1/AJS3 service in order to back up and restore the entire system, these functions greatly reduce the time required until operation resumes.

You can back up and restore the registered execution-schedule information for jobnets in JP1/AJS3 - Manager. For details, see 4.4 *Backing up and recovering the execution registration status of jobnets by using the `ajsrlexport` and `ajsrimport` commands* in the Job Management Partner 1/Automatic Job Management System 3 Administration Guide.

## **(3) Backing up and restoring the entire system**

### **(a) Backup and recovery methods**

When you use an OS command or backup tool to back up the entire system, stop JP1/AJS3 before starting the backup process. To restore the system from the backup, cold-start JP1/AJS3 to initialize the registered execution-schedule information for jobnets and the execution information for jobnets and jobs. For details about the procedure, see 2.4 *Backing up and recovering an entire system* in the Job Management Partner 1/Automatic Job Management System 3 Administration Guide.

### **(b) Considerations before backing up or restoring the entire system**

Consider the following before you back up or restore the entire system:

- Consistency with other data and applications (for example, the status of user jobs)
- To what state (the point in time) you want to restore the jobnet or job
- Which host (the manager host or the agent host) will be cold-started

With products such as JP1/AJS3, which link to a variety of other programs, it is extremely difficult to ensure consistency for the execution status and results of jobnets and jobs, and of executed user jobs. Consistency might be achievable, but only by imposing various constraints on the user jobs executed in the system. That contradicts the main JP1/AJS3 purpose of the flexible management of program operations through the use of jobnets. For these reasons, we recommend that you limit backup and recovery procedures to the JP1/AJS3 environment settings information and definition information.

## **(4) Backing up and restoring the shared disk in a cluster configuration**

### **(a) Backup when replacing the disk**

A shared disk used in a cluster configuration might need to be replaced to avoid hardware failures due to aging of the disk or another problem. In such cases, stop JP1/AJS3, copy the shared disk, and then replace the disk.

To back up or recover an entire shared disk, you must also back up or recover the entire system, including local disks.

## (b) What needs to be backed up and restored and methods

If you want to be able to restore shared-disk data in the event of a failure, you need to back up the information described in (1) *Backing up and restoring JP1/AJS3 environment settings information and definition information* for each logical host in advance.

To back up and restore the physical host environment for a cluster configuration, you need to perform backup and recovery on both the executing and the standby hosts. For a logical host environment, you need to perform backup and recovery only on the executing host. You can then use the information you backed up on the executing host to restore the standby host.

For an overview of backup for a cluster configuration, see 2.1.1(2) *Backup procedure (when a cluster system is used)* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*. For an overview of recovery, see 2.1.2(2) *Recovery procedure (when a cluster system is used)* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

For details about the types of folders processed when you back up or restore the shared disk in a cluster configuration, see 8.2.1(1) *Creating shared files on the shared disk* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or 17.2.1(1) *Creating shared files on the shared disk* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

For details about how to back up and restore the shared folder, see the procedures for logical hosts in 2.2.2 *Backing up the JP1/AJS3 - Manager setup information* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide* and 2.3.3 *Recovering the JP1/AJS3 - Manager setup information* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## (5) Backing up and restoring an embedded database

Embedded databases are classified as scheduler databases and agent management databases. A scheduler database contains definition information for jobnets and jobs, calendar and schedule information, and execution status and execution results for jobnets and jobs. Therefore, after recovery, you need to cold-start JP1/AJS3 to ensure consistency in the system.

You can back up and restore an embedded database in JP1/AJS3 - Manager. For details about how to back up and restore an embedded database see 5.4 *Handling database errors*.

### 5.2.2 Target files and backup timing

Perform a backup whenever changes are made to the settings information needed to run JP1/AJS3. In cases where it would be time-consuming to perform a full backup every time, you can back up just the information that was changed. Consider also whether a full backup should be performed periodically in case a user forgets to take backup after changing a setting.

The following table lists the settings information needed for running JP1/AJS3.

Table 5-3: Essential settings for JP1/AJS3 operation

Type of information	Settings to back up
JP1/Base settings information	See the <i>Job Management Partner 1/Base User's Guide</i> .
JP1/AJS3 - Manager settings information	Files used by JP1/AJS3
	Execution agent information

Type of information	Settings to back up
JP1/AJS3 - Manager settings information	Execution environment definitions for QUEUE jobs and submit jobs
	Definitions of units other than root job groups
	Root job group information
	Calendar information for root job groups
	JP1/AJS3 Console settings information
	Registered execution-schedule for root jobnets
JP1/AJS3 - Agent settings information	Files used by JP1/AJS3
JP1/AJS3 - View settings information	Environment settings files
	Custom job icons
	Icon image folder
	Icon image files and background image files for JP1/AJS3 - Console View
Other settings information	Service account <sup>#1</sup>
	Login script <sup>#2</sup>
	Adjustment values for kernel parameters <sup>#2</sup>
	Command for collecting data for troubleshooting
	Cluster support tools
	User-created tools for linking to a mail system <sup>#2</sup>

#1

Windows only.

#2

UNIX only.

The settings needed to run JP1/AJS3 consist of both fixed information, such as information about the operating environment, and information that is frequently updated, such as jobnet definitions entered when configuring the system. Fixed information can be backed up whenever it is changed, but it would be unrealistic to back up information that is continually updated after every update. Plan to back up this type of variable information once per day.

Typical backup plans are as follows.

Example of a backup plan at the development phase:

- Back up jobnet definitions every day.
- Back up information other than jobnet definitions when a setting is changed.
- Back up all settings once a month.

Example of a backup plan when JP1/AJS3 is operational:

- Back up the changed information when a setting is changed.
- Back up jobnet definitions once a week.
- Back up all settings once a month.

For the backup tasks you need to perform in each program (JP1/Base, JP1/AJS3 - Manager, JP1/AJS3 - Agent, and JP1/AJS3 - View), see 2.2 *Backing up the setup information for a system that uses JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*. For the necessary recovery tasks, see 2.3 *Restoring the*

setup information for a system that uses JP1/AJS3 in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

#### Supplementary note

You can back up and restore the scheduler database using the embedded database functionality. Consider the backup and recovery methods described in [5.4.1 Overview of database backups](#).

### 5.2.3 Taking backup while JP1/AJS3 is active

Files and folders used by JP1/AJS3 can be backed up while JP1/AJS3 is running only if hardware that has disk copy and mirroring functionality is used. Stop all JP1 products before taking backup; otherwise, if you attempt to back up the active JP1/AJS3 system, the following sorts of problems could occur:

- Backed up files are inconsistent, and the restored system does not work properly.  
Multiple files might be updated while a service is running. If one file is backed up after being updated, and another is backed up before being updated, inconsistencies can arise and the system will fail to work correctly after it is restored.
- JP1/AJS3 cannot perform file updates.  
Files are locked during backup processing. If JP1/AJS3 tries but fails to update a locked file, job execution will be affected. For this reason, we recommend that you back up JP1/AJS3 settings information only, as discussed in [5.2.1 Backup and recovery methods](#).

If you need to perform backup while JP1/AJS3 is running, do not back up the following files and folders:

#### JP1/AJS3 - Manager

Files and folders listed in the following tables in [A.1 JP1/AJS3 - Manager files and directories](#) in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*:

- [Table A-3 Files and folders that the user does not need to modify or reference \(JP1/AJS3 - Manager for Windows\)](#)
- [Table A-12 Files and directories that the user does not need to modify or reference \(JP1/AJS3 - Manager for UNIX\)](#)

#### JP1/AJS3 - Agent

Files and folders listed in the following tables in [A.2 JP1/AJS3 - Agent files and directories](#) in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*:

- [Table A-21 Files and folders that the user does not need to modify or reference \(JP1/AJS3 - Agent for Windows\)](#)
- [Table A-29 Files and directories that the user does not need to modify or reference \(JP1/AJS3 - Agent for UNIX\)](#)

### 5.2.4 Constant backup by copying and mirroring a disk

You can use the disk copy and mirroring functionality<sup>#</sup> provided by hardware to constantly back up the contents of a disk.

#

The TrueCopy function of Hitachi disk array systems is an example.

Copy the disk you want to back up as the *main volume* to the disk used for backup (*remote volume*). Because the contents of the main volume are constantly backed up, you can switch the connection to the remote volume and continue operation if the main volume can no longer be used due to a hardware failure or similar problem.

## (1) Prerequisite conditions

The following are the prerequisite conditions for constant backup of a disk.

- The hardware for the disk to be backed up must have the following specifications:
  - The order in which data is written to the main and remote volumes is guaranteed.
  - It must be guaranteed that the hardware ensure consistency between the main and remote volumes if data copying between shared disks stops.
  - Write protection of the remote volume must be guaranteed during data copying between shared disks.
- The version of JP1/AJS3 - Manager must be 09-10 or later.
- The JP1/AJS3 database must be a standard configuration or a standard configuration without ISAM.
- A logical host environment must be used.
- If JP1/AJS3 operates in a cluster system, the conditions described in *11.1.1 Prerequisites for JP1/AJS3, and the scope supported by JP1/AJS3 in the Job Management Partner 1/Automatic Job Management System 3 Administration Guide* must be satisfied.

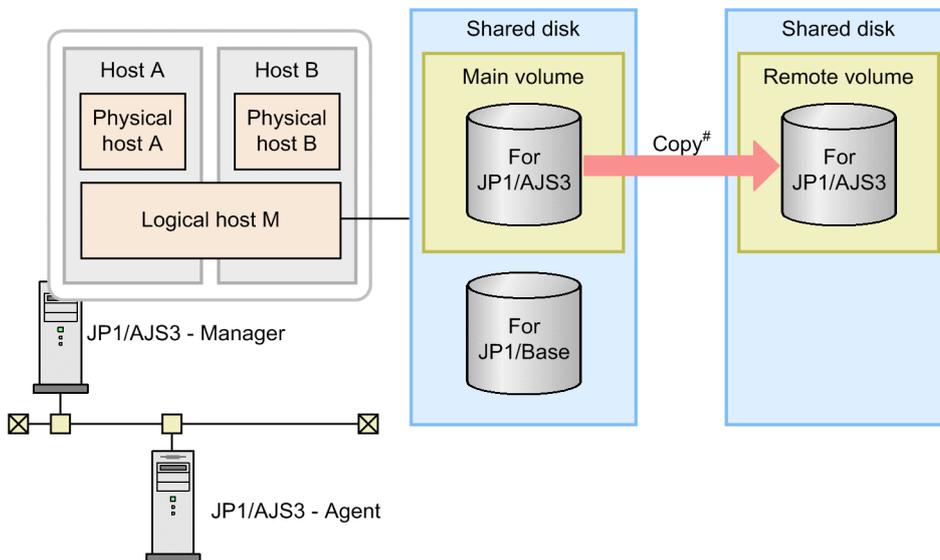
## (2) Support scope

The scope of JP1/AJS3 support is the same as when JP1/AJS3 is used for disaster recovery. See *12.1.2(2) Support scope* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## (3) System configuration

The following figure shows an example of a system configuration that uses constant backup of a disk.

Figure 5-1: Example of a system configuration that uses constant backup of a disk



#: Use the disk copy and mirroring functionality in the hardware to copy data between shared disks. This is not a function of JP1/AJS3.

## (4) Method of operation

Use the disk copy and mirroring functionality of the hardware to start and stop copying, and to check the status. These functions are not provided by JP1/AJS3.

Note that the disk copy and mirroring functionality of the hardware might degrade the performance of the general operation of jobs (job definition, execution, and display). Therefore, make sure that you test the operation of jobs while data is being copied before using the disk copy and mirroring functionality in live operation.

## **(5) Precautionary note**

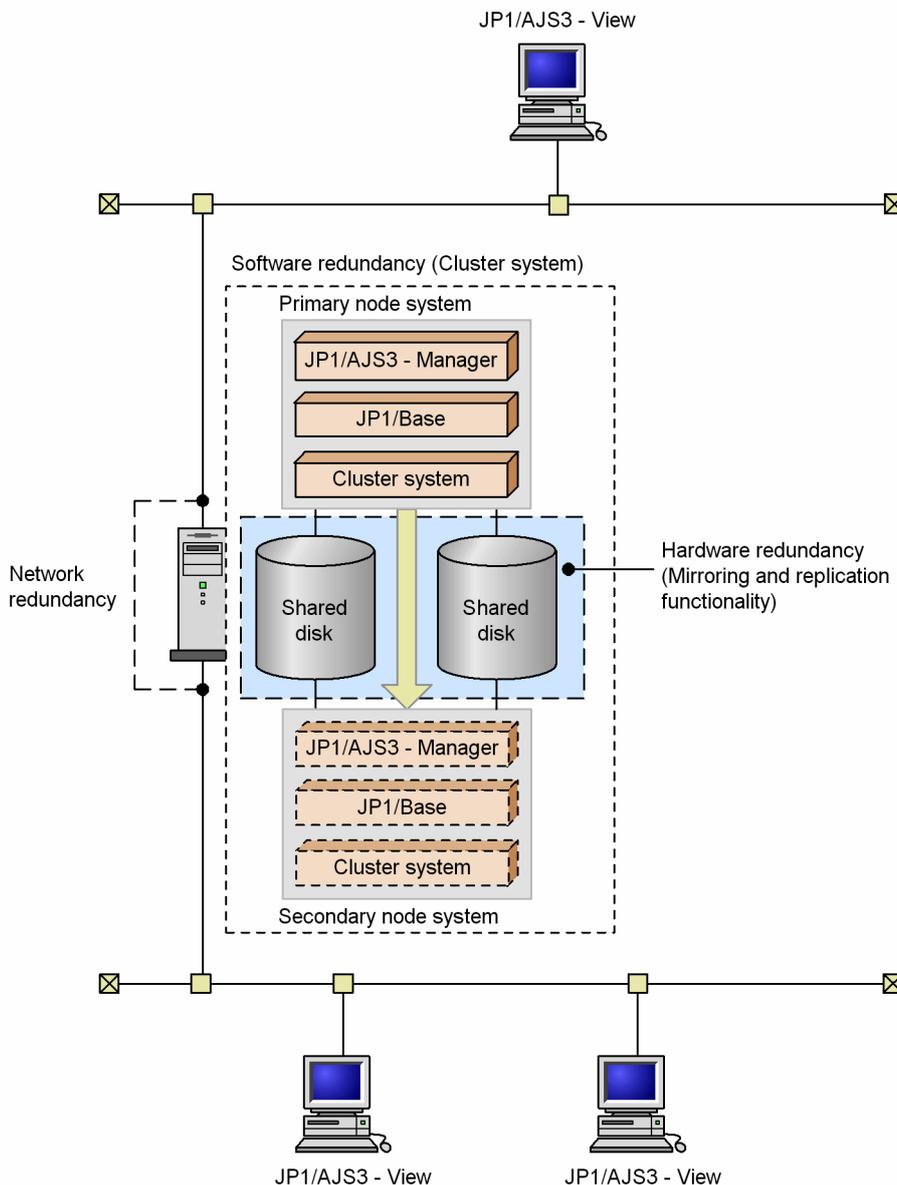
When switching the connection from the main volume to the remote volume, perform a disaster-recovery start of JP1/AJS3 to resume operation. For details about a disaster-recovery start, see *7.2.1 Temporarily changing the start mode of JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## 5.3 Redundancy

This section discusses redundancy in JP1/AJS3. In addition to backing up the system, duplicating part of the system is another effective way of preparing for unexpected situations. Should a failure occur, a redundant system can be restored to normal operation with less trouble. JP1/AJS3 supports software redundancy (in a cluster system) and hardware redundancy (database and network).

The following figure shows an example of a JP1/AJS3 system with a partially redundant configuration. Consider implementing redundancy as required.

Figure 5-2: Example of a redundant JP1/AJS3 system



### Software redundancy

JP1/AJS3 supports cluster systems. A cluster system consists of a number of linked servers that operate as a single system, so that work tasks can continue processing should a failure occur.

For details about cluster systems, see the documentation for your OS and cluster software. For the processing flow when JP1/AJS3 is used in a cluster configuration, see *11. Operation in a Cluster System* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## Database redundancy

JP1/AJS3 uses a database to manage work task definitions and execution results. Consider implementing redundancy through the hard disk functionality. For example, you could implement database redundancy by configuring the hard disks into a RAID array.

## Network redundancy

JP1/AJS3 supports multi-LAN configurations: JP1/AJS3 - Manager, JP1/AJS3 - Agent, or JP1/AJS3 - View is installed on a host that has multiple NICs, and the host is connected to multiple LANs.

The communication settings for JP1/AJS3 are based on those for JP1/Base. For details about the communication settings for JP1/Base, see the JP1/Base communication protocol and explanation of how to set up JP1/Base communication according to the network configuration in the *Job Management Partner 1/Base User's Guide*.

## 5.4 Handling database errors

---

Consider what backup and recovery methods to use if an error occurs in the database used by JP1/AJS3.

### 5.4.1 Overview of database backups

You can back up all the tables in a JP1/AJS3 database (embedded database) to a file in case a failure occurs. If an error occurs in the scheduler database, the backup file can be used to restore the database to its state at the time the backup was taken.

When the embedded database is used, JP1/AJS3 creates system log files containing historical information about updates to the scheduler database. Using the database backup file and the information logged to these system log files, you can restore the scheduler database to its most recent state.

Creating backup files and restoring the database differ according to how the JP1/AJS3 system is operated. The following backup and recovery methods can be used:

- Method 1: Using unload log files

The embedded database automatically unloads the system logs. These unloaded files are known as *unload log files*.

In method 1, the database is restored from unload log files in addition to the backup taken at regular intervals.

This method restores the scheduler database, not just to its state at the time the backup file was created, but instead to the latest information since the backup was taken.

For details, see *(1) Restoring the scheduler database from unload log files*.

- Method 2: Without using the system log

In method 2, the database is restored from backup files only, without using system log files or unload log files. This is simplest method, as the system log is not involved.

With this method, however, you cannot restore the latest information since the backup files were created. For details, see *(2) Restoring the scheduler database without using the system log*.

For more information about the two backup and restore methods, see *C.1(2) Examining the embedded-database operating environment and operating method* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

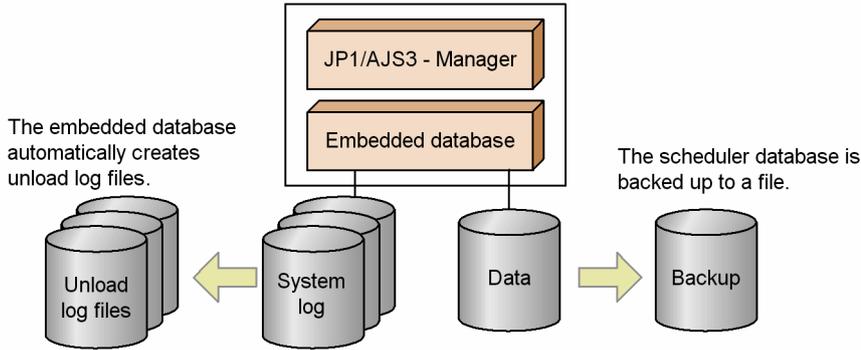
#### (1) Restoring the scheduler database from unload log files

The following describes how to restore the scheduler database using the unload log files created automatically by the embedded database in addition to the database backup file.

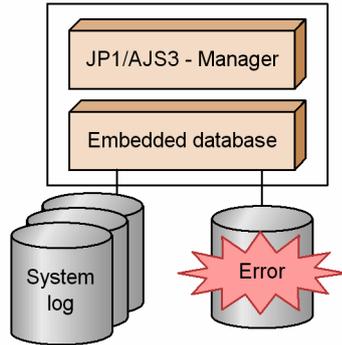
The following figure shows how to recover from a database error using unload log files.

Figure 5–3: Recovery after an error (using unload log files)

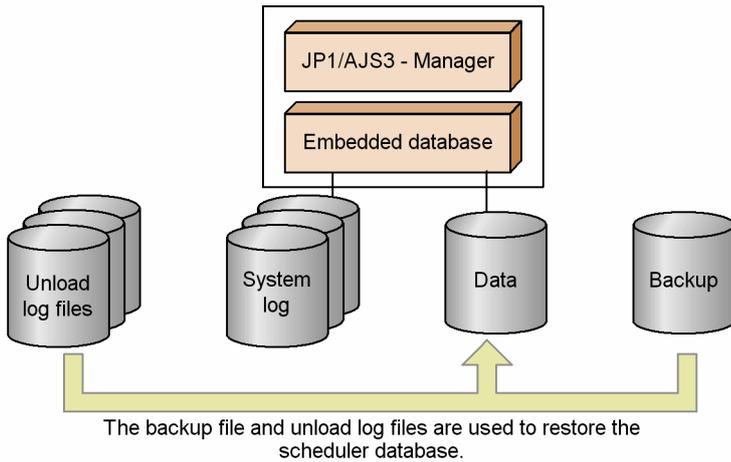
(1) The scheduler database is backed up to a file.



(2) An error occurs in the scheduler database.



(3) The backup file and unload log files are used to restore the scheduler database.



### (a) Duplicating the system files

In a configuration where the system files used by the embedded database are not duplicated, the embedded database stops when an error occurs in a system file.

If the system files are duplicated, and a disk error or other problem occurs in one set of system files, the system files can be restored the moment the error occurs and in the state they are in right before the error occurs. Note that file duplication requires more disk space than for unduplicated system files.

### (b) Using unload log files

#### ■ Automatic log unload function

The embedded database swaps the system log file to an alternate system log file at the following times:

- When the current system log file is full
- When the `ajsembdbbackup` command is executed
- When the `ajsembdboplog` command is executed with the `-w` option specified
- When the embedded database is restarted (only if it was stopped normally during the previous run)

When the current system log file is swapped out, it waits to be unloaded<sup>#1</sup> and cannot be re-assigned. To make this system log file available again, it must be unloaded.<sup>#2</sup> The embedded database automatically unloads the waiting system log files to a specified directory. The unloaded files are called *unload log files*, and the function that unloads them is called the *automatic log unload function*. These unload log files are used in addition to the database backup file to restore the database after a failure.

#1

In this state, the system log file contains historical update information, which is needed for a recovery, and cannot be overwritten. The file cannot be swapped in as an alternate system log file. It must be unloaded first.

#2

*Unload* here means to back up the data in the system log file.

## ■ Unload log file size

The size of the unload log files depends on the scale you set when configuring the environment for the embedded database. The table below lists the size of one unload log file for each of the specifiable scales. Refer to the values in the table when estimating the disk space required for unload log files.

Table 5-4: Size of an output unload log file

Scale specified when configuring the environment for the embedded database	Size of one unload log file
Large scale	Approx. 1,200 megabytes
Medium scale	Approx. 230 megabytes
Small scale	Approx. 30 megabytes

If you have increased the maximum size of a system log file using the `ajsembdbaddlog` command, compare the size specified in the `-s` option of the command with the size shown in [Table 5-4](#). The larger of the two values will be the maximum size of an unload log file. If you have increased the system log file size using the function for automatically expanding the system log, the maximum size of an unload log file will be three times the size given in [Table 5-4](#).

In either case, use the larger value to estimate the disk space required for unload log files.

Note that the size of an unload log file could vary depending on the output timing.

## ■ Estimating when the disk containing the unload log directory will become full

Unless they are deleted or moved to another disk, unload log files continue to be created in the same directory. The number of files keeps growing as JP1/AJS3 continues running, eventually filling the disk in which the unload log directory resides. When the disk is full, the automatic log unload function stops, resulting in *Issue caused by the automatic log unload function stopping* described below.

For this reason, you need to estimate when the disk is likely to become full. Back up the embedded database before that point, and delete unload log files created before the backup was taken or move them to another disk. If backing up the database before the disk is full is not feasible, temporarily move the unload log files to another disk to free up space on the disk containing the unload log directory. For details about how to delete or move unload log files, see [3.1.2\(3\)](#)

The rest of this subsection describes how to estimate at what point the disk with the unload log directory is likely to become full.

The following table provides guidance on how much information can be output to one system log file.

**Table 5-5: Maximum amount of information output to one system log file**

Scale specified when configuring the environment for the embedded database	Number of jobs or jobnets executed per day
Large scale	Approx. 50,000
Medium scale	Approx. 9,600
Small scale	Approx. 1,200

**Note**  
These values vary depending on the operations that are performed on jobs and jobnets, and how often units are created, redefined, deleted, and so on. Adjust the estimated value according to your system operation.

Using the values in the above table and the size of one unload log file as listed in [Table 5-4](#), you can estimate how many days it will take for the disk to become full from the time operation starts.

An estimation example is shown below:

Conditions:

- Scale of the embedded-database environment: Large
- Disk space required for the unload log directory: 10 gigabytes

Calculation:

$$10 \text{ gigabytes} / 1,200 \text{ megabytes} = 8 \text{ days}$$

Under these conditions, you can predict that the disk will be full, at the earliest, at the end of operation on the 8th day from the start of operation.

### ■ Issue caused by the automatic log unload function stopping

When the automatic log unload function stops, the embedded database no longer unloads system log files. If files are not unloaded, the number of system log files waiting to be unloaded continues to increase. If there is no system log file available when the current system log file is ready to be swapped out, the embedded database terminates abnormally.

For details about what causes the automatic log unload function to stop, see [Table 5-6](#).

### ■ Monitoring the operating status of the automatic log unload function

If the automatic log unload function stops, *Issue caused by the automatic log unload function stopping* described above occurs. The operating status of the automatic log unload function therefore needs to be monitored at regular intervals.

You can use either of the following two methods to monitor whether the function is active:

Monitoring using a message

If the automatic log unload function stops, message KFPS01150-E is output to the Windows event log or to `syslog` in UNIX. Determine whether the automatic log unload function is active according to whether this message appears.

## Monitoring using a command

You can check whether the automatic log unload function is active by executing the `ajsembdboplog` command with the `-s` option specified, as in the following example. Here, the environment for the embedded database whose ID is `_JF0` has already been set up:

```
ajsembdboplog -s -id _JF0

HOSTNAME : host_name (180252)
SERVER_NAME:ajs2
AUTO_LOG_UNLOAD NOW_UNLOAD_LOG_GROUP CREATE DIR
                ACTIVE                **** K:/logback
CURRENT LOG GENERATION INFO.
LOG_GROUP GEN_NO. SERVER_RUN_ID RUN_ID UNLOAD_FILE_NAME
log1      1      43c4ad0d      43c4acf3 ajs2_43c4ad0d0001_log1
```

In the execution result, the string (underlined portion) shown for `AUTO_LOG_UNLOAD` indicates the operating status of the automatic log unload function. The function is active if `ACTIVE` appears, but has stopped if `STOP` appears.

If you find that the automatic log unload function has stopped, take the action described in [Table 5-6](#), and then execute the `ajsembdboplog` command with the `-r` option specified, as in the following example:

```
ajsembdboplog -r -id _JF0
```

This command restarts the automatic log unload function.

### ■ Reasons for the automatic log unload function to stop

The following table lists the reasons why the automatic log unload function might stop, and describes what action to take in each case.

Table 5-6: Reasons for the automatic log unload function to stop, and corrective actions

Reason	Action
An error occurred on the disk that contains the unload log directory.	Back up the embedded database in case the unload log files are lost. After correcting the disk error, execute the <code>ajsembdboplog</code> command with the <code>-r</code> option specified, as follows: <code>ajsembdboplog -r</code> This command restarts the automatic log unload function.
The disk that contains the unload log directory is full.	For details about what action to take when the disk is full, see <a href="#">3.1.2(3) Managing backup files and unload log files</a> in the <i>Job Management Partner 1/Automatic Job Management System 3 Administration Guide</i> . After taking the indicated action, execute the <code>ajsembdboplog</code> command with the <code>-r</code> option specified, as follows: <code>ajsembdboplog -r</code> This command restarts the automatic log unload function.
The unload log directory is unavailable for either of the following reasons: <ul style="list-style-type: none"><li>• Incorrect permissions are set.</li><li>• No such directory exists.</li></ul>	After removing the cause of the error, execute the <code>ajsembdboplog</code> command with the <code>-r</code> option specified, as follows: <code>ajsembdboplog -r</code> This command restarts the automatic log unload function.
The <code>ajsembdboplog</code> command was executed with the <code>-t</code> option specified.	Execute the <code>ajsembdboplog</code> command with the <code>-r</code> option specified, as follows: <code>ajsembdboplog -r</code> This command restarts the automatic log unload function.

### ■ Recovery when the embedded database terminates abnormally because there is no alternate system log file

If the embedded database terminates abnormally because there is no system log file to swap in, take the following steps:

1. Stop the scheduler service and all other services that access the database.

2. Unload the system log.

Execute the `ajsembdboplog` command to unload the system log file that is waiting to be unloaded. For the output size per file, see *Table 5-4*.

3. Start the embedded database.

Execute the `ajsembdbstart` command to start the embedded database. The format of the command differs in Windows and UNIX, and according to the status of the embedded database.

- In Windows:

Execute the `ajsembdbstart` command without specifying any options other than the `-id` option.

- In UNIX:

The format of the `ajsembdbstart` command depends on the status of the embedded database. To check the database status, execute the `ajsembdbstatus` command. In the following execution example, the environment for the embedded database whose ID is `_JF0` has already been set up:

```
ajsembdbstatus -s ust -id _JF0
HOSTNAME : host_name(144852)
SYSTEMID : ajs2
UNITID : unt1
ENTRYHOST : host_name
PAIRHOST :
UNIT-STAT FES-STAT SETUP-STAT
STOP ***** SETUP
```

In the execution result, the string (underlined portion) shown for `UNIT-STAT` indicates the status of the embedded database. How you execute the `ajsembdbstart` command is determined by this information. If `UNIT-STAT` is `STOP`, execute the `ajsembdbstart` command with only the `-id` option specified. If `UNIT-STAT` is `PAUSE`, execute the `ajsembdbstart` command with the `-id` and `-R` options specified.

4. Start the services that you stopped at step 1.

Hot-start or warm-start the JP1/AJS3 services. Before you do so, check whether the status of the scheduler database is consistent with the actual job execution status. As the status of the scheduler database can only be preserved until just before the embedded database terminated abnormally, there might be inconsistencies with other control information. If it is too difficult to determine whether the scheduler database is consistent with the actual job execution status, cold-start the JP1/AJS3 services and register the jobnets for execution.

## (c) Cautionary notes

Note the following points when using unload logs.

### ■ When configuring the environment

Duplication of system files requires more disk space than for unduplicated system files. For the amount of disk space required, see *C.1 Preparation for using an embedded database* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

### ■ When using unload logs

- Unless they are deleted or moved to another disk, unload log files continue to be created in the same directory. The number of files keeps growing as JP1/AJS3 continues running, putting pressure on the disk that contains the unload log directory. Once you back up the database, you can delete unload log files created prior to the time at which you

took the backup. For details about how to delete or move unload log files, see 3.1.2(3) *Managing backup files and unload log files* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

- When the automatic log unload function stops, the embedded database no longer unloads system log files, so the number of system log files waiting to be unloaded continues to increase. If there is no system log file available when the current system log file is ready to be swapped out, the embedded database terminates abnormally. You must therefore monitor whether the automatic log unload function is active. For the procedure, see *Monitoring the operating status of the automatic log unload function* in (b) *Using unload log files*.
- If you take backup while the JP1/AJS3 service is active, conflict between the `ajsembddbbackup` command and the job execution process will result in degraded performance in both processes. Take backup at a time when the least amount of jobs are being executed.

#### ■ When restoring the database

- If the scheduler database is backed up while the JP1/AJS3 service is active, in addition to the backup file, you will require unload log files output since the backup was taken to perform a restoration. If the unload log files have been deleted, back up the database again because you will not be able to restore it using only the backup file created while the JP1/AJS3 service was active.
- When restoring the scheduler database using unload log files, you will need all the unload log files output since the backup was taken (that is, all those created since the `ajsembddbbackup` command was executed).
- When restoring the scheduler database using unload log files, we recommend that you specify the `-ld` option in the `ajsembdbrstr` command. If you use the `-l` option, you must specify in date order all the unload log files needed to restore the database, starting from the oldest. If you specify the files in the wrong order or miss any file, the `ajsembdbrstr` command terminates with an error. For the command syntax, see *ajsembdbrstr* in 2.

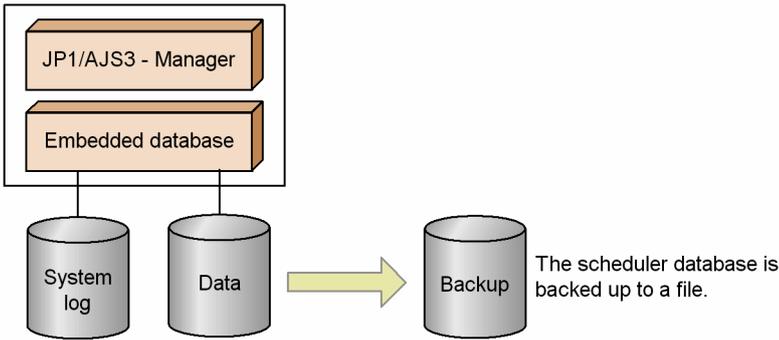
*Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

## (2) Restoring the scheduler database without using the system log

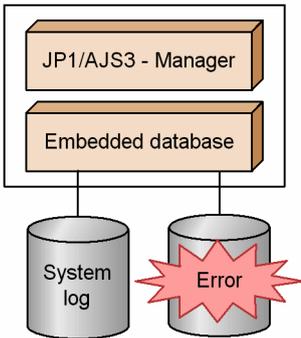
The following describes how to restore the scheduler database from a backup file only, without using any system log files. This is the simplest method, requiring no unload log files. The following figure shows how to recover from a database error without using the system log.

Figure 5-4: Recovery after an error (without using the system log)

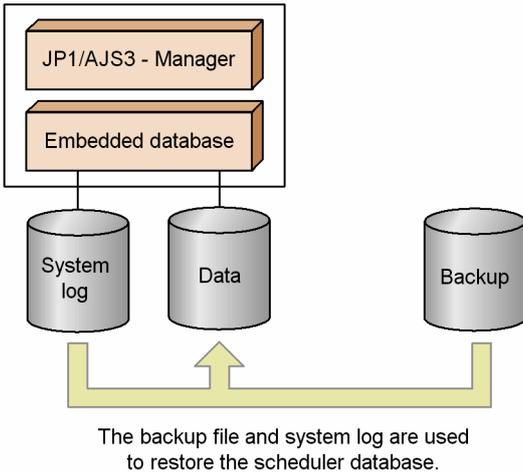
(1) The scheduler database is backed up to a file.



(2) An error occurs in the scheduler database.



(3) The backup file and system log are used to restore the scheduler database.



With this method, you do not need to monitor the system log files. However, as the system log is not used at recovery, any updates since the backup file was created cannot be restored.

### (a) Cautionary notes

Note the following points when not using the system log at recovery.

#### ■ When configuring the environment

Since the system log is not used, the database cannot be restored from system log files. However, because it is used by the embedded database, sufficient disk space must still be allocated to store the system log. For the required disk space, see *C.1 Preparation for using an embedded database in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

### ■ When backing up the database

The scheduler database cannot be backed up to a file while JP1/AJS3 services are active. Take backup at a time when the JP1/AJS3 services can be stopped. For details about how to back up the scheduler database, see *3.1.1(3) Procedure for creating a backup file* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

### ■ When restoring the database

If an error occurs, the scheduler database cannot be restored to its state immediately before the error. Because the system log is not used, the database can only be restored to the point in time at which the backup was taken. For the recovery procedure, see *3.1.1(4) Procedures for restoring the database if an error occurs* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## 5.5 Countermeasures for a large-scale disaster

As countermeasures for a large-scale disaster, JP1/AJS3 supports disaster recovery that uses the disk copy and mirroring functionality<sup>#</sup> provided by the hardware.

#

The TrueCopy function of Hitachi disk array systems is an example.

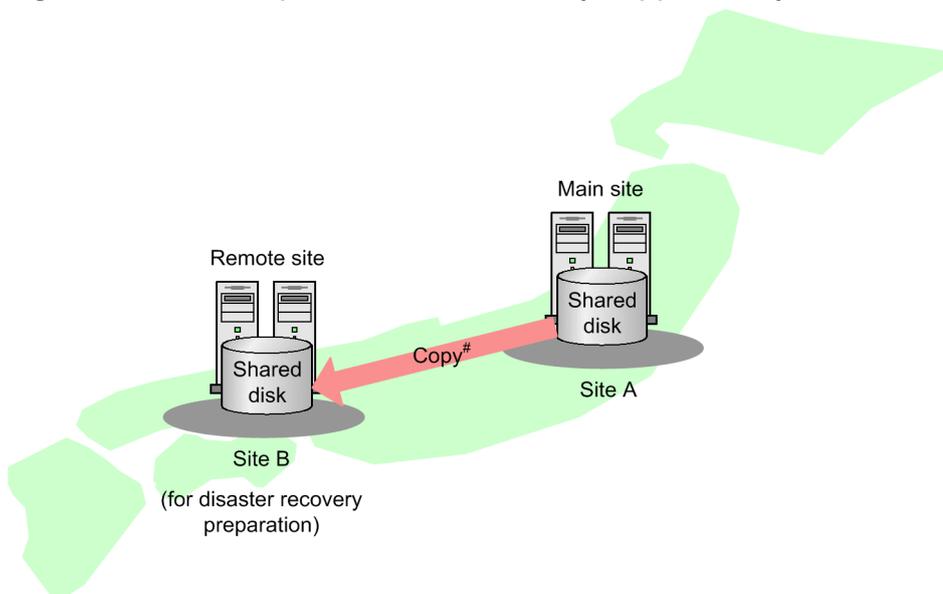
### 5.5.1 Overview of disaster recovery

Disaster recovery refers to measures that are taken for unexpected events such as system shutdown caused by a large-scale disaster.

JP1/AJS3 supports disaster recovery that copies JP1/AJS3 data on the shared disk to a shared disk at a remote site. If the system fails because of an event such as a disaster, the JP1/AJS3 system at the remote site can continue operation by using the copied data. The disk copy and mirroring functionality of the hardware is used to copy data between shared disks.

The following figure shows the concept of disaster recovery supported by JP1/AJS3.

Figure 5-5: Concept of disaster recovery supported by JP1/AJS3



# Use the disk copy and mirroring functionality in the hardware to copy data between shared disks. This is not a function of JP1/AJS3.

For details about JP1/AJS3 disaster recovery operation, see 12. *Disaster Recovery in JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

This subsection describes the considerations required for using JP1/AJS3 for disaster recovery.

### 5.5.2 Disaster recovery considerations

The following describes the considerations you must keep in mind for using JP1/AJS3 for disaster recovery.

Table 5-7: Considerations for using JP1/AJS3 for disaster recovery

No.	What to consider	Explanation
1	The work tasks to which disaster recovery should apply	Determine the work tasks running in JP1/AJS3 that you want to resume operation on the remote site immediately after the site has stopped because of a large-scale disaster, and determine whether disaster recovery should be used.
2	The disaster recovery post-recovery processes	Determine a site on which work tasks should be resumed if the main site stops. Also determine whether to continue to run the work tasks whose operation has resumed at the remote site or return their operation to the original site.
3	The hosts, OSs, and programs to be prepared	Check the system prerequisites, and examine the computers, OSs, and programs, such as JP1/AJS3 - Manager, required for each site.  For details about the prerequisites for disaster recovery, see <i>12.1.2(1) Prerequisites</i> in the <i>Job Management Partner 1/ Automatic Job Management System 3 Administration Guide</i> .
4	The conditions for using the system	Check the conditions for using the system, and examine the system configuration.
5	The system configuration	For details about the disaster recovery system configuration supported by JP1/AJS3, see <i>12.1.3 Configuration of a disaster recovery system compatible with JP1/AJS3</i> in the <i>Job Management Partner 1/Automatic Job Management System 3 Administration Guide</i> .
6	Estimates for the processing performance of the system	Estimate the processing performance in a disaster recovery environment. For details, see <i>5.5.3 Estimating processing performance in a disaster recovery environment</i> .

### 5.5.3 Estimating processing performance in a disaster recovery environment

The following describes how to estimate the processing performance in a disaster recovery environment.

#### (1) Estimating the processing performance for normal operation when disk copy is used

During normal operation, the contents of the shared disk are copied from the main site to the remote site. Therefore, the hardware performance and the method of copying data between disks might affect the processing performance of JP1/AJS3 at the main site.

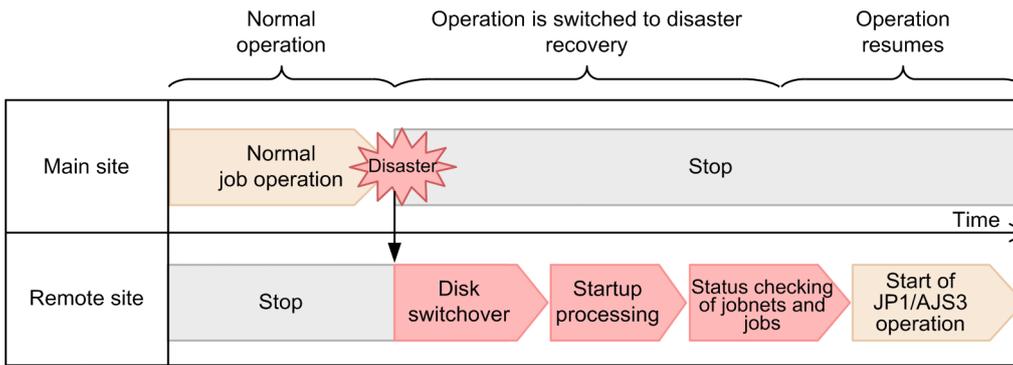
The effects on the processing performance might also change according to the quantity of jobs and the job output processing. Therefore, execute the maximum number of jobs during the system test, and estimate the processing time.

#### (2) Estimating the time required for the switchover operation during disaster recovery

The following describes how to estimate the time required to resume JP1/AJS3 operation at the remote site after the main site has stopped because of a large-scale disaster.

The following figure shows the processing from stoppage of operation at the main site to the start of disaster recovery for the JP1/AJS3 service at the remote site for the resumption of operation.

Figure 5-6: Processing steps from stoppage of main site operation until the resumption of operation at the remote site



Legend:

: Processing when an operation is switched to disaster recovery

As the time required for switching over operation in disaster recovery, estimate the time required for *Disk switchover*, *Startup processing*, and *Status checking of jobnets and jobs* shown in the figure. The following describes how to estimate each time.

#### Time required for disk switchover

Disk switchover is required to allow the remote volume to be used at the remote site. For details about this operation, see the hardware documentation. You should also estimate the processing time by switching over the disk with the maximum number of jobs running during a system test.

#### Time required for startup processing

When the JP1/AJS3 service is started at the remote site, the status of jobs running at the main site when the disaster occurred changes to *Unknown end status*, and the status of a jobnet changes to *Interrupted*. Recalculation of the schedule is also performed. Accordingly, the time required to start the JP1/AJS3 service is related to the number of jobs that are being executed.

You should estimate the processing time by starting the JP1/AJS3 service with the maximum number of tasks running during a system test.

#### Time required for checking the status of jobnets and jobs

When the JP1/AJS3 service at the remote site is started in disaster-recovery mode, the status of jobs running at the main site at the time of a disaster changes to *Unknown end status*, and the status of jobnets changes to *Interrupted*. Use the log output by JP1/AJS3 or a work application to check the status of jobnets and jobs, and the progress of work tasks.

For details about the statuses of jobnets and jobs when the start mode is disaster recovery, see the description about the disaster-recovery start in 7.2.1(3) *Jobnet and job statuses for each start mode* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

# 6

## Maintenance Planning

This chapter describes maintenance of the JP1/AJS3 database.

## 6.1 Database reorganization

This section describes how to estimate when maintenance of the embedded database needs to be performed.

### 6.1.1 Flow of maintenance tasks

When JP1/AJS3 is used over an extended period with the embedded database serving as the scheduler database, invalid areas are created in the indexes as records are erased from the database. You must clean up these invalid areas by either of the following methods:

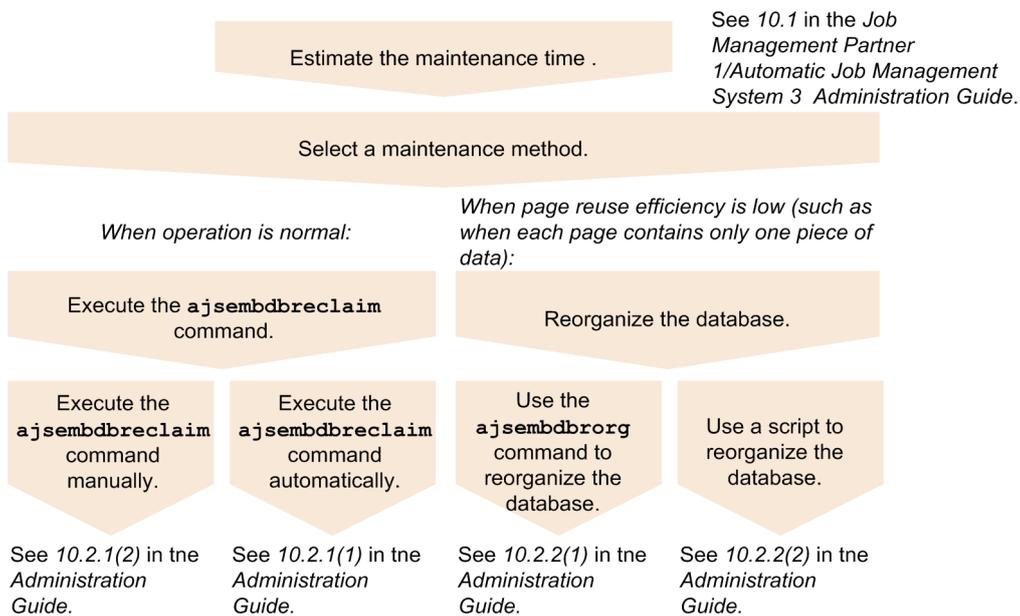
- Execute the `ajsembdbreclaim` command to make the areas usable.
- Reorganize the database.

Using the `ajsembdbreclaim` command, you can reclaim and reuse pages in the database that consist only of invalid areas (unused pages). This command can be executed even while the server is running. By executing the command periodically, you can enable better use of data areas. In most circumstances, if you use this command you will not need to reorganize the database.

However, when page usage efficiency declines (for example, pages have only one item of valid data), the number of pages that can be reclaimed declines and it might not be possible to reuse them efficiently. The database must then be reorganized.

The following figure shows the flow of maintenance tasks.

Figure 6-1: Flow of maintenance tasks



### 6.1.2 Estimating when to perform maintenance

With an embedded database, you must either execute the `ajsembdbreclaim` command, allowing invalid areas to be reused, or reorganize the database at regular intervals. To estimate when to execute the `ajsembdbreclaim` command

or reorganize the database, you need to analyze the database areas. Work out how often maintenance tasks will be required, based on the analysis results described below.

When estimating when to reorganize the database, consider on which day usage of the database peaks, and by how much usage increases, on a weekly and monthly basis.

The following describes how to analyze database areas.

## (1) Analyzing database areas

Execute the `ajsembdbstatus` command to check the database status.

If the analysis result of the `ajsembdbstatus` command shows that there are few unused segments and many unused pages, reorganize the database.

For details about the `ajsembdbstatus` command, see *ajsembdbstatus* in 2. *Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

## (2) Messages indicating an area shortage

When the data storage efficiency of the embedded database declines, message KFPH00211-I or KFPH00212-I is output to the Windows event log or UNIX `syslog`. If either of these messages is output, analyze the database status by executing the `ajsembdbstatus` command, and reorganize the database as required. Examples of the output messages are shown below.

Examples of messages indicating an area shortage

```
KFPH00211-I RDAREA usage xxx%, RDAREA="xxxxx" xxxxx
KFPH00212-I Table should be reorganized, RDAREA="xxxxx", AUTHID=xxxxx,
TABLE=xxxxx
```

If either of these messages is output immediately after you execute the `ajsembdbreclaim` command or reorganize the database, you will need to expand the indicated RD area. For details about how to expand an RD area, see *ajsembdbaddarea* in 2. *Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

# 7

## Special Modes of Operation

This chapter discusses what you might need to consider when using QUEUE jobs and submit jobs, or when using queueless jobs.

## 7.1 Considerations when using QUEUE jobs and submit jobs

The execution environment for QUEUE jobs and submit jobs consists of queues for placing registered or submitted jobs, and agents that execute jobs transferred from a queue.

When using QUEUE jobs and submit jobs, consider the following.

### 7.1.1 Queue/agent configuration

To execute QUEUE jobs and submit jobs in a manager/agent configuration, you must register the agent hosts that execute jobs with the manager host.

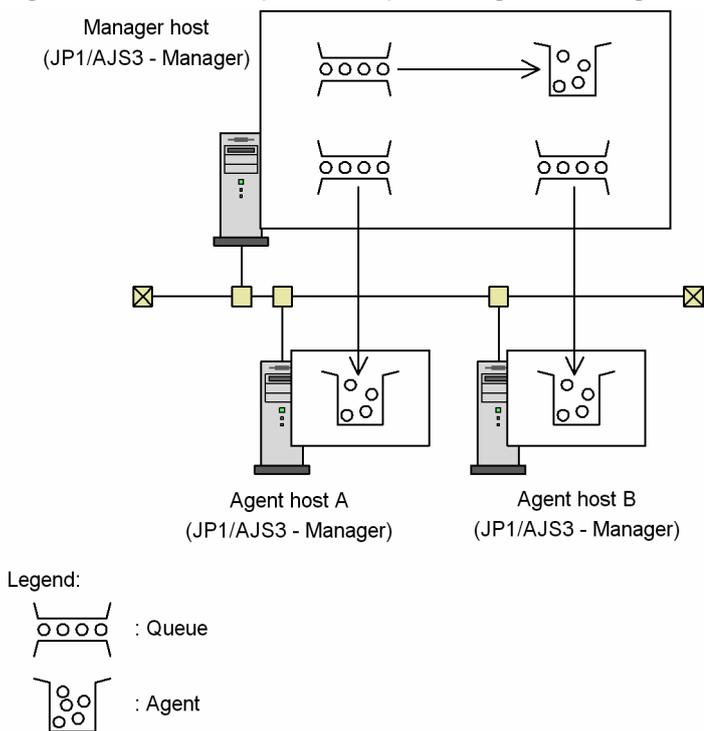
#### (1) Queue/agent configuration

When you register an agent host with the manager host, an internal queue (*default queue*) is created. The default queue has the same name as the agent host.

To execute a QUEUE job or submit job, the user specifies the queue name or agent host name, and the job is registered in that queue. Jobs are queued in order of registration and are sequentially transferred to the connected agent host.

The following figure shows an example of a queue/agent configuration.

Figure 7-1: Example of a queue/agent configuration

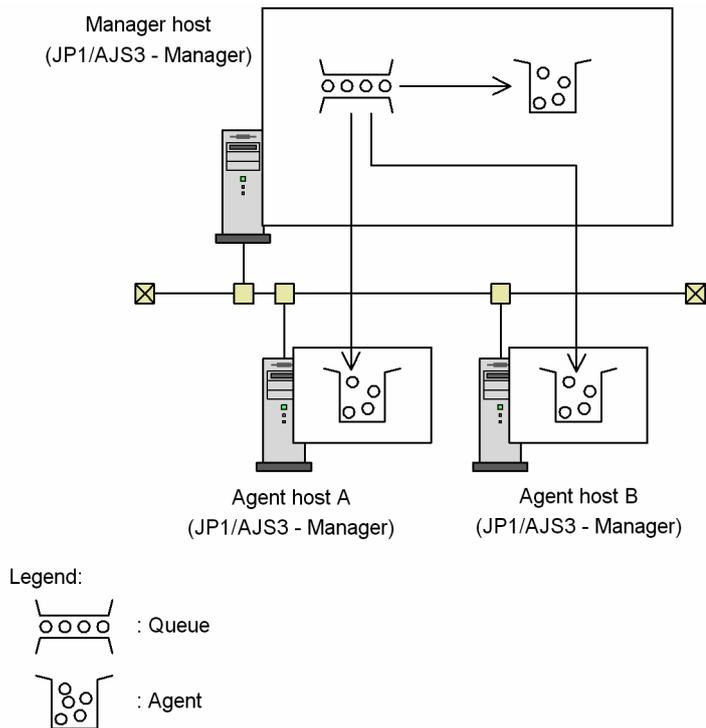


To register an agent host with the manager host, use the `jqimport` command or `jqagtadd` command. For the command syntax, see 3. *Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

Multiple agents can be connected to a queue. By connecting multiple agents to a queue, and setting the priority of each agent and the maximum number of jobs it can execute concurrently, you can distribute the job-processing load.

The following figure shows an example of load distribution with multiple agents connected to a queue.

Figure 7-2: Example of queue/agent load distribution



To change the maximum number of jobs that an agent host can execute concurrently, use the `jpqagtalt` command. To connect multiple agents to a queue and set their priorities, use the `jpqagtlink` command. For the syntax of each command, see 3. *Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

For a description of load distribution based on setting the maximum concurrent jobs and agent priorities, see (2) [About load distribution](#).

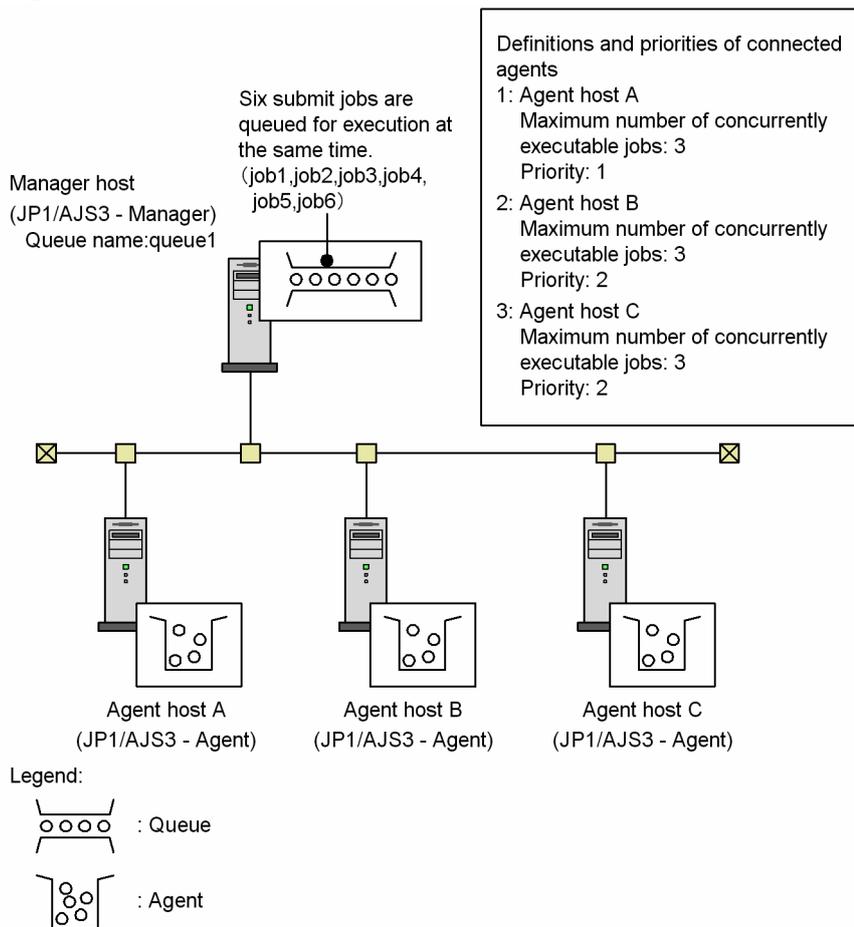
## (2) About load distribution

The following explains the concept of load distribution in JP1/AJS3.

We will assume the following for the examples below:

- There are three agent hosts A, B, and C, each of which can execute up to three jobs at the same time (maximum number of concurrently executable jobs = 3).
- All three agents are connected to queue1, allowing the processing load to be distributed.
- Agent host A has the highest priority, while agent hosts B and C have the same priority.
- Six submit jobs are queued for execution at the same time.

Figure 7-3: Illustration of load distribution



The order of execution of the submit jobs (job1 to job6) is determined as follows:

1. Determine the execution agent for job1.

Ratio: *number of active jobs / maximum number of concurrently executable jobs*:

- Agent host A: 0 / 3
- Agent host B: 0 / 3
- Agent host C: 0 / 3

The processing load is evenly distributed among all the agent hosts. Therefore, job1 is executed by agent host A, based on the order in which the agents are defined for queue1.

2. Determine the execution agent for job2.

The ratio (*active jobs / maximum concurrent jobs*) is now:

- Agent host A: 1 / 3
- Agent host B: 0 / 3
- Agent host C: 0 / 3

Although agent hosts B and C have a lighter load, job2 is assigned to agent host A, based on the priorities of the agents defined for queue1.

3. Determine the execution agent for job3.

The ratio (*active jobs / maximum concurrent jobs*) is now:

- Agent host A: 2 / 3

- Agent host B: 0 / 3
- Agent host C: 0 / 3

Although agent hosts B and C have a lighter load, host A executes job3, based on the priorities of the agents defined for queue1.

4. Determine the execution agent for job4.

The ratio (*active jobs / maximum concurrent jobs*) is now:

- Agent host A: 3 / 3
- Agent host B: 0 / 3
- Agent host C: 0 / 3

Agent host A has reached its maximum number of concurrently executable jobs. Therefore, agent host B executes job4, based on the order in which the agents are defined for queue1.

5. Determine the execution agent for job5.

The ratio (*active jobs / maximum concurrent jobs*) is now:

- Agent host A: 3 / 3
- Agent host B: 1 / 3
- Agent host C: 0 / 3

Agent host C has the lightest load. Therefore, agent host C executes job5.

6. Determine the execution agent for job6.

The ratio (*active jobs / maximum concurrent jobs*) is now:

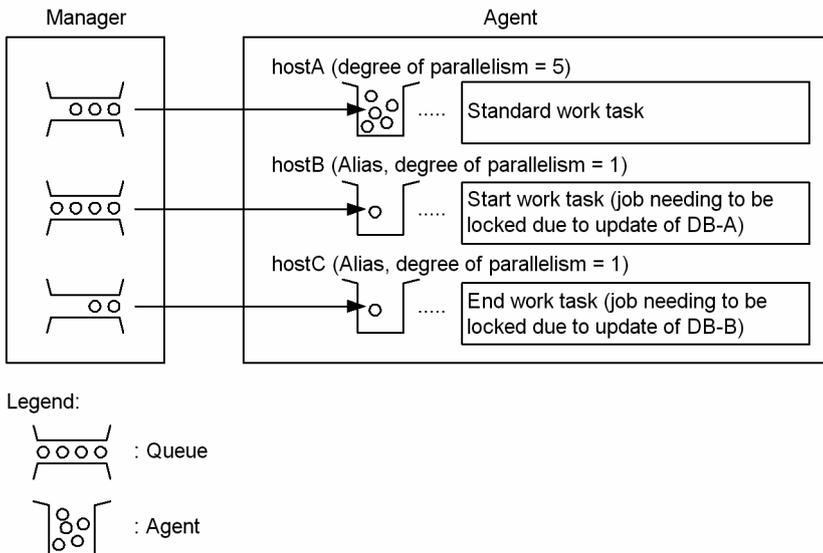
- Agent host A: 3 / 3
- Agent host B: 1 / 3
- Agent host C: 1 / 3

Agent hosts B and C have a lighter load than A, and their load distribution is even. Therefore, agent host B executes job6, based on the order in which the agents are defined for queue1.

### (3) Running multiple execution hosts on the same computer

In JP1/AJS3, you can set the maximum number of jobs that can be executed concurrently by each of the managed agents. By defining multiple agent host names as aliases on the same computer (one IP address), and registering different kinds of jobs with each agent alias, you can distribute work tasks within one computer. For example, *hostB* and *hostC* can be defined as aliases of a real host (*hostA*), allowing work tasks to be distributed on one computer as in the following figure. Note that queueless jobs cannot be executed using an alias for the agent host name.

Figure 7-4: Example of distributing work tasks



To realize this kind of configuration, add the agent host name aliases to the configuration definition of the job execution control. Also specify the agent host name aliases in the `hosts` file so that the IP address can be resolved from each alias. For details about adding agent host names, see (b) *Configuring the job execution control for QUEUE jobs and submit jobs*.

When you define agent aliases in the `jp1hosts` information or `jp1hosts2` information of JP1/Base, JP1 can have its own `hosts` information without changing the `hosts` file or other OS settings.

### (a) Defining `jp1hosts` information or `jp1hosts2` information

For details about how to define `jp1hosts` information or `jp1hosts2` information, see the relevant section in the *Job Management Partner 1/Base User's Guide*.

#### Important note

When you have registered `jp1hosts` information or `jp1hosts2` information, JP1/AJS3 no longer searches the `hosts` file and the DNS server for the host names and IP addresses you entered in the `jp1hosts` information or `jp1hosts2` information. Therefore, you must define both the real host name and aliases for an IP address in the `jp1hosts` information or `jp1hosts2` information. Place the real host name before the aliases.

### (b) Configuring the job execution control for QUEUE jobs and submit jobs

To add agent aliases, follow the steps below.

For the command syntax, see 3. *Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

#### 1. Add agent definitions dynamically.

To add an agent definition, execute the `jpqagtadd` command with the `-ah` option specified. In the `-ah` option, specify an agent host name defined as an alias in the `jp1hosts` information or `jp1hosts2` information. In the `-cp` option, specify the maximum number of jobs that can be executed concurrently by the agent, bearing in mind any jobs that will place a lock on the resource.

For example, suppose hostA executes routine jobs, and you want to execute one job exclusively on hostB, which is defined as an agent alias. Set the maximum number of concurrently executable jobs as follows:

```
jpgagtadd [-mh manager-host-name] -ah hostA -cp 0:00-0:00=5  
jpgagtadd [-mh manager-host-name] -ah hostB -cp 0:00-0:00=1
```

With these settings, hostA can execute a maximum of five jobs concurrently, while hostB can execute only one registered job at any one time.

## 2. Open the queue.

Because the entrance to the queue is closed when you add an agent definition, you must open the queue using the `jpgqueueopen` command.

For example, to open the entrance to hostA's queue, execute the command as follows:

```
jpgqueueopen [-mh manager-host-name] -ah hostA -en
```

## (4) Notes on the execution environment required for QUEUE jobs and submit jobs

Note the following when planning the execution environment for QUEUE jobs and submit jobs.

### (a) Maximum number of concurrently executable jobs (QUEUE jobs and submit jobs)

In JP1/AJS3, you can set the maximum number of jobs that an agent host can execute concurrently. When this maximum is reached, subsequent jobs are placed in the wait state. By setting a maximum number of concurrently executable jobs, you can restrict the number of jobs being executed and distribute the load during particular time periods, or among multiple agents when more than one agent host is connected to a queue.

The maximum number of concurrent jobs must be specified per execution agent. You cannot set a maximum per queue.

#### ■ Notes on setting a maximum number of concurrently executable jobs

The default setting (maximum of five concurrent jobs, 24 hours a day) will suffice if only short jobs are executed, and no more than a few jobs will be registered for execution simultaneously. However, if you execute jobs with long execution times or register many jobs at the same time, the number of concurrent jobs will quickly reach the maximum, and remain there for extended periods of time. This might affect the execution of subsequent jobs.

When the maximum number of concurrently executable jobs is reached on an agent host, subsequent jobs wait in the *queuing* status until the active jobs finish. In such cases, jobs will take longer than expected to execute. Take the job execution time and the number of jobs executed per unit time into consideration when you set the maximum number of concurrently executable jobs.

#### ■ Checking whether the maximum number of concurrent jobs has been reached when jobs remain in queuing status

When the number of active jobs on an agent host reaches the maximum number of concurrently executable jobs, subsequent jobs might remain in the *queuing* status for a long time before being executed. To check whether the maximum number of concurrently executable jobs has been reached, execute the `jpgagtshow` command and compare the number of active jobs (EXECUTING) against the maximum number of concurrently executable jobs (CUREXCHGNUM). For details about the `jpgagtshow` command, see *jpgagtshow* in 3. *Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

By setting up JP1/AJS3 to output the following message to the integrated trace log when the maximum number of concurrent jobs is reached and no more jobs can be executed, you can check whether this is the reason for execution delays:

```
KAVU4310-I The number of executing jobs reaches the
concurrently-executable-job-limit (maximum-number-of-concurrently-
executable-jobs) at the agent (agent-host-name) (host name: host-name, job
number: job-number)
```

For details about how to specify this setting, see [6.2.13 Outputting a message that reports that the maximum number of concurrently executable jobs has been reached](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or [15.2.13 Outputting a message that reports that the maximum number of concurrently executable jobs has been reached](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

## (b) Notes on the execution order of submit jobs

Submit jobs registered by the `jpqjjobsub` command are executed in the order in which they are submitted. However, if any of the following situations applies when a job is sent to the execution agent host, it might not be executed in the proper order:

- The agent usage rate at the execution agent host has reached the limit.
- The execution agent host has failed or stopped.
- A job that accesses the same execution-locked resource as the job being transferred has just ended.

By setting relationship lines for a job or jobnet, you can prevent the job execution order from being changed. Consider using relationship lines if the jobs executed in your system can be grouped in separate jobnets.

If jobnet operation is not feasible, enable the setting that prevents any change to the submit job execution order. This will ensure that, until the above situation is resolved, the job registered first will always be taken from the queue first, thereby preventing any change to the execution order.

For details about this setting, see [7.1.11 Setting for preventing changes in the submit job execution order](#).

*Agent usage rate* here refers to the ratio of active jobs to the maximum number of concurrent jobs at an agent host. For details about the agent usage rate, see [10.4.1\(6\) Distributing jobs among execution hosts \(agent hosts\)](#) in the manual *Job Management Partner 1/Automatic Job Management System 3 Overview*.

### Supplementary note

Jobs submitted with an execution start time specified in the `-st` option of the `jpqjjobsub` command might sometimes fail to start by the specified time, depending on factors such as the availability of the agent host to which the job is to be sent. Such jobs remain in the *queuing* status, along with other jobs waiting for execution, until the agent host is restored. Once the agent host becomes available again, the queued jobs are transferred, but in the order they were submitted, not in order of their execution start times.

## (c) Action when too many jobs are enumerated by the `jpqendjobshow` or `jpqjobshow` command

When execution of the `jpqendjobshow` command (enumeration of completed jobs) or `jpqjobshow` command (enumeration of queued jobs) produces a long list of jobs in the standard output file, the command and other requests might fail or take a long time to execute.

Consider the following to prevent such problems.

When using the `jpqendjobshow` command:

To reduce the amount of data, specify how many items of job information to acquire in the `-rn` option, or specify the time range of the acquired job information in the `-sa` and `-sp` options.

When using the `jpqjobshow` command:

To reduce the amount of data, specify the owner user name of the jobs to be acquired in the `-u` option, or specify the status of the jobs to be acquired in the `-s` option. If the problem still persists, change the communication timeout value. The default is 10 minutes.

For details about how to change the communication timeout value, see *6.2.14 Changing the timeout value for the job execution control manager process* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.2.14 Changing the timeout value for the job execution control manager process* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

When enumerating job information, the job execution control manager (`jpqman`) consumes memory in proportion to the number of listed items. With a large number of items in the list, the `jpqjobshow` command or `jpqendjobshow` command sometimes fails and message KAVU4280-E is output to the integrated trace log. If this happens, you might need to perform a setting to reduce memory usage by the job execution control manager when enumerating job information.

For details about this setting, see *7.1.12 Setting to reduce memory usage by the job execution control manager (jpqman) when enumerating job information*.

## 7.1.2 Setup for using QUEUE jobs and submit jobs

### (1) Setting the execution environment for QUEUE jobs and submit jobs

By default, the execution environment for QUEUE jobs and submit jobs is created on the local host as the execution agent. However, depending on your system requirements, you might need to change the job execution environment (by adding configuration definition information to the job execution environment).

The job execution environment needs to be changed when:

- There are multiple execution hosts in the system.
- JP1/AJS3 is linked with another system (JP1/NQSEEXEC or JP1/OJE, for example).
- Jobs are distributed to multiple execution hosts.
- Particular jobs place a lock on the same resource.

If you need to change the execution environment for QUEUE jobs and submit jobs, add configuration definition information about the execution hosts (agents), queues, or execution-locked resources, using either of the following methods:

- Add the information using a batch file.
- Add the information dynamically while the system is running.

These two methods are described below.

#### (a) Changing the execution environment for QUEUE jobs and submit jobs using a batch file

The following describes how to change the execution environment for QUEUE jobs and submit jobs using the `jpqimport` command. Recreate the execution environment database as follows:

1. Copy `jpgqsetup.conf` (execution environment configuration definition file for QUEUE jobs and submit jobs), open the copied file in an editor, and then define the queues and agents.

The following are the paths for saving the execution environment configuration definition file for QUEUE jobs and submit jobs:

- In Windows

Physical host

`JP1/AJS3 - Manager -installation-folder\conf\jpgqsetup.conf`

Logical host

`shared-folder\jp1ajs2\conf\jpgqsetup.conf`

- In UNIX

Physical host

`/etc/opt/jp1ajs2/conf/jpqsetup.conf`

Logical host

`shared-directory/jp1ajs2/conf/jpqsetup.conf`

For details about the contents to write in this file, see *jpgqimport* in *3. Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

A coding example is shown below:

**Figure 7–5: Example of an execution environment configuration definition file for QUEUE jobs and submit jobs**

-Information about the job execution environment to set

Manager host name: manager\_host1

Name of a new agent to be added: agent\_host1  
agent\_host2

Name of a new queue to be added: queue1 (executes a job on manager\_host1)

queue2 (distributes and executes a job on agent\_host1 and agent\_host2)

File contents

<pre>\$agent \$a1 \$system exec_jobs 0000 0000 5 def_queue \$q1 max_jobs 100 warn_jobs 80 queue_ent open queue_exit open connect \$a1 1 \$end \$agent \$a2 agent_host1 exec_jobs 0000 0000 5 def_queue \$q2 max_jobs 100 warn_jobs 80 queue_ent open queue_exit open connect \$a2 1 \$end \$agent \$a3 agent_host2 exec_jobs 0000 0000 5 def_queue \$q3 max_jobs 100 warn_jobs 80 queue_ent open queue_exit open connect \$a3 1 \$end \$queue \$q101 queue1 max_jobs 100 warn_jobs 90 queue_ent open queue_exit open connect \$a1 1 \$end \$queue \$q102 queue2 max_jobs 100 warn_jobs 90 queue_ent open queue_exit open connect \$a2 1 connect \$a3 1 \$end</pre>	<div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px; margin-bottom: 10px;">                 Definition of the agent (execution host) on manager_host1             </div> <div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px; margin-bottom: 10px;">                 Definition of the agent (execution host) on agent_host1             </div> <div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px; margin-bottom: 10px;">                 Definition of the agent (execution host) on agent_host2             </div> <div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px; margin-bottom: 10px;">                 Queue definition of queue1. Sets an agent (execution host) in the connect statement. In this case, a job is executed on manager_host1.             </div> <div style="border-left: 1px solid black; border-right: 1px solid black; border-bottom: 1px solid black; padding: 5px;">                 Queue definition of queue2. Sets an agent (execution host) in the connect statement. In this case, a job is distributed and executed on agent_host1 and agent_host2.             </div>
--	---

2. Save the file you have edited.

3. Delete all files and temporary files from the database directory of the execution environment for QUEUE jobs and submit jobs.

Stop the JP1/AJS3 service, and then delete the files using the following commands:

- In Windows:

```
del database-directory-for-QUEUE-and-submit-jobs\*#1
```

```
del work-directory-for-manager-process-for-QUEUE-and-submit-jobs\M_JPQ*#2
```

- In UNIX:

```
rm database-directory-for-QUEUE-and-submit-jobs/*#1
```

```
rm work-directory-for-manager-process-for-QUEUE-and-submit-jobs/M_JPQ*#2
```

#1

The database directory of the execution environment for QUEUE jobs and submit jobs is the folder specified in the environment setting parameter `DatabasePath` in `[{JP1_DEFAULT|logical-host-name}\JP1NBQMANAGER\Database]`. For details about the `DatabasePath` environment setting parameter, see 2.3.2(3) *DatabasePath* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

#2

The work directory used by the manager process in the execution environment for QUEUE jobs and submit jobs is the folder specified in the environment setting parameter `WorkPath` in `[{JP1_DEFAULT|logical-host-name}\JP1NBQMANAGER\Process]`. For details about the `WorkPath` environment setting parameter, see 2.3.2(1) *WorkPath* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

4. Execute the `jpgimport` command.

The database is re-created, and the execution environment for QUEUE jobs and submit jobs is set up.

For the `jpgimport` command syntax and notes, see `jpgimport` in 3. *Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

## (b) Changing the execution environment for QUEUE jobs and submit jobs dynamically

Using commands such as `jpgagtadd` and `jpgqueadd`, you can add, delete, or change agents and queues while JP1/AJS3 is running. To add configuration definition information about the execution environment for QUEUE jobs and submit jobs dynamically, use the `jpgagtadd`, `jpgqueadd`, or `jpgresadd` command. To change the information dynamically, use the `jpgagtal` or `jpgquealt` command. For the syntax of each command, see 3. *Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

To add execution hosts (agents) using the `jpgagtadd` command, follow these steps:

1. Add an agent and set the maximum number of jobs it can execute concurrently.

Make sure that the host name of the agent you are adding can be resolved to an IP address. If you do not specify the maximum number of concurrent jobs, the default is `00:00-00:00=0` (no concurrent jobs, 24 hours a day). That is, no jobs can be executed. To enable jobs to be executed by the new agent, specify 1 or higher, or change the maximum number of concurrent jobs afterwards using the `jpgagtal` command. For an example of specifying the maximum number of concurrent jobs in the command's `-cp` option, see the notes following `jpgagtal` in 3. *Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

```
jpgagtadd -ah agent-host-name -cp maximum-number-of-concurrent-jobs
```

2. Open the entrance to the default queue.

When you create an agent, a default queue of the same name is created automatically. The entrance to the queue is closed immediately after an agent is added by the `jpgagtadd` command. You must therefore open the queue using the `jpgqueopen` command.

```
jpgqueopen -ah agent-host-name -en
```

3. Change the maximum number of jobs and the warning value for the default queue.

By default, the maximum number of jobs and warning value for a queue is set as 4,294,967,295. There is no need to change this value unless you need to limit the number of jobs being executed.

```
jpqqquealt -ah agent-host-name -mj maximum-number-of-jobs -wj job-count-  
warning-value
```

#### 4. Connect another agent to the queue and define its priority.

The agent you added with the `jpqqagtadd` command is connected to the default queue. Change the settings if you want to connect another agent to this queue to share the job processing. By connecting multiple agents and specifying their priorities, you can distribute jobs among the agents according to their specified priorities.

```
jpqqagmlink -ah agent-host-name -lh additional-agent-host-name -clp  
priority-of-additional-agent-host
```

#### 5. Check the settings.

Execute the `jpqqagtshow` and `jpqqqueshow` commands to make sure that the settings you performed in steps 1 to 4 are correct.

```
jpqqagtshow -ah agent-host-name  
jpqqqueshow -ah agent-host-name
```

## (2) Setting up the function for automatically reorganizing ISAM files (Windows host)

You can set up JP1/AJS3 - Manager so that the data files used by the physical host and logical hosts are automatically reorganized when the JP1/AJS3 service starts. This ISAM reorganization function is disabled by default at installation time.

To enable the ISAM reorganization function, copy the file `jp1ajs_spm�_pre.conf.model`, located in the environment-settings file storage folder, to the file `jp1ajs_spm�_pre.conf` in the same folder. Set the file's access permission so that it can be read with the JP1/AJS3 service account. The environmental setting file storage folders are as follows:

- Physical host  
`JP1/AJS3-Manager-installation-folder\conf`
- Logical host  
`shared-folder-specified-by-the-jajs_setup_cluster -command\jp1ajs2\conf`

With the ISAM reorganization function enabled, when the JP1/AJS3 service starts, the batch file `jpqqautocond.bat` in the folder `JP1/AJS3-Manager-installation-folder\bin` also starts. This batch file reorganizes the data files in the execution environment for QUEUE jobs and submit jobs.

The following message is output to the integrated trace log when the automatic reorganization of the ISAM files ends:

- When the reorganization ends normally  
KAVU5015-I
- When the reorganization ends abnormally  
KAVU5016-E

#### Cautionary note

To reorganize ISAM files, disk space equivalent to about twice the size of the largest ISAM file in the execution environment for QUEUE jobs and submit jobs must be available on the drive containing the work directory for the

physical host or logical host (work directory for manager process execution, specified in the environment setting parameter `WorkPath`).

In addition, free space of about the same size as the largest of the ISAM files is required on the drive containing the database directory of the execution environment for QUEUE jobs and submit jobs.

#### Supplementary note

`jpgqautocond.bat` executes a number of processes. It checks the validity of the ISAM files to be reorganized and ensures they can be recovered if reorganization fails (`Jischk`). It then extracts the data from each ISAM file to a work file (`Jisext`), recreates the file (`Jisconv`), and renames the file as the master file. If an error occurs in any of these processes, an error message is output to the reorganization log file shown below. Take corrective action, as indicated in the message.

For Windows Server 2012 or Windows Server 2008, if the installation folder is in the default folder or a folder protected by the system:

Physical host:

```
%ALLUSERSPROFILE%\Hitachi\JP1\JP1_DEFAULT\JP1AJS2\log\jpgqautocond[file-number].log
```

Logical host:

```
%ALLUSERSPROFILE%\Hitachi\JP1\JP1_DEFAULT\JP1AJS2\log  
\jpgqautocond_[logical-host-name][file-number].log
```

The default `%ALLUSERSPROFILE%` value is `system-drive\ProgramData`.

A *folder protected by the system* is the path to a folder in any of the following:

- `system-drive\Windows`
- `system-drive\Program Files`
- `system-drive\Program Files (x86)` (for 64-bit Windows)

For Windows Server 2012 or Windows Server 2008 in which an installation folder other than the above is used:

Physical host:

```
JP1/AJS3-Manager-installation-folder\log\jpgqautocond[file-number].log
```

Logical host:

```
JP1/AJS3-Manager-installation-folder\log\jpgqautocond_[logical-host-name][file-number].log
```

In Windows Server 2003:

Physical host:

```
JP1/AJS3-Manager-installation-folder\log\jpgqautocond[file-number].log
```

Logical host:

```
JP1/AJS3-Manager-installation-folder\log\jpgqautocond_[logical-host-name][file-number].log
```

*file-number* is a number between 1 and 4, representing the log file name.

When all four log files are full, they are reused, starting from the oldest file.

### (3) Setting up the function for automatically reorganizing ISAM files (UNIX host)

You can set up JP1/AJS3 - Manager so that the data files used by the physical host and logical hosts are automatically reorganized when the JP1/AJS3 service starts. This ISAM reorganization function is disabled by default at installation time.

To enable the ISAM reorganization function, copy the file `jp1ajs_spmd_pre.conf.model`, located in the directory for environment settings files, to the file `jp1ajs_spmd_pre.conf` in the same directory. The environmental setting file storage directories are as follows:

- Physical host  
`/etc/opt/jp1ajs2/conf`
- Logical host  
`shared--directory-specified-by-the-jajs_setup_cluster -command/jp1ajs2/conf`

With the ISAM reorganization function enabled, `jpqautocond` in the `/opt/jp1ajs2/bin` directory is activated. This script reorganizes the data files in the execution environment for QUEUE jobs and submit jobs.

The following message is output to the integrated trace log when the automatic reorganization of the ISAM files ends:

- When the reorganization ends normally  
KAVU5015-I
- When the reorganization ends abnormally  
KAVU5016-E

#### Cautionary note

To reorganize ISAM files, disk space equivalent to about twice the size of the largest ISAM file in the execution environment for QUEUE jobs and submit jobs must be available in the partition containing the work directory for the physical host or logical host (work directory for execution of the manager process, specified in the environment setting parameter `WorkPath`).

In addition, free space of about the same size as the largest of the ISAM files is required in the partition containing the database directory of the execution environment for QUEUE jobs and submit jobs.

#### Supplementary note

The `jpqautocond` script executes a number of processes. It checks the validity of the ISAM files to be reorganized and ensures they can be recovered if reorganization fails (`Jischk`). It then extracts the data from each ISAM file to a work file (`Jisext`), recreates the file (`Jisconv`), and renames the file as the master file. If an error occurs in any of these processes, an error message is output to the reorganization log file shown below. Take corrective action, as indicated in the message.

#### Physical host

Error messages are output to the following log file:

```
/var/opt/jp1ajs2/log/schedule/jpqautocond[file-number].log
```

*file-number* is a number between 1 and 4, representing the log file name.

When all four log files are full, they are reused, starting from the oldest file.

#### Logical host

Error messages are output to the following log file:



```
network|ajsnetwd.exe||0|3|3|21600|0|0||1|||||||
submitqueue|jppqman.exe||0|3|3|21600|0|0|network|1|||||||
```

(5) Edit *JP1/AJS3-installation-folder*\conf\jplajs\_agtd.conf so that it contains the following line only:

```
queuea|jppqmon.exe|||1800|
```

When writing these parameters, do not create any blank lines (or lines of spaces only).

## (5) Restricting JP1/AJS3 - Manager to the registration and operation of submit jobs (UNIX host)

JP1/AJS3 - Manager can be restricted solely to the registration and operation of submit jobs by job execution control commands, rather than the performance of job operations based on jobnets. To use JP1/AJS3 - Manager in this way, you must change the following JP1/AJS3 definition files:

- jplajs\_spm�.conf
- jplajs\_service\_0700.conf
- jplajs\_hstd.conf
- jplajs\_hstd\_0700.conf
- jplajs\_agtd.conf

To edit these definition files:

### 1. Stop JP1/AJS3.

Execute the following commands to stop the JP1/AJS3 processes and to check that all processes have stopped:

```
# /etc/opt/jplajs2/jajs_stop
# /opt/jplajs2/bin/jajs_spm�_status
```

### 2. Using a text editor such as vi, edit the following files.

(1) Edit /etc/opt/jplajs2/conf/jplajs\_spm�.conf so that it contains the following lines only:

```
jajs_hstd|/opt/jplajs2/bin/jajs_hstd|||1800|
jajs_agtd|/opt/jplajs2/bin/jajs_agtd|||1800|
```

(2) Change the following line in /etc/opt/jplajs2/conf/jplajs\_service\_0700.conf.

Change from:

```
jajs_hstd|/opt/jplajs2/bin/jajs_hstd||0|3|3|21600|0|0|jajs_dbmd|1|||||||
```

Change to:

```
jajs_hstd|/opt/jplajs2/bin/jajs_hstd||0|3|3|21600|0|0||1|||||||
```

(3) Edit /etc/opt/jplajs2/conf/jplajs\_hstd.conf so that it contains the following lines only:

```
ajsnetwd|/opt/jplajs2/bin/ajsnetwd|||1800|
jppqman_hst|/opt/jplajs2/bin/jppqman|||1800|
```

(4) Change the following line in /etc/opt/jplajs2/conf/jplajs\_hstd\_0700.conf.

Change from:



By default, the database for QUEUE jobs and submit jobs uses synchronous write mode. This mode guarantees the sequence in which data is written to the database, thereby increasing reliability. For details about setting the write mode for updating ISAM files, see *2.3 Setting up the job execution environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

#### Cautionary note

Do not create any direct symbolic links to the ISAM files in the database for QUEUE jobs and submit jobs. Symbolic links are destroyed when ISAM files are moved or recreated during database reorganization, resulting in new ISAM files being created in the database directory.

Because the files in the database directory are managed by the directory in which they are stored, specify the database directory if you need to create a symbolic link.

Consider the following when using QUEUE jobs and submit jobs:

- Optional settings for the ISAM database
- Troubleshooting the ISAM database
- Maintaining the ISAM database

## (1) Optional settings for the ISAM database

Set the following options as required:

- Synchronous write mode
- Automatic reorganization of the ISAM database

### (a) Synchronous write mode

Data can be written to the ISAM database in either synchronous or asynchronous write mode. Asynchronous write mode enhances performance, but data files and key files might become inconsistent if a failover occurs. To protect data during a failover when using a cluster system, we recommend that you set synchronous write as the ISAM write mode. Synchronous write mode maintains data consistency by following the order in which the data is written by JP1/AJS3, so that inconsistencies do not arise among the database tables. However, even in synchronous write mode, files can still be corrupted by a power outage while the OS is writing to the disk.

If you are using the ISAM database and file consistency is the only issue, you can fix any inconsistencies by reorganizing the database. However, depending on the timing, it might not be possible to recover from a disk error or file error caused by a power outage, whichever write mode is set. Bearing these points in mind, consider backing up the execution environment definition for QUEUE jobs and submit jobs from time to time.

### (b) Automatic reorganization of the ISAM database

The ISAM database features an automatic reorganization function. You can choose whether to automatically reorganize the database of the execution environment for QUEUE jobs and submit jobs when the JP1/AJS3 service starts. If you do not enable this function, processing performance will gradually deteriorate over time, due to the growing unavailable areas and fragmentation of variable-length tables in the database. Enable the ISAM automatic reorganization function for this reason. For the procedure, see *7.1.2(2) Setting up the function for automatically reorganizing ISAM files (Windows host)* or *7.1.2(3) Setting up the function for automatically reorganizing ISAM files (UNIX host)*.

If you are using a cluster system, we recommend that you enable automatic reorganization of the ISAM database so that recovery can be performed when JP1/AJS3 starts. In the event of a failover (switching of work task processing from the active server to a standby server), the database will need to be reorganized to restore the data and index pages if inconsistencies arise due to the timing of the failover. However, because files are reorganized one by one, as the number of execution results kept for QUEUE jobs and submit jobs continues to grow, the database can take a long time to

reorganize and JP1/AJS3 services might take longer to start. Repeated failovers are typical of a cluster system, so you must adjust the start timeout value set in the cluster software. The time required for ISAM reorganization is proportional to the actual number of records. If adjusting the cluster software's start timeout is not possible, perform settings to prevent ISAM files from becoming excessively large (for example, change the number of days that job information is kept) so as to shorten the reorganization time.

Disable automatic reorganization of the ISAM database if you want JP1/AJS3 services to start quickly at all times and you plan to reorganize the ISAM database manually.

### **Important note**

To reorganize the ISAM database, disk space equivalent to about twice the size of the largest ISAM file in the execution environment for QUEUE jobs and submit jobs must be available on the drive containing the work directory for the physical host or logical host (work directory for execution of the manager process, specified in the `WorkPath` environment settings parameter). In addition, free space of about the same size as the largest of the ISAM files to be reorganized is required on the drive containing the database directory of the execution environment for QUEUE jobs and submit jobs.

## **(2) Troubleshooting the ISAM database**

The ISAM database needs to be recreated if an error occurs. For details about how to perform a status check and recreate the ISAM database, see *2.12 Troubleshooting problems related to invalid ISAM files* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

## **(3) Maintaining the ISAM database**

The following describes how to run a JP1/AJS3 system continuously over a long period using the JP1/AJS3 maintenance mode. Maintenance mode allows you to reorganize the ISAM database without interrupting active work tasks.

To perform maintenance in maintenance mode, execute the `jajs_maintain` command at a time when few work tasks are being executed.

An example of `jajs_maintain` execution is as follows:

```
jajs_maintain -m manager
```

For the command syntax, see `jajs_maintain` in *3. Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

See also *(c) Notes on maintenance mode*.

The maintenance mode provided by JP1/AJS3 temporarily disables some of the system's functionality.

Because its functionality is partially disabled, the system runs in a degenerated state, but still continues operation. If the functionality disabled by maintenance mode is accessed while the system is degenerated, the function is executed after the system is restored without resulting in an error.

The purpose and types of maintenance mode are described next.

### **(a) Purpose of maintenance mode**

After placing JP1/AJS3 in maintenance mode, you can reorganize the ISAM database.

Suppose you are executing 10,000 jobs per day with the ISAM database, and need to perform maintenance about once a year. With twice as many jobs (20,000 per day), the reorganization frequency is doubled (once every six months). The greater the number of jobs being executed, the more often maintenance is required, with a corresponding increase in administrative time and costs.

In previous versions that did not offer a maintenance mode, you had to stop the system to reorganize the database, and start it again afterwards. Now, using the JP1/AJS3 maintenance mode, you can perform maintenance simply by placing the system temporarily in a degenerated state. Also, the `jajs_maintain` command can be scheduled for automatic execution by JP1/AJS3, allowing long-term system operation with maintenance performed transparently. For details about the `jajs_maintain` command, see *jajs\_maintain* in *3. Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

You can also perform maintenance by gradually stopping just the manager functionality of JP1/AJS3 - Manager. In this mode, JP1/AJS3 - Manager denies requests to the manager process of the job execution control for QUEUE jobs and submit jobs, including job execution requests from other hosts and requests executed by the `jpqjjobs` command. Information about active jobs is not lost, however, because changes in job statuses can still be retained by the execution control agent for QUEUE jobs and submit jobs. When performing maintenance in this manner, choose a time when just a few jobs are being executed because the amount of memory used in accumulating unsent job status notifications between the manager and agent increases in proportion to the number of jobs.

Although all processes that access the database stop during maintenance, the execution control for QUEUE jobs and submit jobs starts again as soon as the reorganization is completed.

## (b) Estimating how often to perform maintenance

With the database for QUEUE jobs and submit jobs, job execution performance drops by about 20% after approximately four million jobs have been executed with the JP1/AJS3 service running continuously.

If you are executing 10,000 jobs per day, you will need to reorganize the ISAM files about once a year. With twice as many jobs (20,000 per day), the reorganization frequency is doubled (once every six months). Using these figures as a guideline, monitor unused areas in the files, and estimate when maintenance will be required.

Note that periodically reorganizing the database is unnecessary in maintenance mode if you use the function for automatically reorganizing ISAM files when the JP1/AJS3 service starts.

## (c) Notes on maintenance mode

Some JP1/AJS3 functions are disabled while the system is in a degenerated state in maintenance mode. When using maintenance mode, bear in mind your operating environment and determine the best time for performing maintenance.

### ■ Maintenance mode and restrictions on user operations

The following table shows the restrictions on user operations while JP1/AJS3 is in maintenance mode.

Table 7-2: Maintenance mode and restrictions on user operations

User operation	Whether the operation can be performed
Execution of a QUEUE job from JP1/AJS3 - View <sup>#1</sup>	No
Execution of commands used at setup	Yes
Execution of commands for customizing the environment	No <sup>#1</sup>
Execution of commands for controlling JP1/AJS3	No <sup>#2</sup>
Execution of commands for operating on units	Yes

User operation	Whether the operation can be performed
Execution of commands for executing jobs	Yes
The command that operate embedded database	Yes
The command used for the time of an error	Yes
The command used by special operation	No <sup>#3</sup>

**Legend:**

Yes: Can be performed.

No: Cannot be performed.

**Note**

The "User operation" in this table corresponds to classification of the command indicated on *1.5 Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

**#1**

The command besides the `jpqdbcond` command can be used. When execute a QUEUE job during degeneration, a job will be start failure. Message KAVU0218-E is shown to the Execution result details dialogue box, which is JP1/AJS3 - View at this time.

**#2**

It can be used besides `jajs_stop` command, `jajs_stop.cluster` command, `jajs_spmd_stop` command and `jajs_killall.cluster` command.

**#3**

The commands can be used besides the command used by the QUEUE job and the submit job execution environment. When execute a QUEUE job during degeneration, a job outputs message KAVU4500-W and message KAVU0218-E in integrated trace log, and ends abnormally.

Do not attempt the operations marked *No* in the above table.

For details about the commands for performing user operations, see *1.5 Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

**■ Maintenance mode and restrictions on linkage with another host or system**

The following table shows the restrictions on operations that link with JP1/AJS3 on another host or with another system while JP1/AJS3 is in maintenance mode.

**Table 7-3: Maintenance mode and restrictions on linkage with another host or system**

Operation that links with another host or system	Whether the operation can be performed
Execution of a QUEUE job by JP1/AJS3 on another host <sup>#</sup>	No
Job execution by another system (JP1/NQSEXEC or JP1/OJE, for example)	No
Execution of a remote jobnet transferred to another host <sup>#</sup>	No
Execution of a remote jobnet transferred from another host	No

**Legend:**

No: Cannot be performed.

#

Do not place JP1/AJS3 in maintenance mode on the local host from the time the remote jobnet starts until it ends.

Because the remote host or system cannot recognize that the linked host is in maintenance mode, the job enters the *Ended abnormally* status. Make sure you choose an appropriate time to perform maintenance.

#### **(4) Notes on the database (ISAM files) for QUEUE jobs and submit jobs**

- The JP1/AJS3 ISAM files might become inconsistent if the JP1/AJS3 service stops due to a system error or other problem during execution of a jobnet or job. This occurs if the contents of cache memory were not written to the disk when JP1/AJS3 stopped. If you restart the service with inconsistent ISAM files, operations on the interrupted jobnet are not guaranteed. When a system error interrupts service processing, make sure that you reorganize the ISAM files before you restart JP1/AJS3. If the database reorganization fails, recreate the ISAM files or cold-start JP1/AJS3.

- The ISAM files used by JP1/AJS3 need to be reorganized during operation.

Because performance gradually deteriorates over time when using a database with variable-length tables, plan to reorganize the database when four million jobs have been executed.

In addition, monitor the JPQJOBINFO.K02 file in the database of the execution environment for QUEUE jobs and submit jobs to ensure it does not exceed 20 megabytes.

If you continue running the system past this point without reorganizing the database, performance could rapidly deteriorate.

For details about reorganizing the ISAM database, see *10.3 Reorganizing a database when QUEUE jobs and submit jobs are used* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

- The data files that store the tables in the ISAM database used by JP1/AJS3 cannot exceed 2 gigabytes in size.

The size of the ISAM data files depends on how many records are stored in the tables at peak times.

Some tables tend to become particularly large during job processing. You can control the size of these files as recommended below.

Note that various problems could occur when the file size increases to nearly 2 gigabytes. Performance is likely to decline due to the increase in disk I/O operations, and there might not be enough disk space to reorganize the files. Consider reducing the number of records to keep files as small as possible.

- JPQJOBINFO table in the database of the execution environment for QUEUE jobs and submit jobs

For standard configurations, less than 200,000 records can be stored.

For compatible ISAM configurations, a maximum of approximately 360,000 records can be stored. This table affects job start performance more than any other. Keep the amount of data in the table to around 200,000 records to prevent any decline in performance.

The total number of records in the JPQJOBINFO table is the number of jobs processed during the number of days set for retaining job execution information. If you set a short retention period, files are less likely to get too large.

#### **7.1.4 Estimating the size of the logs output by the execution environment for QUEUE jobs and submit jobs**

There is no real need to estimate the size of the log files output in the execution environment for QUEUE jobs and submit jobs unless the number of jobs executed per day exceeds 10,000. If the number of jobs is less than this number, you can use the default. If more than 10,000 jobs are executed everyday, we recommend that you estimate the size of the logs.

Determine both the size and number of log files for each type of log. Then define the values you have estimated using the `jajs_config` command.

For the environment setting parameter for submitting jobs in [3.4.6 Estimating the size of the logs output by execution](#), execute the following command, and then restart JP1/AJS3:

```
jajs_config -k definition-key-name "environment setting parameter-  
name"=definition-contents  
["environment setting parameter-name-2"=definition-contents-2]
```

Only one definition key can be specified in *definition-key-name*. If you want to set environment setting parameter different in a definition keys, you must execute the `jajs_config` command for each definition key.

## 7.1.5 Environment settings for executing QUEUE jobs and submit jobs

The environment settings (environment setting parameters) for executing QUEUE jobs and submit jobs are set in the job execution environment settings file (`AJS3_Queue.conf`).

For details about the environment setting parameters, see [2.3 Setting up the job execution environment](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

For the setting procedure, see [4.2 Environment setting parameter settings](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or [14.2 Environment setting parameter settings](#) in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

## 7.1.6 Setting the assumed JP1 user function

In JP1/AJS3, the user name *JP1 user* is used for managing access privileges. Each OS user (a user who executes jobs) is mapped to specific JP1 users. This means that execution requests from hosts other than those defined in the user mapping will be denied.

Under JP1/AJS3's user management scheme, each OS user must be individually mapped to one or more JP1 users. If non-specific OS users will be using JP1/AJS3, each OS user will need to be mapped to a JP1 user, increasing the administrator's workload.

To lessen the task of user mapping, JP1/AJS3 provides a *assumed JP1 user function* that maps OS users to a single default JP1 user, allowing unmapped OS users to operate JP1/AJS3 with the access privileges of the default JP1 user. (But if an OS user executing a job is registered as a JP1 user, the privileges of that JP1 user still apply.) The assumed JP1 user function can be used when executing commands available in an execution environment for JP1/AJS3 QUEUE jobs and submit jobs. For details about these commands, see [1.5.9\(2\) Commands available in an execution environment for queue or submit jobs](#) in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

The following describes how to set up the assumed JP1 user function, and provides cautions on usage.

### (1) Setting procedure (Windows)

1. Set user information in JP1/Base.

For details about how to set user information, see *3.1.1(1) Setting user information* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

2. Execute the `jpqregguestuser` command.

Set the JP1 user registered in step 1 as the default JP1 user.

For the command syntax, see *jpqregguestuser* in *2. Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

3. Restart JP1/AJS3.

The definition takes effect.

This completes setup of the assumed JP1 user function.

The `jpqregguestuser` command is also used when clearing the assumed JP1 user function setting.

## (2) Setting procedure (UNIX)

1. Stop JP1/AJS3.

Execute the following commands to stop the JP1/AJS3 processes and to check that all processes have stopped:

```
# /etc/opt/jplajs2/jajs_stop#1
# /opt/jplajs2/bin/jajs_spmd_status
```

#1

First check whether the JP1/AJS3 processes are set to stop automatically.

2. Set user information in JP1/Base.

For details about how to set user information, see *13.1.1(1) Setting user information* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

3. Execute the `jpqregguestuser` command.

Set the JP1 user registered in step 2 as the default JP1 user.

For the command syntax, see *jpqregguestuser* in *2. Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

4. Restart JP1/AJS3.

The definition takes effect.

This completes setup of the assumed JP1 user function.

The `jpqregguestuser` command is also used when clearing the assumed JP1 user function setting.

## (3) Notes

- Only one default JP1 user can be set per JP1/AJS3 - Manager host.
- For the JP1 user defined as the default JP1 user, set user mapping and the JP1 permission level in the same manner as for ordinary JP1 users.

When setting the JP1 permission level, make sure that:

- The permission level allows all potential operations.
- The operating environment cannot be corrupted by user errors.
- In a cluster system, execute the `jpqregguestuser` command on both the active and standby hosts.

For the `jpqregguestuser` command syntax, see *jpqregguestuser* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

## 7.1.7 Method of determining the agent host to which a job is distributed

To distribute QUEUE jobs or submit jobs when multiple agent hosts have the same priority and agent usage rate, use a job distribution method that selects the execution agent that has not been used for the longest time. This method is effective for distributing jobs more evenly.

To set the method for determining which agent host to distribute QUEUE jobs and submit jobs to, follow the procedure below.

There is no need to perform this setting for queueless jobs.

### (1) Setting procedure

#### 1. Stop JP1/AJS3.

In Windows:

From **Administration Tools** in the Windows **Control Panel**, choose **Services** and stop the following service:  
- JP1/AJS3 service

In UNIX:

Execute the following commands to stop the JP1/AJS3 processes and to check that all processes have stopped:

```
# /etc/opt/jplajs2/jajs_stop#1  
# /opt/jplajs2/bin/jajs_spmd_status
```

#1

First check whether the JP1/AJS3 processes are set to stop automatically.

#### 2. Execute the following command to set the environment setting parameter described in (2) below.

```
jajs_config -k definition-key-name "parameter-name"=definition-contents
```

#### 3. Restart JP1/AJS3.

The setting takes effect.

### (2) Environment setting parameter

Table 7-4: Environment setting parameter for setting the method of determining the agent host for distributed jobs

Definition key	Environment setting parameter	Definition contents
[{JP1_DEFAULT  <i>logical-host-name</i> } \JP1NBQMANAGER\Agent]#	"LeastRecentlyUsed"=	Method of determining the distribution-destination agent host

#

In the portion {JP1\_DEFAULT|*logical-host-name*}, specify JP1\_DEFAULT for the physical host, or *logical-host-name* for a logical host.

## 7.1.8 Option for deleting job information asynchronously

In JP1/AJS3, jobs that have been kept for longer than the set retention period are deleted from the ISAM database used for job execution. Deletion is performed when JP1/AJS3 starts, or at the base time for deleting job information. The data file update mode is normally set as synchronous. In synchronous mode, although updates take longer due to the frequent disk I/O operations, the data is more reliable because the buffer contents in memory are written to the disk every time JP1/AJS3 finishes a write process. Executing jobs in parallel with JP1/AJS3 write processing might affect job execution performance. If job information is kept one day or longer, set the base time for deleting job information at a time when just a few jobs are being executed.

If you cannot predict when just a few jobs will be executed, set the option below to quickly delete job information asynchronously. When job information is deleted asynchronously, buffer contents are written to the disk using the OS buffering. Because this write process is not synchronized with JP1/AJS3 processing, there are fewer disk I/O operations and less effect on job performance when deletion processing is performed in parallel with job execution. With a RAID system, however, the gain in performance might not be great. Also, with asynchronous deletion, inconsistencies can easily arise between the information managed in memory and the information written to disk. The lower reliability therefore makes this option unsuitable for cluster configurations. Before using this option, carefully consider the environment in which it will be used.

This option for deleting job information asynchronously is valid only when the data file update mode is set as synchronous.

The procedure for setting this option is as follows.

### (1) Setting procedure

#### 1. Stop JP1/AJS3.

In Windows:

From **Administration Tools** in the Windows **Control Panel**, choose **Services** and stop the following service:  
- JP1/AJS3 service

In UNIX:

Execute the following commands to stop the JP1/AJS3 processes and to check that all processes have stopped:

```
# /etc/opt/jplajs2/jajs_stop#1  
# /opt/jplajs2/bin/jajs_spmd_status
```

#1

First check whether the JP1/AJS3 processes are set to stop automatically.

#### 2. Execute the following command to set the environment setting parameter described in (2) below.

```
jajs_config -k definition-key-name "environment setting parameter-  
name"=definition-contents
```

#### 3. Restart JP1/AJS3.

The setting takes effect.

## (2) Environment setting parameter

Table 7-5: Environment setting parameter for setting the option for deleting job information asynchronously

Definition key	Environment setting parameter	Definition contents
[{JP1_DEFAULT  <i>logical-host-name</i> }\JP1NBQMANAGER\Database]#	"DeleteFlashOption"=	Option for deleting job information asynchronously

#

In the portion {JP1\_DEFAULT|*logical-host-name*}, specify JP1\_DEFAULT for the physical host, or *logical-host-name* for a logical host.

### 7.1.9 Setting the retention period for job information

When 0 is set as the number of days to retain job information, job information is deleted 10 minutes after a job ends. If the job execution command is used to execute jobs, or if the job execution result is not checked at termination even for jobs executed from a jobnet, setting the retention period to 0 days ensures that job information about completed jobs is always deleted, which helps to keep the amount of stored information from increasing too much. Thus, at the base time for deleting job information, large numbers of jobs do not have to be deleted all at once. The 0 setting is also effective in environments where it is difficult to estimate a good base time for deleting job information, such as in a system that executes jobs round the clock or in an irregular pattern. For jobs executed from a jobnet, however, the status reporting process checks the job status at termination. If status reporting fails due to a communication error, the status reporting process monitors the status of the job at 5-minute polling intervals. Any job information deleted during this interval cannot be referenced, and the job is assumed to have ended abnormally.

You can handle such errors by setting the option below to change the length of time that job information is kept after a job ends. This setting is valid only when the retention period for job information is set to 0 days.

The following describes the procedure for setting how long to keep job information after a job ends when the retention period for job information is set to 0 days.

#### (1) Setting procedure

##### 1. Stop JP1/AJS3.

In Windows:

From **Administration Tools** in the Windows **Control Panel**, choose **Services** and stop the following service:  
- JP1/AJS3 service

In UNIX:

Execute the following commands to stop the JP1/AJS3 processes and to check that all processes have stopped:

```
# /etc/opt/jplajs2/jajs_stop#1  
# /opt/jplajs2/bin/jajs_spmd_status
```

#1

First check whether the JP1/AJS3 processes are set to stop automatically.

##### 2. Execute the following command to set the environment setting parameter described in (2) below.

```
jajs_config -k definition-key-name "environment setting parameter-  
name"=definition-contents
```

- 3. Restart JP1/AJS3.  
The setting takes effect.

## (2) Environment setting parameter

Table 7-6: Environment setting parameter for setting the retention period for job information

Definition key	Environment setting parameter	Definition contents
{JP1_DEFAULT   logical-host-name} \JP1NBQMANAGER\Database}#	"PreserveMinute"=	Retention period for job information

#  
In the portion {JP1\_DEFAULT | logical-host-name}, specify JP1\_DEFAULT for the physical host, or logical-host-name for a logical host.

### 7.1.10 Setting for disabling deletion of job information when JP1/AJS3 starts

Job information deletion processing is executed either at the base time for deleting job information, which is specified in the environment settings, or when the JP1/AJS3 service starts. When a base time is used, job information is deleted if it has been kept longer than the set number of days at the base time. When deletion is timed with JP1/AJS3 service startup, job information is deleted if it has been kept longer than the set number of days at the start time. If a failover occur in a cluster configuration while a large number of jobs are being executed, or if the JP1/AJS3 service is restarted due to a system error or other issue, job execution performance might decline due to the conflict with job deletion processing.

By using either of the following options to disable the deletion of job information when the JP1/AJS3 service starts, you can avoid conflict between deletion processing and job execution:

- Delete expired job information when JP1/AJS3 starts, using the base time as the reference point  
When you use this option, job information that has been kept longer than the set number of days at any point between the base time and start time is not deleted when the JP1/AJS3 service starts. However, if the JP1/AJS3 service was stopped at the previous base time and deletion processing was not performed, expired job information might still remain in the database. Only this expired job information will be deleted the next time JP1/AJS3 starts.  
By electing to delete expired job information at the base time without stopping the JP1/AJS3 service, you can prevent job information from being deleted when the JP1/AJS3 service starts.
- Disable deletion of job information when JP1/AJS3 starts  
This option disables deletion of job information when the JP1/AJS3 service starts.  
When you resume JP1/AJS3 operation after a long period of inactivity, there might be a large amount of expired job information to be deleted. In this case, the successive I/O requests generated by the deletion process on ISAM files when the JP1/AJS3 service starts could slow the execution of jobs immediately after service startup.  
With this option set, job information is deleted only at the base time, not at service startup. This prevents adverse effects on the execution performance of jobs executed immediately after the JP1/AJS3 service starts. Do not use this option, however, if your system is set up to stop the JP1/AJS3 service at the base time for deleting job information.

If you use this option with the JP1/AJS3 service set to stop at the base time for deleting job information, expired job information will accumulate over time, and the job execution environment database will occupy more and more space on the disk. An increase in the disk space occupied by the job execution environment database can have various effects, including preventing the JP1/AJS3 service from starting and jobs from being executed, and can even affect programs other than JP1/AJS3.

The following describes how to disable deletion of job information at JP1/AJS3 service startup when the retention period for job information is set as one day or longer.

## (1) Setting procedure

### 1. Stop JP1/AJS3.

In Windows:

From **Administration Tools** in the Windows **Control Panel**, choose **Services** and stop the following service:

- JP1/AJS3 service

In UNIX:

Execute the following commands to stop the JP1/AJS3 processes and to check that all processes have stopped:

```
# /etc/opt/jp1ajs2/jajs_stop#1
# /opt/jp1ajs2/bin/jajs_spmd_status
```

#1

First check whether the JP1/AJS3 processes are set to stop automatically.

### 2. Execute the following command to set the environment setting parameter described in (2) below.

```
jajs_config -k definition-key-name "environment setting parameter-
name"=definition-contents
```

### 3. Restart JP1/AJS3.

The setting takes effect.

## (2) Environment setting parameter

Table 7-7: Environment setting parameter for disabling deletion of job information when the JP1/AJS3 service starts

Definition key	Environment setting parameter	Definition contents
[{JP1_DEFAULT logical-host-name} \JP1NBQMANAGER\Database]#	"StartUpDelete"=	Setting to disable the deletion of job information at JP1/AJS3 service startup

#

In the portion {JP1\_DEFAULT|logical-host-name}, specify JP1\_DEFAULT for the physical host, or logical-host-name for a logical host.

## (3) Setting for disabling deletion of job information when JP1/AJS3 starts and its effects

The following table shows the relationship between the disabling deletion of job information when JP1/AJS3 starts, and whether deletion processing is performed.

Table 7-8: Relationship between the setting for disabling deletion of job information when JP1/AJS3 starts, and whether deletion processing is performed

Setting for disabling deletion of job information at JP1/AJS3 startup	Deletion of job information at JP1/AJS3 startup	Time for deleting job information
0	Yes <sup>#</sup>	Base time
1	Yes	Start time of JP1/AJS3 service
2	No	--

Legend:

Yes: Deletion processing is performed.

No: Deletion processing is not performed.

--: Not applicable.

#

Job information is not deleted when the JP1/AJS3 service starts if deletion took place at the preceding base time.

## 7.1.11 Setting for preventing changes in the submit job execution order

The following describes the setup for preventing any change in the execution order of submit jobs.

### (1) Setting procedure

1. Stop JP1/AJS3.

In Windows:

From **Administration Tools** in the Windows **Control Panel**, choose **Services** and stop the following service:  
 - JP1/AJS3 service

In UNIX:

Execute the following commands to stop the JP1/AJS3 processes and to check that all processes have stopped:

```
# /etc/opt/jp1ajs2/jajs_stop#1
# /opt/jp1ajs2/bin/jajs_spmd_status
```

#1

First check whether the JP1/AJS3 processes are set to stop automatically.

2. Execute the following command to set the environment setting parameter described in (2) below.

```
jajs_config -k definition-key-name "environment setting parameter-  
name"=definition-contents
```

3. Restart JP1/AJS3.

The setting takes effect.

## (2) Environment setting parameter

Table 7-9: Environment setting parameter for preventing changes in the submit job execution order

Definition key	Environment setting parameter	Definition contents
{JP1_DEFAULT   <i>logical-host-name</i> } \JP1NBQMANAGER\Job] #	"PreventChangeJobOrder"=	Setting to prevent changes in the submit job execution order

#

In the portion {JP1\_DEFAULT | *logical-host-name*}, specify JP1\_DEFAULT for the physical host, or *logical-host-name* for a logical host.

### 7.1.12 Setting to reduce memory usage by the job execution control manager (jppqman) when enumerating job information

When the job execution manager (jppqman) enumerates job information, memory usage is proportional to the number of listed items. With more items added, the following commands sometimes fail and message KAVU4280-E is output to the integrated trace log. If this happens, you might need to perform a setting to reduce the amount of memory used by the job execution control manager when enumerating job information.

- jppqjobshow command
- jppqendjobshow command

The procedure for reducing memory usage by the job execution control manager when enumerating job information is as follows.

#### (1) Setting procedure

1. Stop JP1/AJS3.

In Windows:

From **Administration Tools** in the Windows **Control Panel**, choose **Services** and stop the following service:  
- JP1/AJS3 service

In UNIX:

Execute the following commands to stop the JP1/AJS3 processes and to check that all processes have stopped:

```
# /etc/opt/jplajs2/jajs_stop#1  
# /opt/jplajs2/bin/jajs_spmd_status
```

#1

First check whether the JP1/AJS3 processes are set to stop automatically.

2. Execute the following command to set the environment setting parameter described in (2) below.

```
jajs_config -k definition-key-name "environment setting parameter-  
name"=definition-contents
```

3. Restart JP1/AJS3.

The setting takes effect.

## (2) Environment setting parameter

Table 7-10: Environment setting parameter for reducing memory usage by the job execution control manager (jppqman) when enumerating job information

Definition key	Environment setting parameter	Definition contents
[ { JP1_DEFAULT   <i>logical-host-name</i> } \JP1NBQMANAGER\Job]#	"EnumJobSaveMemory"=	Setting to reduce memory usage by the job execution control manager when enumerating job information

#

In the portion { JP1\_DEFAULT | *logical-host-name* }, specify JP1\_DEFAULT for the physical host, or *logical-host-name* for a logical host.

## 7.2 Considerations when using queueless jobs

---

When using queueless jobs, consider the following:

- The size of the output log files
- The environment settings for executing queueless jobs

### 7.2.1 Estimating log file sizes

Estimate the size of the JP1/AJS3 log files for queueless jobs. When an error occurs, this log file information is used to investigate what operation or process caused the error. If the required information has not been kept, identifying the cause will take longer. Estimate the size of the log files as exactly as you can, according to how and what sort of job processing your system performs.

When using queueless jobs, estimate the size of the following log files:

- Queueless log file
- Queueless trace log file
- Internal execution log file for queueless jobs

#### (1) Estimating the size of the queueless log file

A queueless log file contains log entries output by the queueless jobs executed by an agent. Queueless log files are used primarily to monitor the execution of work tasks.

The disk space required for a queueless log file depends on how many queueless jobs are executed by the agent. Estimate the appropriate log file size and change the default disk space if necessary. For details on the default disk space and maximum disk area used by queueless log files, see *1.2.4 List of log files and directories* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

Use the following formula to estimate the size of a queueless log file:

Size of a queueless log file (in bytes) = (60 + *length-of-manager-host-name* + *length-of-scheduler-service-name* + *length-of-job's-full-name* + *length-of-agent-host-name*) x 2 x *number-of-jobs-to-save*

For details about increasing the size of the queueless log file, see *3.5.1 Extending trace log files* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *13.4.4 Extending trace log files* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

#### (2) Estimating the size of the queueless trace log file

A queueless trace log contains traces output by queueless jobs and by commands related to the queueless job execution control. Queueless trace logs are used primarily to investigate the cause of a problem or to calculate how long a process took.

In the initial state, the queueless trace log file is set as follows.

Path:

In Windows Server 2012 or Windows Server 2008:

```
%ALLUSERSPROFILE%\Hitachi\JP1\JP1_DEFAULT\JP1AJS2\log\tracelog.q1
```

In other Windows versions:

```
JP1/AJS3-installation-folder\log\tracelog.q1
```

In UNIX:

```
/var/opt/jplajs2/log/tracelog.q1
```

Size:

Large enough for the traces output by approximately 10,000 jobs (specifically, 15 megabytes (15,360 kilobytes)).

Estimate an appropriate size for the trace log file and increase its size as needed. However, when you use only the queueless job manager function, you do not need to estimate the file size.

Use the following formula to estimate the size of a queueless trace log file:

Size of a queueless trace log file (in kilobyte) =  $3,072 \times (\text{number-of-jobs-executed-from-the-time-a-problem-occurs-until-data-can-be-collected} / 2,000)$

Example: Store one day's worth of queueless trace log entries.

- If 12,000 jobs are executed per day

Size of the queueless trace log file =  $3,072 \times (12,000 / 2,000) = 18,432$  kilobytes

For details about increasing the size of the queueless trace log file, see 3.5.1(2) *Extending the queueless trace log file* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or 13.4.4(2) *Extending the queueless trace log file* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

### (3) Estimating the size of the internal execution logs for queueless jobs

The internal execution log files for queueless jobs contain traces output by queueless jobs.

In the initial state, the internal execution log files for queueless jobs are set as follows.

Path

In Windows:

```
JP1/AJS3-installation-folder\log\ajsqlxeclog#1  
JP1/AJS3-installation-folder\log\ajsqlxeclog_ftp#2
```

In UNIX:

```
/var/opt/jplajs2/log/ajsqlxeclog#3  
/var/opt/jplajs2/log/ajsqlxeclog_ftp#2
```

#1

In a cluster configuration, the file name is:

```
JP1/AJS3-installation-folder\log\ajsqlxeclog-[logical-host-name]
```

*logical-host-name* is truncated after the 30th byte if the file name exceeds 255 bytes.

#2

Created in JP1/AJS3 - Manager only.

#3

In a cluster configuration, the file name is:

```
/var/opt/jplajs2/log/ajsqlxeclog-[logical-host-name]
```

*logical-host-name* is truncated after the 30th byte if the file name exceeds 255 bytes.

## Size

For the `ajsqlxeclog` file:

Large enough for the internal log output by the queueless agent service for approximately 40,000 jobs (specifically, 24 megabytes (24,576 kilobytes)).

For the `ajsqlxeclog_ftpd` file:

Large enough for the internal log output by the queueless file transfer service for approximately 20,000 jobs that involve file transfer (specifically, 10 megabytes (10,240 kilobytes)).

The size of an internal execution log for queueless job varies greatly depending on the number of queueless jobs executed, whether file transfer is involved, and other factors. Estimate an appropriate size for the internal log files and increase their size as needed.

Use the following formulae to estimate the size of the internal execution log files for queueless jobs:

Size of the `ajsqlxeclog` file (in kilobyte) =  $(\text{number-of-queueless-jobs-executed-over-two-days} \times 600) / 1,024$

Size of the `ajsqlxeclog_ftpd` file (in kilobyte) =  $(\text{number-of-queueless-jobs-involving-file-transfer-executed-over-two-days} \times 500) / 1,024$

Example: Store internal execution log files for queueless jobs when:

- 10,000 queueless jobs are executed per day.
- 3,000 of those jobs involve the transmission of transfer files or result files.

Size of the `ajsqlxeclog` file (in kilobyte) =

$((10,000 \times 2) \times 600) / 1,024 = 11,719$  kilobytes

Size of the `ajsqlxeclog_ftpd` file (in kilobytes) =

$((3,000 \times 2) \times 500) / 1,024 = 2,929$  kilobytes

For details about increasing the size of the internal execution logs for queueless jobs, see *ajsqlxecsetsz* in *3. Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

## 7.2.2 Environment settings for executing queueless jobs

The following describes the environment settings for executing queueless jobs.

Use the `jbssetcnf` command to change the values of environment setting parameters. For details about this command, see the *Job Management Partner 1/Base User's Guide*.

For details about the environment setting parameters for an execution environment for queueless jobs, see 2.7 *Setting up the queueless job execution environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

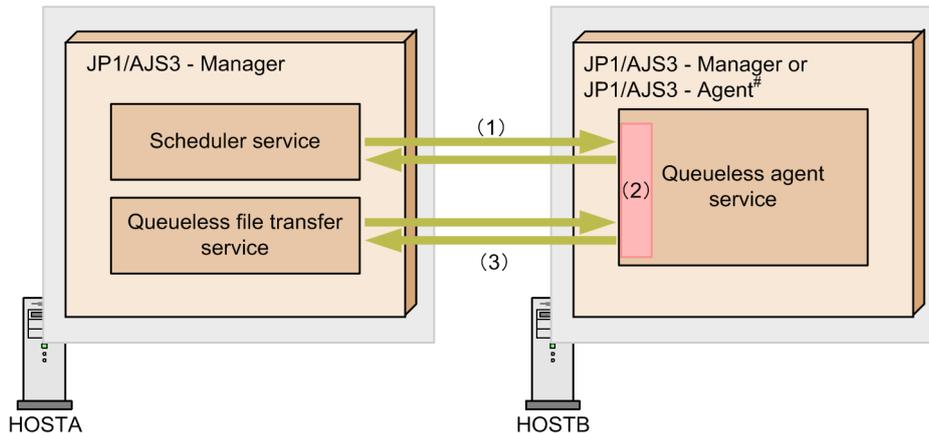
Also consider the following issues.

- When queueless jobs are executed in an environment where the manager host and the agent host use different character code sets

If the manager host and the agent host use different character code sets, you must specify the language code in the `AJSQL_CHARCODE` environment setting parameter.

This environment setting parameter is used for the character code conversion shown in the following figure.

Figure 7-6: Character code conversion for queueless jobs



Legend:

➡ : Data flow

#: JP1/AJS2 - Manager or JP1/AJS2 - Agent will also be treated in the same way.

#### (1) Scheduler service and queueless agent service

The value of the `AJSCHARCODE` environment setting parameter specified for the scheduler service is used as the character code set. Character codes are not converted for the scheduler service.#

#### (2) Queueless agent service

The following data is converted to the character code set specified for the `AJSQL_CHARCODE` environment setting parameter.

- Data accepted from the scheduler service
- Transfer file data

The following data is converted to the character code set specified for the `AJSCHARCODE` environment setting parameter of the scheduler service that issued the request:

- Reply data to the scheduler service
- Result file data

The default value of `AJSQL_CHARCODE` is `none`. If `none` is set, character codes are not converted.

If the manager and the agent use different character code sets, you must specify `AJSQL_CHARCODE` for the queueless agent service to which the request is sent.

#### (3) Queueless agent service and queueless file transfer service

The data in the transfer file is sent from the queueless file transfer service to the queueless agent service where it is converted to the character code set used by the queueless agent service. The data in the result file is converted

to the character code set used by the queueless agent service, and is then sent to the queueless file transfer service. Character codes are not converted in the queueless file transfer service<sup>#</sup>.

#  
If UTF-8 is specified for the `QLMANCHARCODE` environment setting parameter for the manager, character codes are converted.

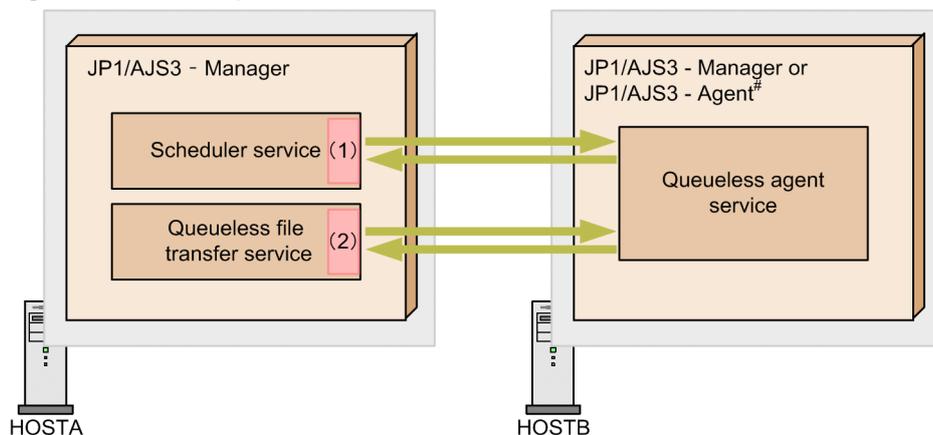
- When queueless jobs are executed on the manager host in a UTF-8 environment

To use the manager in a UTF-8 environment to execute a queueless job on an agent host that does not support UTF-8, you must specify UTF-8 for the `QLMANCHARCODE` environment setting parameter.

This environment setting parameter can be set only when the character code set (value of the `AJSCHARCODE` environment setting parameter) of the manager is UTF-8. Do not set this environment setting parameter if UTF-8 is not the character code set of the manager.

The following shows the scope of the `QLMANCHARCODE` environment setting parameter.

Figure 7-7: Scope of the `QLMANCHARCODE` environment setting parameter



Legend:

➡ : Data flow

#: JP1/AJS2 - Manager or JP1/AJS2 - Agent are used in the same way.

### (1) Scheduler service

If UTF-8 is specified for both the `AJSCHARCODE` and `QLMANCHARCODE` environment setting parameters, character codes are converted. The conversion applies to the job definition items.

The `AJSCHARCODE` setting is specified for each scheduler service whereas the `QLMANCHARCODE` setting is specified for a machine. To use queueless jobs, make sure that the `AJSCHARCODE` setting is the same for all the scheduler services.

### (2) Queueless file transfer service

If UTF-8 is specified for the `QLMANCHARCODE` environment setting parameter, character codes are converted. The conversion applies to the transfer file and result file (execution result details).

For details about the language types that you can use in the system, see [2.4.3 Language type of the system](#).

# 8

## Migration from a Previous Version

This chapter describes how to upgrade from JP1/AJS3 or JP1/AJS2, and provides notes on upgrading.

## 8.1 Version compatibility

For JP1/AJS, there are the following considerations for compatibility:

Hereafter, JP1/AJS3 and JP1/AJS2 are referred to generically as *JP1/AJS*.

- Version compatibility between JP1/AJS and JP1/Base, which is a prerequisite product for JP1/AJS
- Version compatibility between JP1/AJS - Manager and JP1/AJS - View
- Version compatibility between JP1/AJS - Manager and JP1/AJS - Agent
- Version compatibility between JP1/AJS - Manager and JP1/AJS - Manager

The following subsections discuss the version compatibility issues shown above.

### 8.1.1 Version compatibility between JP1/Base and JP1/AJS

The following table shows version compatibility between JP1/Base and JP1/AJS.

Table 8-1: Version compatibility between JP1/Base and JP1/AJS

		JP1/AJS				
		06-00-/C to 08-00	09-00	10-00	10-10	10-50
<b>JP1/Base</b>	<b>06-00-/C to 08-00</b>	#1	--	--	--	--
	<b>09-00</b>	--	F	--	--	--
	<b>10-00</b>	--	--	F	F#2	F
	<b>10-10</b>	--	--	F	F	F
	<b>10-50</b>	--	--	F	F	F

Legend:

F: Fully compatible.

--: Not supported.

#1

See the description of version compatibility between JP1/Base and JP1/AJS2 in the *Job Management Partner 1/Automatic Job Management System 2 Planning and Administration Guide*.

#2

Linux is not supported.

To upgrade JP1/AJS3 to 10-10 when Linux is used, you must first upgrade JP1/Base to 10-10 or later.

### 8.1.2 Version compatibility between JP1/AJS - Manager and JP1/AJS - View

The following table shows version compatibility between JP1/AJS - Manager and JP1/AJS - View.

Table 8-2: Version compatibility between JP1/AJS - Manager and JP1/AJS - View

		JP1/AJS - Manager						
		06-00-/C to 06-71	07-00 to 07-50	08-00	09-00	10-00	10-10	10-50
<b>JP1/AJS - View</b>	<b>06-00-/C to 06-71</b>	#	#	#	--	--	--	--
	<b>07-00 to 07-50</b>	#	#	#	P	--	--	--
	<b>08-00</b>	#	#	#	P	P	P	P
	<b>09-00</b>	--	P	P	F	P	P	P
	<b>10-00</b>	--	--	P	P	F	P	P
	<b>10-10</b>	--	--	P	P	P	F	P
	<b>10-50</b>	--	--	P	P	P	P	F

Legend:

F: Fully compatible.

P: Partially compatible. Only the functions supported in older versions are available.

--: Not supported.

#

See the description of version compatibility between JP1/AJS2 - Manager and JP1/AJS2 - View in the *Job Management Partner 1/Automatic Job Management System 2 Planning and Administration Guide*.

## (1) Notes when there are different versions of JP1/AJS - Manager and JP1/AJS - View

### (a) Notes on using new functionality of JP1/AJS - Manager

When different versions of JP1/AJS - Manager and JP1/AJS - View are present, only the functions that are supported in the older version are available.

If unsupported detail definitions or schedule definitions exist when an older version of JP1/AJS - View is connected to a newer version of JP1/AJS - Manager, the Define Details or Schedule Settings dialog box might not be displayable. Even if the dialog boxes are displayable, the values of definition items might be set to their defaults or disabled. For this reason, if you perform setup using a newer version of JP1/AJS - View and then use an older version of JP1/AJS - View to connect to JP1/AJS - Manager, the defined items might be either restored to their defaults or disabled.

If you want to use the new JP1/AJS - Manager functions, use the same new versions of JP1/AJS - Manager and JP1/AJS - View.

### (b) Notes on using a jobnet connector to control the execution order

- When you are connected to JP1/AJS - Manager 08-10 or later from JP1/AJS2 - View 08-01 or earlier, the jobnet connector is handled as an unknown jobnet and its icon appears as a question mark (?). You can move and delete units, but if you attempt an unsupported operation such as displaying the unit definition, error message KAVV502-E or KAVV556-E is output.
- When you are connected to JP1/AJS - Manager 08-50 or later from JP1/AJS2 - View 08-10, and you are using a jobnet connector to control root jobnets managed by different scheduler services, you cannot perform the following operations in JP1/AJS2 - View 08-10:
  - If you attempt to display the Define Details dialog box for a root jobnet, planning group, or jobnet connector for which **Other service** is specified for **Connection range** in the execution order control settings, message KAVV455-E appears and the dialog box is not displayed.

- If you display the Define Details dialog box for a root jobnet or planning group, and attempt to update the definition by specifying in **Jobnet Connector** the name of a jobnet connector for which **Other service** is specified for **Connection range** in the execution order control settings, message KAVV455-E appears and the update fails.
- If you display the Define Details dialog box for a jobnet connector, and attempt to update the definition by specifying in **Connect destination** the name of a root jobnet or planning group for which **Other service** is specified for **Connection range** in the execution order control settings, message KAVV455-E appears and the update fails.
- If you attempt to display the Monitor Details dialog box for a jobnet connector or root jobnet (including a root jobnet in a planning group) for which **Other service** is specified for **Connection range** in the execution order control settings, sometimes message KAVV455-E appears and the dialog box is not displayed.
- If you display the Monitor Details dialog box for a root jobnet (including a root jobnet in a planning group) for which **Other service** is specified for **Connection range** in the execution order control settings, and the generations are not in a connected relationship, **None** appears in either **Exec. ID (Source)** or **Exec. ID (Destination)**.
- If you attempt to display the Detailed Schedule dialog box for a planning group or root jobnet (including a root jobnet in a planning group) for which **Other service** is specified for **Connection range** in the execution order control settings, sometimes message KAVV455-E appears and the dialog box is not displayed.
- If you attempt to display the Detailed Schedule dialog box for a root jobnet (including a root jobnet in a planning group), planning group, or jobnet connector for which **Other service** is specified for **Connection range** in the execution order control settings, and the generations are not in a connected relationship, **None** appears in either **Exec. ID (Source)** or **Exec. ID (Destination)**.
- If you attempt to perform any of the following operations to display the connection-destination jobnet of a jobnet connector for which **Other service** is specified for **Connection range** in the execution order control settings, message KAVV455-E or KAVV871-E appears and the connection-destination jobnet is not displayed:
  - Choose **View, Connect destination**, and then **Daily Schedule (Hierarchy)**.
  - Choose **View, Connect destination**, and then **Daily Schedule (All Jobs)**.
  - Choose **View, Connect destination**, and then **Monthly Schedule**.
  - Choose **View, Connect destination**, and then **Jobnet Monitor**.
- If you attempt to create a new unit in a root jobnet or planning group for which **Other service** is specified for **Connection range** in the execution order control settings, message KAVV455-E appears and the unit cannot be created.
- If you attempt to create a start condition by choosing **Edit** and then **Define Start Condition** for a root jobnet for which **Other service** is specified for **Connection range** in the execution order control settings, message KAVV455-E appears and the start condition cannot be created.
- If you select a root jobnet or planning group for which **Other service** is specified for **Connection range** in the execution order control settings, and choose **Options** and **Save as Jobnet Connector**, followed by **Edit** and then **Auto-create Jobnet Connector**, message KAVV455-E appears and you cannot create the jobnet connector.

To perform the above operations successfully, upgrade JP1/AJS - View to the same version as JP1/AJS - Manager.

### 8.1.3 Version compatibility between JP1/AJS - Manager and JP1/AJS - Agent

The following table shows version compatibility between JP1/AJS - Manager and JP1/AJS - Agent.

Table 8-3: Version compatibility between JP1/AJS - Manager and JP1/AJS - Agent

		JP1/AJS - Manager						
		06-00 to 06-71	07-00 to 07-50	08-00	09-00	10-00	10-10	10-50
<b>JP1/AJS - Agent</b>	<b>06-00 to 06-71</b>	#	#	#	--	--	--	--
	<b>07-00 to 07-50</b>	#	#	#	P	--	--	--
	<b>08-00</b>	#	#	#	P	P	P	P
	<b>09-00</b>	--	P	P	F	P	P	P
	<b>10-00</b>	--	--	P	P	F	F	F
	<b>10-10</b>	--	--	P	P	F	F	F
	<b>10-50</b>	--	--	P	P	F	F	F

Legend:

F: Fully compatible.

P: Partially compatible. Only the functions supported in older versions are available.

--: Not supported.

#

See the description of version compatibility between JP1/AJS2 - Manager and JP1/AJS2 - Agent in the *Job Management Partner 1/Automatic Job Management System 2 Planning and Administration Guide*.

## 8.1.4 Version compatibility between JP1/AJS - Manager on different hosts

The following table shows version compatibility between JP1/AJS - Manager on different hosts when you execute a remote command or remote jobnet from JP1/AJS3 - Manager on the local host to JP1/AJS3 - Manager on another host.

Table 8-4: Version compatibility between JP1/AJS - Manager on different hosts

		JP1/AJS - Manager (Executing host <sup>#1</sup> / definition source host <sup>#2</sup> )						
		06-00 to 06-71	07-00 to 07-50	08-00	09-00	10-00	10-10	10-50
<b>JP1/AJS - Manager (Execution host<sup>#3</sup>)</b>	<b>06-00 to 06-71</b>	#4	#4	#4	--	--	--	--
	<b>07-00 to 07-50</b>	#4	#4	#4	P	--	--	--
	<b>08-00</b>	#4	#4	#4	P	P	P	P
	<b>09-00</b>	--	P	P	F	P	P	P
	<b>10-00</b>	--	--	P	P	F	P	P
	<b>10-10</b>	--	--	P	P	P	F	P
	<b>10-50</b>	--	--	P	P	P	P	F

Legend:

F: Fully compatible.

P: Partially compatible. Only the functions supported in older versions are available.

--: Not supported.

- #1 Host from which the command is executed.
- #2 Host on which the remote jobnet is defined.
- #3 Host from which the command is executed, or host on which the remote jobnet is executed.
- #4 See the description of version compatibility between JP1/AJS2 - Manager and JP1/AJS2 - Manager in the *Job Management Partner 1/Automatic Job Management System 2 Planning and Administration Guide*.

## **(1) Different versions of JP1/AJS - Manager on the executing host and definition source host**

When a unit in a remote jobnet uses functionality that is not supported by the version of JP1/AJS - Manager on the executing host, the remote jobnet ends abnormally and error message KAVS0650-E is output to the Execution Result Details dialog box. If this message appears, modify the unit definition, and then re-execute the remote jobnet.

## 8.2 Migration to a UTF-8 environment

This section describes how to migrate to a UTF-8 environment in the following case:

- Migrating Linux JP1/AJS2 - Manager from an EUC environment to a UTF-8 environment

Note that the maximum number of characters that can be used in definition items in a UTF-8 environment is less than that of the information defined in Japanese locales that are not UTF-8. This section also explains the maximum number of characters that can be used in definition items in a UTF-8 environment.

### 8.2.1 Migrating the character encoding in Linux from an EUC environment to a UTF-8 environment

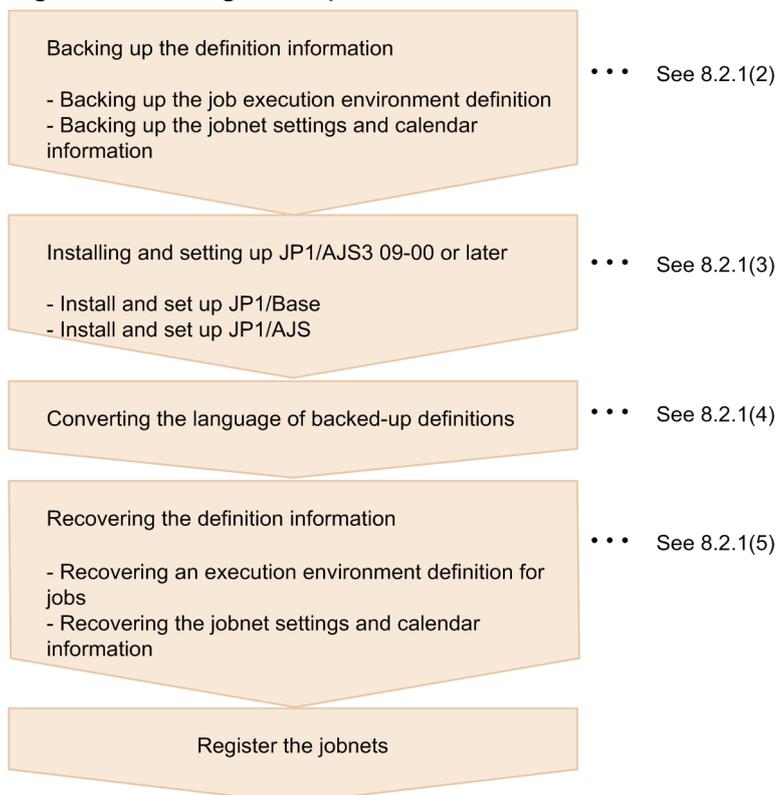
The following describes how to migrate the encoding environment for Linux JP1/AJS2 - Manager from EUC to UTF-8.

#### (1) Migrating the character encoding in Linux to a UTF-8 environment

Because an overwrite installation of the product cannot be performed, you need to back up the existing definition information, uninstall the product, and then install and set up version 09-00 or later of the product.

The following shows the migration procedure.

Figure 8-1: Migration procedure from an EUC environment to a UTF-8 environment



The following describes each step.

## (2) Backing up the definition information

Back up the following definition information:

- Job execution environment definition
- Unit definition

### (a) Backing up the job execution environment definition

To back up the job execution environment definition:

1. Execute the following command to output the job execution environment definition.

```
# jpqexport -dt isam -co file-name [-mh logical-host-name]
```

The job execution environment definition is output to the file specified in *file-name*.

#### Cautionary note

For centralized management, we recommend that you use `jqsetup.conf` as the file to be set by the `jqimport` command.

To back up the definition of a logical host, specify the logical host name in the `-mh` option.

2. Copy the contents of the output file to `jqsetup.conf`.

Copy the contents of the file you output in step 1 to `jqsetup.conf`.

### (b) Backing up the unit definition

The following describes how to back up the jobnet settings and calendar information.

#### Cautionary notes

- The jobnet settings and calendar information must be backed up for each scheduler service. Accordingly, back up the information for each scheduler service separately.
  - A user with superuser privileges for the OS must perform the following procedure.
1. Backing up the definition information for units other than the root job group.

Execute the following command to back up the definition information for the units in the scheduler service. The definition information includes the base time, comments, and all other definitions for each unit, but does not include information about the root job group (`/`), such as the base time, base day, and base month. To back up the root job group information, use the procedures in step 2 and step 3 below.

```
# ajsprint -F scheduler-service-name -a '/*' > unitbackup.txt
```

#### Cautionary note

When you back up a jobnet that was created by copying the root jobnet for which schedule rules have been defined to a nested jobnet, specify `no` for the `AJSPRINTNETSCHPRF` environment setting parameter.

This setting is specified by default in a new installation of JP1/AJS version 08-00 or later. If you upgrade a version of JP1/AJS earlier than 08-00 and this setting has not been specified yet, you will need to change the environment setting parameter. For details about how to change the parameter, see *4.2 Environment setting parameter settings in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows) or *14.2 Environment setting parameter settings in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX). For details about the environment setting parameter, see *2.2 Setting up the scheduler service environment in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

## 2. Backing up the information about the root job group.

Record the following information about the root job group:

- Comments
- Owners
- JP1 resource groups
- Base time
- Base day
- Base month

## 3. Backing up the calendar information for the root job group.

Execute the following command to back up the calendar information (open days and close days) for the root job group.

```
# ajsprint -F scheduler-service-name -d / > rootcal.txt
```

### Cautionary note

If no calendar information is output to `rootcal.txt`, recovery is not needed.

## (3) Installing and setting up JP1/AJS3 09-00 or later

Install and set up JP1/Base and JP1/AJS3 - Manager in a UTF-8 environment. For details about how to set up JP1/Base, see the *Job Management Partner 1/Base User's Guide*. For details about how to set up JP1/AJS3 - Manager, see *13.1 Required setup for JP1/AJS3 - Manager in the Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

### Cautionary notes

- Set up the products in accordance with the environment setting parameters used in the previous version. If the settings of the new and previous versions are different, recovery might fail.
- For JP1/AJS 08-00 or a later version, the environment setting parameter settings used after a new installation and new setup are different from those of JP1/AJS2 07-50 or earlier. If you want to use the same settings that were used in JP1/AJS2 07-50 or earlier, change the values of the environment setting parameters.

## (4) Converting the language of backed-up definitions

Use the `iconv` command or a similar means to convert the backed-up definition files to UTF-8 encoding. If you have registered jobnets for fixed execution by using a schedule information file, also convert the schedule information file to UTF-8 encoding. For details about how to convert the character encoding, including how to use the `iconv` command, see the OS documentation.

## (5) Recovering the definition information

Recover the following definition information you backed up:

- Execution environment definition for QUEUE jobs and submit jobs
- Unit definition

### (a) Recovering an execution environment definition for QUEUE jobs and submit jobs

Use the backedup configuration definition file (`jpgqsetup.conf`) for the execution environment for QUEUE jobs and submit jobs to create the execution environment for QUEUE jobs and submit jobs.

To recover the execution environment definition for QUEUE jobs and submit jobs:

1. Delete the files in the folder containing the queue information database.

(a) For a physical host

```
# rm /var/opt/jp1ajs2/database/queue/*
```

(b) For a logical host

```
# rm shared-folder/jp1ajs2/database/queue/*
```

2. Execute the following command to create an execution environment for QUEUE jobs and submit jobs.

```
# jpqimport -dt isam -ci jpqsetup.conf [-mh logical-host-name]
```

To recover a logical host definition, specify the logical host name in the `-mh` option.

## (b) Recovering the unit definition

The following describes how to recover the jobnet settings and calendar information.

Cautionary notes

- The jobnet settings and calendar information are recovered for each scheduler service. Accordingly, recover the setup information for each scheduler service separately.
- A user with superuser privileges for the OS must perform the procedure described below.
- Make sure that JP1/AJS2 - Manager is running.

1. Starting the JP1/AJS2 - Manager.

In a physical host environment, execute the startup command to start JP1/AJS2 - Manager. In a logical host environment, register JP1 in the cluster software and then start JP1/AJS2 - Manager.

2. Recovering the definition information for units other than the root job group.

Execute the following command to recover the definition information for the units in the scheduler service. The definition information includes the base time, comments, and all other definitions for each unit, but does not include information about the root job group (/), such as the base time, base day, and base month. To recover the root job group information, use the procedures in step 3 and step 4 below.

```
# ajsdefine -F scheduler-service-name unitbackup.txt
```

3. Recovering the information about the root job group.

Set the following information about the root job group that you have recorded.

- Comments
- Owners
- JP1 resource groups
- Base time
- Base day
- Base month

4. Recovering the calendar information for the root job group.

Execute the following command to recover the calendar information (open days and close days) for the root job group.

```
# ajscalendar -F scheduler-service-name -df rootcal.txt /
```

#### Cautionary note

This command recovers the calendar of the scheduler service (AJSROOT1) itself.

If no calendar information has been output to `rootcal.txt`, recovery is not needed. For details, see (2) [Backing up the definition information](#).

## 8.2.2 Maximum number of characters that can be defined for items when converting the character encoding to a UTF-8 environment

In a UTF-8 environment, multi-byte characters such as Japanese are represented by using more bytes than are used in Japanese locales that are not UTF-8. By default, the maximum number of bytes that can be specified for each item of a unit does not depend on the character encoding. Therefore, the maximum number of characters that can be used for definitions in the UTF-8 environment is less than the information defined in Japanese locales that are not UTF-8.

You can set up the embedded database to permit the same number of characters used in a Shift-JIS environment to be used in the UTF-8 environment for the specification of definition items such as a unit name. This setting is available for the following combinations of OSs and JP1/AJS3 - Manager versions:

- Linux and JP1/AJS3 - Manager 09-50-01 or later
- OS Solaris 11 and JP1/AJS3 - Manager 10-00-03 or later
- AIX, HP-UX, or Solaris 10 and JP1/AJS3 - Manager 10-50-01 or later

For details, see *15.1.9 Setting for changing the number of characters specifiable for a unit name in a UTF-8 environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

#### Cautionary notes

- If you set up the embedded database to use the same number of characters that are used in a Shift-JIS environment to specify definition items such as unit names, the maximum number of nesting levels is 10. Therefore, a unit consisting of ten or more levels cannot be migrated to a UTF-8 environment. If you want to migrate such units, you need to change the unit configuration beforehand.
- Migration to a UTF-8 encoding environment must be performed in the standard configuration. For an environment upgraded from JP1/AJS2 - Manager, perform the migration after changing the configuration to the standard configuration.

For details about how to change the configuration to the standard configuration, see *8.5 Setup after upgrading from JP1/AJS2 - Manager to JP1/AJS3 - Manager*.

## 8.3 Migration of definition information from JP1/AJS2 to JP1/AJS3 on a different host

---

This section describes how to migrate setup information from a JP1/AJS2 host to a host on which JP1/AJS3 has been installed as a new installation.

### 8.3.1 How to migrate definition information when changing hosts during an upgrade

To perform a migration, back up the JP1/AJS2 setup information and then restore the information on the installed JP1/AJS3.

You can migrate setup information after setting up JP1/AJS3 on the destination host. In addition, you need to make sure that the source and destination hosts are on the same platform and have the same language environment. When you migrate information to a different platform, first set up the destination host, and then restore only the job execution environment and calendar definition information.

Note that if the host name changes, you will need to change the host name after migration.

#### (1) Backup on a JP1/AJS2 host

For details about how to back up setup information on a JP1/AJS2 host, see the description of backup in the JP1/AJS2 system in the *Job Management Partner 1/Automatic Job Management System 2 Planning and Administration Guide*.

#### (2) Restoring the setup information on a JP1/AJS3 host

For details about how to restore setup information on a JP1/AJS3 host, see 2.3 *Restoring the setup information for a system that uses JP1/AJS3* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

When you perform migration from JP1/AJS2 - Manager to JP1/AJS3 - Manager, if necessary, also perform the procedure described in (3) *Migration of execution agent information (JP1/AJS3 - Manager only)*.

#### (3) Migration of execution agent information (JP1/AJS3 - Manager only)

When you operate the database on the destination JP1/AJS3 in the standard configuration, you can use the procedure below to migrate the execution environment definitions for QUEUE jobs and submit jobs as execution agent information. Thus, the execution agent name in the unit definition that are also migrated can be used without any changes.

To perform the migration:

1. Check the JP1\_HOSTNAME environment variable.

To migrate the execution environment definitions for QUEUE jobs and submit jobs from a logical host, specify the logical host name in the JP1\_HOSTNAME environment variable.

To migrate the execution environment definitions for QUEUE jobs and submit jobs from a physical host, do not change the JP1\_HOSTNAME environment variable.

2. Export the execution environment definitions for QUEUE jobs and submit jobs.

Execute the following command to export the execution environment definitions for QUEUE jobs and submit jobs to a file:

```
jpgqexport -dt isam -co output-destination-file-name -agmfmt
```

Example: When the output destination file name is `AgentBack.csv`:

```
jpgqexport -dt isam -co AgentBack.csv -agmfmt
```

After executing the command, check the return value of the command.

#### Cautionary notes

- For the output destination file, specify a new (nonexistent) file. If you execute the command with an existing file specified, nothing will be exported.
- The `jpgqexport` command does not output anything to the standard output or standard error output. Check the return value of the command to determine whether the command terminated normally or abnormally. If the return value is 0, the command terminated normally.
- The logical host from which the definitions are to be output can be specified in the `-mh` option of the `jpgqexport` command. In this procedure, however, specify the logical host name in the `JP1_HOSTNAME` environment variable as described in step 1, rather than in the `-mh` option.
- You can use the `-agmfmt` option of the `jpgqexport` command only in this procedure. Do not use this option to back up or restore the execution environment definitions for QUEUE jobs and submit jobs.

### 3. Check the number of definitions to be migrated.

Execution agents or execution agent groups exceeding the maximum number of definitions cannot be migrated in the agent information.

If the result file you exported in step 2 contains agent information that exceeds the maximum number of definitions, delete unnecessary definition lines from the result file so that the number of definitions is within the maximum.

The maximum number of definitions in the agent information is as shown below.

Maximum number of execution environment definitions for QUEUE jobs and submit jobs

Agents: 1,024

Queues: 8,192

Maximum number of definitions in the agent information for JP1/AJS3 version 9

Execution agents: 1,023

Execution agent groups: 1,024

To check the number of definitions in the agent information:

#### (1) Use a text editor to open the output results in step 2.

Using a text editor, open the file specified in the `-co` option in step 2.

#### (2) Check the number of definitions to be migrated as execution agents.

Count the lines that begin with "A", which indicate lines that define execution agents. However, do not count a line beginning with "A", "@SYSTEM", which indicates a line that defines the default execution agent.

If there are 1,024 or more lines to be processed, not all of the agent definitions can be migrated as execution agents, in which case, delete unnecessary agent definitions.

#### (3) Check the number of definitions to be migrated as execution agent groups

Count the lines that begin with "G", which indicate lines that define execution agent groups. If there are 1,025 or more lines to be processed, not all of the queue definitions can be migrated as execution agent groups, in which case, delete unnecessary queue definitions.

For example, if the following information is output as a result of step 2, two agent definitions will be migrated as execution agents and two queue definitions will be migrated as execution agent groups.

```
"A", "@SYSTEM", "Agent1", "00:00-00:00=5", "Ef", ""
"A", "Agent1", "Agent1", "00:00-00:00=5", "Ef", ""
"A", "Agent2", "Agent2", "00:00-00:00=0", "In", ""
"G", "Agent2", "Agent1:16,Agent2:16", "In", ""
"G", "quel", "Ef", ""
```

#### 4. Start the JP1/AJS3 service.

If the JP1/AJS3 service is already running, you do not need to restart it.

#### 5. Import the information for the database for QUEUE jobs and submit jobs you exported in step 2 to the agent management database.

Execute the `ajsagtadd` command to import the execution environment definitions for QUEUE jobs and submit jobs to the agent management database.

For details about the `ajsagtadd` command, see *ajsagtadd* in *2. Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

Example: When the import source file name is `AgentBack.csv`:

```
ajsagtadd -f AgentBack.csv
```

## (4) Note on migration of only a unit definition

To migrate only a unit definition from a version 8 or earlier JP1/AJS2 environment to a JP1/AJS3 environment on another host, the agent name specified as the target host in the unit definition must be defined as an execution agent<sup>#1</sup>.

If the unit definition to be migrated contains jobs that will be executed on the local host, perform either of the following operations:

- Specify the default execution agent<sup>#2</sup> as the execution agent in the unit definition containing jobs that will be executed on the local host.  
You can use either of the following methods to specify the default execution agent:
  - Specify `@SYSTEM` for the execution agent in the unit definition.
  - Omit the execution agent specification in the unit definition.
- In addition to the default execution agent, register an execution agent<sup>#1</sup> that has the same name as the local host name.

#1

Use the `ajsagtadd` command to define the execution agent. For details about the `ajsagtadd` command, see *ajsagtadd* in *2. Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

#2

For details about the default execution agent, see *5.1.4 Default execution agent* in the manual *Job Management Partner 1/Automatic Job Management System 3 Overview*.

## (5) Note on the maximum number of concurrently executable jobs

When you perform a migration to JP1/AJS3 version 9 by using the procedure in *(3) Migration of execution agent information (JP1/AJS3 - Manager only)*, two execution agents are created in the local host agent definition: the default execution agent and an execution agent that has the same name as the local host name.<sup>#</sup>

#

If the agent definition that has the same name as the local host name does not exist in version 8 or earlier, only the default execution agent is created. The execution agent that has the same name as the local host name is not created.

Care is required because the selected execution agent depends on how the execution agent is specified in the unit definition as described below.

- When the execution agent is not specified in the unit definition  
The default execution agent is used to execute a job.
- When the local host name is explicitly specified for the execution agent in the unit definition  
The execution agent that has the same name as the local host name is used to execute a job.

In addition, the maximum number of concurrently executable jobs specified for the execution agent applies to each execution agent. If the default execution agent and the execution agent with the local host name are defined, the sum of the maximum number of concurrently executable jobs specified for these agents applies to the jobs that will be executed on the local host.

For example, if local host name `host1` defined as an agent in version 8 or earlier is migrated to JP1/AJS3 version 9, two execution agents, `@SYSTEM` and `host1`, are defined. If the maximum number of concurrently executable jobs for `host1` is set to `00:00-00:00=10` (maximum of 10 concurrent jobs, 24 hours a day), a maximum of 15 jobs can be executed concurrently. This is because the maximum number of concurrently executable jobs for the default execution agent is `00:00-00:00=5` (maximum of five concurrent jobs, 24 hours a day).

## **(6) Migration of execution registration status of jobnets (JP1/AJS3 – Manager only)**

If JP1/AJS2 - Manager 08-50 or later is on the source host, you can use the functions for exporting and importing execution registration information for jobnets to migrate the execution registration status of jobnets to JP1/AJS3 - Manager on the destination host. However, the execution results of jobnets and jobs cannot be migrated.

For details about how to export and import execution registration information for jobnets, see *4.4 Backing up and recovering the execution registration status of jobnets by using the `ajsrlexport` and `ajsrimport` commands* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

If the version of JP1/AJS2 - Manager on the source host is 08-10 or earlier, execution registration information for jobnets cannot be exported. In this case, you need to register the jobnets again with JP1/AJS3 - Manager on the destination host.

## **(7) When the migration source host name and the migration destination host name are different**

For details about the procedure when the migration source host name and the migration destination host name are different, see *8.9 Changing the JP1/AJS3 host settings* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.

## 8.4 Note on programs that use code functions

---

JP1/AJS3 does not support the use of code functions.

If you want to create programs that use code functions, use a JP1 environment whose version is 7i or earlier. Note that programs created in an environment whose version is 7i or earlier can only operate JP1/AJS - Manager 08-00 or a later version running on an OS supported by version 7i or earlier JP1 products. In other OSs, since these programs cannot be executed, consider operation that uses JP1 Version 8 commands.

Also note that programs created in an environment whose version is 7i or earlier cannot use the new functions supported by JP1 Version 8 or later. If any of these new functions is contained in a job or jobnet (including upper-level jobnets), the programs are also unable to use existing functions for the job or jobnet (including upper-level jobnets). Programs that attempt to use such functions might operate incorrectly.

## 8.5 Setup after upgrading from JP1/AJS2 - Manager to JP1/AJS3 - Manager

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The disk and memory requirements increase when JP1/AJS2 - Manager is upgraded to JP1/AJS3 - Manager. Estimate the new requirements appropriately before you perform the upgrade installation and data migration tasks.

You cannot begin using JP1/AJS3 - Manager until you have finished migrating the data. Depending on the amount of data and so on, data migration could take some time. Perform the upgrade and migration tasks in a planned fashion.

### 8.5.1 How to set up JP1/AJS3 - Manager after upgrading from JP1/AJS2 - Manager

Migration tasks must be performed first on the physical host, and then on the logical host.

#### (1) Estimates when migrating data

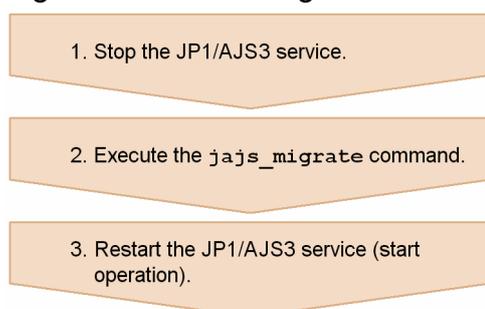
Because data migration involves the creation of temporary files, disk space equivalent to the area used by the existing scheduler services is required. After performing the migration, make sure there are no issues with the new JP1/AJS3 - Manager before you delete these temporary files. For the directory in which the temporary files are created, see *jajs\_migrate* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

You must also estimate the requirements of the new host environment in advance. For details about making estimates, see 3.2 *Estimating system performance*.

#### (2) Standard data migration procedure

The following figure shows the standard workflow when migrating data.

Figure 8-2: Data migration workflow (standard)



To migrate data using the standard procedure:

#### Cautionary note

The logical host environment cannot shift in this procedure. the shift procedure of logical host environment, see (3) *Data migration procedure when using advanced settings* and 2.2.2 *Installing a JP1/AJS3 series program* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or 12.2.1 *Notes on installation* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

1. Stop the JP1/AJS3 service.

In the case of the UNIX environment, please execute the `ajsshmdel` command after a service stop. The path of the `ajsshmdel` command is `/opt/jp1ajs2/bin/ajsshmdel`. The example of execution is shown below.

In the case of `sh`

```
/opt/jp1ajs2/bin/ajsshmdel >/dev/null 2>&1
```

In the case of `csch`

```
/opt/jp1ajs2/bin/ajsshmdel >&/dev/null
```

In UNIX, if you execute the `jajs_migrate` command without executing the `ajsshmdel` command after the service stops, the KAVS0549-E message is output and the command terminates abnormally.

## 2. Execute the `jajs_migrate` command.

If an embedded database is used for the scheduler database before migration, activate the embedded database, and then execute the `jajs_migrate` command.

An execution example is as follows:

```
jajs_migrate -convert -u 5
```

For the command syntax, see `jajs_migrate` in *2. Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

Cautionary notes

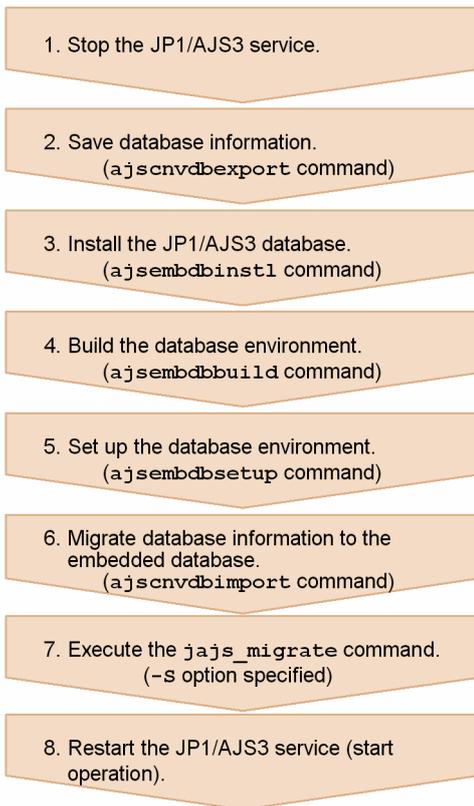
- When using JP1/AJS3 - Manager in a cluster configuration, execute the `jajs_migrate` command for each logical host.
- In the case of the UNIX version, when it uses an embedded database in the scheduler database before shift, a setup of an environment variable is required. For details, see `jajs_migrate` in *2. Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.
- When the `jajs_migrate` command ends normally, check if a warning message has been output. If a warning message has been output, take the action indicated in the message.

## 3. Restart the JP1/AJS3 service.

### (3) Data migration procedure when using advanced settings

The following figure shows the data migration workflow when using advanced settings.

Figure 8-3: Data migration workflow (advanced settings)



To migrate data with advanced settings:

1. Stop the JP1/AJS3 service.

In the case of the UNIX environment, please execute the `ajsshmdel` command after a service stop. The path of the `ajsshmdel` command is `/opt/jplajs2/bin/ajsshmdel`. The example of execution is shown below.

In the case of `sh`

```
/opt/jplajs2/bin/ajsshmdel >/dev/null 2>&1
```

In the case of `csh`

```
/opt/jplajs2/bin/ajsshmdel >&/dev/null
```

In UNIX, if you execute the `jajs_migrate` command without executing the `ajsshmdel` command after the service stops, the KAVS0549-E message is output and the command terminates abnormally.

2. Execute the `ajscnvdbexport` command to save the database information.

An execution example is as follows:

```
ajscnvdbexport -F AJSROOT1 -b D:\workdir
```

This command operates on the pre-migration embedded database. If the embedded database is used for the scheduler database before migration, activate the embedded database and set the following environment variable before you execute the `ajscnvdbexport` command:

In HP-UX:

```
SHLIB_PATH=installation-directory-of-pre-migration-embedded-database/client/lib
```

In Solaris or Linux:

```
LD_LIBRARY_PATH=installation-directory-of-pre-migration-embedded-database/client/lib
```

In AIX:

```
LIBPATH=installation-directory-of-pre-migration-embedded-database/client/lib
```

For the syntax of the `ajscnvdbexport` command, see *ajscnvdbexport* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

3. Execute the `ajsembdbinstl` command to install the JP1/AJS3 database.

An execution example is as follows:

```
ajsembdbinstl -s "C:\Program Files\HITACHI\JP1AJS2\tools\AJS3DB" -id _JF0
```

For the command syntax, see *ajsembdbinstl* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

Cautionary note

To install an embedded database on the logical host, specify a value that is `_JF1` or greater for the `-id` option of the `ajsembdbinstl` command.

4. Execute the `ajsembdbbuild` command to build the database environment.

An execution example is as follows:

```
ajsembdbbuild -s -d "D:\database\RDArea_JF0,D:\database\SYSArea_JF0" -p 22220 -i "C:\Program Files\HITACHI\JP1AJS2\embdb\_JF0" -id _JF0
```

For the command syntax, see *ajsembdbbuild* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

Cautionary note

In the case of the UNIX version, build the first database environment on the relevant host (`-i` option specification value of the `ajsembdbbuild` command) built on an applicable host to `/opt/jp1ajs2/embdb/_JF0`.

5. Execute the `ajsembdbsetup` command to set up the database environment.

An execution example is as follows:

```
ajsembdbsetup -F AJSROOT1 -p 22220 -id _JF0 -ru s -convert
```

For the command syntax, see *ajsembdbsetup* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

6. Execute the `ajscnvdbimport` command to migrate the database information.

An execution example is as follows:

```
ajscnvdbimport -F AJSROOT1 -b D:\workdir
```

For the command syntax, see *ajscnvdbimport* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

7. Execute the `jajs_migrate` command.

An execution example is as follows:

```
jajs_migrate -convert -S
```

For the command syntax, see *jajs\_migrate* in 2. *Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

Cautionary note

When using JP1/AJS3 - Manager in a cluster configuration, execute the `jajs_migrate` command for each logical host.

8. Restart the JP1/AJS3 service.

## (4) The notice which is at the time of re-execution of the `jajs_migrate` command

When re-executing the `jajs_migrate` command, attention is needed about the next.

- A `DBBKUP` directory is created in the database directory of each scheduler service. When the file is stored in the directory, arrange the contents of the `DBBKUP` directory to a database directory.
- To the `ajsembdbstatus` command, specify `-s ust`, check the state of the embedded database, which was being used by the version 8, and, in the case of a `STOP` state, change the database into an `ONLINE` state by using the `ajsembdbstart` command.
- If the `KAVS0550-E` message (the following message) is output to the standard error output and the `jajs_migrate` command terminates abnormally, delete the directories or files below, and then re-execute the `jajs_migrate` command: An error occurred in the shift processing of JP1/AJS3 to the standardized configuration: `jpoman_convert_to_multi 8`

In Windows:

```
JP1/AJS2-Manager-installation-folder\log\EV_Convert_Log.log
JP1/AJS2-Manager-installation-folder\tmp\EVaction_backup
shared-folder-name\jplajs2\log\EV_Convert_Log.log
shared-folder-name\jplajs2\tmp\EVaction_backup
```

In UNIX:

```
/var/opt/jplajs2/log/EV_Convert_Log.log
/var/opt/jplajs2/tmp/EVaction_backup
shared-disk-name/jplajs2/log/EV_Convert_Log.log
shared-disk-name/jplajs2/tmp/EVaction_backup
```

## (5) The procedure to delete environment before a shift

If you use an embedded database or HiRDB as a database of scheduler service before shift, it is necessary to delete if needed after the completion of shift. Uninstall a database according to the procedure of the manual of each version.

In addition, in the case of UNIX, execute the following command after `ajsembdbunset` command execution.

```
/opt/HiRDB_J/bin/pdesetup -u embedded database practical directory
```

## (6) Database before a shift and after a shift

When JP1/AJS3 - Manager is a standard configuration, the database of scheduler service is stored in an embedded database.

Before shift, as a database of scheduler service of JP1/AJS2 - Manager ISAM, HiRDB, or an embedded database built by JP1/AJS2 - manager version 7 is being used, if it shifts to the database of scheduler service of JP1/AJS3 - Manager, `jajs_migrate` command stores the data of four scheduler services to one embedded database automatically.

When the embedded database built by JP1/AJS2 - Manager is being used before shift, if it shifts to the database of scheduler service of JP1/AJS3 - Manager, the state where it is stored as a database of two or more scheduler services to one embedded database.

To change the embedded database in which the database of the scheduler service is stored after shift, perform the procedure of (3) *Data migration procedure when using advanced settings*, or specify `-u` option to `jajs_migrate` command to shift.

The example of composition of the database before shift and after shift is shown below.

(Example 1) When operating with single scheduler service before shift.

Before migration		After migration	
Scheduler service name	Database type	Scheduler service name	Setup identifier
AJSROOT1	ISAM	AJSROOT1	_JF0

(Example 2) When operating with two or more scheduler services before shift.

Before migration		After migration	
Scheduler service name	Database type	Scheduler service name	Setup identifier
AJSROOT1	ISAM	AJSROOT1	_JF0
AJSROOT2	ISAM	AJSROOT2	
AJSROOT3	ISAM	AJSROOT3	
AJSROOT4	ISAM	AJSROOT4	
AJSROOT5	ISAM	AJSROOT5	_JF1
AJSROOT6	ISAM	AJSROOT6	
AJSROOT7	ISAM	AJSROOT7	

(Example 3) When operating with two or more scheduler services before shift (ISAM, HiRDB, embedded database (Version 7) mixture environment).

Before migration		After migration	
Scheduler service name	Database type	Scheduler service name	Setup identifier
AJSROOT1	ISAM	AJSROOT1	_JF0
AJSROOT2	HiRDB	AJSROOT2	
AJSROOT3	HiRDB	AJSROOT3	
AJSROOT4	Embedded database (Version 7)	AJSROOT4	
AJSROOT5	Embedded database (Version 7)	AJSROOT5	_JF1
AJSROOT6	ISAM	AJSROOT6	
AJSROOT7	ISAM	AJSROOT7	

(Example 4) When operating with two or more scheduler services before shift (ISAM, embedded database (Version 8) mixture environment).

Before migration		After migration	
Scheduler service name	Database type	Scheduler service name	Setup identifier
AJSROOT1	ISAM	AJSROOT1	_JF1
AJSROOT2	Embedded database (Version 8) _JAA	AJSROOT2	_JF0

(Example 5) When operating with two or more scheduler services before shift (ISAM, HiRDB, embedded database (Version 7), embedded database (Version 8) mixture environment).

Before migration		After migration	
Scheduler service name	Database type	Scheduler service name	Setup identifier
AJSROOT1	ISAM	AJSROOT1	_JF2
AJSROOT2	Embedded database (Version 8) _JA0	AJSROOT2	_JF0
AJSROOT3	HiRDB	AJSROOT3	_JF2
AJSROOT4	Embedded database (Version 8) _JA0	AJSROOT4	_JF0
AJSROOT5	Embedded database (Version 7)	AJSROOT5	_JF2
AJSROOT6	Embedded database (Version 8) _JA1	AJSROOT6	_JF1
AJSROOT7	ISAM	AJSROOT7	_JF2
AJSROOT8	Embedded database (Version 7)	AJSROOT8	_JF3
AJSROOT9	Embedded database (Version 8) _JA1	AJSROOT9	_JF1
AJSROOTA	ISAM	AJSROOTA	_JF3

## (7) Estimating the disk space requirements after migration from a version 8 embedded database

After migration from a version 8 embedded database, the disk space requirements depend on the migration method as described below.

### (a) Standard migration

The following disk space is required for migration:

$$(50 + (490 + a)) \times \uparrow b/c \uparrow + d \text{ (units: megabytes)}$$

$a$ : Variable that depends on the scale specified in the `-s` option of the `jajs_migrate` command

Substitute one of the following values according to the scale of the database:

l: 20,700

m: 4,200

s: 520 (default value)

*b*: Number of scheduler services

*c*: Value specified in the `-u` option of the `jajs_migrate` command (default is 4)

*d*: Database size for all scheduler services before migration

- For ISAM: Total size of the ISAM files
- For an embedded database: Variable that depends on the scale specified in the `ajsembddbbuild` command  
Substitute one of the following values according to the scale of the database:

`-l`: 1,600 (default value)

`-m`: 800

`-s`: 300

If the database area has been expanded, add the amount of the increase to the value.

- For HiRDB: The size created by using the HiRDB simple setup script

`ajshirdbsetupl`: 288

`ajshirdbsetupm`: 72

`ajshirdbsetups`: 18

`ajshirdbsetupsfm1`: 288

If the database area has been expanded, add the amount of the increase to the value.

Note that the space specified by the value that replaces *d* occupies the disk that contains the directory specified in the `-T` option of the `jajs_migrate` command. When the migration is complete, delete this information because it is no longer necessary.

## **(b) Migration with advanced setup**

For a migration that uses advanced setup, before executing the `ajsembddbbuild` command, you need to determine the scale based on the database capacity and operational requirements before migration.

For the capacity required for setting up one embedded database environment, see *C. Advanced Setup of an Embedded Database* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

## 8.6 About the system block

---

When you change the database configuration to a standard configuration after upgrading JP1/AJS2 - Manager to JP1/AJS3 - Manager, the following operations are suppressed on physical and logical hosts while the standard configuration is being set up. This state is called a *system block*.

- JP1/AJS3 service startup
- Execution of JP1/AJS3 commands

This section describes the events that trigger a system block and describes how to release the system block state.

### 8.6.1 When system blocks occur

Performing the following upgrading and setup causes the physical host and all logical hosts on JP1/AJS3 - Manager to be placed in a system block:

- When JP1/AJS2 - Manager uses an ISAM database as a scheduler database, and the `jajs_migrate` command is used to perform data migration JP1/AJS3 - Manager in a standard configuration after an upgrade to JP1/AJS3 - Manager.
- When JP1/AJS2 - Manager uses a scheduler database that is not an ISAM database, and an upgrade installation of JP1/AJS3- Manager is performed.

### 8.6.2 When system blocks are released

The hosts are released from a system block when the data migration performed by the `jajs_migrate` command has been completed.

# 9

## Notes on System Design

This chapter summarizes points to note when designing a JP1/AJS3 system.

## 9.1 Limits to prevent system-wide effects from external factors

In JP1/AJS3, you can implement various measures to prevent the processing of specific jobs from affecting the entire system. For example, you can discard out-of-bounds data by setting limits on the size and quantity of external data that is input to JP1/AJS3. You can also output a warning message when a constantly increasing item is nearing its limit.

The following table lists items that increase or decrease due to external factors, and the limits that can be imposed on each item in JP1/AJS3.

Table 9–1: Items affected by external factors and specifiable limits

Category	Item	Specifiable limit	Out-of-bounds processing	Message output when the limit is reached
Standard job, action job, custom job, QUEUE job, submit job	Size of result files (standard output file, standard error output file) (manager side)	Size of result files (standard output file; standard error output file)	A warning message is output and the received file is discarded.	KAVU4294-I <sup>#1</sup> KAVU4295-W <sup>#1</sup> KAVU4296-E <sup>#1</sup>
	Number of jobs	Maximum number of jobs in the system; number of warning jobs in the system	A warning message is output when the warning value is exceeded. Startup fails if the maximum value is exceeded.	KAVU4520-W <sup>#2</sup> KAVU4524-W <sup>#2</sup>
	Transfer file size (manager side)	Transfer file size	A warning message is output and the received file is discarded.	KAVU2243-I <sup>#1</sup> KAVU2244-E <sup>#1</sup>
	Job execution time	Timeout period	The job is canceled and placed in killed status.	None
	User job	Maximum data segment size per process (UNIX only)	Dependent on the behavior of the user job.	None
	Communication time	Communication timeout value	Retry based on the retry settings.	KAVU2227-E <sup>#3</sup> KAVU2228-E <sup>#3</sup> KAVU2245-W <sup>#3</sup> KAVU2246-W <sup>#3</sup>
	QUEUE job, submit job	Number of jobs per queue	Maximum number of jobs in the queue	A warning message is output when the warning value is exceeded. Startup fails if the maximum value is exceeded.
Number of queues		Maximum number of defined queues	Definition error	KAVU4522-W <sup>#2</sup>
Number of agents		Maximum number of defined agents	Definition error	KAVU4521-W <sup>#2</sup>
Number of execution-locked resources		Maximum number of defined execution-locked resources	Definition error	KAVU4523-W <sup>#2</sup>
Event job	Number of satisfied start conditions	Monitoring condition (filter out unexpected events by specifying detailed conditions such as the	An unexpected event never meets a start condition.	KAVT0273-W KAVT0582-W

Category	Item	Specifiable limit	Out-of-bounds processing	Message output when the limit is reached
Event job	Number of satisfied start conditions	issuing user name or output of a specific message)	An unexpected event never meets a start condition.	KAVT0273-W KAVT0582-W
	Event with a start condition	Valid range of the start condition	Monitoring ends normally.	None
	Monitoring period	Timeout period	The job ends abnormally and the status of the start condition is <i>Unmonitored + Ended</i> .	None
File	Size of the various log files	Log file size	Data is wrapped around to the next log file.	None

#1

The output message depends on the value of the environment setting parameter that specifies the restrictions placed on file reception.

For details about how to limit items such as the size of received files, see *6.2.7 Placing restrictions on file reception* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *15.2.7 Placing restrictions on file reception* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

#2

You can use the environment setting parameters to change the setting of the maximum number of jobs in the system, the number of warning jobs in the system, the maximum number of definable queues, the maximum number of definable agents, and the maximum number of definable execution-locked resources.

For details about how to change the settings, see *2.3 Setting up the job execution environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

#3

The output message depends on the values of the environment setting parameters that specify the retry interval and the maximum number of retries when a TCP/IP connection error occurs.

For details about how to specify these values, see *6.2.8 Changing the interval and number of retry attempts when a TCP/IP connection error occurs* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in Windows) or *15.2.8 Changing the interval and number of retry attempts when a TCP/IP connection error occurs* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (in UNIX).

#4

You can use the `jpqqquealt` command to change the maximum number of jobs in the queue.

For details about how to change the maximum number of jobs in the queue, see *jpqqquealt* in *3. Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

## 9.2 Notes on JP1/AJS3 host settings

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Note the following points when setting up hosts to run JP1/AJS3:

- Use JP1/AJS3 only in an environment where the IP address can be resolved from the local host name; otherwise, JP1/AJS3 will fail to start.
- If the character encoding used by the system is EUC and the character string displayed in the command execution result contains Japanese characters, the displayed execution result might be misaligned.
- If you execute a command using a character-code set different from that of the JP1/AJS3 service, depending on the command executed, messages in both character-code sets will be output to the integrated trace log.
- You cannot specify disks mounted on network file systems such as NFS file systems for the locations of files and directories to be created or referenced by JP1/AJS3. If you do so, operation is unpredictable.

## 9.3 Notes on the JP1/AJS3 database

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Note the following points in regard to the JP1/AJS3 database:

- High-priority processes (the JP1/AJS3 scheduler services) can monopolize the CPU, causing JP1/AJS3 processing performance to decline. However, setting a lower priority for the JP1/AJS3 scheduler services, and a higher priority for the `ajsmnsvr` process and commands that operate on units, can also cause start delays in jobs and jobnets. When executing commands for operating on units, make sure you use them in an environment where they have the same priority as the scheduler services.

This can be more of an issue in UNIX, depending on the set of nice values. Note the following in regard to the nice value at process startup:

- When executing a command that operates on units  
Execute the command with the same nice value as the JP1/AJS3 service.
- When executing, as a JP1/AJS3 job, a command that operates on a unit (including a command that operates on a unit and is executed within a script specified as a job)  
Change the jobnet's **Priority** parameter from the default (`None`) to 3. If you start the JP1/AJS3 service with a nice value of 20, +20 applies to the default setting of `None` and corresponds to a nice value of 39 (the capped maximum), resulting in the lowest job priority. With a setting of 3, however, +0 applies and corresponds to a nice value of 20. This means that the job will be executed with the same nice value as the JP1/AJS3 service, and is less likely to monopolize the CPU.
- When the configuration of the JP1/AJS3 - Manager database is the standard configuration, the system can operate for a very long time as long as the `ajsembdbreclaim` command is executed periodically. If the system is changed significantly (if you delete or cancel registration of a large-scale jobnet, for example), check the number of unused segments by executing the `ajsembdbstatus` command. When the data storage rate decreases after prolonged system operation, a message is output to the Windows event log or syslog. If necessary, reorganize the database. For details about the output messages, see *6.2.1 How to check the database usage* in the *Job Management Partner 1/Automatic Job Management System 3 Administration Guide*.
- For the items below, consecutive single-byte space characters placed at the end of the line might become invalid. Do not enter any spaces after a comment.
  - Comment of unit definition
  - Comment of release
  - Description of execution agent group
  - Description of execution agent

## 9.4 Notes when running anti-virus software

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If anti-virus software imposes an exclusive control lock on a file or folder used by JP1/AJS3, the following problems might arise:

- JP1/AJS3 does not start.  
An exclusive control lock placed on a definition file that JP1/AJS3 references at startup might prevent JP1/AJS3 from starting.
- Jobs fail to execute or are delayed.  
An exclusive control lock placed on a file needed to execute a job might prevent a job from starting, cause it to terminate abnormally, or delay its execution. This problem can affect any job defined in JP1/AJS3.
- JP1/AJS3 cannot generate execution schedules.  
An exclusive control lock placed on the scheduler database or a file in the job error information directory might prevent JP1/AJS3 from generating a job schedule, and prevent jobs from running as scheduled.
- You cannot change definitions.  
An exclusive control lock placed on a JP1/AJS3 definition file might prevent you from adding or changing a job definition.
- JP1/AJS3 cannot output log data.  
An exclusive control lock placed on a JP1/AJS3 log file might prevent JP1/AJS3 from outputting log data, and make it difficult to troubleshoot errors.
- JP1/AJS3 commands end abnormally.  
An exclusive control lock placed on a file used by a JP1/AJS3 command might cause the command to end abnormally.

If you run a virus check during JP1/AJS3 operation, exclude the following files and folders. If you run a virus check while JP1/AJS3 is stopped, make sure that the anti-virus program has finished checking the following files and folders before you restart JP1/AJS3.

### JP1/AJS3 - Manager files and folders

In Windows:

- JP1/AJS3 - Manager log files and folders  
For details about the log files and folders used by JP1/AJS3 - Manager, see *1.2.4(1) Log files and directories in Windows* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.
- Common files and folders of JP1/AJS3 - Manager that belong to the following categories:
  - Files and folders that users can reference
  - Files and folders that users have no need to reference or modify
  - Files and folders that are available when HP NNM linkage is used, and that users have no need to reference or modify
  - Files and folders associated with the embedded databaseFor details about these files and folders, see *A.1(1)(a) Common files and folders* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting* or *A.1(1)(b) Files when HP NNM linkage is used* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.
- Files and folders of JP1/AJS3 Console Manager that belong to the following categories:
  - Files and folders that users can reference
  - Files and folders that users have no need to reference or modify

For details about these files and folders, see *A.4(1) In Windows* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

- Files and folders specified in a job definition
- Everything in a folder specified in the `-d`, `-a`, `-ld`, or `-bl` option of the `ajsembdbbbuild` command  
For details about the `ajsembdbbbuild` command, see *ajsembdbbbuild* in *2. Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.
- Everything in the folder specified in the `AJSTMPDIR` environment setting parameter  
For details about the `AJSTMPDIR` environment setting parameter, see *2.2 Setting up the scheduler service environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

In UNIX:

- JP1/AJS3 - Manager log files and directories  
For details about the log files and directories used by JP1/AJS3 - Manager, see *1.2.4(2) Log files and directories in UNIX* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.
- Common files and directories of JP1/AJS3 - Manager that belong to the following categories:
  - Files and directories that users can reference
  - Files and directories that users have no need to reference or modify
  - Files and folders that are available when HP NNM linkage is used, and that users have no need to reference or modify
  - Files and directories associated with the embedded databaseFor details about these files and directories, see *A.1(2)(a) Common files and directories* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting* or *A.1(2)(b) Files and directories when HP NNM linkage is used* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.
- Files and directories of JP1/AJS3 Console Manager that belong to the following categories:
  - Files and directories that users can reference
  - Files and directories that users have no need to reference or modifyFor details about these files and directories, see *A.4(2) In UNIX* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.
- Files and directories specified in a job definition
- Everything in a directory specified in the `-d`, `-a`, `-ld`, or `-bl` option of the `ajsembdbbbuild` command  
For details about the `ajsembdbbbuild` command, see *ajsembdbbbuild* in *2. Commands Used during Setup* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.
- Everything in the directory specified in the `AJSTMPDIR` environment setting parameter  
For details about the `AJSTMPDIR` environment setting parameter, see *2.2 Setting up the scheduler service environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

JP1/AJS3 - Agent files and folders

In Windows:

- JP1/AJS3 - Agent log files and folders

For details about the log files and folders used by JP1/AJS3 - Agent, see *1.2.4(1) Log files and directories in Windows* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

- Common files and folders of JP1/AJS3 - Agent that belong to the following categories:
  - Files and folders that users can reference
  - Files and folders that users have no need to reference or modify
  - Files and folders that are available when HP NNM linkage is used, and that users have no need to reference or modify

For details about these files and folders, see *A.2(1)(a) Common files and folders* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting* or *A.2(1)(b) Files when HP NNM linkage is used* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

- Files and folders specified in a job definition

In UNIX:

- JP1/AJS3 - Agent log files and directories

For details about the log files and directories used by JP1/AJS3 - Agent, see *1.2.4(2) Log files and directories in UNIX* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

- Common files and directories of JP1/AJS3 - Agent that belong to the following categories:

- Files and directories that users can reference
- Files and directories that users have no need to reference or modify
- Files and directories used when linking with HP NNM that users have no need to reference or modify

For details about these files and directories, see *A.2(2)(a) Common files and directories* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting* and *A.2(2)(b) Files and directories when HP NNM linkage is used* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

- Files and directories specified in a job definition

JP1/AJS3 - View files and folders

- Files and folders of JP1/AJS3 - View that belong to the following categories:

- Files and folders that users can reference
- Files and folders that users have no need to reference or modify
- Log files

For details about these files and folders, see *A.3 JPI/AJS3 - View files and directories* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

If you run the data collection tool while a virus check is in progress, exclude the following files and folders, in addition to those listed above, from the virus check.

- Files collected for troubleshooting purposes

In Windows:

- Operating system log information required to troubleshoot JP1/AJS3 problems
- JP1-related information required to troubleshoot JP1/AJS3 problems

For details about the files that contain this information, see *1.3.1(1) Log information about the OS* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting* and *1.3.1(2) Information about JPI* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

In UNIX:

- Operating system log information required to troubleshoot JP1/AJS3 problems

- JP1-related information required to troubleshoot JP1/AJS3 problems

For details about the files that contain this information, see *1.3.2(1) Log information about the OS* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting* and *1.3.2(2) Information about JP1* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

- Destination folder for data acquired by the data collection tool

## 9.5 Other cautionary notes

### 9.5.1 Notes when using JP1/AJS3 for x86 in a WOW64 environment

This subsection gives cautions when using JP1/AJS3 for x86 in the Windows-on-Windows 64 (hereafter, WOW64) environments<sup>#1</sup> of Windows Server 2012, 64-bit versions of Windows Server 2008, or Windows Server 2003 x64 Editions.

When a 32-bit application is executed in a WOW64 environment, calls to the file system are redirected from %systemroot%\system32<sup>#2</sup> to %systemroot%\syswow64, and access requests to the registries HKEY\_LOCAL\_MACHINE\Software and HKEY\_CLASS\_ROOT are redirected to HKEY\_LOCAL\_MACHINE\Software\SysWow64 or elsewhere. That is, the operating system isolates 32-bit applications from 64-bit applications, and prevents file and registry collisions.

Because JP1/AJS3 for x86 environments is a 32-bit application, calls are redirected as described above. This could result in any of the problems listed in the table below. To avoid such problems, do not specify any files under %systemroot%\system32 as files to be referenced or updated by JP1/AJS3.

#1

Also includes Windows 8.1, Windows 8, Windows 7 and Windows Vista on a JP1/AJS3 - View host.

#2

%systemroot% is an environment variable that points to the directory in which the Windows system is installed. The default setting is C:\WINDOWS.

Table 9-2: Potential JP1/AJS3 problems in a WOW64 environment

Affected functionality	Problem
PC job <sup>#1</sup> or QUEUE job that runs under Windows	<p>When a file under %systemroot%\system32 is specified as the executable file for a PC job or for a QUEUE job that runs under Windows, the file access is actually redirected to a path under %systemroot%\syswow64. As a result, the job fails to start, or ends abnormally. For a PC job, the following problems might occur:</p> <p><b>Problem 1</b></p> <p>The following message is output to the integrated trace log, and the job fails to start: KAVU4550-W The execution file (<i>file-name</i>) is missing at the agent (<i>agent-host-name</i>).</p> <p>This message might appear, for example, when the backup utility in the system tools (ntbackup) is executed.</p> <p><b>Problem 2</b></p> <p>The following message is output to the Windows event log, and the job ends abnormally with return code 128: This application has failed to start because netman.dll was not found.</p> <p>This message might appear, for example, when the ipconfig command in the system tools is executed.</p>
jplexec command	<p>When an executable file under %systemroot%\system32 is specified in the jplexec command, the command fails to start and the job that executed the command ends abnormally.</p>
Mail system linkage function	<p>When the mail system linkage function is enabled for Outlook 2007 or an earlier version, the communication process for monitoring for email messages ends abnormally when the JP1/AJS3 service starts. A Receive Mail job executed at this time will also end abnormally.<sup>#2</sup></p>
JP1/AJS3 - View tool execution	<p>When an executable file under %systemroot%\system32 is registered with the command for starting a JP1/AJS3 - View tool, the command fails to start the tool.<sup>#3</sup></p>

Affected functionality	Problem
Monitoring Files job	When a file under %systemroot%\system32 is specified as the file to be monitored <sup>#3</sup> , the file access is actually redirected to a path under %systemroot%\syswow64. Updates to the file under %systemroot%\system32 remain undetected and the job remains in running state.
Monitoring Log Files job	When a log file under %systemroot%\system32 is specified as the log file to be monitored <sup>#3</sup> , the log file access is actually redirected to a path under %systemroot%\syswow64. Updates to the log file under %systemroot%\system32 remain undetected and the job remains in running state.
Judgment job	When a file under %systemroot%\system32 is specified as the judgment condition, the file access is actually redirected to a path under %systemroot%\syswow64 and cannot determine whether the file is present in %systemroot%\system32. Consequently, dependent units are not executed.
Standard input file for a PC job	When a file under %systemroot%\system32 is specified as the standard input file for a PC job, the file access is redirected to a path under %systemroot%\syswow64. Because it cannot find the standard input file, the job fails to start.
Standard output file for a PC job	When a file under %systemroot%\system32 is specified as the standard output file for a PC job, the file access is redirected to a path under %systemroot%\syswow64. The PC job started from JP1/AJS3 can reference and update the standard output file if it is a 32-bit application, but not if it is a 64-bit application.
Standard error output file for a PC job	When a file under %systemroot%\system32 is specified as the standard error output file for a PC job, the file access is redirected to a path under %systemroot%\syswow64. The PC job started from JP1/AJS3 can reference and update the standard error output file if it is a 32-bit application, but not if it is a 64-bit application.
Transfer file for a PC job	When a file under %systemroot%\system32 is specified as the transfer source file for a PC job, the file access is redirected to a path under %systemroot%\syswow64. Because it cannot find the transfer source file, the job fails to start. When a file under %systemroot%\system32 is specified as the transfer destination file for a PC job, the file access is redirected to a path under %systemroot%\syswow64. The PC job started from JP1/AJS3 can reference and update the transfer destination file if it is a 32-bit application, but not if it is a 64-bit application.
Command	When a file under %systemroot%\system32 is specified as the file to be used for the command input or output, the I/O file access is redirected to a path under %systemroot%\syswow64 and cannot reference or update the specified file.
Environment settings	When a file under %systemroot%\system32 is specified in the environment settings, the file access is redirected to a path under %systemroot%\syswow64 and cannot reference or update the specified file.

#1

Includes PC jobs for which **Queueless Agent** is specified as the execution service.

#2

In a WOW64 environment, you can run the 32-bit version of Outlook 2010 to use the mail system linkage function. For details about the prerequisite programs for the mail system linkage function and the OS, see *2.3.1 Prerequisite programs for linking mail systems* in the *Job Management Partner 1/Automatic Job Management System 3 Linkage Guide*.

#3

In the Files dialog box, you cannot specify a file under %systemroot%\system32.

An alternative means of avoiding problems in a PC job, QUEUE job that runs under Windows, or jplexec command is to temporarily disable file system redirection when JP1/AJS3 starts a job. This allows 64-bit applications under %systemroot%\system32 to start successfully. For details about the setting to disable redirection, see *6.6.2 Disabling file system redirection when jobs are executed in a WOW64 environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.



# Appendixes

## A. List of Port Numbers

This appendix provides the tables of port numbers to be set and describes the directions of traffic through a firewall.

JP1/AJS3 uses TCP/IP.

Except for a few ports, the port numbers used by JP1/AJS3 are set by default in the `services` file upon shipment or when you set up a particular service.

### A.1 Tables of port numbers

#### (1) JP1/AJS3 - Manager port numbers

The following table lists the port numbers used for JP1/AJS3 - Manager.

Table A-1: JP1/AJS3 - Manager port numbers

Service name	Port number	Purpose
<code>jplajs2qman</code>	20241/tcp	To receive job <sup>#1</sup> registrations To receive a job's <sup>#1</sup> standard output file and standard error output file To accept requests for execution of job execution commands <sup>#2</sup> other than <code>jplexec</code> and <code>jplexit</code> To link with JP1/NQSEEXEC or JP1/OJE for VOS3 (to receive job registrations)
<code>jplajs2qagt</code>	20242/tcp	To send job <sup>#1</sup> execution requests to JP1/AJS3 - Agent
<code>jplajs2qnfy</code>	20243/tcp	To receive job <sup>#1</sup> start/end notifications from JP1/AJS3 - Agent
<code>jplajs2monitor</code>	20244/tcp	JP1/AJS3 - Manager remote jobnet JP1/AJS3 - Manager remote command JP1/AJS3 - View JP1/AJS3 - Definition Assistant
<code>jplajs2report</code>	20245/tcp	To send job <sup>#1</sup> status notifications To link with JP1/NQSEEXEC or JP1/OJE for VOS3 (to receive job status notifications)
<code>jplajs2eamgr</code>	20246/tcp	JP1/AJS3 - Manager event job execution
<code>jplajs2eaagt</code>	20247/tcp	JP1/AJS3 - Agent event job execution
<code>jplajs2gw</code>	23160/tcp	To communicate between scheduler services
<code>jplajs2cm<sup>#3</sup></code>	22275/tcp	To use JP1/AJS3 Console Manager To receive requests from JP1/AJS3 Console View
<code>jplajs2ca<sup>#3</sup></code>	22276/tcp	To use JP1/AJS3 Console Manager To connect with JP1/AJS3 Console Agent To use JP1/AJS3 Console Agent To receive requests from JP1/AJS3 Console Manager
<code>jplajs2chkman<sup>#4</sup></code>	23138/tcp	To use the definition pre-check function Used by the definition pre-check function <sup>#5</sup>
<code>jplajs2chkagt<sup>#4</sup></code>	23139/tcp	To use the definition pre-check function Used by the definition pre-check function

Service name	Port number	Purpose
jp1ajs2qlagt <sup>#4</sup>	20300/tcp	To use queueless jobs For queueless job execution by JP1/AJS3 - Agent
jp1ajs2qlftp <sup>#4</sup>	20301/tcp	To use queueless jobs For queueless file transfer from JP1/AJS3 - Manager
None <sup>#6</sup>	22220/tcp	To communicate with an embedded database that has been configured during the new installation <sup>#7</sup>

## Note

When activating multiple scheduler services within a single logical host, separately assign ports to each `jp1ajs2report` service. Then specify the service name of the job status notification port set in the JP1/AJS3 - Manager environment settings.

#1

Standard job, action job, or custom job.

#2

See the table of job execution commands in *1.5 Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

#3

Set at installation only in the Windows version. In UNIX, the port is set when you set up JP1/AJS3 Console.

#4

Not set at JP1/AJS3 - Manager installation. The port is set when you set up the functionality.

#5

In UNIX, the definition pre-check function does not use the port number for `jp1ajs2chkman`. In Windows, the port number for `jp1ajs2chkman` is used for communication within the same server.

#6

Not registered in `services`.

#7

If you have configured the embedded database by executing the `jaajs_setup`, `jaajs_setup_cluster`, and `jaajs_migrate` commands, use the port numbers described in *2.6.4 Database settings that are set up in JP1/AJS3*. If you have performed an advanced setup to configure the embedded database, use the port number specified by the `-p` option of the `ajsembdbbuild` command.

## (2) JP1/AJS3 - Agent port numbers

The following table lists the port numbers used for JP1/AJS3 - Agent.

Table A-2: JP1/AJS3 - Agent port numbers

Service name	Port number	Purpose
jp1ajs2qman	20241/tcp	To send job <sup>#1</sup> registration requests to JP1/AJS3 - Manager To send a job's <sup>#1</sup> standard output file and standard error output file to JP1/AJS3 - Manager To send requests to JP1/AJS3 - Manager for job execution commands <sup>#2</sup> other than <code>jp1exec</code> and <code>jp1exit</code>
jp1ajs2qagt	20242/tcp	To accept job <sup>#1</sup> execution requests
jp1ajs2qnfy	20243/tcp	To send job <sup>#1</sup> start/end notifications to JP1/AJS3 - Manager

Service name	Port number	Purpose
jp1ajs2eamgr	20246/tcp	JP1/AJS3 - Manager event job execution
jp1ajs2eaagt	20247/tcp	JP1/AJS3 - Agent event job execution
jp1ajs2chkagt <sup>#3</sup>	23139/tcp	To use the definition pre-check function Used by the definition pre-check function
jp1ajs2qlagt <sup>#3</sup>	20300/tcp	To use queueless jobs For queueless job execution by JP1/AJS3 - Agent
jp1ajs2qlftp <sup>#3</sup>	20301/tcp	To use queueless jobs For queueless file transfer from JP1/AJS3 - Manager

#### Note

The following service names are added to the `services` file (or the `/etc/services` file in UNIX), but can be deleted because they are not used in JP1/AJS3 - Agent:

- Service name: `jp1ajs2monitor`, port number: 20244
- Service name: `jp1ajs2report`, port number: 20245
- Service name: `jp1ajs2gw`, port number: 23160

#1

Standard job, action job, or custom job.

#2

See the table of job execution commands in *1.5 Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

#3

Not set at JP1/AJS3 - Agent installation. The port is set when you set up the functionality.

### (3) JP1/AJS3 - View port number

The following table lists the port number used for JP1/AJS3 - View.

Table A-3: JP1/AJS3 - View port number

Service name	Port number	Purpose
jp1ajs2monitor	20244/tcp	JP1/AJS3 - View
jp1ajs2cm	22275/tcp	To use JP1/AJS3 Console View To connect to JP1/AJS3 Console Manager

## A.2 Directions of traffic through a firewall

The following table lists the directions of traffic through a firewall.

JP1/AJS3 supports both packet filtering and NAT (static mode) address translation methods.

Table A-4: Directions of traffic through a firewall (JP1/AJS3)

Program name to be set	Service name	Port number	Direction of the firewall traffic
JP1/AJS3 - Manager	jp1ajs2qman	20241/tcp	Agent -> Manager

Program name to be set	Service name	Port number	Direction of the firewall traffic
JP1/AJS3 - Agent Another program <sup>#1</sup>	jp1ajs2qman	20241/tcp	Manager <--> Manager Manager <--> Another program <sup>#1</sup>
JP1/AJS3 - Manager JP1/AJS3 - Agent	jp1ajs2qagt	20242/tcp	Manager -> Agent
JP1/AJS3 - Manager JP1/AJS3 - Agent	jp1ajs2qnfy	20243/tcp	Agent -> Manager
JP1/AJS3 - Manager JP1/AJS3 - View JP1/AJS3 - Definition Assistant <sup>#2</sup>	jp1ajs2monitor	20244/tcp	JP1/AJS3 - View -> Manager Manager <--> Manager JP1/AJS3 - Definition Assistant <sup>#2</sup> -> Manager
JP1/AJS3 - Manager Another program <sup>#1</sup>	jp1ajs2report <sup>#3</sup>	20245/tcp	Manager <--> Manager Another program <sup>#1</sup> -> Manager
JP1/AJS3 - Manager	jp1ajs2gw	23160/tcp	The requesting manager of the host on which a jobnet connector to be connected is defined <--> Connection-destination manager to which the Jobnet connector connects
JP1/AJS3 - Manager JP1/AJS3 - Agent	jp1ajs2eamgr	20246/tcp	Agent -> Manager
JP1/AJS3 - Manager JP1/AJS3 - Agent	jp1ajs2eaagt	20247/tcp	Manager -> Agent
JP1/AJS3 - Manager JP1/AJS3 - Agent	jp1ajs2qlagt	20300/tcp	Manager -> Agent
JP1/AJS3 - Manager JP1/AJS3 - Agent	jp1ajs2qlftp	20301/tcp	Agent -> Manager
JP1/AJS3 - Manager JP1/AJS3 - Agent	jp1ajs2chkagt	23139/tcp	Manager -> Agent
JP1/AJS3 - Manager	jp1ajs2ca	22276/tcp	Manager -> Manager
JP1/AJS3 - Manager JP1/AJS3 - View	jp1ajs2cm	22275/tcp	JP1/AJS3 - View -> Manager

#### Legends:

->: One-way, from the left to the right

<-->: Two-way, from the left to the right, or the right to the left

#### #1

*Another program* refers to a user program using the functions provided by JP1/NQSEXEC, JP1/OJE for VOS3, or JP1/AJS2. When allowing another program to receive status reports of jobs registered in JP1/AJS3 - Manager, open the job status reporting port specified for the program in the direction of Manager to another program.

For details, see the *Job Management Partner 1/NQSEXEC System Administrator's Guide* or *Job Management Partner 1/NQSEXEC User's Guide* when you use JP1/NQSEXEC. When you use JP1/OJE for VOS3, see the *Job Management Partner 1/Open Job Entry Description, User's Guide and Reference*, for VOS3 systems.

#### #2

For details about setting up a firewall, see the *Job Management Partner 1/Automatic Job Management System 3 - Definition Assistant Description, Operator's Guide and Reference*.

#3

When you activate multiple scheduler services or change the job status reporting port (`jplajs2report` by default) for the scheduler service, open the ports for these services or the changed port as performed for the `jplajs2report` port.

To allow connections over a firewall using the port numbers in the above table, set up the firewall to permit traffic via the port corresponding to the service name and ANY replies to the session established for the port corresponding to the service name. The ANY reply comes about because the OS automatically assigns numbers.

Note the following when installing JP1 products on a firewall server.

1. Internal communication is also subject to firewall control in some cases. When installing JP1/AJS3 on a server with a firewall, set up the firewall to permit communication between internal processes within the server.
2. In the case of Windows JP1/AJS3 - Manager, internal processing within the same computer dynamically uses an empty port to carry out local communication at IP address `127.0.0.1` (local host). If the firewall also regards local communication (at `127.0.0.1`) as the target of access restriction, set the firewall so as to permit all communications at `127.0.0.1` in addition to the setting mentioned in step 1.
3. In the case of JP1/AJS3 - Manager, the internal processing within the same computer for, for example embedded-database processes, uses port numbers that are automatically assigned by the OS. To prevent rejection of these port numbers by a firewall, ensure that all communications within the same computer are permitted. Note that the range of port numbers automatically assigned by an OS varies according to the OS. For details, see the manuals for the applicable OSs.
4. When an option to change the startup method for Jobnet Monitor is enabled in JP1/AJS3 - View, JP1/AJS3 - View dynamically uses an empty port number during the local communications at IP address `127.0.0.1` (localhost). If the firewall restricts local communications (communications at `127.0.0.1`), permit all communications at `127.0.0.1`.

### A.3 Ports used for communications between JP1/AJS3 - View and JP1/AJS3 - Manager

The following describes the ports used for communications between JP1/AJS3 - View and JP1/AJS3 - Manager.

The following table lists the service names and default port numbers for communications from JP1/AJS3 - View to JP1/AJS3 - Manager.

Table A-5: Port numbers for communications from JP1/AJS3 - View to JP1/AJS3 - Manager

Service name	Default port number
<code>jplajs2monitor</code>	20244/tcp
<code>jplajs2cm</code>	22275/tcp

You can change these port numbers as desired.

### A.4 Ports used for communications between JP1/AJS3 - Manager and JP1/AJS3 - Agent

The following describes the ports used for communications between JP1/AJS3 - Manager and JP1/AJS3 - Agent.

- The following table lists the service names and default port numbers for communications from JP1/AJS3 - Agent to JP1/AJS3 - Manager.

**Table A-6: Port numbers for communications from JP1/AJS3 - Agent to JP1/AJS3 - Manager**

Service name	Default port number
jplajs2qman	20241/tcp
jplajs2qnfy	20243/tcp
jplajs2eamgr	20246/tcp
jplajs2qlftp	20301/tcp

You can change port numbers as desired.

- The following table lists the service names and default port numbers for communications from JP1/AJS3 - Manager to JP1/AJS3 - Agent.

**Table A-7: Port numbers for communications from JP1/AJS3 - Manager to JP1/AJS3 - Agent**

Service name	Default port number
jplajs2qagt	20242/tcp
jplajs2eaagt	20247/tcp
jplajs2qlagt	20300/tcp
jplajs2chkagt	23139/tcp

You can change port numbers as desired.

## **A.5 Ports used for communications between JP1/AJS3 - Manager and JP1/AJS3 - Manager**

The following describes the ports used for communications between JP1/AJS3 - Manager and JP1/AJS3 - Manager.

The following table lists the service names and default port numbers for communications from JP1/AJS3 - Manager to JP1/AJS3 - Manager.

**Table A-8: Port numbers for communications from JP1/AJS3 - Manager to JP1/AJS3 - Manager**

Service name	Default port number
jplajs2qman	20241/tcp
jplajs2monitor	20244/tcp
jplajs2report	20245/tcp
jplajs2gw	23160/tcp
jplajs2ca	22276/tcp

You can change port numbers as desired.

When using JP1/AJS3 - Manager as an agent, set the communication ports listed in *A.4 Ports used for communications between JP1/AJS3 - Manager and JP1/AJS3 - Agent*.

## **A.6 Port used for communications between JP1/AJS3 - View and JP1/ Base**

There is no port used in communications between JP1/AJS3 - View and JP1/Base.

## B. List of Limits

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### B.1 Limits on the number of JP1/AJS3 product connections

The following table shows the number of JP1/AJS3 - Agents and the number of JP1/AJS3 - Views that can be connected to JP1/AJS3 - Manager.

Table B-1: Limits of JP1/AJS3 - Views and JP1/AJS3 - Agents that can be connected to JP1/AJS3 - Manager

Definition	Maximum
Number of JP1/AJS3 - Agents that can be connected to a single JP1/AJS3 - Manager (or single logical host in a cluster configuration)	1,024
Number of JP1/AJS3 - Views that can be connected to a single JP1/AJS3 - Manager (or single logical host in a cluster configuration)	128 <sup>#</sup>

#

Connecting 64 or more JP1/AJS3 - Views will greatly increase the load on JP1/AJS3 - Manager and the network. Therefore, if you want to connect 64 or more JP1/AJS3 - Views, prohibit JP1/AJS3 - Views from automatically refreshing their screens or set the automatic refresh interval to 600 seconds or longer. Also, do not use JP1/AJS3 - Manager and the Monthly Schedule window simultaneously, since the window transfers a large amount of data.

The following table shows the maximum number of JP1/AJS3 - Managers that can be connected to JP1/AJS3 - Agent.

Table B-2: Limit of JP1/AJS3 - Managers that can be connected to JP1/AJS3 - Agent

Definition	Maximum
Number of JP1/AJS3 - Managers that can be connected to a single JP1/AJS3 - Agent	16 <sup>#</sup>

#

The maximum value assumes an environment in which the agent and all managers can communicate smoothly with each other. If there is a manager for which name resolution by the agent takes time or a manager for which a timeout occurs during a connection, operation might be affected even when the number of managers is fewer than the maximum. For example, execution of a job from another manager might be delayed. Also, the number of jobs concurrently processed by the agent might affect operation. Make sure that you consider the load on the system during peak times and configure the system accordingly. Note that for a queueless-job execution environment, the number of JP1/AJS3 - Managers that can be connected is not limited.

### B.2 Limits related to the entire JP1/AJS3 system

For details about the language types and character code sets that you can use with JP1/AJS3, see [2.4.3 Language type of the system](#).

### B.3 Limits for units

The following table lists the limits of units defined in JP1/AJS3.

Table B-3: Limits of units

Definition	Maximum
Comment length for a unit	80 (bytes) <sup>#1</sup>
Number of units that can be defined in one level of hierarchy below the jobnet <sup>#2</sup>	10,000
Number of root jobnets that can be defined	Not limited
Jobnet group name <sup>#3</sup> (full name)	930 (bytes) <sup>#4</sup>
Jobnet name <sup>#3</sup> (full name)	930 (bytes) <sup>#4</sup>
Job name <sup>#3</sup> (full name)	930 (bytes)
Maximum number of nests of unit <sup>#2</sup>	30 <sup>#5</sup>
Unit name	30 (bytes) <sup>#1</sup>
Number of jobnets that can be registered for execution	2,147,483,647 <sup>#6</sup>
Number of logs to keep	99 (or 999 <sup>#7, #8</sup> )
Number of backup files that can be created in a backup box	1,024
Scheduler log file capacity	2,048,000,000 (bytes)
Last date	2036/12/31
Maximum number of scheduled generations in a single jobnet	7,680 <sup>#8</sup>
Maximum number of concurrently monitored generations waiting for start conditions to be satisfied	7,680 <sup>#9</sup>
Number of jobs that can be executed simultaneously	Not limited <sup>#6</sup>
Number of event jobs that can be defined in start conditions	32
Number of units whose ends are being waited for and that can be set for one unit with a wait condition	32
Maximum number of generations per day for which the temporary change operation management function can store temporary change information <sup>#10</sup>	999
Length of the TZ environment variable	95 (bytes)
Length of a host name	255 (bytes)
Length of the LANG environment variable	58 (bytes)

#1

If UTF-8 encoding is used and `sjis` is specified for the `DEFLENTYPE` environment setting parameter, this value is the number of bytes that is converted to Shift-JIS.

#2

The value used for multiplying the horizontal and vertical sizes of the map area set in the Jobnet Editor window is the number of units that can be defined in one level of hierarchy.

Creating many units in one root jobnet might have an operational impact, such as insufficient memory, because a large amount of information needs to be processed. We recommend that you create no more than 40,000 job network elements in one root jobnet.

#3

Alphanumeric characters, multi-byte characters, and the following symbols can be used to define unit names:

! # \$ % + @ - (hyphen) . (period) \_ (underscore)

The following symbols are also available. However, these are provided for migration from previous JP1/AJS product. Do not use the symbols for other purposes.

" & ' \* < > ? [ \ ] ^ ` { | } ~

When specifying a unit name containing any of these symbols in the command line of a command that manipulates a unit, enclose the entire unit name in double quotation marks (") and cast the unit name with a backslash (\) before each symbol. For example, to specify unit `/net[1]` in the `ajsprint` command, write as follows: `ajsprint "/net\[1\"]"`

Note that some symbols have special meanings to command interpreters such as UNIX shells. In this case, avoid using such symbols for unit names since they might generate incorrect operations.

Periods (.) and at signs (@) are not allowed at the beginning of unit names, except for `.CONDITION` used as the unit name of a start condition.

Characters that are specific to computers cannot be used for unit names. In addition to unit names, we recommend that you do not use computer-dependent characters for any definition items, since they might become garbled.

#4

When the maximum number is reached, no lower units can be created.

#5

The limit is 10 if UTF-8 encoding is used and `sjis` is specified for the `DEFLENTYPE` environment setting parameter.

#6

This value is calculated independent of resources such as disks and memory, and execution performance.

#7

This is the maximum value available with the extended function for the number of logs to keep.

#8

In accordance with the database restrictions, the total number of logs to keep and scheduled generations cannot exceed 8,000.

With an extended function, the maximum number of logs to keep can be increased to 999. However, if the number of scheduled generations is set to a maximum of 7,680, the maximum permissible number of logs to keep is decreased to 320. Such a restriction is provided to prevent deletion of schedules that are already registered for fixed execution. To increase the maximum permissible number of logs to keep using the extended function, manage operations so as to limit the future schedules to 7,001 or less.

#9

This value indicates the maximum number of concurrently monitored generations waiting for start conditions to be satisfied.

Normally when a generation satisfies the start conditions and begins to run, the generation is excluded from the generations that are subject to this limit.

#10

The temporary change operation management function can store temporary change information for a maximum of 999 generations per day for one root jobnet. If you attempt to make temporary changes to the 1,000th and later generations, an error occurs and the temporary change information will not be stored. When you use the temporary change operation management function, make sure the number of generations executed per day by one root jobnet does not exceed 999.

## B.4 Limits for scheduler services

The following table lists the limits for scheduler services.

Table B-4: Limits for the scheduler service

Definition	Maximum
Maximum number of scheduler services defined	20 <sup>#</sup>

#

The maximum number of scheduler services that can be defined per computer (physical and logical hosts) is 20.

## B.5 Limits for the job execution environment

The following table lists the limits for executing Unix jobs, PC jobs, event jobs, action jobs, and custom jobs in JP1/AJS3.

Table B-5: Limits for the job execution environment

Definition	Maximum
Number of registered execution agents	1,024 <sup>#</sup>
Number of registered execution agent groups	1,024
Number of agent hosts that can be specified for one execution agent	1
Number of execution agents that can be grouped in an execution agent group	1,024

#

Because the default execution agent is defined when JP1/AJS3 is set up, the `ajsagtadd` command can be used to add 1,023 agents.

Note that the default execution agent cannot be deleted. For details on the default execution agent, see [2.5.1\(3\) Default execution agent](#).

## B.6 Limits for the submit job execution environment

The following table lists the limits for executing QUEUE jobs and submit jobs.

Table B-6: Limits for the submit job execution environment

Definition	Maximum
Maximum number of queues defined	8,192
Number of connectable agents	1,024
Number of execution-locked resources	8,192

## B.7 Limits for queueless job execution control

The following table shows the limit for executing queueless jobs in JP1/AJS3.

Table B-7: Limit for queueless job execution control

Definition	Maximum
Number of logical hosts that can be attached concurrently to the queueless agent service	9

## B.8 Limits for the event/action control

The following table lists the limits for executing event jobs in JP1/AJS3.

Table B-8: Limits for the event/action control

Item	Maximum in a standard configuration	Maximum in a compatible ISAM configuration
Number of event jobs (including those set in start conditions) that can be concurrently registered for execution or forcibly terminated on an agent host from one or more manager hosts	1,000 <sup>#1</sup>	1,000 <sup>#1</sup>
Number of event jobs (including those set in start conditions) that can be concurrently registered for execution or forcibly terminated on multiple agent hosts from one manager host	4,000 <sup>#1</sup>	1,300 <sup>#1</sup>
Maximum number of event jobs (including those set in start conditions) executed on one agent host that can continue to run through the warm-start or hot-start process of a JP1/AJS3 service or scheduler service on a manager host	1,000 <sup>#1</sup>	1,000 <sup>#1</sup>
Maximum number of event jobs (including those set in start conditions) that can continue to run through the warm-start or hot-start process of a JP1/AJS3 service or scheduler service on a manager host, per scheduler service	4,000 <sup>#1</sup>	1,300 <sup>#1</sup>
Maximum number of event jobs (including those set in start conditions) that can continue to run through the warm-start or hot-start process of a JP1/AJS3 service or scheduler service on a manager host, per manager host	80,000 <sup>#1</sup>	4,000 <sup>#1</sup>
Maximum number of event jobs (including those set in start conditions) executed on one agent host that can continue to run through the restart process of a JP1/AJS3 service on an agent host, per agent host	1,000 <sup>#1</sup>	1,000 <sup>#1</sup>
Maximum number of event jobs (including those set in start conditions) executed on one agent host that can continue to run through the execution of the <code>jajs_maintain</code> command with the <code>-F</code> option specified	--	1,000 <sup>#1</sup>
Maximum number of event jobs (including those set in start conditions) that can continue to run through the execution of the <code>jajs_maintain</code> command with the <code>-F</code> option specified per scheduler service	--	1,300 <sup>#1</sup>
Maximum number of event jobs (including those set in start conditions) that can continue to run through the execution of the <code>jajs_maintain</code> command without the <code>-F</code> option specified per manager host	--	4,000 <sup>#1, #2</sup>
Number of <code>ajskill</code> or <code>ajsintrpt</code> commands that can be executed consecutively on event jobs (including those set in start conditions)	4,000 <sup>#1, #3</sup>	1,300 <sup>#1, #3</sup>
Number of Monitoring Log Files jobs that can be executed concurrently on one execution host	150 <sup>#4</sup>	150 <sup>#4</sup>

Legend:

--: Not applicable

#1

The value when no events have occurred. If events are likely to occur at the same time, configure the system so that the maximum value, counting events and event jobs, will not be exceeded.

If the maximum is exceeded, and an operation is performed on an event job, or an event job (including an event job in a start condition) detects the monitored event, the following issues might occur:

- Event jobs registered for execution (including those in start conditions) remain in *queuing* status.
- Active event jobs, and jobnets with start conditions that JP1/AJS3 is monitoring, fail to end when killed.
- Event jobs (including those in start conditions) do not detect monitored events.

Be aware of these issues, but note that in some high-performance environments, exceeding any of the limits might not cause problems.

These issues are due to the high volume of communication that takes place in the processing of a large number of jobs. For details about what causes the issues and recovery procedures, see *7.6.8 Notes on restarting the JP1/AJS3 service while event jobs are running in the Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*.

#2

In addition to active event jobs, the maximum value includes the number of event jobs (including those set in start conditions) that are scheduled to start at a time when the system is in maintenance mode.

#3

Executing these commands consecutively over a short duration results in a high volume of communication. If the maximum value is exceeded, the issues in #1 above might occur. For details about what causes the issues and recovery procedures, see *7.6.8 Notes on restarting the JP1/AJS3 service while event jobs are running in the Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide*.

#4

This is the maximum value under the following conditions:

- The Monitoring Log Files jobs run under Windows.
- Each Monitoring Log Files job monitors one log file only.
- Log files are monitored by Monitoring Log Files jobs only, not in conjunction with the JP1/Base log file trapping function.

In UNIX, when one Monitoring Log Files job monitors multiple log files, or is used in conjunction with the JP1/Base log file trapping function, estimate the number of Monitoring Log Files jobs that can be executed based on the number of log files that can be monitored by the log file trapping function. For details, see the *Job Management Partner 1/Base User's Guide*.

## B.9 Limits for JP1/AJS3 Console

Table B-9: Limits for JP1/AJS3 Console

Definition	Maximum
Number of JP1/AJS3 Console Views that can be connected to JP1/AJS3 Console Manager	64 (hosts)
Number of JP1/AJS3 Console Managers that can monitor a single JP1/AJS3 Console Agent	64 (hosts)
Number of JP1/AJS3 Console Agents (manager hosts) that can be monitored by a single root work-task scope	50 (hosts)
Maximum number of levels of work-task scope (a maximum of 3 levels available as nested work-task scope)	3 (levels)

Definition	Maximum
Total number of AJS3 unit monitored objects and nested work-task scope (including AJS3 unit monitored objects under the scope) that can be defined in root work-task scope map area	500 (units)
Name of work-task scope or AJS3 unit monitored object <sup>#1</sup>	30 (bytes)
Length of comment for work-task scope or AJS3 unit monitored object	80 (bytes)
Monitored host name	255 (bytes)
Monitored unit name <sup>#2</sup>	2,047 (bytes)
Map vertical and horizontal extension sizes	100 (units)
Display zoom	200 (%)

#1

Alphanumeric characters, multi-byte characters, and the following symbols can be used to define these names:

! # \$ % + @ - (hyphen) . (period) \_ (underscore)

Characters that are specific to computers are not available.

The characters below cannot be input:

- (space)
- (
- )
- , (comma)
- : (colon)
- ; (semicolon)
- /
- =

In addition to this item, we recommend that you do not use computer-dependent characters for any definition items, since they might become garbled.

#2

The characters below cannot be input:

- (
- )
- , (comma)
- : (colon)
- ; (semicolon)
- =

## B.10 Limits for the definition pre-check function

The following table describes the limit for pre-checks on JP1/AJS3 definitions.

Table B-10: Limit for definition pre-check

Definition	Maximum number
Number of definition pre-checks that can be executed simultaneously	1

## B.11 Limits for using operation profiles

The following tables describe the limits for using operation profiles.

Table B-11: Limits for using an execution agent profile

Definition	Maximum number
Number of units that can be set for an execution agent profile	128 (units)
File size for an execution agent profile	5 (megabytes)
Record length for an execution agent profile	2,047 (bytes) <sup>#</sup>

#

The number of bytes does not include linefeed characters (LF: 0x0a and CR: 0x0d) if they exist. If no linefeed characters exist, the maximum record length is 2,048 bytes.

Table B-12: Limits for using a unit-attribute profile

Definition	Maximum number
Number of units that can be set for a unit-attribute profile	128 (units)
File size for a unit-attribute profile	10 (megabytes)
Record length for a unit-attribute profile	2,047 (bytes) <sup>#</sup>

#

The number of bytes does not include linefeed characters (LF: 0x0a and CR: 0x0d) if they exist. If no linefeed characters exist, the maximum record length is 2,048 bytes.

## B.12 Limits on file sizes

JP1/AJS3 cannot use large files (files exceeding 2 GB). However, if you enable the `LARGEFILEUSE` environment setting parameter, you can use large files for the following:

- Monitoring target files for a monitoring files job
- Files used for judgment conditions for judgment jobs

For details, see *6.3.17 Enabling monitoring of a large file* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows) or *15.3.12 Enabling monitoring of a large file* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX).

Note that the following embedded-database files might become large files:

- Files under the data area storage directory when the embedded database is large-scale database
- Files under the data area storage directory (when the function for automatically expanding the database is used)

- Files under the system area directory (when the function for automatically expanding the system log is used)
- Backup files
- Unload files (when database reorganization is performed)
- Unload log files (when restoring the scheduler database from unload log files)

## C. Functions and Operating Modes for Verifying the Legitimacy of JP1/AJS3 Operations

Historical information for verifying the legitimacy of operations performed in JP1/AJS3 is output to the scheduler log. Using this information, you can check whether your JP1/AJS3 system has been used for illegal activities.

This appendix discusses the functions, settings, and operating modes you can use to verify that JP1/AJS3 operations are legitimate.

### C.1 Functions for verifying the legitimacy of JP1/AJS3 operations

The following describes the functions you can use for verifying the legitimacy of JP1/AJS3 operations.

#### (1) Outputting extended information to scheduler log files

In the environment settings, you can specify parameters for extended output to scheduler log files. You can then use the information to verify that JP1/AJS3 operations are legitimate.

The following table describes the additional information that you can output, and the required parameter setting for each extended function.

Table C-1: Additional information output to the scheduler log and required parameter settings

Extended function	Parameter to set
Output connection start/end messages from JP1/AJS3 - View.	In Windows: Set <code>all</code> in the environment setting parameter <code>MONLOG</code> to output messages to a scheduler log file.  In UNIX: Set <code>all</code> in the environment setting parameter <code>MONLOG</code> to output messages to a scheduler log file. Set <code>all</code> in the environment setting parameter <code>MONSYSLOG</code> to output messages to <code>syslog</code> .
Output user authentication messages.	In Windows: Set <code>all</code> in the environment setting parameter <code>AUTHLOG</code> to output messages to a scheduler log file <sup>#1</sup> .  In UNIX: Set <code>all</code> in the environment setting parameter <code>AUTHLOG</code> to output messages to a scheduler log file <sup>#1</sup> . Set <code>all</code> in the environment setting parameter <code>AUTHSYSLOG</code> to output messages to <code>syslog</code> .
Output the following additional information to the unit execution log and operation log: <sup>#2</sup> <ul style="list-style-type: none"><li>• Operation user type Mapped OS user type</li><li>• Requester IP address<sup>#3</sup> IP address of the host that requested an operation</li><li>• Requester ID information<sup>#3</sup> Information identifying the product or function that requested an operation</li><li>• Command options</li></ul>	Set <code>yes</code> in the environment setting parameter <code>AJSLOGOUTPUTEXTEND</code> .

Extended function	Parameter to set
Options specified when executing a command <ul style="list-style-type: none"> <li>Unit name</li> <li>Name of the target unit</li> </ul>	Set <code>yes</code> in the environment setting parameter <code>AJSLOGOUTPUTEXTEND</code> .
Output the date in <code>year/month/day</code> format to a scheduler log (the default format is <code>month/day</code> ).	Set <code>yes</code> in the environment setting parameter <code>AJSLOGOUTPUTYEAR</code> .
Output start/end messages about the scheduler log output process.	In Windows: Set <code>all</code> in the environment setting parameter <code>LOGDLOG</code> to output messages to a scheduler log file.  In UNIX: Set <code>all</code> in the environment setting parameter <code>LOGDLOG</code> to output messages to a scheduler log file. Set <code>all</code> in the environment setting parameter <code>LOGDSYSLOG</code> to output messages to <code>syslog</code> .
Output the start/end messages about the scheduler log output processes for each host.	In Windows: Set <code>all</code> in the environment setting parameter <code>HLOGDLOG</code> to output messages to a scheduler log file for each host.  In UNIX: Set <code>all</code> in the environment setting parameter <code>HLOGDLOG</code> to output messages to a scheduler log file for each host. Set <code>all</code> in the environment setting parameter <code>HLOGDSYSLOG</code> to output messages to <code>syslog</code> .
Output an execution log of commands executed while the scheduler service was stopped.	Set <code>host</code> in the environment setting parameter <code>AJSLOGOUTPUTDEST</code> .

#1

Output to the scheduler log for each host.

#2

When this function is enabled and a value other than `none` is set in the environment setting parameter `REFLOG`, a message about the reference operation that was executed when a unit ended abnormally is output .

#3

The requesting host's IP address and ID information are not output to the log if the operation was performed from the local computer or from JP1/AJS3 Console.

For details about performing these settings, see *4.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for Windows systems) or *14.2 Environment setting parameter settings* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (for UNIX systems).

For details about the environment setting parameters, see *2.2 Setting up the scheduler service environment* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2*.

For details about the contents of scheduler log files, see *C.1 Log entries output by the scheduler services* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

## (2) Outputting the last update time of unit definitions

You can output the last update time of unit definitions in either of two ways:

- Using the `ajspri` command

By executing the `ajsprint` command with the `-f` option specified, you can acquire the last update time of all the lower-level units of the specified unit.

For the command syntax, see *ajsprint* in 2. *Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

- Import unit definitions in JP1/AJS3 - Definition Assistant

When you import unit definition information using JP1/AJS3 - Definition Assistant, the last update time of each unit is output to the log.

You can edit the output last update times, but not when exporting the imported unit definition information.

For details about how to import unit definitions in JP1/AJS3 - Definition Assistant, see the manual *Job Management Partner 1/Automatic Job Management System 3 - Definition Assistant*.

You can also hide the last update-time field in the imported unit definition information. This field is displayed by default. To hide the last update times:

1. Open the following file in an editor:

`JP1/AJS3-Definition-Assistant-installation-folder\conf\ajs2da.conf`

2. Set `N` in the parameter `TYPE-LASTUPDATE=`.

3. Save the settings.

### **(3) Extracting log information for verifying JP1/AJS3 operations**

Using the `ajslogprint` command, you can extract information needed for verifying JP1/AJS3 operations from the scheduler log and output the information to a file.

For the command syntax, see *ajslogprint* in 2. *Commands* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

### **(4) Checking the job information about QUEUE jobs and submit jobs**

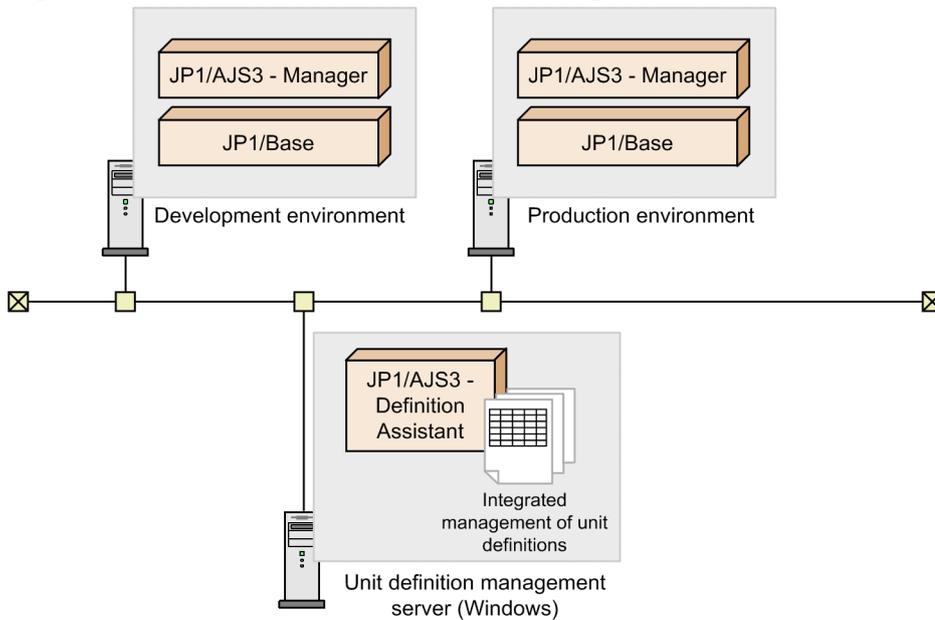
You can use the `jpgendjobshow` command to output the job information about QUEUE jobs and submit jobs to the standard output.

For the command syntax, see *jpgendjobshow* in 3. *Commands Used for Special Operation* in the manual *Job Management Partner 1/Automatic Job Management System 3 Command Reference 2*.

## **C.2 Recommended system configurations**

The following figure shows an example of a recommended system configuration for using the functions for verifying the legitimacy of operations performed in JP1/AJS3.

Figure C-1: Recommended device configuration



The configuration in this example has the development and production environments on different hosts. Using JP1/AJS3 - Definition Assistant, import unit definition information from JP1/AJS3 - Manager on the development host, and then edit the information, or create new unit definitions. Next, test the unit definitions you edited or created by exporting them back to JP1/AJS3 - Manager on the development host. If the test is successful, change the host name and other settings in the unit definitions to match the production environment, and then export the unit definitions to JP1/AJS3 - Manager on the production host.

With this kind of configuration, to use the logging functions for verifying JP1/AJS3 operations, the following products must be installed in the corresponding hosts in both the development and production environments:

- JP1/AJS3 - Manager 09-00 or later, or JP1/AJS2 - Manager 08-10 or later
- JP1/Base 08-10 or later

In addition, the following product is required on the unit definition management server:

- JP1/AJS3 - Definition Assistant 09-00 or later, or JP1/AJS2 - Definition Assistant 08-10 or later

For details about importing and exporting unit definitions in JP1/AJS3 - Definition Assistant or JP1/AJS2 - Definition Assistant, see the manual *Job Management Partner 1/Automatic Job Management System 3 - Definition Assistant* or *JP1/Automatic Job Management System 2 - Definition Assistant*.

### C.3 Examples of verifying JP1/AJS3 operations

The following table gives examples of verifying operations performed in JP1/AJS3.

Table C-2: Examples of verifying JP1/AJS3 operations

Environment	Type of operation	Available information	Verification method
Development	Create or change a unit definition	--	--
	Test	--	--

Environment	Type of operation	Available information	Verification method
Development	Export a unit definition to the production environment	Export result file of JP1/AJS3 - Definition Assistant	Determine the date and time of the unit definition from the name of the export result file of JP1/AJS3 - Definition Assistant. <i>Example:</i> The file name for a unit definition exported on 2009/12/20 13:43:25.976 would be: ASJDA-EXPORT-091220134325976.xls
Production	Prepare to start system operation	<ul style="list-style-type: none"> <li>Log entries about created units</li> <li>List of last update times of unit definitions</li> </ul>	<ul style="list-style-type: none"> <li>The export file name of JP1/AJS3 - Definition Assistant is output to the requester ID information.</li> <li>Compare the last update time of the unit definitions with the requester ID information in the log entries about created units to make sure no definitions were wrongly changed.</li> </ul>
	Register and execute a jobnet	<ul style="list-style-type: none"> <li>Jobnet registration log entry</li> <li>Jobnet execution log entry</li> </ul>	<ul style="list-style-type: none"> <li>Verify that the jobnet is correctly registered.</li> <li>Verify that the jobnet has been correctly executed.</li> </ul>
	Rerun Hold Change plan	Operation log entries	From the output logs, make sure that the jobnet operation has been performed correctly.
	Temporarily change a unit definition	<ul style="list-style-type: none"> <li>Export result file of JP1/AJS3 - Definition Assistant</li> <li>Log entry about the unit definition change</li> <li>List of last update times of unit definitions</li> </ul>	<ul style="list-style-type: none"> <li>From the name of the export result file of JP1/AJS3 - Definition Assistant, determine the date and time of the unit definition after the change.</li> <li>The file name of the export result file in JP1/AJS3 - Definition Assistant is output to the requester ID information.</li> <li>Compare the last update time of the unit definition with the requester ID information in the log entry about the unit definition change to make sure the definition was not wrongly changed.</li> </ul>

Legend:

--: None.

## D. Communication Settings in Multiple-LAN Environments

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This section explains connection examples for non-cluster and cluster operations for the multiple-LAN configurations described in *2.3.4 Example configurations with multiple LANs and their communications settings*. Examples are provided according to which host on the LAN a product is used.

### D.1 Example of connections and communication settings for non-cluster operation

The following explains connection examples for non-cluster operation in environments where multiple LANs are connected (dissociated network environments), and their communications settings. We deal in turn with cases where JP1/AJS3 - Manager and JP1/AJS3 - Agent are connected to multiple LANs.

When the JP1/AJS3 Console functionality is used, replace JP1/AJS3 - View with JP1/AJS3 Console View, JP1/AJS3 - Manager with JP1/AJS3 Console Manager, and JP1/AJS3 - Agent with JP1/AJS3 Console Agent.

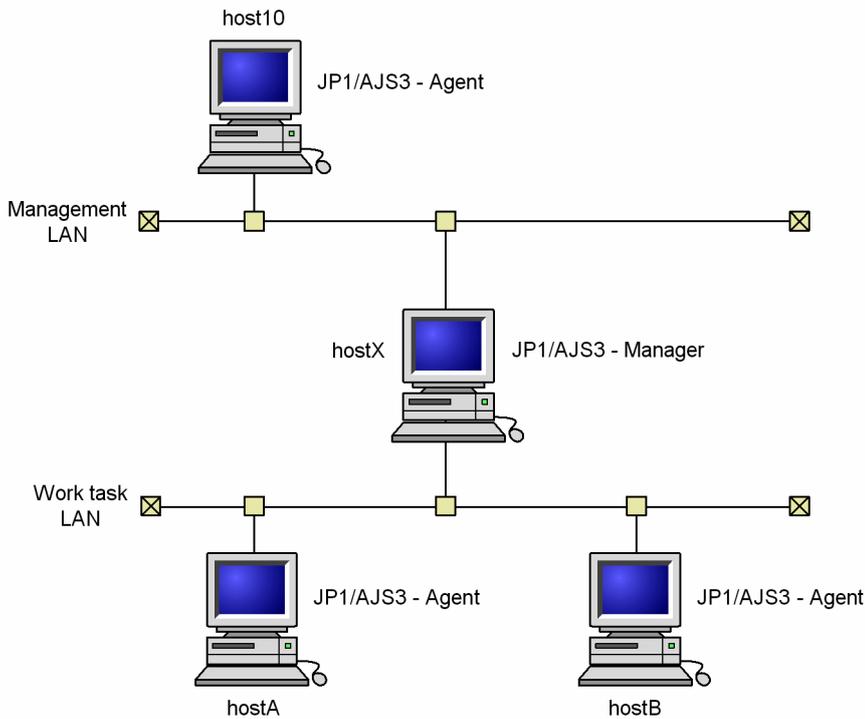
#### (1) Cases where JP1/AJS3 - Manager is connected to multiple LANs for non-cluster operation

When JP1/AJS3 - Manager is connected to multiple LANs, JP1/AJS3 can be connected to JP1/AJS3 - Agent, JP1/AJS3 - View, or JP1/AJS3 - Manager on all the connected LANs. The hosts require an OS environment in which they can mutually resolve the host name.

##### (a) Case where JP1/AJS3 - Manager is connected to multiple LANs and linked to their JP1/AJS3 - Agents

When JP1/AJS3 - Manager is connected to multiple LANs, jobs can be executed in the JP1/AJS3 - Agents on multiple LANs. The following figure shows an example when JP1/AJS3 - Manager is connected to multiple LANs to execute jobs in JP1/AJS3 - Agents on the LANs.

Figure D-1: JP1/AJS3 - Manager connected to multiple LANs (connection to JP1/AJS3 - Agents)



hostX, on which JP1/AJS3 - Manager is installed, is connected to multiple LANs. JP1/AJS3 - Agent is installed on the host connected to each LAN.

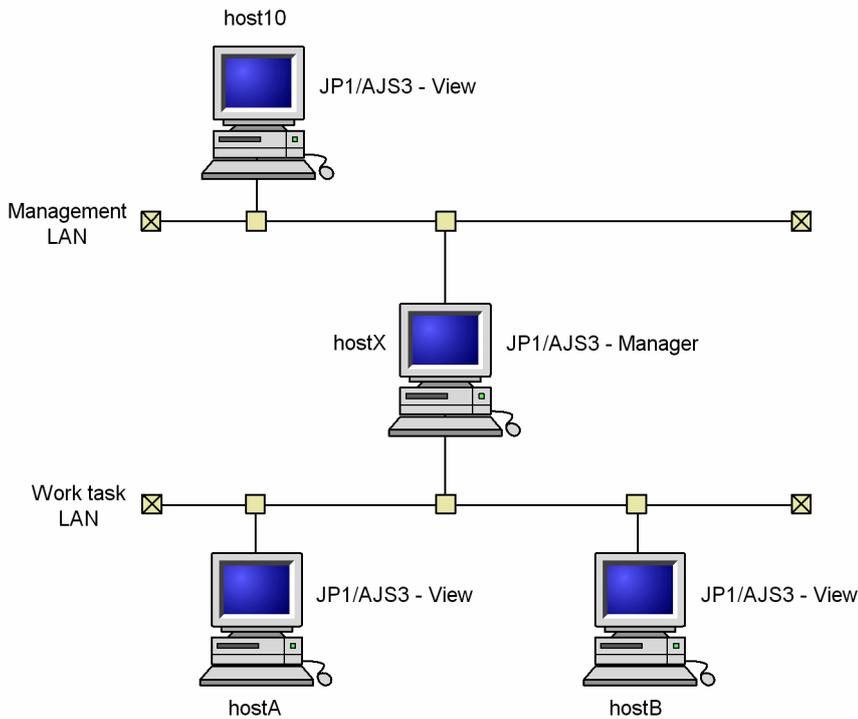
In this system configuration, hostX serves as the manager host and jobs can be executed at the agent host host10 in the Management LAN, and the agent hosts hostA and hostB in the Work task LAN.

Regarding the communications settings at each host, follow the example communications settings for non-cluster operation in the *Job Management Partner 1/Base User's Guide*.

### (b) Case where JP1/AJS3 - Manager is connected to multiple LANs and linked to their JP1/AJS3 - Views

When JP1/AJS3 - Manager is connected to multiple LANs, units can be operated from JP1/AJS3 - Views on multiple LANs. The following figure shows an example when JP1/AJS3 - Manager is connected to multiple LANs to operate units from the JP1/AJS3 - Views.

Figure D-2: JP1/AJS3 - Manager connected to multiple LANs (connection to JP1/AJS3 - Views)



`hostX`, on which JP1/AJS3 - Manager is installed, is connected to multiple LANs. JP1/AJS3 - View is installed on each host connected to each LAN.

In this system configuration, units at the manager host `hostX` can be operated from JP1/AJS3 - View at `host10` on the Management LAN, and from JP1/AJS3 - Views at `hostA` and `hostB` on the Work task LAN.

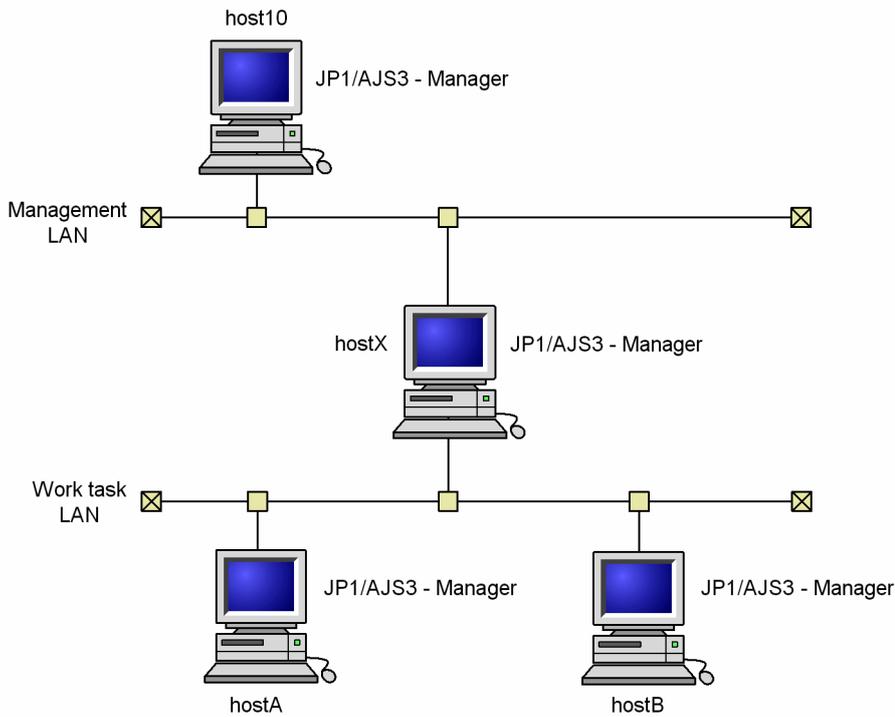
Regarding the communications settings at host `hostX`, follow the example communications settings for non-cluster operation described in the *Job Management Partner 1/Base User's Guide*.

### (c) Case where JP1/AJS3 - Manager is connected to multiple LANs and linked to their JP1/AJS3 - Managers

When JP1/AJS3 - Manager is connected to multiple LANs, you can execute remote jobnets and remotely execute commands in the JP1/AJS3 - Managers on multiple LANs.

The following figure shows an example when JP1/AJS3 - Manager is connected to multiple LANs to execute remote jobnets on or remotely execute commands on JP1/AJS3 - Managers.

Figure D-3: JP1/AJS3 - Manager connected to multiple LANs (connection to JP1/AJS3 - Managers)



hostX, on which JP1/AJS3 - Manager is installed, is connected to multiple LANs. JP1/AJS3 - Manager is installed on each host connected to each LAN.

In this system configuration, the manager host, hostX, is connected to the manager host host10 on the Management LAN, and to the manager hosts hostA and hostB on the Work task LAN. hostX executes remote jobnets and remotely executes commands.

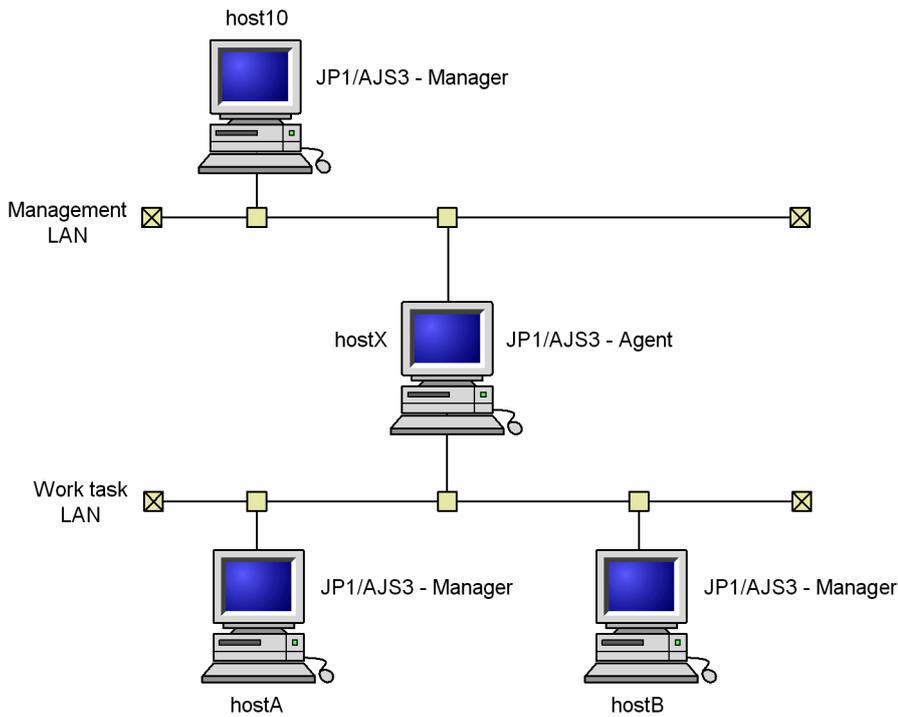
Regarding the communications settings at the hosts host10, hostA, and hostB, follow the example communications settings for non-cluster operation described in the *Job Management Partner 1/Base User's Guide*.

## (2) Case where JP1/AJS3 - Agent is connected to multiple LANs for executing jobs for non-cluster operation

When JP1/AJS3 - Agent is connected to multiple LANs, you can execute jobs from the JP1/AJS3 - Managers on all connected LANs. The hosts require an OS environment in which they can mutually resolve the host name.

The following figure shows an example when JP1/AJS3 - Agent is connected to multiple LANs to execute jobs from the JP1/AJS3 - Manager on each LAN.

Figure D-4: JP1/AJS3 - Agent connected to multiple LANs (connection to JP1/AJS3 - Managers)



`hostX`, on which JP1/AJS3 - Agent is installed, is connected to multiple LANs. JP1/AJS3 - Manager is installed on each host connected to each LAN.

In this system configuration, `hostX` is the agent host. Jobs can be executed from the manager host `host10` on the Management LAN and from the manager hosts `hostA` and `hostB` on the Work task LAN.

Regarding the communications settings at each host, follow the example communications settings for non-cluster operation described in the *Job Management Partner 1/Base User's Guide*.

### (3) Cautionary note

When you specify IP binding as the receive setting for `hostX` on which JP1/AJS3 - Manager or JP1/AJS3 - Agent is installed, you need to specify both the IP address of the management LAN and the IP address of the work task LAN in `jp1hosts` or `jp1hosts2` on `hostX`. If you do not, communication between hosts might not be performed as intended. For example, if only the IP address of the management LAN is written in `jp1hosts` or `jp1hosts2` on `hostX`, communication from the work task LAN (`hostA` and `hostB`) to `hostX` might result in an error.

## D.2 Example connections and communication settings for cluster operation

The following describes example connections and communications settings for cluster operation in an environment where multiple LANs are connected (dissociated network). The explanations deal separately with cases where JP1/AJS3 - Manager is connected to multiple LANs and cases where JP1/AJS3 - Agent is connected to multiple LANs.

When the JP1/AJS3 Console functionality is used, replace JP1/AJS3 - View with JP1/AJS3 Console View, JP1/AJS3 - Manager with JP1/AJS3 Console Manager, and JP1/AJS3 - Agent with JP1/AJS3 Console Agent.

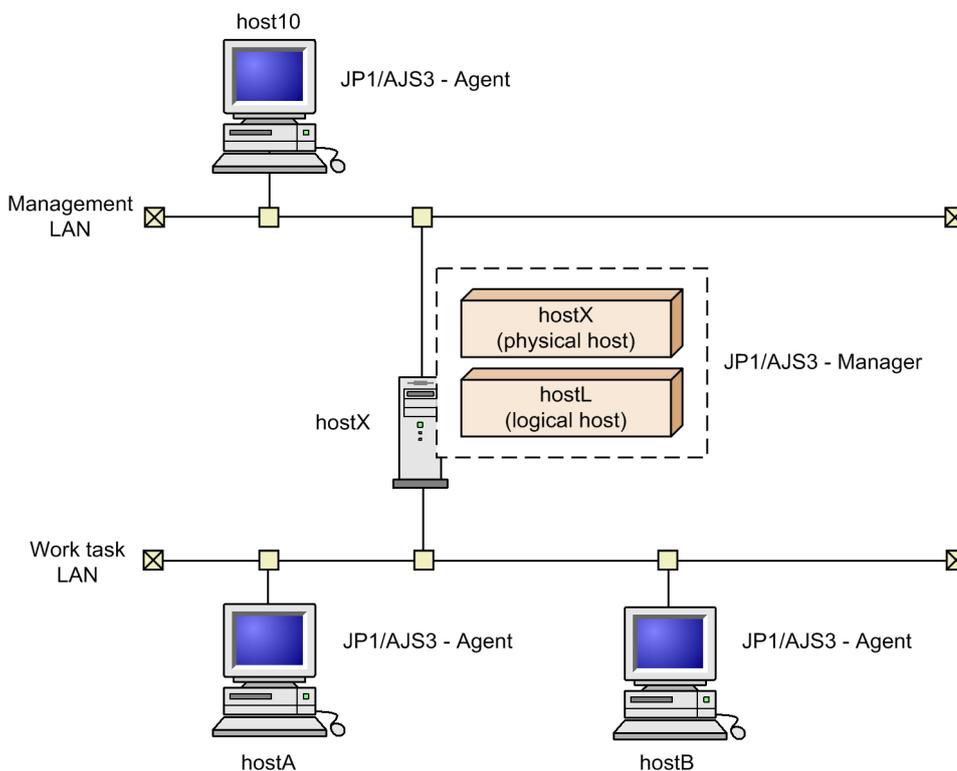
## (1) Cases where JP1/AJS3 - Manager is connected to multiple LANs in a cluster configuration

When JP1/AJS3 - Manager is connected to multiple LANs in a cluster configuration, you can connect JP1/AJS3 - Manager to JP1/AJS3 - Manager, JP1/AJS3 - Agent, or JP1/AJS3 - View on the LANs. The hosts require an OS environment in which they can mutually resolve the host name.

### (a) Cluster system where JP1/AJS3 - Manager is connected to multiple LANs and linked to their JP1/AJS3 - Agents

In a cluster system where JP1/AJS3 - Manager is connected to multiple LANs, you can link the JP1/AJS3 - Manager with JP1/AJS3 - Agents on the LANs. In this configuration, you can execute jobs with the JP1/AJS3 - Agents from either the physical or logical host. Such a system is shown below.

Figure D-5: JP1/AJS3 - Manager connected to multiple LANs for cluster operation (connection to JP1/AJS3 - Agents)



hostX, on which JP1/AJS3 - Manager is installed, is connected to multiple LANs for cluster operation. JP1/AJS3 - Agent is installed on each host connected to each LAN, and these hosts are defined as agent hosts for both the physical host hostX and the logical host hostL.

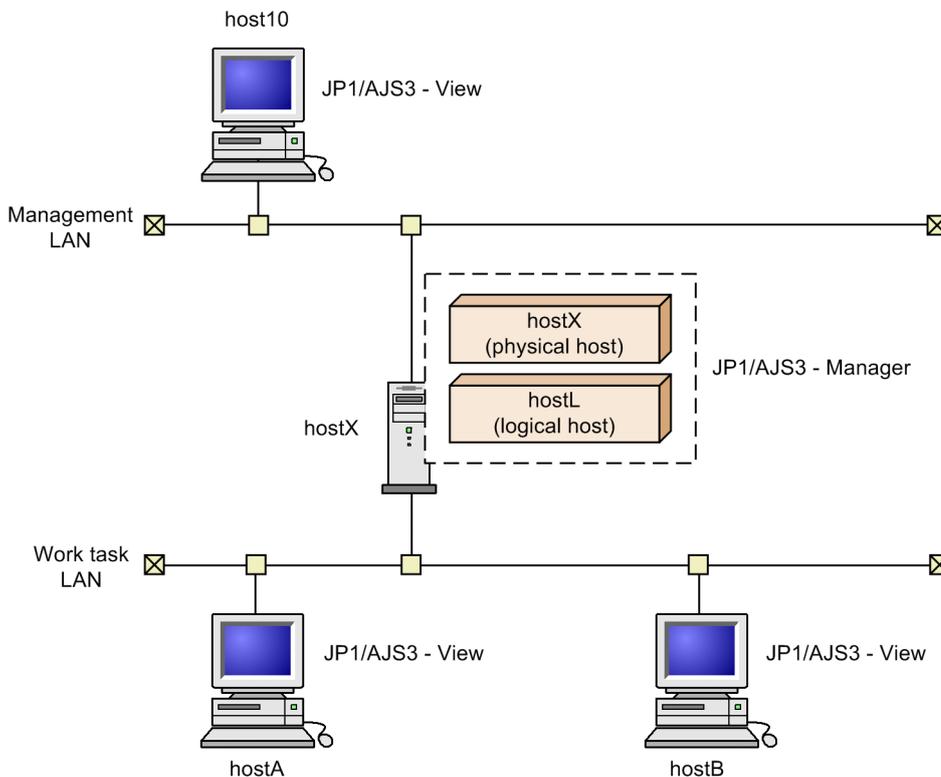
In this system configuration, hostX or hostL serves as the manager host and jobs can be executed at the agent host host10 on the Management LAN, and at the agent hosts hostA and hostB on the Work task LAN.

Regarding the communications settings at each host, follow the example communications settings for cluster operation in the *Job Management Partner 1/Base User's Guide*.

## (b) Cluster system where JP1/AJS3 - Manager is connected to multiple LANs and linked to their JP1/AJS3 - Views

When JP1/AJS3 - Manager is connected to multiple LANs for cluster operation, you might be able to use the JP1/AJS3 - Manager with JP1/AJS3 - Views on the LANs. When JP1/AJS3 - Manager is working with JP1/AJS3 - Views on the LANs, from the JP1/AJS3 - Views, you can operate units running on either the physical or logical host. Such a system is shown below.

Figure D-6: Example of JP1/AJS3 - Manager connected to multiple LANs in a cluster system (connection with JP1/AJS3 - View)



hostX, on which JP1/AJS3 - Manager is installed, is connected to multiple LANs for cluster operation. JP1/AJS3 - View is installed on each host connected to each LAN.

In this system configuration, the physical host hostX or the logical host hostL serves as the manager host and units can be executed at the agent host host10 on the Management LAN, and at the agent hosts hostA and hostB on the Work task LAN.

Regarding the communications settings on each host, follow the example communications settings for cluster operation in the *Job Management Partner 1/Base User's Guide*.

### Supplementary note

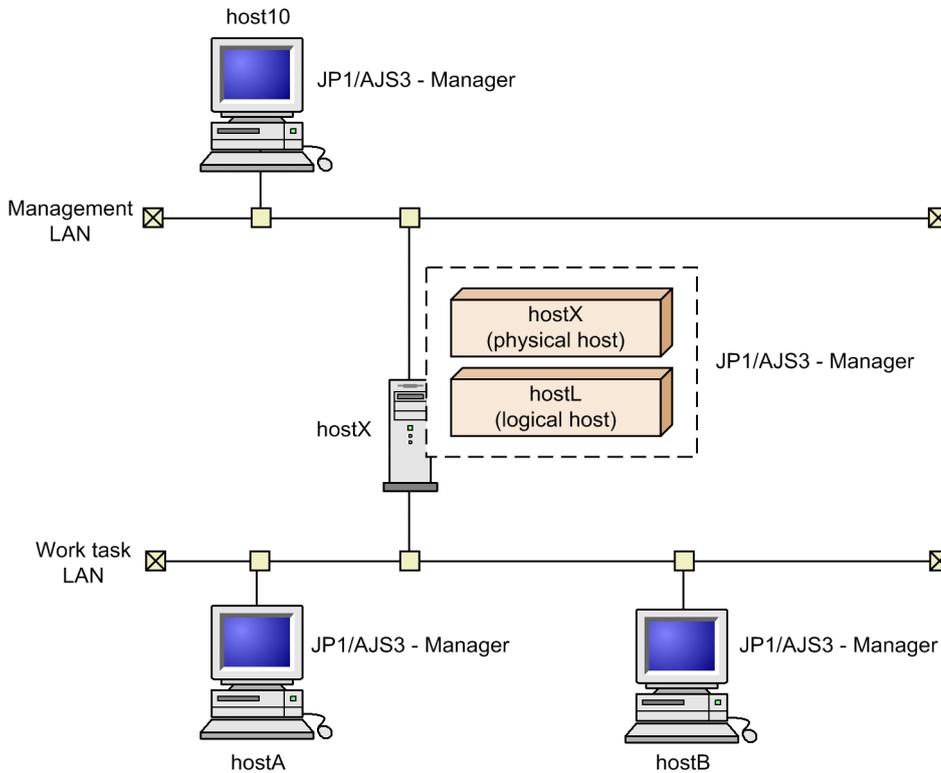
If a JP1/AJS3 - Manager service is not running (for example, if a physical JP1/AJS3 service is not used), you can connect JP1/AJS3 - View and JP1/AJS3 - Manager.

## (c) Cluster system where JP1/AJS3 - Manager is connected to multiple LANs and linked to their JP1/AJS3 - Managers

When JP1/AJS3 - Manager is connected to multiple LANs and is linked to JP1/AJS3 - Managers on the LANs, you can execute remote jobnets and remotely execute commands on the physical or logical host from JP1/AJS3 - Managers on the LANs.

The following figure shows a connection example when JP1/AJS3 - Manager is connected to multiple LANs to execute remote jobs or remotely execute commands from JP1/AJS3 - Manager in a cluster configuration.

Figure D-7: JP1/AJS3 - Manager connected to multiple LANs for cluster operation (connection to JP1/AJS3 - Managers)



hostX, on which JP1/AJS3 - Manager is installed, is connected to multiple LANs for cluster operation. JP1/AJS3 - Manager is installed on each host connected to each LAN.

In this system configuration, the physical host, hostX, or the logical host, hostL, serves as the manager host. Remote jobnets can be executed, and commands remotely executed, either from the manager host host10 on the Management LAN or from the host hostA or hostB on the Work task LAN.

Regarding the communications settings at hostX, follow the example settings for cluster operation in the *Job Management Partner 1/Base User's Guide*.

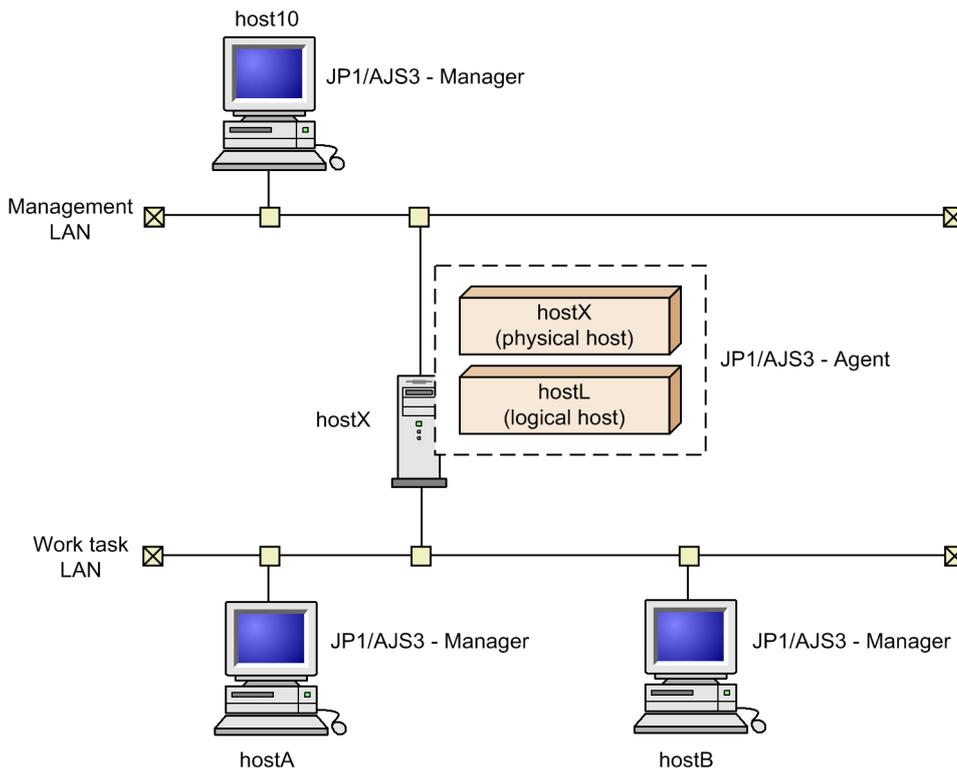
#### Supplementary note

The rules for connecting JP1/AJS3 - Managers to execute remote jobnets or remotely execute commands are the same as the rules for connection from JP1/AJS3 - View.

## (2) Cases where JP1/AJS3 - Agent is connected to multiple LANs to execute jobs in a cluster configuration

In a cluster system where JP1/AJS3 - Agent is connected to multiple LANs to work with JP1/AJS3 - Managers on the LANs, from the JP1/AJS3 - Managers, jobs can be executed on the physical or logical host. Such a system is shown below. The hosts require an OS environment in which they can mutually resolve the host name.

Figure D-8: JP1/AJS3 - Agent connected to multiple LANs for cluster operation (connection to JP1/AJS3 - Managers)



hostX, on which JP1/AJS3 - Agent is installed, is connected to multiple LANs for cluster operation. JP1/AJS3 - Manager is installed on each host connected to each LAN, and both the physical host hostX and the logical host hostL are defined as agent hosts.

In this system configuration, the physical host hostX, or the logical host hostL, serves as the agent host. Jobs can be executed either from the manager host host10 on the Management LAN or the manager host hostA or hostB on the Work task LAN.

Regarding the communications settings at each host, follow the example settings for cluster operation in the *Job Management Partner 1/Base User's Guide*.

### (3) Cautionary notes

- For JP1/AJS3 - Manager and JP1/AJS3 - Agent in a cluster configuration, the IP binding method must be set for the receive setting. The reason is that if the ANY binding method is set, data sent to a physical host might be received by a logical host, or data sent to a logical host is received by a physical host. Either case prevents jobs from being executed normally.
- Because the receive setting is set to the IP binding method immediately after a cluster is set up, data can be received from only one LAN even if multiple LANs are connected. Therefore, you need to set up the JP1/Base communication protocol as described in the example of setting up communication for a cluster system in the *Job Management Partner 1/Base User's Guide*.
- Because the transmission setting is set to the IP binding method immediately after a cluster is set up, the data can be sent to only one LAN, and the host on either LAN can be linked. Therefore, to connect to multiple LANs, you need to set the transmission setting to the ANY binding method. For details, see the example of setting up communication for a cluster system in the *Job Management Partner 1/Base User's Guide*.

- When connection is established from JP1/AJS3 - View to JP1/AJS3 - Manager, the host that matches the IP address specified in the connection setting is connected, no matter whether the host is a physical or logical host.

## D.3 JP1/AJS3 - View communication settings

The following describes example connections and communications settings when JP1/AJS3 - View is used in an environment where multiple LANs are connected (dissociated network).

### Supplementary note

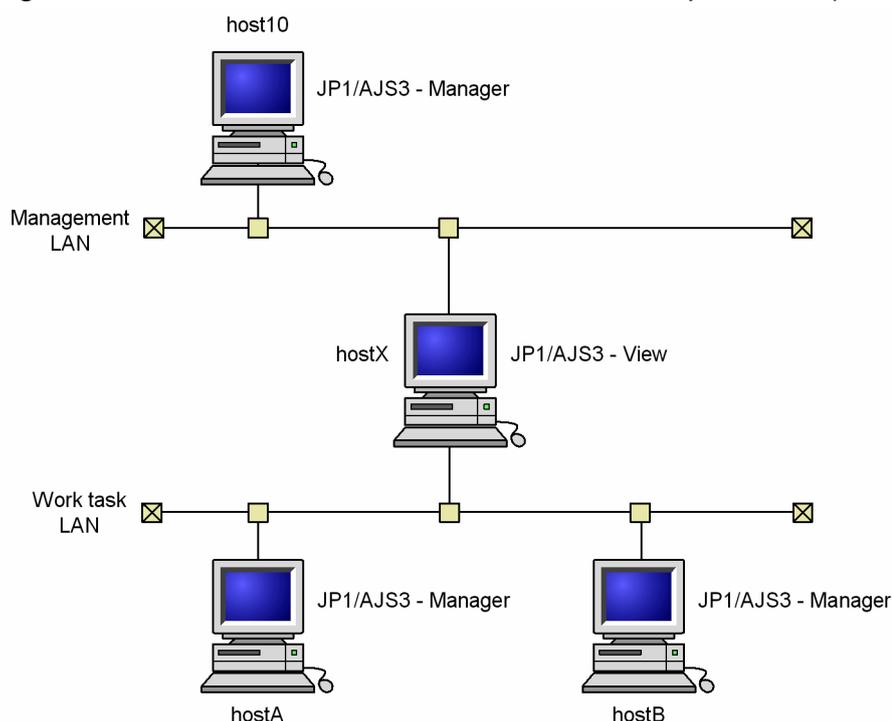
When the JP1/AJS3 Console functionality is used, the same network configuration is supported. In this case, replace JP1/AJS3 - View with JP1/AJS3 Console View, JP1/AJS3 - Manager with JP1/AJS3 Console Manager, and JP1/AJS3 - Agent with JP1/AJS3 Console Agent.

### (1) Case where JP1/AJS3 - View is connected to multiple LANs to operate units

When JP1/AJS3 - View is connected to multiple LANs, you can operate units from the JP1/AJS3 - Managers on all connected LANs.

The following figure shows an example when JP1/AJS3 - View is connected to multiple LANs to operate units from JP1/AJS3 - Managers.

Figure D-9: JP1/AJS3 - View connected to multiple LANs (connection to JP1/AJS3 - Managers)



hostX, on which JP1/AJS3 - View is installed, is connected to multiple LANs. JP1/AJS3 - Manager is installed on each host connected to each LAN.

In this system configuration, JP1/AJS3 - View on hostX can connect to the manager host host10 on the Management LAN, and to the manager hosts hostA and hostB on the Work task LAN to operate units.

Regarding the communications settings at `host10`, `hostA`, and `hostB`, follow the example communications settings for non-cluster operation described in the *Job Management Partner 1/Base User's Guide*.

Note that `hostX` requires an OS environment capable of resolving the host names of `host10`, `hostA`, and `hostB` to IP addresses. Because JP1/AJS3 - View does not apply the settings in the `jp1hosts` file or the `jp1hosts2` file, set the `hosts` file or DNS server so that the host names can be resolved.

## E. Operating JP1/AJS3 By Using an AJS Administrator Account (UNIX Only)

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This appendix describes the conditions for, and cautionary notes on, operating JP1/AJS3 by using an AJS administrator account. For an overview of AJS administrator accounts, see *8.1.3 User management using the JP1 administrators group of JP1/Base (UNIX only)* in the manual *Job Management Partner 1/Automatic Job Management System 3 Overview*.

For details about how to set an AJS administrator account, see *G. Installation and Setup for Operation by AJS Administrators (UNIX Only)* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

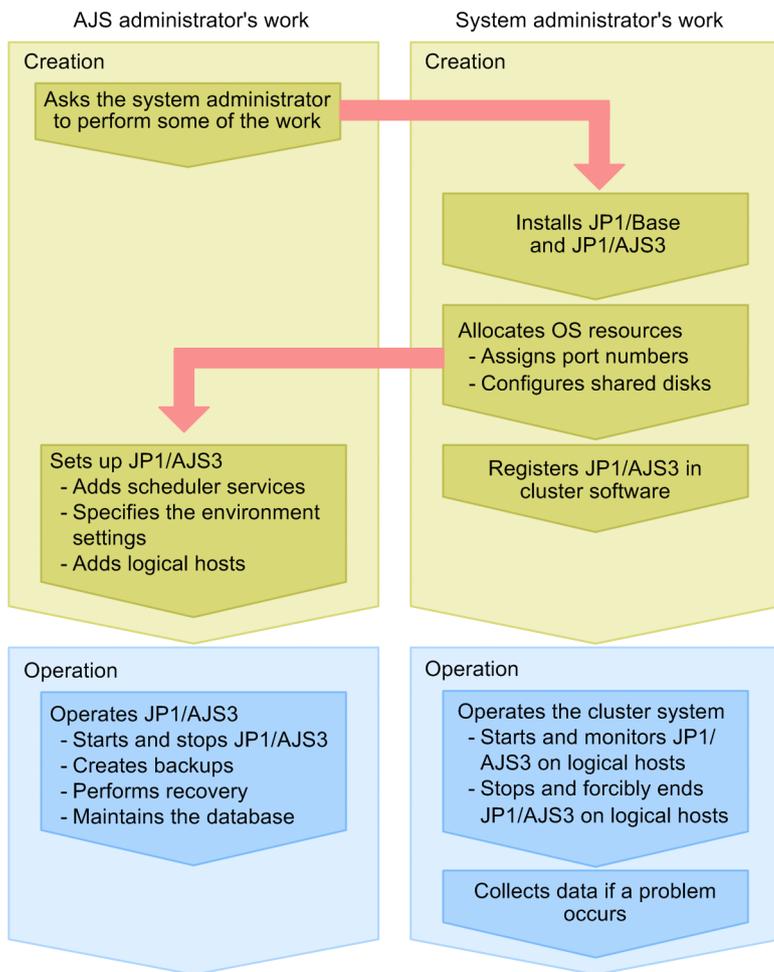
### E.1 Operating JP1/AJS3 by using an AJS administrator account

An AJS administrator can manage and operate a JP1/AJS3 system except for some operations that require superuser privileges. When you set an AJS administrator account, the AJS administrator and a user with superuser privileges (system administrator) can divide the workload of managing and operating a JP1/AJS3 system.

For example, the AJS administrator could specify the environment settings of JP1/AJS3 and perform daily operations while the system administrator performed only the operations, such as installations, that require superuser privileges.

The following figure shows an example in which the AJS administrator and the system administrator divide the workload of creating and operating a JP1/AJS3 system.

Figure E-1: Example of dividing the workload of creating and operating a JP1/AJS3 system



In this example, the AJS administrator and the system administrator divide the workload as follows.

### Creating the system

The AJS administrator asks the system administrator to install programs such as JP1/AJS3 and JP1/Base and to allocate OS resources. The system administrator installs the programs and allocates OS resources as requested. When the system administrator's work is finished, the AJS administrator sets up JP1/AJS3. For a cluster system, the AJS administrator asks a user who has the operation privilege for cluster software such as the system administrator to operate the cluster software.

### Operating the system

The AJS administrator performs daily operations. When necessary, the AJS administrator starts and stops JP1/AJS3, backs up definitions, and maintains the database. If the AJS administrator does not have the operation privilege for cluster software, the AJS administrator asks the system administrator or any other user with the operation privilege to operate the cluster system.

If a problem occurs, the system administrator collects the data necessary for determining the cause of the problem.

## E.2 Conditions for setting an AJS administrator account

All of the following conditions must be satisfied to set up an AJS administrator account. Make sure beforehand that all of these conditions can be satisfied in the environment where the JP1/AJS3 system is to be created.

- Initial installation of JP1/AJS3

An AJS administrator account can be set up when JP1/AJS3 is initially installed. No AJS administrator account can be set up in an environment where JP1/AJS3 is already installed.

Note that you cannot set up an AJS administrator account when you perform an upgrade installation. If you want to set up an AJS administrator account when you upgrade JP1/AJS3, back up the definitions of JP1/AJS3 currently in use, uninstall JP1/AJS3, and re-install JP1/AJS3.

- Operation of JP1/AJS3 by using an AJS administrator account does not violate security policies  
An AJS administrator can control JP1/AJS3 processes that are executed with superuser privileges. If there are security policy issues when an ordinary OS user is able to control processes executed with superuser privileges, you must not set an AJS administrator account.
- A dedicated OS user can be prepared for the AJS administrator account  
If you set an OS user as an AJS administrator, you cannot change the setting later. For this reason, prepare a dedicated OS user for the AJS administrator account so that the AJS administrator account does not need to be changed during operation.  
If you set an OS user assigned solely to an individual for the AJS administrator account, problems arise if the individual is transferred somewhere else. Do not set an OS user assigned solely to an individual for the AJS administrator account.

### E.3 Cautionary notes on using an AJS administrator account

- An AJS administrator can control the processes that are executed with superuser privileges. Manage the AJS administrator account very carefully, treating it as if it were the superuser account (`root` user).
- During JP1/AJS3 operations, do not delete the JP1 administrators group or AJS administrator account. If you accidentally delete the JP1 administrators group, create it again and restart the JP1/AJS3 service. The following settings of the JP1 administrators group that you create must be the same as those of the original JP1 administrators group that you deleted:
  - Name of the OS user group for the JP1 administrators group
  - Group ID of the OS user group for the JP1 administrators group

If you accidentally delete the AJS administrator account, create it again and restart the JP1/AJS3 service. The following settings of the AJS administrator account that you create must be the same as those of the AJS administrator that was specified when JP1/AJS3 was installed:

- OS user name for the AJS administrator
- User ID of the OS user for the AJS administrator
- Primary group of the OS user for the AJS administrator

Note that you can use the `jajsshowadminusr` command to check the information for the JP1 administrators group and AJS administrator account that were specified during the JP1/AJS3 installation. For details about the `jajsshowadminusr` command, see *jajsshowadminusr (UNIX only)* in *2. Commands* in the *Job Management Partner 1/Automatic Job Management System 3 Command Reference 1*.

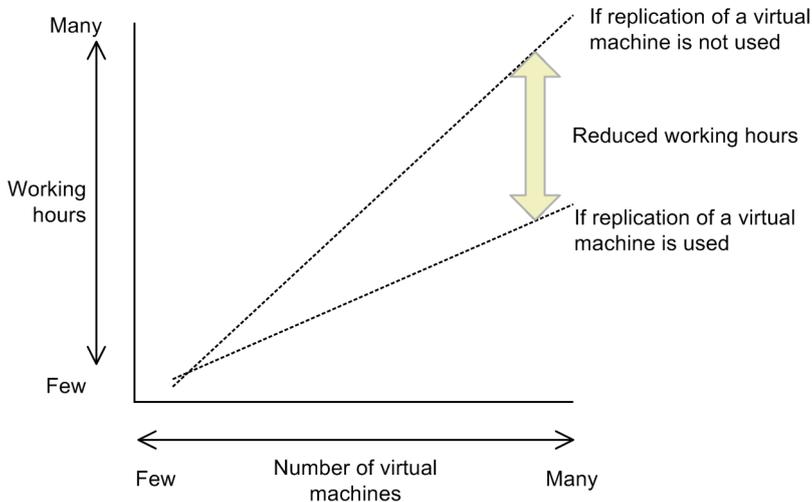
## F. Replicating a Virtual Machine on which JP1/AJS3 Is Installed and Set Up

After you have installed and set up JP1/AJS3 - Manager and JP1/AJS3 - Agent on a virtual machine, you can replicate that virtual machine. This reduces the workload for installing and setting up JP1/AJS3 instances running on multiple virtual machines.

If you want to replicate the default settings immediately after installing JP1/AJS3 products, replicate the virtual machine after installation. If you want to replicate the environment in which environment setting parameters and system environments have been set up, replicate the virtual machine after the setup.

By replicating a virtual machine, you only have to install and set up JP1/AJS3 for a single virtual machine to operate JP1/AJS3 on multiple virtual machines. You can also prevent omissions or differences in the settings among multiple virtual machines. Thus, the more virtual machines there are, the more effectively replication of a virtual machine can reduce working hours. The following figure shows the relationship between the number of virtual machines and working hours.

Figure F-1: Relationship between the number of virtual machines and working hours

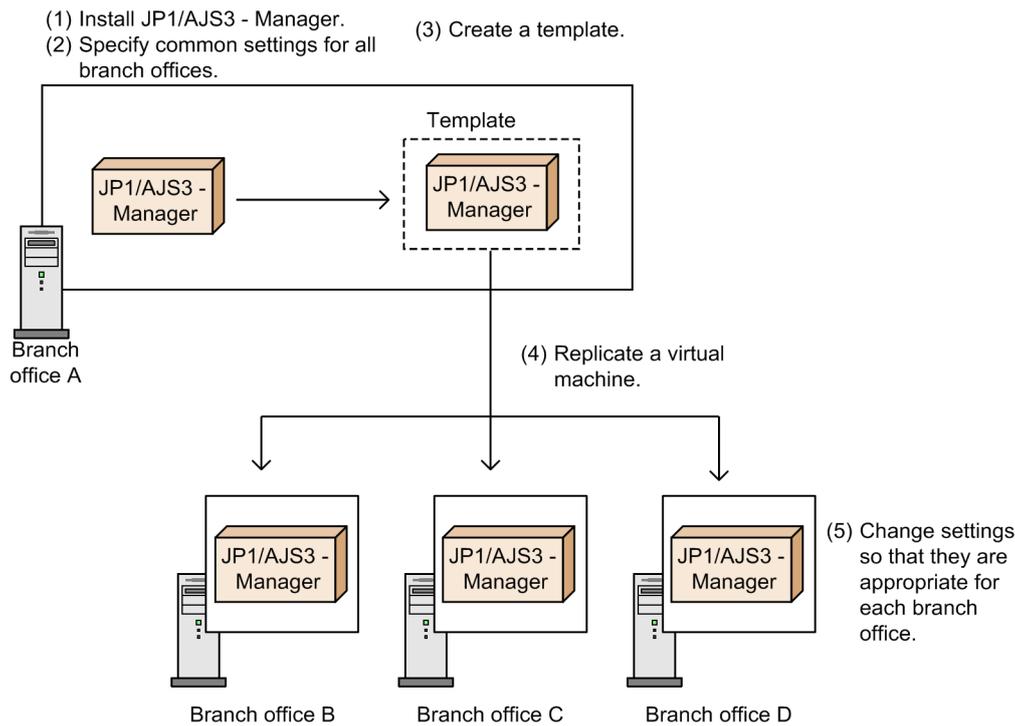


For details about how to replicate a virtual machine after installing and setting up JP1/AJS3, see *H. Procedure for Replicating a Virtual Machine on which JP1/AJS3 Is Installed and Set Up* in the *Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1*.

### F.1 Operation example for replicating a virtual machine on which JP1/AJS3 - Manager is set up

The following figure shows an operation example for replicating a virtual machine on which JP1/AJS3 - Manager has been set up.

Figure F-2: Operation example for replicating a virtual machine on which JP1/AJS3 - Manager has been set up



This example shows how a virtual machine environment set up for branch office A is replicated to other branch offices. In this example, a *template* means the original virtual machine.

The following describes the general procedure for this example:

1. Install JP1/AJS3 - Manager on a virtual machine in branch office A.
2. On the virtual machine for branch office A, set up the common environment settings for the branch offices.
3. Create a template based on the virtual machine for branch office A.
4. Replicate the template as virtual machines for branch offices B, C, and D.
5. On the virtual machine for each branch office, specify settings for each respective branch office.

## F.2 Notes on replicating a virtual machine on which JP1/AJS3 is installed and set up

- Only Windows and Linux support replication of a virtual machine on which JP1/AJS3 has been installed and set up.
- Replication of JP1/AJS3 is not supported for a virtual machine for which a logical host has been set up. A logical host must be set up on a replicated virtual machine.
- On the original virtual machine, do not install a product that does not support replication of a virtual machine.
- Replication of a virtual machine on which JP1/AJS3 is already running is not supported.

## G. Version Revisions

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This appendix lists the changes in each version of the JP1/AJS series programs.

### G.1 Revisions in 10-50

The following lists the revisions in 10-50 for each program.

#### (1) JP1/AJS3 - Manager

- A virtual machine on which JP1/AJS3 has been installed and configured can now be duplicated.
- Functionality was expanded so that a disaster recovery environment can be set up with the main and remote hosts whose logical host names are the same.
- A setting for shifting the start day by a number of days (counting both open and closed days) was added.
- A function that holds jobnet execution during immediate execution registration was added.
- A function that can execute some commands from JP1/AJS3 - View to JP1/AJS3 - Manager was added.
- The files `jajs_log.bat` and `jajs_log`, which have the same functionality as the data collection tool (`_04.bat` and `_04`), are now available. In addition, an option was added to the Windows version of the data collection tools that allows you to specify the location to which data is output.
- An option was added to the `ajsprint` command so that relation line information can be output in order of the unit name.
- The procedure for changing the IP address of an agent host was changed.
- UTF-8 was added to the list of character encodings that can be used in AIX, HP-UX, and Solaris 10.
- The number of characters that can be used when specifying a logical host name for the command `jajs_killall.cluster` was increased.

#### (2) JP1/AJS3 - Agent

- The files `jajs_log.bat` and `jajs_log`, which have the same functionality as the data collection tool (`_04.bat` and `_04`), are now available. In addition, an option was added to the Windows version of the data collection tools that allows you to specify the location to which data is output.
- The procedure for changing the IP address of an agent host was changed.
- UTF-8 was added to the list of character encodings that can be used in AIX, HP-UX, and Solaris 10.
- The number of characters that can be used when specifying a logical host name for the command `jajs_killall.cluster` was increased.

#### (3) JP1/AJS3 - View

- A setting for shifting the start day by a number of days (counting both open and closed days) was added to the **Schedule by days from start** settings in the **Advanced** tab of the Schedule Rule dialog box.
- A setting for holding jobnet execution if the registration method is **Immediate execution** was added to the Register for Execution dialog box.
- A function that can execute some commands from JP1/AJS3 - View to JP1/AJS3 - Manager was added.

- The files `jajs_log.bat` and `jajs_log`, which have the same functionality as the data collection tool (`_04.bat` and `_04`), are now available. In addition, an option was added to the Windows version of the data collection tools that allows you to specify the location to which data is output.

## G.2 Revisions in 10-10

The following lists the revisions in 10-10 for each program.

### (1) JP1/AJS3 - Manager

- A function was added that uses IP addresses to restrict the hosts that are able to connect to a manager host.
- A function was added for checking the execution schedule of unregistered units in the Monthly Schedule window of JP1/AJS3 - View.
- A function was added for preventing scheduler services for which the JP1 user logged in to JP1/AJS3 - View has no access privileges from appearing in JP1/AJS3 - View.
- A function was added for restricting the maximum number of allowed JP1/AJS3 - View concurrent sessions for a scheduler service.
- A function was added for changing the passwords of JP1 users by using JP1/AJS3 - View.
- The following OS is supported:
  - Linux 5.1 (x86) or later
  - Linux 5.1 (AMD/Intel 64) or later
- Content related to Solaris 11 (SPARC) was added.

### (2) JP1/AJS3 - Agent

- A function was added that uses IP addresses to restrict the hosts that are able to connect to an agent host.
- Content related to Solaris 11 (SPARC) was added.

### (3) JP1/AJS3 - View

- A function was added for checking the execution schedule of unregistered units in the Monthly Schedule window of JP1/AJS3 - View.
- A function was added for preventing scheduler services for which the JP1 user logged in to JP1/AJS3 - View has no access privileges from appearing in JP1/AJS3 - View.
- A function was added for restricting the maximum number of allowed JP1/AJS3 - View concurrent sessions for a scheduler service.
- A function was added for changing the passwords of JP1 users by using JP1/AJS3 - View.
- The way in which the Register Custom Job dialog box and the Set Properties of Custom Job dialog box are displayed was changed.
- A change was made so that when **Jobnet Definition** is selected from **Function Menu**, jobnets for which execution has been registered are displayed in the list area of the JP1/AJS3 - View window (main window).
- The function for hiding the icons of unused units in the Jobnet Editor window (a setting in the Set Default Values dialog box) was extended.

- A function was added for preventing the history of previously-used login-user names and connection-destination host names from appearing on the Login screen.

## G.3 Revisions in 10-00

The following lists the revisions in 10-00 for each program.

### (1) JP1/AJS3 - Manager

- IPv6 addresses are now supported for communication.
- Mirroring by copying a disk is now supported to enable disaster recovery operations.
- The AJS administrator, with JP1/AJS3 access permissions that are almost equivalent to superuser permissions, can now be designated when JP1/AJS3 is installed as a new installation.
- Wait conditions can now be used as a means for controlling the execution order of units across jobnets.
- The number of definition items for which macro variables can be specified has been increased, and the passing information setting job, which uses macro variables to pass information, has been added.
- A function that assigns a created or copied unit the attributes inherited from the upper-level unit, and a function that can permanently assign (fix) an execution user to a job have been added.
- A function that prevents jobs from being executed on unauthorized execution agents has been added.
- A function that allows users to save information about temporary change operations and to re-execute temporary change operations has been added.
- A function that automatically retries execution of a job when the executable file defined for the job terminates abnormally has been added.
- The dependent job of a judgment job can now be re-executed when the judgment job terminates normally.
- Mutually exclusive conditions and range conditions can now be specified as judgment conditions for judgment jobs.
- The Monitoring Event Log Job now can monitor the types of log data and events that were added in Windows Server 2008.
- An option that can be used when the Interval Control Job is defined as a start condition has been added to forcibly assume that the start condition is satisfied immediately after the monitoring of the start condition starts.
- The email sending job now supports a function that sends emails without using Outlook.
- SNMP traps can now be issued in Windows Server 2008.
- Processes for managing the embedded database have been improved.
- The startup type of the JP1/AJS3 Database service has been changed to **Manual** so that the JP1/AJS3 Database ClusterService service will not be created.
- An option has been added that checks the permissions of JP1 users mapped to OS users that have administrator permissions based on the JP1 permission level.
- A time period can now be specified when the `aj_sentry` command is used to register a jobnet for fixed execution.
- Options that can be specified when the `jajs_setup` or `jajs_setup_cluster` command is used to set up the embedded database have been added.
- The `ajsembdbidlist` and `ajsembdbstatus` commands can now be used to display the status of the embedded database.

- The embedded database settings file is now generated when an embedded database is set up. If this file is specified when the `ajsembddbbuild` command is used to build another embedded database, the other embedded database will be set up with the settings in the file.
- *Execution user name* and *Execution time* have been added as extended attributes that can be output for JP1 events (specific information) so that JP1 events indicating job termination can be used as job operating information.
- JP1/AJS3 - Manager can now link with JP1/DH - AJE, and DHAJEW has been added as a standard custom job.
- The following OS is no longer supported:
  - Solaris 9(SPARC)
  - Linux 5 (x86)
  - Linux 5 (AMD/Intel 64)
  - Linux 5 (IPF)
- The following OS is supported:
  - Windows Server 2012
  - Solaris 11(SPARC)
  - Linux 6 (x86)
  - Linux 6 (x64)

## (2) JP1/AJS3 - Agent

- IPv6 addresses are now supported for communication.
- The AJS administrator, with JP1/AJS3 access permissions that are almost equivalent to superuser permissions, can now be designated when JP1/AJS3 is installed as a new installation.
- An option that can be used when the Interval Control Job is defined as a start condition has been added to forcibly assume that the condition is satisfied when the monitoring of the start condition starts.
- The email sending job now supports a function that sends emails without using Outlook.
- SNMP traps can now be issued in Windows Server 2008.
- The Monitoring Event Log Job now can monitor the types of log data and events that were added in Windows Server 2008.
- The following OS is no longer supported:
  - Solaris 9(SPARC)
  - Linux 5 (x86)
  - Linux 5 (AMD/Intel 64)
  - Linux 5 (IPF)
- The following OS is supported:
  - Windows Server 2012
  - Solaris 11(SPARC)
  - Linux 6 (x86)
  - Linux 6 (x64)

### (3) JP1/AJS3 - View

- The Wait Conditions Settings List window and the Wait Conditions Statuses window have been added as means for managing units with wait conditions and units whose end is being waited for.
- A dialog box which lists temporary change operations that have already been performed and which allows users to re-execute (re-apply) specific temporary change operations has been added.
- Retry information can now be displayed in the following windows:
  - Daily Schedule window
  - Monthly Schedule window
  - Jobnet Monitor window
  - Detailed Schedule dialog box
  - Monitor Details - [*icon-name*] dialog box
- Whether retries are enabled is now displayed in the list area of the Jobnet Editor window.
- The Jobnet Monitor window was provided with a function that grays out all relation lines and units other than the day's units (the units that were executed and are to be executed on the day).
- **Specify period**, **Reference calendar**, **Waiting-target**, and **Execution type** have been added as search conditions that can be specified in the Search window.
- In the Search window, **Retry Settings** and **Retry execution** can now be specified as search conditions. In addition, the search results displayed in the Search window now include items related to automatic retry.
- The procedure for displaying the units found in the Search window in the Summary Monitor window has been simplified.
- The Display Item Setup dialog box can now be used to set the items to be displayed in the list areas of the Jobnet Editor window and the Jobnet Monitor window.
- A function that allows users to define all-at-one-time schedule rules that start execution at regular intervals, and a function that allows users to delete multiple schedule rules at one time have been added.
- Definition items related to automatic retry have been added to the detailed definitions of Unix jobs, PC jobs, QUEUE jobs, and custom jobs.
- Mutually exclusive conditions and range conditions can now be specified as judgment conditions for judgment jobs.
- The types of log data and events that were added in Windows Server 2008 can now be specified as **Log type** and **Event type** in the detailed definition of the Monitoring Event Log Job.
- The **Expire right after starting** option has been added in the detailed definition of the Interval Control Job. When the job has been defined as a start condition, this option can be used to forcibly assume that the condition is satisfied immediately after the monitoring of the start condition starts.
- An option ensuring that the job groups and planning groups displayed in the list area are initially selected when the JP1/AJS3 - View window (Main window) opens has been added. In addition, an option ensuring that the nested jobnets and nested remote jobnets displayed in the map area are initially selected when the Jobnet Editor window or the Jobnet Monitor window opens has been added.
- An option has been added that displays a nested jobnet as being selected at the location at which the jobnet existed before it was moved to the upper layer in the Jobnet Editor window or the Jobnet Monitor window.
- When the **Depends on upper-level jobnet** check box is selected in the schedule settings of a nested jobnet, whether to display a confirmation message before defined schedule rules are deleted can now be selected by using an option.
- The **Start** button, which allows users to launch arbitrary programs, has been added to the Monitor Details - [*custom-job-name*] dialog box.

- Because of the user authentication function added in JP1/AJS3 - Definition Assistant 09-10, specifying the JP1 user name is now mandatory for starting JP1/AJS3 - Definition Assistant from JP1/AJS3 - View. With this specification change, **User name** has been added as an item that can be selected from the **Replace** drop-down list in the Tool Entry dialog box.
- The following OS is supported:
  - Windows 8.1
  - Windows 8
  - Windows Server 2012
- An option for preventing the opening of multiple Jobnet Editor windows and Jobnet Monitor windows has been added.

## G.4 Revisions in 09-00

The following lists the revisions in 09-00 for each program.

### (1) JP1/AJS3 - Manager

- The standard database of JP1/AJS3 is now an embedded database.
- Functions related to an embedded database have been changed as follows:
  - The sizes of the large-scale, medium-scale, and small-scale database models have been changed.
  - The database area auto-increment function and the system log auto-increment function have been added.
  - The system log is no longer used.
  - The functions of the commands used to control an embedded database have been enhanced.
- The ISAM database is now used only for QUEUE jobs and submit jobs.
- An agent management function has been added for specifying a logical execution agent name as the destination host for a job or jobnet. Previously, users could only specify execution hosts by their real names.
- Jobs that are in the *Now queuing* status when the service is stopped are now returned to the *Wait for prev. to end* status when the service restarts (in hot-start mode), before being resubmitted.
- A jobnet release function has been added for replacing the definition of a jobnet that is registered for execution with another definition.
- The job execution control manager process (jqpman) and event/action control manager process (jpomanager) can now be started on a scheduler service basis.
- A scheduler log file can now be output for an individual scheduler service or host.
- The following functions have been enhanced:
  - The method by which the number of logs to keep is managed
  - The process by which monitored generations of jobnets with start conditions are established
  - The process by which execution generations when a start condition is established are held
- A format specification has been added to the `ajsshows` command for outputting the standard output file name.
- The Manager Environment Settings dialog box is no longer provided. Instead, you can use the `ajjs_config` command to set up the manager environment.
- The following environment setting parameters have been added:

- `FixedHostnameForAgent`
- `NotificationConstantRetry`
- `NotificationRetryInterval`
- `NotificationRetryCount`
- `ClientConnectTimeout`
- A function has been added to support end delay monitoring based on how long a job takes to execute.
- The jobnet connector functionality has been enhanced to enable control of the execution order of root jobnets managed by different scheduler services.
- The definition pre-check has been enhanced so that if an invalid execution order is found in the units of the jobnet being checked, the names of the units are output to the check results file.
- The file permission check performed at execution of a Unix job has been enhanced to include checks of the access control list and secondary group settings as well as file permissions.
- A function has been added that enables event jobs to continue executing even if the JP1/AJS3 service stops on the execution host.
- A function has been added for exporting and importing the registration statuses of jobnets as registered execution-schedule information.
- Linkage with message queues on UNIX hosts (TP1/LiNK, TP1/Message Queue, MQSeries) is no longer supported.
- Windows Server 2008 has been added as platforms supported by JP1/AJS3 - Manager.
- A unit called a jobnet connector which controls the execution order of root jobnets has been added.
- An option has been added to output a detailed history of user operations, such as changes to jobnet definitions, to the scheduler log.
- The `ajslogprint` command for extracting log entries from the scheduler log has been added.

## (2) JP1/AJS3 - Agent

- The Agent Environment Settings dialog box is no longer provided. Instead, you can use the `jajs_config` command to set up the agent environment.
- Linkage with a message queue system is no longer supported.
- The following environment setting parameters have been added:
  - `FixedHostnameForAgent`
  - `NotificationConstantRetry`
  - `NotificationRetryInterval`
  - `NotificationRetryCount`
  - `ClientConnectTimeout`
- The file permission check performed at execution of a Unix job has been enhanced to include checks of the access control list and secondary group settings as well as file permissions.
- Linkage with message queues on UNIX hosts (TP1/LiNK, TP1/Message Queue, MQSeries) is no longer supported.
- Windows Server has been added as platforms supported by JP1/AJS3 - Agent.

### (3) JP1/AJS3 - View

- An agent management function has been added for specifying a logical execution agent name as the destination host for a job or jobnet. Previously, users could only specify execution hosts by their real names.
- A jobnet release function has been added for replacing the definition of a jobnet that is registered for execution with another definition.
- Function menus have been added to the JP1/AJS3 - View window to facilitate task-oriented operation.
- The JP1/AJS3 - View window (Summary Monitor window) has been added. In this window, you can view the progress of jobnets and other information.
- JP1/AJS3 - View can now be started in the following modes:
  - Normal mode  
In this mode, the JP1/AJS3 - View window is equipped with function menus.
  - Monitoring mode  
A mode dedicated to monitoring jobs and jobnets. Only the JP1/AJS3 - View window (Summary Monitor window) is displayed.
  - Compatible mode  
JP1/AJS3 - View operates in the same way as JP1/AJS2 - View version 8 or earlier.
- A Detailed Information area has been added to the JP1/AJS3 - View window (Main window), which displays detailed information about a unit.
- The concurrent execution setting of monitored generations and the holding behavior of execution generations (produced when a start condition is satisfied) can now be selected in the detailed definition of a start condition.
- A list filter function has been added for filtering the information in a list.
- A function has been added for saving list information in CSV format.
- You can now click a button in the Daily Schedule window and Monthly Schedule window to move between days and months.
- A list area has been added to the Jobnet Editor window and Jobnet Monitor window. This area displays the jobs defined in the jobnet.
- A Search window has been added, in which you can set detailed search conditions and perform operations on units listed in the search results.
- You can now use a mouse wheel to scroll inside JP1/AJS3 - View.
- A function has been added that allows you to select whether **Type** in list areas are grouped by type or displayed in detailed format.
- A function has been added for prohibiting changes to specific definition items in the Define Details dialog box.
- A function has been added for removing icons you no longer use from the icon list area in the Jobnet Editor window.
- Windows 7 has been added as a supported OS (JP1/AJS3 - View 09-00-05 or later).
- A function has been added to support end delay monitoring based on how long a job takes to execute.
- The jobnet connector functionality has been enhanced to enable control of the execution order of root jobnets managed by different scheduler services.
- An option has been added to the Filter Settings dialog box so that jobnets with hold plans can be treated as jobnets in *Being held* status for filtering purposes in the Daily Schedule window and Monthly Schedule window.
- The ability to define, operate, and monitor jobnet connectors which control the execution order of root jobnets has been added.
- A function that displays the preceding and succeeding jobs of a given job or jobnet in bold has been added.

- Support for Windows Vista has been added.

## G.5 Revisions in 08-00

The following lists the revisions in 08-00 for each program.

### (1) JP1/AJS2 - Manager

- The recommended values for the environment settings are now set during installation and setup.
- A Monitoring Files job can now monitor files larger than 2 gigabytes (large files).
- The `ajsstatus` command can now output the connection status of JP1/AJS2 - View.
- The following commands used to control an embedded database have been added:
  - `ajsembdbaddarea` command (expands a database area in an embedded database)
  - `ajsembdbaddlog` command (expands a log area in an embedded database)
  - `ajsembdbcancel` command (cancels execution of a command manipulating an embedded database)
  - `ajsembdboplog` command (manipulates embedded database logs)
  - `ajsembdbreclaim` command (maintains an embedded database)
  - `ajsembdbrorg` command (unloads and reloads an embedded database)
  - `ajsembdbstr` command (backs up and restores an embedded database)
  - `ajsembdbstart` command (starts an embedded database)
  - `ajsembdbstatus` command (monitors an embedded database)
  - `ajsembdbstop` command (stops an embedded database)
  - `ajsembdbunset` command (removes the setup of an embedded database)

With support of the `ajsembdbreclaim` command, the time required to reclaim free pages has been reduced.

- JP1/Performance Management - Agent Option for JP1/AJS2 can now be linked with JP1/AJS2 to analyze the operating status.
- The `jajs_start` command and the `jajs_start.cluster` command can now check whether a process has already been started when JP1/AJS2 is started. (UNIX only)

### (2) JP1/AJS2 - Agent

- The recommended values for the environment settings are now set during installation and setup.
- A Monitoring Files job can now monitor files larger than 2 gigabytes (large files).

### (3) JP1/AJS2 - View

- Icons have been changed.

## G.6 Revisions in 07-50

The following lists the revisions in 07-50 for each program.

## (1) JP1/AJS2 - Manager

- Macro variables can now be used during registration for execution to specify information to be passed.
- Judgment jobs can now perform variable judgment.
- A function has been added that suppresses jobnet executions that follow an abnormally terminated jobnet and that will be started when their start conditions are satisfied.
- A definition pre-check function has been added for conducting a final check before starting production in the production environment after the unit definitions are migrated from the development environment.
- The `jpomanevreset` command has been added for deleting data accumulated in the event action manager if a large amount of unprocessed data accumulated in the event action manager has caused delay. To identify the start conditions and agents that have caused this problem, the `jpomanevshow` command has also been added for displaying information about agents that frequently send data to the manager and the start conditions.
- A function that alleviates consumption of the Desktop heap has been added. (Windows only)
- A function has been added for specifying the maximum wait time for the scheduler service to connect to a database.
- Messages that were output to only the integrated trace log can now be output to syslog also. (UNIX only)
- The following functions have been added to the data collection tool:
  - Specifying a logical host name
  - Filtering the data to be collected
  - Adding types of data that can be collected
- Descriptions of messages have been improved.
- An urgent command has been added that can be executed if an error occurs.
- A function has been added that places limits on, for example, the size of files that can be received, to prevent a part of job processing from affecting the entire system operation.
- A function has been added that performs a synchronized write when updating event job information or the wait information file.
- The monitoring interval for linkage with MQ Series can now be specified in seconds.
- If a TCP/IP connection error occurs, the retry interval and count can now be changed.
- The policy to determine the agent hosts to which a job will be dispatched can now be specified.
- All the detailed processes of the event action function can now be stopped to terminate the agent process for the event action function if any of the detailed processes have terminated upon receiving a signal.
- Microsoft(R) Visual C++ .NET Version 2003 is now supported as a compiler for the provided code functions.
- The `ajsshow` command can now display the hold attribute of a jobnet or job even when the jobnet or job has already terminated.

## (2) JP1/AJS2 - Agent

- A definition pre-check function has been added for conducting a final check before starting production in the production environment after the unit definitions are migrated from the development environment.
- The following functions have been added to the data collection tool:
  - Specifying a logical host name
  - Filtering the data to be collected
  - Adding types of data that can be collected

- Descriptions of messages have been improved.
- The monitoring interval for linkage with MQ Series can now be specified in seconds.
- All the detailed processes of the event action function can now be stopped to terminate the agent process for the event action function if any of the detailed processes have terminated upon receiving a signal.
- A function has been added that performs a synchronized write when updating event job information or the wait information file.

### (3) JP1/AJS2 - View

- Macro variables can now be used during registration for execution to specify information to be passed.
- Judgment jobs can now perform variable judgment.
- A function has been added that suppresses the jobnet executions that follow an abnormally terminated jobnet and that will be started when their start conditions are satisfied.
- The **Add**, **Change Time**, **Execute Immediately**, and **Release Change** options have been added to the JP1/AJS2 - View window.
- The **Paste (Extension)** menu command has been added for copying units and relationship lines at the same time.
- Relationship lines can now be drawn from multiple units to a single job network element.
- When opening the Jobnet Monitor window of JP1/AJS2 - View from JP1/AJS2 Console View, if there is already an activated JP1/AJS2 - View, the window can now be opened in JP1/AJS2 - View.
- The following functions have been added to the data collection tool:
  - Specifying a logical host name
  - Filtering the data to be collected
  - Adding types of data that can be collected
- Descriptions of messages have been improved.
- The maximum log file size for JP1/AJS2 - View has been increased.
- The maximum log file size for JP1/AJS2 Console View has been increased.
- In JP1/AJS2 - View, log information that previously was output many times in small units can now be output at one time.
- In JP1/AJS2 Console View, log information that previously was output many times in small units can now be output at one time.
- In the Windows version of JP1/AJS2 - View, **Help** has been added to the **Start** menu.

## G.7 Revisions in 07-00

The following lists the revisions in 07-00 for each program.

### (1) About JP1/AJS2 - Manager

- A function was provided to temporarily compress JP1/AJS2 and reconfigure the ISAM database (scheduler database and job execution environment database) without stopping active applications.
- ISAM databases can now be reconfigured in parallel.
- The number of scheduler services that can be added has been changed from 9 to 20.

- An option was added for outputting the execution timings of reference commands, such as `ajs show` and the history of service processing requests from operation commands, as the operation log to the scheduler log.
- The number of logs to keep for a jobnet has been changed from 99 to 999.
- For a cold start of JP1/AJS2, the job execution environment database is deleted so that the startup time of JP1/AJS2 becomes shorter.
- A function is now supported for validating the user profile information in the environment setup for job execution control.
- By setting the number of days that job information is held to 0 days, jobs that terminate abnormally can now be handled by changing the save time.
- The JP1/AJS2 job information deletion can now be suppressed.
- Any event job can now be used in a DNS environment (host name in the FQDN format).
- Event job reception information can now be inherited as macro variables as the parameters of standard jobs and action jobs without having to pay attention to double quotation marks in the inherited information.
- The extended regular expression supported by JP1/Base can now be used in Receive event job monitoring jobs, Monitoring log files jobs, and Monitoring event log jobs according to the JP1/Base settings.
- A function to execute queueless jobs is now supported.

## **(2) About JP1/AJS2 - Agent**

- Event job reception information can now be inherited as macro variables of the parameters of standard jobs and action jobs without being aware of double quotation marks in the inherited information.
- A function for executing queueless jobs was supported.
- When JP1/AJS2 - Agent starts, it no longer accesses the authentication server (07-00-/C or later).

## **(3) About JP1/AJS2 - View**

- A user profile can now be used to set the JP1/AJS2 - View environment.
- A line feed character can now be inserted at any point in a unit name displayed in the map area of the Jobnet Editor and Jobnet Monitor windows.
- The default values in the dialog box can now be changed.
- Display items (columns) in the following locations can now be selected.
  - List area in the JP1/AJS2 - View window
  - Execution result list in the Daily Schedule window
  - Execution result list in the Monthly Schedule window

## H. Reference Material for This Manual

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This appendix provides reference information, including various conventions, for this manual.

### H.1 Related publications

This manual is part of a related set of manuals. The manuals in the set are listed below (with the manual numbers):

About JP1/AJS:

- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Overview* (3021-3-318(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 System Design (Work Tasks) Guide* (3021-3-320(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 1* (3021-3-321(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Configuration Guide 2* (3021-3-322(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Administration Guide* (3021-3-323(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Troubleshooting* (3021-3-324(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Operator's Guide* (3021-3-325(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Command Reference 1* (3021-3-326(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Command Reference 2* (3021-3-327(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Linkage Guide* (3021-3-328(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Messages 1* (3021-3-329(E))
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 Messages 2* (3021-3-330(E))
- *Job Management Partner 1/Automatic Job Management System 2 Description* (3020-3-K21(E))
- *Job Management Partner 1/Automatic Job Management System 2 Planning and Administration Guide* (3020-3-K22(E))
- *Job Management Partner 1/Automatic Job Management System 2 Setup Guide* (3020-3-K23(E))
- *Job Management Partner 1/Automatic Job Management System 2 Operator's Guide* (3020-3-K24(E))
- *Job Management Partner 1/Automatic Job Management System 2 Command Reference* (3020-3-K25(E))
- *Job Management Partner 1/Automatic Job Management System 2 Linkage Guide* (3020-3-K27(E))
- *Job Management Partner 1/Automatic Job Management System 2 Messages* (3020-3-K28(E))

- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 - Print Option Description, User's Guide (3021-3-331(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 - Definition Assistant Description, Operator's Guide and Reference (3021-3-332(E))*
- *Job Management Partner 1/Automatic Job Management System 3 - Web Operation Assistant Description, Operator's Guide and Reference (3020-3-S18(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Automatic Job Management System 3 for Enterprise Applications Description, User's Guide and Reference (3021-3-333(E))*

#### About JP1:

- *Job Management Partner 1 Version 10 Job Management Partner 1/Base User's Guide (3021-3-301(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Base Messages (3021-3-302(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Base Function Reference (3021-3-303(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Integrated Management - Manager Quick Reference (3021-3-304(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Integrated Management - Manager Overview and System Design Guide (3021-3-305(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Integrated Management - Manager Configuration Guide (3021-3-306(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Integrated Management - Manager Administration Guide (3021-3-307(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Integrated Management - Manager GUI Reference (3021-3-308(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Integrated Management - Manager Command and Definition File Reference (3021-3-309(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Integrated Management - Manager Messages (3021-3-310(E))*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Script Description and Reference (3021-3-135(E)), for Windows Systems*
- *Job Management Partner 1 Version 10 Job Management Partner 1/File Transmission Server/FTP Description, Reference, and Operator's Guide (3021-3-334(E)), for Windows systems*
- *Job Management Partner 1 Version 10 Job Management Partner 1/File Transmission Server/FTP Description, Reference, and Operator's Guide (3021-3-335(E)), for UNIX systems*
- *Job Management Partner 1 Version 10 Job Management Partner 1/Data Highway - Automatic Job Executor Operation manual (3021-3-336(E))*
- *Job Management Partner 1/Software Distribution Description and Planning Guide (3020-3-S79(E)), for Windows systems*
- *Job Management Partner 1/Software Distribution Setup Guide (3020-3-S80(E)), for Windows systems*
- *Job Management Partner 1/Software Distribution System Administrator's Guide Volume 1 (3020-3-S81(E)), for Windows systems*
- *Job Management Partner 1/Software Distribution System Administrator's Guide Volume 2 (3020-3-S82(E)), for Windows systems*
- *Job Management Partner 1/Software Distribution Automatic Installation Tool Description and Reference (3020-3-S83(E)), for Windows systems*

- *Job Management Partner 1/Software Distribution Administrator Kit Description and Operator's Guide (3020-3-S84(E))*
- *Job Management Partner 1/Software Distribution Client Description and User's Guide (3020-3-S85(E)), for UNIX systems*
- *Job Management Partner 1/Software Distribution SubManager Description and Administrator's Guide (3020-3-L42(E)), for UNIX systems*
- *Job Management Partner 1/Software Distribution Manager Description and Administrator's Guide (3000-3-841(E))*
- *Job Management Partner 1/Consolidated Management 2/Extensible SNMP Agent Description, Operator's Guide and Reference (3020-3-L04(E)), for UNIX systems*
- *Job Management Partner 1/NQSEXEC System Administrator's Guide (3020-3-F30(E))*
- *Job Management Partner 1/Open Job Entry Description, User's Guide and Reference (6190-3-365(E)), for VOS3 systems*
- *Job Management Partner 1/Open Job Entry Description, User's Guide and Reference (9000-3-365(E)), for MVS systems*
- *Job Management Partner 1/Open Job Entry Description, User's Guide and Reference (9000-3-366(E)), for OSIV/MSP systems*
- *Job Management Partner 1/Open Job Entry for Midrange Computer Description and User's Guide (9000-3-367(E))*

## H.2 Conventions: Abbreviations for product names

This manual uses the following abbreviations for product names:

Abbreviation		Full name or meaning
JP1/AJS3	JP1/AJS3 - Manager	Job Management Partner 1/Automatic Job Management System 3 - Manager
	JP1/AJS3 - Agent	Job Management Partner 1/Automatic Job Management System 3 - Agent
	JP1/AJS3 - View	Job Management Partner 1/Automatic Job Management System 3 - View
JP1/AJS2	JP1/AJS2 - Manager	Job Management Partner 1/Automatic Job Management System 2 - Manager
	JP1/AJS2 - Agent	Job Management Partner 1/Automatic Job Management System 2 - Agent
	JP1/AJS2 - View	Job Management Partner 1/Automatic Job Management System 2 - View
JP1/AJS2 - Advanced Manager		Job Management Partner 1/Automatic Job Management System 2 - Advanced Manager <sup>#</sup>
JP1/AJS2 - Client Toolkit		Job Management Partner 1/Automatic Job Management System 2 - Client Toolkit <sup>#</sup>
JP1/AJS3 - Definition Assistant		Job Management Partner 1/Automatic Job Management System 3 - Definition Assistant
JP1/AJS3 for Enterprise Applications		Job Management Partner 1/Automatic Job Management System 3 for Enterprise Applications

Abbreviation		Full name or meaning
JP1/AJS3 - Web Operation Assistant		Job Management Partner 1/Automatic Job Management System 3 - Web Operation Assistant
JP1/DH - AJE		Job Management Partner 1/Data Highway - Automatic Job Executor
JP1/DH - Server		Job Management Partner 1/Data Highway - Server
JP1/FTP		Job Management Partner 1/File Transmission Server/FTP
JP1/IM	JP1/IM - Manager	Job Management Partner 1/Integrated Management - Manager
	JP1/IM - View	Job Management Partner 1/Integrated Management - View
	JP1/IM - Central Console	Job Management Partner 1/Integrated Manager - Central Console <sup>#</sup>
	JP1/IM - Central Scope	Job Management Partner 1/Integrated Manager - Central Scope <sup>#</sup>
JP1/OJE		Job Management Partner 1/Open Job Entry
JP1/OJE for Midrange Computer		Job Management Partner 1/Open Job Entry for Midrange Computer
JP1/OJE for VOS3		VOS3 Job Management Partner 1/Open Job Entry
JP1/SES		Job Management Partner 1/System Event Service
NNM	HP NNM	HP Network Node Manager Software version 7.5 or earlier
		HP Network Node Manager Software Starter Edition version 7.5 or earlier
AIX		AIX 5L 5.3
		AIX V6.1
		AIX V7.1
HP-UX	HP-UX (IPF)	HP-UX 11i V2(IPF)
		HP-UX 11i V3(IPF)
Linux	Linux 6.1 (x86)	Red Hat Enterprise Linux(R) Server 6.1 (32-bit x86)
	Linux 6.1 (x64)	Red Hat Enterprise Linux(R) Server 6.1 (64-bit x86_64)
	Linux 5.1 (x86)	Red Hat Enterprise Linux(R) 5.1 (x86)
	Linux 5.1 (AMD/Intel 64)	Red Hat Enterprise Linux(R) 5.1 (AMD/Intel 64)
SAP BW		SAP Business Information Warehouse
SAP R/3		SAP R/3(R)
Solaris		Solaris 10(SPARC)
		Solaris 11(SPARC)

# Version 7

- In this manual, *JPI/AJS* is sometimes used generically, referring to JP1/AJS3 and JP1/AJS2.
- *UNIX* is sometimes used generically, referring to HP-UX, Solaris, AIX and Linux.

## H.3 Conventions: Acronyms

This manual also uses the following acronyms:

Acronym	Full name or meaning
ACL	Access Control List
DB	Database
DBMS	Database Management System
DNS	Domain Name System
EUC	Extended UNIX Code
FQDN	Fully Qualified Domain Name
FTP	File Transfer Protocol
GUI	Graphical User Interface
IME	Input Method Editor
IPF	Itanium(R) Processor Family
ISAM	Indexed Sequential Access Method
LAN	Local Area Network
MAPI	Messaging Application Programming Interface
MIB	Management Information Base
MIME	Multipurpose Internet Mail Extensions
NAT	Network Address Translator
NFS	Network File System
NIC	Network Interface Card
OS	Operating System
PDF	Portable Document Format
RDB	Relational Database
SMTP	Simple Mail Transfer Protocol
SNMP	Simple Network Management Protocol
SUP	Service Using Program
TCP/IP	Transmission Control Protocol/Internet Protocol
UAC	User Account Control
UNC	Universal Naming Convention
WAN	Wide Area Network
WOW64	Windows On Windows 64

Acronym	Full name or meaning
WSDL	Web Services Description Language

## H.4 Conventions: KB, MB, GB, and TB

This manual uses the following conventions:

- 1 KB (kilobyte) is 1,024 bytes.
- 1 MB (megabyte) is 1,024<sup>2</sup> bytes.
- 1 GB (gigabyte) is 1,024<sup>3</sup> bytes.
- 1 TB (terabyte) is 1,024<sup>4</sup> bytes.

## H.5 Conventions: Meaning of "directory" and "folder"

As a general rule, Windows folder names are used in this manual if they are identical to UNIX directory names.

## H.6 Conventions: Meaning of "member of the Administrators group"

The term *member of the Administrators group* in this manual refers to a user who is a member of the Administrators group on the local PC only. The privileges of local users, domain users, and Active Directory users are no different as long as these users are members of the Administrators group on the local PC.

## H.7 Default installation folders of JP1/AJS3 for Windows

The default installation folders of JP1/AJS3 for Windows are as follows:

Default installation folders of JP1/AJS3 - Manager:

`system-drive\Program Files#\HITACHI\JP1AJS2`  
and

`system-drive\Program Files#\HITACHI\JP1AJS2CM`

Default installation folder of JP1/AJS3 - Agent:

`system-drive\Program Files#\HITACHI\JP1AJS2`

Default installation folder of JP1/AJS3 - View:

`system-drive\Program Files#\HITACHI\JP1AJS2V`

#

For 64-bit versions of Windows, replace Program Files with Program Files (x86).

## H.8 About the Start menu in Windows

In Windows Server 2012 or later, instead of using the **Start** menu, perform the operation as described below.

In Windows 8 or Windows Server 2012 (except Windows Server 2012 R2):

Right-click on the Start screen to display the All Apps screen.

In Windows 8.1 or Windows Server 2012 R2:

Click the down-pointing arrow icon to display the Apps screen.

## H.9 Online manual

JP1/AJS3 - View comes with an online manual that you can read in browsers.

The HTML manual contains the same content as the *Job Management Partner 1/Automatic Job Management System 3 Operator's Guide*.

In JP1/AJS3 - View, you can view the manual by choosing **Help** and then **Contents**. You can also press the **F1** key to view the manual contents. Your Web browser must be associated with a file that has the extension `htm`; otherwise, the online manual will not be displayed correctly. If this happens, associate the `htm` file with the Web browser.

Cautionary note

Depending on the OS settings, the online manual might appear in the active window of the browser when you launch the manual from the **Start** menu.

## H.10 Regular expressions available in JP1/AJS3

Regular expressions can be used in some items in dialog boxes and commands. For details about regular expressions in Windows, see the *Job Management Partner 1/Base User's Guide*. For details about regular expressions in UNIX, see your UNIX documentation.

The regular expressions that you can use when executing an event job on a Windows host depend on the JP1/Base settings. For details on setting regular expressions for event job execution, see the explanation about extending the available regular expressions in the *Job Management Partner 1/Base User's Guide*.

Searching may take a long time if you often use the regular expression `.*` (which means match any character or characters). In long messages, use `.*` only where necessary. In UNIX, you can use `[^ ]*` (repeat characters other than space characters) instead of `.*` when you want to find a match other than space characters. Using `[^ ]*` reduces the search time.

## H.11 About the 3rd level and 4th level Kanji characters added in JIS 2004 (JIS X 0213:2004)

JP1/AJS3 cannot use the 3rd level and 4th level Kanji characters added in JIS 2004. If these characters are used, operation might not be performed correctly.

## H.12 About NNM linkage

JP1/AJS3 supports linkage with the following products:

- HP Network Node Manager Software version 6 or earlier
- HP Network Node Manager Starter Edition Software version 7.5 or earlier

In this manual, these products are indicated as *HP NNM*.

Note that linkage with the following products is not supported:

- HP Network Node Manager i Software v8.10

# I. Glossary

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## abnormal end

A jobnet ends abnormally if one of the processes defined in the jobnet fails to execute properly. The jobnet is interrupted at that point and subsequent processes are not executed.

A job ends abnormally if it fails to execute properly. The process is interrupted at that point.

The embedded database system ends abnormally when an error causes its status to change from active to stopped or paused, without any intervention by the user. For details, see *D. How the Embedded Database Operates* in the manual *Job Management Partner 1/Automatic Job Management System 3 Troubleshooting*.

## abnormal threshold

A value that is compared with a job's return code to evaluate whether the job ended normally or abnormally.

## action job

A job that sends email, or sends events reporting the system status to JP1/ IM or the HP NNM.

## agent host

A host that executes jobs on request from a manager host. JP1/AJS3 - Agent must be installed on the agent host, or since JP1/AJS3 - Manager also provides JP1/AJS3 - Agent functionality, JP1/AJS3 - Manager might be installed on the agent host.

The agent host executes the job on receipt of a job request from the manager host. At completion of the job, the agent host receives the execution result (return value) of the executable file and forwards it to the manager host.

## AJS3 unit monitored object

An object for monitoring the status of root jobnets in JP1/AJS3. By defining the monitoring conditions in this object, you can then switch to monitoring mode and monitor the root jobnets.

## AJS administrator

A user that has access permissions almost equivalent to superuser permissions for JP1/AJS3. Only one of the JP1/Base administrators in the JP1 administrators group can be designated as the AJS administrator. An ordinary user designated as the AJS administrator can perform such JP1/AJS3 system management operations as specifying the environment settings and starting and stopping services.

## AJSPATH

An environment variable for defining the paths used by JP1/AJS3. When this environment variable is defined, you do not need to specify the full path when specifying a jobnet name in a command.

## automatic retry

A function that automatically retries execution of a job if the executable file defined for the job terminates abnormally. Because jobs that have terminated abnormally due to a temporary error might be able to run normally when automatically retried, this function can improve the system availability.

## backup box

A directory or a folder for storing backup files.

## backup file

A file containing the units defined in JP1/AJS3.

## base day

A date specified as the starting day of the month in the calendar information.

## base time

The time that marks when a day ends and the next day begins in a JP1/AJS3 system. For example, if 8:00 a.m. is set as the base time, the previous day is regarded as lasting until 7:59 a.m.

## calendar information

Information about open days and closed days for jobnet execution. You can define calendar information separately for each job group. The calendar information specifies the days on which jobnets in the job group can and cannot be executed. (When the processing cycle falls on a closed day, the jobnet can be executed on another day if a substitute schedule is defined.) For open days, you can specify the base day, base month, and base time.

## closed day

A day on which jobnets are not executed. However, if **Execute without shift** is specified, the jobnet will be executed on that closed day.

## cluster system

A system configured as multiple linked server systems, designed to continue operation even if one system fails. If a failure occurs in the server currently executing applications (primary node), the other standby server (secondary node) takes over and continues processing the applications. Therefore, a cluster system is also referred to as a *node switching system*.

The term *cluster system* can also mean load balancing based on parallel processing. In this manual, however, *cluster system* refers only to node-switching functionality for preventing interruption of application processing.

## common user profile

A file containing the environment settings for JP1/AJS3 - View, accessible to all JP1 users. The system administrator saves the common user profile in JP1/AJS3 - Manager. JP1 users can download this file, enabling the same JP1/AJS3 - View environment to be set for all JP1 users.

A common user profile is useful when a large number of JP1 users will be using JP1/AJS3 - View in the same environment.

## compatible ISAM configuration

A system configuration in which JP1/AJS3 information is managed exclusively by the ISAM database.

This configuration is offered to help users migrate from JP1/AJS2 version 8 or earlier. It can restrict to the same degree as in previous versions, the use of resources such as hard disk and memory. However, from version 9 only a subset of the new features offered is provided.

## correlation ID

Information for identifying sent and received messages. The correlation ID is received in the character code set specified by the sender.

## custom job

A predefined job for executing a task with a specific purpose. JP1/AJS3 provides standard custom jobs such as file transfer and job requests to a mainframe. In addition, you can register your own frequently used jobs as custom jobs. When registering a custom job, you can represent it by creating an icon with a special shape and design, and you can create a dialog box for entering job information.

To use a custom job, the requisite program for the job must be installed.

## Daily Schedule window

A window that displays each day's execution schedules, execution status, and execution results.

## data collection tool

These tools are provided by JP1 for batch collection of log data and other information required to investigate problems. In addition to problems in JP1/AJS3, problems might occur in the OS or user programs or as the result of operational mistakes. The data collection tools collect JP1/AJS3 log data and other information, such as OS log data, at the same time.

## default queue

A queue created in an agent host for executing jobs. You must always create a default queue.

When you submit a job for execution, if you specify an agent host name as the destination, the job will be submitted to the default queue of the specified agent host.

## dependent job

A job executed when the judgment result of a judgment job is true.

## dependent jobnet

A jobnet executed when the judgment result of a judgment job is true.

## disaster recovery

Disaster recovery refers to measures that are taken when there are unexpected occurrences such as system shutdown due to a large-scale disaster.

JP1/AJS3 supports a disaster recovery operation that copies JP1/AJS3 data on the shared disk to a shared disk at a remote site. If the JP1/AJS3 system fails because of an event such as a disaster, the JP1/AJS3 system at the remote site can continue operation by using the copied data. The disk copy and mirroring functionality of hardware is used to copy data between shared disks.

## embedded database

The standard database of JP1/AJS3. An embedded database offers high reliability, and is well suited to large-scale systems that handle large quantities of information.

## embedded database administrator (database administrator)

A user authorized to assign and cancel various permissions for an embedded database (a user with DBA permissions).

Database administrators are managed within an embedded database.

## embedded database operation commands

A generic term for commands whose name begins with `ajsembdb`.

### **embedded database service**

A service that provides the environment for using the embedded database in Windows. This service must be started before you can use the embedded database. The name of the embedded database service is JP1/AJS3 Database *setup-identifier*.

### **embedded database system administrator**

The owner of an embedded database practical directory and embedded database file system areas (data area and system area). The embedded database system administrator can execute commands for an embedded database.

The OS manages embedded database system administrators.

### **end with warning**

A status indicating that a jobnet finished, but some of the processes defined in the jobnet were executed incorrectly. The jobnet continues to the end without interruption.

This ending method is used when an error is not so serious as to terminate the jobnet.

### **environment setting parameter**

A parameter for defining the information required to operate JP1/AJS3, written in an environment settings file. With these parameters, you can specify the directory in which information about JP1/AJS3 units is stored, whether to output syslog messages, and other such preferences.

### **environment settings file**

A file containing the settings required to operate JP1/AJS3, such as the scheduler service environment and job execution environment.

### **event**

A specific event, such as email reception or file update, that occurred in the system. Events can be used to start a job or jobnet, and can be monitored using an event job.

### **event job**

A job that monitors specific events occurring in the system. When an event job is initiated, it starts monitoring for file updates, incoming messages, or other specified events.

### **execution agent**

The logical name of an agent host that executes jobs or jobnets. Based on the agent information defined in the manager host, the manager maps the execution agent specified in the job or jobnet to the physical host name of the agent host, and distributes the job or jobnet accordingly.

### **execution agent group**

A group of execution agents configured to realize load distribution. The manager distributes jobs among the execution agents according to their assigned priorities.

### **execution agent restriction**

A function that suppresses execution of jobs on an execution agent that the administrator has not permitted to execute the jobs. The execution agents permitted to execute jobs can be set for each unit.

When the execution agent profile is enabled, this function checks for whether the execution agent is permitted to execute jobs at the following times:

- When a unit is defined in JP1/AJS3 - View
- When the `ajschkdef` command is used to conduct a definition pre-check
- When a job is executed

### execution ID

A number assigned to an execution schedule of the uppermost jobnet.

### execution-locked resource

A means of preventing multiple jobs from executing at the same time, by specifying the same resource name (execution-locked resource name) for each job.

### fixed execution registration

A method of registering a jobnet so that it starts and runs at a predetermined date and time calculated by the system from schedule definitions.

### fixed schedule

A schedule set by absolute times when a jobnet is registered for fixed execution.

### HP NNM

A suite of integrated network management tools from Hewlett-Packard Co. for managing network configuration, performance, and failures.

### immediate execution registration

A method for starting and processing a jobnet immediately after registering it for execution.

### ISAM database

The database that manages the execution environment for QUEUE jobs and submit jobs. Data is indexed using the Indexed Sequential Access Method (ISAM) and is managed in the database. The ISAM database is provided as standard with JP1/Base.

### job

A group of commands, shell scripts, or Windows executable files.

### job execution environment

A job execution environment consists of a JP1/AJS3 manager and agents.

The job execution environment for the manager is used to manage the definition information for execution agents (such as the maximum number of concurrently executable jobs and job transfer restriction status), job distribution method, and job execution results.

The job execution environment for the agent is used mainly to manage how a job is executed.

These job execution environments are managed by using a database and environment setting parameters.

When QUEUE jobs and submit jobs are used, the ISAM database and environment setting parameters are used as the job execution environment for the QUEUE jobs and submit jobs.

Note that queueless jobs are managed in the queueless job execution environment.

## job group

A folder for classifying and managing jobnets.

## job network element

The generic term for these elements is *unit*.

## jobnet

A set of jobs associated in execution order. When a jobnet is executed, the jobs in the jobnet are automatically executed in their predetermined order.

## jobnet connector

A unit for controlling the execution order of root jobnets. A jobnet connector establishes connections between root jobnets and controls their execution order by having connected generations wait for their counterparts to start or finish.

## Jobnet Editor window

A window in which you can create new jobnets or edit existing jobnets.

## Jobnet Monitor window

A window that displays the execution status or detailed execution results of jobnets or jobs. You can manipulate jobnets or jobs in this window.

## JP1 event

Event information that is reported to JP1/Base when an event occurs in the system. JP1 events are reported to other systems via JP1/Base.

## JP1 permission level

A name that indicates the operations that a JP1 user is allowed to perform on management targets (resources) defined in JP1/AJS3, including applications and events. Use JP1/Base to define JP1 permission levels.

## JP1 resource group

A name given to a specific JP1/AJS3 unit for controlling access by JP1 users to that unit.

## JP1 user

A user designation for using JP1/AJS3 or JP1/IM - Manager. Each JP1 user is registered in the authentication server, which controls the user's access to management targets (resources).

## JP1/AJS3 - Definition Assistant

This program allows you to register a large amount of JP1/AJS3 definition information edited using an Excel template into a manager host, or to retrieve JP1/AJS3 definition information from a manager host to an Excel template. The Excel templates provided by JP1/AJS3 - Definition Assistant are called *definition management templates*. With a definition management template in the spreadsheet format, you can enter or edit definition information efficiently by using automatic filling, automatic filtering, and other Excel functionalities.

## JP1/AJS3 - Print Option

This program allows you to display or print jobnet or schedule information formatted as needed (for example, as jobnet definition information, an execution schedule table, or an execution result confirmation table).

You can also output jobnet or schedule information in CSV format so that you can edit the information.

### **JP1/AJS3 Console Agent**

A JP1/AJS3 component that regularly monitors the status of objects (root jobnets) on the local host, specified in JP1/AJS3 Console Manager. Any change in status is notified to JP1/AJS3 Console Manager.

### **JP1/AJS3 Console Manager**

A JP1/AJS3 component that stores definitions about monitored objects defined in JP1/AJS3 Console View, and gets status information about monitored objects by issuing requests to JP1/AJS3 Console Agent.

### **JP1/AJS3 Console View**

A JP1/AJS3 component that allows you to define objects to be monitored, using a graphical user interface. The definitions are stored in JP1/AJS3 Console Manager. Using JP1/AJS3 Console View, you can view and monitor the status of target objects notified by JP1/AJS3 Console Agent to JP1/AJS3 Console Manager. You need to log in to JP1/AJS3 Console Manager before using JP1/AJS3 Console View.

### **JP1/AJS3 for Enterprise Applications**

A program that allows you to control jobs in an R/3 system from another system. You can submit, delete, and monitor R/3 jobs.

R/3 jobs can be executed automatically from JP1/AJS3 if you register them as custom jobs for JP1/AJS3 for Enterprise Applications when you define a JP1/AJS3 jobnet.

JP1/AJS3 for Enterprise Applications is the successor to JP1/Application Manager for R/3.

### **JP1/Base**

A program that provides the event service function. JP1/Base allows you to control the order in which services start, and it lets you send and receive JP1 events. JP1/Base is a prerequisite program for JP1/IM and JP1/AJS3. When JP1/IM is deployed in a system with JP1/AJS3, JP1/Base provides functionality for restricting operations by JP1 users.

### **JP1/DH - AJE**

A program that automatically sends data to and receives data from JP1/DH - Server.

### **JP1/FTP**

A program for performing file transfer tasks efficiently, including file transfer/reception linked to application execution, scheduled file transfer, and automated program execution following file reception. JP1/FTP supports monitoring of transfer status, enhancing file transfer reliability.

### **JP1/IM**

A program for centrally monitoring a distributed system. Using the windows in JP1/IM - View, the system administrator can monitor JP1 events, which provide information about job execution status or problems in the distributed system.

### **JP1/NQSEXEC**

A program for executing routine batch processing on a distributed system and for running batch jobs efficiently.

### **JP1/OJE for Midrange Computer**

A program for submitting batch jobs to AS/400 from a Windows or UNIX host, or for submitting batch jobs from AS/400 to a Windows or UNIX host.

### **JP1/OJE for VOS3**

A program that links with JP1/AJS3 for executing and monitoring batch jobs between a Windows or UNIX system and a mainframe (VOS3).

### **JP1/Script**

A program for creating and executing scripts (batch files) that control jobs on Windows. Job operation can be automated by linking JP1/Script with JP1/AJS3.

### **JP1/Software Distribution**

A general term for a system that distributes software and manages clients using batch operations over a network.

By linking with JP1/AJS3 using the JP1/Software Distribution command interface, the user can automate software distribution and other tasks.

### **judgment job**

A job that executes a dependent unit if the judgment result of a specified condition is true.

### **judgment value**

A value for evaluating whether a job ended normally or abnormally.

### **kill**

To forcibly terminate a unit being executed.

When the root jobnet is killed, all the jobs being executed are killed and the jobnets are terminated.

### **list file**

A file containing a list of extracts from sent and received mail.

### **logical host**

A logical server that provides the JP1 execution environment for running a cluster system. If a failure occurs on the primary node, the logical host is switched to the secondary node.

Each logical host has a unique IP address. At failover, the secondary node inherits the IP address. Thus, if the physical server fails, clients can access the secondary node using the same IP address. To the clients, it appears that one server is operating continuously.

### **macro variable**

A variable used to pass information from one job to another job during execution.

A macro variable name and passing information (or for an event job, a passing information name) are specified during unit definition. A macro variable can be used during job execution by specifying the name of the macro variable in the succeeding job.

**macro variable name**

A character string in ?AJS2xxxx? format that indicates the name of a macro variable. If a macro variable name is specified during the definition of a unit, the macro variable set in the preceding job can be used during job execution.

**mail filtering application**

A program or a shell script that converts email formats.

A mail filtering application is required to convert the character set when exchanging email in formats other than RFC822.

**mail receipt parameter file**

A file containing the mail receipt monitoring parameters defined by the user. The file extension is .prm. This file is created automatically when the user defines a Receive Email Event job.

**mail send parameter file**

A file containing the mail send parameters defined by the user. The file extension is .prm. This file is created automatically when the user defines a Send Email Action job.

**manager host**

A host that manages jobnet definitions and schedule information in a database, and requests agent hosts to execute jobs. You must install JP1/AJS3 - Manager on the manager host.

The manager host creates jobnet execution schedules from the defined schedule information. At jobnet run time, the manager host starts the executable files defined as jobs, forwards the job definitions to an agent host, and requests the agent host to execute the jobs. When execution completes, the execution result is received by the agent host and the database is updated. Based on the updated information, the manager host executes a succeeding job or schedules the next execution of the jobnet.

**manager job group**

A job group for monitoring JP1/AJS3 - Manager applications from another JP1/AJS3 - Manager.

**manager jobnet**

A jobnet for monitoring JP1/AJS3 - Manager applications from another JP1/AJS3 - Manager.

**MAPI (Messaging Application Programming Interface)**

The standard messaging API for Windows.

**max. shiftable days**

A set number of days within which to shift the next scheduled execution date when the recalculated date falls on a closed day.

**maximum number of concurrently executable jobs**

The maximum number of jobs that can be executed concurrently.

**message ID**

One item in an MQSeries message descriptor. Message IDs are stored in the character set specified by the sender. They can be used as storage locations to help identify messages.

**MIME (Multipurpose Internet Mail Extensions)**

An extended SMTP function used for sending and receiving non-ASCII data.

MIME specifies various procedures, such as how data is to be transmitted between email systems, and the format of control messages for email transfer.

**Monthly Schedule window**

A window that displays each month's execution schedules and execution results.

**nested jobnet**

A jobnet defined within another jobnet.

**node switching system**

See *cluster system*.

**normal end**

A normal end of a jobnet occurs when all the processes defined in the jobnet have executed correctly and the jobnet has completed.

A normal end of a job occurs when the job has executed correctly.

**open day**

A day when jobnets run.

**passing information**

Values specified for macro variables during registration for execution, event IDs, event issuance dates, and other information (values) that is dynamically set in macro variables and passed to succeeding jobs.

**passing information name**

A variable name indicating the event information to be received by an event job.

Variable names that can be used for this purpose include `EVID` (event ID) and `EVDATA` (event issuance date). These variable names are specified during the definition of an event job.

**physical host**

An environment unique to each of the servers (nodes) in a cluster system. When a secondary node takes over from the primary node, the environment of the physical host remains unchanged and is not inherited by the other server.

**planned execution registration**

A method of registering a jobnet so that it starts and executes according to schedule definitions.

**planning group**

A unit for switching execution among multiple root jobnets in a planned manner. Directly under a planning group, you can create a number of root jobnets, each defined differently and with differing execution schedules. This enables the root jobnets to be executed automatically in turn, according to the set schedules.

**preceding job**

A job executed immediately before another job or jobnet.

### preceding jobnet

A jobnet executed immediately before another job or jobnet.

### processing cycle

The interval between one execution start date and the next execution start date of a jobnet. By defining a processing cycle, you can execute a jobnet at regular intervals.

### queue

An area for temporarily keeping jobs registered for execution. Jobs are submitted to the queue in order of registration, and are sequentially transferred for execution to the agent connected to that queue.

The queue controls the number of jobs that the agent executes concurrently, thereby preventing any degradation in performance caused by a large number of jobs being executed at the same time.

### queueless job

A job transferred directly from the manager to an agent host for execution, without using a queue. Queueless jobs simplify processing because they are not managed in a queue by the job execution control. As a result, they offer better performance than ordinary queued jobs, allowing more jobs to be executed within a given period of time. However, job execution control functions such as execution agent names and execution agent groups are not available with queueless jobs.

You can define PC jobs and Unix jobs in a jobnet as queueless jobs by specifying **Queueless Agent** as the execution service.

Unless otherwise indicated, the descriptions in this manual apply to jobs for which **Standard** is specified as the execution service.

### queueless job execution environment

A queueless job execution environment consists of execution environments for the JP1/AJS3 manager (scheduler service and queueless file transfer service) and queueless agents (queueless agent services). The execution of queueless jobs is managed by using the environment setting parameters for the job execution environment.

Note that the job execution environment must be set up by using the `ajsqlsetup` command before environment setting parameters are set.

### queuing job

A job submitted directly to a queue and waiting to be executed.

### recovery job

A job to be executed when a job or jobnet ends abnormally.

### recovery jobnet

A jobnet to be executed when a job or jobnet ends abnormally.

### schedule by days from start

A schedule defined for recalculating the next scheduled execution date, using as the base day the next scheduled execution date determined from the execution start time, processing cycle, and substitute schedule for closed days.

**schedule information file**

A text file containing schedule information parameters, entered by command when setting fixed execution registration for a jobnet.

**schedule rule**

Jobnet information such as execution start time and processing cycle. Up to 144 schedule rules can be defined for a single jobnet.

**scheduler service**

A service that manages the schedules for jobnet execution, and executes processes according to those schedules. Each scheduler service manages all the units in the root job group whose name matches the scheduler service name.

Multiple scheduler services can be activated in a single manager. This allows root job groups to be managed individually. For example, if you start a separate scheduler service for each application, each scheduler service can run its specific application (jobnet and jobs) in parallel, independently of the other scheduler services.

**shift days**

A set number of days within which to determine a substitute date when the next execution date falls on a closed day.

**shutdown status**

A situation in which a jobnet fails to start or end due to an error, and the execution status or the next scheduled execution cannot be verified. If this happens, you must cancel and then re-register the jobnet for execution.

**SMTP (Simple Mail Transfer Protocol)**

A protocol, generally used in UNIX networks, for transferring ASCII data by TCP/IP between heterogeneous systems.

**standard configuration**

A system configuration in which JP1/AJS3 information is managed by the embedded database.

Unless otherwise indicated, the descriptions in this manual relate to a system in a standard configuration.

Note that the ISAM database is still used to store some information related to QUEUE jobs and submit jobs.

**start condition**

A definition of the conditions under which a jobnet starts when the jobnet is driven by a specific event.

**subject**

A character string written in the subject line of an email message. Non-ASCII characters are supported in JP1/AJS3, but might not be supported in connected email systems.

**submit**

To request the system to execute a job.

**submit job**

A standard job registered using the `jpqjobsub` command.

**substitute schedule**

A means of executing a jobnet on a different day when the next execution date, determined from the jobnet schedule, falls on a closed day.

**succeeding job**

A job executed immediately after another job or jobnet.

**succeeding jobnet**

A jobnet executed immediately after another job or jobnet.

**suspend**

To suppress the execution of the root jobnet and lower units.

When you change a definition under a root jobnet that has been registered for execution, you should suspend the root jobnet to prevent erroneous operation such as the execution control processing running with the old definition. By suspending the root jobnet, the redefinition processing can be synchronized with the execution control processing.

**threshold**

A value for evaluating the termination status of a job. You can define an abnormal threshold and a warning threshold for each job.

**timeout period**

A time interval after which an executed job is forcibly terminated if there was no response from the job or if it failed to complete during the specified period.

**TP1/Server Base**

Software for distributing transaction processing and server processing in an open system. JP1/AJS2 uses TP1/Server Base transaction processing.

**unit**

A generic term for any job network element.

**unit definition parameter file**

A text file containing unit definition parameters, entered by command when defining the units.

**unit ID**

A unique number allocated to a unit.

**unit whose end is being waited for**

A unit specified as a wait condition of another unit. The unit for which the unit whose end is being waited for is specified as a wait condition starts when the unit whose end is being waited for terminates.

**virtual machine**

A virtual computer system (host) created on a physical host to run an OS is called a *virtual machine*. Multiple virtual machines can operate on a single physical host to execute multiple processes simultaneously or to run different OSs concurrently.

By replicating a virtual machine that has already been set up, you can easily increase hosts that have the same environment.

**unit with wait condition**

A unit for which another unit (unit whose end is being waited for) is specified as a wait condition. The unit with the wait condition starts execution when the associated unit (unit whose end is being waited for) terminates.

**wait condition**

A condition set for a unit that allows the execution order of units across jobnets to be controlled. A unit with another unit specified as a wait condition starts execution when the associated unit terminates.

**warning threshold**

A value for evaluating whether a job ended with a warning.

**Windows Messaging**

A facility that provides an interface for sending and receiving email. Using Windows Messaging, you can manage, access, and share a variety of information such as data received from an online service.

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