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JP1 Version 12

IT Operations Automation: Getting Started

3021-3-D01-30(E)

Notices

■ Relevant program products

- P-2A2C-E1CL JP1/Automatic Operation 12-60 (for Windows Server 2012, Windows Server 2012 R2, Windows Server 2016, Windows Server 2019, Windows Server 2022)

  The above product includes the following:

  - P-CC2A2C-EACL JP1/Automatic Operation - Server 12-60 (for Windows Server 2012, Windows Server 2012 R2, Windows Server 2016, Windows Server 2019, Windows Server 2022)
  - P-CC2A2C-EBCL JP1/Automatic Operation - Contents 12-60 (for Windows Server 2012, Windows Server 2012 R2, Windows Server 2016, Windows Server 2019, Windows Server 2022)
- P-2A2C-E3CL JP1/Automatic Operation Content Pack 12-60 (for Windows Server 2012, Windows Server 2012 R2, Windows Server 2016, Windows Server 2019, Windows Server 2022)
- P-822C-E1CL JP1/Automatic Operation 12-60 (for Red Hat Enterprise Linux 6 (x64), Red Hat Enterprise Linux 7, Oracle Linux 6 (x64), Oracle Linux 7, CentOS 6 (x64), CentOS 7, SUSE Linux 12)

  The above product includes the following:

  - P-CC822C-EACL JP1/Automatic Operation - Server 12-60 (for Red Hat Enterprise Linux 6 (x64), Red Hat Enterprise Linux 7, Oracle Linux 6 (x64), Oracle Linux 7, CentOS 6 (x64), CentOS 7, SUSE Linux 12)
  - P-CC822C-EBCL JP1/Automatic Operation - Contents 12-60 (for Red Hat Enterprise Linux 6 (x64), Red Hat Enterprise Linux 7, Oracle Linux 6 (x64), Oracle Linux 7, CentOS 6 (x64), CentOS 7, SUSE Linux 12)
- P-862C-E1CL JP1/Automatic Operation 12-60 (for Red Hat Enterprise Linux 8, Oracle Linux 8, CentOS 8)

  The above product includes the following:

  - P-CC862C-EACL JP1/Automatic Operation - Server 12-60 (for Red Hat Enterprise Linux 8, Oracle Linux 8, CentOS 8)
  - P-CC822C-EBCL JP1/Automatic Operation - Contents 12-60 (for Red Hat Enterprise Linux 8, Oracle Linux 8, CentOS 8)
- P-822C-E3CL JP1/Automatic Operation Content Pack 12-60 (for Red Hat Enterprise Linux 6 (x64), Red Hat Enterprise Linux 7, Red Hat Enterprise Linux 8, Oracle Linux 6 (x64), Oracle Linux 7, Oracle Linux 8, CentOS 6 (x64), CentOS 7, CentOS 8, SUSE Linux 12)

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Summary of amendments

The following table lists changes in this manual (3021-3-D01-30(E)) and product changes related to this manual.

Changes	Location
The prerequisites for installing JP1/AO were changed.	1.2.1
Notes were added regarding the use of products that use the same Common Component.	1.2.1, 1.3.1
Windows Server 2022 was added as a supported operating system.	B.2
The following operating systems are now supported: • Red Hat Enterprise Linux 8 • Oracle Linux 8 • CentOS 8	B.5

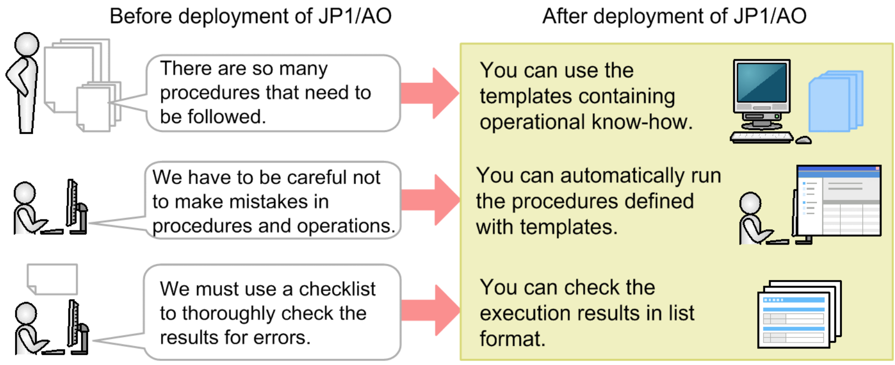
In addition to the above changes, minor editorial corrections were made.

Preface

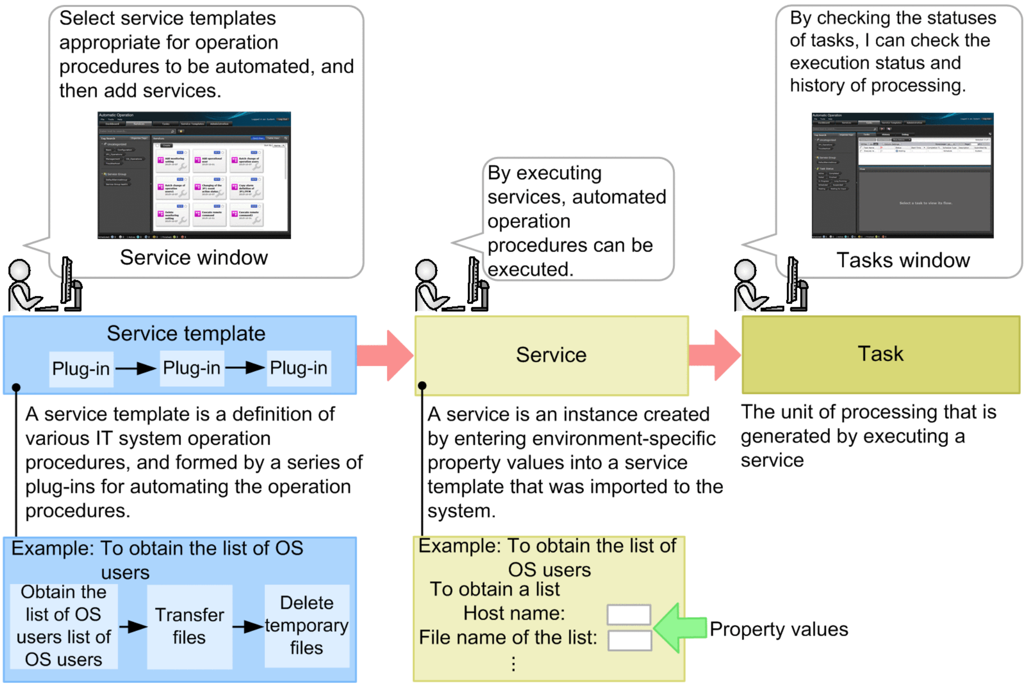
The following provides an overview of JP1/AO and this manual.

■ What you can do with JP1/AO

System operations require many operation procedures. The number and complexity of the procedures results in large workloads on the personnel involved. To improve this situation, measures need to be taken to reduce the tasks that depend on human resources and to improve operational efficiency. By deploying JP1/AO to automate operations of consolidated systems, you can improve operational efficiency and reduce the workload of administrators.


Before deployment of JP1/AO
After deployment of JP1/AO
There are so many procedures that need to be followed.
You can use the templates containing operational know-how.
We have to be careful not to make mistakes in procedures and operations.
You can automatically run the procedures defined with templates.
We must use a checklist to thoroughly check the results for errors.
You can check the execution results in list format.

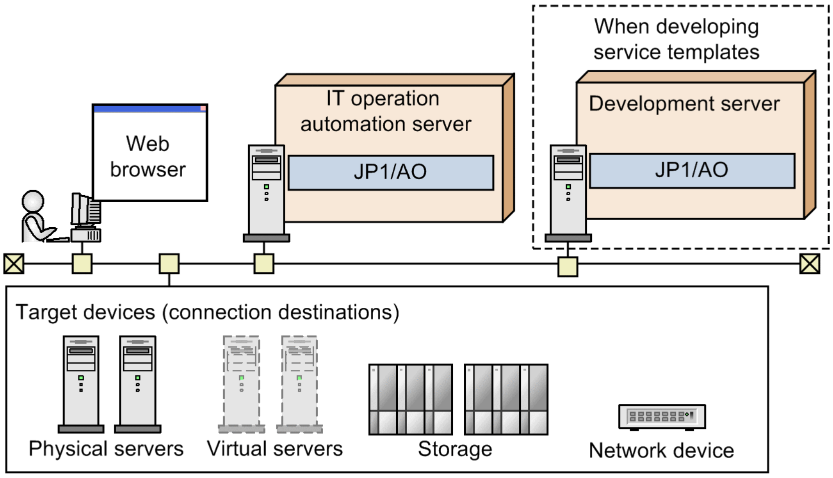
The following figure shows the basic concept of JP1/AO. To automate typical IT operation procedures performed in data centers and office systems, JP1/AO uses "service templates".


Select service templates appropriate for operation procedures to be automated, and then add services.
Service window
By executing services, automated operation procedures can be executed.
By checking the statuses of tasks, I can check the execution status and history of processing.
Tasks window
Service template
Plug-in
Plug-in
Plug-in
Service
Task
A service template is a definition of various IT system operation procedures, and formed by a series of plug-ins for automating the operation procedures.
A service is an instance created by entering environment-specific property values into a service template that was imported to the system.
The unit of processing that is generated by executing a service
Example: To obtain the list of OS users
Obtain the list of OS users list of OS users
Transfer files
Delete temporary files
Example: To obtain the list of OS users
To obtain a list
Host name:
File name of the list:
⋮
Property values

■ What is explained in this manual

This manual provides an overview of JP1/AO products, and describes the basic usage. The goal of this manual is to enable users to use the products to automate IT operation procedures.

The basic system configuration consists of an IT operation automation server, a Web browser for operating JP1/AO, and target devices (connection destinations) to which JP1/AO is to be connected. If you want to develop service templates, we recommend that you prepare a development server separately.


When developing service templates
Web browser
IT operation automation server
JP1/AO
Development server
JP1/AO
Target devices (connection destinations)
Physical servers
Virtual servers
Storage
Network device

For details about how to use JP1/AO by using a different system configuration such as a cluster configuration or a configuration where JP1/AO is linked to other products, see the topic "System design" in the *JP1/AO Overview and System Design Guide*.

■ How to read this manual

This section describes the organization of JP1/AO manuals, and how to refer to the manuals according to your purpose.

Refer to this manual according to what you want to do, as follows.

Users who want to use the service templates provided by JP1/AO without change:

- 1. Setting Up the JP1/AO System
- 2. Automatic Execution of IT Operations

Users who want to customize the service templates according to the tasks to be automated:

- 1. Setting Up the JP1/AO System
- 3. Customizing a Service Template
- 2. Automatic Execution of IT Operations

For JP1/AO, eight manuals are available including this manual. This manual describes the basic usage of JP1/AO. In addition to basic functions, JP1/AO provides various functions to enable customers to perform operations that suit their environments. To learn more about the advanced functions and operations, refer to the appropriate manual as shown below.

Purpose	Manual to be referenced
Overview of JP1/AO products and basic usage	*IT Operations Automation: Getting Started*
Overview of JP1/AO	*JP1/AO Overview and System Design Guide*
JP1/AO functions	
Checking what needs to be evaluated during the design process, and designing the system	
Setting up a JP1/AO system	*JP1/AO Configuration Guide*
Linkage between JP1/AO and other products	
Setting up a cluster system	
Performing an overwrite installation of JP1/AO	
Performing an upgrade installation of JP1/AO	
Uninstalling JP1/AO	
Migrating the environment in JP1/AO	
Using JP1/AO	*JP1/AO Administration Guide*
Maintaining the system	
Understanding the limitations of JP1/AO	
Using the commands	*JP1/AO Command and API Reference*
Using the API	
Service templates and plug-ins provided by JP1/AO	*JP1/AO Service Template Reference*
Developing the service templates and plug-ins	*JP1/AO Service Template Developer's Guide*
When problems occur	*JP1/AO Configuration Guide*
	JP1/AO Administration Guide
Checking the content of messages if problems occur, and action to be taken	*JP1/AO Messages*

A reference to another manual is written as follows: For details about something, see topic-title in the manual-name. Using topic-title as a keyword, search for the relevant section in the target manual.

Operations in each window assume the following environment:

- Server on which to install JP1/AO
  Environment that uses Windows Server 2012 or Windows Server 2012 R2

Note that the explanations in this manual assume that the version of the Web browser used for operating JP1/AO is Internet Explorer 10.

Some windows in this manual might differ from the windows of your product because of improvements made without prior notice. Please keep this in mind before reading this manual.

■ 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*.

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1 Setting Up the JP1/AO System

This chapter describes how to set up the JP1/AO system. This chapter is intended for users who install and set up JP1/AO.

1.1 General procedure for setting up the JP1/AO system

You need to install and set up JP1/AO before you can start operation.

Table 1-1: General procedure for setting up the JP1/AO system

Task		Required/optional
1	Prepare to install JP1/AO.	Required
2	Install JP1/AO.	Required
3	Perform setup.	Required
4	Prepare to execute services in JP1/AO.	Required

1.2 Preparation before installation

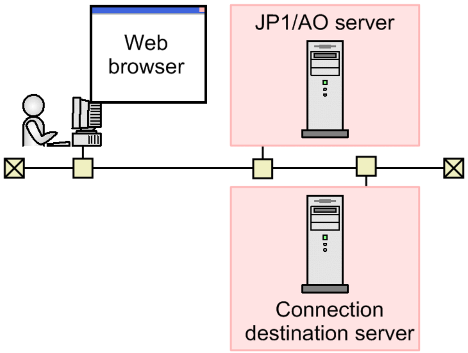
This section explains how to check the conditions and environment required to install JP1/AO.

1.2.1 Checking the prerequisites for installing JP1/AO

Before you install JP1/AO, check the requirements for the server on which JP1/AO will be installed (JP1/AO server) and the impact on other products.

Context

The following figure shows the basic configuration of the JP1/AO system. In this subsection, you check the prerequisites for the JP1/AO server.



Procedure

1. Log in to the JP1/AO server as a user with Administrator or root permissions, and then check the following items:
    - Check the memory size, hard drive size, and OS that are required to install JP1/AO. If the OS of the server on which JP1/AO will be installed is Linux, check the prerequisite libraries.
    - Confirm that the network environment uses the TCP/IP protocol.
    - Confirm that network transmission within the local host is not blocked.

      Note that the JP1/AO server cannot be installed and operated in an environment in which network transmission to and from the IP address "127.0.0.1" is blocked within the local host. Do not block communications in firewall settings.
    - Make sure that the language set in the OS of the host on which JP1/AO will be installed is the same as the language to be used in JP1/AO.
2. Check for installed products other than JP1/AO, and then perform the following tasks:
    - If Hitachi Automation Director or Hitachi Ops Center Automator are installed, uninstall it.
    - If JP1/OA, Hitachi Command Suite products, or Hitachi Ops Center products are installed, stop all JP1/OA, Hitachi Command Suite product, and Hitachi Ops Center product services.

      When JP1/OA, Hitachi Command Suite products, or Hitachi Ops Center products are installed on the JP1/AO server, Common Component is shared with JP1/AO. When you install JP1/AO, you must stop all JP1/OA, Hitachi Command Suite products, and Hitachi Ops Center products. Similarly, when you install JP1/OA, Hitachi Command Suite products, or Hitachi Ops Center products on the JP1/AO server, you must stop JP1/AO services.

3. Review the services and other programs that are running on the JP1/AO server, so that JP1/AO can be installed on the server.

   - Stop any security monitoring software, virus detection software, or process monitoring software.

     If such software is running, the installation of JP1/AO might fail.

   - When installing JP1/AO in Windows, a service related to JP1/AO cannot start if **Startup Type** for that service is set to **Disabled**, which causes installation to fail. Make sure that **Startup Type** for each service is set to **Automatic** or **Manual**.

     For details about the relevant services, see the information about JP1/AO services in the *JP1/AO Administration Guide*.

   - If the OS on the JP1/AO server is Linux, firewall exceptions are not automatically registered during the installation of JP1/AO. Register firewall exceptions according to the OS-specific procedure.

   - If other programs use Windows event logs, perform the following:

     - If the **Event Viewer** window opens, close it.

     - If the **Computer Management** window opens, close it.

     - Stop the event log monitoring program.

     If a program that accesses event logs is running during the installation of JP1/AO, the installation might fail.

   - If the OS on the JP1/AO server is Windows, close the command prompt before you install JP1/AO.

     If JP1/AO is installed with the command prompt open, the environment variables that you specified during the installation operation are not applied.

Related topics

- 1.2.3 Installation folder for each product
- Topic "JP1/AO services" in the JP1/Automatic Operation Administration Guide
- Topic "Functions for linking with other products" in the JP1/Automatic Operation Overview and System Design Guide

1.2.2 About the OS language settings on the JP1/AO server

The table below shows the language settings (locales) that are supported by JP1/AO, for each OS.

Specify the settings according to the table. Make sure that language settings are configured as shown below. If not, characters might be garbled or defined information might be rewritten.

Table 1-2: OS language settings supported by JP1/AO

OS	Setting item	Specifiable value			
		Japanese	English	Chinese	Other languages#
Windows	Setting items in the **Control Panel**	Japanese	English	Chinese (Simplified)	Locale and language settings of other languages
Linux	Value of the LANG environment variable	Set either of the following locales: • ja_JP.UTF-8 • ja_JP.utf8	Set "C".	Set either of the following locales: • zh_CN.UTF-8 • zh_CN.utf8	Set any locale for the language.

#

"Other languages" refer to German, French, Spanish, Korean, and Russian. If you set one of these languages, text in operation windows is displayed in English. However, characters specific to these languages can be input and output.

1.2.3 Installation folder for each product

If the OS on the JP1/AO server is Windows, specify the installation folder for each product in the installation wizard. If the OS on the JP1/AO server is Linux, the installation folder for each product is fixed and you cannot change it.

Table 1-3: Default installation folders (in Windows)

Item	Installation folder	Can be changed?
JP1/AO	*system-drive*\Program Files\Hitachi\JP1AO#1	Y
JP1/AO - Contents	*system-drive*\Program Files(x86)\Hitachi\JP1AOCONT#2	Y
Common Component#3	*system-drive*\Program Files\Hitachi\HiCommand\Base64#4	Y

Legend

Y: Can be changed.

#1

The part "JP1AO" is fixed. In this manual, "the JP1/AO installation folder" refers to *system-drive*\Program Files\Hitachi\JP1AO.

#2

The part "JP1AOCONT" is fixed.

#3

This component is a collection of functions that are shared by JP1/AO and Hitachi Command Suite products. Common Component is installed as part of JP1/AO.

If Hitachi Command Suite products have been installed, Common Component also has been installed in a folder that was created during the installation of Hitachi Command Suite products. Therefore, the folder "*system-drive*\Program Files\Hitachi\HiCommand\Base64" is not created.

#4

The part "HiCommand\Base64" is fixed.

If you change the JP1/AO installation folder, the part "*system-drive*\Program Files\Hitachi" is changed.

Table 1-4: Installation folders (in Linux)

Item	Installation folder	Can be changed?
JP1/AO	• /opt/jp1ao • /var/opt/jp1ao	N
JP1/AO - Contents	/opt/jp1aocont	N
Common Component#	/opt/HiCommand/Base64	N

Legend

N: Cannot be changed.

#

This component is a collection of functions that are shared by JP1/AO and Hitachi Command Suite products. Common Component is installed as part of JP1/AO.

If Hitachi Command Suite products have been installed, Common Component also has been installed. In this case, Common Component has been installed in a folder that was created during the installation of other Hitachi Command Suite products. Therefore, the folder "`/opt/HiCommand/Base64`" is not created.

If the OS on the JP1/AO server is Windows, you cannot specify the folders below as installation destinations. Do not specify the JP1/AO Content Pack installation folder or its subfolders as installation destinations.

Table 1-5: Folders that cannot be specified as installation destinations

Folder	Remark
Roots of drives	You cannot specify the root of a drive (for example, `c:\` or `d:\`) as an installation destination.
Folders for 32-bit applications on the 64-bit version of Windows	You cannot specify the following folders: `%programfiles(x86)%`#, `%CommonProgramFiles(x86)%`#, `%WinDir%`, `%WinDir%\system32`, and `%programfiles%\WindowsApps`
Network drives	--

Legend

--: None.

#

You can specify this folder for the installation folder of JP1/AO - Contents.

1.3 Installing JP1/AO

This section explains how to install JP1/AO.

1.3.1 New installation of JP1/AO (in Windows)

Use the Hitachi Integrated Installer to install JP1/AO.

Before you begin

You must finish necessary tasks before installing JP1/AO, such as checking the server on which JP1/AO will be installed and installing prerequisite products.

Procedure

1. Insert the distribution media, and then execute the Hitachi Integrated Installer.

2. Follow the wizard to configure settings.
   Specify the JP1/AO installation folder.

3. The information that was specified in the wizard is displayed. Check the content.
   If necessary, click the **Advanced Settings** button to change the following items:
   - Installation folders for the databases
   - IP address or host name of the JP1/AO server
   - Port number of the JP1/AO server
   - Whether to back up databases, and the backup folder
     As the preparation for an installation failure, specify whether to back up the databases that are shared with JP1/OA or Hitachi Command Suite products and set the backup folder. You must set these items only when JP1/OA or Hitachi Command Suite products have been already installed.

4. Click the **Install** button to start the installation of JP1/AO.
   When JP1/AO is installed, the installation wizard for JP1/AO - Contents appears.

5. Specify the installation folder for JP1/AO - Contents.

6. The information that was specified in the wizard is displayed. Check the content.

7. Click the **Install** button to start the installation of JP1/AO - Contents.

8. In Windows, if you enter a value other than the default port number, perform the procedure to change a port number.

9. After the installation is complete, execute the `hcmds64srv` command with the `start` option specified to start the JP1/AO services.

   Location where the commands are stored:

   ```
   Common-Component-installation-folder\bin
   ```

   Example of executing the command:

   ```
   hcmds64srv /start
   ```

Result

- The installation of JP1/AO starts.
- The following product names are displayed in **Programs and Features** under **Programs** in the **Control Panel** in Windows.

Table 1-6: Product names that are displayed in **Programs and Features**

Product name	Version
Job Management Partner 1/Automatic Operation	*vv.rr.mm*
Job Management Partner 1/Automatic Operation - Contents	*vv.rr.mm*

- **JP1_Automatic Operation** is added to **All Programs** in the Start menu.
- Some ports used for external connections in JP1/AO are registered as firewall exceptions.

Caution

- If you interrupt the installation, an empty folder might be created. If an empty folder is created, manually delete it.
- If the installation of Common Component fails and you attempt to install it again, you cannot specify an installation destination different from the previous installation destination. Even if you enter a different installation destination, Common Component is automatically installed in the previous installation destination.

Related topics

- 1.2.3 Installation folder for each product
- Topic "Installation folders for databases" in the JP1/Automatic Operation Configuration Guide
- Topic "Database backup folder" in the JP1/Automatic Operation Configuration Guide
- Topic "JP1/AO services" in the JP1/Automatic Operation Administration Guide
- Topic "List of shared built-in service properties" in the JP1/Automatic Operation Administration Guide
- Topic "Ports used for JP1/AO external connections" in the JP1/Automatic Operation Overview and System Design Guide

1.3.2 New installation of JP1/AO (in Linux)

Use the Hitachi PP Installer to install JP1/AO. The Hitachi PP Installer is stored in the distribution media for JP1/AO. For details about the procedure to be performed on an OS, see the documentation for the OS.

Before you begin

- You must finish necessary tasks before installing JP1/AO, such as checking the server on which JP1/AO will be installed and installing prerequisite products.
- Log in to the JP1/AO server (a server on which JP1/AO will be installed) as a user with root permissions.

Procedure

1. Insert the distribution media for JP1/AO.

2. Mount the distribution media. For details on how to mount the distribution media, see the documentation for the OS.

   ```
   /bin/mount -r -o mode=0544 /dev/cdrom/mnt/cdrom
   ```

   The device special file name (*dev/cdrom*) and the mount directory name (*/mnt/cdrom*) for the distribution media file system differ depending on the environment.

3. Start the Hitachi PP Installer.

   Depending on the environment, the directory and file names for the distribution media might differ from those shown below. Use the `ls` command to check them, and then enter the displayed file name.

   ```
   /mnt/cdrom/X64LIN/setup /mnt/cdrom
   ```

   For */mnt/cdrom*, specify the mount directory name for the distribution media to be used.

4. In the initial window that appears when the Hitachi PP Installer starts, enter "I".

   The list of software programs that can be installed appears.

5. Move the cursor over the software to be installed, and then press the space bar.

6. Enter "I".

   The installation of JP1/AO starts. After the installation is complete, enter "Q" to return to the initial window.

7. Unmount the distribution media.

   After the installation is complete, unmount the distribution media. For details on how to unmount the distribution media, see the documentation for the OS.

   ```
   /bin/umount /mnt/cdrom
   ```

   For */mnt/cdrom*, specify the mount directory name for the distribution media to be used.

8. After the installation is complete, execute the `hcmds64srv` command with the `start` option specified to start JP1/AO services.

   Location where the commands are stored:

   ```
   /opt/HiCommand/Base64/bin
   ```

   Example of executing the command:

   ```
   hcmds64srv -start
   ```

   ⚠ **Caution**

   - In Linux, do not specify a symbolic link as the installation destination. If you specify a symbolic link, installation will fail.
   - If you interrupt the installation, an empty folder might be created. If an empty folder is created, manually delete it.
   - If the installation of Common Component fails and you attempt to install it again, you cannot specify an installation destination different from the previous installation destination. Even if you enter a different installation destination, Common Component is automatically installed in the previous installation destination.

Result

- JP1/AO and JP1/AO - Contents are installed at the same time.
- In the following installation log files, check the result.

- In /var/opt/jp1ao/logs
  JP1AO_Inst_*VV.R.R_yyyy-mm-dd-HH-MM-SS*.log#1, #2
- In /var/opt/HiCommand/Base64/log/HInst
  inst_*yyyymmdd-HHMMSS-nn*.log#3
- In /tmp
  - hcmds64inst.log
  - hcmds64rtn.inst
  - hcmdshdb_result

#1

If the installation is interrupted, log files of this type might be stored in /tmp.

#2

VV.R.R indicates the version and revision number of JP1/AO. *yyyy-mm-dd* indicates the execution date. *HH-MM-SS* indicates the execution time.

#3

yyyymmdd indicates the execution date. *HHMMSS* indicates the execution time. *nn* indicates a generation number in the range from 01 to 30.

Related topics

- 1.2.3 Installation folder for each product
- Topic "Installation folders for databases" in the JP1/Automatic Operation Configuration Guide
- Topic "Database backup folder" in the JP1/Automatic Operation Configuration Guide
- Topic "JP1/AO services" in the JP1/Automatic Operation Administration Guide
- Topic "List of shared built-in service properties" in the JP1/Automatic Operation Administration Guide
- Topic "Ports used for JP1/AO external connections" in the JP1/Automatic Operation Overview and System Design Guide

1.4 Setup

To use JP1/AO, you need to set up the JP1/AO server and the connection destination server as described below.

1.4.1 Setting up a firewall

JP1/AO supports packet-filtering and NAT (static mode) firewalls. If you set up a firewall in the system, configure the firewall to permit JP1/AO communications.

Procedure

1. Configure a firewall to permit JP1/AO communications.

   For details about the port number, see "Lists of port numbers" in the *JP1/Automatic Operation Overview and System Design Guide*.

1.4.2 Enabling administrative shares

To use service templates that use the general command plug-in, file transmission plug-in, or content plug-in at a connection destination that runs on Windows, you must enable administrative shares.

Caution

JP1/AO does not support the system configuration in which multiple JP1/AO servers connect to a single connection destination that runs on Windows.

Procedure

1. To enable administrative shares, configure the registry settings as shown in "Prerequisites for connection destinations" of the *JP1/Automatic Operation Overview and System Design Guide*, then restart the OS on the agentless remote connection.

   Tip

   You can also use the following command to specify administrative share settings:

   ```
   reg add HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services
   \Lanmanserver\parameters /v AutoShareServer /t REG_DWORD /d 1
   ```

Related topics

- Topic "General command plug-in" in the JP1/Automatic Operation Service Template Reference
- Topic "File-Transfer Plug-in" in the JP1/Automatic Operation Service Template Reference
- Topic "JP1/AO Standard-package plug-in" in the JP1/Automatic Operation Service Template Reference
- Topic "JP1/AO Content Pack Plug-ins" in the JP1/Automatic Operation Service Template Reference

1.5 Preparing to execute services in JP1/AO

Before you execute services, you need to make preparations, such as adding service templates and designing services, as described below.

1.5.1 Adding (importing) service templates to JP1/AO

Adding service templates to JP1/AO is referred to as importing service templates.

Before you begin

Permissions and roles required for this operation:

- Users who have Administrator or root permissions for the OS, and users who have the Admin or Develop role.

Procedure

1. Log in to JP1/AO.

2. In the main window, select the **Service Templates** tab.

3. In the **Service Templates** area, click the **Import** button.

4. Click the **Selection** button, and then specify a service template file (*.st) that you want to import.
   - You cannot select a service template file (*.st) that is under development.
   - Do not use any multi-byte characters to name a service template file.

5. Click the **OK** button.

Result

The service template is imported to JP1/AO.

You can check the imported service template in the **Service Template** area.

Tip

- To import service templates from the command line interface, execute the `importservicetemplate` command.
- The service templates that you build or release by using the **Service Builder** window are automatically imported.
- To import two or more service template files (.st files), create a .ZIP file containing the service template files, and then import the ZIP file. When you create a .ZIP file, no folder is needed, and only the service template files must be compressed.

Related topics

- 2.2.1 Logging in to JP1/AO
- 1.5.2 Locations of the service templates for the JP1/AO standard package and JP1/AO Content Pack

1.5.2 Locations of the service templates for the JP1/AO standard package and JP1/AO Content Pack

There are two types of service templates and plug-ins provided by JP1/AO: Those included in the standard package and those separately provided as JP1/AO Content Pack.

The service templates for the JP1/AO standard package and JP1/AO Content Pack are stored in the following folders:

JP1/AO standard-package service templates:

- In Windows:
  `JP1/AO-Contents-installation-folder\contents\setup`
- In Linux:
  `/opt/jp1aocont/contents/setup`

JP1/AO Content Pack service templates:

- In Windows:
  `JP1/AO-Content-Pack-installation-folder\contents\setup`
- In Linux:
  `/opt/jp1aocontset/contents/setup`

The service templates for the JP1/AO standard package and JP1/AO Content Pack are compressed into ZIP files.

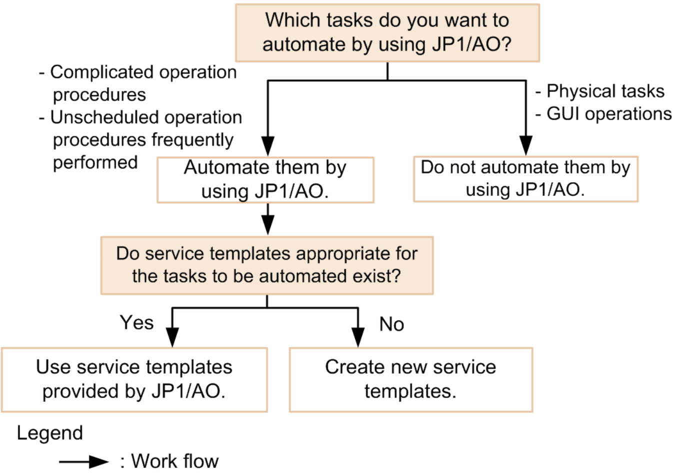
Related topics

- Topics "Installation folder for each product" and "JP1/AO Content Pack installation folder" in the JP1/Automatic Operation Configuration Guide

1.5.3 Determining the service templates to be used (service design)

Determine the operation procedures to be automated by JP1/AO. JP1/AO provides service templates in which the information required to automate operation procedures is defined.

Figure 1-1: Determining the operation procedures to be automated and the service templates to be used


Which tasks do you want to automate by using JP1/AO?
- Complicated operation procedures
- Unscheduled operation procedures frequently performed
- Physical tasks
- GUI operations
Automate them by using JP1/AO.
Do not automate them by using JP1/AO.
Do service templates appropriate for the tasks to be automated exist?
Yes
No
Use service templates provided by JP1/AO.
Create new service templates.
Legend
: Work flow

You can automate operation procedures by using various types of service templates that are provided in the JP1/AO standard package or provided as JP1/AO Content Set. These service templates that are provided by JP1/AO support the setup, operation, and error handling of various JP1 products, virtual server operations, and cloud operations.

From the following viewpoints, determine the service templates to be used to automate operation procedures:

- Which operation procedures will be automated by JP1/AO?

  Based on the procedure manuals for system operations to be automated, determine the scope of operation procedures to be automated by using JP1/AO service templates. In particular, for complicated operation procedures and unscheduled operation procedures frequently performed, you can obtain a high effect of automation by JP1/AO. JP1/AO can be used to automate operation procedures, excluding physical tasks and GUI operations.
- Can service templates provided by JP1/AO be used to automate operation procedures?

  Check the detailed information of the service templates, and then determine whether they can be used. For the detailed information of service templates, see the description of each service template in the *JP1/Automatic Operation Service Template Reference*. If you want to automate system operations without using the service templates provided by JP1/AO, consider creating service templates and plug-ins. You can create new service templates and plug-ins, or copy and edit service templates and plug-ins that are provided by JP1/AO.

If you determine the service template to be used, confirm that its prerequisites are met by the operating environments of the target devices (such as servers and storage systems) that will automatically perform IT operations. For details about the prerequisites for service templates, see the window that explains the details of individual service templates, or the descriptions of the prerequisites for the individual service templates in the manual *JP1/Automatic Operation Service Template Reference*.

Note that you will use the devices whose operating environments were checked here to determine the "access control for connection destinations" in the operation design.

If you decide to change a service template to be used after you review services, review the operation design and system design as necessary.

Related topics

- 3. Customizing a Service Template
- 2. Automatic Execution of IT Operations

1.5.4 Viewing the list and details of service templates

To identify service templates that can be used to automate operation procedures, display the list and details of service templates.

Procedure

1. In the main window, select the **Service Templates** tab.

   The list of service templates is displayed.

2. Click the service template whose details you want to view.

3. Click the **Service Details** button.

   The details of the service template are displayed.

1.5.5 Creating a connection destination definition

Create a connection destination definition in JP1/AO, and then register a connection destination in the definition. By registering the devices that you want to give permission for JP1/AO to access in connection destination definitions beforehand, JP1/AO can access the devices when executing services. You can limit the accessible devices based on the service group that the task belongs to.

Before you begin

Permissions and roles required for this operation:

- Users with the Admin role

Procedure

1. In the main window, select the **Administration** tab.

2. In the **Administration** area, select **Agentless Remote Connections**.

3. In the **Agentless Remote Connections** area, click the **Add** button.

4. In the **Add Agentless Remote Connection** dialog box, define a connection destination.
   The example operations in Chapter 3 assume that the remote-command execution target server was defined as a connection destination here.

5. Click the **OK** button.

Result

A connection destination definition is created in the **Agentless Remote Connections** area.

Related topics

- 3. Customizing a Service Template
- Topic "Input format for Connection Destinations" in the JP1/Automatic Operation Administration Guide

1.5.6 Configuring email notification settings

To use email notifications, you must set a SMTP server and email addresses.

Before you begin

Permissions and roles required for this operation:

- Users with the Admin role

Procedure

1. In the main window, select the **Administration** tab.

2. In the **Administration** area, select **System Settings**.

3. In the **System Settings** area, click the **Edit** button, and then configure email notification settings.
   In this example, set the following items:

Table 1-7: Example settings in the **System Settings** area

Item		Value to be set
E-Mail	**SMTP**	Set items such as the IP address and port number of the SMTP server
	Recipients	Set the sender's and receiver's email addresses for email notifications.
System Parameters	**Notification Settings**	Turn email notifications "ON".

4. When settings are complete, click the **Save** button.

2 Automatic Execution of IT Operations

This chapter describes how to automatically execute IT operations as services by using service templates. This chapter is intended for users who create and execute services.

2.1 General procedure for automatically executing IT operations as services

To automatically process the desired operating procedure, execute a service. Each time you submit a service for execution, enter the necessary property values and specify the execution timing. If you execute a service, a task associated with the service is generated, and then processing begins at the time you specified as the execution timing.

Table 2-1: General procedure for automatically executing IT operations as services

Task		Required/optional
1	Execute a service.	Required
2	Check the execution results of the service.	Required

2.2 Executing a service

If you execute a service, the processing is automatically executed.

2.2.1 Logging in to JP1/AO

Log in to JP1/AO by entering the login URL in a Web browser.

Before you begin

Permissions and roles required for this operation:

- All users

Procedure

1. Use your Web browser to access the login URL.

Table 2-2: Login URL

System configuration	URL	How to specify
Non-cluster system	For HTTP connection http://*host-name-or-IP-address*:*port-number*/Automation/ For HTTPS connection https://*host-name-or-IP-address*:*port-number*/Automation/	• As *host-name-or-IP-address*, specify the host name or IP address you specified when installing JP1/AO. • The default for *port-number* is as follows: For HTTP connection 22015 For HTTPS connection 22016 Note that you can change the port number from the default.

2. Enter your user ID and password.
   The first time you log in to the installed JP1/AO, use the user ID and password for the system account.
   - User ID for the system account: system
   - Password for the system account: manager

> **Tip**
>
> To prevent unauthorized access, we recommend that you change the password of the system account.
>
> If necessary, register additional users for operating JP1/AO.

3. Click the **Log In** button.

Related topics

- Topic "Default user in JP1/AO" in the JP1/Automatic Operation Administration Guide
- Topic "Adding users to JP1/AO" in the JP1/Automatic Operation Administration Guide

2.2.2 Checking service usage on the dashboard window

The **dashboard** window is displayed after you log in to JP1/AO. On the **dashboard** window, you can view the statuses of services and tasks from a broad perspective.

Before you begin

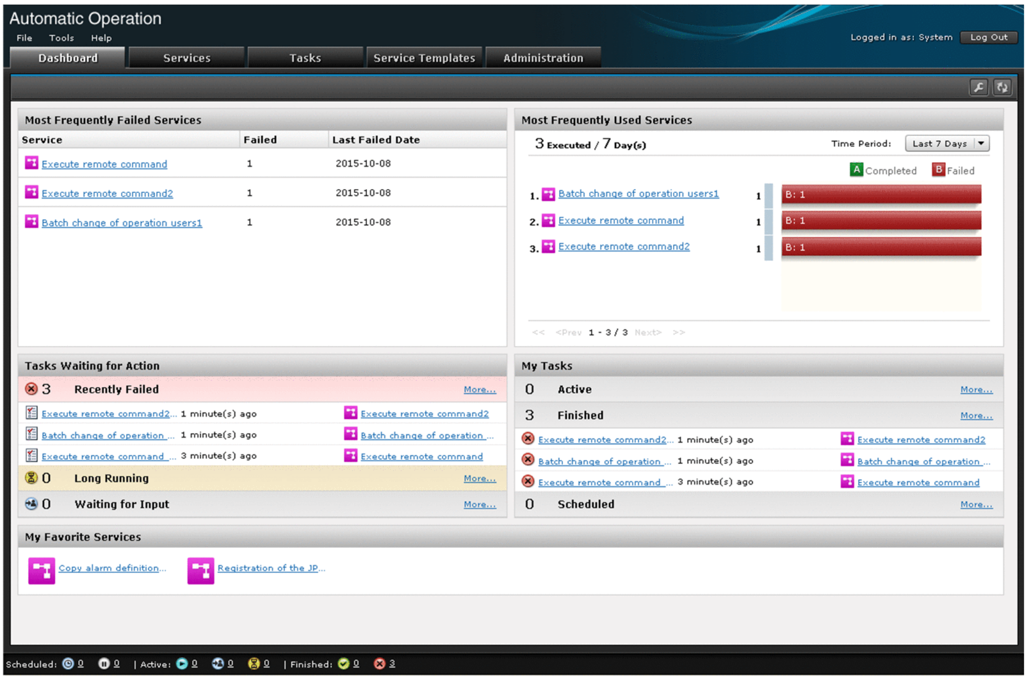
Permissions and roles required for this operation:

- All users

Procedure

1. Log in to JP1/AO.

2. Use the **dashboard** window to check the statuses of services and tasks.



Most Frequently Failed Services

Service	Failed	Last Failed Date
Execute remote command	1	2015-10-08
Execute remote command2	1	2015-10-08
Batch change of operation users1	1	2015-10-08

Most Frequently Used Services

3 Executed / 7 Day(s)

Time Period: Last 7 Days

A Completed B Failed

1. Batch change of operation users1 1 B: 1
2. Execute remote command 1 B: 1
3. Execute remote command2 1 B: 1

<< <Prev 1 - 3 / 3 Next> >>

Tasks Waiting for Action

3 Recently Failed More...

Execute remote command2...	1 minute(s) ago	Execute remote command2
Batch change of operation ...	1 minute(s) ago	Batch change of operation ...
Execute remote command ...	3 minute(s) ago	Execute remote command

0 Long Running More...

0 Waiting for Input More...

My Tasks

0 Active More...

3 Finished More...

Execute remote command2...	1 minute(s) ago	Execute remote command2
Batch change of operation ...	1 minute(s) ago	Batch change of operation ...
Execute remote command ...	3 minute(s) ago	Execute remote command

0 Scheduled More...

My Favorite Services

Copy alarm definition... Registration of the JP...

Scheduled: 0 0 | Active: 0 0 0 | Finished: 0 3

The dashboard window displays items such as **Most Frequently Failed Services** and **Most Frequently Used Services**.

Tip

- You can customize the items to be displayed on the **dashboard** window, and the order of the items. To do this, click the **Settings** button at the top right of the window, and then specify the settings in the displayed **Settings** window.
- If you register services that you execute frequently as favorites in the **Services** window, you can easily access them from **My Favorite Services** on the **dashboard** page.

2.2.3 Creating a service based on a service template

Define properties by using an existing service template as the template, and then create a new service.

Before you begin

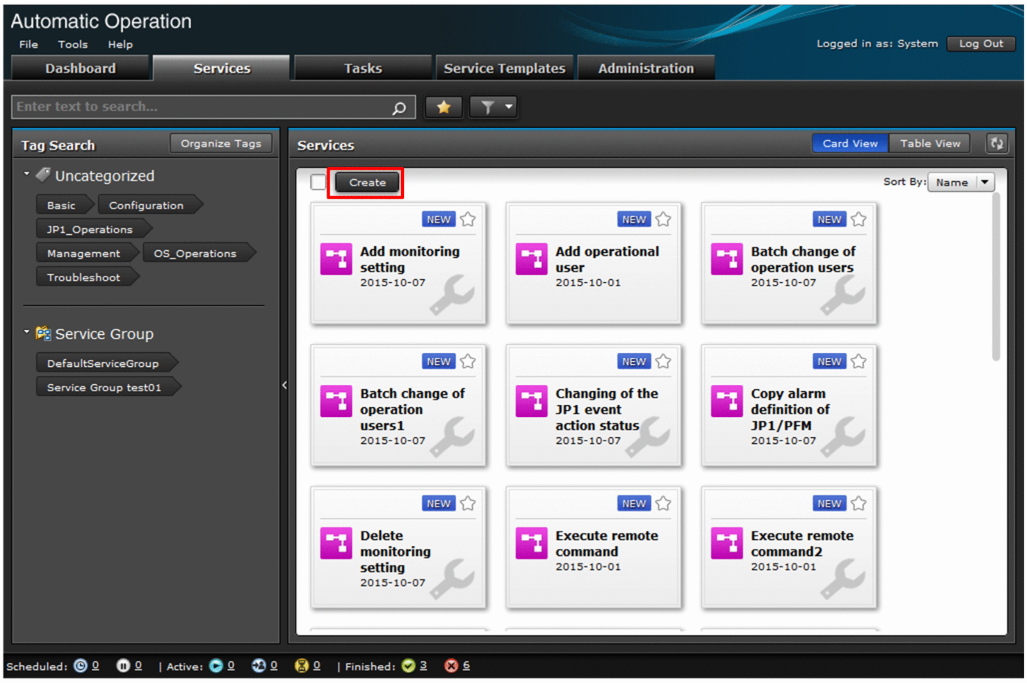
Permissions and roles required for this operation:

- A user who has the Admin, Develop, or Modify role

Procedure

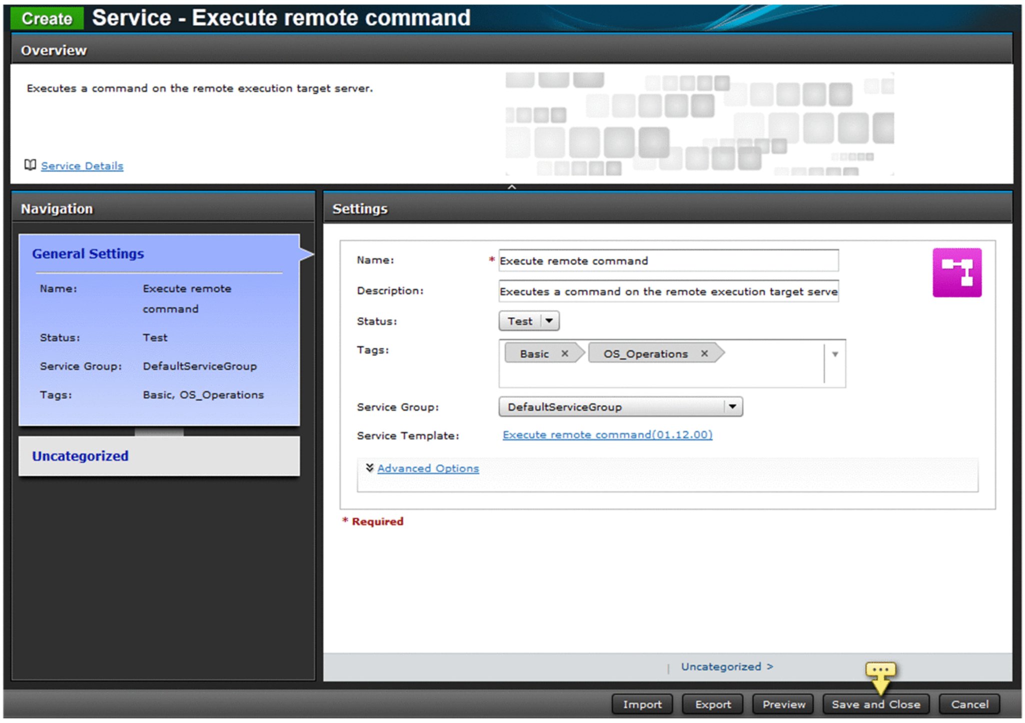
1. In the main window, select the **Service** tab.

2. In the **Service** area, click the **Create** button.



3. Select the service template on which the service is to be based, and then click the **Create New Service** button.

4. In the **Navigation** and **Settings** areas, configure settings on the service.
   The configuration items differ depending on service templates.



Service - Execute remote command

Overview

Executes a command on the remote execution target server.

Service Details

Navigation

General Settings

Name: Execute remote command

Status: Test

Service Group: DefaultServiceGroup

Tags: Basic, OS_Operations

Uncategorized

Settings

Name: * Execute remote command

Description: Executes a command on the remote execution target serve

Status: Test

Tags: Basic ×, OS_Operations ×

Service Group: DefaultServiceGroup

Service Template: Execute remote command(01.12.00)

Advanced Options

* Required

5. Click the **Preview** button.

   A preview of the **Create Service Request** window, which is displayed when the service is executed, is displayed.

6. Check the preview, and then click the **Cancel** button.

7. Click the **Save and Close** button.

Result

The created service is displayed in the **Service** area in the **Service** tab.

2.2.4 Executing a service

If you execute a service, the automatic processing defined in the service template is executed either immediately or according to the defined schedule.

Before you begin

Permissions and roles required for this operation:

- If the status of the service is "Release":

  All users

- If the status of the service is "Maintenance" or "Test":

  Users who have the Admin, Develop, or Modify role

- If the status of the service is "Debug":

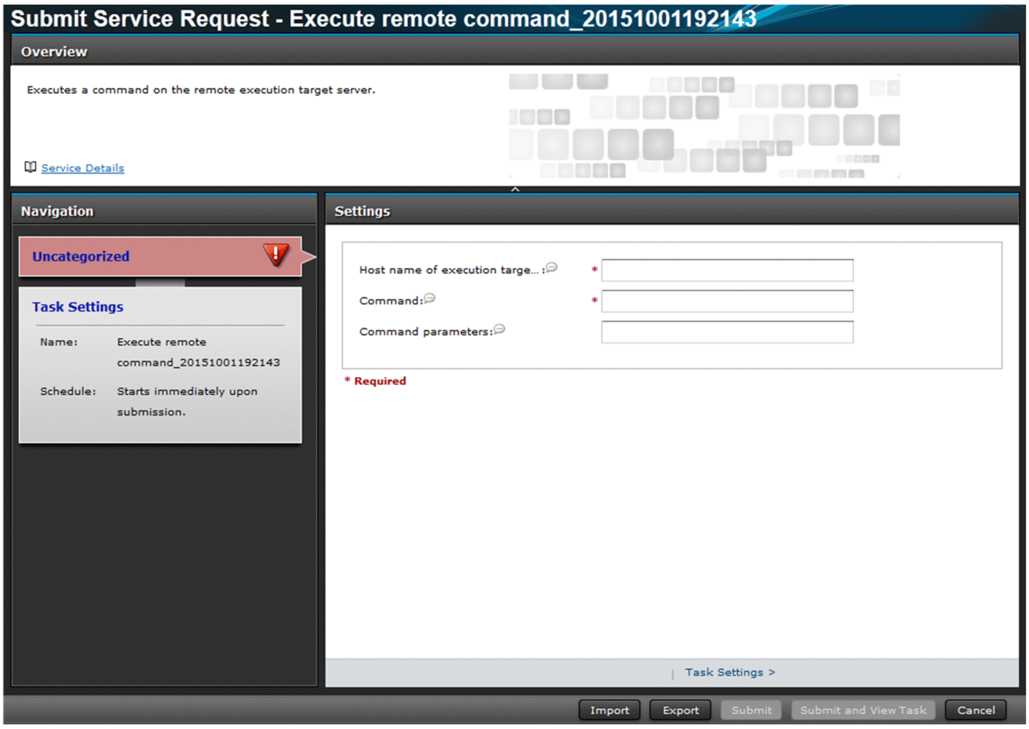
  Users who have the Admin or Develop role

Procedure

1. In the main window, select the **Service** tab.

2. Select the service that you want to execute, and then click the **Submit** button.

3. In the **Navigation** and **Settings** areas, set the items required to execute the service.



Submit Service Request - Execute remote command_20151001192143

Overview

Executes a command on the remote execution target server.

Task Settings

Name: Execute remote command_20151001192143

Schedule: Starts immediately upon submission.

Settings

Host name of execution targe... : *

Command: *

Command parameters:

* Required

The items that can be set as property information differ depending on the service template.

4. Click the **Submit** button.

Result

- Processing is executed either immediately or according to the defined schedule.
- In the **Tasks** area, the task generated from the executed service is displayed. To display the **Tasks** area, select the **Tasks** tab in the main window.

2.3 Checking the execution results of the service

By checking the task status, you can check the execution results of the service.

2.3.1 Checking the statuses of all tasks

If you execute a service, a task is generated. By checking the status of the task, you can check the execution status of the service.

From the list of tasks, you can obtain, in a list, the start time of the processing and the task progress such as in progress, succeeded, or failed, and you can confirm whether operations are being performed without problems. Note that, from the list of tasks, users can check the statuses of all tasks for which they have view permissions.

Before you begin

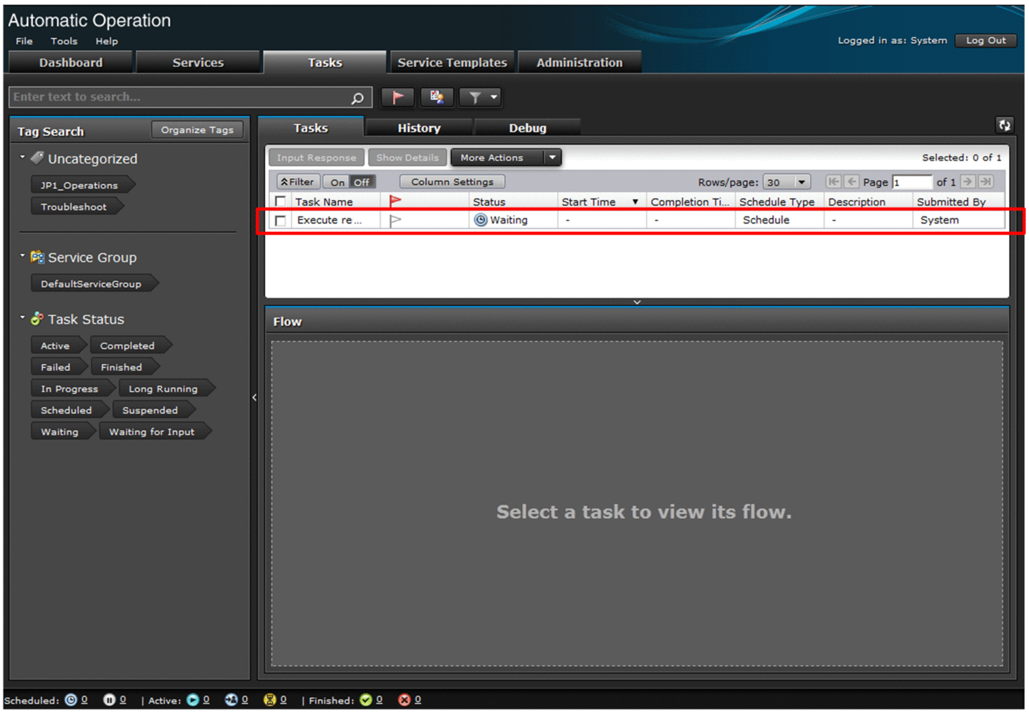
Permissions and roles required for this operation:

- All users

Procedure

1. In the main window, select the **Tasks** tab.

2. In the list of tasks, check the statuses of tasks.



□	Task Name	🚩	Status	Start Time ▼	Completion Ti...	Schedule Type	Description	Submitted By
□	Execute re ...	⚐	Waiting	-	-	Schedule	-	System

Related topics

- Topic "Task statuses and status transitions" in the JP1/Automatic Operation Administration Guide

2.3.2 Checking the details of a task

You can check the task details such as the task progress and the processing results.

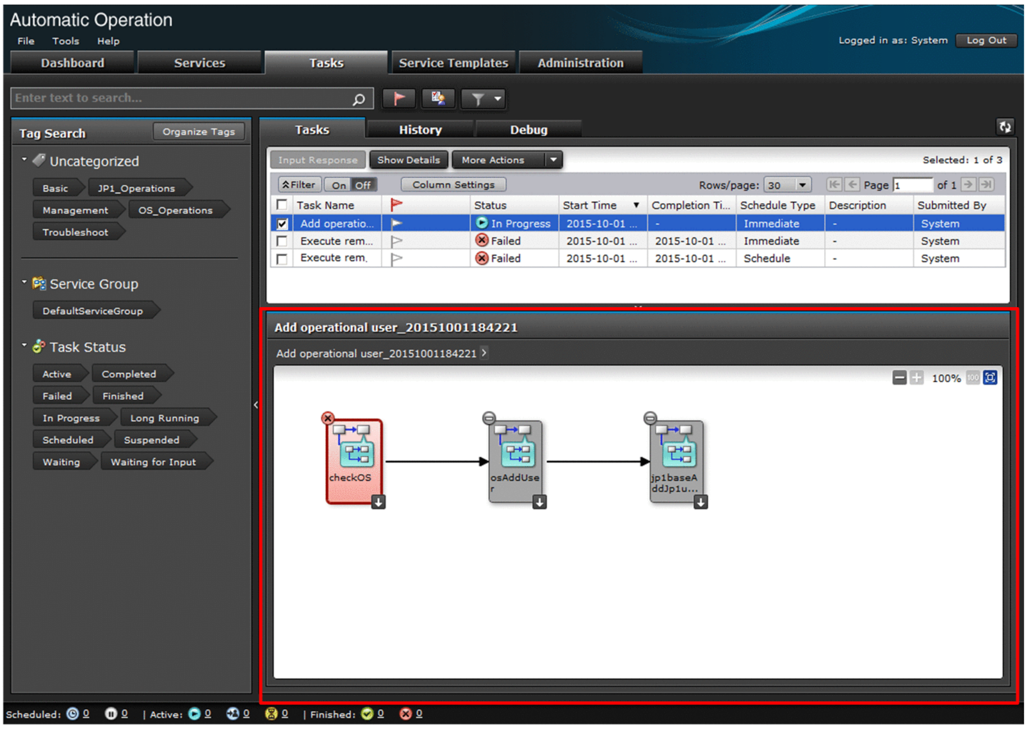
Before you begin

Permissions and roles required for this operation:

- If the status of the executed service is "Release":
  All users
- If the status of the executed service is "Maintenance" or "Test":
  A user who has the Admin, Develop, or Modify role
- If the status of the executed service is "Debug":
  A user who has the Admin or Develop role

Procedure

1. In the main window, select the **Tasks** tab.
2. In the list of tasks, select the task whose progress you want to check.
3. In the **Flow** area at the lower part of the window, check the progress of the task.



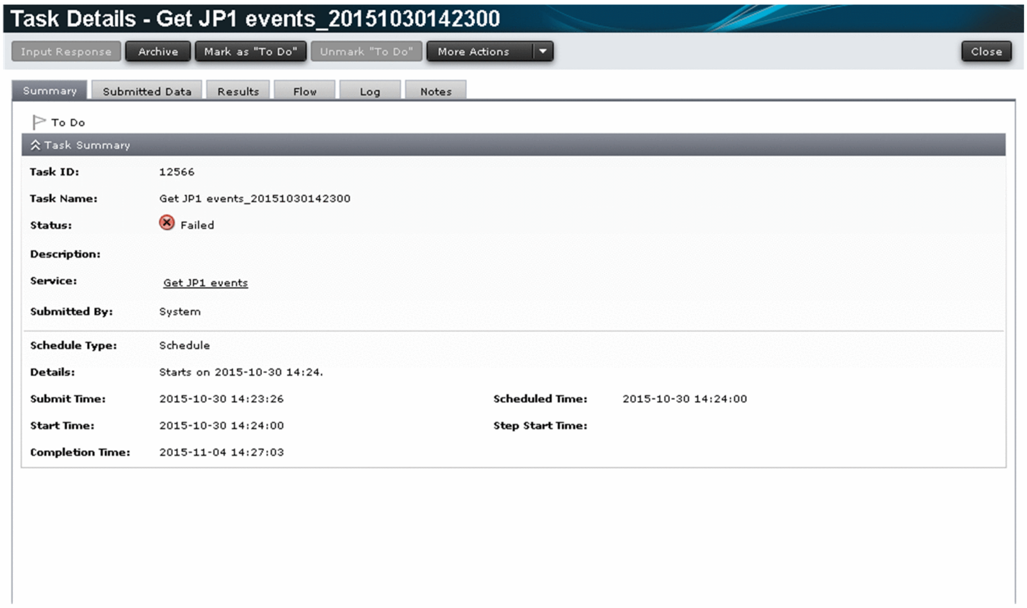
	Task Name		Status	Start Time	Completion Ti...	Schedule Type	Description	Submitted By
☑	Add operatio...		In Progress	2015-10-01 ...	-	Immediate	-	System
□	Execute rem...		Failed	2015-10-01 ...	2015-10-01 ...	Immediate	-	System
□	Execute rem.		Failed	2015-10-01 ...	2015-10-01 ...	Schedule	-	System

Add operational user_20151001184221

Add operational user_20151001184221 >

4. To check more details about the task, click the **Show Details** button.

5. In the **Task Details** window, check the details of the task.



Task ID:	12566		
Task Name:	Get JP1 events_20151030142300		
Status:	Failed		
Description:			
Service:	Get JP1 events		
Submitted By:	System		
Schedule Type:	Schedule		
Details:	Starts on 2015-10-30 14:24.		
Submit Time:	2015-10-30 14:23:26	**Scheduled Time:**	2015-10-30 14:24:00
Start Time:	2015-10-30 14:24:00	**Step Start Time:**	
Completion Time:	2015-11-04 14:27:03		

Caution

The **Flow** area does not display any tasks that were restored by using the `restoresystem` command.

Related topics

- Topic "Task statuses and status transitions" in the JP1/Automatic Operation Administration Guide
- Topic "Step statuses" in the JP1/Automatic Operation Administration Guide

3 Customizing a Service Template

This topic describes how to customize a service template, which automates IT operations.

You can use service templates provided by JP1/AO without customizing them. Please read this topic if you want to create or edit service templates.

If you want to customize a service template, we recommend that you prepare the development environment separately from the production environment. See 1. Setting Up the JP1/AO System, and then install JP1/AO in the development environment.

3.1 General procedure for customizing a service template

If you want to customize a JP1/AO service template (a service template included in the JP1/AO standard package or JP1/AO Content Pack), you must make a copy of the service template beforehand.

Table 3-1: General procedure for customizing a service template

Task		Required/optional
1	Preparing to implement the customization example	Required
2	Changing the properties or the processing flow to be automated	Required
3	Make the service template available for use.	Required

3.2 Overview of customizing service templates

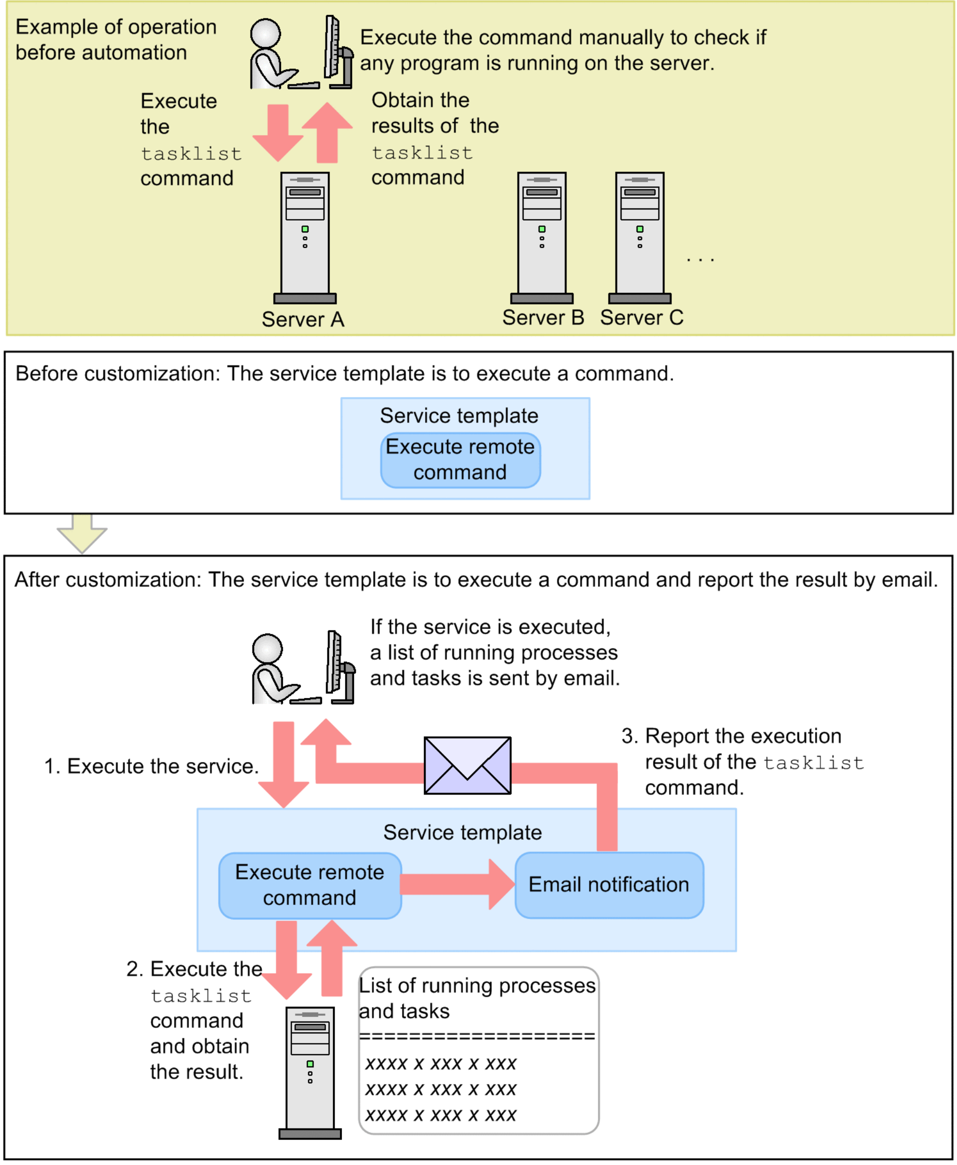
You can customize service templates provided by JP1/AO to automate IT operation procedures to meet your business requirements and environments.

This example assumes that you need to automate the procedure in which the Windows `tasklist` command is executed to check if any program is running, and then have the check results automatically reported by email.

First, you must determine the JP1/AO service template that you are going to customize. In this example, you customize the JP1/AO service template "Execute remote command". This service template can be used to execute a command stored on the specified server and then output the results.

In this example, you are going to add Email Notification Plug-in to the service template "Execute remote command".

Figure 3-1: Example of customizing a service template


Example of operation before automation
Execute the command manually to check if any program is running on the server.
Execute the tasklist command
Obtain the results of the tasklist command
Server A
Server B
Server C
...
Before customization: The service template is to execute a command.
Service template
Execute remote command
After customization: The service template is to execute a command and report the result by email.
If the service is executed, a list of running processes and tasks is sent by email.
1. Execute the service.
3. Report the execution result of the tasklist command.
Service template
Execute remote command
Email notification
2. Execute the tasklist command and obtain the result.
List of running processes and tasks
==================
xxxx x xxx x xxx
xxxx x xxx x xxx
xxxx x xxx x xxx

Related topics

- Topic "Execute remote command" in the JP1/Automatic Operation Service Template Reference

3.3 Preparing to implement the customization example

JP1/AO setup and configuration are required to implement this example of customizing a service template.

Procedure

1. Make sure that JP1/AO has been set up. Make sure that the following settings were made during setup:
   - The service template "Execute remote command" must be imported into JP1/AO.
   - The server on which the remote command is to be executed must be defined as the connection destination.
   - Settings must be made to enable the use of email notification.
   - JP1/AO must support the prerequisite products in the system, the prerequisite products in the system running the service template, and the operating systems that run the prerequisite products in the system running the service template. For details, see the Release Notes.
   - The server on which the remote command is to be executed must run the Windows operating system and must be able to execute the `tasklist` command.
   - The hosts file must be edited so that the JP1/AO server can resolve the name of the SMTP server.

Related topics

- 3.2 Overview of customizing service templates
- 1.5.1 Adding (importing) service templates to JP1/AO
- 1.5.5 Creating a connection destination definition
- 1.5.6 Configuring email notification settings
- 1.4.2 Enabling administrative shares

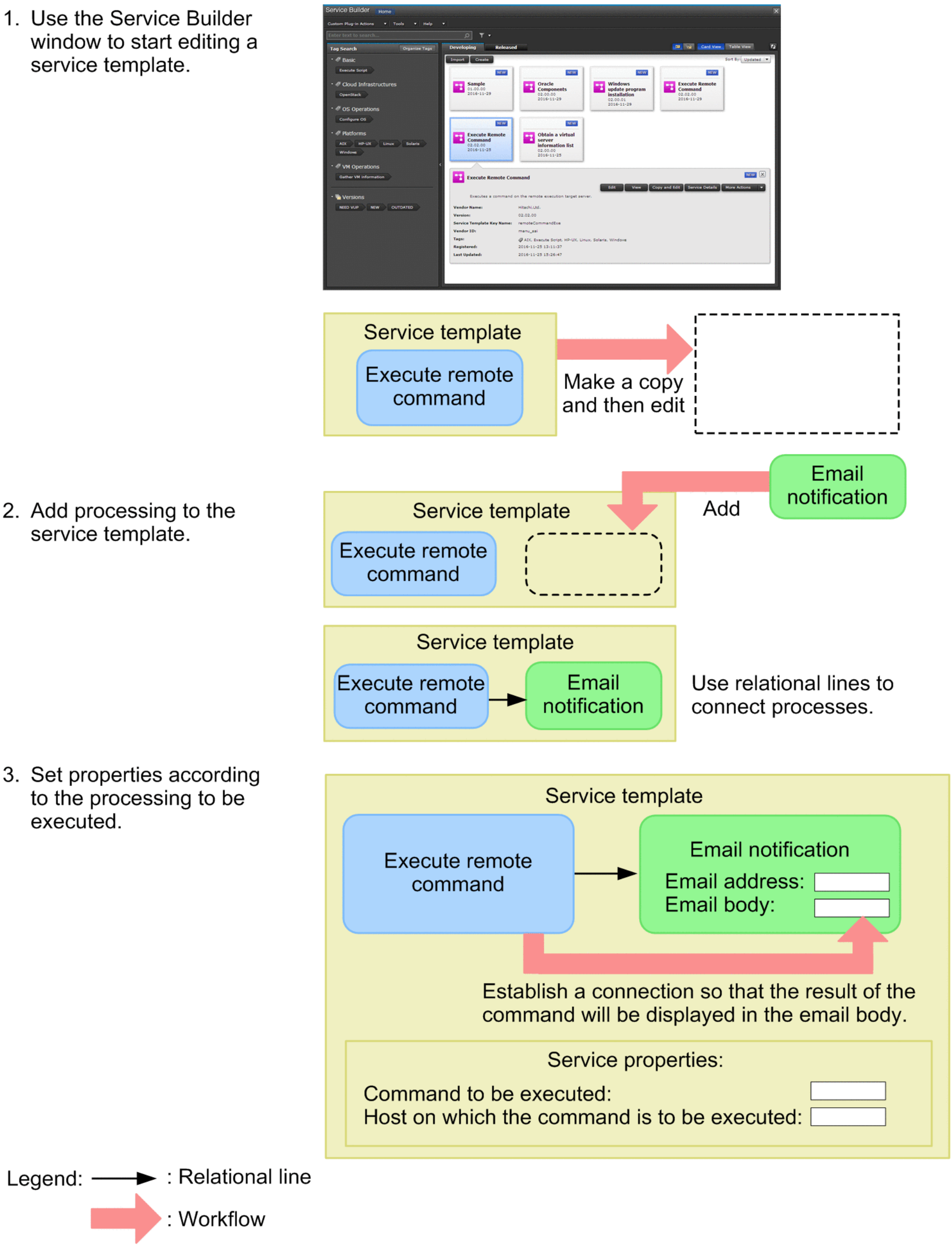
3.4 Changing the properties or the processing flow to be automated

To customize a service template, change the properties or the processing flow defined in the existing service template.

3.4.1 Overview of changing the properties or the processing flow to be automated

Use the **Service Builder** window to change the processing flow and properties defined in a service template.

Figure 3-2: Changing the properties or the processing flow to be automated



1. Use the Service Builder window to start editing a service template.

2. Add processing to the service template.

3. Set properties according to the processing to be executed.

3.4.2 Using the Service Builder window to start editing a service template

Use **Service Builder** to develop service templates. This allows you to create a new service template out of an existing service template and make edits.

Before you begin

Permissions and roles required for this operation:

- A user who has the Admin or Develop role

Procedure

1. In the main window, select the **Service Templates** tab.
2. Select the service template to be used to create your new template, and then click the **Copy** button.
   In this example, select the **Execute Remote Command** service template, and then click the **Copy** button.
3. Enter information about the service template.
4. Click the **Save** button.
5. Click the **OK** button.

Result

The **Service Builder** window appears. You can edit the copied service template in this window.

Related topics

- Topic "Compatibility for service templates and plug-ins created in the Service Builder window" in the JP1/Automatic Operation Service Template Developer's Guide
- Topic "Notes when an interrupt operation is performed in the Service Builder window" in the JP1/Automatic Operation Service Template Developer's Guide

3.4.3 Adding processing to the service template

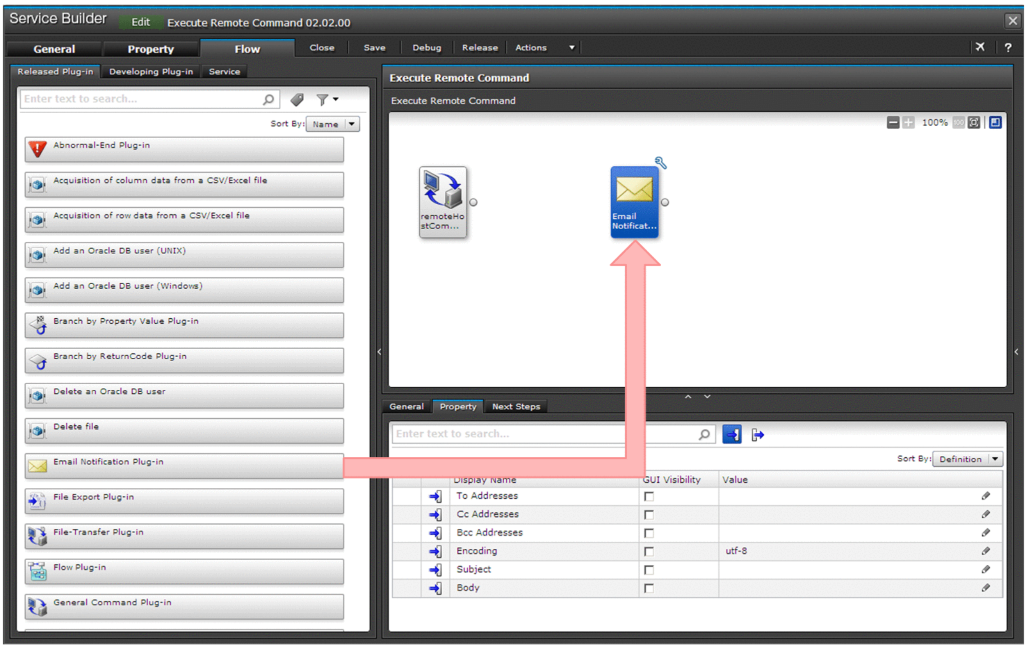
To add processing to the service template, drag components to the **Flow** area. To define the processing flow or the relationship between the processes, connect the components by using relational lines.

Before you begin

- Permissions and roles required for this operation:
  - A user who has the Admin or Develop role
- Display the **Service Builder Edit** window so you can edit the service template.

Procedure

1. In the **Component** area, select the component to be added, and then drag the component to the **Flow** area.



Display Name	GUI Visibility	Value
To Addresses	□	
Cc Addresses	□	
Bcc Addresses	□	
Encoding	□	utf-8
Subject	□	
Body	□	

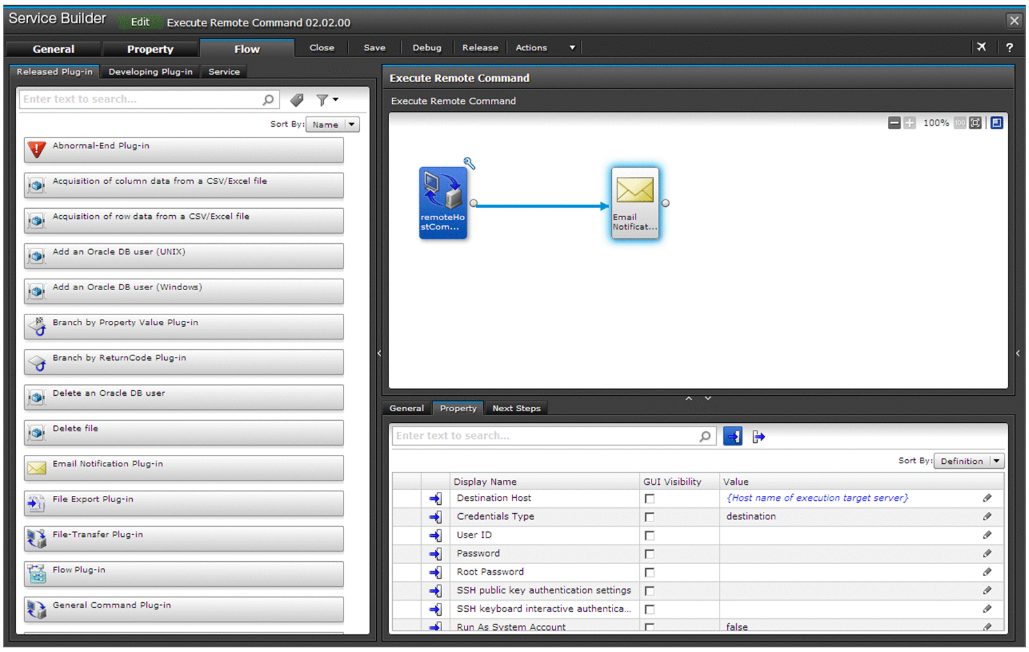
In this example, drag **Email Notification Plug-in** to the right of the **Execute remote command** icon.

2. In the **Create Step** dialog box, review the step definition information, and then click the **OK** button.

   For this step, leave the initial settings unchanged and click the **OK** button.

   Steps are added to the **Flow** area.

3. Select the icon o that indicates an earlier step, and then drag it to another icon that indicates a later step. Do not drop the icon until the color of the icon changes.



Display Name	GUI Visibility	Value
Destination Host	□	{Host name of execution target server}
Credentials Type	□	destination
User ID	□	
Password	□	
Root Password	□	
SSH public key authentication settings	□	
SSH keyboard interactive authentica...	□	
Run As System Account	□	false

In this example, connect the **Execute remote command** and **Email Notification Plug-in**.

Result

Now you have added processing to the service template, and have defined the processing order.

3.4.4 Setting properties according to the processing to be executed

You can set the properties of steps and services to specify the address for the recipient of email notification and pass values from one step to another step.

This topic explains, as an example, how to set properties of the plug-ins for remote command execution and email notification, so as to:

- Make sure that the result of the remotely executed `tasklist` command is passed to the body of the email notification plug-in.
- Make sure that the email address for the recipient of email notification is always the same.
- Set the default name of the command to be executed and the default name of the host on which the command is to be executed. Note that the the command name and the host name can be changed when the service is executed.

Before you begin

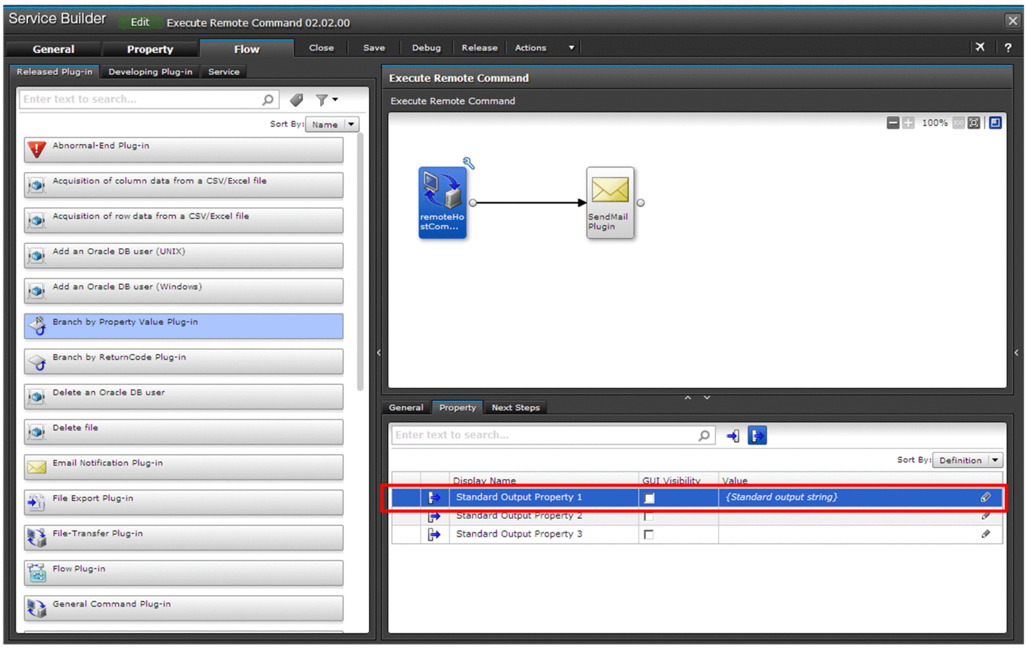
- Permissions and roles required for this operation:
  - A user who has the Admin or Develop role
- Display the **Service Builder Edit** window so you can edit the service template.

Procedure

1. In the **Flow** area, select **Execute remote command**.

2. In the **Properties** tab in the **Step Properties** area, click the output property icon.

3. Select the **Standard Output Property 1** line, and then click the pencil icon.



Display Name	GUI Visibility	Value
Standard Output Property 1	□	{Standard output string}
Standard Output Property 2	□	
Standard Output Property 3	□	

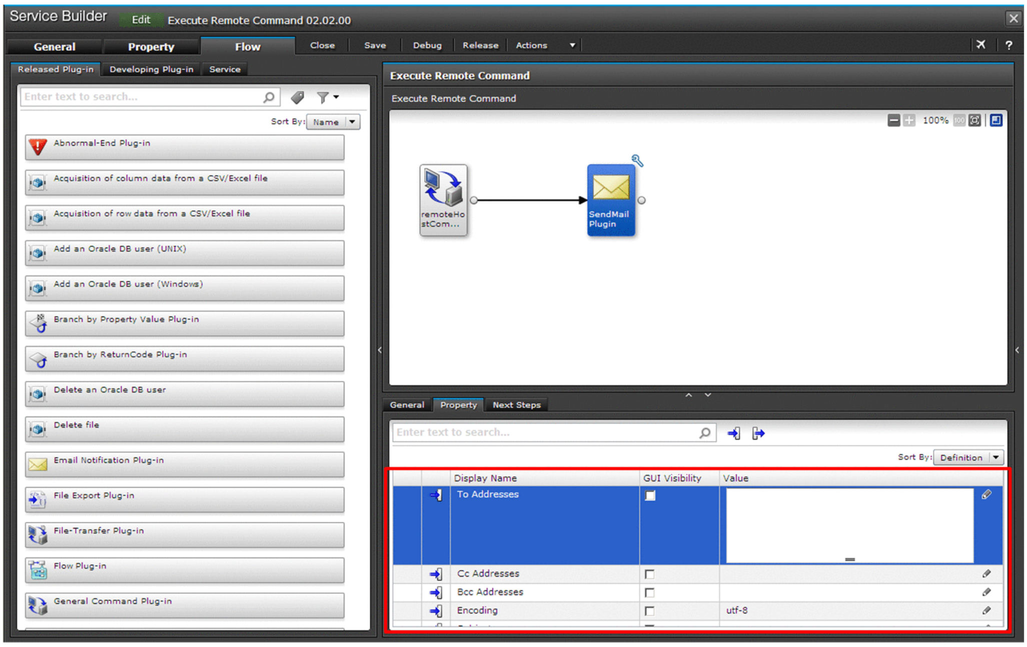
4. In the **Specify Component Output Property Mapping Parameters** dialog box, in **Setting Method**, select the **None** radio button.

5. Click the **OK** button.

6. In the **Flow** area, select **Email Notification Plug-in**.

7. In the **Properties** tab in the **Step Properties** area, click the input property icon.

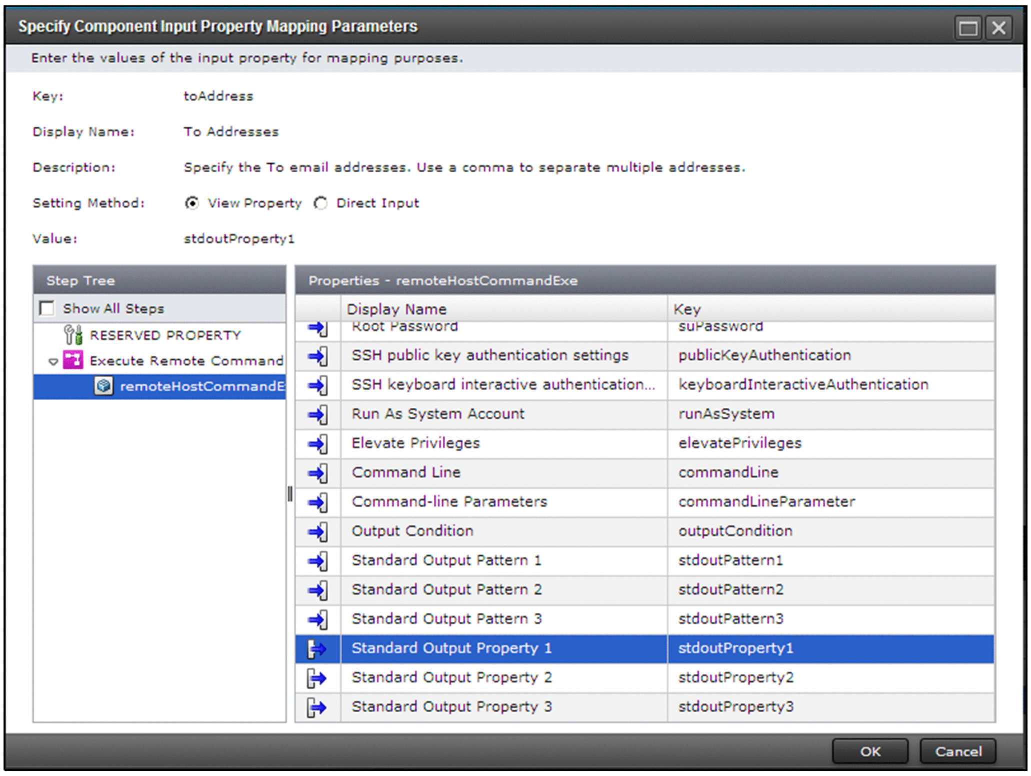
8. For the **Value** column on the **To Addresses** line, enter the email address of the destination.



Display Name	GUI Visibility	Value
To Addresses	☑	
Cc Addresses	□	
Bcc Addresses	□	
Encoding	□	utf-8

9. In the **Step Properties** area, select the **Body** line, and then click the pencil icon.
The **Specify Component Input Property Mapping Parameters** dialog box appears.

10. In **Step Tree**, select **Execute remote command** > **Standard Output Property 1**, and then click the **OK** button.



Specify Component Input Property Mapping Parameters
Step Tree
Properties - remoteHostCommandExe
OK
Cancel

Enter the values of the input property for mapping purposes.

Key: toAddress

Display Name: To Addresses

Description: Specify the To email addresses. Use a comma to separate multiple addresses.

Setting Method: ● View Property ○ Direct Input

Value: stdoutProperty1

□ Show All Steps

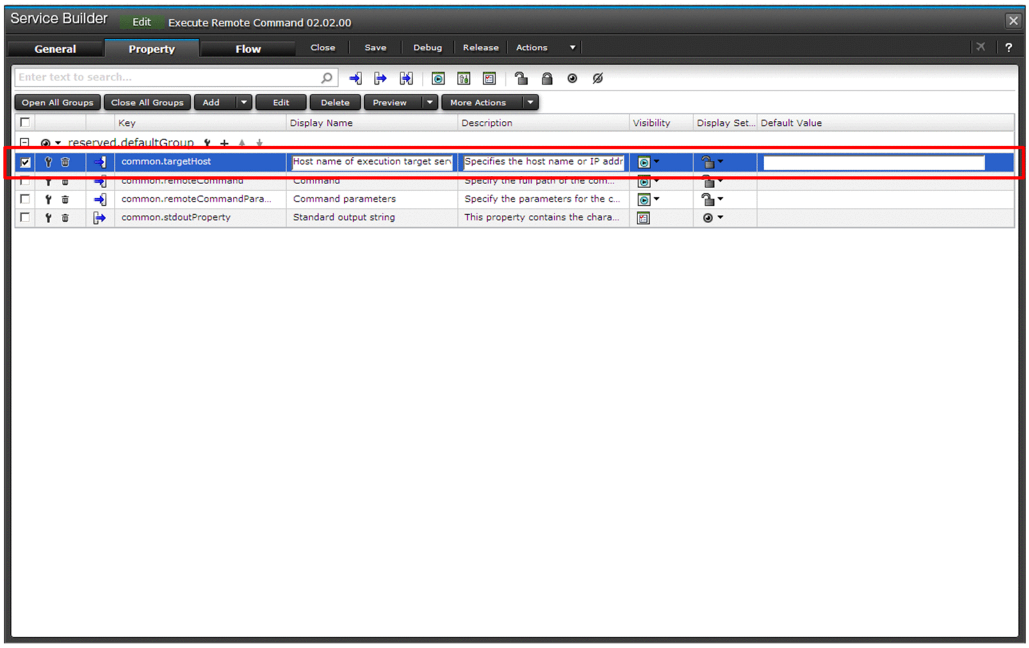
- RESERVED PROPERTY
- Execute Remote Command
  - remoteHostCommandE

Display Name	Key
Root Password	suPassword
SSH public key authentication settings	publicKeyAuthentication
SSH keyboard interactive authentication...	keyboardInteractiveAuthentication
Run As System Account	runAsSystem
Elevate Privileges	elevatePrivileges
Command Line	commandLine
Command-line Parameters	commandLineParameter
Output Condition	outputCondition
Standard Output Pattern 1	stdoutPattern1
Standard Output Pattern 2	stdoutPattern2
Standard Output Pattern 3	stdoutPattern3
Standard Output Property 1	stdoutProperty1
Standard Output Property 2	stdoutProperty2
Standard Output Property 3	stdoutProperty3

As the value of **Body**, a character string that indicates **Standard Output Property 1** is displayed.

11. In the upper part of the **Service Builder Edit** window, click the **Properties** tab.

12. Select properties and set values for **Default Value**.



reserved.defaultGroup

	Key	Display Name	Description	Visibility	Display Set...	Default Value
☑	common.targetHost	Host name of execution target serv	Specifies the host name or IP addr			
□	common.remoteCommand	Command	Specify the full path of the com...			
□	common.remoteCommandPara...	Command parameters	Specify the parameters for the c...			
□	common.stdoutProperty	Standard output string	This property contains the chara...			

In this example, set the properties shown below. The values that you set in this window are displayed as the default values when the service is executed.

Table 3-2: Example of service property settings

Service property	Value to be set
Host name of execution target server	Name or IP address of the host on which the command is to be executed
Command to be executed	tasklist

Result

Properties have been set to the plug-ins for remote command execution and email notification.

> ### Caution
>
> If the `tasklist` command generates more than 1,024 characters, the excessive characters are not included in the email.

Next steps

Now you have set properties. Next, you build the service template.

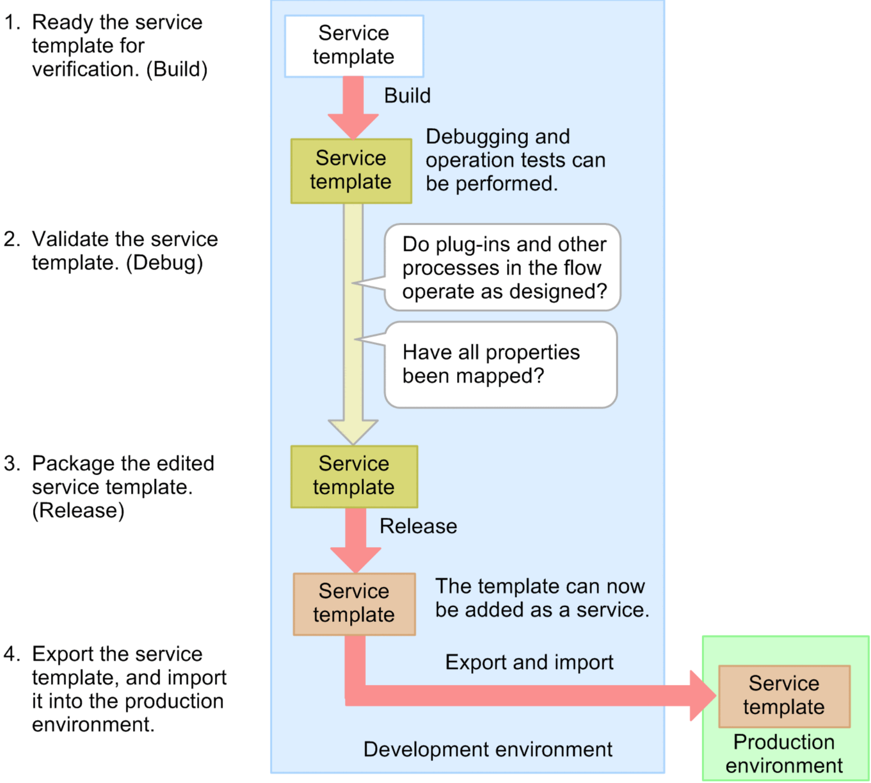
3.5 Making your service template available for use

After you finish editing your service template, you must build, debug, release, and import the service template to make it available for use.

3.5.1 General procedure for making a service template available for use

The following figure shows the general procedure for building, debugging, releasing, exporting, and importing a service template.

Figure 3-3: General procedure for making a service template available for use


1. Ready the service template for verification. (Build)
2. Validate the service template. (Debug)
3. Package the edited service template. (Release)
4. Export the service template, and import it into the production environment.
Service template
Build
Service template
Debugging and operation tests can be performed.
Do plug-ins and other processes in the flow operate as designed?
Have all properties been mapped?
Service template
Release
Service template
The template can now be added as a service.
Export and import
Service template
Production environment
Development environment

3.5.2 Building the service template to ensure that the template is ready to be verified

When you select and build a service template, a service template package is created and imported into the JP1/AO server. After a service template is built, the template is ready for debugging and operation testing.

Caution

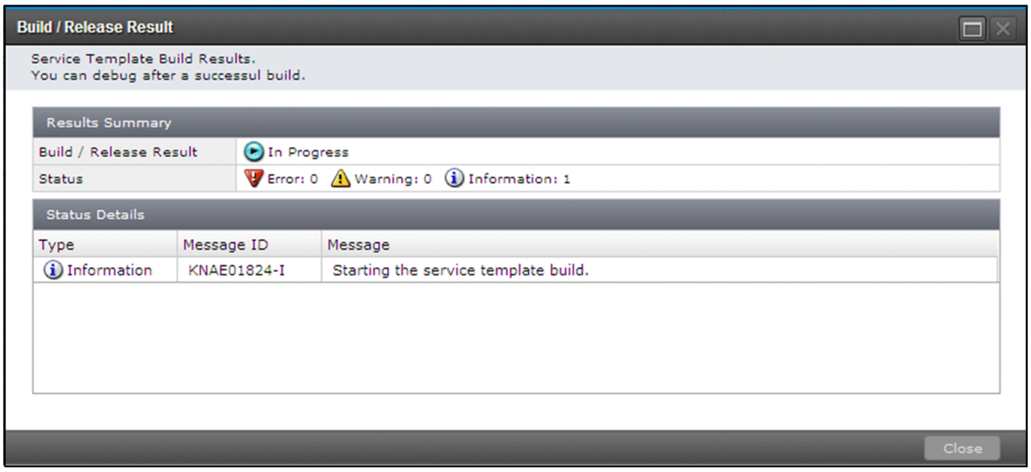
If you redefine plug-ins that have already been placed as steps of a flow, inconsistencies might occur between the mapping settings and step properties defined in the steps. An error occurs if a mismatch is found when you build the template. If this error occurs, you must redo the property settings and the placement of plug-ins.

Before you begin

- Permissions and roles required for this operation:
  - A user who has the Admin or Develop role
- Display the **Service Builder Edit** window so you can edit the service template.

Procedure

1. Click the **Debug** button.
2. In the confirmation dialog box, click the **OK** button.
3. Check the result of the build.



Service Template Build Results.
You can debug after a successul build.

Results Summary

Build / Release Result	In Progress
Status	Error: 0 Warning: 0 Information: 1

Status Details

Type	Message ID	Message
Information	KNAE01824-I	Starting the service template build.

If an error occurs while you are building a service template, a message displays the cause of the error and prompts you to correct the flow. In such a case, the top right of the **Service Builder Edit** window displays the **Error** button. After you close the message box, you can see the message again by clicking the **Error** button. This button appears until you close the **Service Builder Edit** window.

If your service template is already released or deleted by another user, an error occurs and the build fails.

Result

The service template is built.

Next steps

Now you have built a service template. Next, click the **Run Debugger** button to start debugging the service template.

Related topics

- Topic "Overview of building" in the JP1/Automatic Operation Service Template Developer's Guide
- Topic "Reference information for build and release operations" in the JP1/Automatic Operation Service Template Developer's Guide

3.5.3 Debugging and validating the service template

If the build finishes successfully, you must debug the service template and identify problems with the flow or plug-ins.

Before you begin

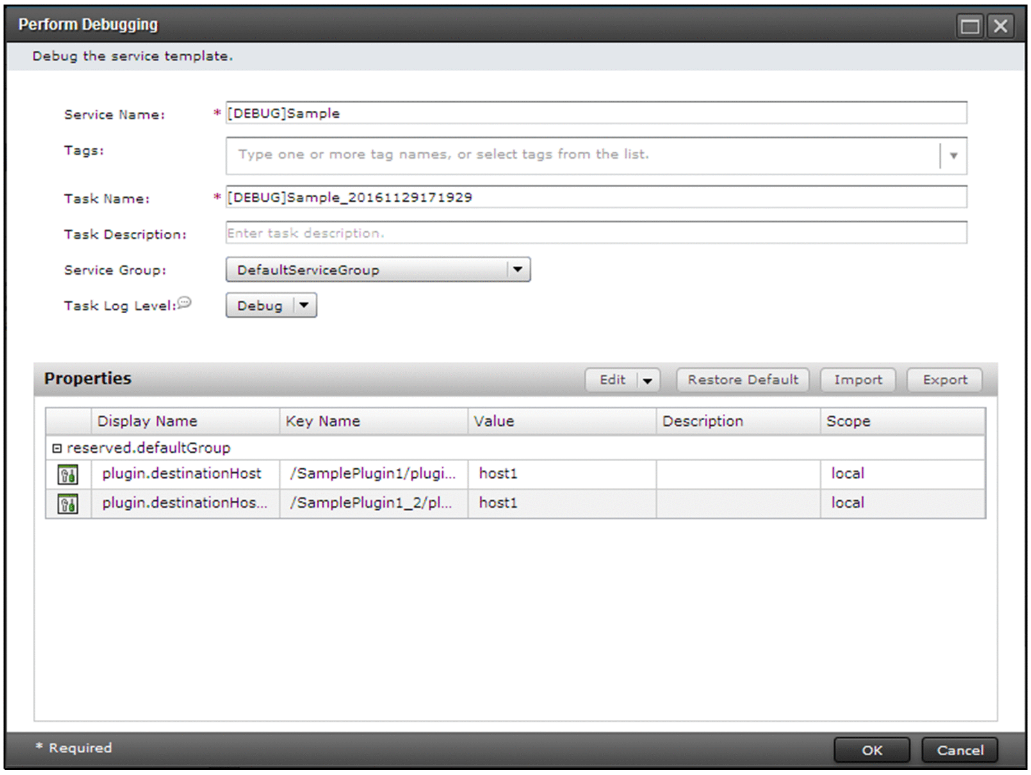
Permissions and roles required for this operation:

- A user who has the Admin or Develop role

Procedure

1. If all components included in the service template can be executed without any problems, first, execute a debug task without executing the service template in a step-by-step manner.

   In this step, check whether there are problems with the processing transition in the flow and with the processing of each plug-in. If the service template contains any components that you do not want to execute, skip step 1, and start the procedure from step 2.



Perform Debugging

Debug the service template.

Service Name: * [DEBUG]Sample

Tags: Type one or more tag names, or select tags from the list.

Task Name: * [DEBUG]Sample_20161129171929

Task Description: Enter task description.

Service Group: DefaultServiceGroup

Task Log Level: Debug

Properties

	Display Name	Key Name	Value	Description	Scope
⊟ reserved.defaultGroup					
	plugin.destinationHost	/SamplePlugin1/plugi...	host1		local
	plugin.destinationHos...	/SamplePlugin1_2/pl...	host1		local

* Required

2. After determining all problems with the processing transition and plug-in processing, run a debug task, stopping processing for each step, to identify the locations and check the details of the problems.

   You can also set a breakpoint at any step.

   If necessary, change the values of input and output properties while validating the service template. You can run a debug any number of times by using the **Retry Debug** pull-down menu in the **Service Builder Debug** window.

3. Modify the service template in the **Service Builder Edit** window.

4. Build the service template again, and debug it. Repeat steps 1 to 4 until all problems are corrected.

5. Confirm that all problems have been corrected, and then terminate the debug.

Result

This triggers the debugging of the service template.

Related topics

- Related topic: "Overview of debugging" in the manual JP1/Automatic Operation Service Template Developer's Guide
- Topic "Functions used during debug operations" in the JP1/Automatic Operation Service Template Developer's Guide

3.5.4 Releasing and packaging the edited service template

After you finish editing the service template, you are going to release the template. After the release, the service template is packaged and then imported into the JP1/AO server. You can create the service if your development environment for the service template is the same as the production environment.

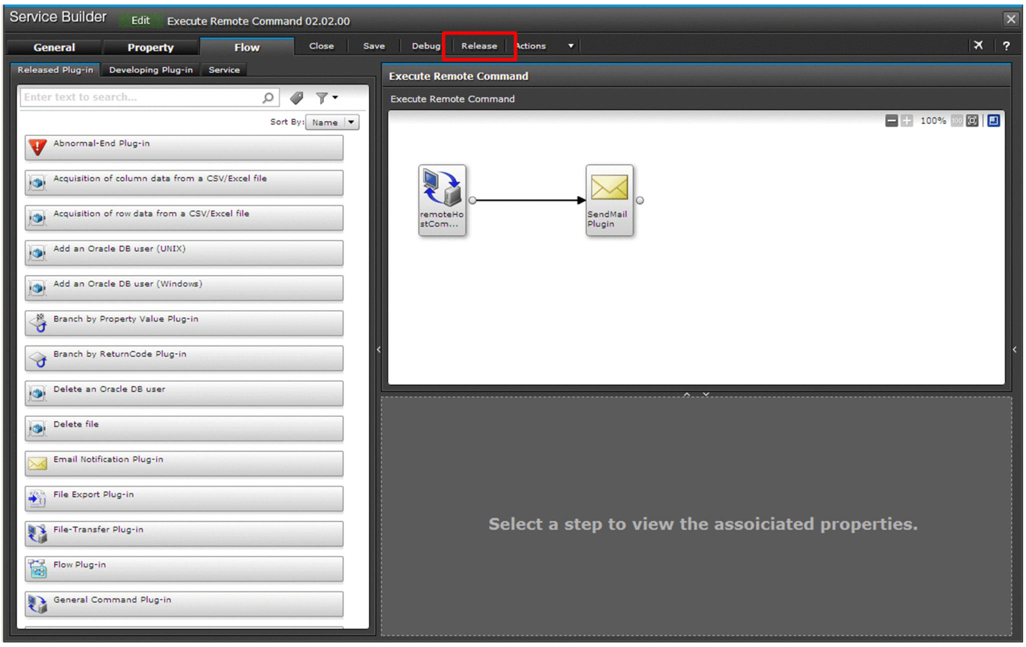
Before you begin

- Permissions and roles required for this operation:
  - A user who has the Admin or Develop role
- Display the **Service Builder Edit** window so you can edit the service template.

> ⚠ **Caution**
>
> - After you release a service template, you will no longer be able to edit the template. If you make a copy of a released service template or update the released service template, you can edit it.
> - If you release a service template from the service template debug area, the latest build of the service template built by the user who performed debugging is released. If the latest build of the service template built by the user who performed debugging is edited and rebuilt by another user, the edits are not applied.

Procedure

1. In the **Service Builder Edit** window, click the **Release** button.



2. Check the result of the release, and then click the **Close** button.

   If an error occurs while you are building a service template, a message displays the cause of the error and prompts you to correct the flow. In this case, the **Error** button appears at the top right of the **Service Builder Edit** window. After you close the message box, you can see the message again by clicking the **Error** button. This button appears until you close the **Service Builder Edit** window.

   If your service template is already released or deleted by another user, an error occurs and the build fails.

Related topics

- Topic "Overview of service template release" in the JP1/Automatic Operation Service Template Developer's Guide

3.5.5 Importing the service template into the production environment

After exporting a service template from the development environment, import the service template into the production environment.

Before you begin

Permissions and roles required for this operation:

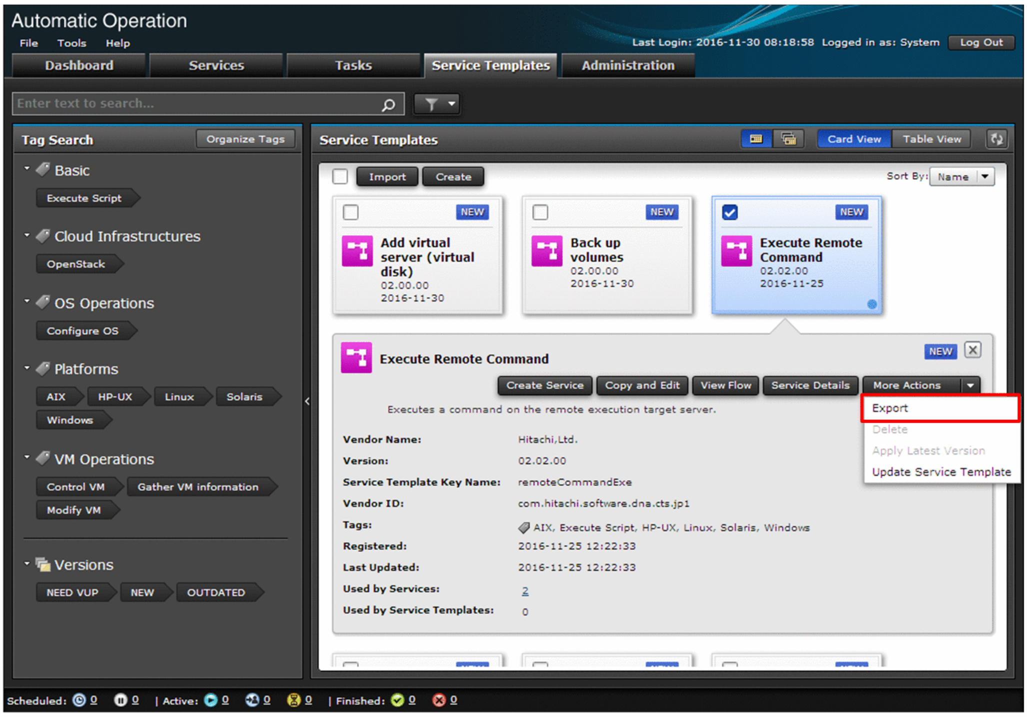
- A user who has the Admin or Develop role

Procedure

1. In the development environment, in the JP1/AO main window, click the **Service Template** tab.

2. In the **Service Templates** area, import the service template into the production environment.

3. In the **Service Templates** area, click **More Actions** > **Export**.



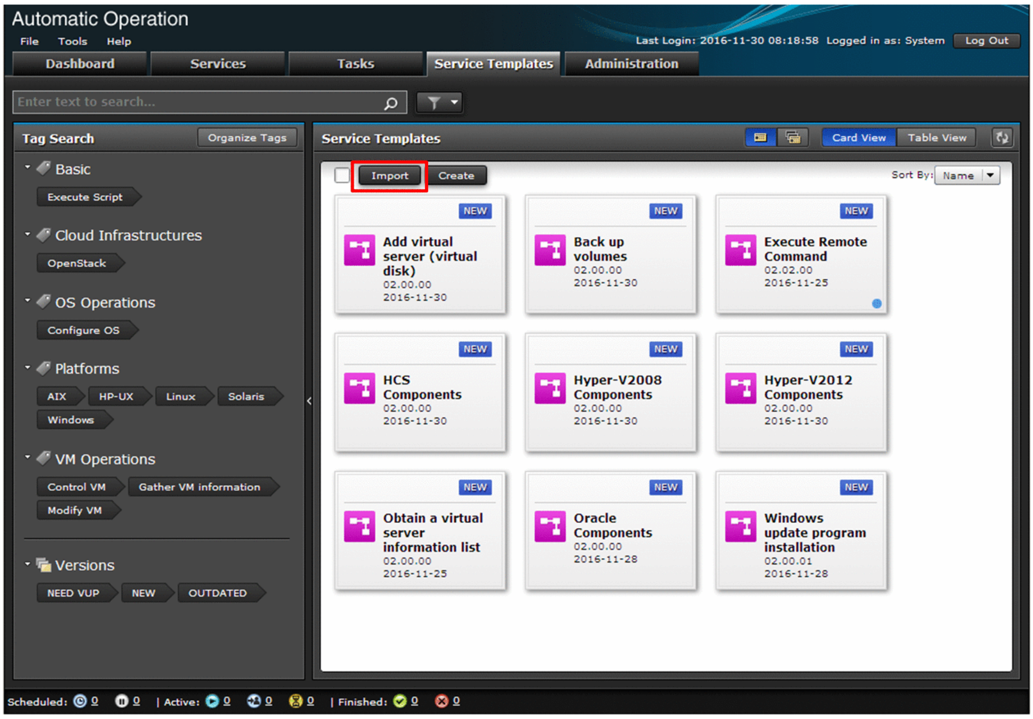
Executes a command on the remote execution target server.

Vendor Name: Hitachi,Ltd.
Version: 02.02.00
Service Template Key Name: remoteCommandExe
Vendor ID: com.hitachi.software.dna.cts.jp1
Tags: AIX, Execute Script, HP-UX, Linux, Solaris, Windows
Registered: 2016-11-25 12:22:33
Last Updated: 2016-11-25 12:22:33
Used by Services: 2
Used by Service Templates: 0

4. In the confirmation dialog box, click the **OK** button to save the service template to a file.

5. In the production environment, in the JP1/AO main window, click the **Service Template** tab.

6. In the **Service Templates** area, click the **Import** button.


Automatic Operation
File Tools Help
Last Login: 2016-11-30 08:18:58 Logged in as: System
Log Out
Dashboard
Services
Tasks
Service Templates
Administration
Enter text to search...
Tag Search
Organize Tags
Basic
Execute Script
Cloud Infrastructures
OpenStack
OS Operations
Configure OS
Platforms
AIX
HP-UX
Linux
Solaris
Windows
VM Operations
Control VM
Gather VM information
Modify VM
Versions
NEED VUP
NEW
OUTDATED
Service Templates
Card View
Table View
Import
Create
Sort By: Name
NEW
Add virtual server (virtual disk) 02.00.00 2016-11-30
NEW
Back up volumes 02.00.00 2016-11-30
NEW
Execute Remote Command 02.02.00 2016-11-25
NEW
HCS Components 02.00.00 2016-11-30
NEW
Hyper-V2008 Components 02.00.00 2016-11-30
NEW
Hyper-V2012 Components 02.00.00 2016-11-30
NEW
Obtain a virtual server information list 02.00.00 2016-11-25
NEW
Oracle Components 02.00.00 2016-11-28
NEW
Windows update program installation 02.00.01 2016-11-28
Scheduled: 0 0 | Active: 0 0 0 | Finished: 0 0

7. Select the service template file (*.st), and then click the **OK** button.

Result

The service template is imported.

Tip

To import two or more service template files (.st files), create a .ZIP file containing the service template files, and then import the ZIP file by using the **Service Template** window or by executing the `importservicetemplate` command.

Related topics

- 1.5.1 Adding (importing) service templates to JP1/AO
- 1.5.2 Locations of the service templates for the JP1/AO standard package and JP1/AO Content Pack
- Topic "Reason for maintaining separate development and active environments" in the JP1/Automatic Operation Service Template Developer's Guide

Appendixes

A. Advanced Use

This appendix introduces functionality that is very useful for getting the most out of JP1/AO.

A.1 Advanced use

This appendix introduces functionality that is very useful for getting the most out of JP1/AO. For details, see the manuals for the JP1/AO series.

Table A-1: Functionality useful for getting the most out of JP1/AO

Functionality	Overview	Reference
Managing users	You can register, edit, and lock the user accounts used to log in to JP1/AO. You can also control operation targets that users can access according to the permissions.	Topic "Managing Users" in the *JP1/AO Administration Guide*
Sharing property values among services (Service Share Properties)	If you set Service Share Properties, the values for the properties can be shared among services. For example, when you use a service template to manage a common server, if you define the host name, user ID, and password for that server at the connection destination as Service Share Properties, you can save the time needed to enter such server information each time a service is run. Service Share Properties are classified into two types: The Service Share Properties that are different for each service template, and the shared built-in service properties that are predefined in JP1/AO.	Topic "Evaluating the shared service properties" in the *JP1/AO Overview and System Design Guide*
Linking with other products	JP1/AO provides functions for improving the work efficiency of administrators, including email notifications when errors occur, and a direct access URL that enables target windows to be displayed directly. • Taking advantage of existing JP1 resource groups - linking with authentication function of JP1/Base • Using Active Directory to manage users and groups - linking with Active Directory • System monitoring linked with JP1/IM - linking with event monitoring function of JP1/IM • Streamlined error detection - email notification • Improving work efficiency by directly accessing a target window (such as a service execution window, a service setup window, and a task details window) - direct-access URL • Calling JP1/AO functions from external programs - API • Single sign-on to a JP1/IM - NP window - Linking with JP1/IM - NP job contents	Topic "Functions for linking with other products" in the *JP1/AO Overview and System Design Guide*

B. Reference Material for This Manual

This appendix describes the abbreviations for product names, icons used in this manual, and the notation for folders.

B.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):

- *JP1 Version 12 JP1/Automatic Operation Overview and System Design Guide*# *(3021-3-D02(E))*
- *JP1 Version 12 JP1/Automatic Operation Configuration Guide*# *(3021-3-D03(E))*
- *JP1 Version 12 JP1/Automatic Operation Administration Guide*# *(3021-3-D04(E))*
- *JP1 Version 12 JP1/Automatic Operation Service Template Developer's Guide*# *(3021-3-D05(E))*
- *JP1 Version 12 JP1/Automatic Operation Command and API Reference*# *(3021-3-D06(E))*
- *JP1 Version 12 JP1/Automatic Operation Service Template Reference*# *(3021-3-D07(E))*
- *JP1 Version 12 JP1/Automatic Operation Messages*# *(3021-3-D08(E))*

#: In the JP1/AO manuals, JP1/Automatic Operation is abbreviated to JP1/AO.

B.2 Abbreviations for Microsoft product names

This manual uses the following abbreviations for Microsoft product names.

Abbreviation	Full name or meaning
Active Directory	Microsoft(R) Active Directory
Internet Explorer	Windows(R) Internet Explorer(R)
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 Server 2016	Microsoft(R) Windows Server(R) 2016 Datacenter
	Microsoft(R) Windows Server(R) 2016 Standard
Windows Server 2019	Microsoft(R) Windows Server(R) 2019 Datacenter
	Microsoft(R) Windows Server(R) 2019 Standard
Windows Server 2022	Microsoft(R) Windows Server(R) 2022 Datacenter
	Microsoft(R) Windows Server(R) 2022 Standard

Windows is often used generically to refer to Windows Server 2022, Windows Server 2019, Windows Server 2016, Windows Server 2012 R2, or Windows Server 2012.

B.3 Conventions: Fonts and symbols

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

Text formatting	Convention
Italic	Italic characters indicate a placeholder for actual text to be provided by the user or system. For example: *YYYYMMDD* indicates that a date is specified.
Bold	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.
Bold > **Bold**	Successive bold characters connected by the character > indicate successive selection of menus. For example: Select **File** > **New**. The above example instructs you to select **New** in the **File** menu.

B.4 Conventions: Installation folders

In this manual, the default installation folders are represented as follows:

Windows

JP1/AO installation folder:

`system-drive\Program Files\Hitachi\JP1AO`

JP1/AO - Contents installation folder:

`system-drive\Program Files(x86)\Hitachi\JP1AOCONT`

Common Component installation folder:

`system-drive\Program Files\Hitachi\HiCommand\Base64`

Linux

JP1/AO installation folder:

- `/opt/jp1ao`
- `/var/opt/jp1ao`

JP1/AO - Contents installation folder:

`/opt/jp1aocont`

Common Component installation folder:

`/opt/HiCommand/Base64`

B.5 Conventions: Abbreviations for product names

This manual uses the following abbreviations for product names.

Abbreviation	Full name or meaning
JP1/IM	JP1/Integrated Management
	JP1/Integrated Management 2

Abbreviation		Full name or meaning
JP1/IM - NP		JP1/Integrated Management - Navigation Platform
		JP1/Navigation Platform
JP1/OA		JP1/Operations Analytics
UNIX	HP-UX	HP-UX 11i V3 (IPF)
	Linux#	Linux (R)
	Solaris	Solaris 10 (SPARC)
		Solaris 11 (SPARC)

#

This is the notation for pertaining to the OS of an operation-target device. The notation for pertaining to the OS of a JP1/AO server is as follows:

Abbreviation			Full name or meaning
Linux	Linux 6	CentOS 6 (x64)	Community ENTerprise Operating System 6 (x64)
		Oracle Linux 6 (x64)	Oracle Linux(R) Operating System 6 (x64)
		Red Hat Enterprise Linux 6 (x64)	Red Hat Enterprise Linux(R) Server 6 (64-bit x86_64)
	Linux 7	CentOS 7	Community ENTerprise Operating System 7
		Oracle Linux 7	Oracle Linux(R) Operating System 7
		Red Hat Enterprise Linux 7	Red Hat Enterprise Linux(R) Server 7
	Linux 8	CentOS 8	Community ENTerprise Operating System 8
		Oracle Linux 8	Oracle Linux(R) Operating System 8
		Red Hat Enterprise Linux 8	Red Hat Enterprise Linux(R) Server 8
	SUSE Linux 12		SUSE Linux(R) Enterprise Server 12

B.6 Conventions: Acronyms

This manual also uses the following acronyms.

Acronym	Full name or meaning
AIX	Advanced Interactive Executive
API	Application Programming Interface
CC	Carbon Copy
DB	Data Base
DWORD	Double Word
FTP	File Transfer Protocol
GUI	Graphical User Interface
HTTP	Hyper Text Transfer Protocol

Acronym	Full name or meaning
HTTPS	Hypertext Transfer Protocol Security
ID	IDentifier
IP	Internet Protocol
IPF	Itanium(R) Processor Family
IT	Information Technology
NAT	Network Address Translation
OS	Operating System
PCRE	Perl Compatible Regular Expressions
SAN	Storage Area Network
SMTP	Simple Mail Transfer Protocol
SSL	Secure Socket Layer
TCP/IP	Transmission Control Protocol/Internet Protocol
UAC	User Account Control
udp	User Datagram Protocol
URL	Uniform Resource Locator
UTF	Unicode Transformation Format
WMI	Windows Management Instrumentation

B.7 Conventions: Units (such as KB, MB, GB, and TB)

This manual uses the following conventions:

1 KB (kilobyte) is 1,024 bytes.1 MB (megabyte) is 1,024^2 bytes. 1 GB (gigabyte) is 1,024^3 bytes. 1 TB (terabyte) is 1,024^4 bytes.

B.8 Version changes

(1) Changes in version 12-60

- The prerequisites for installing JP1/AO were changed.
- Notes were added regarding the use of products that use the same Common Component.
- The following operating systems are now supported:
    - Windows Server 2022
    - Red Hat Enterprise Linux 8
    - Oracle Linux 8
    - CentOS 8

(2) Changes in version 12-01

- None

(3) Changes in version 12-00

- None

(4) Changes in version 11-10

- JP1/AO no longer requires JP1/Base as a prerequisite product, and descriptions of this requirement were deleted.
- JP1/AO no longer uses JP1/AJS3 as a task processing engine, and content indicating otherwise was deleted.
- Adobe Flash Player is no longer required, and descriptions of this requirement were deleted.
- The **Service Builder** window was redesigned.

(5) Changes in 11-01

- A cautionary note was added warning that you cannot specify a symbolic link as the installation destination when performing a new installation of JP1/AO in Linux.

Glossary

A

Admin role

A kind of role. User groups granted this role can manage service groups, manage service templates, develop service templates, manage services, and execute services.

B

build

Changing the status of a development service template to the status in which the development service template can be debugged and added as a service in the development environment. Development service templates that have been built can be imported in the JP1/AO server.

C

Common Component

This component is a collection of functions that are shared by Hitachi Command Suite products. Common Components are installed as part of JP1/AO and provide functions such as user management, log output, and commands.

component

Components refer to plug-ins and release service templates that can be deployed in the flow of a service template as steps.

connection destination

This term refers to a connection destination host that JP1/AO manages as a target of a service. You can restrict user access to the connection destination by associating the connection destination with a service group.

D

debug

A series of operations that detect problems with flows or plug-ins through examination of the results of a debug task. These operations are intended to validate the behavior of a development service template.

debug task

A task that is generated during debugging of a development service template. This task is generated when a debug service is executed. In the debug process, the results of the debug task can be used to identify problems with flows or plug-ins.

debugger

A JP1/AO function that helps you debug development service templates.

Develop role

A kind of role. User groups granted this role can manage service templates, develop service templates, manage services, and execute services.

development plug-in

A plug-in being created by the user, or a plug-in created as a result of making a copy of an existing plug-in. Development plug-ins are used in the development environment.

development service template

A service template being created by the user, or a service template created as a result of making a copy of a release service template. Development service templates are used in the development environment.

F

flow

A definition of procedural steps in the operation to be automated in a service template.

H

Hitachi Command Suite

A product that configures and monitors storage environments and allows for integrated management of heterogeneous storage systems.

J

Job Management Partner 1/Automatic Operation

A product that provides functions required to automate operation procedures and offers run book automation capabilities.

JP1 resource group

In JP1/Base, the management targets (resources), such as jobs and events, are classified into various groups. These groups of management targets (resources) are called JP1 resource groups.

JP1 user

A user managed by JP1/Base. JP1 users are allowed to log in to JP1/AO if external authentication with JP1/Base is configured.

JP1/Automatic Operation Content Pack

A package of multiple service templates. This package provides a variety of service templates of different types for different categories such as virtual server operations and cloud operations.

M

Modify role

A kind of role. User groups granted this role can manage services and execute services.

P

plug-in

The smallest unit of processing for automating IT operations. Plug-ins are categorized into JP1/AO standard-package plug-ins and JP1/AO Content Pack plug-ins. The JP1/AO standard-package plug-ins that perform email notification, flow iteration, and other general purpose processing are referred to as basic plug-ins.

profile

A collection of data used to manage a user, including the user ID and address.

property mapping

Property mapping is a mechanism that enables value inheritance between step properties or between a step property and service property. For example, the property mapping can be set for a step to inherit (as the value of the input property) the value of the previous step's output property.

R

relational line

A line that connects two steps. You can put steps required for performing an application and connect these steps with relational lines to define the order in which the processing steps are to be performed.

release

An act of making sure that a verified development service template can be added as a service in the production environment. Once a development service template is released, the template is treated as a release service template and can no longer be edited. After the release, the release service template is imported in the JP1/AO server.

release plug-in

A plug-in that is imported after the release of a development service template, or a plug-in that is included in the service template provided by JP1/AO. Release plug-ins are used in the production environment.

release service template

A development service template that has been released. The service template provided by JP1/AO is a release service template. Release service templates are used in the production environment. You can deploy release service templates as service plug-ins in a flow during development of a service template.

role

An attribute that restricts operations (such as service management and execution) that a user group can perform on a service group. Four types of roles exist: the Admin role, the Develop role, the Modify role, and the Submit role.

S

service

A JP1/AO term that refers to an imported service template to which the property values appropriate for the environment are input. You can automate operation procedures by executing services.

Service Share Property

A property containing a value shared by services to be executed by JP1/AO. For example, if you define the host name of the connection destination server, the user ID, and the password as Service Share Properties, you do not need to enter server information that is already defined. The Service Share Properties provided by JP1/AO are referred to as built-in shared service properties.

service template

A template that facilitates execution of different operation procedures for your IT system based on the specified property values and schedules in the JP1/AO window.

service template package

A service template that was built and imported in the JP1/AO server. Service template packages are stored as files with the extension ".st". Multiple service template packages can be contained in a file in ZIP format.

step

An element of a flow. This executes a plug-in.

Submit role

A kind of role. User groups granted this role can execute services.

T

task

A unit of processing generated as a result of service execution. You can check the progress or result of automatic processing by checking the task.

U

user group

A group of users who use the same service group and have the same operation permission for that service group.

User Management permission

The permission required to manipulate all the user accounts. The user with the User Management permission can use the function for managing users and user groups.

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