ITA_User instruction manual

Ansible-driver

― Version 1.10 ―

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※「Exastro IT Automation」is written as「ITA」in this document.
※"Ansible Tower" changed name to "Ansible Automation controller" in Ansible Automation Platform 2.0.
This document contains both Ansible Tower and Ansible Automation Controller.

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Introduction

This document explains the function and the operation method of ITA.

1 Ansible Driver Overview

This chapter explains Ansible, Ansible Automation Controller and Ansible driver.

1.1 Ansible Core

Ansible Core is a platform construction automation tool that makes deploying applications/systems to many construction management targets easy.

Ansible Core can implement various operations by describing YAML textfiles called Playbook which record routine operations and executing them.
Tasks are linked to processing programs called modules, and can control various devices.

For more information regarding Ansible Core, please refer to the Ansible Core manual.

1.2 Ansible Automation Controller

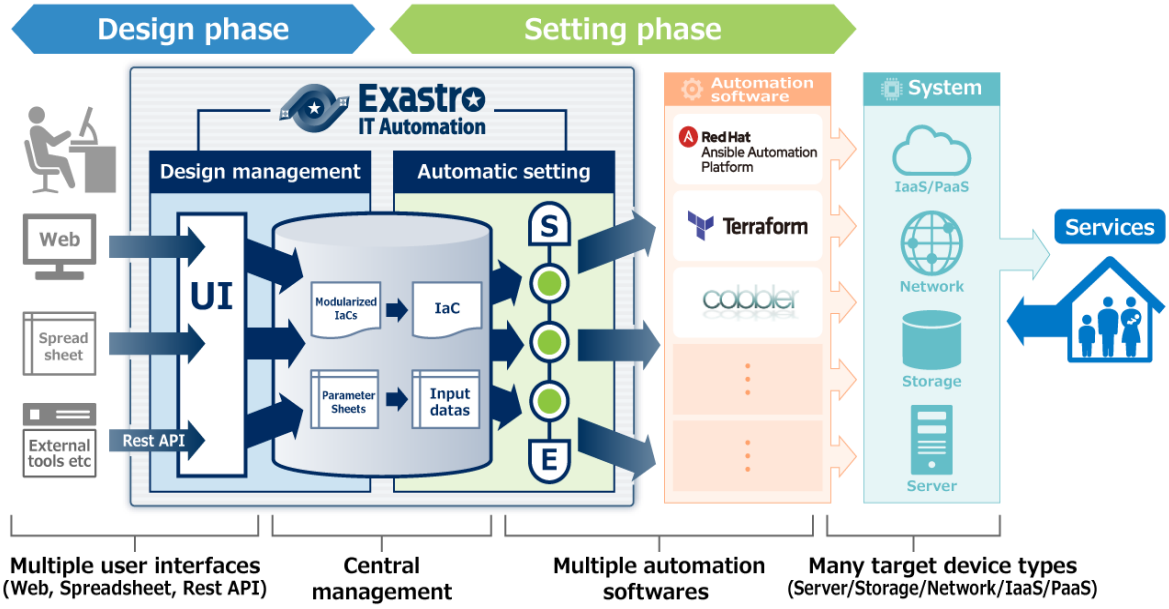
Ansible Automation Controller is a management platform that extends the function of Ansible, a platform construction automation tool such as "access control", "job scheduling", "task visualization", etc.

Ansible can combine "project", "inventory", "credentials" to create "job template" and execute with Ansible.
By combining multiple "Job Templates" to create a "Workflow Job Template", a more diverse workflow can be expressed.

For more information regarding Ansibe Automation Controller, please refer to the Ansible Automation Controller product manual.
For the information regarding ITA compatible Ansible Automation Controller versions, please refer to "System Configuration/Environment Construction Guide-Ansible-driver".
Please note that the notation according to the newest version may not be used.

1.3 About Ansible driver

Ansible driver operates as options of ITA system. Ansible driver selects using Ansible Core or Ansible Ansible Automation Controller and perfom actual operation configuration automatically according to each construction target server, storage, network device registered on ITA system.



The following 3 modes are available in Ansible driver according to the usage.

① **Legacy mode**
Configure settings to various hosts using the standard function of Ansible.
Register the construction code in a single YAML file and construct the operation pattern with that combination.
This mode is assumed to be used in works such as environment configuration of operation system and network

② **Legacy Role mode**
Similar with the Legacy mode, configure settings to various hosts using the standard function of Ansible.
Register construction code as package and construct work pattern with the combination of Role.
It is assumed that this mode will be used when using the Role package provided by the product department to install product or construct environment, etc.

③ **Pioneer mode**
Possible to add individual module to Ansible and input setting in interactive mode.
Supports all devices that can login using Telnet or SSH, regardless of server, storage or network device.
Since interacting with target device directly is required, appropriate IT skills are required.

In addition, Ansible driver can configure the variables in Playbook from screen. For details please refer to "Variable handling in Ansible driver" in this manual.

2 Variable handling in Ansible driver

2.1 Variable type

Ansible driver can set the specific value of Playbook variable in the setting screen in ITA.

※For the detail of setting method, please refer to "5.3.11Substitution value list" in this manual

8 of the Playbook variables can be used as variables in ITA. See the table below for more information..

Table2.1 variable type

Type	Content	Legacy	Pioneer	Legacy Role
Normal variable	A variable that can define one specific value to the variable name. Please write the variable in Playbook as {{△VAR_xxx△}}. △:half-width space xxx: half-width alphanumeric character and underscore (_) e.g.) VAR_users: root	○	○	○
Multiple specific value variable	A variable that can define multiple specific value for a variable name. Please write the variable in Playbook as {{△VAR_xxx△}}. △:half-width space xxx: half-width alphanumeric character and underscore(_) e.g.) VAR_users: - root - mysql	○	○	○
Nested variable	Hierarchical variables. Please write the variable in Playbook as {{△VAR_xxx△}}. △:half-width space xxx: half-width alphanumeric character and underscore(_) e.g.) VAR_users: - user name: alice authorized: password The member variable name can use ascii characters (0x20 ~ 0x7e) except for the following 7 characters. " . [ ] ' ¥ : For more information, please see Yaml syntax.	×	×	○
Global variable	Variable registered from the "Global variable" menu.	○	○	○
Template	Variable registered from the “Template list” menu.	○	○	○

embedded variable				
File embedded varaible	Variable registered from the “File list” menu.	○	○	○

<table>
<tr><th>Type</th><th>Content</th><th>Legacy</th><th>Pioneer</th><th>Legacy Role</th></tr>
<tr><td>ITA original variable</td><td>
Original variable defined by ITA.
The following items in the basic console device list can be handled as variables.
<table>
<tr><th>Item name</th><th>variable name</th></tr>
<tr><td>host name</td><td>__loginhostname__</td></tr>
<tr><td>protocol</td><td>__loginprotocol__</td></tr>
<tr><td>login user ID</td><td>__loginuser__</td></tr>
<tr><td>login password</td><td>__loginpassword__</td></tr>
</table>
The「__」surrounding the variable name is a pair of 2 half-width underscore.
For “device list”, please refer to "User instruct manual_basic console"

Operations when executing can be handled as the following variable.
<table>
<tr><th>Item name</th><th>Variable name</th></tr>
<tr><td>Operation</td><td>__operation__</td></tr>
</table>
Setting value : Scheduled date/time for execution
「YYYY/MM/DD HH:MM」_operation
ID : operation name

Directory path when executing can be handled as the following variable.
<table>
<tr><th>Item name</th><th>Variable name</th></tr>
<tr><td>Operation directory path</td><td>__workflowdir__</td></tr>
</table>
By creating a file under the operation directory path in Playbook, users can download the result data file of "operation execution" menu.

The directory path shared by each Movement during Symphony execution can be handled as following variable.
<table>
<tr><th>Item name</th><th>Variable name</th></tr>
<tr><td>Symphony Operation directory path</td><td>__symphony_workflowdir__</td></tr>
</table>
By creating files under the Symphony operation directory path in Playbook, files can be shared between each Movement.
Also, when operation is executed from ansible driver, _workflowdir_will be set to same path.

The directory path shared by each Movement during
</td><td>○</td><td>○</td><td>○</td></tr>
</table>

<table>
<tr>
<td></td>
<td>Conducror execution can be handled as following variable.
<table>
<tr><th>Item name</th><th>Variable name</th></tr>
<tr><td>Conductor
Operation directory path</td><td>__conductor_workflowdir__</td></tr>
</table>
By creating files under the Conductor operation directory path in Playbook, files can be shared between each Movements.
Also, when operation is executed from ansible driver, _workflowdir_will be set to same path.

Each file path of the collect function can be handled as the following variables.
<table>
<tr><th>Item name</th><th>Variable name</th></tr>
<tr><td>Operation directory (in)
「_parameters」path</td><td>__parameters_dir_for_epc__</td></tr>
<tr><td>Operation directory (in)
「_parameters_file」path</td><td>__parameters_file_dir_for_epc__</td></tr>
<tr><td>Operation result directory (out)
「_parameters」path</td><td>__parameter_dir__</td></tr>
<tr><td>Operation result directory (out)
「_parameters_file」path</td><td>__parameters_file_dir__</td></tr>
</table>
「_parameters」: Source file (parameter) for storage destination.
「_parameters」: Collected file for storage destination.
※File placement when the target of the parameter is a file upload collumn.
For more information about the collect function, please refer to the "ITA_User_Instruction_Manual_Collect function".</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Substitution variable</td>
<td>Variable "LCA_XXX" that used to handle variables in Defaults variable definition file or ITA readme other than "VAR_XXX" type in ITA.
For details, please refer to "6.5 Write translation table (Ansible-Legacy Role only)".</td>
<td>×</td>
<td>×</td>
<td>○</td>
</tr>
</table>

2.2 Extract variables and register specific values

Users can extract variables from files and playbooks uploaded to ITA and register specific values from the different Ansible menus.The Specific values registered from the Ansible menus are output to the host variable file when executed.

See the section below for extracting variables.

(1) Ansible-Legacy

Extract the varaiable definitions in the following format from the Playbook uploaded in "Playbook file list (5.3.3 Playbook file list (Ansible-Legacy only) in this manual)".

Format	Specific value settings
{{△VAR_xxx△}} {{△VAR_xxx△|△filter△}}	These specific values can be registered from the “5.3.9 Substitute value auto registration settings”and”5.3.11 substitute value management”menus. The specific value registration process is different if the user wants to register multiple values.
{{△GBL_xxx△}} {{△GBL_xxx△|△filter△}}	These specific values can be registered from the “5.2.3 Global variable list” menu.
{{△TPF_xxx△}} {{△TPF_xxx△|△filter△}}	These specific values can be registered from the “5.2.4 Template list” menu.
{{△CPF_xxx△}} {{△CPF_xxx△|△filter△}}	These specific values can be registered from the “5.2.5 File list” menu.

※ △:half-width space
xxx: half-width alphanumeric character and underscore (_)

(2) Ansible-Pioneer

Extract the same variable definition as Ansible-Legacy from the dialog file uploaded in "Dialog files(5.3.6 Dialog files (Ansible-Pioneer only) in this manual)"

Format	Specific value settings
{{△VAR_xxx△}} {{△VAR_xxx△|△filter△}}	These specific values can be registered from the “5.3.9 Substitute value auto registration settings”and”5.3.11 substitute value management”menus. The specific value registration process is different if the user wants to register multiple values.
{{△GBL_xxx△}} {{△GBL_xxx△|△filter△}}	These specific values can be registered from the “5.2.3 Global variable list” menu.
{{△TPF_xxx△}} {{△TPF_xxx△|△filter△}}	These specific values can be registered from the “5.2.4 Template list” menu.
{{△CPF_xxx△}} {{△CPF_xxx△|△filter△}}	These specific values can be registered from the “5.2.5 File list” menu.

(3) Ansible-Legacy Role

Extract the variable from the Playbook in role package uploaded in "Role package list(5.3.4 Role package list (Ansible-Legacy Role only)in this manual)"
Please refer to "Role package list (5.3.4 Role package list (Ansible-Legacy Role only)in this

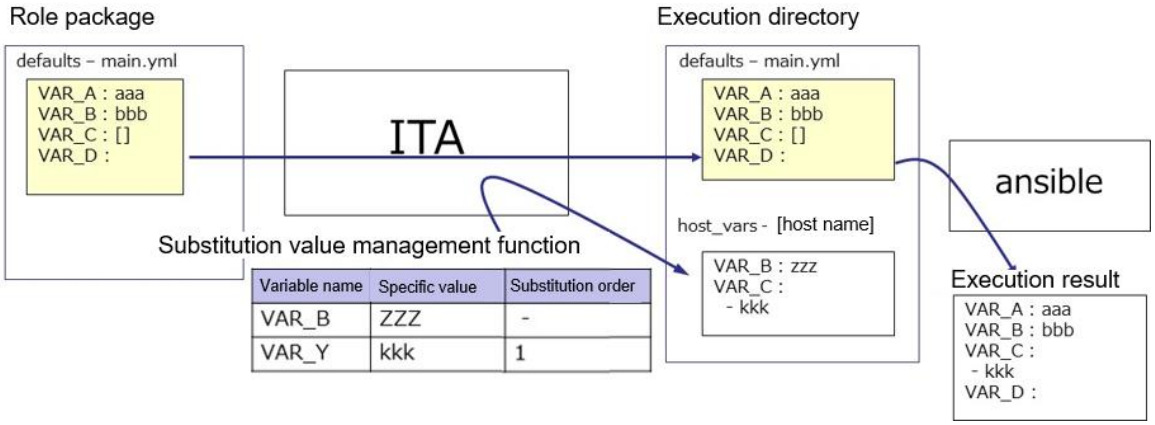
manual)" for details.
By creating translation table, ITA can handle the variables other than "VAR_xxx" defined in defaults varaiable definition file and ITA readme. Please refer to "6.5 Write translation table (Ansible-Legacy Role only)" for details.
Defined variables with the following format from Playbooks from uploaded role packages will be extracted.

Format	Role package directory		Specific value settings
	meta, handlers, templates, tasks	Other	
{{△GBL_xxx△}} {{△GBL_xxx△|△filter△}}	○	×	These specific values can be registered from the “5.2.3 Global variable list” menu.
{{△TPF_xxx△}} {{△TPF_xxx△|△filter△}}			These specific values can be registered from the “5.2.4 Template list” menu.
{{△CPF_xxx△}} {{△CPF_xxx△|△filter△}}			These specific values can be registered from the “5.2.5 File list” menu.

○ = Playbook with variable definition extracted
x = Playbook without variable definition extracted

2.3 Variable handling according to substitution value registration

By using substitution value registration function, it is possible to overwrite the value of variable defined in Playbook.
The relationship between Playbook variable and the variable value registered in substitution value management function is shown as the following figure.



The value of the variable registered in the substitution value management function is output to the variable definition file (host_vars) for each host, and executed on each host by using the original Playbook and variable definition file as input in Ansible.

The priority of variable values in the result is as below.

① Value registered in substitution value management function
② Value specified in Playbook variable
Please refer to "5.3.11 Substitution value list" for details.

3 Ansible driver console menu configuration

This chapter explains the configuration of ITA console menu.
For the method to log in Web console and the components / basic operations of the menu screen, please refer to the "First Step Guide".

3.1 Menu/screen list

① ITA basic console menu
The menu list of ITA basic console used in Ansible driver is as below.

Table 3.1-1 Basic console menu/screen list

No	Menu group	Menu･Screen	Descritption
1	ITA baic console	Device list	Maintain (View/Register/Update/Discard) operation target system list.
2		Linked menu	Manage the configuration management database linked with Substitution value auto-registration setting menu.
3		Input operation list	Maintain(View/Register/Update/Discard) input operation list

② Ansible common console menu
Ansible common console menu list is as below.

Table 3.1-2 Common console menu/screen list

No	Menu group	Menu･Screen	Description
1	Ansible common console	Interface information	Select whether to use Ansible or Ansible Automation Controller server as the execution engine for the construction operation. Manage the path of directory shared by ITA system, Ansible driver server, and execution engine server and the connection interface information to the execution engine server.
2		Ansible Automation Controller host list	Manage the information needed to execute Ansible Automation Controller's RestAPI and the information needed to transfer construction files to Ansible Automation Controller.
3		Global variable list	Manage the variable commonly used in Playbook or dialog file, etc. (referred to as global variable hereafter) and their specific values.
4		Template list	Manage template files and embedded variables used in the template modules, etc. in Playbook.
5		Contents list	Manage the files and embedded variable used in each module in Playbook.

③ Ansible console menu

The menu list according to each Ansible console is as below.

Table 3.1-3 Ansible driver console menu/screen list

No	menu group: Ansible console: Legacy	Ansible console: Legacy	Ansible console: Pioneer	Menu・Screen	Hidden menu	Description
1			○	OS type		Manage the type of OS of the devices.
2	○	○	○	Movement list		Manage the list of Movements registered in Symphony.
3	○			Playbook files		Manage Playbook file.
4		○		Role package list		Manage role package.
5			○	Dialog type list		Manages the type of grouping dialog files of the same purpose as dialog type.
6			○	Dialog files		Manage the OS type linked with the dialog type and the ITA system original format work procedure file (referred to as dialog file in the following).
7	○	○	○	Movement-Playbook link (Movement - Dialog file type link, Movement-Role link)		Manage links between Movements and Playbook files.
8		○		Nested variable list		Manage the maximum iteration array count if nested variable is configured as iterative array.
9	○	○	○	Substitution value auto-registration setting		Manage Movement and variable linked to every item value of operation and host registered in the configuration management database menu.
10	○	○	○	Target host		Manage the host used in Movement.
11	○	○	○	Substitution value list		Manage the substitution value of variable.
12	○	○	○	Execution		Select the Movement and Operation for work execution and indicate the execution.
13	○	○	○	Check operation status		Displays the operation execution status.
14	○	○	○	Execution list		Manage the operation execution history.
15	○	○	○	Variable name list	○	Legacy: Manages variable names used in Playbooks uploaded to the Playbook file collection Pioneer: Manages variable names used by dialogue files uploaded to the Dialogue file collection Legacy Role: Manages variable names defined in the ITAreadme file and other default variable definition files found in the Package "zip" file uploaded to the Role package list menu.

No	menu group			Menu・Screen	Hidden menu	Description
	Ansible console					
	Legacy	Legacy	Pioneer			
16	○	○	○	Movement variable association list	○	Manages variables used in Movements
17		○		Role name list	○	Manages roles registered in the Package "zip" file uploaded to the Role package list menu.
18		○		Role variable name list	○	Manages variables defined in the ITAreadme file and other default variable definition files found in the Package "zip" file uploaded to the Role package list menu. The variables are managed per role.
19		○		Variable specific value list	○	Manages the specific values of variables defined in the ITAreadme file and other default variable definition files found in the Role Package "zip" file uploaded to the Role package list menu.
20		○		Member variable list	○	Manages member variables of nested variables defined in the ITAreadme file and other default variable definition files found in the Role Package "zip" file uploaded to the Role package list menu.
21		○		Nested variable member list	○	Manages the structure of nested variables defined in the ITAreadme file and other default variable definition files found in the Role Package "zip" file uploaded to the Role package list menu.
22		○		Nested variable array combination list	○	Manages repeat cycles of the nested values defined in the ITAreadme file and other default variable definition files found in the Role Package "zip" file uploaded to the Role package list menu.
23		○		Reading variable list	○	Manages variables defined in the conversion table file found in the Role Package "zip" file uploaded to the Role Package list menu.

※1 Hidden menus are used to update/register data with the Backyard function.
These menus are set to be hidden when you install the Ansible Driver function.
If you want to display the hidden menus, access the "Management console -> Role/Menu link list" menu and restore the menus you wish to display. For more information, please see the "User_manual_Management_Console".
Please not that updating some of the data in these menus might cause the Backyard function to not function properly.

4 Ansible driver operation procedure

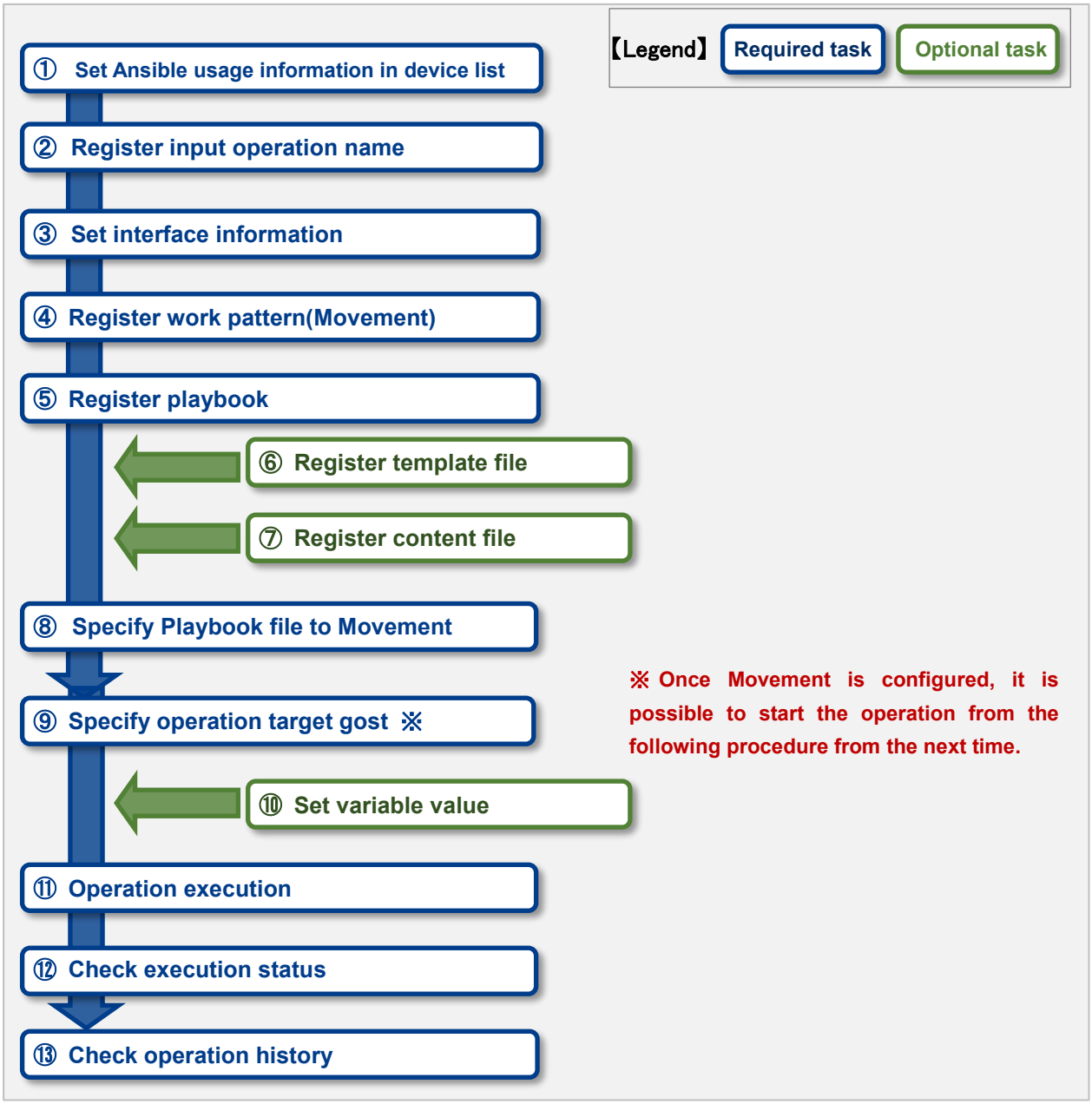
This chapter explains the operation procedure for using each Ansible console.

4.1 Workflow

The standard workflow of each Ansible console is as follow.
The details of each operation is writed in the next section.
Please refer to "User instruction manual_Basic console" for how to use the ITA basic console.

4.1.1 Workflow of Ansible-Legacy

The workflow of executing operation using Ansible-Legacy is as follows.



- **Workflow details and references**

① **Set Ansible usage information in device list**

Set the Ansible usage information to each devices in the device list screen of ITA basic console.
Please refer to "5.1.1 Device list" for details.

② **Register input operation name**

Register the input operation name for work from the input operation list screen of ITA basic console.
Please refer to "5.1.2 Input operation list" for details.

③ **Set interface information**

Select using whether Ansible Core or Ansible Automation Controller server as the execution engine and register the connection information of the execution engine server from the interface information screen of Ansible common console.
Please refer to "5.2.1 Interface information" for details.

④ **Register work pattern (Movement)**

Register the Movement for operation from the Movement list screen of Ansible-Legacy console.
Please refer to "5.3.2 Movement list" for details.

⑤ **Register playbook**

Register the Playbook used in operation from the Playbook files screen of Ansible-Legacy console.
Please refer to "5.3.3 Playbook file list (Ansible-Legacy only)" for details.

⑥ **Register template file (execute if necessary)**

Register/Update/Discard the template file (src) and the template embedded variable used in the template module, etc. of Playbook from the template list screen of Ansible common console.
Please refer to "5.2.4 Template list " for details.

⑦ **Register content file (execute if necessary)**

Register the file used to configure the operation target server from the contents list screen of Ansible common console.
Please refer to "5.2.5 Contents list" for details.

⑧ **Specify Playbook file to Movement**

In the Ansible-Legacy Console -> Movement-Playbook link (Movement-Dialogue file type link, Movement-Role link) screen, specify a Playbook to the registered Movement.
Please refer to "5.3.7 Movement-Playbook link (Movement - Dialog file type link, Movement-Role link)" for details.

⑨ **Specify operation target host**

Specify the operation target host from the target host screen of Ansible-Legacy console.
Please refer to "5.3.10 Target host" for details.

⑩ **Set variable value (execute if necessary)**
Set the value of the variable in the Playbook which has been registered to Movement from the substitution value list screen in Ansible-Legacy console. If variable is not used, then configuration is not required.
Please refer to “5.3.11 Substitution value list” for details.

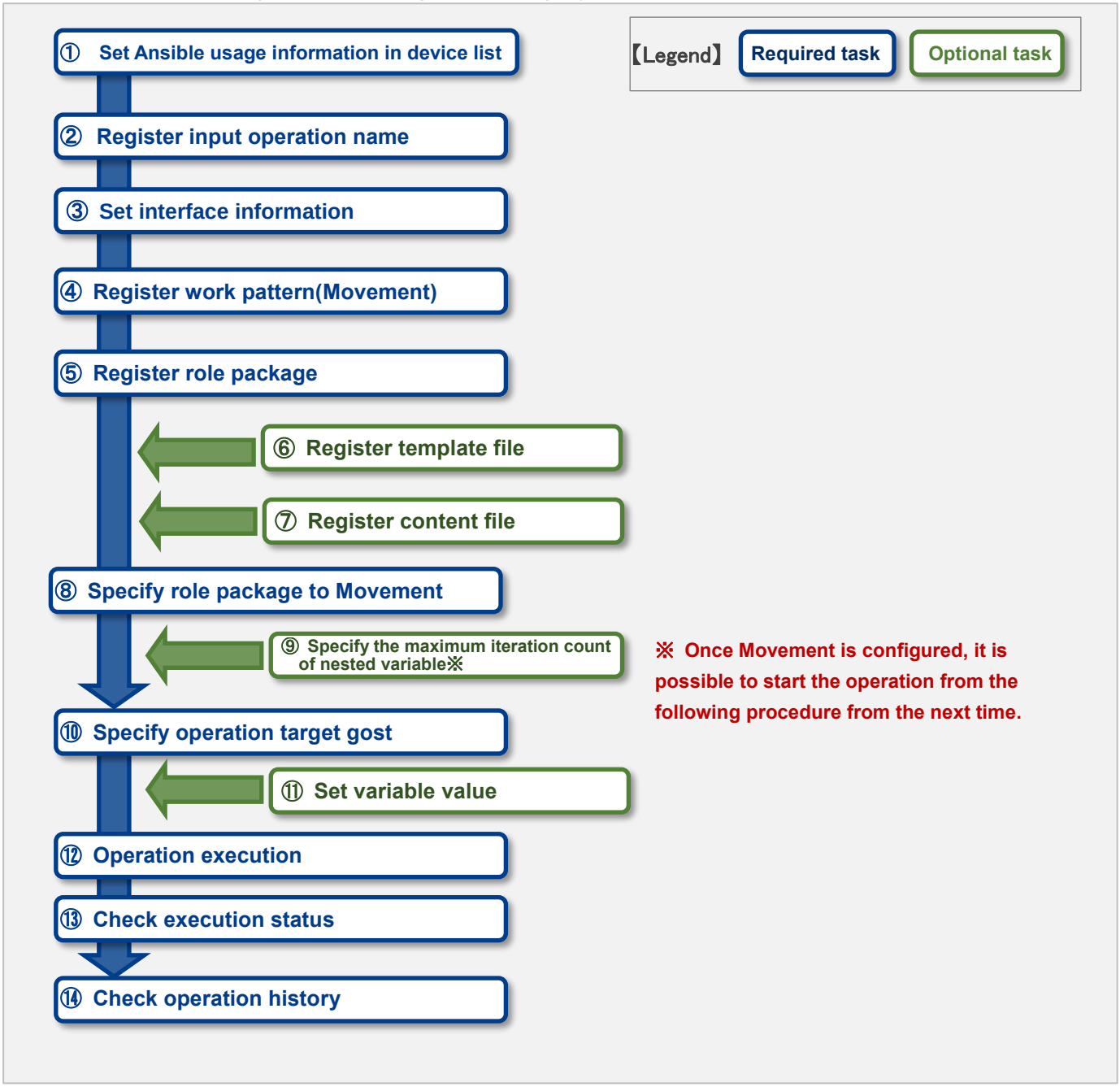
⑪ **Operation execution**
Select and set execution date, input operation and indicate operation execution from the execution screen of Ansible-Legacy console.
Please refer to “5.3.14 Execution” for details.

⑫ **Check operation status**
The status of executed operation is displayed in real time in the "Check operation status" screen of Ansible-Legacy console. In addition, users can perform emergency stop on operation and monitor the execution log and error log.
Please refer to “5.3.12 Check operation status” for details.

⑬ **Check operation history**
The list of executed operation is displayed in the execution list screen of Ansible-Legacy console and users can check the execution history.
Please refer to “5.3.13 Execution list” for details.

4.1.2 **Workflow of Ansible-Legacy Role**

The workflow of executing operation using Ansible-Legacy Role is as follows.



- **Workflow details and references**

① **Set Ansible usage information in device list**
Set the Ansible usage infromation according to each devices in the device list screen of ITA basic console.
Please refer to “5.1.1 Device list” for details.

② **Register input operation name**
Register the input operation name from the input operation list screen of ITA basic console.
Please refer to “5.1.2 Input operation list” for details.

③ **Set interface information**
Select using whether Ansible Core or Ansible Automation Controller server as the execution engine and register the connection information of the execution engine server from the interface information screen of Ansible common console.
Please refer to “5.2.1Interface information” for details.

④ **Register work pattern (Movement)**
Register the Movement for operation from the Movement list screen of Ansible-Legacy Role console.
Please refer to “5.3.2 Movement list” for details.

⑤ **Register role package**
Register the role package used in operation from the role package list screen of Ansible-Legacy Role console.
Please refer to “5.3.4 Role package list (Ansible-Legacy Role only)” for details.

⑥ **Register template file (execute if needed)**
Register/Update/Discard the template file (src) and the template embedded variable used in the template module, etc. of Playbook from the template list screen of Ansible common console.
Please refer to “5.2.4 Template list” for details.

⑦ **Register content file (execute if needed)**
Register the file used to configure the operation target server from the contents list screen of Ansible common console.
Please refer to “5.2.5 Contents list” for details.

⑧ **Specify role package to Movement**
Specify the Playbook file to the registered Movement from Movement details screen of Ansible-Legacy Role console.
Please refer to “5.3.7 Movement details” for details.

⑨ **Specify the maximum iteration count of nested variable**
Specify the maximum iteration count of the array of member variables defined in nested variables from Nested variable list screen of the Ansible-Legacy Role console.
Please refer to “5.3.8 Nested variable list (Ansible-Legacy Role only)” for details.

⑩ **Specify operation target host**
Specify the operation target host from the target host screen of Ansible-Legacy Role console.
Please refer to “5.3.10 Target host” for details.

⑪ **Set variable value (execute if needed)**
Set the value of the variable in the Playbook which has benn registered to Movement from the substitution value list screen in Ansible-Legacy Role console. If variable is not used, then configuration is not required.
Please refer to “5.3.11 Substitution value list” for details.

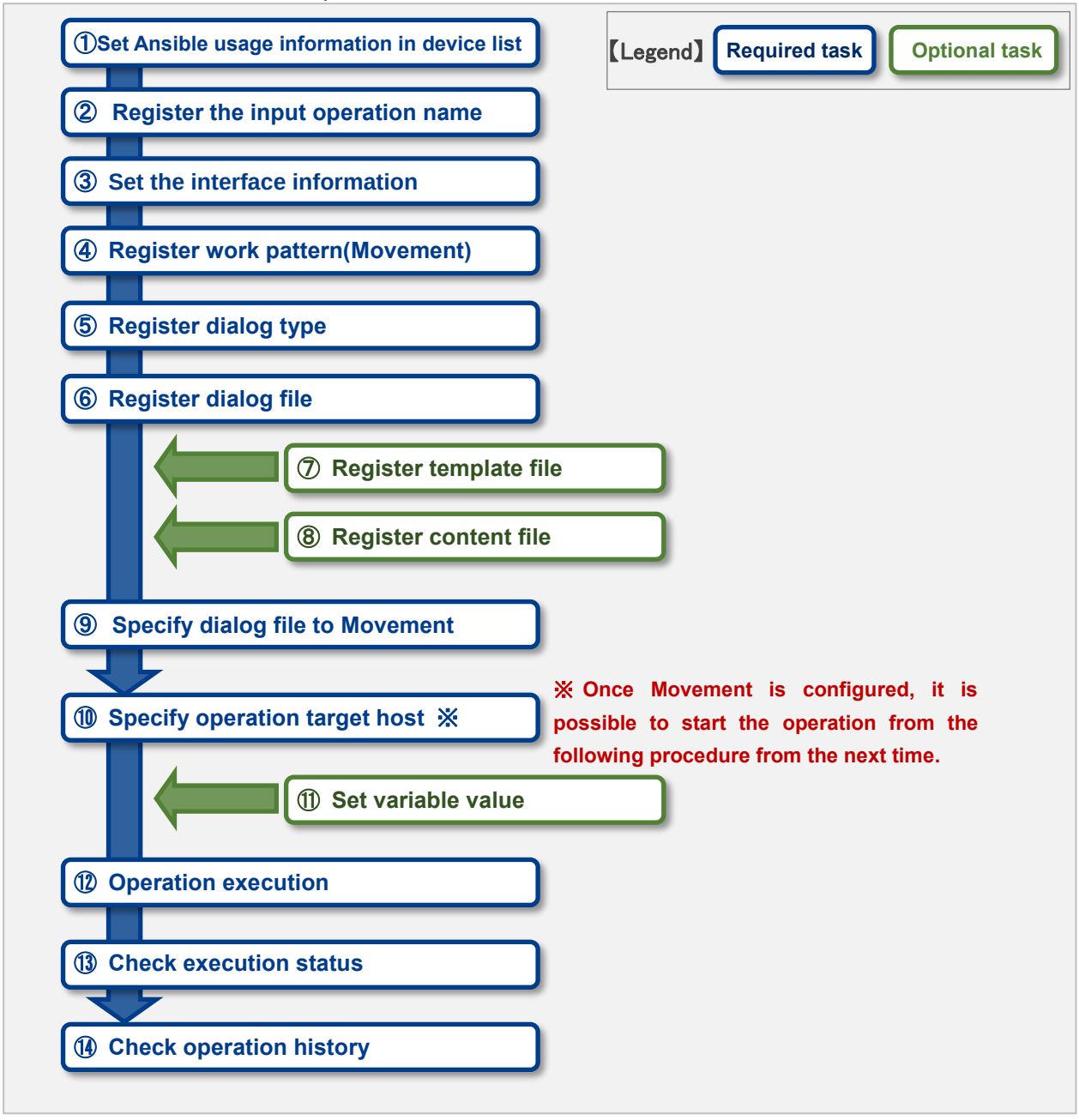
⑫ **Operation execution**
Select and set execution date, input operation and instruct operation execution from the execution screen of Ansible-Legacy Role console.
Please refer to “5.3.14 Execution” for details.

⑬ **Check operation status**
The status of executed operation is displayed in real-time in the "Check operation status" screen of Ansible-Legacy console. In addition, users can perform emergency stop on operation and monitor the execution log and error log.
Please refer to “5.3.12 Check operation status” for details.

⑭ **Check operation history**
The list of executed operation is displayed in the execution list screen of Ansible-Legacy Role console and users can check the execution history.
Please refer to “5.3.13 Execution list” for details.

4.1.3 **Workflow of Ansible-Pioneer**

The workflow to execute the operation in Ansible-Pioneer is as follows.



- **Workflow details and references**

① **OS type registration**

Set the OS type of the device to be operated from Pioneer.

② **Set Ansible usage information in device list**

Set the Ansible usage information for each device from the device list screen of the ITA basic console.

For details, please refer to “5.1.1 Device list”.

③ **Register the input operation name**
Register the input operation name from the input operation list screen of ITA basic console.
Please refer to “5.1.2 Input operation list” for details.

④ **Register the interface information**
Select using whether Ansible Core or Ansible Automation Controller server as the execution engine and register the connection information of the execution engine server from the interface information screen of Ansible common console.
Please refer to “5.2.1 Interface information ” for details.

⑤ **Register work pattern (Movement)**
Register the Movement for operation from the Movement list screen of Ansible-Pioneer console.
Please refer to “5.3.2 Movement list” for details

⑥ **Register dialog type**
Register dialog type from the dialog type list screen of Ansible-Pioneer console.
Ansible-Pioneer defines the differences for each OS type in each dialog file, and combines the same purpose dialog file as dialog type to absorb (abstract) the device difference.
Please refer to “5.3.5 Dialog type list (Ansible-Pioneer only)” for details.

⑦ **Register dialog file**
Register dialog file according to the combination of dialog type and OS type from the dialog files screen of Ansible-Pioneer console.
Please refer to “5.3.6 Dialog files (Ansible-Pioneer only)” for details.

⑧ **Register template file (execute if needed)**
Register/Update/Discard the template file (src) and the template embedded variable used in the template module, etc. of Playbook from the template list screen of Ansible common console.
Please refer to “5.2.4 Template list” for details.

⑨ **Register content file (execute if needed)**
Register the file used to configure the operation target server from the contents list screen of Ansible common console.
Please refer to “5.2.5 Contents list” for details.

⑩ **Specify dialog file to Movement**
Specify dialog file to the registered Movement from movement details screen of Ansible-Legacy Role console.
Please refer to “5.3.7 Movement details” for details.

⑪ **Specify operation target host**
Specify the operation target host from the target host screen of Ansible-Pioneer console.
Please refer to “5.3.10 Target jost” for details.

⑫ **Set variable value (execute if needed)**
Set the value of the variable in the Playbook which has been registered to Movement from the substitution value list screen in Ansible-Pioneer console. If variable is not used, then configuration is not required.
Please refer to “5.3.11Substitution value list ” for details.

⑬ **Operation execution**
Select and set execution date, input operation and indicate operation execution from the execution screen of Ansible-Pioneer console.
Please refer to “5.3.14 Execution” for details.

⑭ **Check operation status**
The status of executed operation is displayed in real time in the Check operation status screen of Ansible-Pioneer console. In addition, users can perform emergency stop on operation or monitor the execution log and error log.
Please refer to “5.3.12 Check operation status” for details.

⑮ **Check operation history**
The list of executed operation is displayed in the execution list screen of Ansible-Pioneer console and users can check the execution history.
Please refer to “5.3.14 Execution list” for details.

■**Legend of Registration screen item list**

The content of the Registration screen item list are writed in the next section.

① Item	② Description	③ Input required	④ Input type	⑤ Restrictions

① Item

・The item name in the submenu.

② Description

・The description for the item.

③ Input required

・○: Items that entering contents are required for them.
・- : Items that entering contents are optional for them.

④ Input type

・Manual: Items that require manual input.
・Auto: Items whose content are entered automatically.
・Checkbox: Check box format item.
・Button: Radio button format item.
・List: List box format item.

⑤ Restrictions

・The restrictions for the item(Limitation on number of characters, etc.)

5 Ansible driver　function・operation method explanation

This chapter explains each console function used in Ansible driver.

5.1 Basic console

This section writes the operation of ITA basic console.
Please refer to the ITA basic console manual for this operation and perform the operation in the ITA basic console screen.

5.1.1 **Device list**

(1) Registration/Update/Discarding information of operation target host is performed in the "Device list" menu.
This document explains the items (red frame) in the device list required for Ansible driver operations.
Please see the “Exastro-ITA_User_Instruction_Manual_Basic_Console.pdf” together with this document.

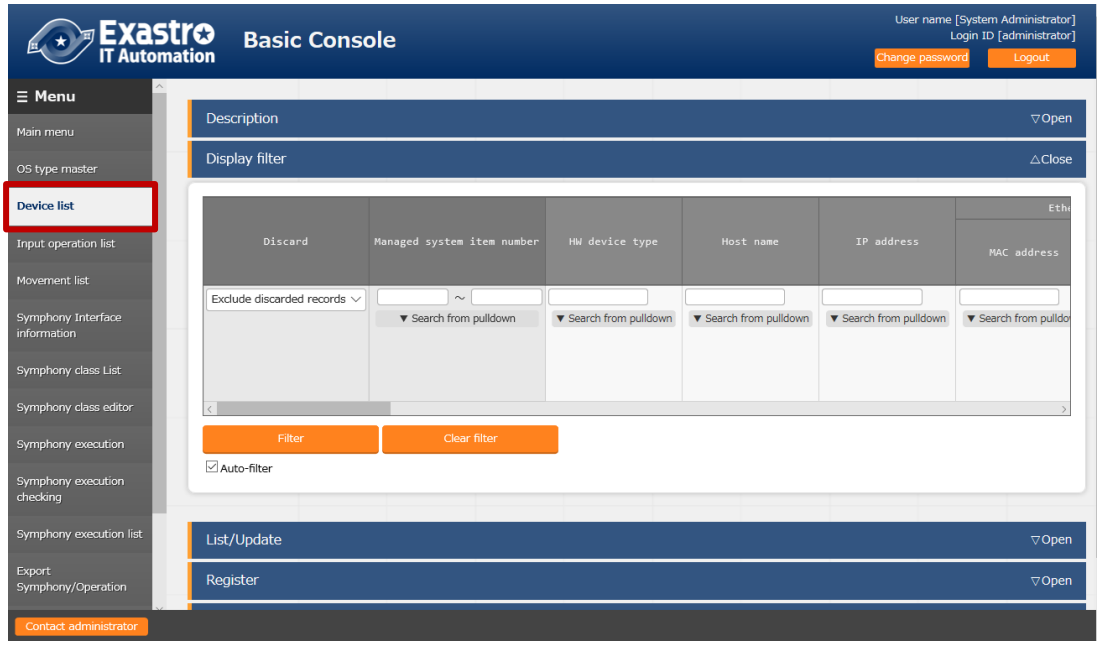


Figure 5.1-1 Submenu screen (Device list)

(2) Click the "Register" - "Start Registration" button to register the device information.

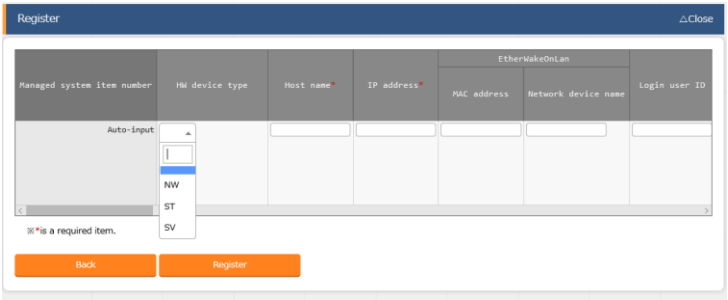


Figure 5.1-2 Registration screen(Device list-common item)

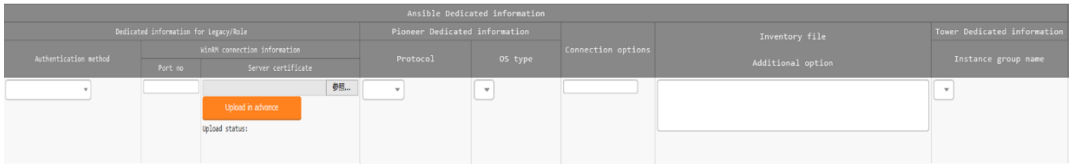


Figure 5.1-3 Registration screen(Device list-Ansible usage information)

(3) The list of common item in registration screen is as follows.
Input of the columns with a red asterisk (*) after their column name in the web screen is required.
In the case of using Ansible driver, please enter the usage information of Ansible.
If operation is executed while required column is not entered, unexpected errors may occur.

Table 5.1-1 Registration screen item list (Device list)

Item		Description	Input required	Input type	Restrictions
Managed system item number		A unique ID that identifies the registration information is entered automatically.	-	Auto	-
host name		Enter host name. If you set the hostname to localhost and use pioneer as the working host, you may get an error when executing the operation. In that case, please add the path to the python3 file installed on the ansible server in the following parameter to the add inventory file option. Exp) ansible_python_interpreter: /usr/bin/python3	○	Manual	Maximum length 128 bytes
IP address		Enter IP address in xxx.xxx.xxx.xxx format.	○	Manual	Maximum length 15 bytes
EtherWake OnLan	MAC address	Enter MAC address.	-	Manual	Maximum length 17 bytes
	Network	Enter network device name.	-	Manual	Maximum length

Item				Description	Input required	Input type	Restrictions
		device name					256 bytes
Login user ID				Enter network device name.	○	Manual	Maximum length 30 bytes
Login password		Management		Select " ● " when using ITA to manage password.	○	List	-
		Login password		Specify password.	○	Manual	Maximum length 30 bytes
ssh authentication key file				Specify the ssh authentication key file and enter the file when using key authentication. Required when specifying the ssh authentication key file if authentication method is the key authentication.	-	File	Maximum size 10K bytes
Ansible dedicated information	Dedicated information for Legacy/Role	Authentication method		Select the authentication method used when connecting from Ansible/Ansible Automation Controller to the target device. ●Password Authentication If you also choose ● for Login password Management, you will be required to input a login password. ●Key Authentication (No passphrase) You must upload an SSH secret key file (id_ras). ●Key Authentication (With passphrase) You must upload an SSH seccret key file (id_ras) and input a passphrase. ●Key Authentication (Key Exchanged)※1 You will not be required to upload an SSH secret key file (id_ras) ●Password Authentication (winrm) If necessary, input the WinRM connection information. If you choose anything else than Password authentication (winrm), you must configure the following settings for the target device. -Set the Login-user's sudo permissions to /etc/sudoers with NOPASSWD Example) Demo_user ALL=(ALL) NOPASSWD:ALL	○○	List	As writed in the description column.
		WinRM connection	Port no.	Enter the port number when connecting to WindowsServer with WinRm. If the column is left not entered, Ansible will connect to the default (5985) WinRM.	-	Manual	As writed in the description column
			Server certificate	Enter the server certificatie when https port number is specified as the WinRM connection	-	File	Maximum size 10K bytes

Item				Description	Input required	Input type	Restrictions
				port To omit server certificate authentication, add the following to the inventory file additional option. ansible_winrm_server_cert_validation=ignore			
	Pioneer dedicated information		Protocol	Select the protocol (ssh/telnet) for when logging in to the target device. ●If you selected ssh Select something other than "Password Authentication (winrm)" for Authentication method. ●If you selected telnet you will connect to telnet without using the set value for Authentication method.	○〇	List	-
			OS type	Select the OS of target device. The OS types registered in the OS type master are displayed in list.	○〇	List	-
	Connection options			(In the case of connecting via ssh) If users want to set options other than the ssh options set in /etc/ansible.cfg/ssh_args , please enter the desired option. (In the case of connecting via telnet) If users want to set options when connecting via telnet, please enter the desired option.	-	Manual	Maximum length 512 bytes
	Inventory file addition option			Enter the option parameter of inventory file that is not set in ITA. e.g.) ansible_connection: network_cli ansible_network_os: nxos	-	Manual	Maximum length 512 bytes
	Tower dedicated information		Instance group name※2	If the Ansible Automation Controller is a Cluster configuration, select which Ansible Automation Controller instance group it should be executed in. The instance group set here will be set to the Tower's Evently Objects. If nothing is selected, the detault Ansible Automation Controller value will be used. If the Ansibl Automation Controller in use is not a cluster configuration, you can leave this blank.	○	List	-

Item			Description	Input required	Input type	Restrictions
		Connection type	Set the connection type for Ansible Automation Controller authentication cedentials. Normally Machine is selected.In the case where Ansible_Connection needs to bet to local Network OS, Choose Network. If a Network is selected the user must set Platform Options other than (ansible_cnnection) for the additional inventory file options Exp) Example of Inventory file addition option settings. Set value when Network OS is ios. ansible_network_os: ios ansible_become: yes ansible_become_method: enable For more information regarding the Ansible Automation Controller authentication connection type, please refer to the "Authentication type" document. For information regarding Network OS, ansible_connection and Platform options, please refer to the "Platform_Options" document.	○	List	
Remarks			Free description field.	-	Manual	Maximum length 4000 bytes

※1 Distribution of public key file required when the authentication method is key authentication (key exchanged).

・For Ansible Engine

Make an ssh connection to the target host from the "Ansible common console=>User set in the interface information" of the server where ansible is installed.

Copy the user's public key to the user that will log in to the device's "Authorized keys".

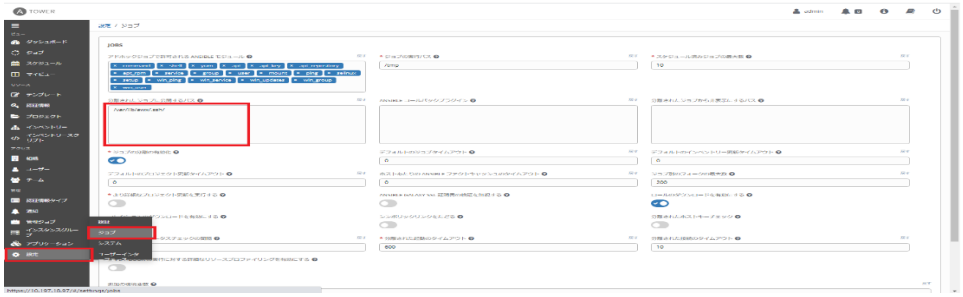
・For Ansible Automation Controller

Connect from the Ansible Automation Controller's awx user to the Operation host with SSH.

Copy the awx user's public key to the user that will log in to the devices' "Authorized keys"

You will also need to configure settings in the Tower web's "Setting"->"Job"->"paths to expose to isolated jobs".

For more information, please refer to the "Exastro-ITA_System_Configuration_Enviroment_Construcion_Guide_Ansible-driver" chapter 5, Ansible Automation Controller Initial settings.



Note that in Ansible Automation Controller4.x and later versions, it is not possible to use the awx user's ssh directory, meaning that it is not possible to connect to the operation host with a key authentication (key changed).

※2 You can select from the data acquired from the Ansible Driver Backyard function, "Ansible Automation Controller Data Synchronization".

5.1.2 **Input operation list**

(1) In the "Input operation list" screen, the operations for the target host to be executed by the orchestrator are managed. Operations are selected from the menu in ITA basic console

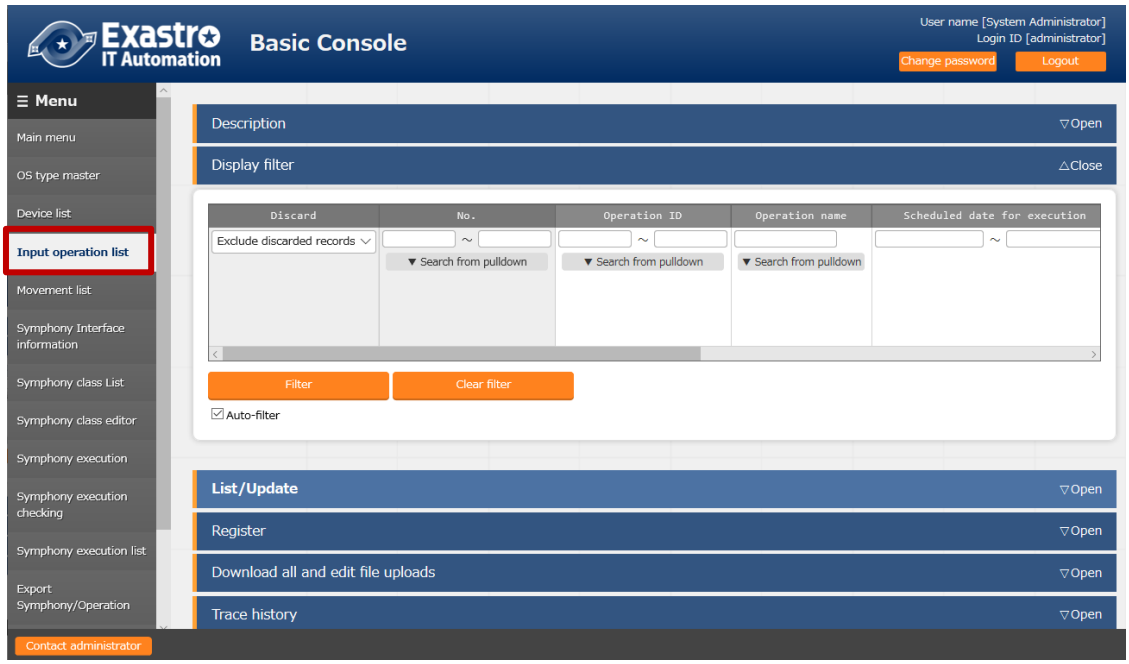


Figure 5.1-4 Submenu screen (Input operation list)

Please refer to the related manual "User instruction manual_Basic console" for the details of registration method.

5.2 Ansible common console

This section writes the operation of Ansible common console.

5.2.1 **Interface information**

(1) In the ”interface information" menu, select using whether Ansible Core or Ansible Automation Controller Ansible Automation Controller for the execution engine and register/update/discard the shared directory path between ITA system, Ansible driver server, and execution engine server , and the connection interface information of the execution engine server.

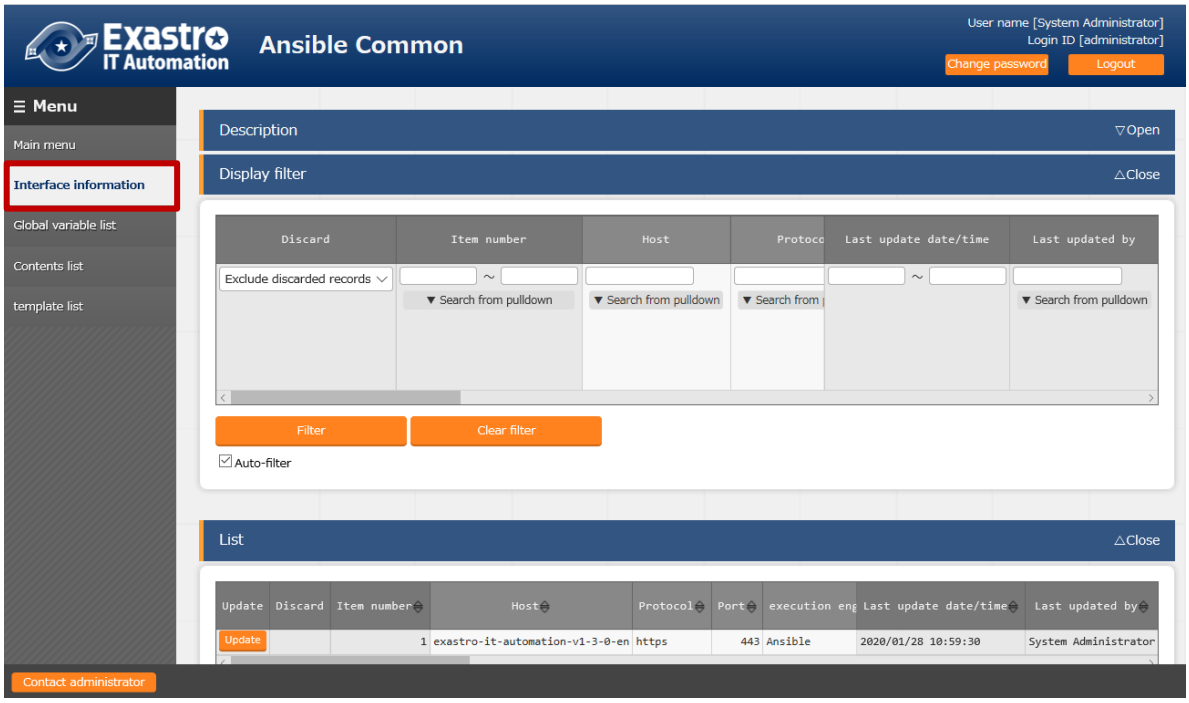


Figure 5.2-1 Submenu screen (interface information)

(2) Click the "List" - "Update" button to register the interface information.

Figure 5.2-2 Registration screen (Interface information)

(3) The item list of interface information screen is as follows.
If operation is executed while interface information not registered or multiple information is registered, unexpected errors may occur.

Table 5.2-1 Registration screen item list (Interface information)

Item		Description	Input required	Input type	Restrictions
Execution engine		Select the execution engine between Ansible and Ansible Automation Controller. Whem Ansible Automation Controller is selected, in order to execute ansible-vault command, Ansible Engine interface is also needed.	○	List	
Ansible Core interface	Host	Enter the host name (or IP address) of Ansible server. It is recommended to enter host name when using HTTPS communication.	○	Manual	Maximum length 128 bytes The user must configure Ansible Core interface settings, even if "Ansible Core" is not set as the execution engine.
	Protocol	Enter either http/https as the protocol with Ansible, Ansible Automation Controller server.	○	Manual	- The user must configure Ansible Core interface settings, even if "Ansible Core" is not set as the execution engine.
	Port	Enter the connection port (80/443) of Ansible, Ansible Automation Controller. The port is usually HTTPS (443).	○	Manual	- The user must configure Ansible Core interface settings, even if "Ansible Core" is not set as the execution engine.
	Execution user	Enter the execution user to execute ansible-playbook/ansible-vault command with sudo.	-	Manual	Maximum length 64 bytes The user must configure Ansible Core interface settings, even if "Ansible Core" is not set as the execution engine.
	ACCESS_KEY_ID	Enter the access key used for authentication when connecting to the Ansible server.	-	Manual	Maximum length 64 bytes The user must configure Ansible Core interface

Item		Description	Input required	Input type	Restrictions
					settings, even if "Ansible Core" is not set as the execution engine.
	SECRET_ACCESS_KEY	Enter the secret access key used for authentication when connecting to the Ansible server.	-	Manual	Maximum length 64 bytes The user must configure Ansible Core interface settings, even if "Ansible Core" is not set as the execution engine.
Ansible Automation Controller interface	Host	Select Ansible Automation Controller that will connect to ITA. You can select from the list of hosts that are registered in the Ansible Automation Controller Host list.	○	Manual	Maximum length 128 bytes Required
	Protocol	Enter either http/https as the protocol with Ansible, Ansible Automation Controller server.	○	Manual	Required when the execution engine is Ansible
	Port	Enter the connection port (80/443) of Ansible, Ansible Automation Controller. The port is usually HTTPS (443).	○	Manual	Required if “Ansible Core” is not set as execution engine.
	Organization name	Enter the organization name registered in Ansible Automation Controller.	-	List	Required if “Ansible Core” is not set as execution engine.
	Authentication token	Enter the user authentication token when connecting Ansible Automation Controller server from ITA.	-	Manual	Maximum length 128 bytes. Required if “Ansible Core” is not set as execution engine.
	Delete runtime data	Select whether to delete the data automatically generated by Ansible Automation Controller during operation execution after operation is done. Select “Delete” from the pulldown list to delete.	-	List	Required if “Ansible Core” is not set as execution engine.
SCM List Git link	Host name	A Git repository linked with the Ansible Automation Controller will be created on the host where the Ansible driver backyard feature is installed.		Manual	Maximum length 128 bytes Required if “Ansible Automation Controller” is set as execution engine.
	⌐ User	Input the user needed in order to connect to the		Manual	Maximum length 128

Item			Description	Input required	Input type	Restrictions
			Git repository with ssh protocol from the Ansible Automation Controller.			bytes Required if “Ansible Automation Controller” is set as execution engine.
		Ssh secret key file	Upload the secret key file needed in order to connect to the Git repository with ssh protocol from the Ansible Automation Controller.		File	File selection. Maximum file size: 4GB Required if “Ansible Automation Controller” is set as execution engine.
		Passphrase	Input the passphrase for the ssh secret key file.		Manual	Maximum length 256 bytes
Data relay storage path (ITA) ※1			Enter the directory viewed from the ITA system / Ansible driver server.	○	Manual	Maximum length 128 bytes
Data relay storage path (Ansible/Ansible Automation Controller)			Enter the directory viewed from the Ansible RestAPI and Ansible Automation Controller servers.	○	Manual	Maximum length 128 bytes
Symphony instance data relay storage path (Ansible/Ansible Automation Controller)			Enter the directory which shares the shared directory between each movement when executing Symphony with Ansible RestAPI, Ansible Automation Controller server. The path viewed from the ITA system is set from the Symphony interface information menu. Please refer to the "User instruction manual_ITA basic console" for the Symphony interface information.	○	Manual	Maximum length 128 bytes
Conductor instance data relay storage path (Ansible/Ansible Automation Controller			When executing Conductor, enter the directory shared by each Movement. The path viewed from the ITA system is set from the Conductor interface information menu. For the Conductor interface information, please refer to "ITA User_Instruction_Manual_Conductor”.	○	Manual	Maximum length 128 bytes
Optional parameter			Enter the Movement-common optional parameter of Ansible-Playbook command. Movement-specific optional parameters are entered in the Movement list menu. In the case that the execution engine is Ansible: Enter the optional parameter of Ansible-Playbook command. The -i option is set by ITA.	-	Manual	Maximum length 512 bytes

Item	Description	Input required	Input type	Restrictions
	In the case that the execution engine is Ansible Automation Controller: The following option parameters can be set: -verbosity -f FORKS,--forks=FORKS -l SUBSET,--limit=SUBSET -e EXTRA_VARS,--extra-vars=EXTRA_VARS EXTRA_VARS: Variable name=specific value Variable name=specific value..... -t TAGS,--tags=TAGS -b,--become -D,--diff --skip-tags=SKIP_TAGS --start-at-task=START_AT_TASK The original optional parameters of Ansible Automation Controller are as follows. -ufc,--use_fact_cache use fact cache -as,--allow_simultaneous enable simultaneous job execution -jsc,--job_slice_count= job slice count For the original optional parameters of Ansible Automation Controller, please refer to the description of job template in the Ansible Automation Controller user guide.			
Number of parallel executions	Enter the maximum numbers of Movement (Legacy/Pioneer/Legacy-Role) that can be executed at the same time.	○	Manual	
Status monitoring cycle(milliseconds)	Enter the refresh interval of the log displayed in "5.3.12 Check operation status". Usually the value around 3000 milliseconds is recommended.	○	Manual	Minimum value 1000 milliseconds
Number of rows to display progress status	Enter the maximum display line count of the execution log, errorlog in "5.3.12 Check operation status". Usually the value around 1000 lines is recommended.	○	Manual	-
NULL link	Set whether to register NULL (blank) value to substitution value list menu if the specific value in parameter sheet is NULL (blank) in the substitution value auto-registration setting menu. This value will be applied when “NULL link” in the substitution value auto-registration setting menu is blank.	○	List	-

Item	Description	Input required	Input type	Restrictions
	・If the "Valid" is set, any value in the parameter sheet will be registered in the substitution value list menu. (NULL value will be registered) ・If the "Invalid" is set, only specific value in the parameter sheet will be registered in the substitution value list menu(NULL value will not be registered)			
Remarks	Free description field	-	Manual	Maximum length 4000 bytes

※1 Data relay storage paths also supports configurations where ITA and Ansible operate on separate servers, so the directory paths will be managed separately.
For more information, please refer to the "Exastro-ITA_System_Configuration_Enviroment_Construcion_Guide_Ansible-driver" document.

5.2.2 **Ansible Automation Controller host list**

In [Ansible Automation Controller Host List], register/update/abolish the information required to execute Rest API of Ansible Automation Controller and the information required to transfer the construction materials to Ansible Automation Controller.
If Ansible Automation Controller is built in a cluster configuration, it is necessary to register all host information in the cluster. The user will not have to register Ansible Automation Controller's hop node.

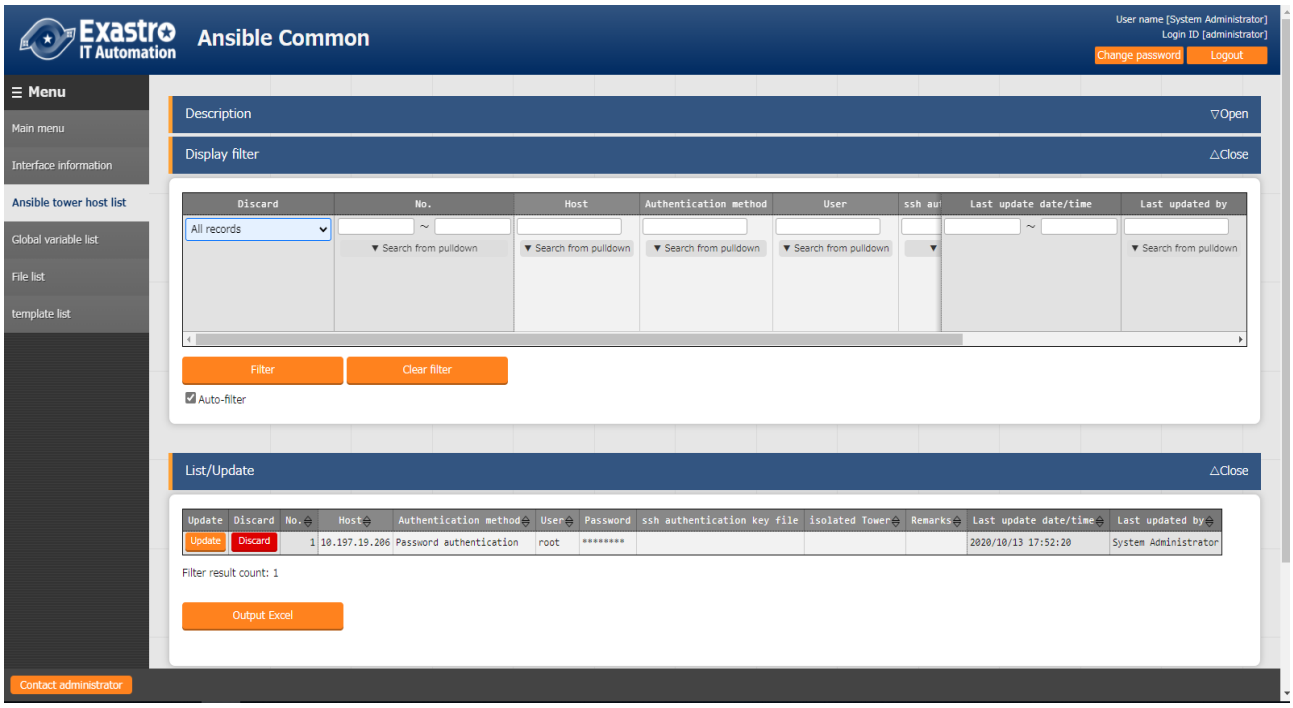


Figure 5.2-3 Submenu screen (Ansible Automation Controller host list)

(1) Click the "List"-"Update" button to register the Ansible Automation Controller host information.

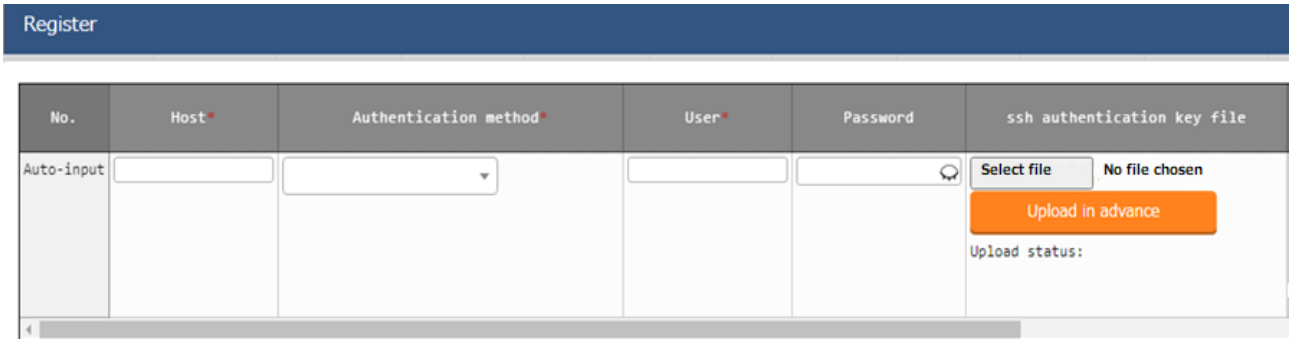


Figure 5.2-4 Registration screen (Ansible Automation Controller host)

(2) The list of items on the Ansible Automation Controller host list screen is as follows.

Table 5.2-2 Registration screen item list (Ansible Automation Controller host list)

Item	Description	Input required	Input type	Restrictions
Host	Enter the host name (or IP address) of the Ansible	○	Manual	Maximum length

Item		Description	Input required	Input type	Restrictions
		Automation Controller server. For HTTPS communication, the host name is recommended.		input	128 bytes
Authentication method		Select the authentication method used when connecting from Ansible/Ansible Automation Controller to the target device. ●Password Authentication If you also choose ● for Login password Management, you will be required to input a login password. ●Key Authentication (No passphrase) You must upload an SSH secret key file (id_ras). ●Key Authentication (With passphrase) You must upload an SSH seccret key file (id_ras) and input a passphrase. ●Key Authentication (Key Exchanged)※1 You will not be required to upload an SSH secret key file (id_ras)	○	Manual input	Maximum length 30 bytes
Login user		Enter the login user for connecting to the Ansible Automation Controller server via file transfer (scp). Set and use a password for the login user and the awx user generated when installing Ansible Automation Controller.	○	Manual input	Maximum length 30 bytes
Password		This is required when password authentication is selected as the authentication method. Specify the password of the login user.	―	Manual input	Maximum length 30 bytes
Ssh key authentic information	ssh authentication key file	When key authentication is selected in the authentication method, enter the file for key authentication by specifying the ssh authentication key file.	-	File	Maximum size 4gb
	Passphrase	If passphrase is set to the secret key file, input the passphrase.	-	Manual input	Maximum 256 bytes
isolated Tower		Select｛「●」for isolated Tower when it is built in a cluster configuration.	―	Select	
Remarks		Free description field.	―	Manual input	Maximum length 4000 bytes

※1 Distrubution of the public key file required when the authentication method is Key authentication (key exchanged)

With ssh, connect to the from the root of the server where ITA is installed to Ansible Automation Controller's awx user.

Copy the root's public key to the Ansible Automation Controller's AWX User's authorized keys.

5.2.3 **Global variable list**

(1) In the "Global variable list" menu, register/update/discard the global variable name used in Playbook, dialog files, etc.

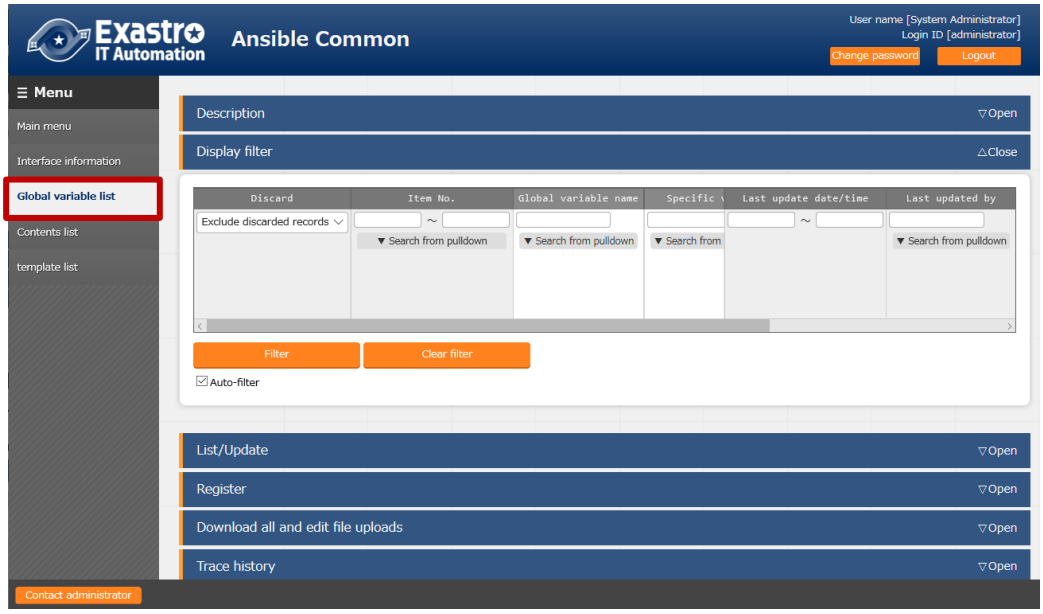


Figure 5.2-5 Submenu screen (Global variable list)

(2) Click the "Register" - "Start Registration" button to register the operation information.

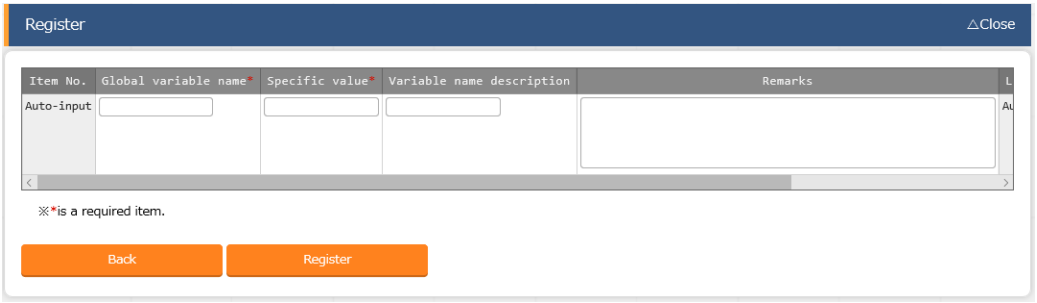


Figure 5.2-6 Registration screen (Global variable list)

(3) The item list of global variable list screen is as follows.

Table 5.2-3 Registration screen item list (Global variable list)

Item	Description	Input required	Input type	Restrictions
Global variable name	Enter the variable name. Enter the variable name in the "GBL_****" format. Half-width alphanumeric character and underscore (_) can be used. (Minimum length: 1 byte, maximum length: 128 bytes)	○	Manual	As writed in the description column.
specific value	Enter the specific value File embedded variable "CPF_" and template embedded variable "TPF_" can be entered in the specific value column. When describing the variables, enclose the variable names with {{}} as describing the variables in the Playbook. e.g.) Entering TPF_sample for specific value '{{△TPF_sample△}}' △: half-width space ‘: recommended	○	Manual	Maximum length 8192 bytes
Variable name discription	Enter the description or comment of the variable.	-	Manual	Maximum length 256 bytes
Remarks	free description field	-	Manual	Maximum length 4000 bytes

5.2.4 **Template list**

(1) In the "template list" menu, register/update/discard the Jinja2 template file and the template embedded variable used in the parameter of template module and ios_config module, etc. defined in the Playbook.
If template module is registered in the template list, the template file used in the template module etc. defined in the playbook can be specified by template embedded variable.

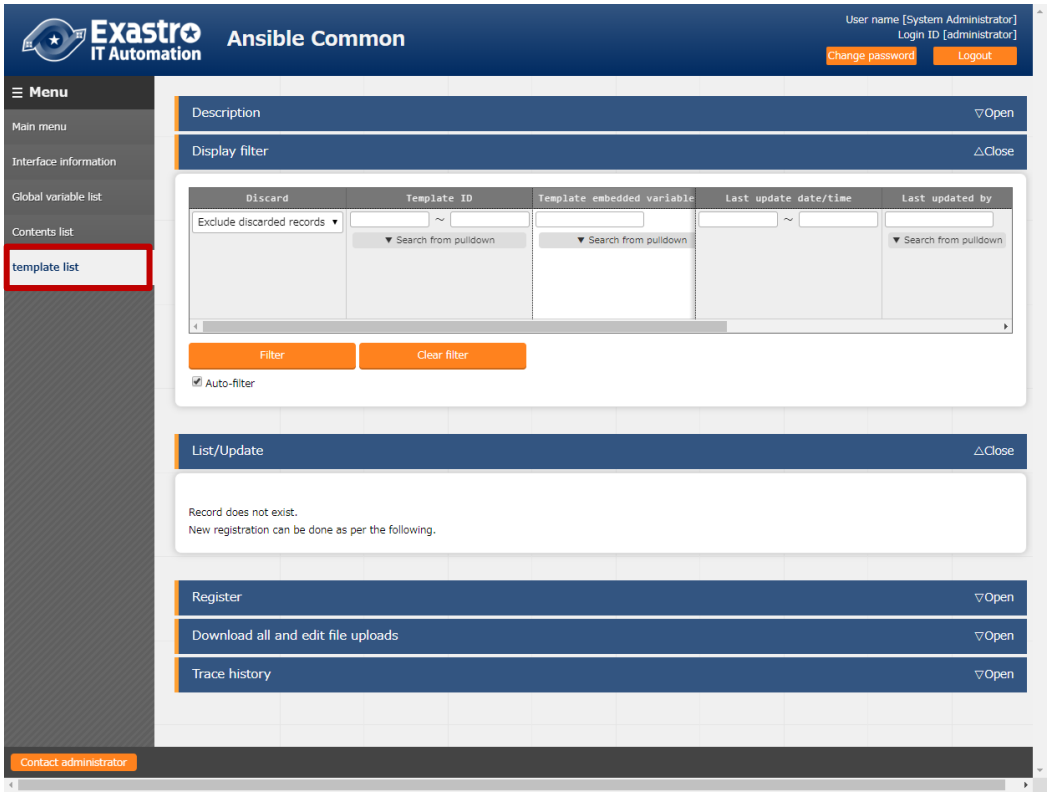


Figure 5.2-7 Submenu screen (Template list)

(2) Click the "Register" - "Start Registration" button to register the file management information.

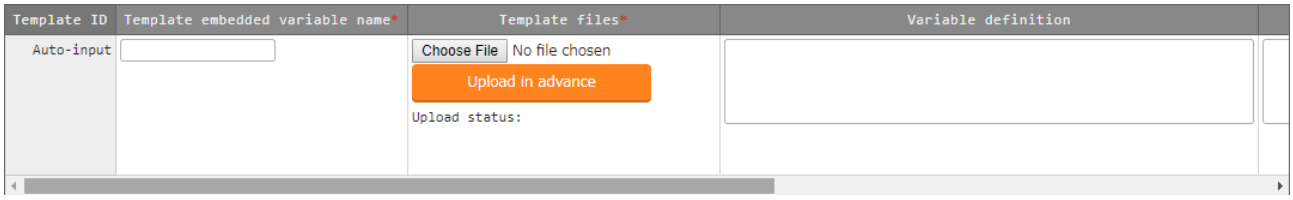


Figure 5.2-8 Registration screen (Template list)

(3) The items of registration screen are as follows.

Table 5.2-4 Registration screen item list (template list)

Item	Description	Input required	Input type	Restrictions
Template embedded variable name	Enter the variable name embedded in parameters such as template module or ios_config module, etc. Enter the variable name in the "TPF_****" format. Half-width alphanumeric character and underscore (_) can be used.(Minimum length: 1 byte, maximum length: 128 bytes)	○	Manual	As writed in the description column.
Template files	Upload the Jinja2 template file used as the parameter of module.	○	File	Text format Maximum size 4GB
Variable definition	Define the variable used in the template file. If the template is used only in Ansible-Role and the variable is defined in the default variable definition file, then the variable definition column can be omitted. If the template is used only in Ansible-Role and the variable is defined in the default variable definition file, then the variable definition column can be omitted. If the variable with same name is used in multiple template, the variable definitions have to match. Error will occur during registration if the variable definitions do not match. Although the variable definition is based on the specification of Ansible, there is own specification of ITA.The notes of variable definition is writed in 5.2-5-1.	-	Manual	Maximum length 4000 bytes
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

Please "Upload in advance (①)" the "template files" before "register".
Please click the "Register" button after checking the Playbook file name displayed in the "Upload status(②)".

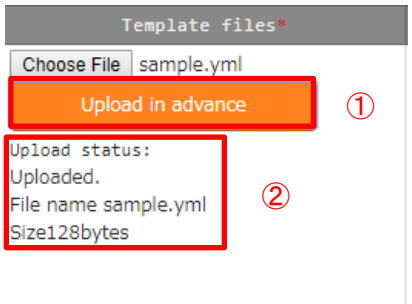


Table 5.2-5 Notes of variable definition

Type	Notes
Normal variable	Specfic value is optional. e.g.) VAR_sample_1: none VAR_sample_2:
Multiple specific value variable	Specfic value is optional. e.g.) VAR_sample_1: △- none VAR_sample_2: [] Please enter 1 or more half-width space(△) before - when defining specific value. The variable definition maybe misinterpreted.
Multistage variable	It is possible to define hierarchical variable structures e.g.) VAR_sample_1: - item1: none item2: VAR_sample_2: - array: - item1: none item2: The template with nested variable defined can only be used in Ansible-Role When used in Ansible-Role, if the variable with same name is defined in default variable definition file, etc., the definition of the variables have to match. If the definition of the variables do not match, an error will occur during registration.
Global variable	The definition of specific value is optional e.g.) GBL_sample_1: none GBL_sample_2:
ITA original variable	The definition of variable is not required.
substitution variable	The 3 kinds of variable that can be defined are as follows. ・Normal variable ・Multiple specific value variable ・Nested variable The note of each variable definition are the same. e.g.) LCA_sample_1: LCA_sample_2: [] LCA_sample_3: - item1: none item2: The template with substitution variable defined can only be used in Ansible-Role

For details, Please refer to the attachment "User Instruction Manual - Ansible-driver attachment- Ansible usage guideline with additional rules"

① Write Playbook

When describing the template registered in template list menu in Playbook, write the appropriate parameter in the template embedded variable name.

If the template embedded variable name is not used, write the variable registered in the substitution list and the path of the file.

e.g.)

Write Playbook

- template: src='{{△TPF_hosts△}}' dest=/etc/hosts

△: half-width space

Registration content

Template embedded variable name	Template file
TPF_hosts	/etc/hosts

Please write the file name in _dest. If the file name is not specified, the work will be executed with the registered template file whose file name is added with the ITA management number in the front of the file name.

For example, in the case of dest=/etc/, the file name will be /etc/10-digit-number_hosts

② Write dialog file

In the case of describing the dialog file, write the template embedded variable name.

e.g.)

Write dialog file

- expect: '{{△__loginuser__△}}@{{△__loginhostname__△}}'
  exec: 'scp △ITA user@ITA host name:{{△TPF_hosts△}}△forwarding destination'
- expect: 'password:'
  exec: 'ITAuser password'

△: half-width space

Registration content

Template embedded variable name	Template file
TPF_hosts	/etc/hosts

Please write the file name in the forwarding destination.

If the file name is not specified, the work will be executed with the registered template file whose file name is added with the ITA management number in the front of the file name.

For example, in the case of forwarding destination=/etc/, the file name will be /etc/10-digit-number_hosts

{{△TPF_hosts△}} will be replaced by the absolute path during execution.

By reading the variable definition of template with internal process, it is possible to register specific value in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".

Since the timing of file reading is not in real time, it may take some time※1 until the variables can be handled in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".

※1 The timing of file reading is writed in " 7.2 About the maintenance method", so please refer to it.

5.2.5 **File list**

(1) In the "contents list" menu, register/update/discard the file and file embedded variable used in each module defined in the Playbook.
If the files are registered in the contents list, the file used in each module defined in the Playbook can be specified by file embedded variable.

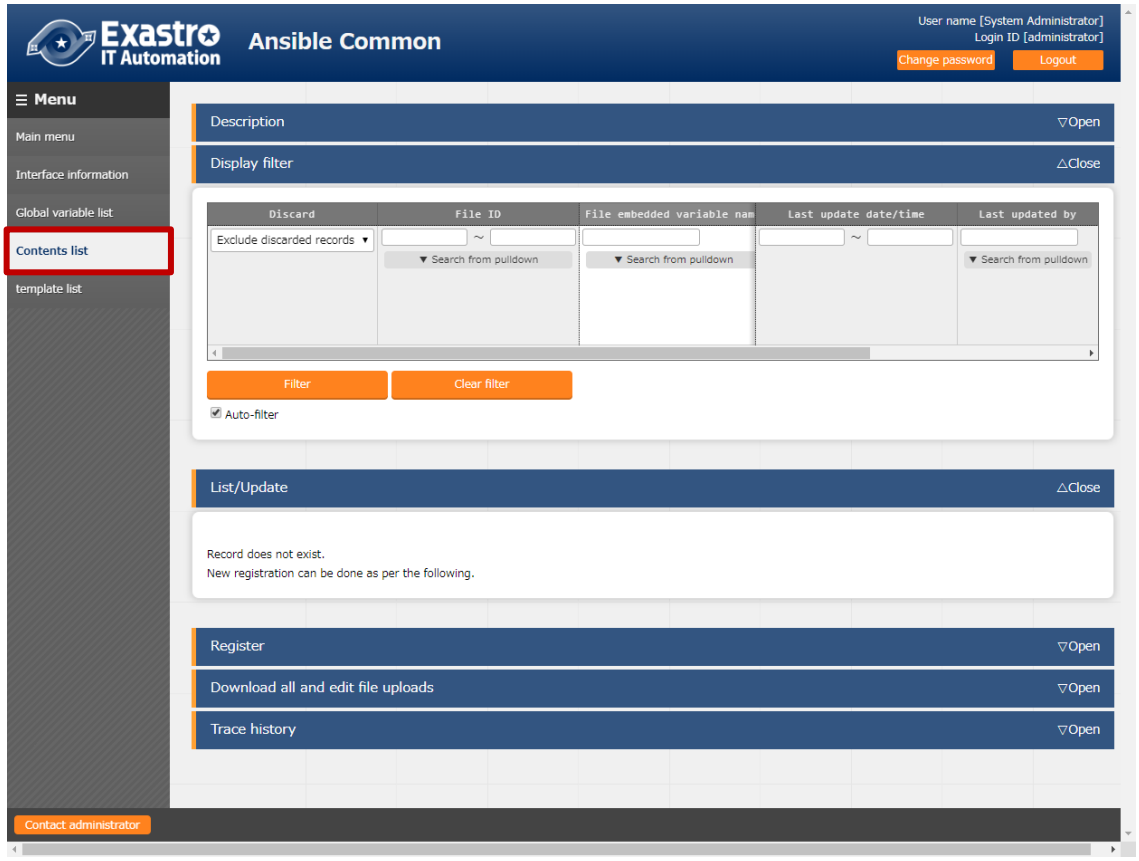


Figure 5.2-9 submenu screen (Contents list)

(2) Click the "Register" - "Start Registration" button to register the file management information.

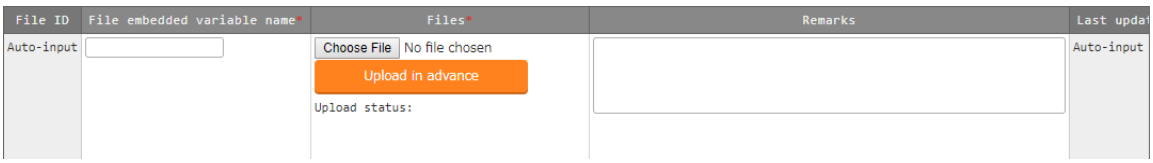


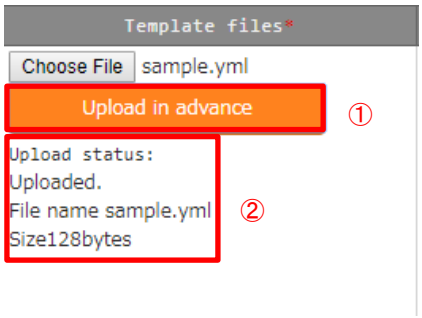
Figure 5.2-10 Registration screen (Contents list)

(3) The items of registration screen are as follows.

Table 5.2-6 Registration screen item list (contents list)

Item	Description	Input required	Input type	Restrictions
File embedded variable name	Enter the variable names to be embedded in the parameter of each module. Enter the variable name in the "CPF_****" format. Half-width alphanumeric character and underscore(_) can be used.(Minimum length: 1 byte, maximum length: 128 bytes)	○	Manual	As writed in the description column
Files	Upload the file used in each module.	○	File	Maximum size 4GB
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

Please "Upload in advance (①)" the "template files" before "register".
Please click the "Register" button after checking the Playbook file name displayed in the "Upload status(②)".



① Write Playbook

When describing each modules in the Playbook, write the file embedded variable name.

e.g)

Playbook Registration content

-copy: src='{{△CPF_hosts△}}' dest=/etc/hosts

△: half-width space

File embedded variable name	Files
CPF_hosts	hosts

Please write the file name for dest. If the file name is not specified, the work will be executed with the registered file whose file name is added with the ITA management number in the front of the file name.

For example, in the case of dest=/etc/, the file name will be /etc/10-digit-number_hosts

-unarchive src={{△CPF_tool_tgz△}} dest=/usr/local/bin

△: half-width space

File embedded variable name	Files
CPF_tool_tgz	tool.tgz

② Write dialog file

In the case of describing the dialog file, write the file embedded variable name.

e.g)

Dialog file Registration content

- expect: '{{△__loginuser__△}}@{{△__loginhostname__△}}'
  exec: 'scp △ITA user@ITA host name:{{△CPF_hosts△}}△forwarding destination'
- expect: 'password:'
  exec: 'exec: ITAuser password'

△:half-width space

File embedded variable name	Files
CPF_hosts	hosts

Please write the file name in the forwarding destination.

If the file name is not specified, the work will be executed with the registered file whose file name is added with the ITA management number in the front of the file name.

For example, in the case of forwarding destination=/etc/, the file name will be /etc/10-digit-number_hosts

{{△CPF_hosts△}} will be replaced by the absolute path of forwarding origin during execution.

5.2.6 **Collection interface information**

In [Collection Interface Information], in order to use the standard RESTAPI of ITA used in the collect function, the connection interface information for RESTAPI access is updated.

For details, please refer to the "Exastro-ITA_User_Instruction_Manual _Collect Function".

5.2.7 **Collection item value list**

In [Collection item value list], the item to be collected is linked to the item of the parameter sheet.

For details, please refer to the "Exastro-ITA_User_Instruction_Manual _Collect Function".

(1) Clicking the Menu name or the List/Update Menu ID will move the user to that selected menu.

Figure 5.2-11 Submenu screen (Collected item value list)

5.3 Ansibel-Legacy／Legacy Role／Pioneer console

The operation of Ansibel-Legacy／Legacy Role／Pioneer console.

5.3.1 **OS type master**

(1) On the [OS Type master] screen, the OS type of the device to be operated is managed from the ITA Pioneer.
※This menu exists only in the Ansible-Pioneer console.

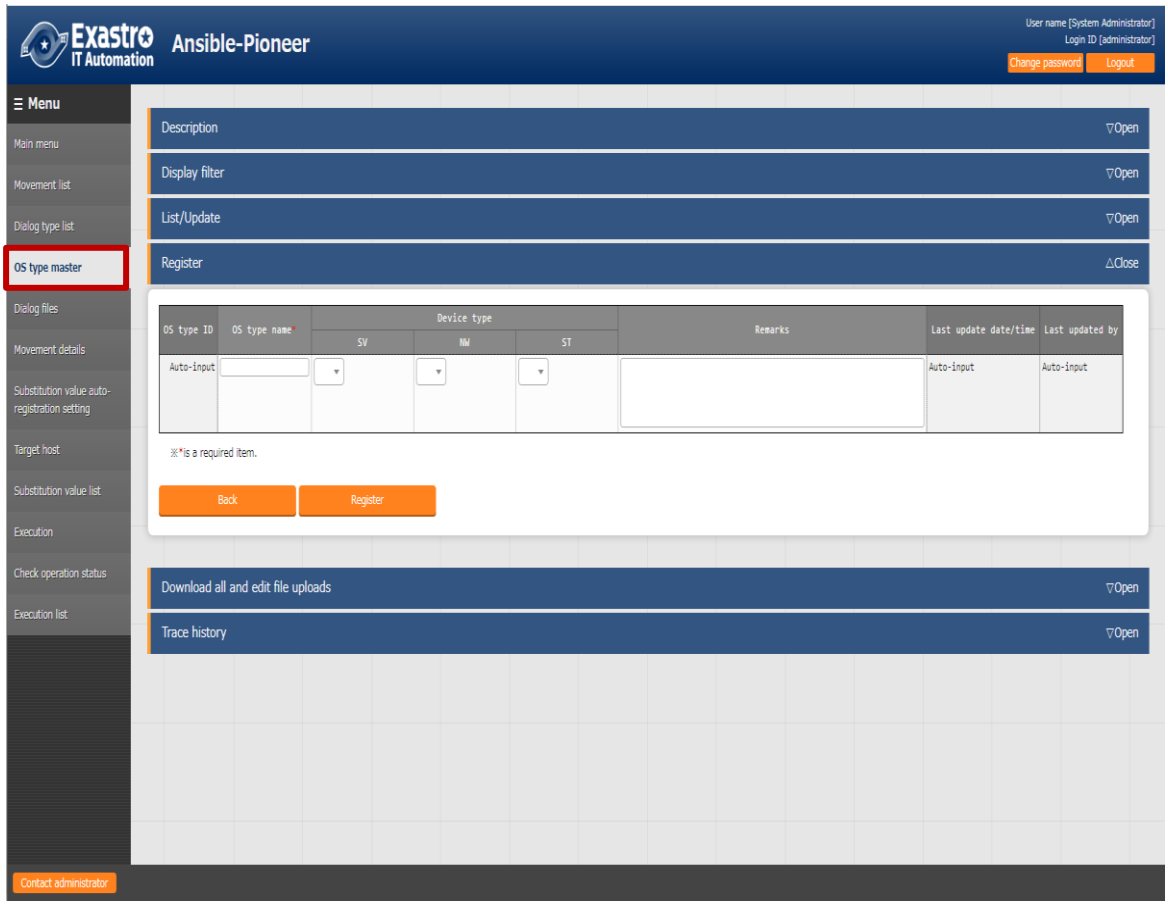


Figure 5.3-1 Submenu screen (OS type master)

(2) Click the "Register"-"Start Registration" button to register the OS information.

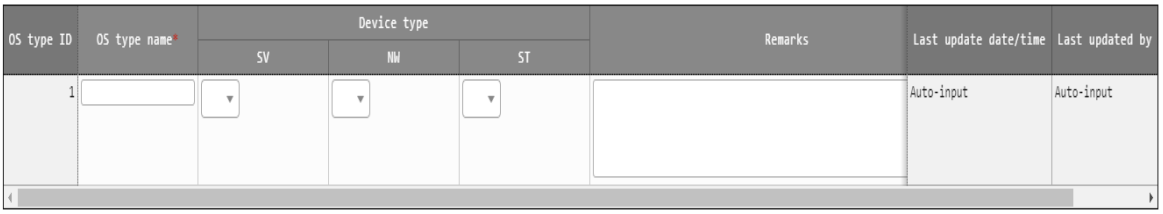


Figure 5.3-2 registration screen (OS type master)

(3) Clicking the Dialogue file material collection button will move the user to the target 5.3.6 Dialogue file collection.

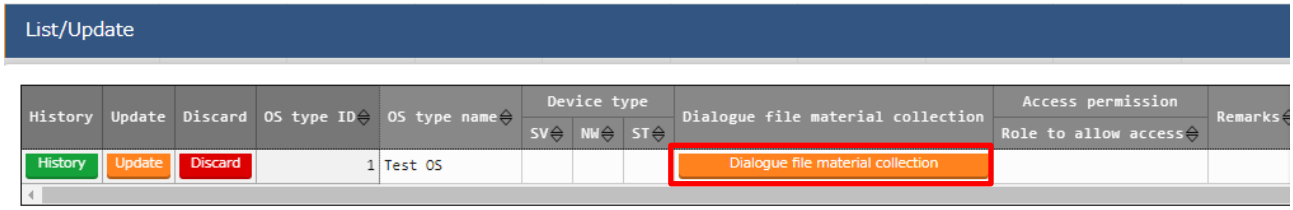


Figure 5.3-3 Sub menu screen (OS Type master)

(4) The list of items on the registration screen is as follows.

Table 5.3-2 registration screen item list (OS type master)

Item		Description	Input required	Input type	Restrictions
OS type ID		A unique ID that identifies the registration information will be automatically entered.	○	Auto	-
OS type name		Enter any device name.	○	Manual	Maximum length 256 bytes
Model	SV	Select "●" if the equipment type is a server.	-	List	-
	NW	Select "●" if the device type is network device.	-	List	-
	ST	Select "●" if the device type is storage device.	-	List	-
Remarks		Free description field.	-	Manual	

5.3.2 **Movement list**

(1) Register/Update/Discard Movement name in "Movement list"

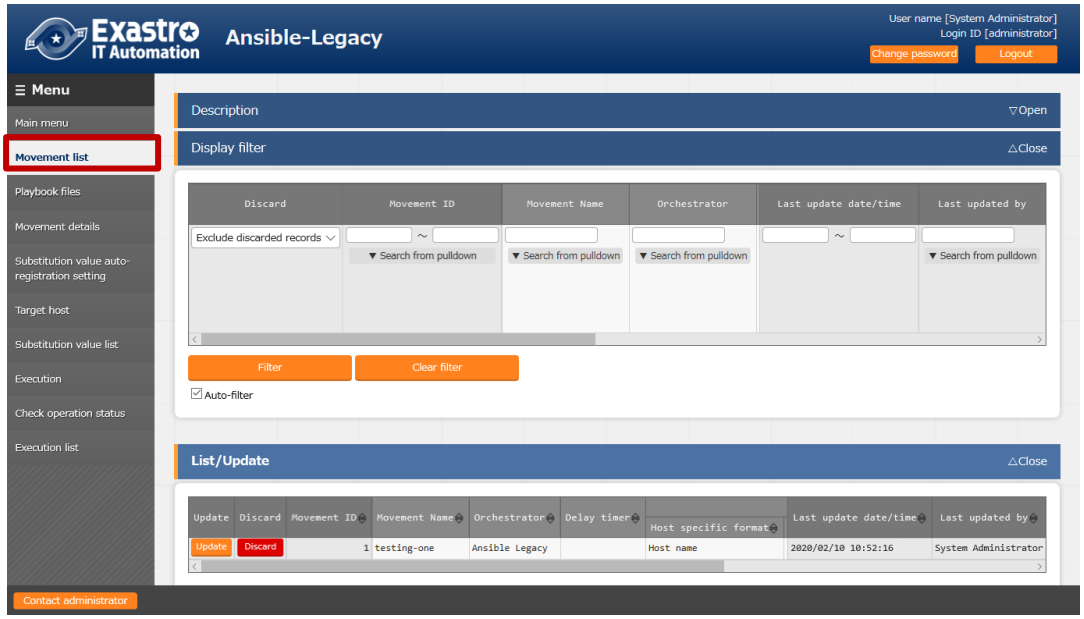


Figure 5.3-4 submenu screen (Movement list)

(2) Click the "Register" - "Start Registration" button to register the Movement information.

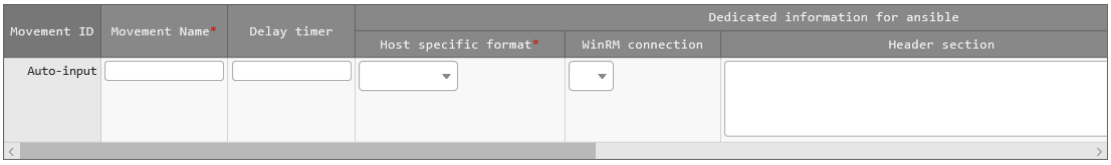


Figure 5.3-5 Registration screen (Movement list)

(3) Clicking the Movement-Playbook link (Movement-Dialogue type link, Movement - Role link) button will move the user to the target 5.3.7Movement-Playbook link (Movement-Dialogue type link, Movement - Role link).

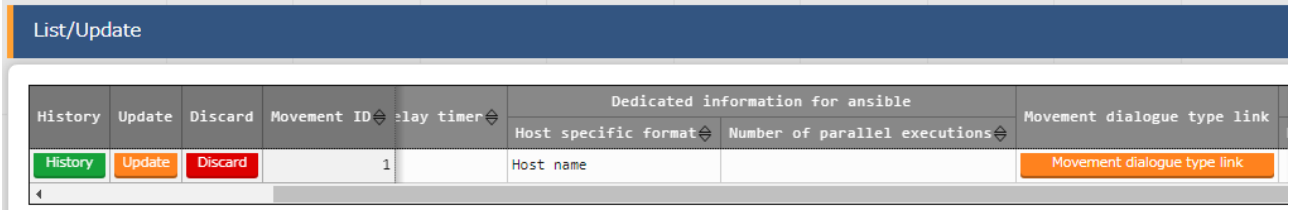


Figure 5.3-6 Submenu screen (Movement list)

(4) The list of registration screen items are as follows.

Table 5.3-2 Registration screen item list (Movement list)

Item	Description	Input required	Input type	Restrictions
Movement name	Enter the name of Movement	○	Manual	Maximum length 256 bytes
Delay timer	Enter the specified period (1~) if you want the warning of delay status to display when the scheduled time of Movement has delayed. (Unit:minute) The warning will not display if the column is not entered.	-	Manual	-
Host specific format	Select "Host name" if the user wants to specify the host that is not represented by an IP address. Normally IP is recommended	○	List	-
Number of parallel executions ※Only displayed in the Pioneer Movement list	Enter the number of target hosts that Ansible can execute simultaneously. ■About the behavior when the column is not entered ・In the case of Ansible driver, the content of configuration file(/etc/ansible.conf) in the server will be the default values. ・In the case of Ansible Automation Controller driver, the default value of Ansible Automation Controller will be used.	-	Manual	NULL or Integer
WinRM connection	Select "●" if the target host if WindowsServer.	-	List	-
Header section ※ Not displayed in the Pioneer Movement list	Edit the parent Playbook automatically generated by ITA from the beginning to the tasks or roles section. The following will be applied if the column is not entered. Ansible: - hosts: all remote_user: ¥"{{ __loginuser__ }}¥" gather_facts: no become: yes Ansible Automation Controller: - hosts: all gather_facts: no become: yes ※In case of connecting with winrm, become:yes can't be applied.	-	Manual	Maximum length 512 bytes
Optional parameter (Not displayed in the Pioneer	Enter the Movement-specific optional parameter of Ansible-Playbook command. In the case that the execution engine is Ansible:	-	Manual	Maximum length 256 bytes

Movement list)	Enter the optional parameter of Ansible-Playbook command. The -i option is set by ITA In the case that the execution engine is Ansible Automation Controller: The following option operator can be set -verbosity -f FORKS,--forks=FORKS -l SUBSET,--limit=SUBSET -e EXTRA_VARS,--extra-vars=EXTRA_VARS EXTRA_VARS: Variable name=specific value Variable name=specific value. -t TAGS,--tags=TAGS -b,--become -D,--diff --skip-tags=SKIP_TAGS --start-at-task=START_AT_TASK The original optional parameters of Ansible Automation Controller are as follows. -ufc,--use_fact_cache use fact cache -as,--allow_simultaneous enable simultaneous job execution -jsc,--job_slice_count= job slice count For the original optional parameters of Ansible Automation Controller, please refer to the description of job template in the Ansible Automation Controller user guide.			
Virtualenv ※Displayed when the execution engine is Ansible Automation Controller	Select the Ansible execution environment where virtualenv is constructed. The Ansible execution environment used when installing Tower will be used if this column is not selected.	-	List	
Remarks	free description field	-	Manual	Maximum length 4000 bytes

【Notes】
In the case of selecting "●" in the WinRM connection column, all connection hosts will be considered as WindowsServer.

5.3.3 **Playbook file list (Ansible-Legacy only)**

(1) Register/update/discard the Playbooks created by users in the "Playbook files" menu.
※This menu only exists in the Ansible-Legacy console.
Please refer to "6.1 Write Playbook (Ansible-Legacy)" about describing Playbook.

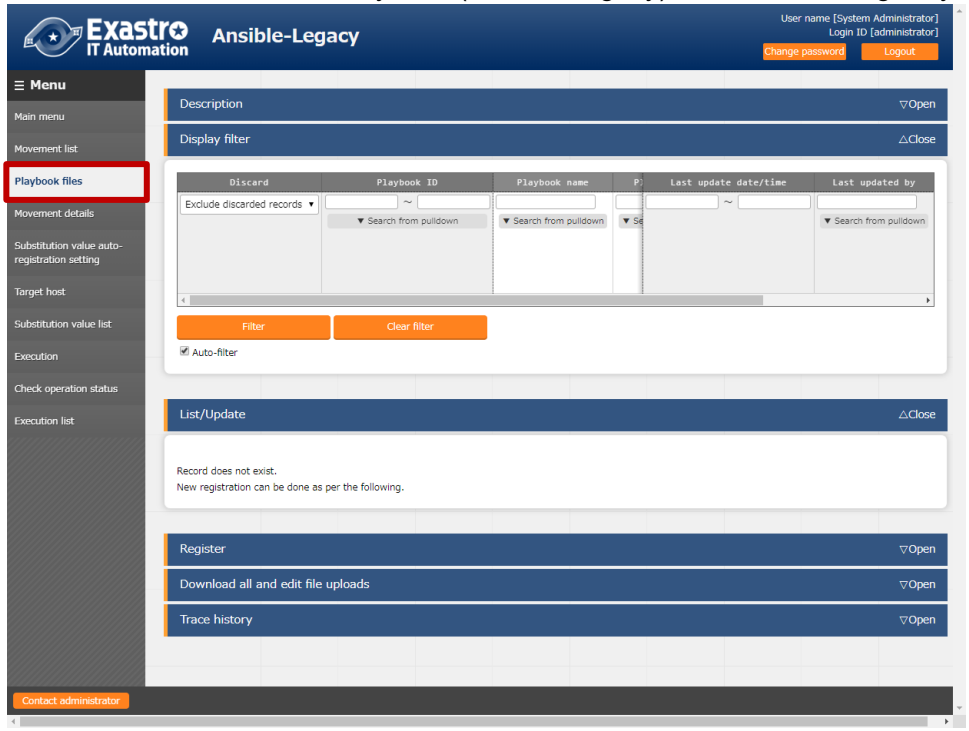


Figure 5.3-7 Submenu screen (Playbook files)

(2) Click the "Register" - "Start Registration" button to register the Playbook.

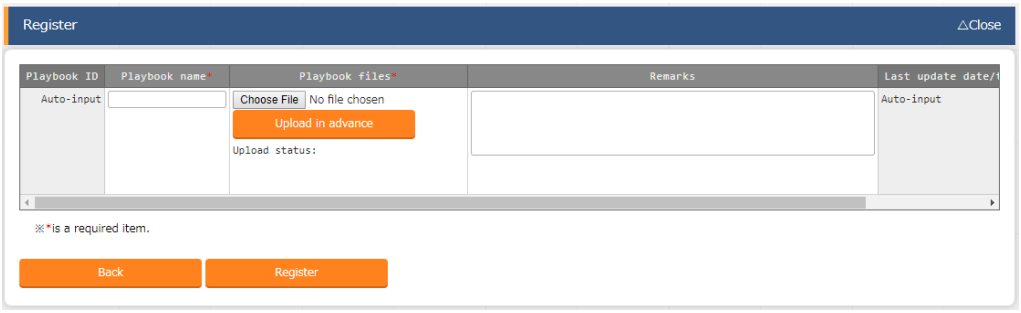


Figure 5.3-8 Registration screen (Playbook files)

(3) Clicking the Movement-Playbook link (Movement-Dialogue type link, Movement - Role link) button will move the user to the target 5.3.7Movement-Playbook link (Movement-Dialogue type link, Movement - Role link).

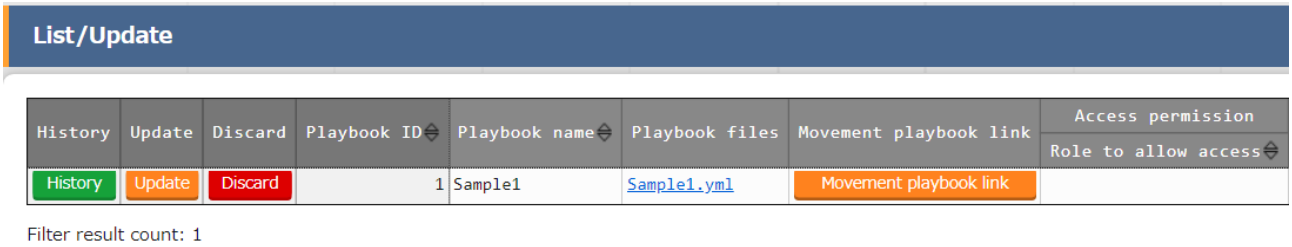


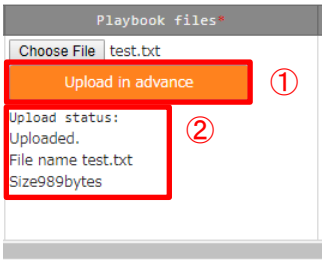
Figure 5.3-9 Submenu screen（Playbook files）

(4) The list of registration screen items are as follows.

Table 5.3-3 Registration screen item list (Playbook files)

Item	Description	Input required	Input type	Restrictions
Playbook name	Enter the Playbook name to be managed in ITA.	○	Manual	Maximum length 256 bytes
Playbook files	Upload the created Playbook file. Please make sure that the playbook file is created with UTF-8 Code when uploading it. Playbook files other than those with a character code of UTF-8 and without BOM will get an error in uploading.	○	File	Maximum size 4GB
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

Please "Upload in advance (①)" the "Playbook files" before "register". Please click the "Register" button after checking the Playbook file name displayed in the "Upload status(②)".



The internal process will extract the variables defined in Playbook files.Users can register specific value of the extracted variables in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".
Since the timing of extraction is not in real time, it may take some time※1 until the variables can be handled in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".

※1 The timing of extraction is writed in " 7.2 About the maintenance method", so please refer to it.

5.3.4 **Role package list (Ansible-Legacy Role only)**

(1) Register/upload/discard the role package file created by the users.

※This menu only exists in Ansible-Legacy Role console.

Please compress the directory of the hiearchy level which contains "roles" into zip file and register role package file with the zip file.

Please refer to " 6.3 Write role package (Ansible-Legacy Role)" for the structure of role package directory.

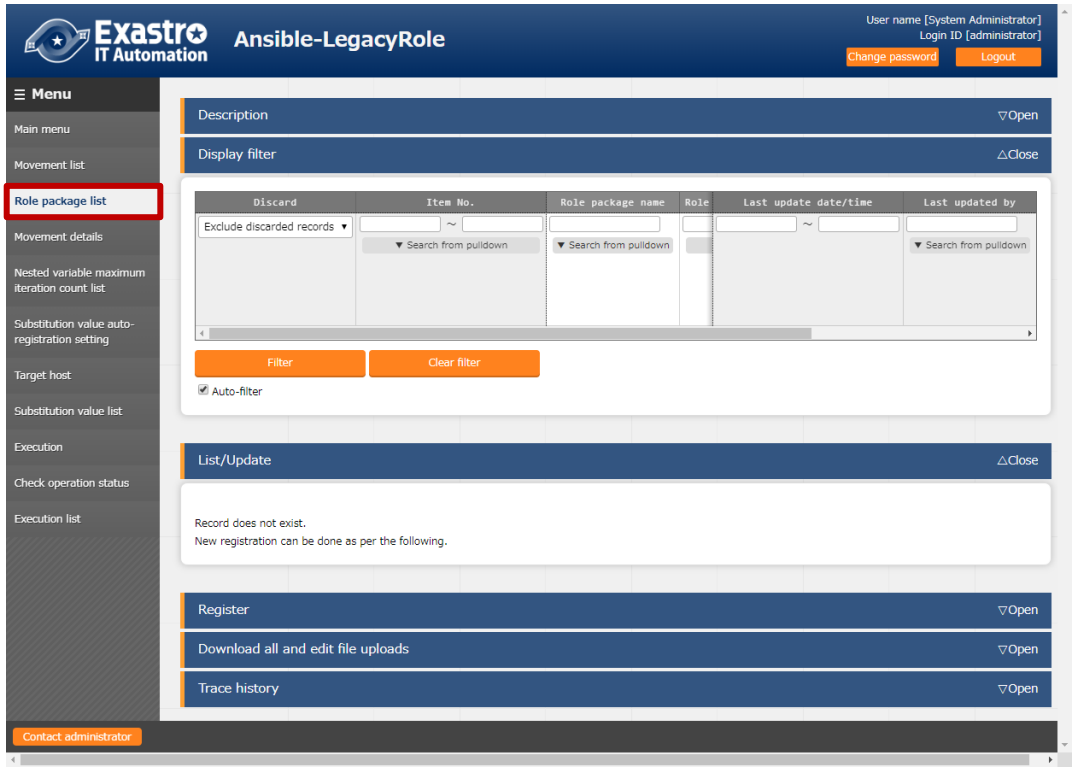


Figure 5.3-10 Submenu screen (Role package list)

(2) Click the "Register" - "Start Registration" button to register the Playbook.

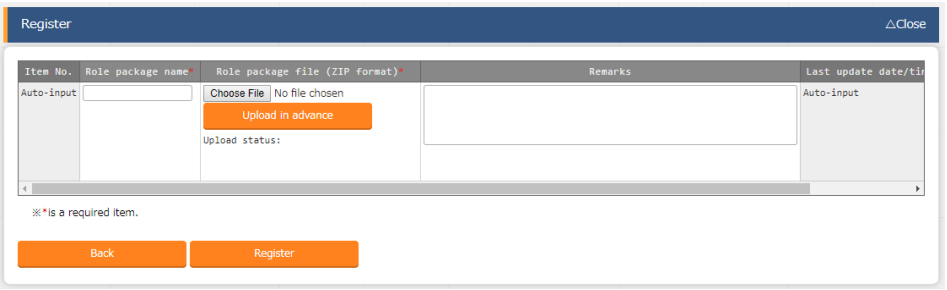


Figure 5.3-8 Registration screen (Role package list)

(3) Clicking the Movement-role link (Movement-Dialogue type link, Movement - Role link) button will move the user to the target 5.3.7 Movement-Playbook link (Movement-Dialogue type link, Movement - Role link).

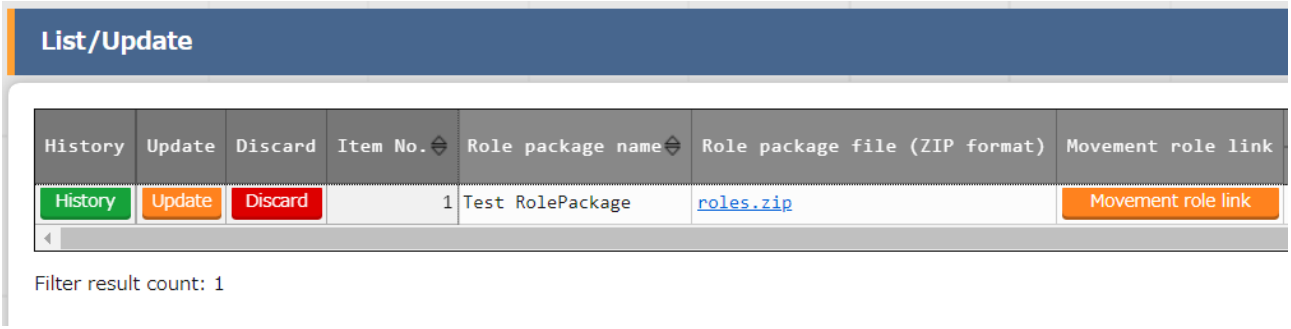


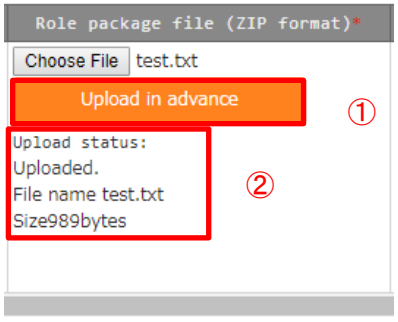
Figure 5.3-12 Submenu screen (Role package list)

(4) The list of registration screen items are as follows.

Table 5.3-4 Registration screen item list (Role package list)

Item	Description	Input required	Input type	Restrictions
Role package name	Enter the role package name to be managed in ITA.	○	Manual	Maximum length 256 bytes
Role package file	Upload the created role package file (zip format). Please make sure that the role package file is created with UTF-8 Code and without BOM when uploading it. If a playbook file other than UTF-8 without BOM is included, an error will occur during registration. For details, plese refer to the 6.3 Role package (Ansible-Legacy Role).	○	File	Maximum size 20M bytes
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

Please "Upload in advance (①)" the "Role package file" before "register".
Please click the "Register" button after checking the role package file name displayed in the "Upload status (②)".



The internal process will extract the variables defined in Role package files.Users can register specific value of the extracted variables in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".
Since the timing of extraction is not in real time, it may take some time※1 until the variables can be handled in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".

※1 The timing of extraction is writed in " 7.2 About the maintenance method", so please refer to it.

5.3.5 **Dialog type list (Ansible-Pioneer only)**

(1) Register/update/discard dialog type in the "dialog type list" menu
This menu only exists in the Ansible-Pioneer console
Ansible-Pioneer defines the differences for each OS type in each dialog file, and combines the same purpose dialog file as dialog type to remove (abstract) the device difference.

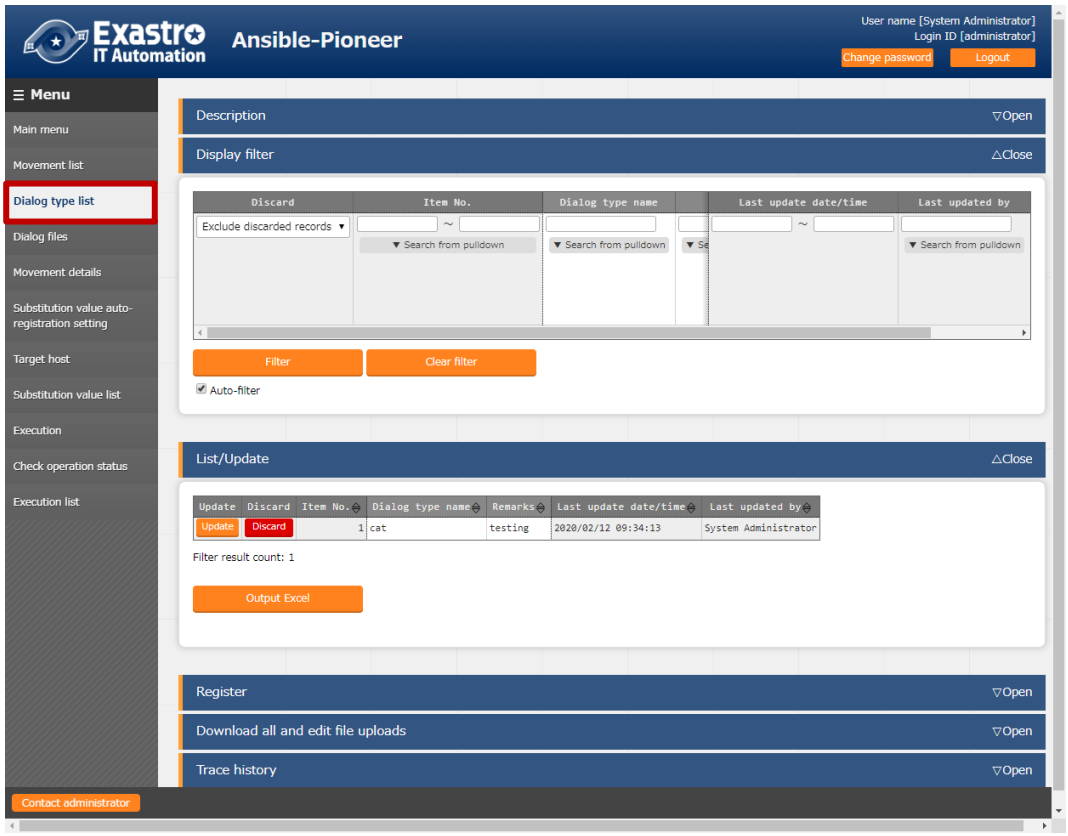


Figure 5.3-13 Submenu screen (dialog type list)

(2) Click the "Register" - "Start Registration" button to register the operation information.

Figure 5.3-14 Registration screen (Dialog type list)

(3) Clicking the Movement-dialogue type link (Movement-Dialogue type link, Movement - Role link) button will move the user to the target 5.3.7 Movement-Playbook link (Movement-Dialogue type link, Movement - Role link). Clicking the Dialogue file material collection button will move the user to the target 5.3.6 Dialogue file material collection.

Figure 5.3-15 Submenu screen (Dialogue type list)

(4) The list of registration screen items are as follows.

Table 5.3-5 Registration screen item list (Dialog type list)

Item	Description	Input required	Input type	Restrictions
Dialog type name	Enter the name of dialog type	○	Manual	Maximum length 256 bytes
Remarks	Free description field	-	Manual	Maximum length 4000 bytes

5.3.6 **Dialog files (Ansible-Pioneer only)**

(1) Register/update/discard the dialog file created by users in "dialog files" menu.
※This menu only exists in Ansible-Pioneer console.

(2) Please refer to "6.2 Write Dialog file (Ansible-Pioneer)" for describing the dialog file, etc.
Register dialog files for each combination of dialog type and OS type.
Please register dialog file of each "OS type" with the same "dialog type" in the case of supporting multiple OS types with one "dialog type".

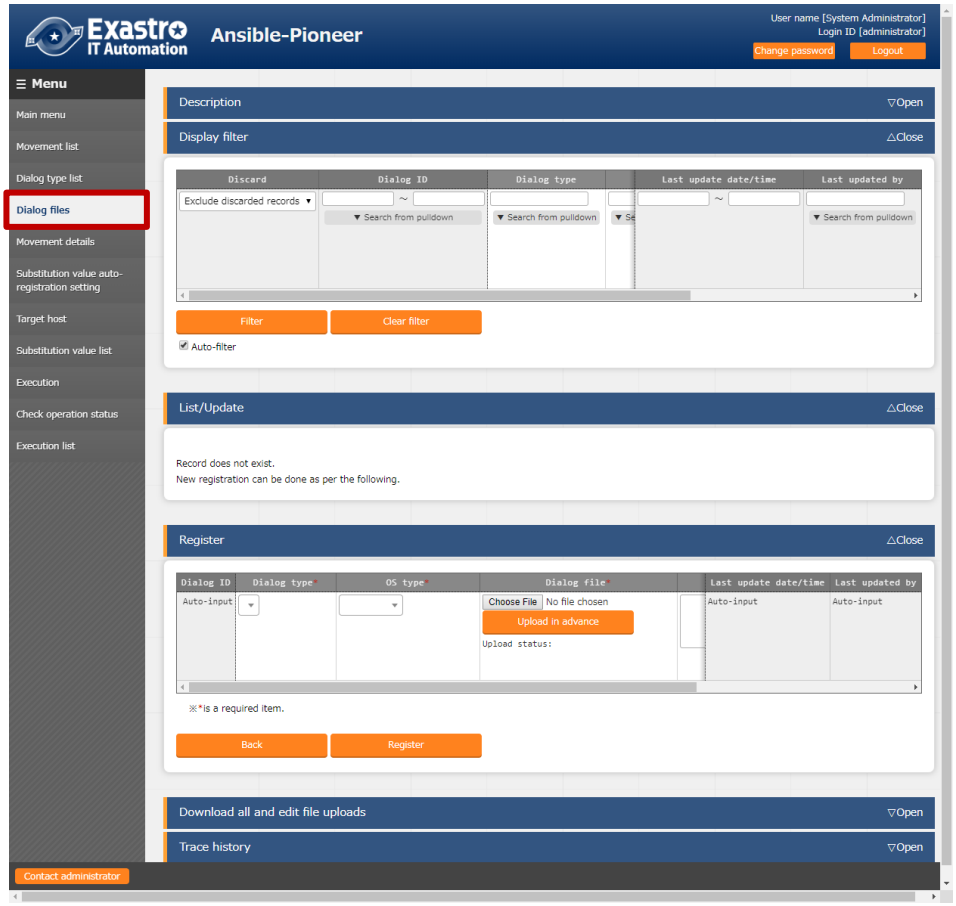


Figure 5.3-16 Submenu screen (dialog files)

(3) Click the "Register" - "Start Registration" button to register the dialog files.

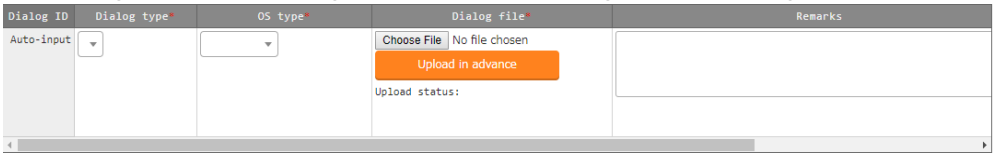


Figure 5.3-17 Registration screen (dialog files)

(4) Clicking the list/update's Dialog type will move the user to the 5.3.5 dialog type list.
Clicking the OS Type will move the user to the 5.3.1 OS Type master.

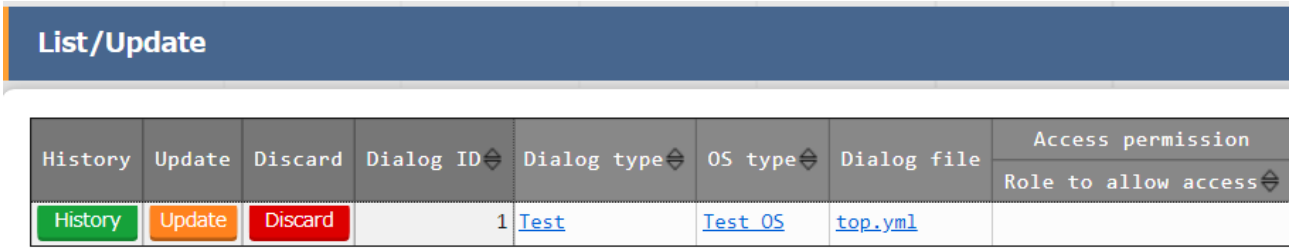


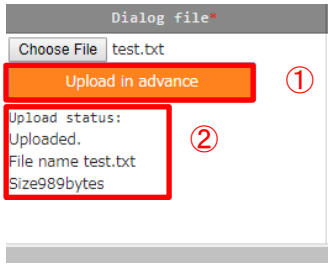
Figure 5.3-18 Submenu screen (Dialog files)

(5) The list of registration screen items are as follows.

Table 5.3-6Registration screen item list (Dialog files)

Item	Description	Input required	Input type	Restrictions
Dialog type	The dialog type registered in the dialog type list menu will be displayed. Select the dialog type of dialog file to be registered.	○	List	-
OS type	The OS type registered in the OS type master menu will be displayed. Select the OS type of dialog file to be registered.	○	List	-
Dialog file	Upload the dialog file according to the dialog type and OS type. Please make sure that the file is created with UTF-8 Code and without BOM when uploading it. An error will occur if the character code is anything else.	○	File	Maximum size 4gb
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

Please "Upload in advance (①)" the "dialog file" before "register".
Please click the "Register" button after checking the dialog file name displayed in the "Upload status(②)".



The internal process will extract the variables defined in dialog files.Users can register specific value of the extracted variables in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".
Since the timing of extraction is not in real time, it may take some time※1 until the variables can be handled in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".

※1 The timing of extraction is writed in " 7.2 About the maintenance method", so please refer to it.

5.3.7 **Movement details**

(1) Register/update/discard the files executed in the Movement in "Movement details" menu.

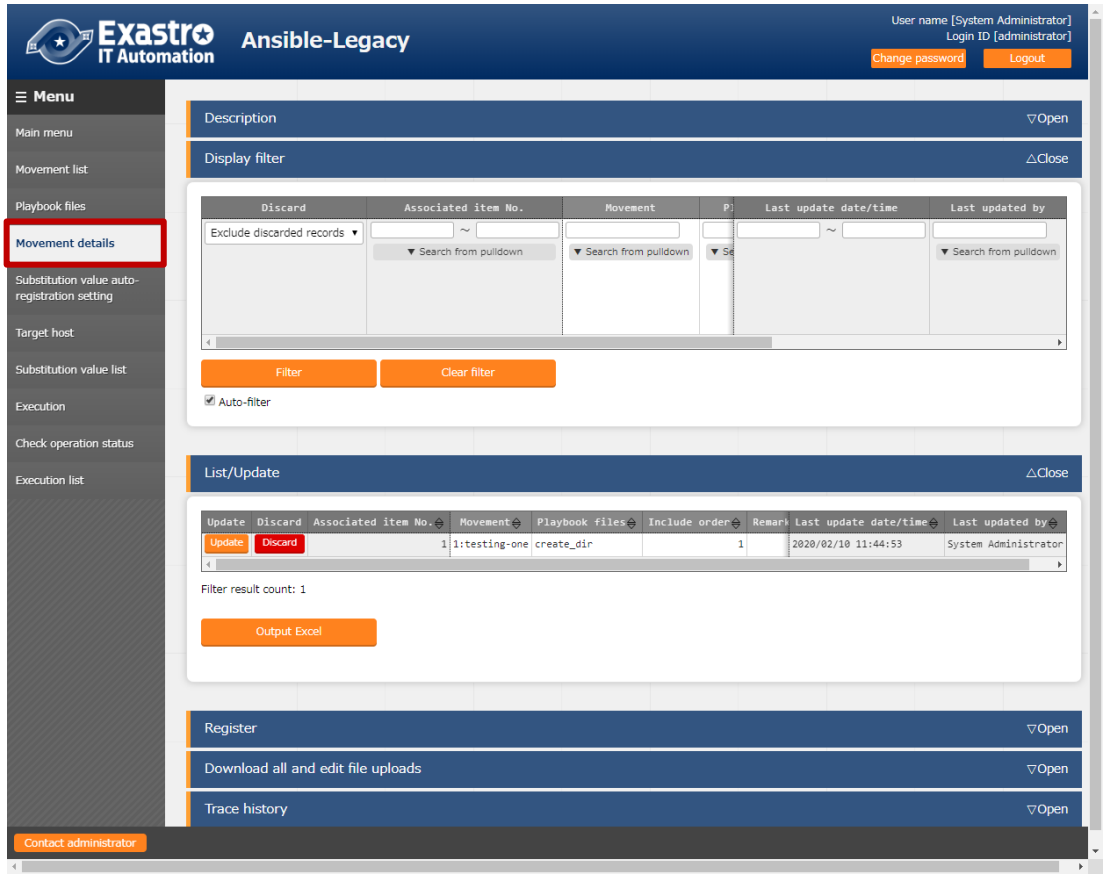


Figure 5.3-19 Submenu screen (Movement details)

※The screen is from Ansible Legacy.

(2) Click the "Register" - "Start Registration" button to register the details of Movement.

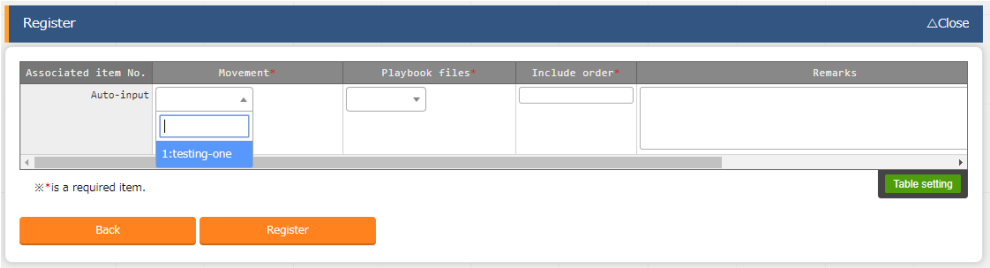


Figure 5.3-20 Registration screen (Movement details)

(3) Clicking the Movement button will move the user to the target 5.3.2 Movement list.
Clicking the Playbook file button will move the user to the target 5.3.3 playbook files.
※For Movement-dialog type link (Ansible-Pioneer), it will be Movement and Dialoge type.
For Movement-Role link (Ansible-Legacy role), it will be Movement and Role package name link.

(4) The list of registration screen items are as follows.

- **In Ansible-Legacy**

Table 5.3-7 Registration screen item list (Movement details in Ansible-Legacy console)

Item	Description	Input required	Input type	Restrictions
Movement	The Movement registered in the Movement list will be displayed. Select the Movement.	○	List	-
Playbook file	The Playbook file registered in "5.3.3 Playbook file list (Ansible-Legacy only)" will be displayed. Select the Playbook file.	○	List	-
Include order	Enter the execution order of playbook files (unique value starts from 1). Playbook files will be executed as the enetered include order (ascending).	○	Manual	Half-width integer
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

- **In Ansible-Legacy Role**

Table 5.3-8 Registration screen item list (Movement details in Ansible-Legacy Role console)

Item	Description	Input required	Input type	Restrictions
Movement	Same as Ansible-Legacy	○	List	-
Role package name	The role package registered in the role package list menu will be displayed.Select the role package to be executed. Multiple role packages cannot be registered in the same Movement.	○	List	-
Role name	The role names included in role package selected in role package name are displayed.Select the role in the role package to be executed.	○		-
Include order	Same as Ansible-Legacy	○	Manual	Half-width integer
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

- **In Ansible-Pioneer**

Table 5.3-9 Registration screen item list (Movement details in Ansible-Pioneer console)

Item	Description	Input required	Input type	Restrictions
Movement	Same as Ansible-Legacy.	○	List	-
Dialog type	The dialog type registered in "Dialog type list (Ansible-Pioneer list" will be displayed. Select the dialog type of dialog file to be executed.	○	List	-

	The dialog file linked with the OS type and dialog type of every host are execution target.			
Include order	Same as Ansible-Legacy	○	Manual	Half-width integer
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

5.3.8 **Nested variable list (Ansible-Legacy Role only)**

(1) In the "Nested variable list" menu, update the maximum iteration count of member variable array defined as nested array in the nested variable which is defined in the role package registered in "5.3.4 Role package list (Ansible-Legacy Role only)". Click the update button of the member variable that the user want to change and update the maximum iteration count.

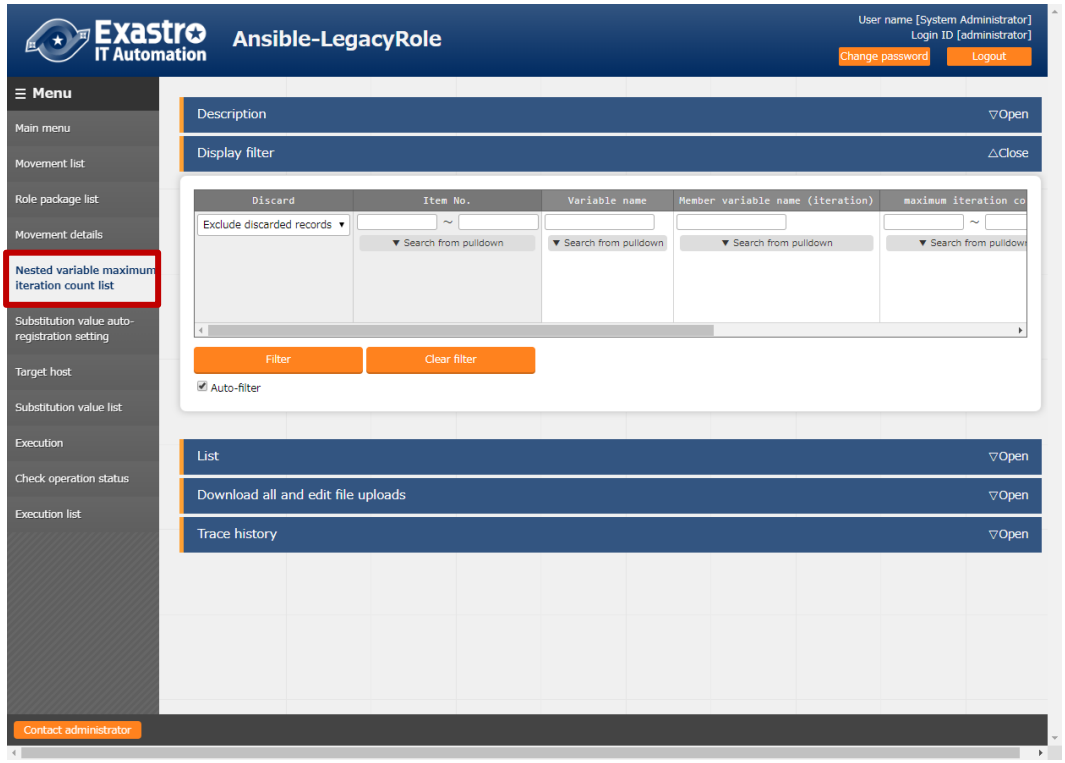


Figure 5.3-22 Submenu screen (Nested variable list)

(2) Click the "List" - "Update" button to update the maximum iteration count.
（※Not the registration button）

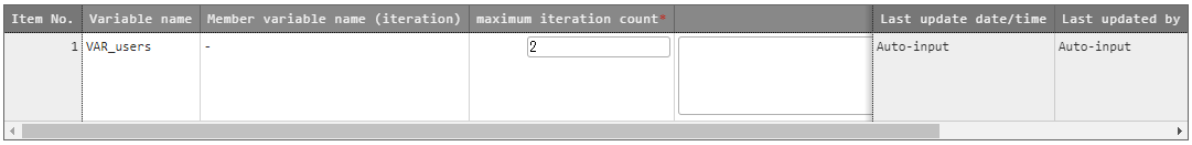


Figure 5.3-23 Registration screen (Nested variable list)

(3) The list of registration screen items are as follows.

Table 5.3-10 Registration screen item list (Nested variable list)

Item	Description	Input required	Input type	Restrictions
maximum iteration count	Enter the maximum iteration count of the array in the range of 1~99,999,999.	○	Manual	Value 1～99,999,999
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

The display of member variable names are the variables of each heriarchy level scoped with ".".
Also, if the first level is nested array, the member variable name will be displayed as "-".
e.g.)

Variable definition	**Display of member variable**	**default value of the maximum iteration count**
VAR_users:		
- name: alice	-	1
authorized:		
- /tmp/alice/onekey.pub		
nested:	nested	2
- craete_users:		
Name: root		
password: xxxxxxxxx		
- craete_users:		
Name: mysql		
password: xxxxxxxxx		

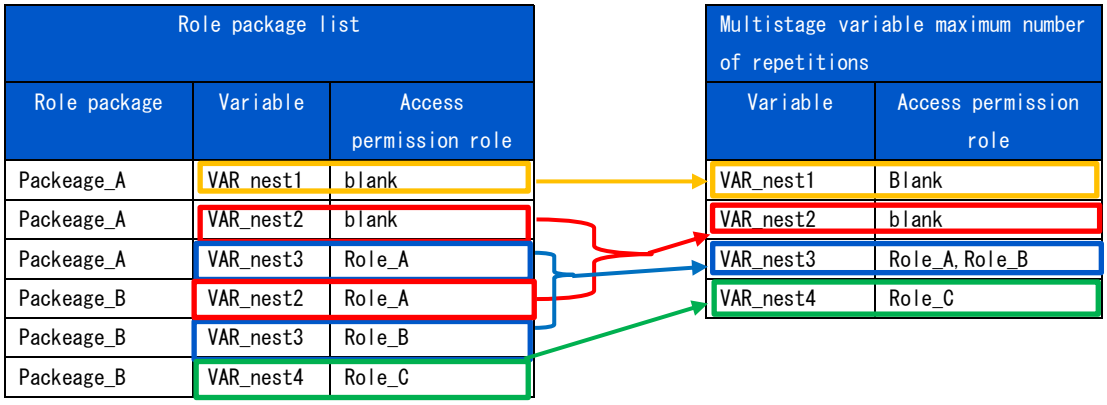
The internal process initially registers the iteration count of member variable defined in the nested variable which is defined in the role package. After the initial registration, the iteration count can be updated in the "Nested variable list" menu.
Also, since initial registration and update of iteration count is not in real time, it may take some time※1 until the variables can be handled in menu "5.3.9 Substitution value auto-registration setting" and menu "5.3.11 Substitution value list".

※1 The timing of extraction is writed in " 7.2 About the maintenance method", so please refer to it.

(4) Unique list of variable names
Variable name list is unique in all role packages. When using the same variable name across role packages, the number of repetitions set in multistage variable maximum repeat list applies to variables in all role packages.

(5) Access permission role

The permission role is set for multistage variable maximum repeat list is set to the role package management permission role for which the variable will be defined. If a variable is defined in more than one role package list, all permission roles in the role package lists will be set. If the permission role is empty, access to all roles will be treated as accessible. If the access permission role for each role package list is blank, the permission role for multistage variable maximum repeat list will be also se to blank. For more information about access permission roles, please refer to the "User_Instruction_Manual_Role-Based Access Control."



Role package list		
Role package	Variable	Access permission role
Packeage_A	VAR_nest1	blank
Packeage_A	VAR_nest2	blank
Packeage_A	VAR_nest3	Role_A
Packeage_B	VAR_nest2	Role_A
Packeage_B	VAR_nest3	Role_B
Packeage_B	VAR_nest4	Role_C

Multistage variable maximum number of repetitions	
Variable	Access permission role
VAR_nest1	Blank
VAR_nest2	blank
VAR_nest3	Role_A, Role_B
VAR_nest4	Role_C

5.3.9 **Substitution value auto-registration setting**

(1) Link the parameter sheet created in menu creation function with the variables in the Movement. The registered information will reflected to "substitution value list" menu and "target host" menu by internal process.

The reflection rule is writed in “6.6BackYard contents (2) Substitution value auto-registration setting”.

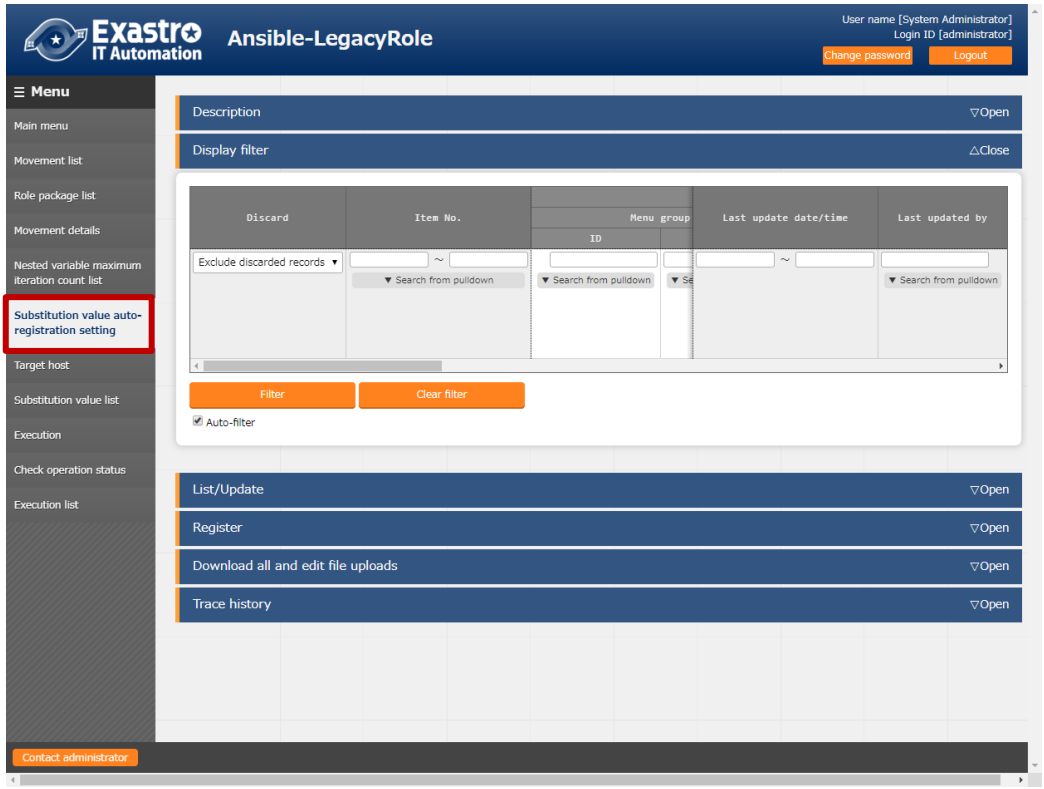


Figure 5.3-24 Submenu screen (Substitution value auto-registration setting)
※The screen is from Ansible-Legacy Role

(2) Click the "Register" - "Start Registration" button to set the substitution value auto-registration.

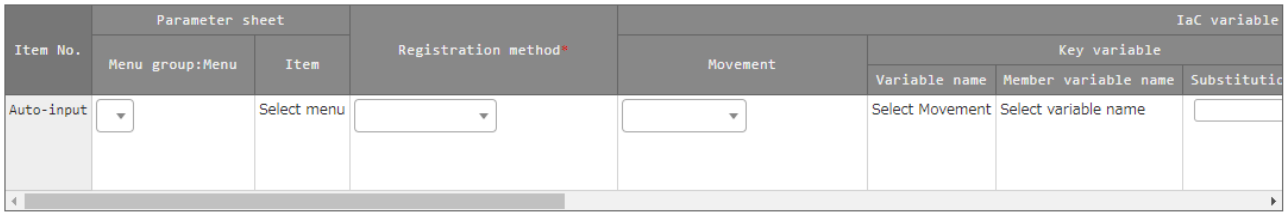


Figure 5.3-25 Registration screen (Substitution value auto-registration setting)

(3) Clicking the "List/Update" Menu ID/Menu link will move the user to the target menu.。

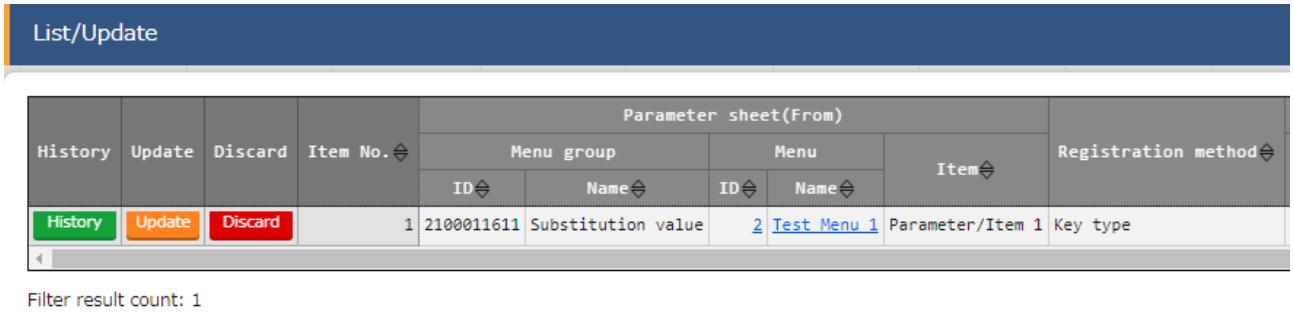


Figure 5.3-26 Submenu screen (Substitution value auto registration setting)

Table 5.3-11 corresponding column list (Substitution value auto-registration setting)

Column		Legacy	Legacy Role	Pioneer
Menugroup:Menu		○	○	○
Item		○	○	○
Registration method		○	○	○
Movement		○	○	○
Key variable	Variable name	○	○	○
	Member variable name	―	▲	―
	Substitution name	△	△	△
Value variable	Variable name	○	○	○
	Member variable name	―	▲	―
	Substitution name	△	△	△
NULL link		●	●	●

○: Required
●: Optional
△: Required only if multiple specific value can be set to the selected variable.
▲: Required only if the selected variable is nested variable
―: Not displayed

(4) The list of registration screen items is as follows.

Table 5.3-12 Registration screen item list (Substitution value auto-registration setting)

Column	Description	Input required	Input type	Restrictions
Menugroup:Menu	The menu of parameter list is displayed. Select the menu of association target.	○	List	-
item	The item of selected parameter list menu is displayed. Select the item of association target.	○	List	-
Registration method	Value type: Select to set the setting value of item as the specific value of the linked variable. Key type: Select to set the name of item as the specific value of the linked variable. If the setting value of the item is blank, it cannot be linked. Key-Value type: Select to set the name(Key) and setting value(Value) of item as the specific value of the linked variable.	○	List	-
Movement	The Movement registered in the Movement list will be displayed. Select the Movement.	○	List	-

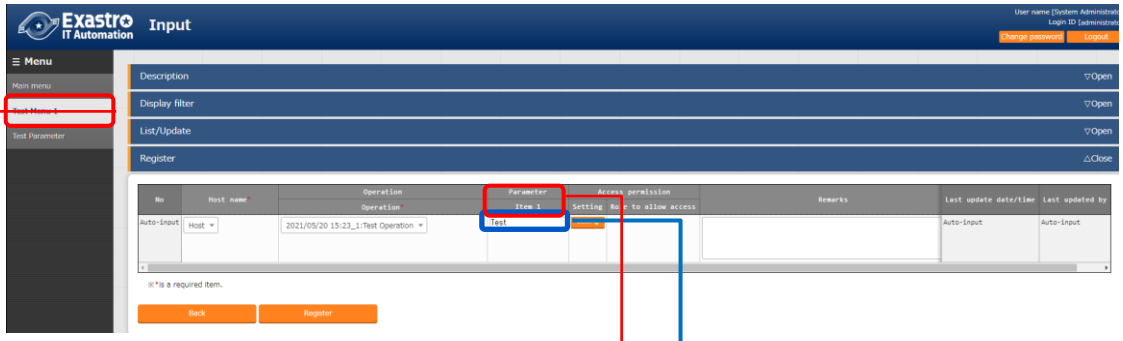
Column		Description	Input required	Input type	Restrictions
Key variable	Variable name	The variables used in the file registered in Movement details menu are displayed. Select the variable to associate with its specific value in key type.	○ or ／	List	Required if the registration method is key type of key-value type.
	Member variable name	If nested variable is selected in the variable name column, the member variable of nested variable will be displayed. Select the member variable.	○ or ／	List	
	Substitution name	Required only if multiple specific value can be set to the selected variable Enter the substitution order (1~) of specific value. Value will be substituted in ascending order following the entered value. Please enter the substitution order (from 1) even if there are no more specific value.	○ or ／	Manual	Blank or positive integer.
Value variable	Variable name	The variables used in the file registered in Movement details menu are displayed. Select the variable to associate with its specific value in value type.	○ or ／	Manual	Required if the registration method is key type of key-value type.
	Member variable name	If nested variable is selected in the variable name column, the member variable of nested variable will be displayed. Select the member variable.	○ or ／	List	-
	Substitution name	Required only if multiple specific value can be set to the selected variable Enter the substitution order (1~) of specific value. Value will be substituted in ascending order following the entered value. Please enter the substitution order (from 1) even if there are no more specific value.	○ or ／	Manual	Blank or positive integer.
NULL link		Set whether to register NULL (blank) value to substitution value list menu if the specific value in parameter sheet is NULL (blank). ・If the "Valid" is set, any value in the parameter sheet will be registered in the substitution value list menu. (NULL value will be registered) ・If the "Invalid" is set, only specific value in the parameter sheet will be registered in the substitution value list menu (NULL value will not be registered) ・If the column is blank, the "NULL link" value in Ansible interface information menu will be applied.	-	List	-
Remarks		Free description field.	-	Manual	Maximum length 4000 bytes.

※ Please refer to "5.3.11 Substitution value list" for the description of member variable name.

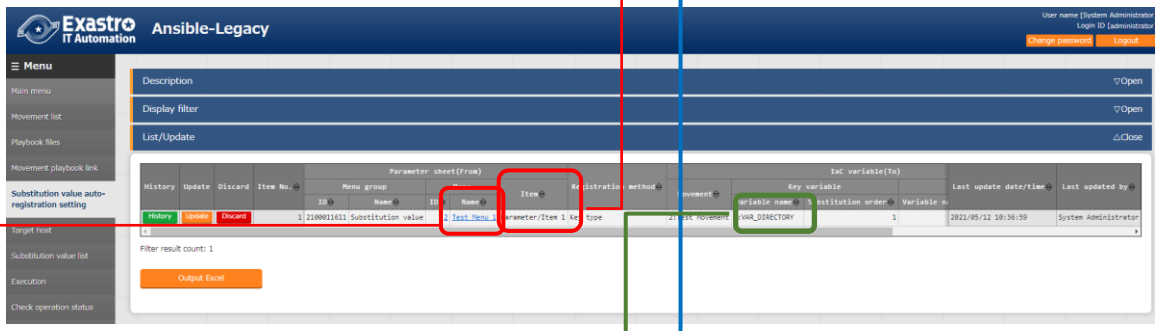
(5) If the "Ansible Common : Template list:Template Variable name / Ansible Common: File list:File embedded variable names." are used as Parameter sheet items in the Substitute value automatic registration settings,
The selected item setting value's linked Variable's specific value (Variable name) will be displayed in the Substitute value list as "{{ Variable name }}"

Parameter sheet definition

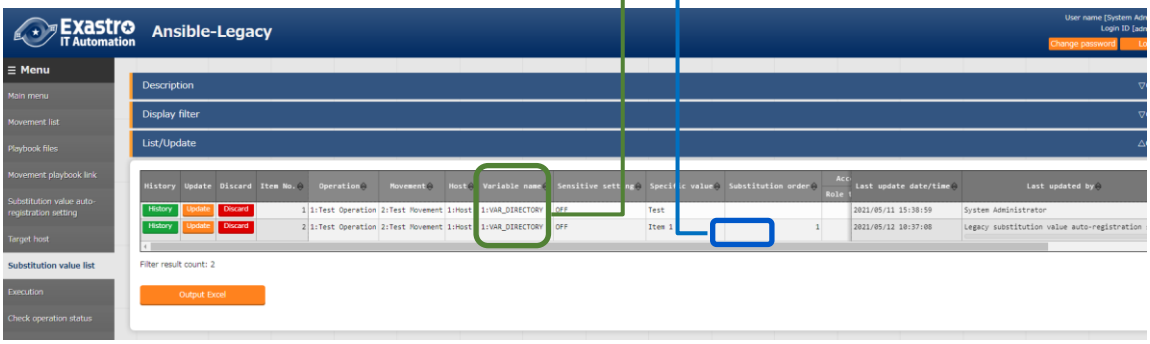
Parameter sheet



Substitution value auto-registration setting

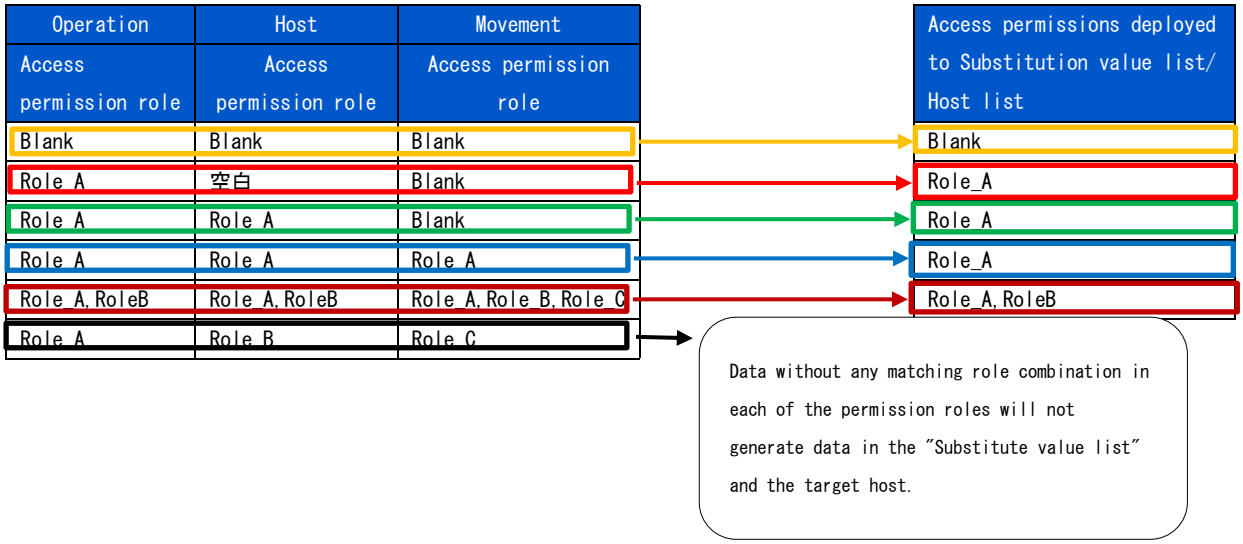


Substitution value list



(6) Access permission role

The access permission roles set for the "Substitute value list"and "Operation target hosts" generated from the information in the "Automatic substitute value registration"will be set to the roles that match the access permission roles for each of the hosts (device list) and Operations set in the Movement and parameter sheets set in the "Automatic substitute value registration". If the permission role is empty, access to all roles will be treated as accessible. Data without any matching role combination in each of the permission roles will not generate data in the "Substitute value list" and the target host. For more information about access permission roles, please refer to the "User_Instruction_Manual_Role-Based Access Control."



5.3.10 **Target host**

(1) Register/update/discard the Movement and host linked with Operation in the "Target host" menu.

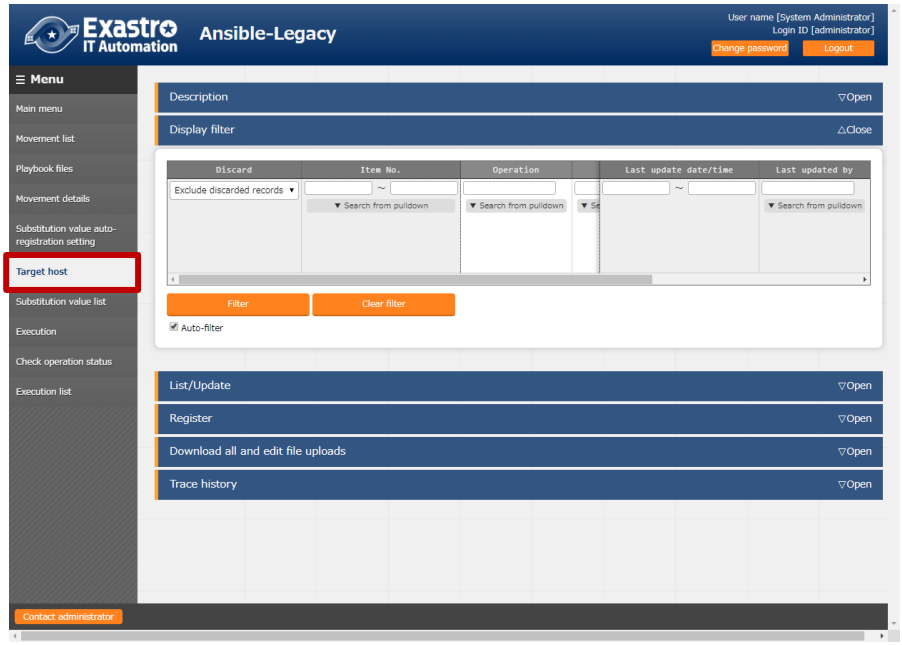


Figure 5.3-27 Submenu screen (Target host)

(2) Click the "Register" - "Start Registration" button to register the operation target host.

Figure 5.3-28 Registraton screen (Target host)

(2) Clicking the Movement link in the “List/Update” submenu will move the user to the target 5.3.7 Movement-Playbook Link. Pressing the Substitution value management button will take the user to the target 5.4.11 Substitution value management

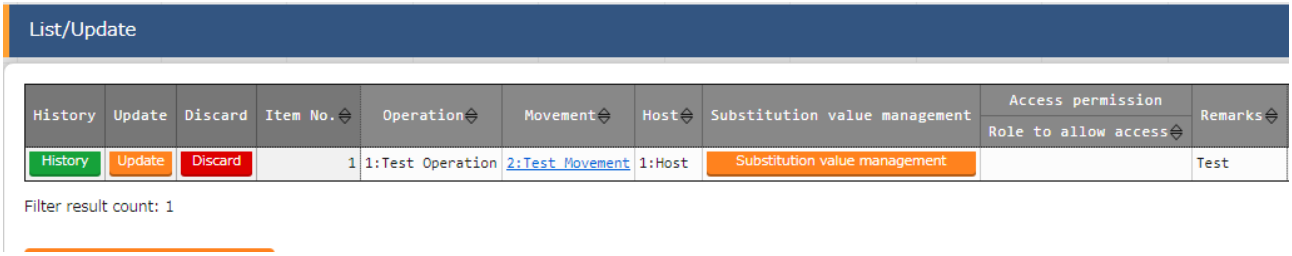


Figure 5.3-29 Registraton screen (Target host)

(3) The list of registration screen items are as follows.

Table 5.3-13 Registration screen item list (Target host)

Item	Description	Input require	Input type	Restrictions
operation	The Operation registered in the input operation list is displayed.Select the Operation.	○	List	-
Movement	The Movement registered in the Movement list is displayed. Select the Movement to associate with Operation.	○	List	-
Host	The host name registered in the device list will be displayed. Select the host to be linked with the Operation.	○	List	-
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

5.3.11 **Substitution value list**

(1) Register/update/discard the substitution value of variable.

Users can perform maintenance (view/register/update/discard) of the specific values that are substituted with variable “VAR_” of Playbook and template file to be used in target Movement for each operation.

Users can also maintain the specific values that are substituted with variable “LCA_” other than "VAR_" according to the definition of translation table. Please refer to"6.5 Write translation table (Ansible-Legacy Role only)" for details.

The registered variable information will be output into host variable file (under host_vars/) during operation execution.

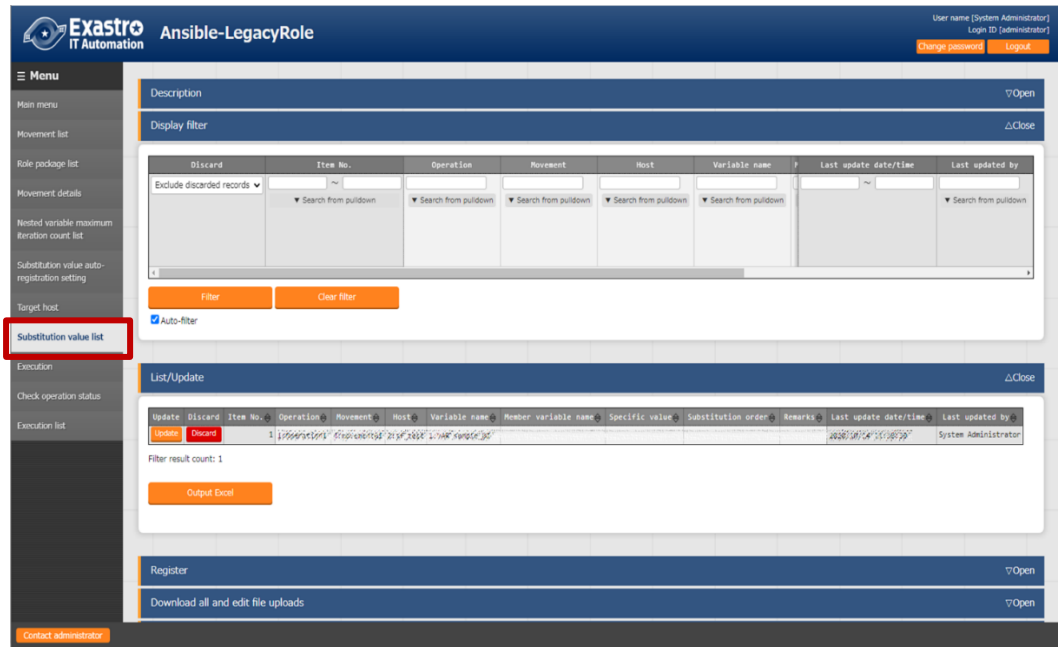


Figure5.3-21 Submenu screen (Substitution value list)

※The screen is from Ansible-Legacy Role.

(2) Click the "Register" - "Start Registration" button to manage the substitution value.

Figure 5.3-22 Registration screen (Substitution value list)

The variable name in substitution value list menu is reflected from the uploaded Playbook and the information registered in the substitution value auto-registration setting menu.

※ The timing of extraction is writed in "7.2 About the maintenance method", so please refer to it.

(3) The list of registration screen items are as follows.

Table 5.3-14 corresponding column list (Substitution value list)

column	Legacy	Legacy Role	Pioneer
Operation	○	○	○
Movement	○	○	○
host	○	○	○
variable name	○	○	○
Member variable name	―	▲	―
Substitution order	△	△	△
Default value(display only)	―	○	―

○: Required
△: Required only if multiple specific value can be set to the selected variable
▲: Required only if the selected variable is nested variable
―: Not displayed

Table 5.3-15 Registration screen item list (Substitution value list)

Item	Description	Input required	Input type	Restrictions
Operation	The Operation registered in the operation target host is displayed. Select the Operation.	○	List	-
Movement	The Movement linked with the Operation selected from the data registered in the target host menu is displayed. Select the Movement.	○	List	-
Host	The host linked with the Operation and Movement selected from the data registered in the target host menu is displayed. Select the host.	○	List	-
Variable name	The variable name attached with the Movement selected from the data registered in the Movement-Playbook link menu is displayed. Select the variable.	○	List	-
Member variable name	If nested variable is selected in the variable name column, the member variable of nested variable will be displayed. Select the member variable.	○ or ／	List	-
Sensitive settings	Select "OFF" or "ON". If "ON" is selected, the specific value will be encrypted and will not be displayed on ITA.		Button	

	・ For Legacy/Legacy-Role Host variable files passed to Ansible will be set with contents encrypted in Ansible-Vault. ・ For Pionner Host variable files passed to Ansible will be set with ITA's original encrypted content.			
Specific value 値※1	Enter the specific value used in Operation / Movement / Host. File embedded variable "CPF_" and template embedded varaible "TPF_" can be entered in the specific value column. When describing the variable, enclose the variable name in {{}} as describing them in the Playbook. e.g.) Entering TPF_sample as specific value. '{{△TPF_sample△}}' △: Half-width space ‘: recommended	○	Manual input	Maximum length 1024 bytes
Substitution order	Required only if multiple specific value can be set to the selected variable. Enter the substitution order (1~) of specific value. Value will be substituted in ascending order following the entered value. Please enter the substitution order (1~) even if there are no multiple specific value.	○ or ／	Manual input	Blank or positive integer
Default value	The specific value of variable selected in the variable name or member variable name column set in the default variable definition file(defaults->main.yml) is displayed Please refer to " 6.4 Write ITA readme (Ansible-Legacy Role only)" for details. True is displayed when the specific value is "Yes","Y", or "y". False is displayed when the specific value is "No","N", or "n".	-	Display only	-
Remarks	Free description field.	-	Manual input	Maximum length 4000 bytes

※1If you are going to set filed embedded variables (CPF) or template embedded variables (TPF) to the specific values, make sure that the Sensitive settings are set to "OFF".
If the Sensitive settings are set to "ON", the variables will not be used.

【The display content of member variable name】
Selecting member variable is required only if the variable is nested variable.
Only the variable that requires specific value is displayed in the member variables.

The display of variable names of each heriarchy level is scoped with "." .
If the variable is in nested array, the variables are scoped with "[]" at the iteration position (0~).
The iteration array count is set in "5.3.8 Nested variable list (Ansible-Legacy Role only)".

e.g.)

Variable definition	Display of member variable
VAR_users:	
- name: alice	[0].name
authorized:	[0].authorized
- /tmp/alice/onekey.pub	
mysql:	
password: mysql-password	[0].mysql.password
hosts:	[0].mysql.hosts
- "127.0.0.1"	
- "localhost"	
- name: bob	[1].name
authorized:	[1].authorized
- /tmp/alice/onekey.pub	
mysql:	
password: mysql-password	[1].mysql.password
hosts:	[1].mysql.hosts
- "127.0.0.1"	※mysql is the variable which indicates the hierarchy directory, so is not displayed in member variable.
- "localhost"	

The information registered in "substitution value auto registration setting" menu is reflected to "substitution value list" menu and "target host" menu by internal process.

※ The timing of extraction is writed in " 7.2 About the maintenance method", so please refer to it.

① **Entering the substitution order**

In Ansible-Legacy, if the substitution order is not enetered, the variable will be treated as normal variable.

If the substitution order is entered, the variable will be handled as multiple specific value variable.

Please enter the substitution order although multiple specific value is not required (one specific value is sufficient) if the variable is multiple specific value variable.

In Ansible-Legacy Role, by selecting variable name or member variable name, it is possible to enter substitution order only for multiple specific value variables.

Please enter if the variable is multiple specific value variables.

In Ansible-Pioneer, if the substitution order is not enetered, the variable will be handled as normal variable.

If the substitution order is entered, the variable will be handled as multiple specific value variable

Please enter the substitution order although multiple specific value is not required (one specific value is sufficient) if the variable is multiple specific value variable.

In each mode, it is no problem although the substitution order is not consecutive for specific multiple concrete value variables.

e.g.)

Registration in substitution value list menu

Host	Variable	Specific Value	Substitution order
HOST_A	VAR_std	value1	
HOST_A	VAR_list_a	value2	10
HOST_A	VAR_list_b	value3	100
HOST_A	VAR_list_b	value4	200

The content output to the host variable file of HOST_A

```
VAR_std: value1
VAR_list_a:
 - value2
VAR_list_b:
 - value3
 - value4
```

② **Output to the host variable file**

The specific value of variable registered in substitution value list menu will be output to host variable file.

In Ansible-Legacy and Ansible-Pioneer, if the specific value of variable used in Playbook or dialog file is not registered in substitution value list menu during operation execution, unexpected error will occur.

In Ansible-Legacy Role, only the variable registered in substitution value list menu the will be output to host variable file during operation execution.

It is same for nested variables that only the member variable registered specific value will be output.

e.g.)

Variable definition

```
VAR_users:
  - name: alice
    authorized:
      - /tmp/alice/onekey.pub
    mysql:
        password: mysql-password
        hosts:
          - "127.0.0.1"
          - "localhost"
  - name: bob
    omitted
```

Registration in substitution value list menu

Host	Variable	Member variable	Specific value	Subsitution order
HOST_A	VAR_users:	[0].name	value1	
HOST_A	VAR_users	[1].authorized	value2	

The content ouput to the host variable file of HOST_A

```
VAR_users:
 - name :value1
 - .authorized: value2
```

③ Default value check option

In the "System settings" of "ITA Management console", users can set the parameter to display warning message and not register the specific value when registering the specific value of the variable whose default value does not match between multiple roles.
This parameter is not registered by default. Please register if necessary.
The content to register in system settings is as follows.
Also, please refer to "User instruction manual_Ansible-Management console" for system settings.

Table 5.3-16 Registration content in system settings

Item	Input value	Input required
ID	ANSIBLE_DEF_VAL_CHK	○
Item name	Any desired string	-
Setting value	1：Parameter enabled Contents other than 1 or record not registered: Parameter disabled.	○
Remarks	Any desired string	

5.3.12 **Check operation status**

(1) Monitor the status of operation execution.

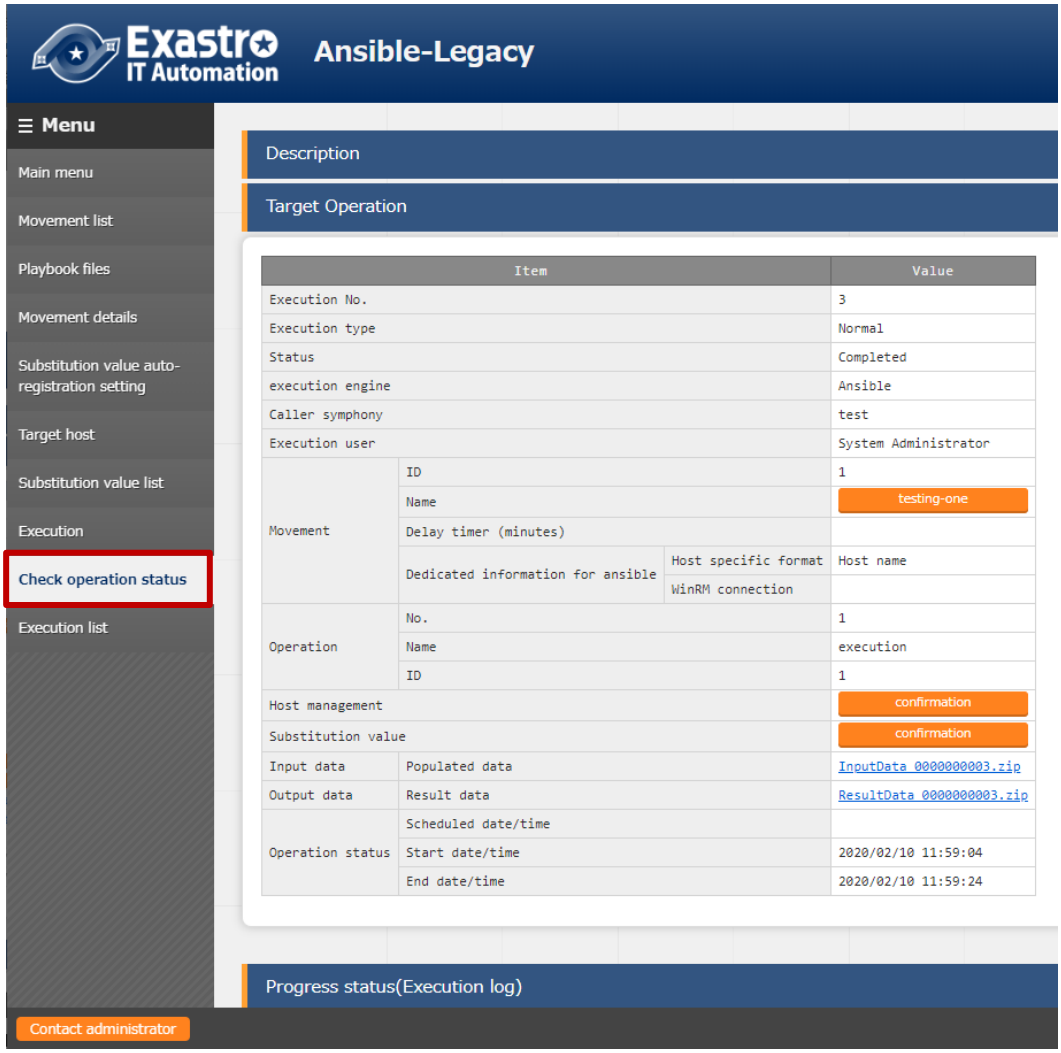


Figure 5.3-23 Submenu screen (Check operation status)

① **Display of execution status**

"Status" is displayed according to the execution status.

Also, the details of the execution status is displayed in execution log and error log

In the "execution type", "Dry run" is displayed when performing dry run, "Normal" will be displayed for other cases

If the status ends with an unexpected error, the cause is incomplete registration of web contents, message will be displayed in error log.

In addition, in the case that communication with Ansible RestAPI fails due to incomplete registration in "5.2.1 Interface information", message will not be displayed in error log.

In this case, error information will be record in application log. Please check the application log if necessary.

The symphony which the operation is executed from is displayed in "Caller symphony"

The column will be blank if the operation is executed directly from Ansible-Legacy, Pioneer, LegacyRole driver.

The login user when clicking the "execute" or "dry run" button in the "exeuction" menu will be displayed in "Execution User".

② **Host management**

By clicking the "confirmation" button, "5.3.10 Target host" will display and the host filtered by the operation and Movement of operation target will be displayed.

③ **Substitution value confirmation**

By clicking the "confirmation" button, "5.3.11 Substitution value list" will display and the substitution value filtered by the operation and Movement of operation target will be displayed.

④ **Emergnecy stop/ Schedule cancellation**

It is possible to stop the construction operation by clicking the "Emergency stop" button

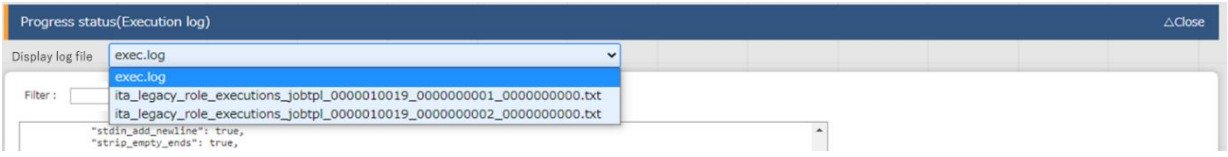
In addition, for the "scheduled execution" operation before execution, the "schedule cancellation" button will display. Cancel the scheduled execution by clicking the "schedule cancellation" button.

⑤ **Display of execution log**

When Ansible Automation Controller is executed, the Playbook is executed in units of the device to be built grouped by which item value, such as the user password instance group in the list of devices to be built and the ansible execution log is split.

In addition, by specifying the number of job slices in the optional parameters in the Movement list, the grouped device to be built is further divided by the number of job slices, the playbook is executed and the ansible execution log is also divided.

When the execution log is splited, the pull-down of the display log file will be displayed and possible to select the log file you want to display.



There are two types of log file names displayed in the pull-down of the display log file.

exec.log: This is a log file that summarizes all execution logs.

Without exec.log: Splited execution log file. The file naming conventions is as follows.

Ita_<mode name>_executions_jobtpl_<work number>_<group number>_<serial number

Table 5.3-17 Naming elements for split execution log files.

Element	Content
Modename	Executed mode name legacy/pioneer/legacy_role
Execution number	Executionnumber of execution list menu.
Group number	Serial number from 1 that is grooved by the item value of the user, password, instance groove etc. of the device list and the device to be built.
Serial number	Serial number from 1 that divides the group by setting the number of job slices. If 0, no division of job slicing was done.

⑥ **Log filter**

Execution log and error log can be filtered. By entering the string that the user wants to search in the filter box of each log and checking the "Display only corresponding lines" checkbox, only the corresponding line will be displayed.

The display refresh cycle and the maximum display line count of exeuction and error log can be set in "Status monitoring cycle (milliseconds)" and "Number of rows to display progress status" of "5.2.1 Interface information" menu.

⑦ **Input data**

Users can download files such as the executed Playbook.

Please refer to “8.1 The linkage between the input data used during Ansible execution and ITA menu” for the configuration of input data.

⑧ **Result data**

Users can download files such as execution log and error log.

5.3.13 **Execution list**

(1) The history of operation can be viewed here.
The operation list table and graph will display by specifying criteria and clicking the "filter" button.

By clicking the "Check execution status" button, the screen will transit to "5.3.12 Check operation status" and the details of execution status can be viewed.

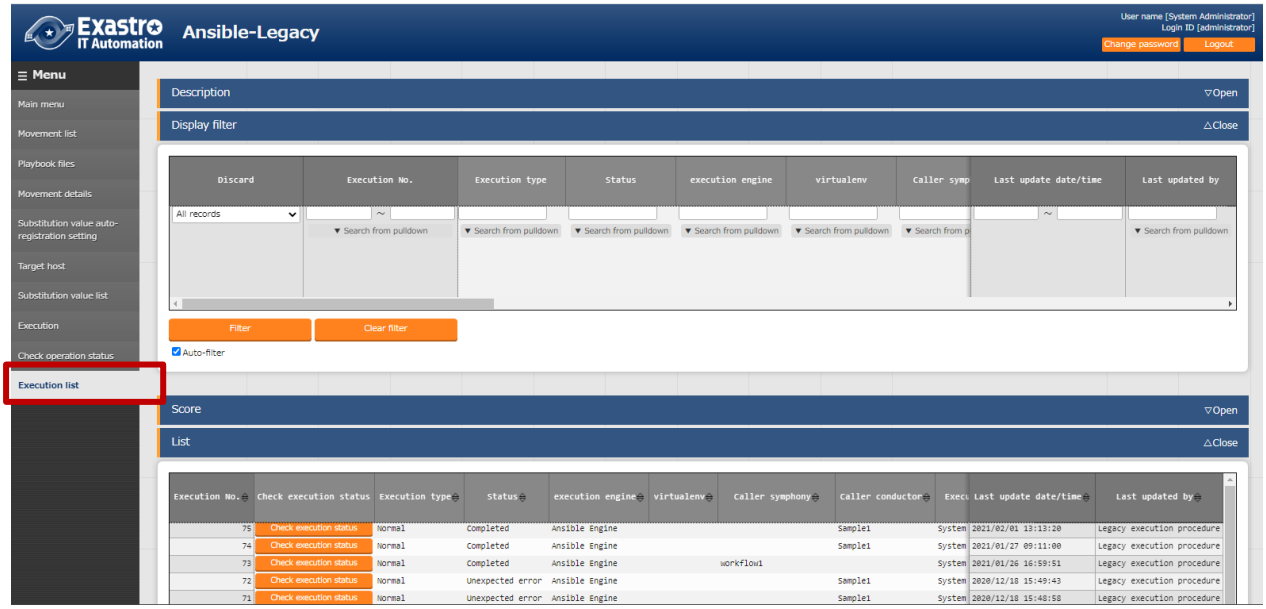


Figure 5.3-24 Submenu screen (Execution list)

5.3.14 **Execution**

(1) Indicate Operation execution. Select the radio button from the Movement list and operation list and click the execution button, the screen will transit to "5.3.12 Check operation status" and the operation will be executed.

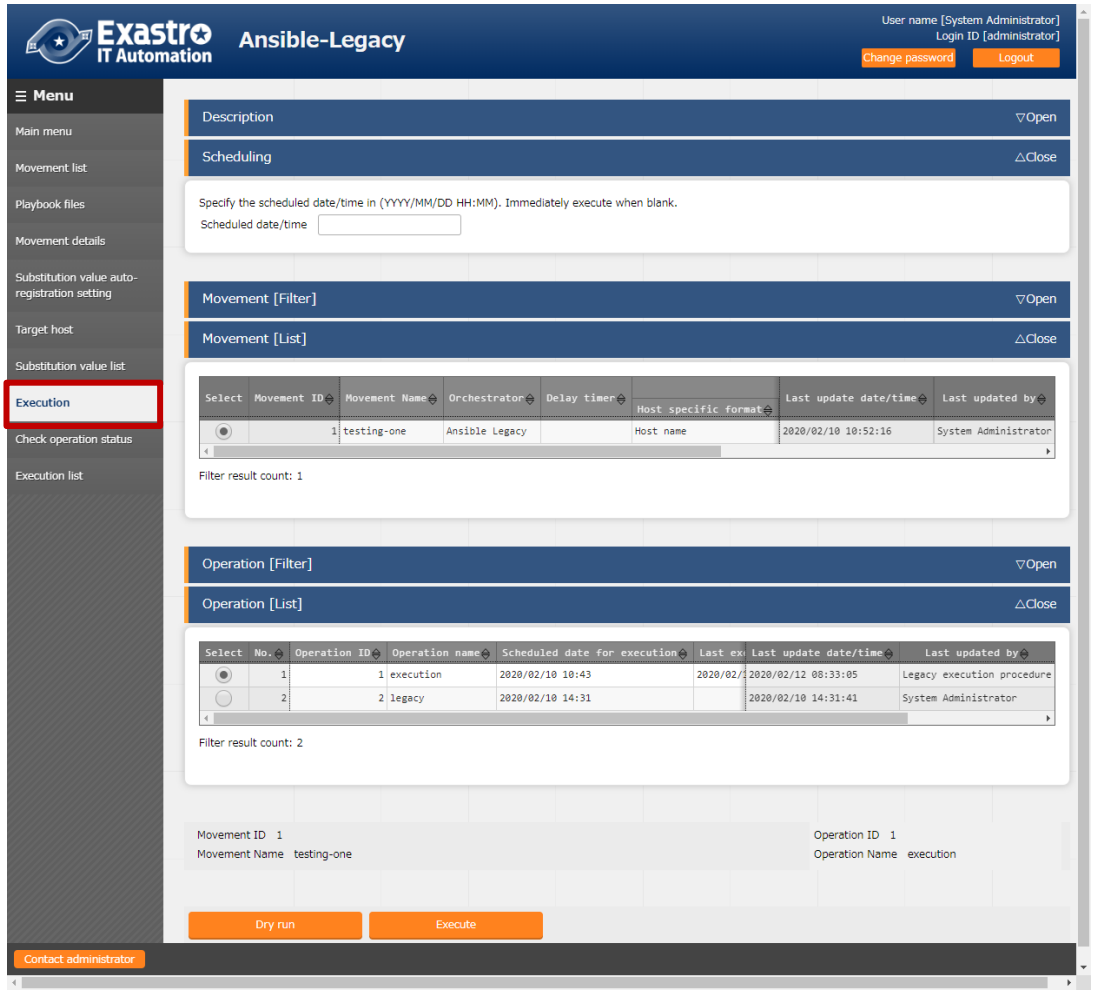


Figure 5.3-25 Submenu screen (Execution)
※The screen is from Ansible Legacy

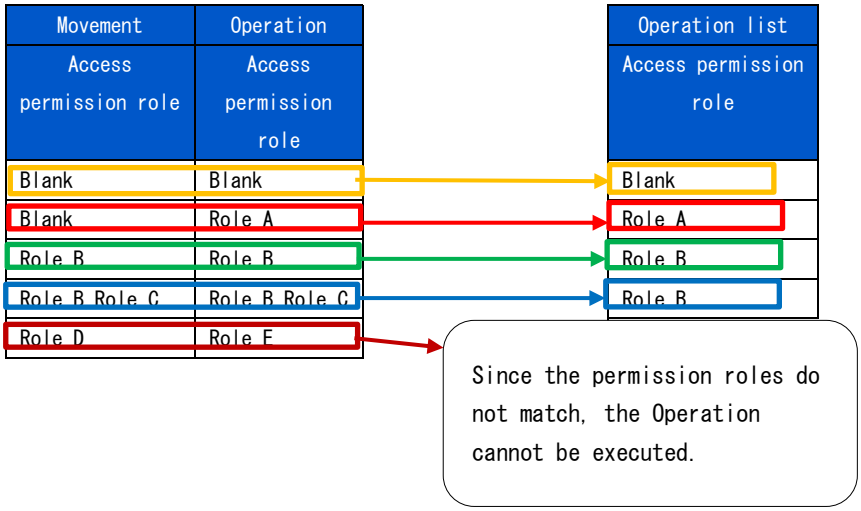
① **Dry run**
By clicking the "Dry run" button, dry run can be executed without actually constructing the target device. In the case of dry run, the operation of each mode is as follows.

Driver	Action
Ansible-Legacy	Execute the playbook by specifying the -check parameter to the Ansible-Playbook command.
Ansible-Legacy Role	Execute the role by specifying the - check parameter to the Ansible-Playbook command.
Ansible-Pioneer	Only perform the connection check to target device

② **Specify scheduled date/time**
Execution can be scheduled by entering “Scheduled date/time” column.
Only future date/time can be registered for "Scheduled date/time"

(2) Determining access permission role compatibility when executing

Determines whether there are matching roles for each access permission role in the Movement and Operations selected in the Movement list and Operations list. If there are no matching roles, an error message will be dispalyed and the operation cannot be executed. Matching roles will be set to have access to Operation lists. If the permission role is blank, all the roles will be handled as accessible. If each access permission role is blank, the operation list access permission role will be also set to blank. For more information about access permission roles, please refer to the "User_Instruction_Manual_Role-Based Access Control."



6 How to write construction code

6.1 Write Playbook (Ansible-Legacy)

Playbooks uploaded to 5.3.3 Playbook file list (Ansible-Legacy only) are included in the Playbook file generated by ITA and excuted in Include format. The Master playbook created by ITA are constructed by the Header section and the Tasks section.

(1) Header section

The playbook does not require a header section when being uploaded.

The header section has a default value, but you can change it in the header section of "5.3.2.Movement List".

Defult value of header section

・Ansible Core

```
- hosts: all
  remote_user: "{{ __loginuser__ }}  "
  gather_facts: no
  become: yes
```

・Ansible Automation Controller

```
- hosts: all
  gather_facts: no
  become: yes
```

(2) tasks section

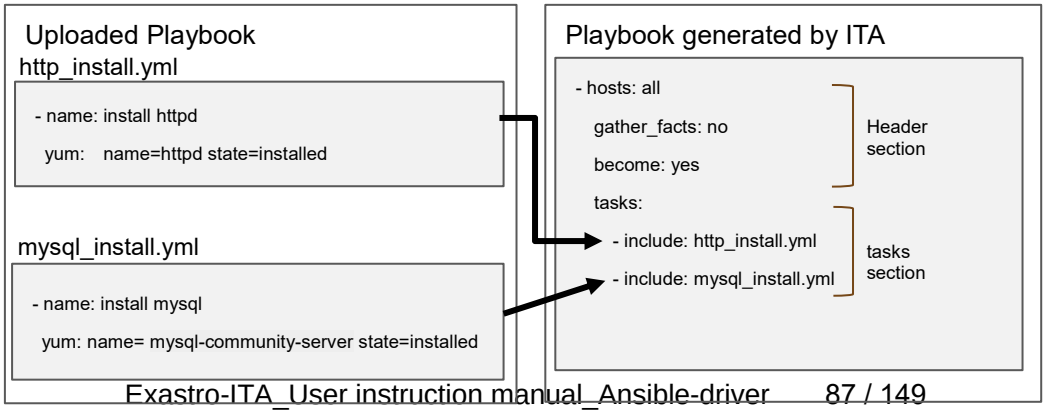
Please refer to the official manual for the basic Playbook format.

Please adjust the indent in the Playbook to multlple of 2.

Make sure the character code is UTF-8 without BOM.

```
e.g.)
-△name: comment
△△template:
△△△△src:     "{{ item.src }}"
△△△△dest:    "{{ item.dest }}"
△△△△owner: "{{ item.owner is none |ternary('root', item.owner) }}"
△△△△group: "{{ item.group is none |ternary('bacula', item.group) }}"
△△△△mode:    "{{ item.mode is none |ternary('0654', item.mode) }}"
```

Uploaded Playbooks are included in the include order of “5.3.7 Movement details”.



6.2 Write Dialog file (Ansible-Pioneer)

The dialog file in Ansible-Pioneer incorporates an ITA-specific module into Ansible.
The dialog file is in ITA-specific format.
Please use UTF-8 for the character encoding.

(1) Structure of dialog file

The dialog file is constructed with 2 types of section.

Section name	Usage
Conf	Specify the timeout value according to timeout parameter. timeout value: 1~3600(unit:second)
exec_list	Construct the target host with 4 kinds of dialog command.

Write the timeout parameter in the beginning of dialog file then write the dialog comment in the later part.
Comments can be writed in the same format with Ansible basic format.

e.g.)
Comment
conf:
△△timeout: 10
exec_list:
※△: Half-width space
Please enter 2 half-width space before “timeout:”

(2) Dialog command

There are 4 kinds of dialog commands as follows.

Module	Use
exec	Input command to the target host
expect	Waiting for the output of expected string (prompt) from the contents that the target host outputs to the standard output.
state	Input the command to target host. The contents of the standard output until the prompt is output to the standard output are analyzed by external shell, and the result is determined.
command	Loops and conditional branching can be performed before and after inputting commands to the target host.

① expect module

Waiting for the output of expected string (prompt) from the contents that the target host outputs to the standard output.
Write the expected string in regular expression.
When the expected string is received, proceed to the next. In addition, if the string is not received within the time specified by the time out parameter, the dialog file will terminate abnormally.

e.g.) Waiting for the prompt of password entry via telnet connection
△△-△expect:△’Password’
※△: half-width space
Please enter 2 half-width space before “- expect:”
It is recommended to enclose the waiting string with quotation.

② exec module

Input command to the target host.

exec module and expect module are used in pairs.

> e.g.) Wait for the password entry prompt via telnet connection and input password.
> △△-△expect:△'Password'
> △△△△exec:△itapassword
> **※△: Half-width space**
> **Please enter 4 half-width space before the description of "exec:"**
> **It is recommended to enclose the waiting string with quotation if necessary.**

③ state module

Input the command to target host. The contents of the standard output until the prompt is output to the standard output are analyzed by external shell, and the result is determined.

The format of state module

Parameter	Required/ Optional	Description
△△－△state:△xxx	Required	Specify the input command.
△△△△prompt:△xxx	Required	Specify the waiting prompt. The prompt can be writed in regular expression.
△△△△shell:△xxx	Optional	Specify the shell file name to check the result with the created shell. If the exit code of the created shell is 0, the result is determined as normal, and the others are abnormal. This parameter is not required when checking the result with default shell. The default shell will grep the contents of standard output with the string specified by parameter (-). If there is at least one matching row, the result is determined normal, and if there is no matching row, the result is determined to be abnormal. In addition, if the parameter is not specified, the result will be determined as abnormal. In the case of using the parameter to save the command result (standard output) to the file specified by stdout_file, please specifiy yes for ignore_errors.
△△△△parameter: △△△△△△-△xxx △△△△△△-△xxx	Optional	Specify the string to search for the result (standard output) of the input command. If the shell is specified, the strings will become the parameters during shell execution. Enumerate the criteria strings if there are multiple of them.
△△△△stdout_file:△xxx	Optional	The file to save the result (standard output) of the input command.
△△△△success_exit:△xxx	Optional	Please set this file to the shell parameter if the shell parameter if specified. Specify "yes" to exit the dialog normally if the search result is normal and specify no to proceed to the next. "no" is set on default.

Parameter	Required/ Optional	Description
△△△△ignore_errors: △xxx ※△:Half-width space	Optional	Specify "yes" to proceed to the next even if the search result is abnormal. "no" is set on default.

Exp2-3)
cat the hosts file and grep the displayed results with parameter value. If there is line containing 139.0.0.1 or lalhost, the result is determined as normal and proceed to the next. If there is no such line, the result is determined as abnormal and the dialog file is terminated abnormally.

```
exec_list:
  - state: 'cat /etc/hosts'
    prompt: 'root@{{ __loginhostname__ }}'
    parameter:
      - '139.0.0.1'
          - 'lalhost'
  - expect: root@{{ _loginhostname_ }}
    exec: exit
```

Exp2-4)
cat the hosts file and grep the displayed results with parameter value.If there is line containing 139.0.0.1 or lalhost, the result is determined as normal and terminate normally according to the success_exit:yes setting. If there is no such line, the result is determined as abnormal and the dialog file is terminated abnormally

```
exec_list:
- state: 'cat /etc/hosts'
    prompt: 'root@{{ __loginhostname__ }}'
    parameter:
      - '139.0.0.1'
      - 'lalhost'
    success_exit: yes
  - expect: root@{{ _loginhostname_ }}
```

Exp2-5)
cat the hosts file and grep the displayed results with parameter value.If there is line containing 139.0.0.1 or lalhost, the result is determined as normal and proceed to the next.If there is no such line, the result is determined as abnormal and proceed to the next according to the ignore_errors:yes setting.

```
exec_list:
  - state: cat /etc/hosts
    prompt: root@{{ __loginhostname__ }}
    parameter:
      - 139.0.0.1
      - lalhost
ignore_errors: yes
    - expect: root@{{ _loginhostname_ }}
```

Exp2-6)
cat the hosts file and use the user created shell to grep the displayed results with parameter value. If there is line containing 139.0.0.1 or lalhost, the result is determined as normal and proceed to the next. If there is no such line, the result is determined as abnormal and the dialog file is terminated abnormally

```
exec_list:
   - state: cat /etc/hosts
      prompt: root@{{ __loginhostname__ }}
      shell: /tmp/grep.sh
      stdout_file: /tmp/stdout.txt
      parameter:
        - 139.0.0.1
        - lalhost
```

User created shell(/tmp/grep.sh)

```
#!/bin/bash
STDOUT=/tmp/STDOUT.tmp
STDERR=/tmp/STDERR.tmp
cat /tmp/stdout.txt|grep $1|grep $2 | wc -l >${STDOUT} 2>${STDERR}
RET=$?
if [ $RET -ne 0 ]; then
      EXIT_CODE=$RET
else
      if [ -s ${STDERR} ]; then
            EXIT_CODE=1
      else
            CNT=`cat ${STDOUT}`
            if [ ${CNT} -eq 0 ]; then
                  EXIT_CODE=1
            else
                  EXIT_CODE=0
            fi
      fi
fi
```

Exp2-7)
cat the hosts file and save the displayed result to the file specified by stdout_file then proceed to the next. If the “no” parameter is set to the default shell, the result will be determined as abnormal.
Set ignore_errors:yes to proceed to the next. exec_list:

```
   - state: cat /etc/hosts
      prompt: root@{{ __loginhostname__ }}
      stdout_file: {{ __symphony_workflowdir__ }}/hosts
      ignore_errors: yes
      - expect: root@{{ _loginhostname_ }}
      exec: exit
```

④ command module

Loops and conditional branching can be performed before and after inputting commands to the target host.

Command module format

Parameter	Required/ Optional	Description
△△－△command:△xxx	Required	Specify the input command.
△△△△prompt:△xxx	Required	Specify the waiting prompt. It can be writed in regular expression.
△△△△timeout:△xxx	Optional	Specify the timer to wait for the prompt after the command is sent. If the parameter is omitted, then conf->timeout is used.
△△△△register:△xxx	Optional	Save the information of the standard output to any string specified after sending the command. When using with_items to loop, the information of the standard output after the last command input is saved. This variable can be used in condition judgment (can only be used in condition judgment). However, saving the information of standard output for every variable name is not possible. Previous information will be overwritten. 1 exec_list: 2 - expect: 'assword:' 3 exec: '{{ __loginpassword__ }}' 4 - command: 'systemctl status httpd' 5 prompt: '{{ __loginuser__ }}@{{ __loginhostname__ }}' 6 register: httpd_status_register 7 - command: 'systemctl restart httpd' 8 when: 9 - httpd_status_register no match(running) 10 prompt: '{{ __loginuser__ }}@{{ __loginhostname__ }}' 11 - command: 'systemctl status mysql' 12 prompt: '{{ __loginuser__ }}@{{ __loginhostname__ }}' 13 register: mysql_status_register 14 - command: 'systemctl restart mysql' 15 when: 16 - mysql_status_register no match(running) 17 prompt: '{{ __loginuser__ }}@{{ __loginhostname__ }}' 18 - expect: '{{ __loginuser__ }}@{{ __loginhostname__ }}' 19 exec: exit Since the 6th line, httpd_status_register, has a different value set to the Register variable in the command module on line 11 (mysql_status_register), it is valid all up until line 10.
△△△△with_items: △△△△△△-△'{{ VAR_x }}' △△△△△△-△'{{ VAR_y }}' Enclose the defining variables in single quotation marks.	Optional	If you're looping and inputting commands to with_items, configure multiple variable names. The scope of each variable is "item.X(X is 0-99). If you using with_items with prompt, timeout, refer to the following for variable names prompt: {{△VAR_prompt_XXX△}} timeout: {{△VAR_timeout_XXX△}}

Parameter	Required/ Optional	Description
		(△ =half-width space. XXX=any half-width alphabetic characters and underscore) If the number of variable's specific values set to with_items are not the same, it will loop at the maximum number of specific values. If there are any variables that does not have any specific values, they will have their specific value set to "blank". Additionally, if you're using with_items with Prompt or Timeout, pay attention to the numbers of specific values. promt->command->prompt->command->prompt...(Loop) As it will loop like this, you will need to set 1 additional specific value (Number of commands+1). If there are any prompt or timeout variables that does not have specific values set, an error will occur when the operation is executed. If you want to run the following command with Command module, ・systemctl start httpd ・systemctl start mysql The dialogue file and the specific values of the variables used in with_items are as follows. - command: "systemctl {{ item.0 }} {{ item.1 }}" prompt: '{{ item.2 }}' timeout: '{{ item.3 }}' with_items: - '{{ VAR_status_list }}' # item.0 - '{{ VAR_service_list }}' # item.1 - '{{ VAR_prompt_list }}' # item.2 - '{{ VAR_timeout_list }}' # item.3 VAR_status_list: VAR_service_list: - start - httpd - start - mysql VAR_prompt_list: VAR_timeout_list: - Command prompt - 10 - Command prompt - 10 - Command prompt - 10 The variables defined with with_items can be scoped with item.X (other than register/when) Exp） with_items: — '{{ VAR_item1 }}' **#item.0** — '{{ VAR_item2 }}' **#item.1** exec_when: — '{{ item.0 }} == active' — '{{ item.0 }} == {{ VAR_status }}' — 'register 変数 match({{ item.0 }})

Parameter	Required/ Optional	Description
		failed_when: — ‘stdout match({{ item.1 }})’
△△△△when: △△△△△△-△xxx △△△△△△-△xxx	Optional	The condition judgement before command executes. Execute command if the condition matches. Move to the next “command” line if the condition doesn't match. Conditional expression Judging variable definition VAR_xx is define Variable defined true VAR_xx is undefined Variable undefined true Exp) — ‘VAR_status is define’ — ‘VAR_status is undefine’ ※define/undefine can be specified only for ITA variable(VAR_xx) Judging variable specific value VAR_xx/register variable relational_operator string VAR_xx/register variable relational_operator VAR_xx VAR_xx/register variable match(Regular expression string /VAR_xx) VAR_xx/register variable no match(Regular expression string /VAR_xx) ※Relational operators are「==」、「!=」、「>」、「>=」、「<」、「<=」 ※The「>」、「>=」、「<」、「<=」 relational operators are assumed to be used for numerical values. ※It is not required to enclose string and regular expression string with single or double quotations. — ‘{{ VAR_status }} match(active)’ — ‘{{ VAR_status }} == active’ — ‘register variable match(active)’ Compound condition with and / or When processing with or condition, add OR between judge conditions Exp） — ‘{{ VAR_status }} == 1 OR {{ VAR_status }} == 2’ When processing with and condition, write the statement in multiple lines. Exp） — ‘{{ VAR_status }} == 1 OR {{ VAR_status }} == 2’ — ‘{{ VAR_sub_status }} == 1’
△△△△exec_when: △△△△△△-△xxx △△△△△△-△xxx	Optional	Judge condition for every loop (continue condition) Perform condition judgement if with_items is writed. If the condition matches, execute command of the corresponding loop. If the condition doesn't match, move on to the next loop. Conditional expression Same format as “when:”
△△△△failed_when: △△△△△△-△xxx △△△△△△-△xxx	Optional	Condition judgment for the stdout content after command execution(for every loop) Perform condition judgment even if with_items is not writed

Parameter	Required/ Optional	Description
※△: half-width space		If the condition matches, the result is normal If the condition doesn't match, the result is abnormal and the dialog file is terminated abnormally Conditional expression Judging variable specific value stdout relational_operator string stdout relational_operator VAR_xx stdout match(regular expression string/VAR_xx) stdout no match(regular expression string/VAR_xx) ※Relational operators are 「==」、「!=」、「>」、「>=」、「<」、「<=」 ※The 「>」、「>=」、「<」、「<=」 relational operators are assumed to be used for numerical values. ※It is not required to enclose string and regular expression string with single or double quotations. VAR_status match(active) VAR_status == active Compound condition with and / or Same format as “when:”

```
Exp3-1)
conf:
  timeout: 30

exec_list:
# If waiting for strings other than prompt is required, use the combination of expect/exec.
# In the case that the password is required.
  - expect: 'password:'
    exec:    '{{ __loginpassword__ }}'

# If the ITA variable, VAR_hosts_make, is writed in host variable file, cat the host file.
# If the variable is not writed, skip the command.
 - command: cat /etc/hosts
    prompt: root@{{ __loginhostname__ }}
    when:
      - VAR_hosts_make is define
  - expect: root@{{ __loginhostname__ }}
    exec: exit
```

```
Exp3-2)
conf:
  timeout: 30

exec_list:
# If waiting for strings other than prompt is required, use the combination of expect/exec.
# In the case that the password is required.
  - expect: 'password:'
    exec:     '{{ __loginpassword__ }}'

# If the ITA variable, VAR_hosts_make, is writed in host variable file, cat the host file.
# If the variable is not writed, skip the command."
# Use cat to save the contents of the standard output hosts file to result_stdout.
  - command: cat /etc/hosts
    prompt: root@{{ __loginhostname__ }}
    register: result_stdout
    when:
      - VAR_hosts_make is define

# If the ITA variable, VAR_hosts_make, is writed in host variable file, cat the host file.
# If the variable is not writed, skip the command.
# Execute the command for the numbers of the specific values of the multiple specific value
# variable set in the with_items.
# From the result of condition judgment for each loop, if "ip address host name" does not
# correspond to the hosts file, execute command.
# Add "IP_address host_name" to the last line of hosts file by using echo.
  - command: 'echo {{ item.0 }}    {{ item.1 }} >> /etc/hosts'
    prompt: 'root@{{ __loginhostname__ }}'
    when:
      - VAR_hosts_make is define
    with_items:
      - '{{ VAR_hosts_ip }}'          # item.0
      - '{{ VAR_hosts_name }}'     # item.1
    exec_when:
      - result_stdout no match({{ item.0 }} *{{ item.1 }})

  - expect: root@{{ __loginhostname__ }}
    exec: exit
```

```
Exp3-3)
conf:
  timeout: 30

exec_list:
# If waiting for strings other than prompt is required, use the combination of expect/exec.
# In the case that the password is required.
  - expect: 'password:'
    exec:     '{{ __loginpassword__ }}'

# Execute the command for the numbers of the specific values of the multiple specific value
# variable set in the with_items
# Execute auto startup configuration.
  - command: 'systemctl enable {{ item.0 }}'
    prompt: 'root@{{ __loginhostname__ }}'
    with_items:
      - '{{ VAR_service_name_list }}'   # item.0

# Execute the command for the numbers of the specific values of the multiple specific value
# variable set in the with_items
# Execute service startup
  - command: 'systemctl start {{ item.0 }}'
    prompt: 'root@{{ __loginhostname__ }}'
    with_items:
      - '{{ VAR_service_name_list }}'   # item.0

Execute the command for the numbers of the specific values of the multiple specific value
variable set in the with_items.
Output the service status to standard output.
If the content of result output to standard output contains the regular expression of item.1, the
result is right.
For example, in the case that the specific value of VAR_service_status_list is set to running and
the service is running, "running" in "Active: active(running)" matches so the result is right. (Move
on to the next loop)
In the case that condition doesn't match, the result is determined as abnormal and the dialog
file terminates abnormally.
   - command: 'systemctl status {{ item.0 }}'
    prompt: 'root@{{ __loginhostname__ }}'
    with_items:
      - '{{ VAR_service_name_list }}'   # item.0
      - '{{ VAR_service_status_list }}'   # item.1
    failed_when:
      - stdout match({{ item.1 }})

  - expect: root@{{ __loginhostname__ }}
    exec: exit
```

```
Exp3-4)
conf:
  timeout: 30

exec_list:
# If waiting for strings other than prompt is required, use the combination of expect/exec.
# In the case that the password is required.
  - expect: 'password:'
    exec:     '{{ __loginpassword__ }}'

# Execute the command for the numbers of the specific values of the multiple specific value
# variable set in the with_items.
# When describing the command with "{{item.0}}" only, enclose it with double-quotation.
# Please note the numbers of specific value when using with_items in prompt or timeout.
# prompt→command→prompt→command→prompt…(loops thereafter), it is required to plus 1
# to the command count. (Same for timeout)
  - command: "{{ item.0 }}"
    prompt: '{{ item.1 }}'
    timeout: '{{ item.2 }}'
    with_items:
      - '{{ VAR_command_list }}'    # item.0
      - '{{ VAR_prompt_list }}'     # item.1
      - '{{ VAR_timeout_list }}'    # item.2
   - expect: root@{{ __loginhostname__ }}
    exec: exit
```

Exp5)

Variable name	Specific value
VAR_command_list	systemctl status {{ item.1 }}
VAR_service_name_list	ky_pioneer_execute-workflow.service

```
conf:
   timeout: 30

exec_list:
# If waiting for strings other than prompt is required, use the combination of expect/exec.
# In the case that the password is required.
   - expect: 'password:'
     exec:     '{{ __loginpassword__ }}'

# Execute the command for the numbers of the specific values of the multiple specific value
# variable set in the with_items.
# Setting the specific value of substitution value list to {{item.X}} is possible. In that case, please
# make the numerical value writed in the specific value of item.X which is writed in the
# dialog file grows.
# The command executed in this example is "systemctl status ky_pioneer_execute-workflow.service".
   - command: "{{ item.0 }}"
     prompt: 'root@{{ __loginhostname__ }}'
     with_items:
        - '{{ VAR_command_list }}'          # item.0
        - '{{ VAR_service_name_list }}'   # item.1
   - expect: root@{{ __loginhostname__ }}
     exec: exit
```

```
Exp6)
conf:
  timeout: 30

exec_list:
# If waiting for strings other than prompt is required, use the combination of expect/exec.
# In the case that the password is required.
  - expect: 'password:'
    exec:     '{{ __loginpassword__ }}'

# Example of compound condition using and / or.
# When processing with or condition, write the if statement horizontally.
# When processing with and condition, describing the statement in multiple lines.
# "when" is used as the example here but the same applies to exec_when and failed_when.
  - command: echo aaa
    prompt: 'root@{{ __loginhostname__ }}'
    when:
      - 10 == 9 OR 10 != 9 OR 10 >= 9
      - 10 > 9 OR 10 <= 9 OR 10 < 9

  - expect: root@{{ __loginhostname__ }}
    exec: exit
```

and condition

⑤ localaction module

Execute command on Ansible/Ansible Automation Controller server.

Localation module format

Parameter	Reguired/ Optional	Description
△△－△localaction:△xxx	Required	Specifiy the command to be executed.
△△△△ignore_errors:△xxx ※△:Half-width space	Optional	Specify “yes” to continue if the execution result of the command is abnormal. If “no” is specified, the dialog will end if the result of execution is abnormal. Default is “no”.

Exp4-1)
During Symphony execution, create a directory to output the hosts file for every host in the shared directory ({{ __symphony_workflowdir__ }}) of each Movement.

```
exec_list:
  - localaction: mkdir -p 755 {{ __symphony_workflowdir__ }}/{{ __loginhostname__ }}
    ignore_errors: yes
  - state: cat /etc/hosts
    prompt: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
    stdout_file: {{ __symphony_workflowdir__ }}/{{ __loginhostname__ }}/hosts
    ignore_errors: yes
  - expect: root@{{ _loginhostname_ }}
      exec: exit
```

(3) Regular expression

The strings writed in the following command and parameter are evaluated in regular expression.

- ・expect module
- ・The prompt parameter of state module
- ・The prompt parameter of command module

When the string is writed in regular expression contains metacharacter "(){}.", etc., inserting escape character "¥" before metacharacters is required.

Exp1)
When waiting for the following command, the red characters are metacharacters.
XAMPP Developer Files [Y/n] exec_list:
Inserting escape character "¥" before metacharacters is required.
XAMPP Developer Files ¥[Y¥/n¥] exec_list:

State module and command module extracts the result (standard ouput) of the executed command. The notes of the extraction are as follows.

① The delimitation between the result (standard ouput) of the executed command and the prompt.
The delimitation between the result (standard ouput) of the executed command and the prompt is performed by the string specified in the prompt parameter. When judging the result of the executed command (standard output) or saving it to a file, please do not write a preceding match with .* in regular expression. The result (standard ouput) of the executed command can not be extracted.

.* Example of preceding match with .* in regular expression.
‘.*[¥#¥$¥%] $’

② Support of escape sequence
Depending on the target device, an Operating System Command sequence may be added immediately before the prompt sent from the target device.
Escape sequences immediately before the string specified by the prompt parameter are excluded.

(4) Notes when using multiple specific value variable

The only parameter in the dialog file that can use multiple specific value variable is the with_items parameter of command module. If multiple specific value variable is used in other cases, the operation execution will turn out to be error.

(5) Things to be aware of when processing prompts other than command prompts.
If you want to process prompts other than command prompts, combine exec module and expect module and create a dialogue file.
Command and State modules cannot be processed.

Exp)
Process ssh-keygen in a dialogue file

Variable	Specific Value
VAR_id_rsa_path	Set file path of the secret key
VAR_passphrase	Set passphrase

If you want it to return
If you are using variables, leave the specific values blank.
If you are not using variables, input an empty string (with two quotations).。
exec: ''

```
conf:
  timeout: 10


exec_list:
  # ssh connection  Password authentication
  - expect: 'assword:'
    exec: '{{ __loginpassword__ }}'

  # ssh-keygen command execution
  - expect: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
    exec: ssh-keygen

  # The following is the process for prompts other than the command prompt.
  # Set file path of the secret key
  # Since expect is evaluated in regular notation, the escape character (¥) must be inserted for meta characters that need to be escaped.
  - expect: 'id_rsa¥):'
    exec: '{{ VAR_id_rsa_path }}'

  # Set passphrase
  - expect: ' passphrase¥):'
    exec: '{{ VAR_passphrase }}'

  # Confirm passphrase
  - expect: ' passphrase again:'
    exec: '{{ VAR_passphrase }}'

  # Confirm the created secret key file.
  - expect: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
    exec: 'ls -al {{ VAR_id_rsa_path }}'

  # Close ssh connection
  - expect: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
    exec: exit
```

(6) Things to be aware of when ending dialogue files.

Make sure to input a command that ends the session at the end of the dialogue file.

Ending the last line of the module closes the session.

If the final line is a file copy or any other process that takes time, the session will close before the command is finished and may end up ending abnormaly.

```
Exp)
conf:
  timeout: 10

exec_list:
  # ssh connection  password authentication
  - expect: 'assword:'
    exec: '{{ __loginpassword__ }}'

  # File copy
  - expect: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
    exec:  ‘cp -rfp {{ VAR_src_path }} {{ VAR_dest_path }}

  # Write a line that waits for the previous command to end in the command prompt and inputs
an exit command at the end of the dialogue file.
  - expect: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
    exec: exit
```

(7) Things to keep in mind when writing dialogue files in yaml format.

Dialogue files are treated as yaml format files.If there are lines or descriptions that do not follow the YAML format, an error will occur when uploading the dialogue module or when executing the operation. See example below.

・If a variable is written in the parameter of each module and the whole parameter is not enclosed in quotation marks.

・If the parameters are only written in constants, the constant doesnt end in ":", or other cases where parameters are not enclosed in quotations.

We recommend to enclose all the module parameters in quotation marks.

Example when not written in YAML Format
(Red text)

```
- expect: assword:
  exec:  {{ __loginpassword__ }}
- expect: {{ __loginuser__ }}@{{ __loginhostname__ }}
  exec: ls
- command: echo {{ item.0 }}
  prompt: {{ __loginuser__ }}@{{ __loginhostname__ }}
  exec_when:
    - {{ item.1 }} == run
  with_items:
    - {{ VAR_echo }}
    - {{ VAR_exec_when }}
    - {{ VAR_failed_when }}
  failed_when:
    - stdout == match({{ item.2 }})
- state: {{ VAR_command }}
  prompt: {{ __loginuser__ }}@{{ __loginhostname__ }}
  parameter:
    - {{ VAR_p1 }}
    - {{ VAR_p2 }}
```

Closing the parameters when the description is not written in YAML format.

```
- expect: 'assword:'
  exec:  '{{ __loginpassword__ }}'
- expect: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
  exec: 'ls'
- command: 'echo {{ item.0 }}'
  prompt: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
  exec_when:
    - '{{ item.1 }} == run'
  with_items:
    - '{{ VAR_echo }}'
    - '{{ VAR_exec_when }}'
    - '{{ VAR_failed_when }}'
  failed_when:
    - stdout == match({{ item.2 }})
- state: '{{ VAR_command }}'
  prompt: '{{ __loginuser__ }}@{{ __loginhostname__ }}'
  parameter:
    - '{{ VAR_p1 }}'
    - '{{ VAR_p2 }}'
  success_exit: 'yes'
```

Variables listed in with_items should be enclosed in single quotes.

(8) LANG for the construction device's login user

The Login user's "LANG" supports the following: UTF-8/euc/shift_jis.

The Login user's "LANG" settings must be configured from the device list.

If "euc" or "shift_jis" i used, the dialogue file may not be processed correctly due to the characteristics of the decoding process to UTF-8 of the pexpect module used in the communication control with the device.

・Some full-width characters(such as "①②" cannot be used with the UTF-8 decoder. Characters that are not decodable will be displayed as "??".

(3) ・When some full-width characters (such as " -, etc") are used in prompt waiting,

The waiting will end successfuly if the LANG is "UTF-8". If it is "euc/shift_jis" the wait will time out.

(9) Termination codes for commands input to the Construction device.

The Command's termination codes is "LF".

If it is "CRLF", add "/r" to the end of the command.

```
conf:
  timeout: 10
exec_list:
  - expect: 'password:'
    exec:   'XXXXXXXX¥r'
  - command: '{{ VAR_command }}¥r"
    prompt:  '{{ __loginuser__ }}@{{ __loginhostname__ }}'
  - state:   '{{ VAR_state }}¥r'
    prompt:  '{{ __loginuser__ }}@{{ __loginhostname__ }}'
    parameter:
      - '{{ VAR_parameter1 }}'
      - '{{ VAR_parameter2 }}'
```

6.3 Write role package (Ansible-Legacy Role)

Please refer to the Ansible best practices official manual for the basic format.
Please use UTF-8 for the character encoding.
This section writes the directory that is required to be in the zip file of role package file uploaded in "5.3.4 Role package list (Ansible-Legacy Role only)" and the process in ITA.

(Parent directory)

├─site.yml — site.yml(master Playbook) is created in ITA.
The file will be overwritten if exists.

├─hosts — hosts file is created in ITA.
The file will be overwritten if exists.

├─group_vars — host group variables are not handled.
The group_vars directory will be removed if exists.

├─host_vars — Host variables are created in ITA.
This directory will be overwritten if it exists.

├─ITA readme — ITA readme is defined for every role. Error doesn't occur even if the file deosn't exist
The naming rule of ITA readme file name:
ita_readme_[role_name].yml
e.g.)
Role name: mysql — File name: ita_readme_mysql.yml
Role name: mysql/install — File name: ita_readme_mysql%install.yml
※If role is in a deep directory hierarchy,
replacing "/" in the role name with "%" is required.

├─translation table — Translation table is defined for every role. Error doesn'st occur even if the file deosn't exist
The naming rule of translation table file name
ita_translation-table_[role_name].txt
e.g.)
Role name: mysql — File name: ita_translation-table_mysql.txt
Role name: mysql/install — File name: ita_translation-table_mysql%install.txt
※If role is in a deep directory hierarchy,
replacing "/" in the role name with "%" is required.

ITA does not concern if other directory or file exists other the directory or file above.

└─roles — Error occur during upload if the roles directory does not exist.

├─[role name①] — Error occur during upload if the role name directory does not exist.

```
|   |                       Handle the directory containing tasks directory as a role.
|   |                       Errors doesn't occur even if the directory hierarchy is deep.
|   |
|   ├─readme.md           ITA does not concern with the file.
|   ├─tasks               The tasks directory is required.
|   |   ├ main.yml        Error occur during upload if main.yml does not exist.
|   |   └ user_files      Files other than main.yml can be placed here.
|   |       └ user.yml    Files other than main.yml can be placed in subdirectory.
|   |
|   ├─handlers            Doesn't concern if handlers directory exists or not.
|   |   ├ main.yml        Doesn't concern if main.yml exists or not
|   |   └ user_files      Files other than main.yml can be placed here.
|   |     └ user.yml      Files other than main.yml can be placed in subdirectory.
|   |
|   ├─templates           Doesn't concern if templates directory exists or not.
|   |   ├ hosts.j2        Files can be placed in subdirectory.
|   |   └ user_files
|   |     └ user.j2
|   |
|   ├─files               Doesn't concern if files directory exists or not.
|   |   sudoers           Doesn't concern if file and subdirectory exists or not.
|   |                     The file content is not concerned.
|   |
|   ├─vars                Doesn't concern if vars directory exists or not.
|   |   main.yml          Doesn't concern if file and subdirectory exists or not.
|   |                     The file content is not concerned.
|   |
|   ├─defaults            Doesn't concern if defaults directory exists or not.
|   |   ├ main.yml        Doesn't concern if main.yml exists or not.
|   |   └ user_files      Files other than main.yml can be placed here.
|   |     └ user.yml      Files other than main.yml can be placed in subdirectory.
|   |
|   ├─meta                Doesn't concern if meta directory exists or not.
|   |   main.yml          Doesn't concern if file and subdirectory exists or not.
|   |                     The file content is not concerned.
|   |
|   ITA does not concern if other directory or file exists other the directory or file above.
|
└─[role name②]            There is no specific limit on the number of roles.
```

(1) Master playbook

The master Playbook you create in ITA consists of a hedder section and a roles section.

① header section

The default value of the header section is fixed, but you can change it in the header section of "5.3.2. Movement list".

Defult value of vector section

・For Ansible engine

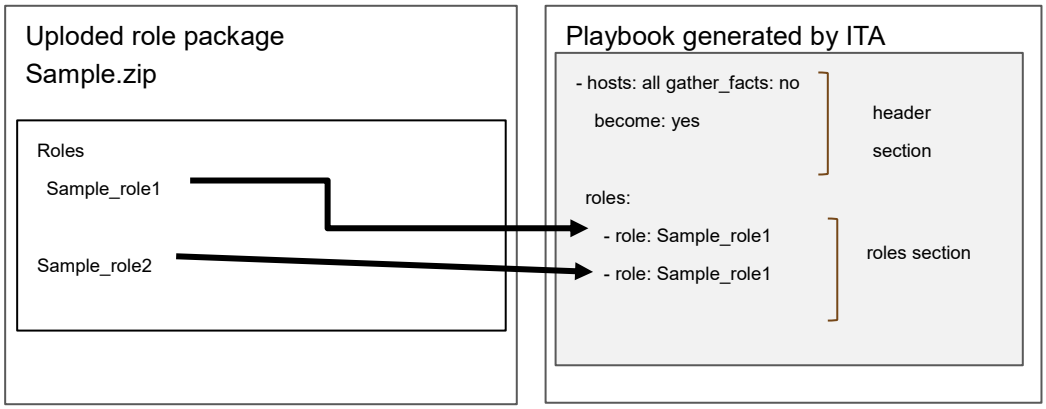
```
- hosts: all
  remote_user: "{{ __loginuser__ }}  "
  gather_facts: no
  become: yes
```

・For AnsibleTower

```
- hosts: all
  gather_facts: no
  become: yes
```

② roles section

Execute the roles in the uploaded role package in the role according to the included order in "5.3.7Movement details".



(2) Unique management of variable name

The variable information registered in the substitution value list of ITA is handled as host variable.

Variable names in all role packages of each drivers are uniquely managed.

When using same the variable name between roles with different variable structure, error will occur during upload

For example, in the case that the normal variable and nested variable or the nested structure is different between nested variables, etc.

(3) ITA original specification of default variable definition file (defaults-> main.yml)

There is ITA original specification of the description (variable definition) of default variable definition.

Please refer to the attachment file "User Instruction Manual - Ansible-driver attachment Ansible usage guideline with additional rules" for details.

(4) Notes on subdirectories of a predetermined directory in Ansible Role Directory Structure

If a subdirectory that has the same name of the predetermined directory is created under the predetermined directory in Ansible Role Directory structure (For example, a "files" directory under the "files" directory, etc.), error will occur during operation execution.

(5) Points to note when the role name in the role package is set to the directory hierarchy.
The following directory hierarchy role package will be explained as an example.

```
└──roles
   ├──parent
   │    ├──sample_role1
   │    │    ├──defaults
   │    │    └──tasks
   │    └──sample_role2
   │         ├──defaults
   │         ├──sample_role3
   │         │    ├──defaults
   │         │    └──tasks
   │         ├──sample_role4
   │         │    ├──defaults
   │         │    └──tasks
   │         └──tasks
   ├──sample_role5
   │    └──defaults
   └──sample_role6
        ├──defaults
        └──tasks
```

① The directory recognized as a role is the directory containing the tasks directory.
In this example. There are three directory hierarchies (role names) to be handled by roles.
In this example. There are three directory hierarchies (role names) to be handled by roles.
・parent/sample_role1
・parent/sample_role2
・sample_role6

② Exclude directory hierarchies with multiple tasks directories
There are tasks directories in parent/sample_role2/sample_role3 and parent/sample_role2/sample_role4, but parent/sample_role2 has a tasks directory and recognizes it as a role, so it is not handaled as a role.

6.4 Write ITA readme (Ansible-Legacy Role only)

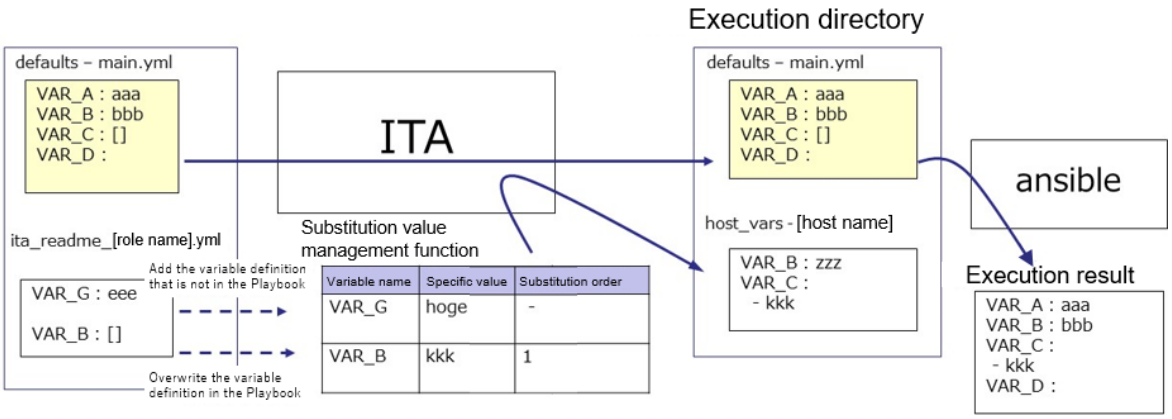
The substitution value management function interpretes the variable type defined in defaults variable definition file and sets the variable value of each variable and its' member variable.

In the cases such as not wanting to define variable directly in the Playbook, etc. if variable is not defined in defaults variable definition file, variable value can be specified in the substitution value management function by setting the variable definition in ITA readme file.

(1) Naming rule of file name of ITA readme
ita_readme_[role name].yml
e.g.)
Role name: mysql File name: ita_readme_mysql.yml
Role name: mysql/install File name: ita_readme_mysql%install.yml
※If the role's directory hierarchy is deep, it is necessary to replace "/" in the role name with "%".

(2) The format of translation table
The format is YAML format.
Make sure the character code is UTF-8 without BOM.

The relation between ITA readme file and substitution value management function is as the following figure.



If the variable that is not in Playbook is defined in ITA readme file, the value of defined variable can be set in the substitution value management function.
Furthermore, if a type different from the variable in the Playbook is defined in the ITA readme file, the value can be registered in the substitution value management function with the overwritten variable type.

The value set in the substitution value management function is output to the variable definition file (host_vars) of each host, and is executed on each host by using the original Playbook and variable definition file as input in Ansible.

ITA readme file is only used to provide variable definition to substitution value management function, the variable and variable value defined in ITA readme don't affect the excecution of Ansible.

It is optional to create ITA readme. If the variable definition in ITA readme and defaults variable definition file overlaps, the following rules will be used to handle the situation.

Table 6.4-1 variable adoption rule

defaults variable definition file	ITA readme	Adoption source of variable definition
defined	undefined	defaults variable definition file
undefined	defined	ITA readme
defined	defined	ITA readme

In addition, the default value displayed in "5.3.11 Substitution value list" is processed following the rule below.

Table 6.4-2 default value display rule

defaults variable definition file	ITA readme	The method to handle the default value
defined	undefined	Adopt the defaults variable definition file.
undefined	defined	Handle as no default value.
defined	defined	Adopt the defaults variable definition file. However, the rule is applied only when the definition variable matches. If the variable definition doesn't match, the variable is handled as no default value.

ITA readme is seperated from role package during work execution.
The variable and specific value registered in ITA readme can't be applied.

6.5 Write translation table (Ansible-Legacy Role only)

The translation table is a file set for making setting the specific value of variable other than "VAR_xxx" defined in defaults varaiable definiton file or ITA readme in "5.3.11 Substitution value list" possible.
Define the link between the “arbitrary variable” defined in the default variable definition file or ITA readme with the “substitution variable” handled in substitution management function.

(1) Naming rule of file name of ITA readme

ita_readme_[role name].txt

e.g.)

Role name: mysql File name: ita_translation-table_mysql.txt

Role name: mysql/install File name: ita_translation-table_mysql%install.txt

※If the role's directory hierarchy is deep, it is necessary to replace "/" in the role name with "%".

(2) The format of translation table

The format is as follows in text format.

Make sure the character code is UTF-8 without BOM

The combination of substitution variable and arbitrary variable has to be unique within single role.

Substitution variable($s*):($s+)arbitrary variable

substitution variable：LCA_***

***：half-width alphanumeric character and underscore(_) can be used.
(Minimum length: 1byte, Maximum length: 256 bytes)

Arbitrary variable: (Minimum length: 1byte, Maximum length: 256 bytes)

($s*)： More than 0 half-width space

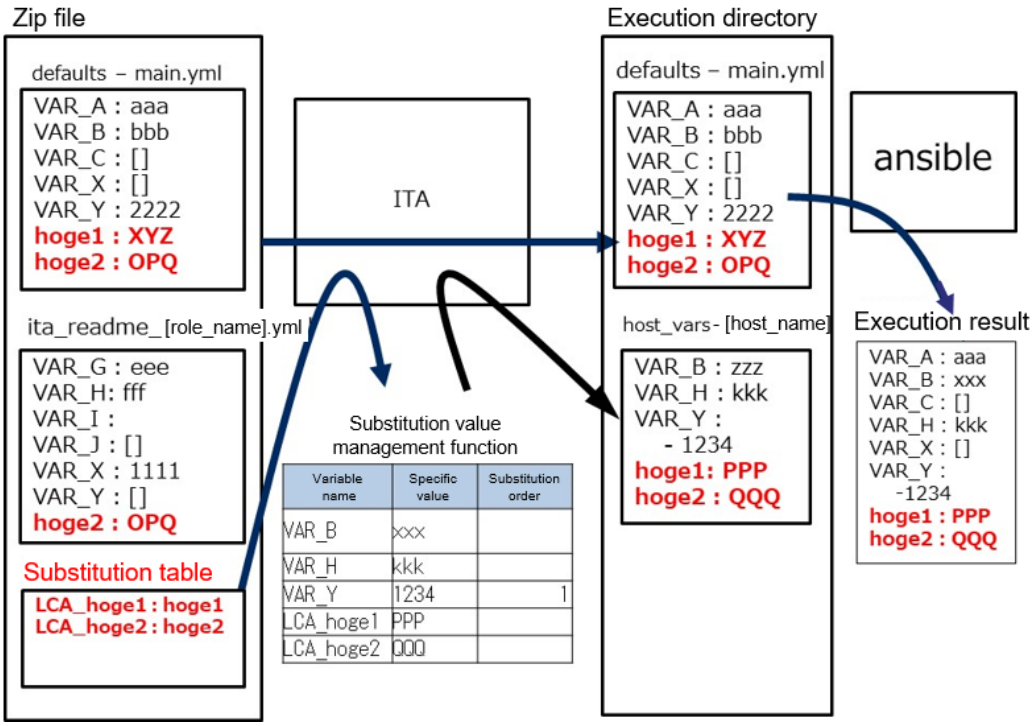
($s+)： More than 1 half-width space

e.g.)

LCA_var1: var1

The line starts with # is comment line

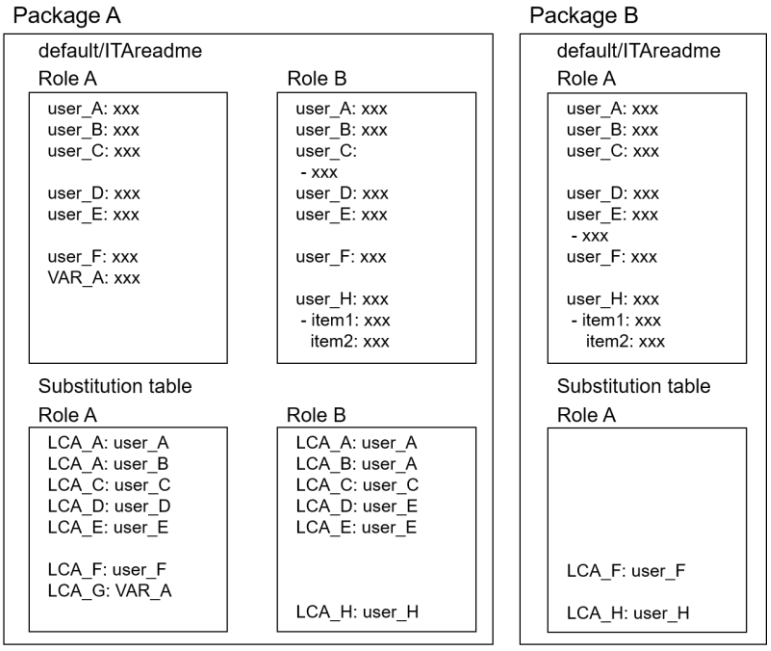
The relationship of substitution value management function is as the following figure.


Zip file
defaults – main.yml
VAR_A : aaa
VAR_B : bbb
VAR_C : []
VAR_X : []
VAR_Y : 2222
hoge1 : XYZ
hoge2 : OPQ
ita_readme_[role_name].yml
VAR_G : eee
VAR_H: fff
VAR_I :
VAR_J : []
VAR_X : 1111
VAR_Y : []
hoge2 : OPQ
Substitution table
LCA_hoge1 : hoge1
LCA_hoge2 : hoge2
ITA
Substitution value management function
Variable name
Specific value
Substitution order
VAR_B
xxx
VAR_H
kkk
VAR_Y
1234
1
LCA_hoge1
PPP
LCA_hoge2
QQQ
Execution directory
defaults – main.yml
VAR_A : aaa
VAR_B : bbb
VAR_C : []
VAR_X : []
VAR_Y : 2222
hoge1 : XYZ
hoge2 : OPQ
host_vars - [host_name]
VAR_B : zzz
VAR_H : kkk
VAR_Y :
- 1234
hoge1: PPP
hoge2 : QQQ
ansible
Execution result
VAR_A : aaa
VAR_B : xxx
VAR_C : []
VAR_H : kkk
VAR_X : []
VAR_Y :
-1234
hoge1 : PPP
hoge2 : QQQ

(2) Notes

Listing the notes when creating translation table.

Case	ITA behaviour	Remarks
The translation table exists but defaults variable definition file and ITA readme doesn't exist. (For every role)	Translation table can't be read.	
The variable begins with VAR_ is defined as arbitrary variable	Error occurs when uploading role package.	
Uses any variables not defined in the defaults variable definition file and ITA readme	Error occurs when uploading role package.	
Definition of substitution variables are duplicated in the role	Error occurs when uploading role package.	Package A->Role A LCA_A: user_A/LCA_A: user_B
Definition of arbitrary variables are duplicated in the role	Error occurs when uploading role package.	Package A->Role B LCA_A: user_A/LCA_B: user_A
The structure of arbitrary variable differs between roles	Error occurs when uploading role package.	Package A->Role A/B LCA_C: user_C
The combination of substitution variable and arbitrary variable is not unique in role package	Error occurs when uploading role package.	Package A Role A LCA_D: user_D Role B LCA_D: user_E
The structure of arbitrary variable differs between role packages	Error doesn't occurs when uploading role package, but the substiution variable is not displayed in substitution value list.	Package A->Role A LCA_F: user_F Package B->Role A LCA_F: user_F
Nested arbitrary variable is defined between role packages	The nested structure is the same so error does not occur but the setting of nested iteration count is common setting for each package.	Package A->Role B LCA_H: user_H Package B->Role A LCA_H: user_H



6.6 ita_readme file and translation table (Ansible-Legacy Role only)

This chapter lists 9 different ita_readme and translation table usecases.

This section presumes that the Ansible-Legacy Role (roles directory) is acquired from an external source.
The following figure illustrates the process of using the ita_readme file and translation table to upload and checking the results.

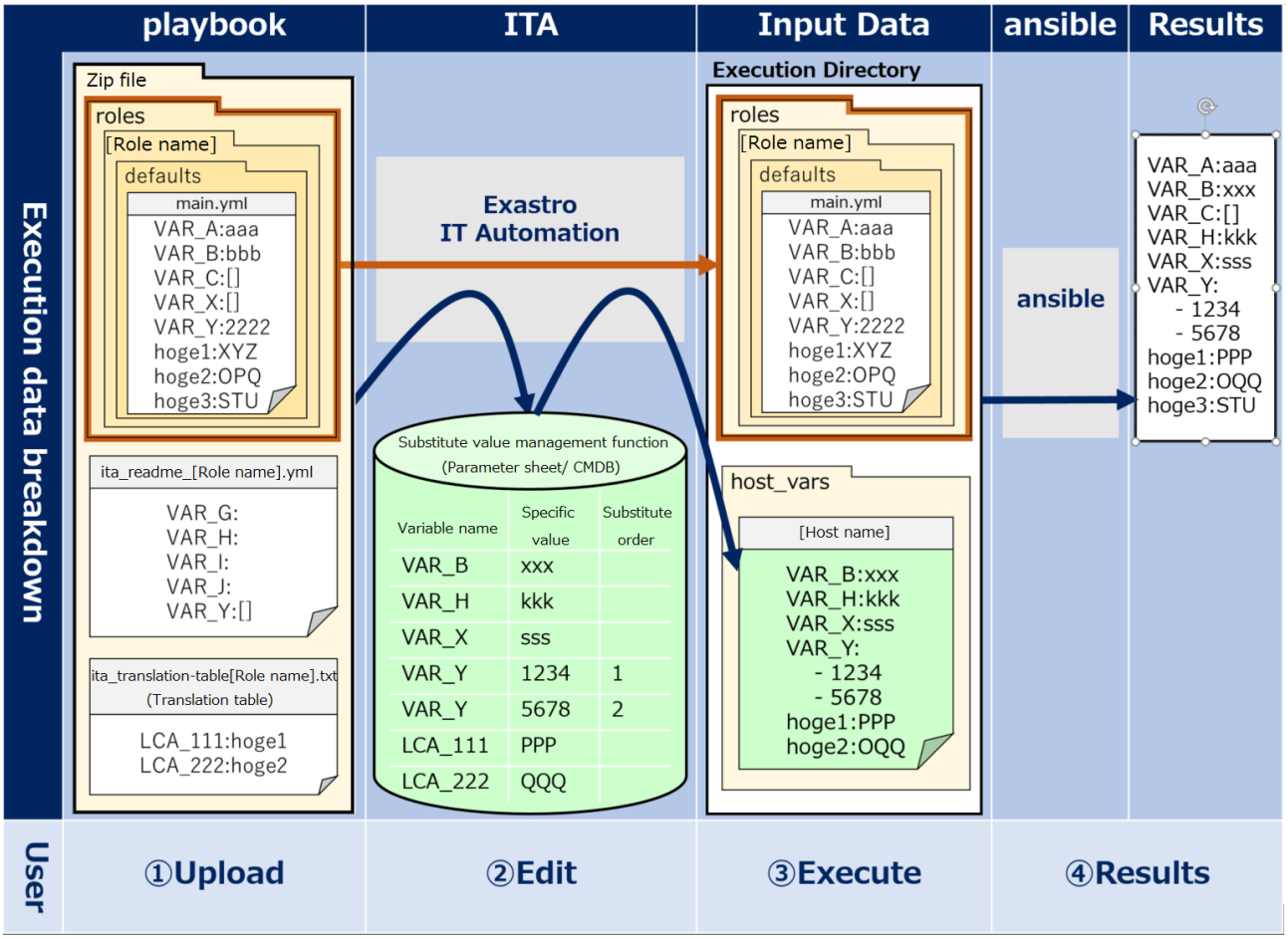


Figure 6.6-1 Overview image

The 9 usecases introduced in this chapter uses the figure above as a base.

No.	Usecase
1	Using Ansible-Legacy Role without modifying it.
2	ita_readme and translation table role
3	Variable definitions and default values described in the "defaults/main.yml" file.
4	"host_vars" files and ITA/CMDB
5	Adding variables to “defaults/main.yml”
6	"VAR_" Prefix
7	Linking "ita_readme" and translation table
8	Applying Playbook Length evaluation
9	Applying Playbook Defined evaluation

- **Case 1. Using Ansible-Legacy Role without modifying it**

Users can use Ansible-Legacy Role (roles directory) acquired from anexternal source without modifying it.
Therefore, users can put the ita_readme file and/or substitute table in the “roles” directory and assign parameters to the variables used inside the directory.

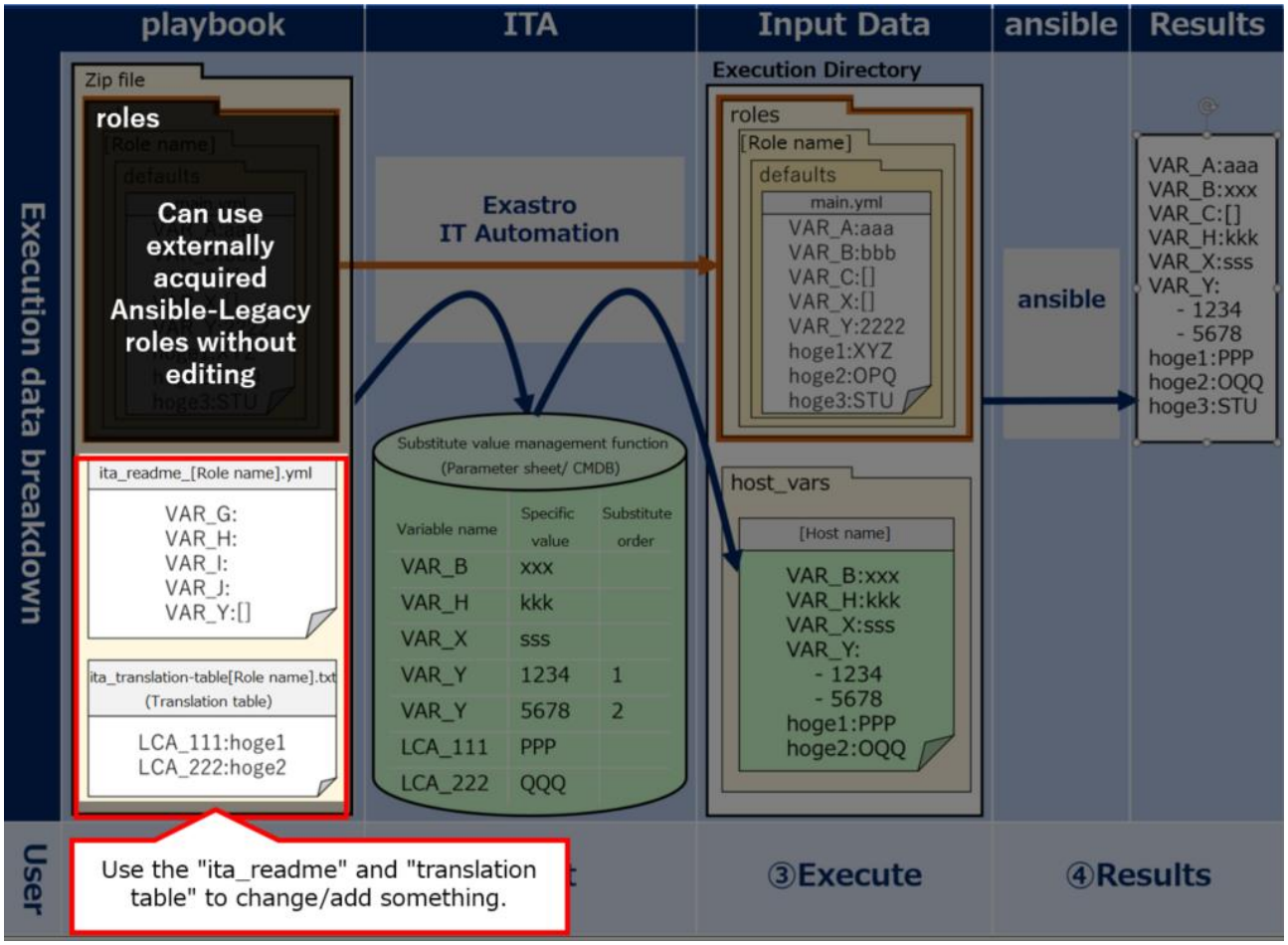


Figure 6.6-2 Case 1

- **Case 2. ita_readme and translation table role**

Both the ita_readme file and translation table are used to send variables/variable types to ITA.
In other words, they are not used to define specific values (Parameters).
ITA will not be able to read any specific values written in them.

Please see the other cases below for information on how to assign specific values.

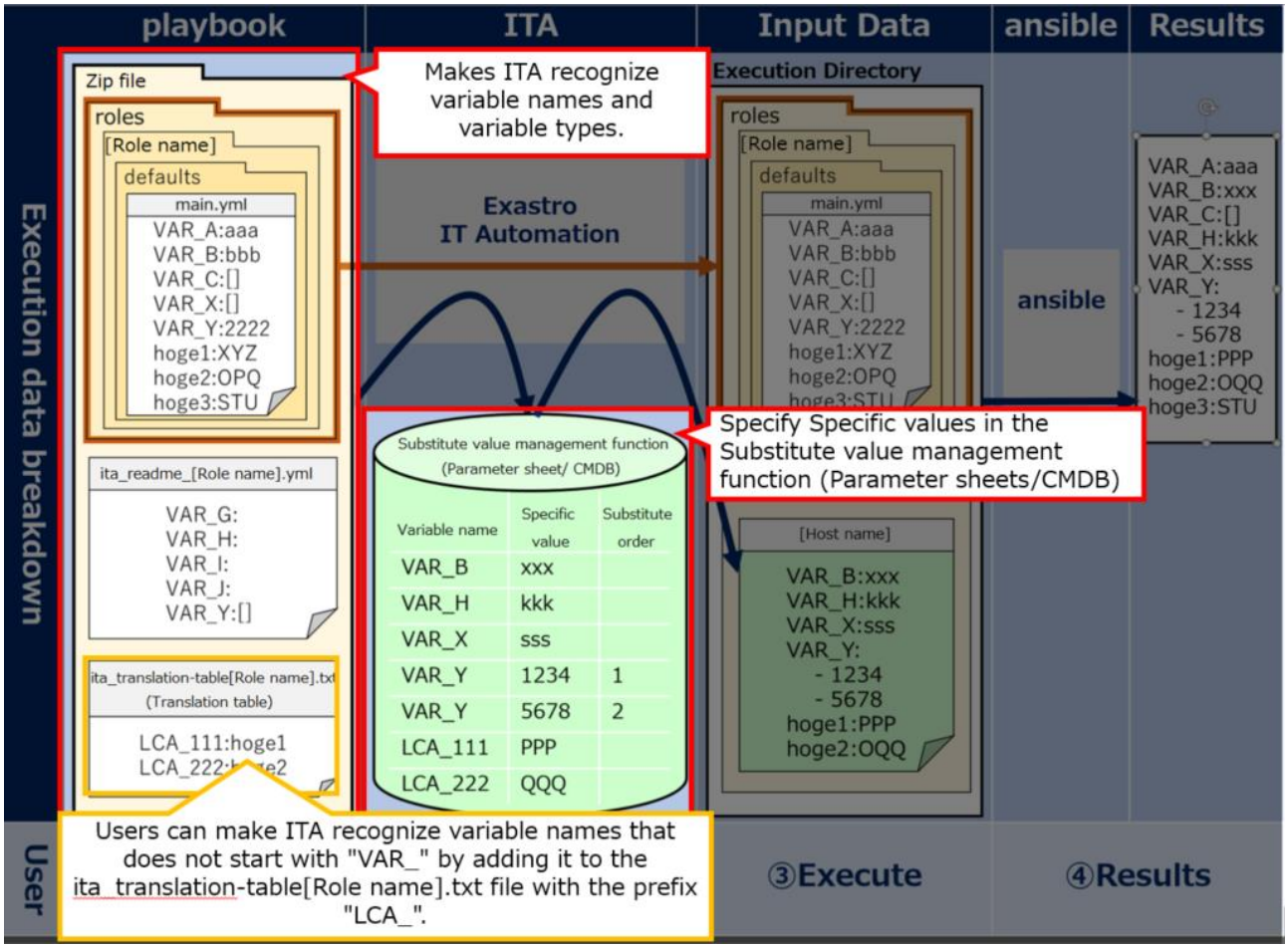


Figure 6.6-3 Case 2

- **Case 3. Variable definitions and default values described in the "defaults/main.yml" file.**

The "defaults/main.yml" file stored under "roles" is automatically passed to ansible.
The file will be automatically sent as long only if no variables or default values are defined in host_vars.(E.g: "VAR_A：aaa").

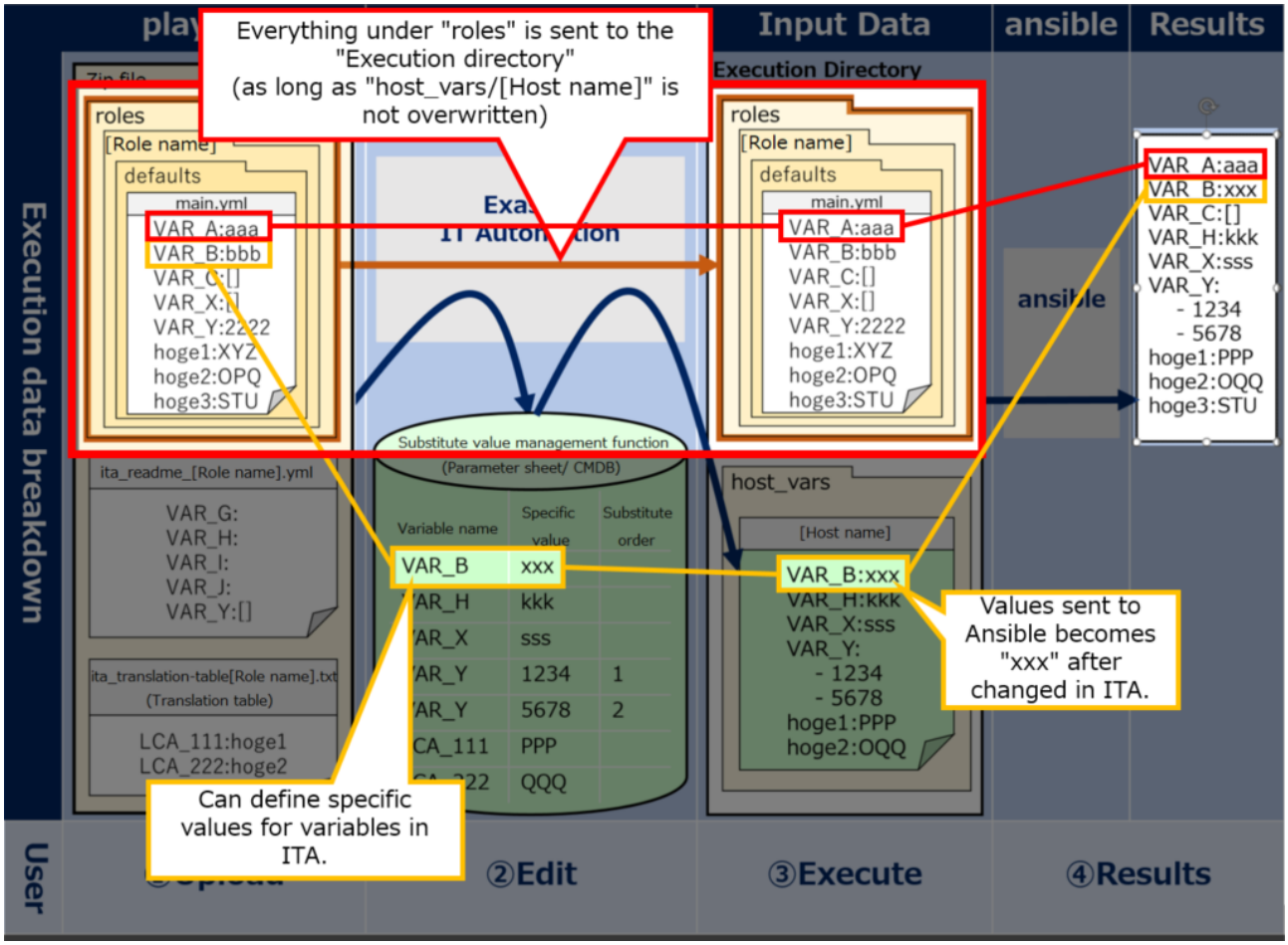


Figure 6.6-4 Case 3

- **Case 4. ”host_vars” files and ITA/CMDB**

Host_vars files are automatically created everytime ITA's CMDB (parameter sheet) executes something.

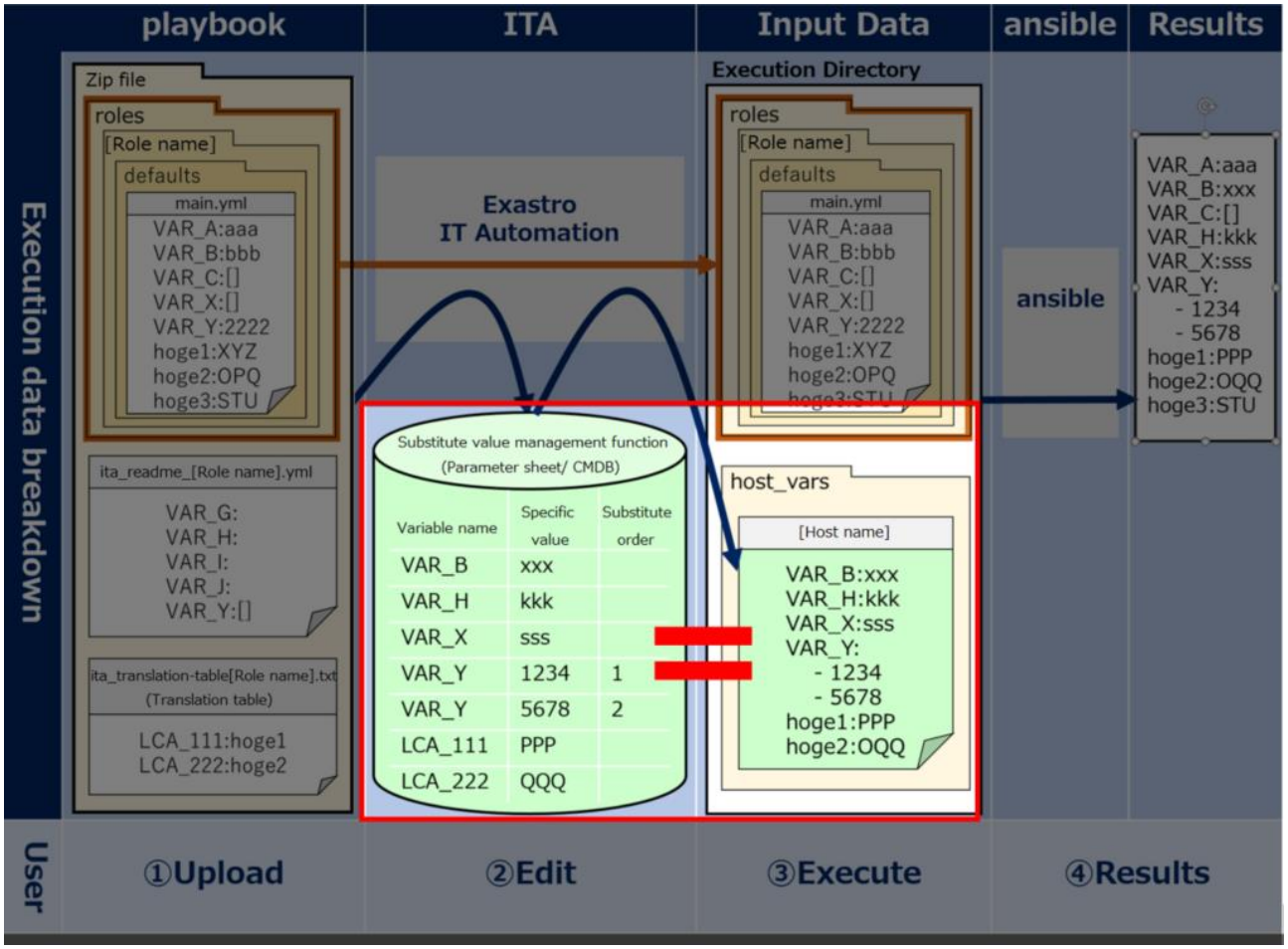


Figure 6.6-5 Case 4

- **Case 5. Adding variables to “defaults/main.yml”**

If you want to add any changes to Ansible-Legacy Role ("roles" directory), users can describe variable names/types in the "ita_readme" file.

Users do not have to define any variables in the ita_readme file that are already defined in the "defaults/main.yml" file.
If there are different definitions for the same variables in the files, the ones in the "ita_readme" file will be prioritized.

※The figure below illustrates that it is possible to add variables by describing a variable(VAR_H) in the ita_readme file

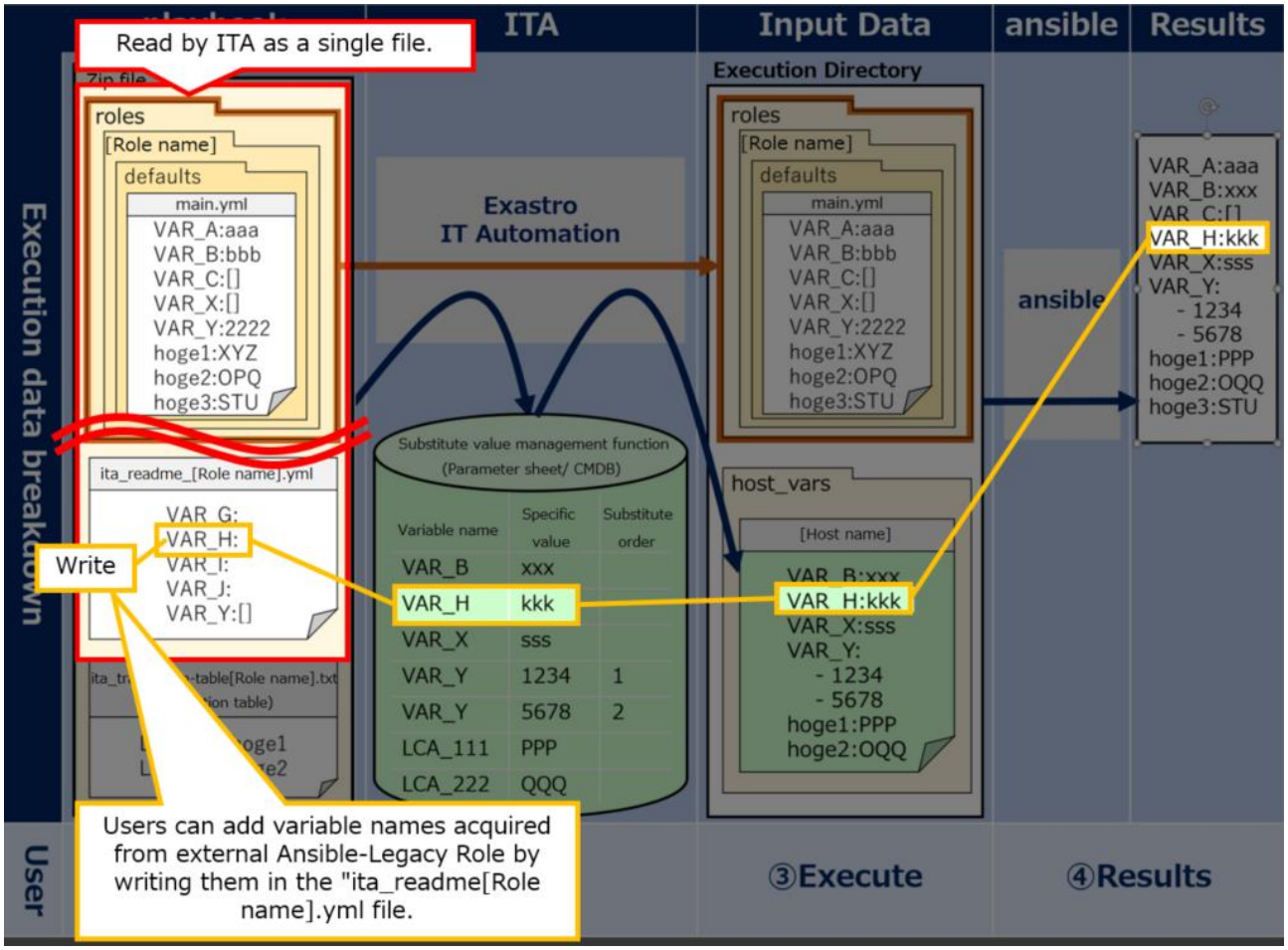


Figure 6.6-6 Case 5

- **Case 6. “VAR_” Prefix**

ITA manages only variables in the "defaults/main.yml" that starts with the prefix "VAR_".
If the user want to manage variables that does not start with "VAR_", use the "Translation table".
Users can define variables that does not start with "VAR_" by writing them in the Translation table and adding prefix "LCA_".

If the user can of course refrain from using the translation table if they want to execute an operation without giving parameters from ITA to "defaults/main.yml" variables (those without the "VAR_" prefix") .
※See the variable "hoge" in the figure below

※Translation tables are only active when they contain a definition that starts with "LCA_".

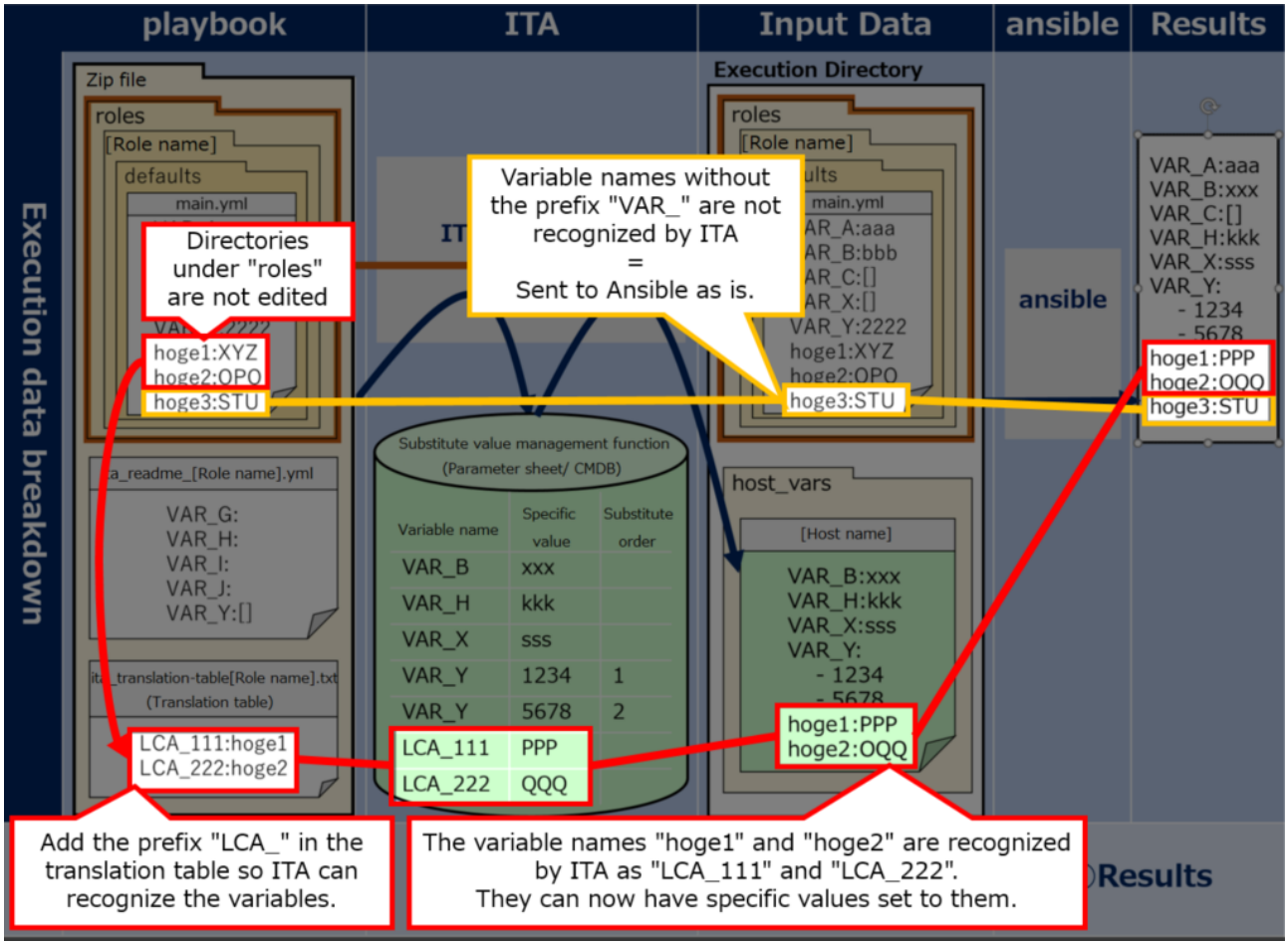


Figure 6.6-7 Case 6

Case 7. Linking “ita_readme” and translation table

Users can give Parameters from ITA to variables in "tasks/main.yml"(Playbook) that does not start with "VAR_" and are not defined in "default/main.yml" by using both the "ita_readme" file and a "translation table".

For example as shown in the figure below, if the "hoge" variable under the "tasks/main.yml" is used, users can follow the following steps in order to send it to ITA.

① Add the variable name "hoge" to the "ita_readme" file.
② Add the "hoge" to the "Translation table" with the "LCA_" prefix.

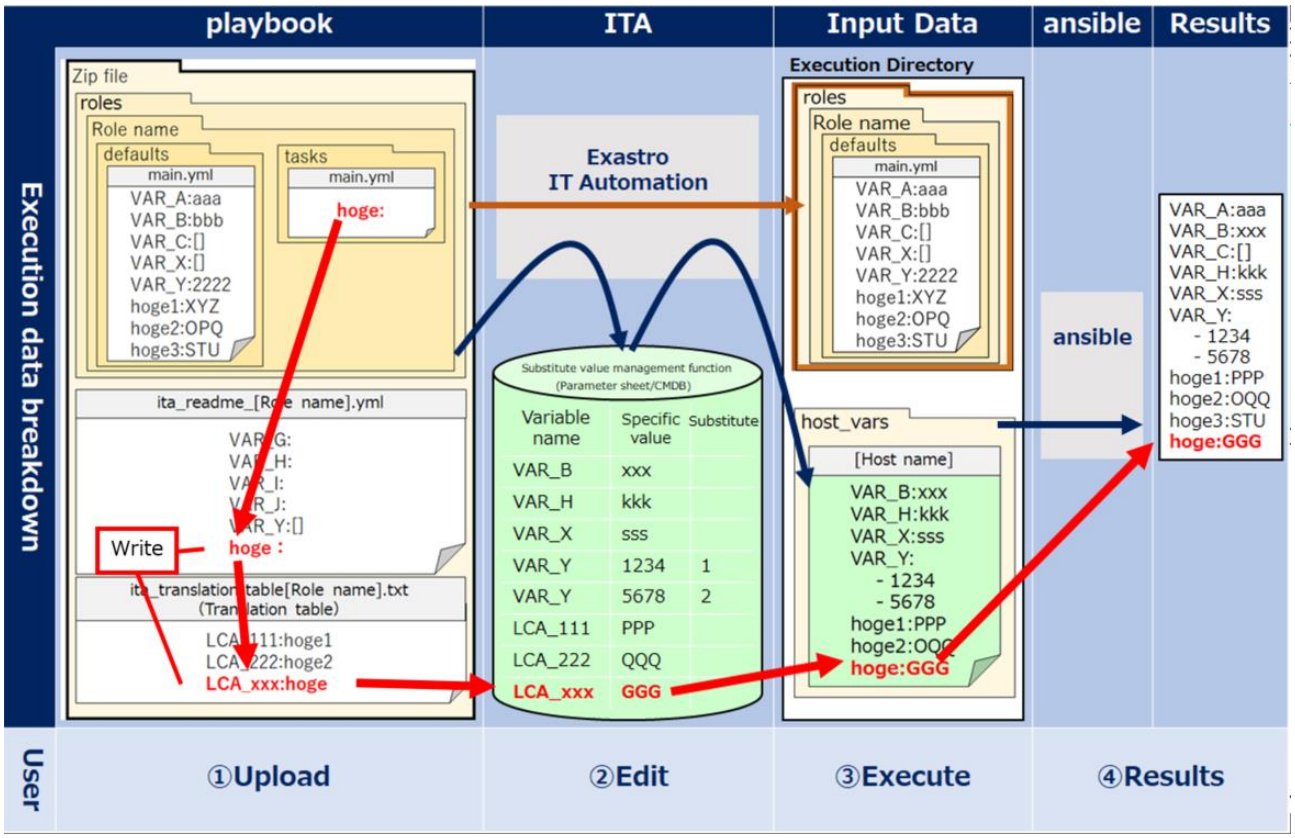


Figure 6.6-8 Case 7

- **Case 8. Applying Playbook Length evaluation**

Depending on whether a variable has a concrete value or not, it can be used as a conditional branch for length evaluation.

For example if "VAR_C：[]" is written in "defaults/main.yml", the length will equal 0 if the operation is executed with no specific value set to "VAR_C".
On the other hand, doing the same with a specific value set will have length be <0 (length<0). (E.g.: VAR_X：sss)

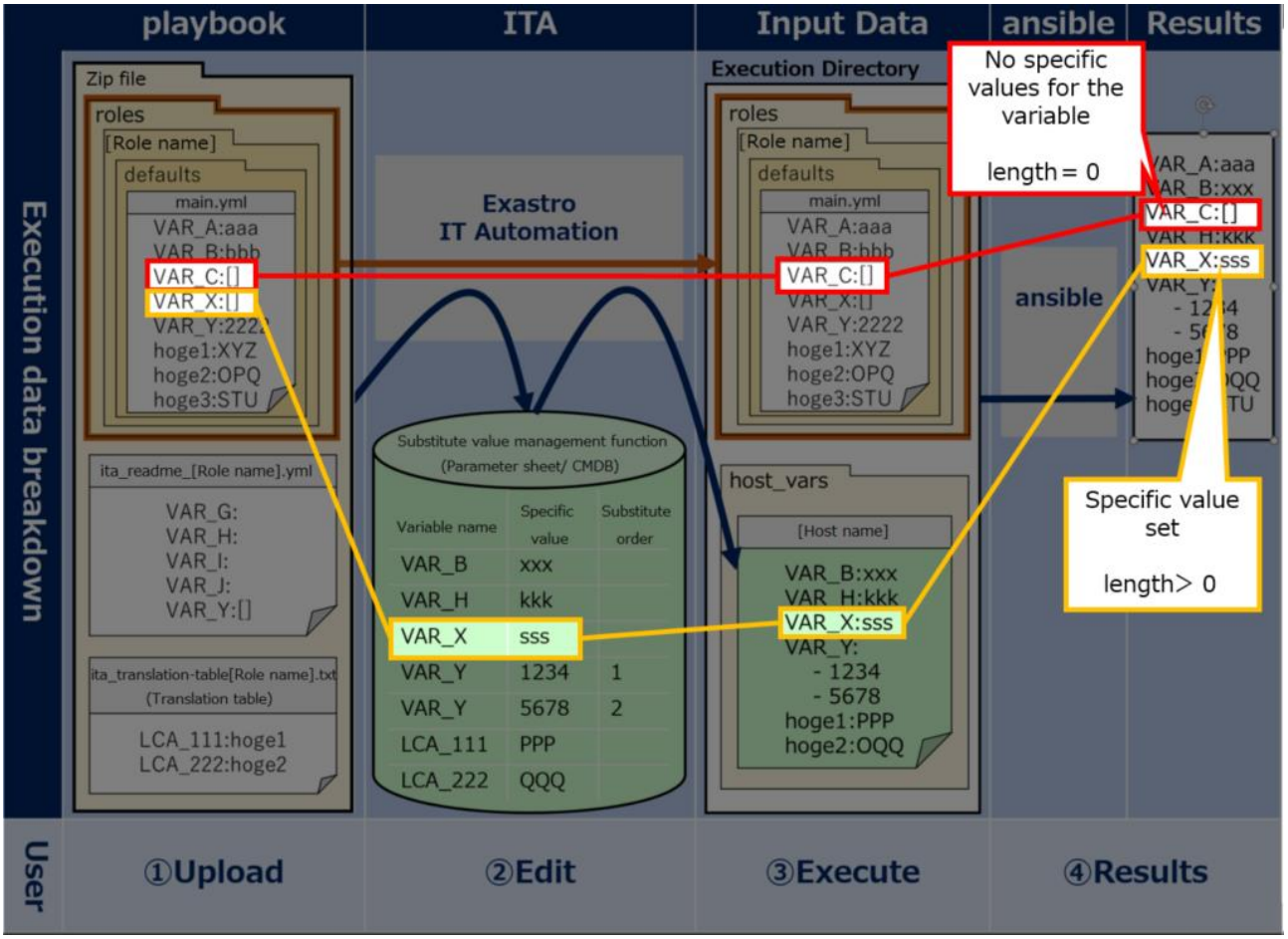


Figure 6.6-9 Case 8

Case 9. : Applying Playbook Defined evaluation

Depending on whether a variable has a concrete value or not, it can be used as a conditional branch for defined valuation.

For example, first write a definition for the variables "VAR_G" and "VAR_H" in the "ita_readme" file. By doing so, they can be used by ITA's CMDB.

Running an operation without giving a specific value to "VAR_G" while it is not defined in "defaults/main.yml" or "host_vars" will turn "defined" to "false".
On the other hand, if the specific value "kkk" is added to "VAR_H", "defined" will turn into "true".

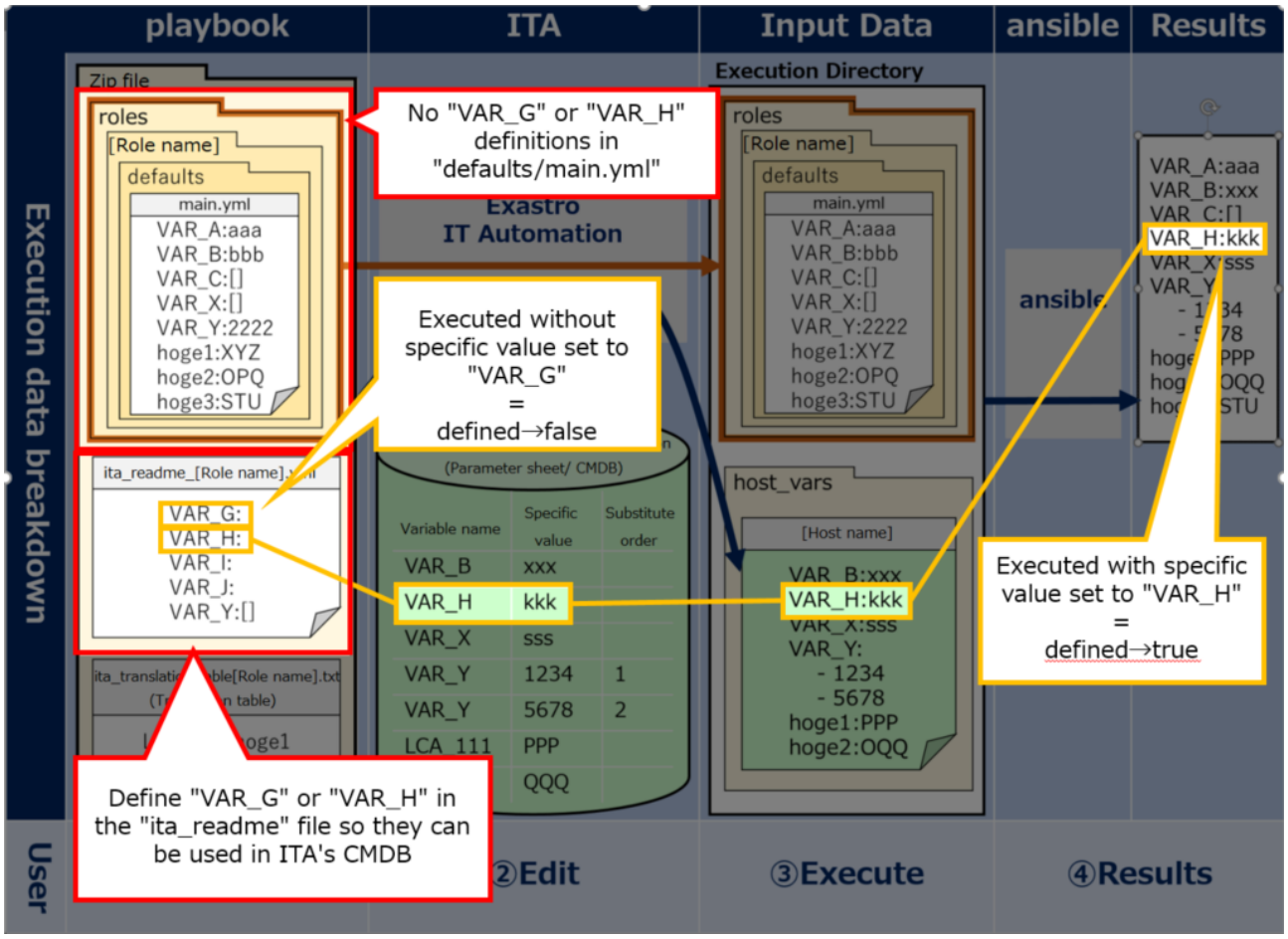


Figure 6.6-10 Case 9

6.7 BackYard contents

(1) Variable auto registration

When the variable analysis target file is uploaded, extract variable from the uploaded file.

Table 6.6-1 Variable handling of the file uploaded in each mode

Menu	Legacy	Legacy Role	Pioneer
Playbook files	○	×	×
Role package list	×	○	×
Dialog files	×	×	○

The extract timing depends on the startup cycle of the automatic process.

※Unique management of variable name

The extracted variable names in all role packages of each mode are uniquely managed.
Since the variable structure is defined in the default variable definition file, the notes when the variable stucture is different in each file are as follows

●Single role package

When using same the variable name between roles with different variable structure.

※In the case that the normal variable and nested variable or the nested structure is different between nested variables, etc.

=> Error occurs during file upload.

●All role package

When using same the variable name between role packages with different variable structure.

=> Error occurs during file upload.

(2) Substitution value auto-registration setting

The Operation of parameter sheet and Movement linked with the item setting value of every host and the variable information are reflected to Target host menu and Substitution value list menu as the association target.
The reflection timing also depends on the startup cycle of the automatic process as writed above.
Target host and substitution value list menu is updated by multiple operators. Reflection will not be performed if the last updater is other operator (not Backyard).
When user wants to reflect the data in substitution value auto-registration setting menu, please perform operations such as discard the applicable record in substitution value list value or disable the applicable record in other BackYard process.

The reflection rules to Target host menu and Substitution value list menu are as follows.

① When reflecting the information registered in substitution value auto-registration setting to substitution value list.

The status of substitution value list	Doesn't exist applicable record	Exist applicable record			Applicable record is being discarded
		= Specific value	≠ Specific value		
			Last updated by		
			BackYard process	Other operators	
Reflection in substitution value list	Add new record	-	Update the specific value of the applicable record	-	Restore the discarded record

※Applicable record: The record that has same Operation+host+Movement+variable name +(member variable)+(include order)

② When reflecting the information that is not registered in "substitution value auto-registration setting" menu (registered only in "substitution value" menu) to substitution value list

The status of substitution value list	Exist applicable record	
	Last updated by	
	BackYard process	Other operators
Reflection in substitution value list	Discard the applicable record	-

③ When reflecting the information registered in substitution value auto-registration setting to target host menu

The status of operation target host	Doesn't exist applicable record	Exist applicable record	Applicable record is being discarded
Reflection in operation target host	Add new record	–	Restore the discarded record

※ Applicable record: The record that has same Operation+host+Movement

④ When reflecting the information that is not registered in substitution value auto-registration setting(only registered in target host menu) to target host menu

The status of substitution value list	Exist applicable record	
	Last updated by	
	BackYard process	Other operators
Reflection in substitution value list	Discard the applicable record	–

⑤ When link to multiple items is registered to for the same Movemeny, variable, and substitution order.
When multiple parameter sheets are linked with same operation and host, one item is selected randomly and reflected to substitution value list.

Parameter sheet: sheetA

No	Operation	host	Item 1
1	Op1	Host01	Value1
2	Op1	Host02	Value2

Substitutuion value auto-registration setting

Parameter sheet		Movement	Registration method	IaC variable	
Menu	Item			Value variable	Substitution order
sheetA	Item 1	setting	Value	VAR_val	
sheetB	Item 1	setting	Value	VAR_val	

Since Operation: Op1 amd host: Host01 is linked with multiple parameter sheet, the setting value of the item in the random selected parameter sheet: sheetA is reflected to substitution value list.

Parameter sheet: sheetB

No	Operation	host	Item 1
1	Op1	Host01	Value4
2	Op1	Host03	Value3

Substitutuion value list

Operation	host	Movement	Variable name	Substitution order
Op1	Host01	setting	VAR_val	Value1
Op1	Host02	setting	VAR_val	Value2
Op1	Host03	setting	VAR_val	Value3

6.8 Ansible usage guideline ITA additional rules

A Playbook creation guideline for using ITA to execute on Ansible.
Please refer to the attachment "User Instruction Manual - Ansible-driver attachment- Ansible usage guideline with additional rules" for details.

7 Application operation

The operation to utilize ITA system contains not only inputs by user from the browser screen of client PC but also operations according to system operation and maintenance. The available operation and maintenance are as follows.

7.1 Maintenance

The required file to start/stop/restart Ansible driver independent processes are as follows.

Description	Target file name
Legacy/pioneer/legacyRole execution monitor Execute the unexecuted Operation.	ky_legacy_execute-workflow.service
legacy variable automatic registration Extract variable from the uploaded file.	ky_legacy_varsautolistup-workflow.service
legacy automatic registration setting Reflect the information set in auto-registration setting to substitution value list and operation target host menu.	ky_legacy_valautostup-workflow.service
pioneer automatic registration setting Reflect the information set in auto-registration setting to substitution value list and operation target host menu.	ky_ pioneer_valautostup-workflow.service
legacyRole variable automatic registration Extract variable from the uploaded file.	ky_legacy_role_varsautolistup-workflow.service
legacyRole automatic registration setting Reflect the information set in auto-registration setting to substitution value list and operation target host menu.	ky_legacy_role_valautostup-workflow.service
Ansible Automation Controller data synchronization Obtain setting information from Ansible Automation Controller.	ky_ansible_towermasterSync-workflow.service

The target files are stored in “/usr/lib/system/system”.
The method to start/stop/restart process are as follows.
Please execute the command with root privilege.

① Start process

```
# systemctl start ky_legacy_execute-workflow.service
```

② Stop process

```
# systemctl stop ky_legacy_execute-workflow.service
```

③ Restart process

```
# systemctl restart ky_legacy_execute-workflow.service
```

Please substitute each target file name to start/stop/restart the process.

7.2 About the maintenance method

① Change to NORMAL level
Rewrite the 8th line of the following file from “DEBUG” to “NORMAL”.
Log level setting file: <insallation direcotory>/ita-root/confs/backyardconfs/ita_env

② Change to DEBUG level
Rewrite the 8th line of the following file from “NORMAL” to “DEBUG”.
Log level setting file: <installation direcotory>/ita-root/confs/backyardconfs/ita_env

③ Change the startup cycle
Change the 5th parameter of ExecStart in each target file. (Unit: second)
Please use the default value of startup cycle excluding exceptions.

```
ExecStart=/exastro/ita-root/backyards/common/ky_loopcall-php-procedure.sh
/usr/local/bin/php /usr/local/bin/php /exastro/ita-
root/backyards/ansible_driver/ky_pioneer_varsautolistup-workflow.php /exastro/ita-
root/logs/backyardlogs 10 NORMAL > /dev/null 2>&1
```

After rewriting the file, **the change takes effect after restarting the process.**

Log file output destinaton: <installation directory>/ita-root/logs/backyardlogs

8 Appendix

8.1 The linkage between the input data used during Ansible execution and ITA menu

Extract information from each ITA menu and create the "input data" that is required for Ansible execution.At that time, the password in device list menu is encrypted. Ansible-Legacy and Ansible-LegacyRole encrypts with ansible-vault, while pioneer encryptes with the original method of ITA.
The "Input data" can be downloaded from "5.3.12 Check operation status" in ZIP format. Executing the following command in Ansible directly is also possible.

The relationship between various data and the ITA menu is as follows.

8.1.1 **Ansible-Legacy input data**

【Parent directory】

- child_playbooks — The directory containing user created Playbooks.

Ansible-Legacy	Playbook files	Playbook file
Ansible-Legacy	Movement details	Include order

- template_files — The directory containing the template file used in Playbook that is going to be executed.

Ansible-Legacy	Template list	Template file
Ansible-Legacy	Movement details	Include order

- copy_files — The directory containing the file that is going to be deployed on operation target server.

Ansible-Legacy	Contents list	Files
Ansible-Legacy	Movement details	Include order

- host_vars — The directory containing the host information of the operation target host and the definition file of various variable.

Ansible common	Global variable list	Variable name/specific value
Ansible-Legacy	Substitution value list	Variable name/specific value
Ansible-Legacy	Template list	Template file
Ansible-Legacy	Contents list	File variable name
Ansible-Legacy	Movement details	Include order
Ansible-Legacy	Interface information	Data relay storage path(ITA)
Ansible-Legacy	Interface information	Symphony instance data relay storage path(Ansible)
Basic console	Device list	Protocol
Basic console	Device list	Login user ID
Basic console	Device list	Login password ※Encrypted with ansible-vault
Basic console	Device list	Host name

- ssh_key_files — The directory in which the specified ssh authentication key file is stored when using key authentication as the authentication method.

Basic console	Device list	ssh authentication key file

- winrm_ca_files — The directory in which the file that defines the connection information when connecting to WinRM is stored.

Basic console	Device list	WinRM connection information

- AnsibleExecOption.txt — Parameter for AnsiblePlaybook execution

Ansible common	Interface information	Option parameter
Ansible-Legacy	Movement list	Number of parallel executions

- hosts — The file describing the operation execution target host

Basic console	Device list	host name
Basic console	Device list	IP address
Basic console	Device list	Login user ID
Basic console	Device list	Login password ※Encrypted with ansible-vault
Basic console	Device list	Connection options ※The parameter of ansible_ssh_extra_args
Basic console	Device list	ssh authentication key file
Basic console	Device list	Server certificate
Basic console	Device list	Inventory file additional option

- playbook.yml — The file calls the whole information of playbook and host information and executes Ansible.

Ansible-Legacy	Playbook files	Playbook file
Ansible-Legacy	Movement details	Include order
Ansible-Legacy	Movement details	gather_facts

8.1.2 **Ansible-Pioneer input data**

【Parent directory】

- template_files — The directory containing the template file used in Playbook that is going to be executed.

Ansible-Pioneer	Template list	Template file
Ansible-Pioneer	Movement details	Include order

- copy_files — The directory containing the file that is going to be deployed on operation target server.

Ansible-Pioneer	Contents list	Files
Ansible-Pioneer	Movement details	Include order

- ssh_key_files — The directory in which the specified ssh authentication key file is stored when using key authentication as the authentication method.

Basic console	Device list	ssh authentication key file

- winrm_ca_files — The directory in which the file that defines the connection information is stored when connecting to WinRM.

Basic console	Device list	WinRM connection information

- host_vars — The directory in which the host information of the operation target host and the definition file of various variable is stored.

Ansible common	Interface information	Data relay storage path(ITA)
Ansible common	Interface information	Symphony instance data relay storage path(Ansible)
Ansible common	Global variable list	Variable name/specific value
Ansible-Pioneer	Substitution value list	Variable name/specific value
Ansible-Pioneer	Template list	Template file
Ansible-Pioneer	Movement details	Include order
Ansible-Pioneer	Contents list	File variable name
Ansible-Pioneer	Movement details	Include order
Basic console	Device list	Login password ※Encrypted with ITA original method
Basic console	Device list	Host name
Basic console	Device list	Connenction options
Basic console	Device list	Protocol
Basic console	Device list	Login user ID

- dialog_files — The directory in which user created dialog files is stored.

	Ansible-Pioneer	Dialog files	Dialog file
	Ansible-Pioneer	Movement details	Include order

AnsibleExecOption.txt　Parameter for AnsiblePlaybook execution.

Ansible common	Interface information	Option parameter

hosts　The file describing the operation execution target host

Basic console	Device list	Host name
Basic console	Device list	IP address
Basic console	Device list	Login user ID
Basic console	Device list	Login password ※Encrypted with ITA original method
Basic console	Device list	ssh authentication key file
Basic console	Device list	Inventory file additional option

playbook.yml　The file calls the whole information of playbook and host information and executes Ansible.

Ansible-Pioneer	Interface information	Data relay storage path(ITA)

8.1.3 **Ansible-LegacyRole input data**

【Parent directory 】

- copy_files — The directory in which the file that is going to be deployed on operation target server is stored.

Ansible-LegacyRole	Contents list	Files
Ansible-LegacyRole	Movement details	Include order

- roles — The directory containing the user created role.

Ansible-LegacyRole	Role package list	Role package file (ZIP format)

- ssh_key_files — The directory in which the specified ssh authentication key file is stored when using key authentication as the authentication method.

Basic console	Device list	ssh authentication key file

- winrm_ca_files — The directory in which the file that defines the connection information when connecting to WinRM is stored.

Basic console	Device list	WinRM connection information

- host_vars — The directory containing the host information of the operation target host and the definition file of various variable.

Ansible common	Interface information	Data relay storage path(ITA)
Ansible common	Interface information	Symphony instance data relay storage path(Ansible)
Ansible common	Global variable list	Variable name/specific value
Ansible-LegacyRole	Substitution value list	Variable name/specific value
Ansible-LegacyRole	Template list	Template file
Ansible-LegacyRole	Movement details	Include order
Ansible-LegacyRole	Contents list	File variable name
Ansible-LegacyRole	Movement details	Include order
Basic console	Device list	Protocol
Basic console	Device list	Login user ID
Basic console	Device list	Login password ※Encrypted with ansible-vault
Basic console	Device list	Host name

AnsibleExecOption.txt　Parameter for AnsiblePlaybook execution.

Ansible common	Interface information	Option parameter
Ansible-LegacyRole	Movement list	Number of parallel executions

hosts　The file describing the operation execution target host.

Basic console	Device list	host name
Basic console	Device list	IP address
Basic console	Device list	Login user ID
Basic console	Device list	Login password ※Encrypted with ansible-vault
Basic console	Device list	Connection options ※The parameter of ansible_ssh_extra_args
Basic console	Device list	ssh authentication key file
Basic console	Device list	Server certificate
Basic console	Device list	Inventory file additional option

site.yml　The file calls the whole information of playbook and host information and executes Ansible.

Ansible-Legacy	Playbook files	Playbook file
Ansible-Legacy	Movement details	Include order
Ansible-Legacy	Movement details	gather_facts

8.1.4 **Directly executing the input data**

(1)Create a directory where the input data will be decompressed.

Create the two following directories and extract the input data into directory 1

1. /Base Directory/Driver path/Operation No./in
2. /Base Directory/Driver path/Operation No./out

Base Directory: Interface information=>Data relay storage path(Ansible/Ansible Automation Controller)

Driver path: legacy: legacy/ns Legacy-role: legacy/rl pioneer: pioneer/ns

Operation No.: Number of the Operation when executed. The whole number is 10 numbers. The operation number is then moved to the right and the rest of the numbers are filled with “0”.

Operation No.: 12345 => 0000012345

The input file does not include the secret key file uploaded to the device list.If chosen authentication method requires a secret key file, open the inventory file ″hosts″ included in the input data and copy the path of the secret key file set to ″ansible_ssh_private_key_file″.

Inventory file”hosts”

```
all:
  children:
    hostgroups:
      hosts:
        target_host_1:
          ansible_ssh_user: keyauth_user
          ansible_ssh_private_key_file: /exastro/data_relay_storage/ansible_driver/legacy/ns/0000000060/in/ssh_key_files/0000000006-keyauth_user_id_rsa
```

(2) Commands that directly executes input data.

Ansible-Legacy

ansible-playbook (Option) –i hosts --vault-password-file Password file playbook.yml

Ansible-Pioneer

ansible-playbook (Option) –i hosts --vault-password-file Password file playbook.yml

Ansible-LegacyRole

ansible-playbook (Option) –i hosts --vault-password-file Password site.yml

The Password file name can be whatever you want.

The password set in the password file should be the value of the contents of ITA-Installation-directory/ita-root/confs/commonconfs/ansible_vault_accesskey.txt, decoded in the order rot13, base64.

8.2 Result data created during Ansible execution

The result of executing [Input data] with ansible is saved as [Result data] in ZIP format.
[Result data] can be downloaded in ZIP format from "5.3.12 Check operation status".

8.2.1 Legacy/LegacyRole List of files saved in result data

Table 8.2.1-1 Legacy/LegacyRole List of files where result data is saved

File name	Record content	In Ansible Engine	In Ansible Tower
result.txt	Record the execution checking of Ansible	○	
xxx.pid	A file that records the process ID of the Ansible-playbbok command. xxx: Process ID of the Ansible-playbbok command	○	
error.log	Error output destination file when ITA outputs an error message due to some error when executing work, or when the Ansible-playbbok command outputs an error message due to some error. The contents displayed in the error log of work execution confirmation.	○	○
exec.log	A log file that is a partial processing of the execution log output by Ansible-playbbok. Contents displayed in the execution log of work execution confirmation.	○	○
exec.log.org	Execution log output by ansible-playbook	○	○
Ita_<mode name>_executions_jobtpl_<execution no.>_<group no.>	Splited execution log file. For the naming convention of the file name, please refer to ⑥ Execution log display of 5.3.12 Check operation status.		○
forced.txt	Record file in emergency stop	○	
user_files	The directory where the file is recorded when some kind of file is output to the ITA original variable 「__workflowdir__」 in the executed playbook.	○	○

8.2.2 **List of files saved in Pioneer result data**

Table 8.2.1-2 List of files for which Pioneer results data is stored

File name	Record content	In Ansible Engine	In Ansible Tower
result.txt	Record the execution result of Ansible	○	
xxx.pid	A file that records the process ID of the Ansible-playbbok command. xxx: Process ID of the Ansible-playbbok command	○	
error.log	The error destination file when the ITA outputs an error message due to some error when executing or if the Ansible-playbbok command outputs an error message due to some error. The contents will be displayed in the error log of execution confirmation.	○	○
exec.log	A log file that is a partial processing of the execution log output by Ansible-playbbok. Contents displayed in the execution log of execution confirmation.	○	○
exec.log.org	Execution log output by ansible-playbook	○	○
Ita_<mode name>_executions_jobtpl_<execution no.>_<group no.>	Splited execution log file. Please refer to (6) execution log display of 5.3.12 check operation status for the naming convention of the file name.		○
forced.txt	Record file in case of emergency stop.	○	
user_files	A directory where files are recorded when some file is output to ITA's original variable "__workflowdir__" in the playbook executed.	○	○

(1) Legacy-Role

Table 9.2.1-3 Legacy-Role list of files where result data is saved

File name	Record content	In Ansible Engine	In Ansible Tower
result.txt	Record the execution result of Ansible	○	
xxx.pid	A file that records the process ID of the Ansible-playbbok command. xxx: Process ID of the Ansible-playbbok command	○	
error.log	The error destination file when the ITA outputs an error message due to some error when executing or if the Ansible-playbbok command outputs an error message due to some error. The contents will be displayed in the error log of execution confirmation.	○	○
exec.log	A log file that is a partial processing of the execution log output by Ansible-playbbok. Contents displayed in the execution log of execution confirmation.	○	○
exec.log.org	Execution log output by ansible-playbook	○	○
Ita_<mode name>_executions_jobtpl_<execution no.>_<group no.>	This is a divided execution log file. Please refer to (6) execution log display of 5.3.12 check operation status for the naming convention of the file name.		○
forced.txt	Record file in case of emergency stop.	○	
user_files	A directory where files are recorded when some file is output to ITA's original variable "__workflowdir__" in the playbook executed.	○	○

8.3 Option Parameter list

The following section explains the option parameters for the Interface information and the Movement list.
In ITA, the ansible-playbook option parameters are configured in the following order.
If multiple parameters that only allow a single values are defined, the parameters in the Movement list=>optional parameters will be activate.

・Ansible common=> Interface information=> Option parameter
・Movement list=> Option parameter

For Ansible Core

If the Ansible Core is set as the Execution engine, input the ansible-playbook command's option parameter.
For more information regarding the ansible-playbook commands' option parameter, please run thecommands below and see the help information displayed.
「 ansible-playbook –h 」

For execution engines other than Ansible Core

The following table displays the specifyable option parameters for execution engines other than Ansible Core.

Table 8.3.1 List of specifyable option parameters for execution engines other than Ansible Core

Option Parameter	Specification method	Ansible Automation Controller settings location	Remarks
-v --verbose	-v -vv -vvv -vvvv -vvvvv --verbose	Configure number of "v"s specified to the Template screen's "More information"	・Uses the total amount of "v"s ・"--verbose" is the same as "-v" Example："--verbose −vvv"is the same as、"-vvvv" ・If more than 6 "v"s are specified, it will be specified as 5.
-f --forks	-f FORKS --forks=FORKS	The "FORKS" specified in the template's "Fork" is set.	Specify numeric values for FORKS If multiple are defined, the last parameter defined will be active. Example: If -f 1 –forks=10, then --forks=10 will be active. If something other than a numeric value is specified, an error will occur.
-l	-l SUBSET	The SUBMIT	・SUBSET：Host name in the

Option Parameter	Specification method	Ansible Automation Controller settings location	Remarks
--limit	--limit=SUBSET	specified to the Template's "Limit" is set	Device list ・If multiple are defined, the last parameter defined will be active.
-e --extra-vars	-e EXTRA_VARS --extra-vars=EXTRA_VARS	テンプレートの[追加変数]に変数名:具体値の形式で設定される	・EXTRA_VARS: Variable name, Specific values are either json or yaml format. Example: For json format: –extra-vars={"VAR_1":"directory","VAR_2":"0755"} For yaml format: –extra-vars=VAR_1: directory¥nVAR_2: 0755 ・If multiple are defined, the last defined parameter will be active.
-t --tags	-t TAGS --tags=TAGS	テンプレートの[ジョブタグ]に設定したTAGS が設定される	・TAGS:Tag name ・Allows for multiple parameters
-b --become	-b --become	テンプレートのオプション[権限昇格の有効化]がチェックされる	・Parameters are active as long as at least one is specified
-D --diff	-D --diff	テンプレートの[変更]の表示が有効化される	・Parameters are active as long as at least one is specified
--skip-tags	--skip-tags=SKIP_TAGS	テンプレートの[スキップタグ]に設定したSKIP_TAGS が設定される	・SKIP_TAGS:Skip tag name ・Allows for multiple parameters
--start-at-task	--start-at-task=START_AT_TASK	※Ansible Automation Controller の Web UI には --start-at-task の表示はない。	・If multiple are defined, the last parameter defined will be active.
-ufc --use_fact_cache	-ufc --use_fact_cache	テンプレートのオプション[ファクトキャッシュの有効化]がチェックされる	・Parameters are active as long as at least one is specified
-kkoas --allow_simultaneous	-as --allow_simultaneous	テンプレートのオプション[同時実行ジョブの有効化]がチェックされる	・Parameters are active as long as at least one is specified
-jsc --job_slice_count	-jsc Number of job slices --	テンプレートの[ジョブスライス数]に指定し	・Specify numeric value for amount of Job slices

Option Parameter	Specification method	Ansible Automation Controller settings location	Remarks
	job_slice_count=Nakumber of job slices	たジョブスライス数が設定される	・If multiple are defined, the last parameter defined will be active.

※For more information regarding Ansible Automation Controller's option parameters, please refer to the explanation for Ansible Automation Controller user guide's job template.

8.4 Using ITA proprietary variables in Ansible Automation Controller.

The following is a list of points to keep in mind when executing operations with Ansible Automation Controller in a cluster configuration for Movements including Playbooks, which uses the following ITA proprietary variables to output files.

ITA Proprietary variables

- __workflowdir__
- __symphony_workflowdir__
- __conductor_workflowdir__
- __movement_status_filepath__
- __parameters_dir_for_epc__
- __parameters_file_dir_for_epc__
- __parameter_dir__
- __parameters_file_dir__

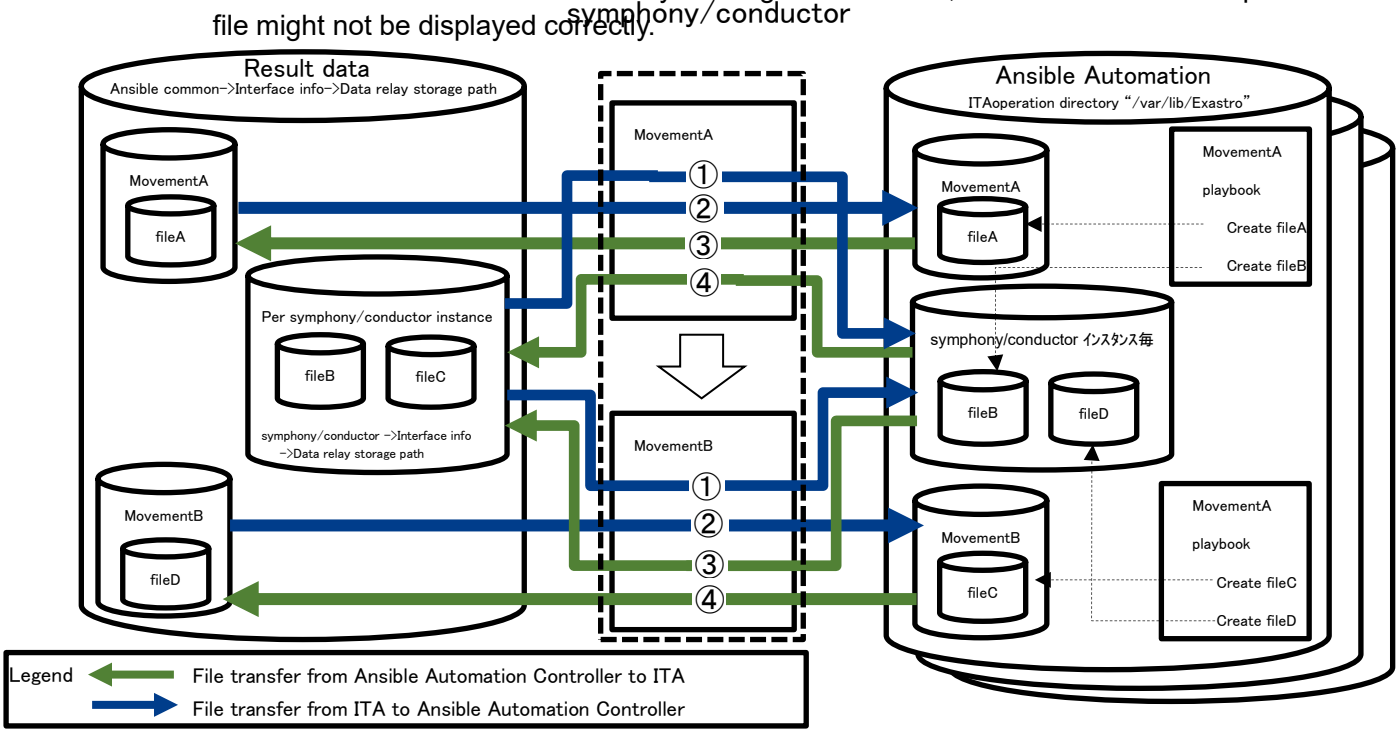
(1) Managing files created using ITA's proprietary variables

The Output directory of the files created using the ITA proprietary values is set to the Ansible Automation Controller's ITA Operation directory, "/var/lib/exastro".

Before Movements are executed, the result data is transferred as a file to "/var/lib/exastro" under the Ansible Automation Controller's ITA operation directory.

The file created when the Movement is executed is transferred from the Ansible Automation Controllers to the result data in overwrite mode.

If a file with the same name as an already existing file is created, the result data of the updated file might not be displayed correctly.



① If a Movement is executed from symphony/conductor The files placed under the corresponding symphony/conductor instance is transfered to the Ansible Automation Controller's ITA operation directory

② The files under the corresponding Movements are transfered to the Ansible Automation Controller's ITA operation directory before the Movement is executed.

③ If a Movement is executed from symphony/conductor,

the file created by the corresponding movement in the ITA operation directory in the Ansible Automation Controller is transferred to the result data.

④ The file created under the corresponding symphony/conductor instance under the Ansible Automation Controller's ITA operation directory is transferred to the result data after the Movement is executed.

(2) Important notes

① Make sure that the file name includes ansible"_loginhostname_" for each target host linked to the movement in order to avoiding overlapping of file names.

② If executing from symphony/conductor, make sure that the movement file names don't overlap.

8.5 Data resources deleted when executing.

The following list contains data resources that will be deleted if the user selects "Delete" when executing interface information.

Table 8.5-1 List of data resources deleted when running data deletion.
(Ansible Automation Controller side)

Data resources	Resource type	Execution engine		Remarks
		Ansible Tower3.x	Ansible Automation Controller4.x	
ITA operation directory /var/lib/exastro/ita_< section >_executions_10 digit operation number	Directory	○	○	
SCM management directory /var/lib/awx/projects/ita_< section >_executions_10 digit operation number	Directory	○	※	※ Deleted by Projectresource deletion
Inventory Resource name: ita_< section >_executions_inventory_10 digit operation number	Resource	○	○	
Authentication information Resource name:: ita_< section >_executions_credential_10 digit operation number_serial number ita_< section >_executions_vault_credential_10 digit operation number ita_< section >_executions_git_credential_10 digit operation number	Resource	○	○	
Project ﾄ Resource name:: ita_< section >_executions_project_10 digit operation number	Resource	○	○	
Job template Resource name:: ita_<section>_executions_jobtpl_10 digit operation number_serial number	Resource	○	○	
Workflow job template Resource name:: ita_< section >_executions_workflowtpl_10 digit operation number	Resource	○	○	
Job Resource name:: Job number—ita_< section >_executions_workflowtpl_10 digit operation number Job number—ita_< section >_executions_jobtpl_10 digit operation number	Resource	○	○	

Table 8.5-2 List of data resources deleted when running data deletion.
(ITA side)

Data resources	Resource type	Execution engine		Remarks
		Ansible Tower3.x	Ansible Automation Controller4.x	
Git repository ITAinstall directory/ita-root/repositorys/ansible_driver/<Section>_10 digit operation number	Git repository	○	○	Deletion per directory

section: legacy/legacy_role/pioneer