



ITA_User Instruction Manual

Terraform-driver

— Version 1.5 —

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Introduction

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

1 Terraform driver overview

This chapter describes Terraform and Terraform driver.

1.1 About Terraform

Terraform is an Orchestration tool provided by HashiCorp that streamlines the infrastructure.

For the infrastructure configuration coded in the language called HCL (HashiCorp Configuration Language), the execution plan is generated and the construction is executed.

In addition, it is possible to code and manage access policies based on Policy as Code.

For more information on Terraform, please refer to the Terraform product manual.

1.2 About Terraform driver

Terraform driver functions as an option of the ITA system, and can create an organization, create a workspace, execute work (Plan / PolicyCheck / Apply), and acquire work logs for Terraform Enterprise registered in the ITA system.

Module files used for execution of work (Plan/Apply) and Policy files for performing Policy Check can be made into parts on the ITA system and managed so that they can be reused.

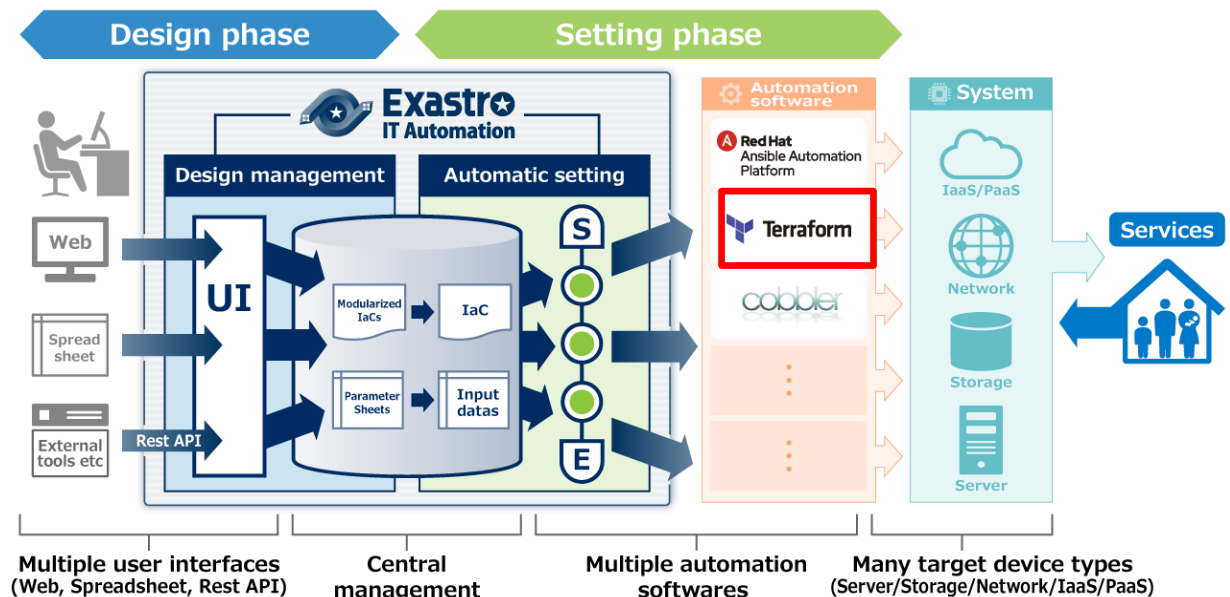


Figure 1.2-1 ITASystem Overview

In addition Terraform driver can set variables in Module from the screen. For details, refer to "2 Handling Variables in Terraform driver" in this manual.

2 Variable handling in Terraform driver

2.1 Variable type

With Terraform driver, set the specific value of the variable in Module from the ITA setting screen.

※For details on the setting method, refer to "6.2.11 Substitution value list" in this manual.

Among the variables in Module, there are the following one types of variables that can be handled as ITA variables

Type	Content
Normal variable	A variable that allows you to define one specific value for the variable name. Describe the variables in Module with var.xxx e.g.) access_key = var.access_key

2.2 Extraction of variables and registration of concrete values

Can extract variables from the Module file uploaded to ITA and register specific values.

For the specific value of the extracted variable, register the specific value in "6.2.11 Substitution value list"

The registered variables and concrete values are registered as "Key" for "Variable name" and "Value" for "Specific value" for Variables managed in Workspace on the Terraform Enterprise side when the work is executed.

3 Terraform driver console menu structure

This chapter describes the menu structure of the ITA console.

For details on how to log in to the Web console and the components/basic operations of the menu screen.

See the “First Steps Guide”.

3.1 Manu/Screen list

① ITA basic console menu

The menu list of the ITA basic console used by Terraform driver is described below.

Table 3.1-1 Basic console menu/screen list

No	Menu Group	Menu Screen	Description
1	ITA Basic console	Input operation list	Can maintain (view/register/update/abolish) the input operation list.

② Console menu of Terraform driver

The menu list of Terraform driver console is described below.

Table 3.1-2Terraform driver console menu/screen list

No	Menu Group	Menu Screen	Description
1	Terraform	Interface information	Manage Terraform Enterprise information that works with ITA.
2		Organizations list	Manage Organization information used by Terraform Enterprise.
3		Workspaces list	Manage Workspace information used by Terraform Enterprise.
4		Movement list	Manage the list of movements registered in Symphony.
5		Module files	Manage the module file.
6		Policies list	Manage the policy file.
7		Policy Sets list	Manage the Policy Set. By associating the Policy Set with the Policy and Workspace, the Policy is enabled for the target Workspace when the work is executed.
8		PolicySet-Policy link list	Manages the link between PolicySet and Policy.
9		PolicySet-Workspace link list	Manages the link between PolicySet and Workspace.
10		Movement details	Manages the association between Movement and Module materials.
11		Substitution value list	Manages the vriable substitute values.
12		Work execution	Select the Movement and operation to be executed and instruct the execution.
13		Check operation status	Displays the work execution status.
14		Work list	Manage work execution history.

4 Terraform driver usage instruction

Explains how to use each Terraform console.

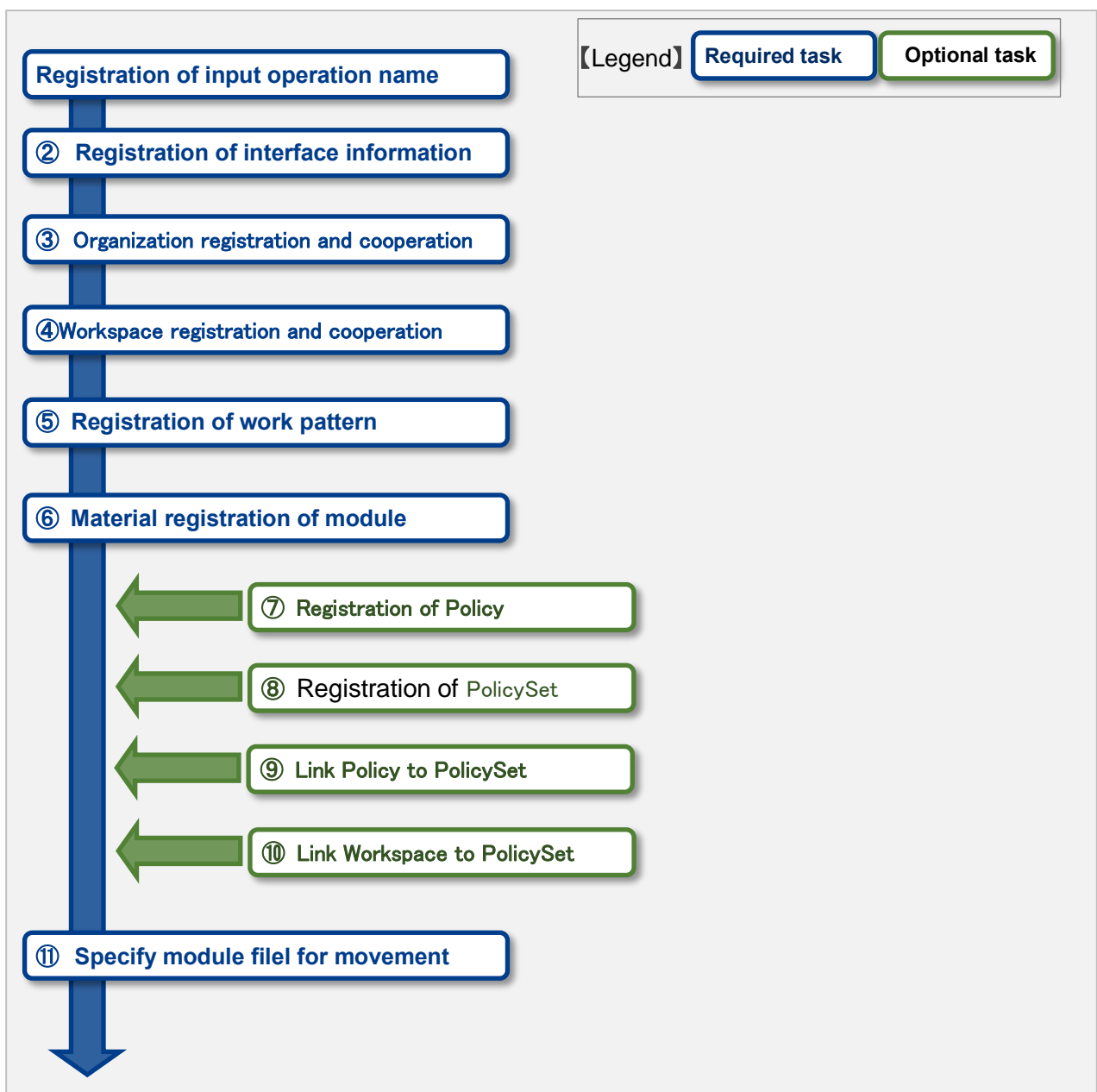
4.1 Terraform workflow

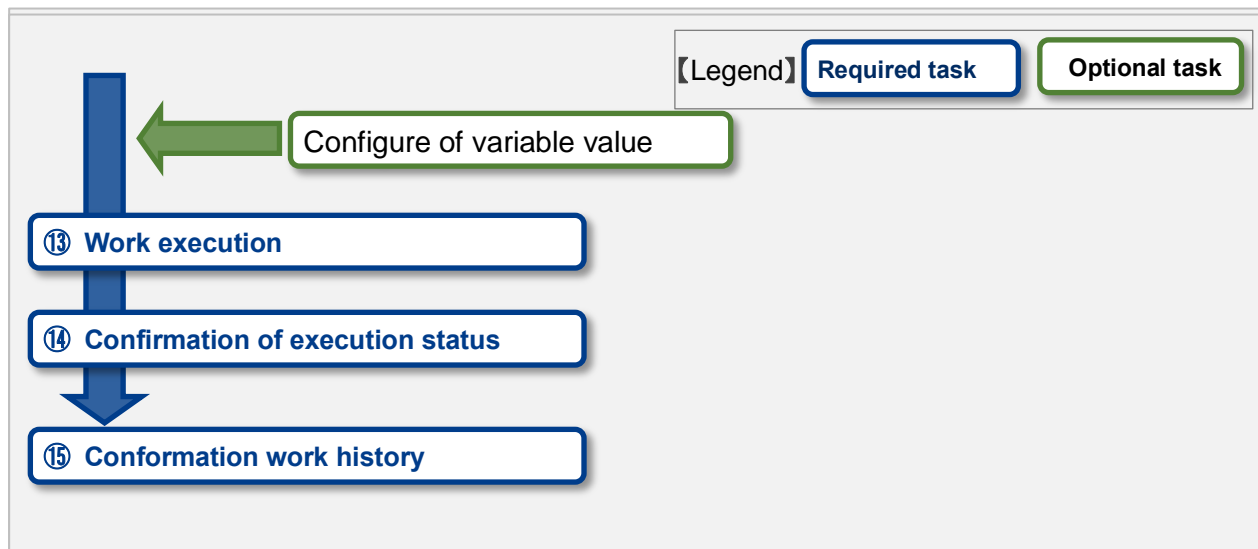
The standard workflow for each Terraform console is as follows.

Details of each work are described in the next section.

For information on how to use the ITA Basic Console, refer to "Usage Procedure Manual_Basic Console".

The following is the flow to execute the work in Terraform.





● Work flow details and reference

① Registration of input operation name

Register the input operation name for work from the input operation list screen of the ITA basic console.

For details, refer to "6.1.1 Input operation list".

② Registration of interface information

Register the information of Terraform Enterprise that works with the ITA system.

For details, refer to "6.2.1 Interface Information".

③ Organization registration and cooperation

Register Organization information and link with Terraform Enterprise.

For details, refer to "6.2.2 Organizations list".

④ Registration and cooperation of Workspace

Register Workspace information and link with Terraform Enterprise.

For details, refer to "6.2.3 Workspace list".

⑤ Registration of work pattern (Movement)

Register a movement for work.

For details, refer to "6.2.4 Movement list".

⑥ Registration of module material

Register the Module file to be executed in the work.

For details, refer to "6.2.5 Module files".

⑦ Registration of policy (implemented as necessary)

Register the Policy file to be executed by Policy Check performed before executing the work.

For details, refer to "6.2.6 Policies list".

⑧ Registration of PolicySet (implemented as necessary)

Register a PolicySet to associate with the Workspace to which the Policy is applied.

For details, refer to "6.2.7 Policy Sets list".

⑨ **Specify Policy in Policy Set**

Register the association to PolicySet and Policy.

For details, refer to "6.2.8 PolicySet-Policy link list".

⑩ **Specify Workspace in Policy Set**

Register the association between PolicySet and Workspace.

For details, refer to "6.2.9 PolicySet-Workspace link list".

⑪ **Specify Module material for Movement**

Specify the Module material for the registered Movement.

For details, refer to "6.2.10 Movement details".

⑫ **Configure of Variable value (implemented as necessary)**

Set the value of the variable defined in the Module material registered in Movement. If you are not using variables, no settings are required.

For details, refer to "6.2.11 Substitution value list".

⑬ **Work execution**

Select and set the execution date and time and input operation to instruct the execution of the process.

For details, refer to "6.2.12 Execution".

⑭ **Check work status**

The status of the work performed is displayed in real time.

Also monitor the emergency stop of work, execution log, and error log.

For details, refer to "6.2.13 Check operation status".

⑮ **Check operation history**

List of executed work is displayed and check the history.

For details, refer to "6.2.14 Execution list".

5 To operate Policy in Terraform driver

5.1 About link Policy/PolicySet/Workspace

In order to apply the Policy, it is necessary to set the association after registering each setting related to the Policy.

At first, link the Policy registered in "6.2.6 Policies list" and the Policy Set registered in "6.2.7 Policy Sets list" with "6.2.8 PolicySet-Policy Link list".

Next, link the Workspace registered in "6.2.3 Workspaces list" and the Policy Set registered in "6.2.7 Policy Sets List" with "6.2.9 PolicySet-Workspace link list".

PolicySet and the Policy associated with it are applied to the Workspace associated with Movement when the work is executed.

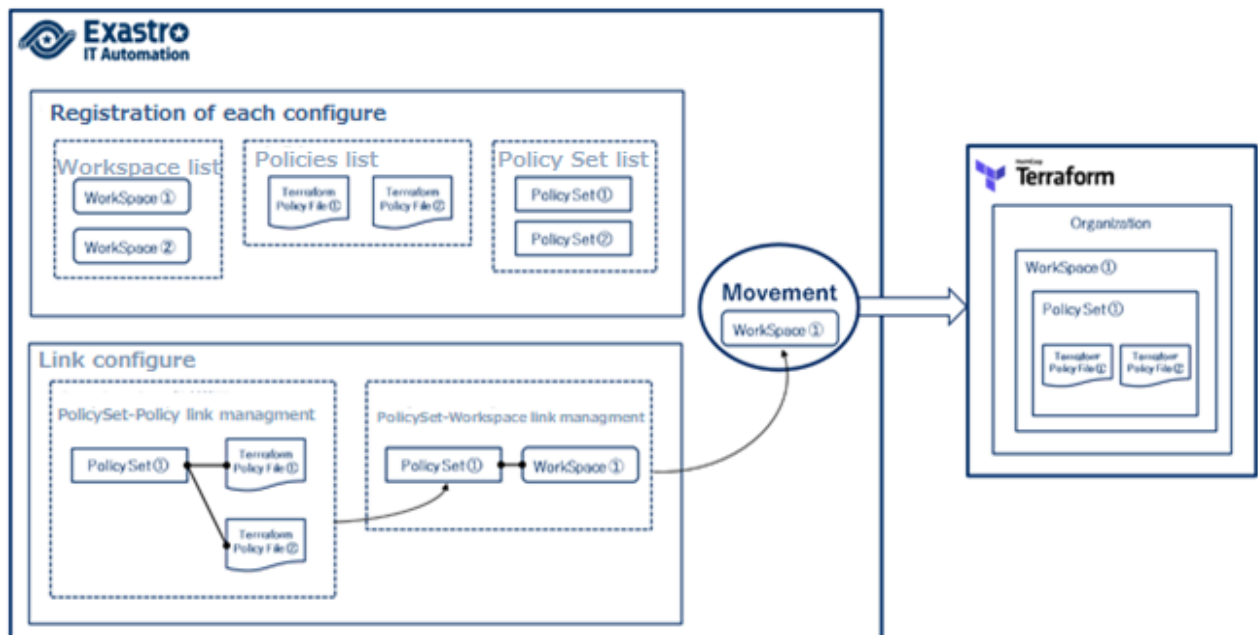


Figure 5.1-1 About link Policy/PolicySet/Workspace

6 Terraform driver function · operation method explanation

This chapter explains each console function used in Terraform driver.

6.1 Basic console

This section describes 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.

6.1.1 Input operation list

- (1) On the [Submission Operation List] screen, manage the operations for the work target host executed by the orchestrator. Select the work from the menu in the ITA basic console.

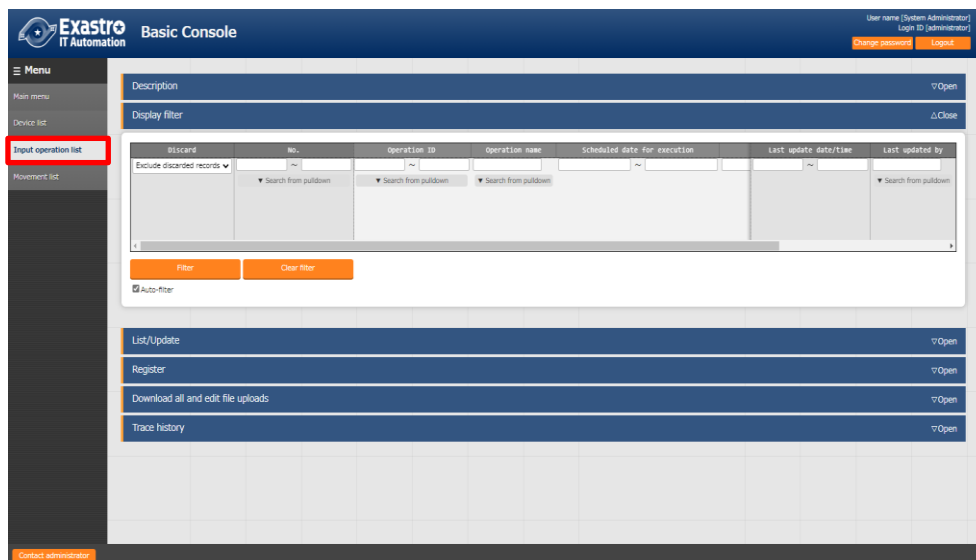


Figure 6.1.1-1 Submenu screen (list of input operations)

For details on the registration method, refer to "Usage Procedure Manual_Basic Console" in the related manual.

6.2 Terraform driver console

This section describes the operation on the Terraform console.

6.2.1 Interface information

- (1) In [Interface Information], maintain (view/update) the information of Terraform Enterprise linked with the ITA system. The Hostname of Terraform Enterprise to be linked and the User Token issued by User of Terraform Enterprise are required.

Figure 6.2.1-1 Submenu screen (Interface Information)

- (2) Click the "List"->"Update" button to register the interface information. If the work is executed while the interface information is not registered or multiple records are registered, the work execution will result in an unexpected error.

Figure 6.2.1-2 Registration screen (Interface Information)

- (3) The list of items on the interface information screen is as follows.

Table 6.2.1-1 Item list (interface information)

Item	Description	Input required	Input type	Restriction
Hostname	Enter the Hostname of the Terraform Enterprise	○	Manual	Maximum length

Item	Description	Input required	Input type	Restriction
	with which the ITA system works.			256 bytes
User Token	Enter the User Token issued from [User Settings] of Terraform Enterprise.	○	Manual	Maximum length 256 bytes
Condition monitoring cycle (Unit milliseconds)	Enter the refresh interval of the log displayed in "6.2.13 Check operation status". Normally, about 3000 milliseconds is the recommended value.	○	Manual	Minimum value 1000 ms
Number of lines to display progress	Enter the maximum number of lines to be displayed in the progress log and error log in "6.2.13 Check operation status ".Normally, about 1000 lines is the recommended value.	○	Manual	-
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

6.2.2 Organizations list

- (1) In [Organizations list], maintenance (view/registration/update/abolition) of the Organization used in Terraform Enterprise is performed. In addition, the Organization registered in the ITA system can be linked (registered/updated/deleted) to Terraform Enterprise.

Figure 6.2.2-1 Submenu screen (Organizations list)

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

Figure 6.2.2-2 Registration screen (Organizations list)

- (3) After "Registering" the Organization, click the "Check Link Status" button from "List/Update" to check the linkage status with Terraform Enterprise. The link (Register/Update /Delete) button to Terraform Enterprise changes to active according to the link status, and link with Terraform Enterprise by clicking it.

If the work is executed without the Organization being linked (registered) with Terraform Enterprise, the work execution will result in an unexpected error.

If the "Host name" and "User Token" registered in "6.2.1 Interface Information" are incorrect, the link with Terraform Enterprise will fail and the following message will be displayed in the link status.

"Failed to connect to Terraform Enterprise. Check the interface information".

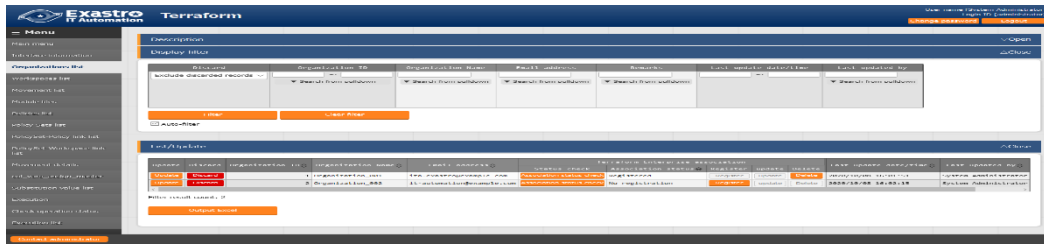


Figure 6.2.2-3 Terraform Enterprise cooperation (Organizations list)

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

Table 6.2.2-1 Item list (Organizations list)

Item		Description	Input required	Input type	Restriction
Organization Name		Enter the name of organization. Only single-byte alphanumeric characters and symbols underscore and hyphen (_,-) can be used.	<input type="radio"/>	Manual	Maximum length 40 bytes
Email address		Enter the Email address of organization.	<input type="radio"/>	Manual	Maximum length 128 bytes
Terraform Enterprise Link	Check link state	It is a button to execute the linkage status check.	-	-	
	Link state	The status of link with Terraform Enterprise is displayed for the target Organization. If not registered on the Terraform Enterprise side, it become "No registration". If it is registered but there is a difference in the email address, it become "updated" If it is registered, "Registered" will be displayed.	-	-	
	Registration	It is a button to execute registration. Activated when "No registration". Click to register the target Organization in Terraform Enterprise.	-	-	
	Update	This is the button to execute the update. Activated when "Updated". Click to update the email address of the target Organization registered in Terraform Enterprise.	-	-	
	Delete	It is a button to execute deletion. It is activated when "Registered" or "Updated". Click to delete the target Organization registered in Terraform Enterprise. ※The deleted Organization cannot be restored. Also, Workspace under Organization will be deleted.	-	-	
Remarks		Free description field.	-	Manual	Maximum length 4000 bytes

6.2.3 Workspaces list

- (1) Workspaces list performs maintenance (view/registration/update /decommission) of Workspace used in Terraform Enterprise.

Also, Workspace registered in the ITA system can be linked (registered/updated/deleted) to Terraform Enterprise.

Since Workspace is linked to Organization, it is necessary to register the target in "6.2.2 Organizations List" first.

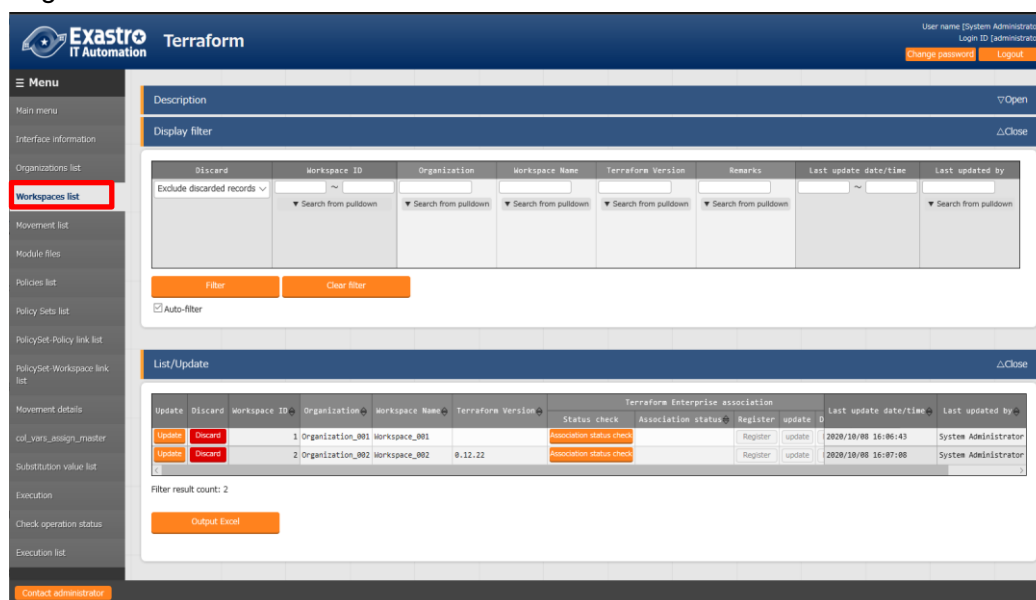


Figure 6.2.3-1 Submenu screen (Workspaces list)

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



Figure 6.2.3-2 Registration screen (Workspaces list)

- (3) After registering Workspace, click the "Link status check" button from "List/Update" to check the linkage status with Terraform Enterprise. The link (register/update/delete) button to Terraform Enterprise changes to active according to the link status, and link with Terraform Enterprise by clicking it.

If the work is executed without the Organization being linked (registered) with Terraform Enterprise, the work execution will result in an unexpected error.

If the "Host name" and "User Token" registered in "6.2.1 Interface Information" are incorrect, the link with Terraform Enterprise will fail and the following message will be displayed in the link status.

Failed to connect to terraform Enterprise. Check the interface information.

Also, similar message will be displayed if the selected Organization is not linked (registered)

with Terraform Enterprise.

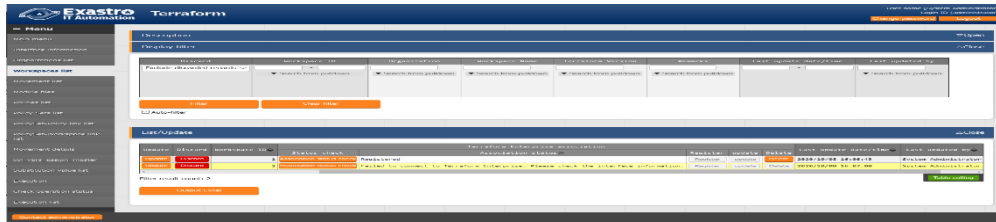


Figure 6.2.3-3 Terraform Enterprise Integration (Workspaces List)

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

Table 6.2.3-1 item list (Workspaces list)

Item		Description	Input required	Input type	Restriction
Organization Name		Select the Organization Name registered in "6.2.2 Organizations list".	<input type="radio"/>	List selection	
Workspace Name		Only single-byte alphanumeric characters and symbols underscore and hyphen (_, -) can be used.	<input type="radio"/>	Manual	Maximum length 90 bytes
Terraform Version		Enter the version of Terraform. If left blank, the latest version will be applied automatically when link (registering).		Manual	
Terraform Enterprise Link	Check link state	It is a button to execute the linkage status check.	-	-	
	Link state	The status of link with Terraform Enterprise is displayed for the target Workspace. If not registered on the Terraform Enterprise side, it become "No registration". If it is registered but there is a difference in Terraform Version, it become "Updated". If it is registered, "Registered" will be displayed.	-	-	
	Registration	It is a button to execute registration. Activated when "No registration". Click to register the target Workspace in Terraform Enterprise.	-	-	
	Update	This is the button to execute the update. Activated when "Updated". Click to update the Terraform Version of the target Workspace registered in Terraform Enterprise.	-	-	
	Delete	It is a button to execute deletion. It is activated when "Registered" or "Updated". Click to delete the target Workspace registered in Terraform Enterprise. ※The deleted Workspace cannot be restored.	-	-	
Remarks		Free description field.	-	Manual	Maximum length 4000 bytes

6.2.4 Movement list

- (1) In [Movement list], maintenance (view/registration/update/abolition) of the movement name is performed.

Since Movement needs to be linked with Organization: Workspace as Terraform usage information, it is necessary to register the target in "6.2.2 Organizations list" and "6.2.3 Workspaces list" first.

Figure 6.2.4-1 Submenu screen (Movement list)

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

Figure 6.2.4-2 Registration screen (Movement list)

- (3) The items on the Movement list screen are as follows.

Table 6.2.4-1 Item list (Movement list)

Item	Description	Input required	Input type	Restriction
Movement Name	Enter the name of the Movement.	○	Manual	Maximum length 256 bytes
Orchestrator	"Terraform" is automatically entered.	-	-	-
Delay timer	Enter the specified period (1~) if you want the status to be displayed as a warning when the movement is delayed for the specified period.	-	Manual	-

		(Unit: minutes) In not input, no warning will be displayed.			
Terraform use informati on	Organization :Workspace	Select the Workspace registered (linked to Organization) in "6.2.3 Workspaces list".	○	List select	
Remarks		Free description field.	-	Manual	Maximum length 4000 bytes

6.2.5 Module files

- (1) In [Module files], maintenance (view/registration/update/abolition) of the module created by the user is performed.

For the description of Module, refer to "7.1 Module description".

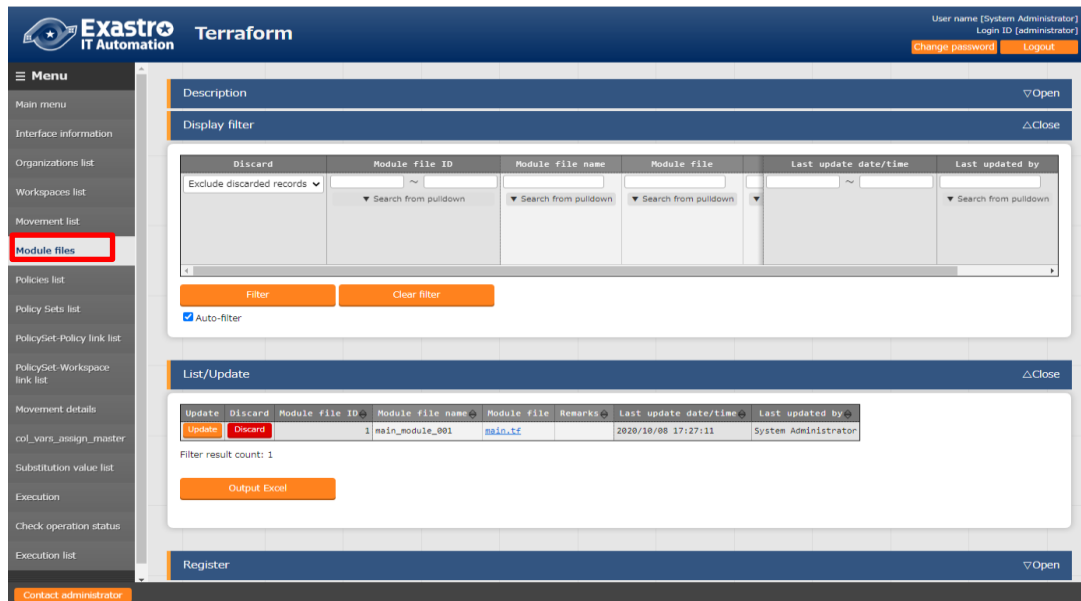


Figure 6.2.5-1 Submenu screen (Module files)

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

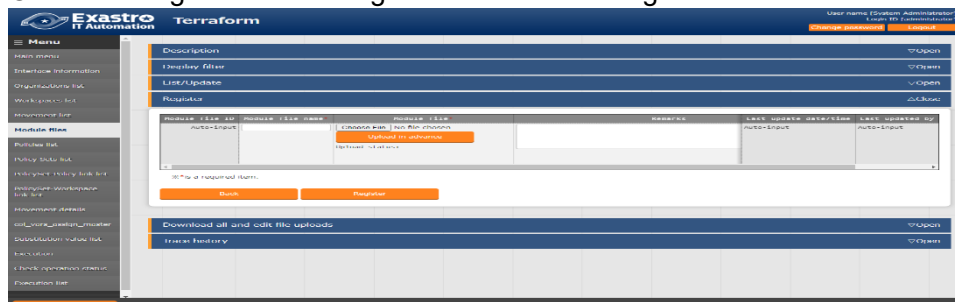
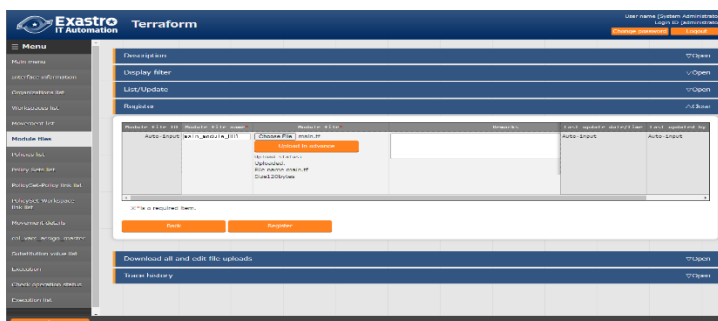


Figure 6.2.5-2 Registration screen (Module files)

Before "Registration", please "Upload (①)" "Module files". Make sure that the "upload situation (②)" to the Module of the file name is displayed, please press the "Register" button.



(3) The list of items in the Module files is as follows.

Table 6.2.5-1 Item list (Module files)

Item	Description	Input required	Input type	restriction
Module files name	Input the Module file name managed by ITA.	○	Manual	Maximum length 256 bytes
Module files	Upload the created Module file.	○	File select	Maximum size 4G bytes
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

Extract the variables defined in the Module file by internal processing. For the extracted variables, register specific values in "6.2.11 Substitution value list".

Since the timing of extraction is not real-time, it may take some time before the variables can be handled in "6.2.11 Substitution value list".

※The timing of extraction is described in "③ Change of startup cycle" in "8.2 Maintenance method", so please refer to it.

6.2.6 Policies list

- (1) [Policies List] maintains (views/registers/updates/discontinues) policies created by users. For details on Policy description, refer to "7.2 Policy description".

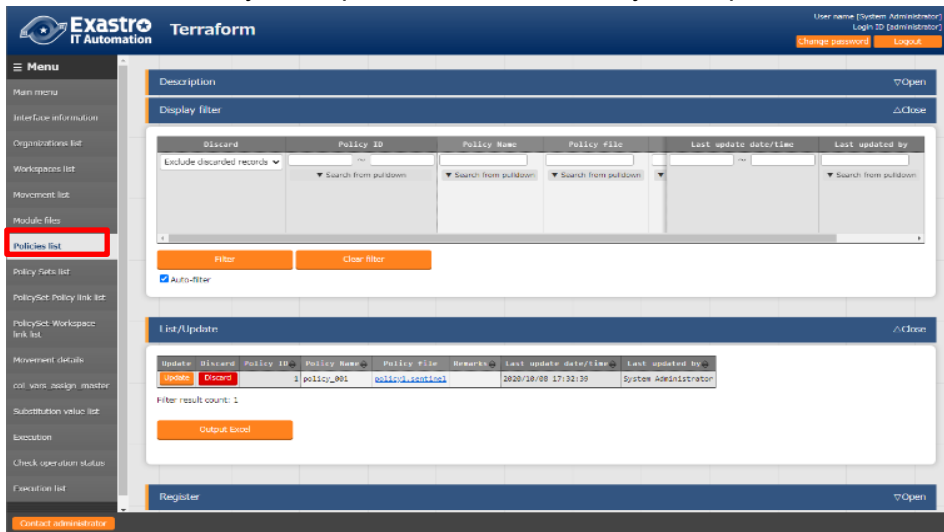


Figure 6.2.6-1 Submenu screen (Policies list)

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

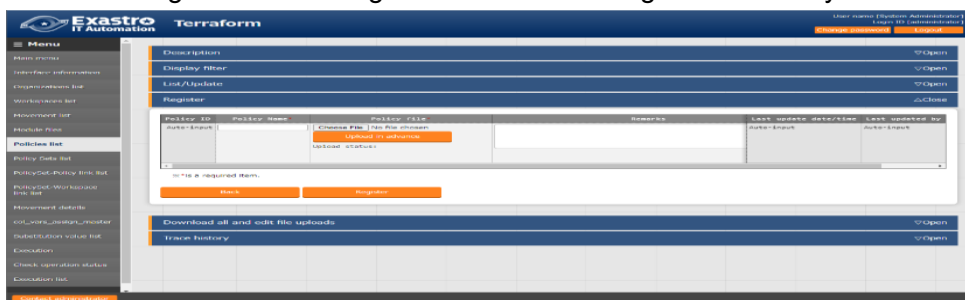
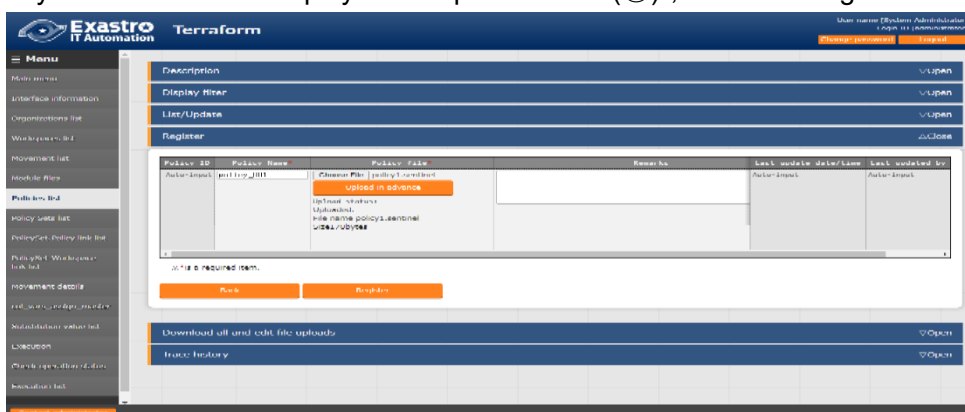


Figure 6.2.6-2 Registration screen (Policies list)

Before "Registration", please "Upload in advance (①)" of "Policy list". After confirming that the Playbook file name is displayed in "Upload status (②)", click the "Register" button.



(3) The list of items managed by Policies is as follows.

Table 6.2.6-1 Item list (Policies list)

Item	Description	Input required	Input type	Restriction
Policy name	Input the Module file name managed by ITA.	○	Manual	Maximum length 256 bytes
Policy file	Upload the created Module file.	○	File select	Maximum size 4G bytes
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

6.2.7 Policy Sets list

In [Policy Sets list], maintain (view/register/update/abolish) Policy Sets

By link Policy Set with Policy and Workspace in "6.2.8 Policy Set-Policy linked list" and "6.2.9 Policy Set-Workspace link list", Policy is applied to Workspace at the time of work execution.

Figure 6.2.7-1 Submenu screen (Policy Sets list)

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

Figure 6.2.7-2 Registration (Policy Sets list)

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

Table 6.2.7-1 Item list (PolicySets list)

Item	Description	Input required	Input type	Restriction
PolicySet name	Enter the PolicySet name managed by ITA.	○	Manual	Maximum length 256 bytes
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

6.2.8 PolicySet-Policy link list

- (1) In [Policy Set-Policy link list], maintenance (view/registration/update/abolition) is performed for the link of the Policy created in "6.2.6 Policies list" and the Policy Set created in "6.2.7 Policy Sets list".

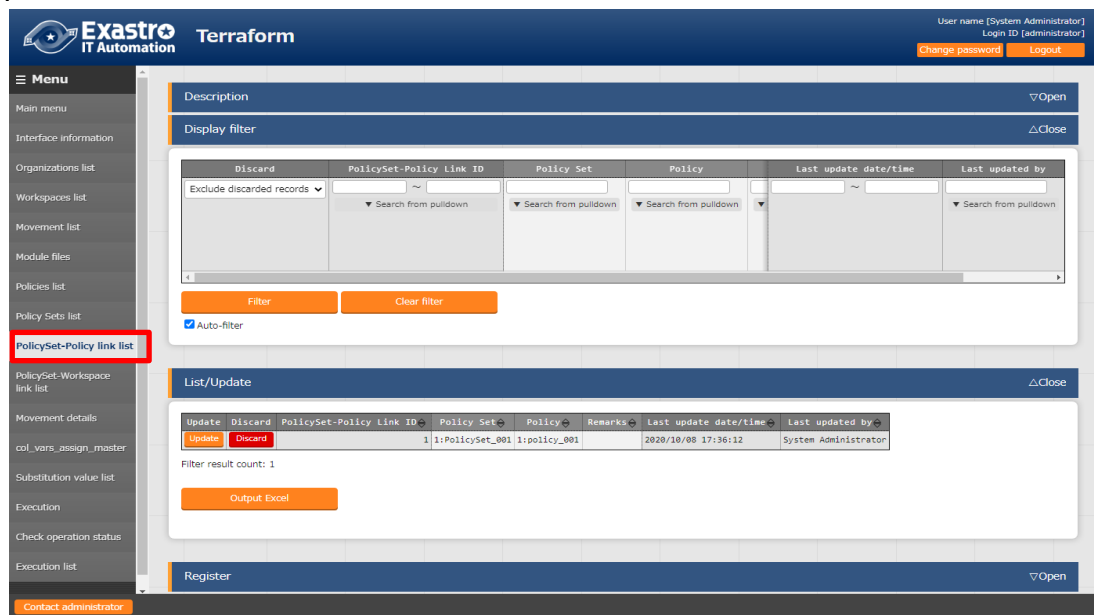


Figure 6.2.8-1 Submenu screen (PolicySet-Policy link list)

- (2) Click the "Register"- "Start Registration" button to register the PolicySet-Policy link.

Figure 6.2.8-2 Registration screen (PolicySet-Policy link list)

- (3) Click the "Register"- "Start Registration" button to register the PolicySet-Policy link.

Table 6.2.8-1 Item list (PolicySet-Policy link list)

Item	Description	Input required	Input type	Restriction
Policy Set	Select the Policy Set name registered in "6.2.7 Policy Sets list".	○	List select	
Policy	Select the Policy name registered in "6.2.6 Policies list".	○	List select	
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes.

6.2.9 PolicySet-Workspace link list

- (1) In [PolicySet-Workspace link list], maintenance (view/registration/update/abolition) is performed for the link of Workspace created in "6.2.3 Workspaces list" and PolicySet created in "6.2.7 Policy Sets list".

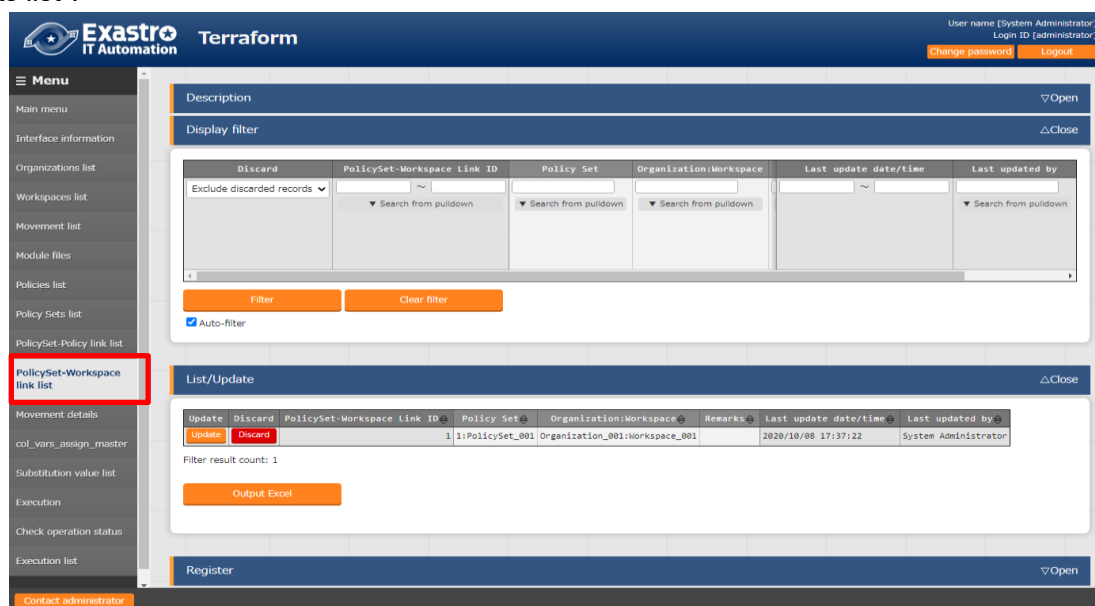


Figure 6.2.9-1 Submenu screen (PolicySet-Workspace link list)

- (2) Click the "Register"- "Start Registration" button to register the PolicySet-Workspace link.

Figure 6.2.9-2 Registration screen (PolicySet-Workspace link list)

- (3) The list of items for PolicySet-Workspace association list is as follows.

Table 6.2.9-1Item list (PolicySet-Policy link list)

Item	Description	Input required	Input type	Restriction
Policy Set	Select the PolicySet name registered in "6.2.7 Policy Sets list".	○	List select	
Organization:Workspace	Select the Workspace registered (link to Organization) in "6.2.3 Workspaces list".	○	List select	
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

6.2.10 Movement Details

- (1) Browsing/register/update/discard the module files executed in the "Movement details menu".
Possible to link multiple module files to Movement.

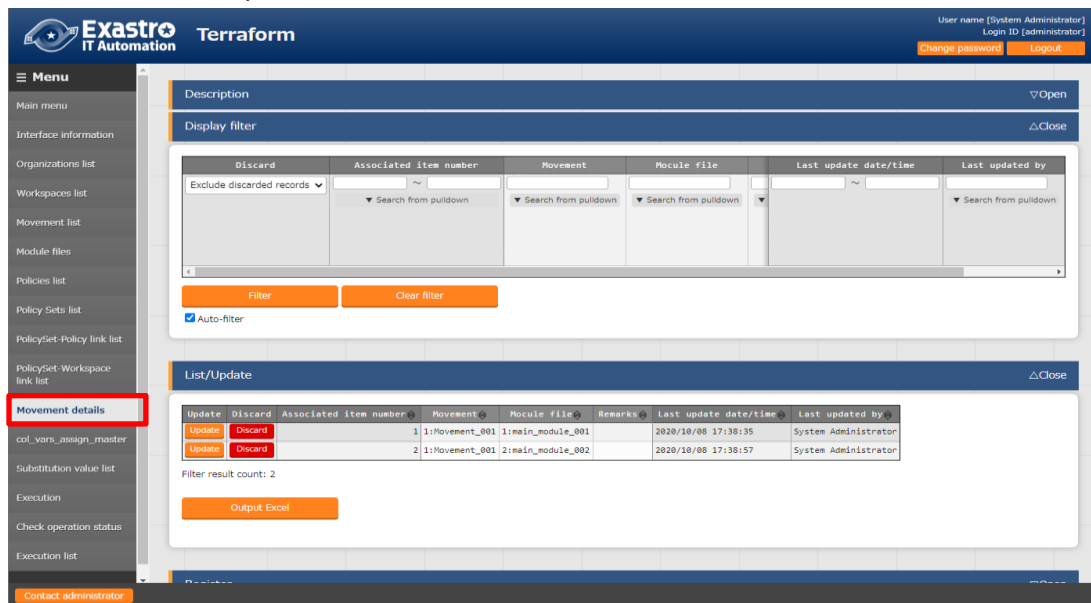


Figure 6.2.10-1 Submenu screen (Movement details)

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

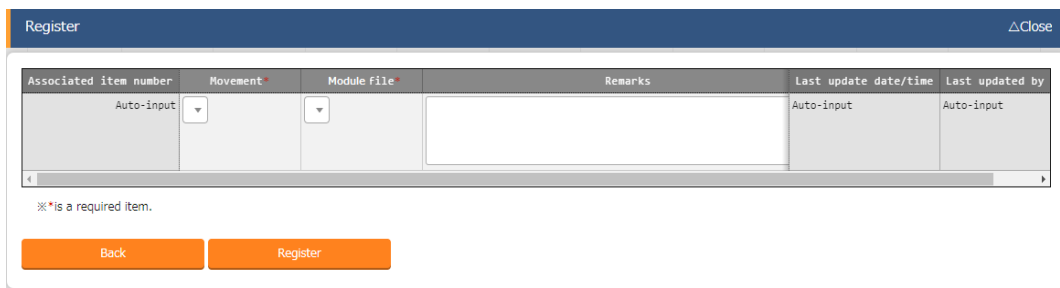


Figure 6.2.10-2 Registration screen (Movement details)

- (3) The item list of Movement details is as follows.

Table 6.2.10-1 Item list (Movement details)

Item	Description	Input required	Input type	Restriction
Movement	Select the Movement registered in "6.2.4 Movement list".	○	List select	-
Module files	Select the Module file registered in "6.2.5 Module files".	○	List select	-
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

6.2.11 Substitution Value List

- (1) In [Substitution value list], maintain (view/register/update/abolish) the specific value to be assigned to the variable "var.xxx" in the Module used in the target Movement for each operation.

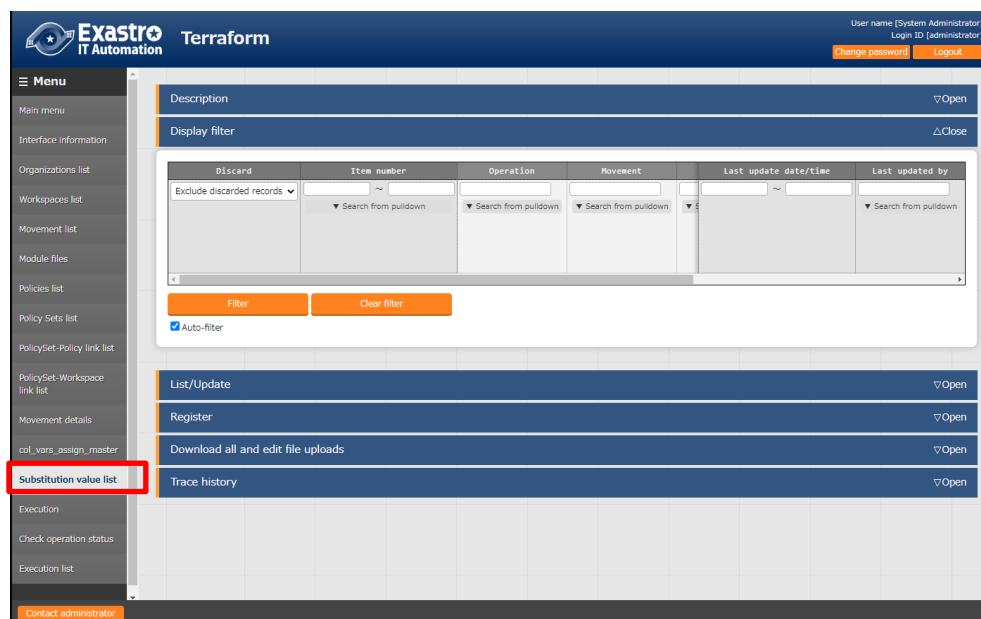


Figure 6.2.11-1 Submenu screen (Substitution value list)

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

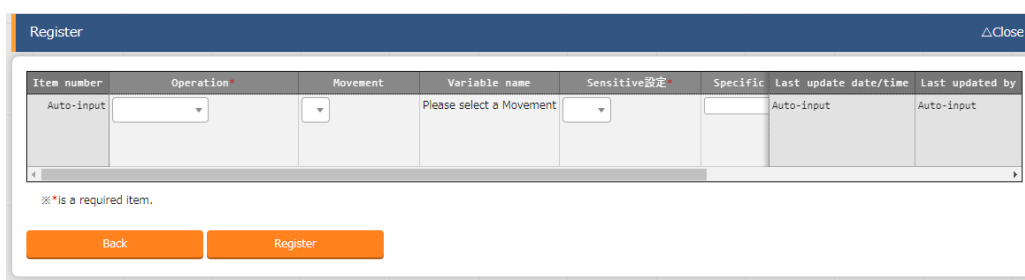


Figure 6.2.11-2 Registration screen (Substitution value list)

Variables for assignment value list are reflected from the file information registered in "6.2.5 Module files".

※ The timing of extraction is described in "③ Change of startup cycle" of " 8.2 About the maintenance method", so please refer to it.

- (3) For the variables registered in the substitution value list, the "variable name" is registered as "Key" and the "concrete value" is registered as "Value" for the Variables managed in the Workspace on the Terraform Enterprise side when the work is executed.

(4) The list of items for assignment value list is as follows.

Table 5.2-13 Item list (Substitution value list)

Item	Description	Input required	Input type	Restriction
Operation	Select the target operation.	<input type="radio"/>	List select	-
Movement	Select the target movement.	<input type="radio"/>	List select	-
Variable name	The variable name attached to the selected Movement is displayed from the Module files registered in the Movement details. Select a variable.	<input type="radio"/>	List select	-
Sensitive configure	Select "OFF" or "ON". If you select "ON", enable "Sensitive" for that variable when registering in the Workspace on the Terraform Enterprise side so that the specific value is not displayed.	<input type="radio"/>	List select	
Specific value	Input the specific value of the variable used in the operation/movement.	<input type="radio"/>	Manual	Maximum Length 8192 bytes
Remarks	Free description field.	-	Manual	Maximum Length 4000 bytes

6.2.12 Execution

- (1) Instructs the execution of work. Select from the Movement list and the operation list with the radio buttons, and press the execute button to move to "6.2.13 Check operation status" and execute.

The screenshot displays the Exastro IT Automation Terraform interface. The left sidebar contains a menu with the following items: Main menu, Interface information, Organizations list, Workspaces list, Movement list, Module files, Policies list, Policy Sets list, PolicySet-Policy link list, PolicySet-Workspace link list, Movement details, col_vars_assign_master, Substitution value list, **Execution** (highlighted with a red box), Check operation status, and Execution list. The main content area is titled "Terraform" and shows the "Execution" submenu. It includes sections for "Movement [Filter]", "Movement [List]", "Operation [Filter]", and "Operation [List]". The "Movement [List]" table shows two movements: Movement_001 and Movement_002. The "Operation [List]" table shows one operation: Operation01. The "Execution" submenu also includes a "Contact administrator" button.

Select	Movement ID	Movement Name	Orchestrator	Delay timer	Terraform Enterprise Integration	Remarks	Last update date/time	Last updated by
<input checked="" type="radio"/>	1	Movement_001	Terraform		Organization_001:Workspace_001		2020/10/08 16:15:08	System Administrator
<input type="radio"/>	2	Movement_002	Terraform	10	Organization_002:Workspace_002		2020/10/08 16:15:44	System Administrator

Filter result count: 2

Select	No.	Operation ID	Operation name	Scheduled date for execution	Last execution date	Remarks	Last update date/time	Last updated by
<input checked="" type="radio"/>	1	1	Operation01	2020/10/08 16:00			2020/10/08 15:58:27	System Administrator

Filter result count: 1

Movement ID 1
Movement Name Movement_001

Operation ID 1
Operation Name Operation01

Contact administrator

Figure 6.2.12-1 Submenu screen (Execution)

① 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"

6.2.13 Check operation status

(1) Monitor the execution status of operation.

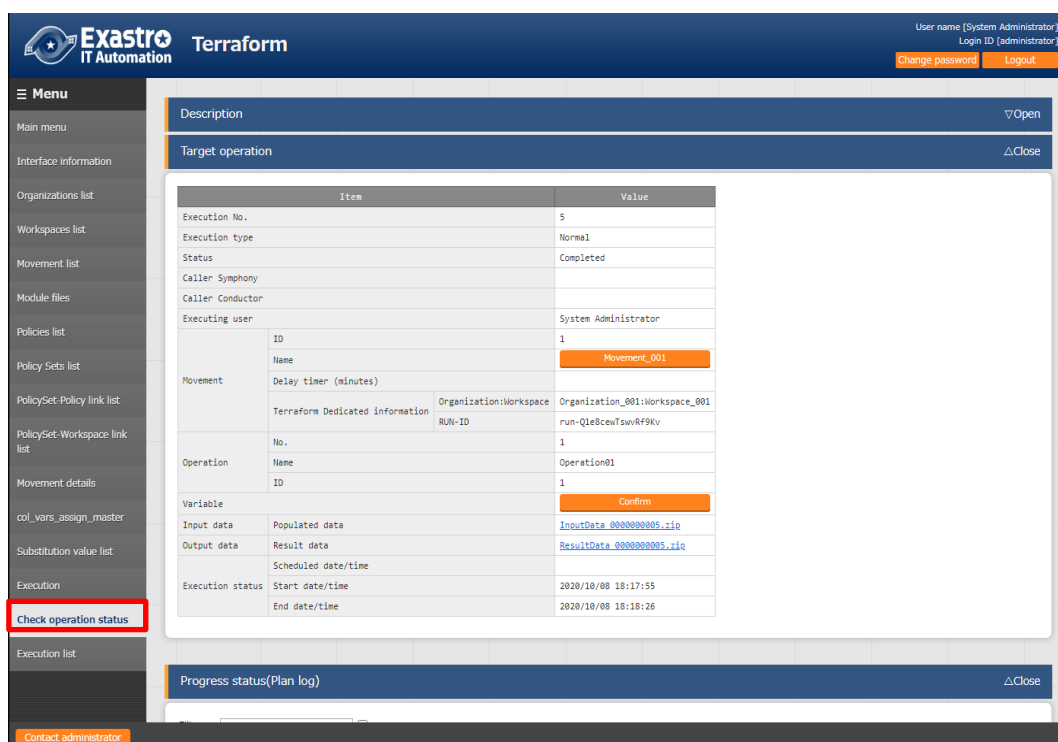


Figure 6.2.13-1 Submenu screen (Check operation status)

① Display of execution status

"Status" is displayed according to the execution status.

Also, the execution status log of plan/policyCheck/apply executed by Terraform Enterprise is displayed in the execution log and error log.

If the status ends with an unexpected error, the registration of "6.2.1 Interface Information" is incorrect, and the linkage (registration) with Terraform Enterprise in "6.2.2 Organizations list" and "6.2.3 Workspaces list" has not been performed. Or, if it is due to improper registration of other web content, a message will be displayed in the error log.

For other errors, no message is displayed in the error log. In this case, the error information is recorded in the process log. Check the process log if necessary.

※Please refer to "④ Log file name" in "8.2 Maintenance method" for the process log.

Caller Symphony shows from which Symphony it was executed. It will be blank if it is executed directly from the Terraform driver or if it is executed from Conductor.

Caller Conductor shows from which Conductor it was executed. This will be blank if you run it directly from the Terraform driver or from Symphony.

In "Execution user", the login user when the "Execute" button is pressed from the work execution menu is displayed.

The "RUN-ID" displayed in "Terraform Usage Information" is the execution list ID managed by Terraform Enterprise, and is used when link with Terraform Enterprise using Backyard

content.

② **Substitution value confirmation**

By clicking the "confirmation" button, "6.2.11 Substitution value list" will display and the substitution value filtered by the operation and Movement of operation target will be displayed.

③ **Emergency 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.

④ **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 execution and error log can be set in "Status monitoring cycle (milliseconds)" and "Number of rows to display progress status" of "6.2.1 Interface information" menu.

⑤ **Input data**

User can download the executed Module files.

⑥ **Result data**

User can download execution logs, error logs, and state files generated by Terraform Enterprise.

6.2.14 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 hovering the mouse cursor over each graph, the download button of each graph will be displayed on the top-right of the graph.

Users can download the graph by clicking the download button of each displayed graph.

By clicking the "Check execution status" button, the screen will transit to "6.2.13 Check operation status" and the details of execution status can be viewed.

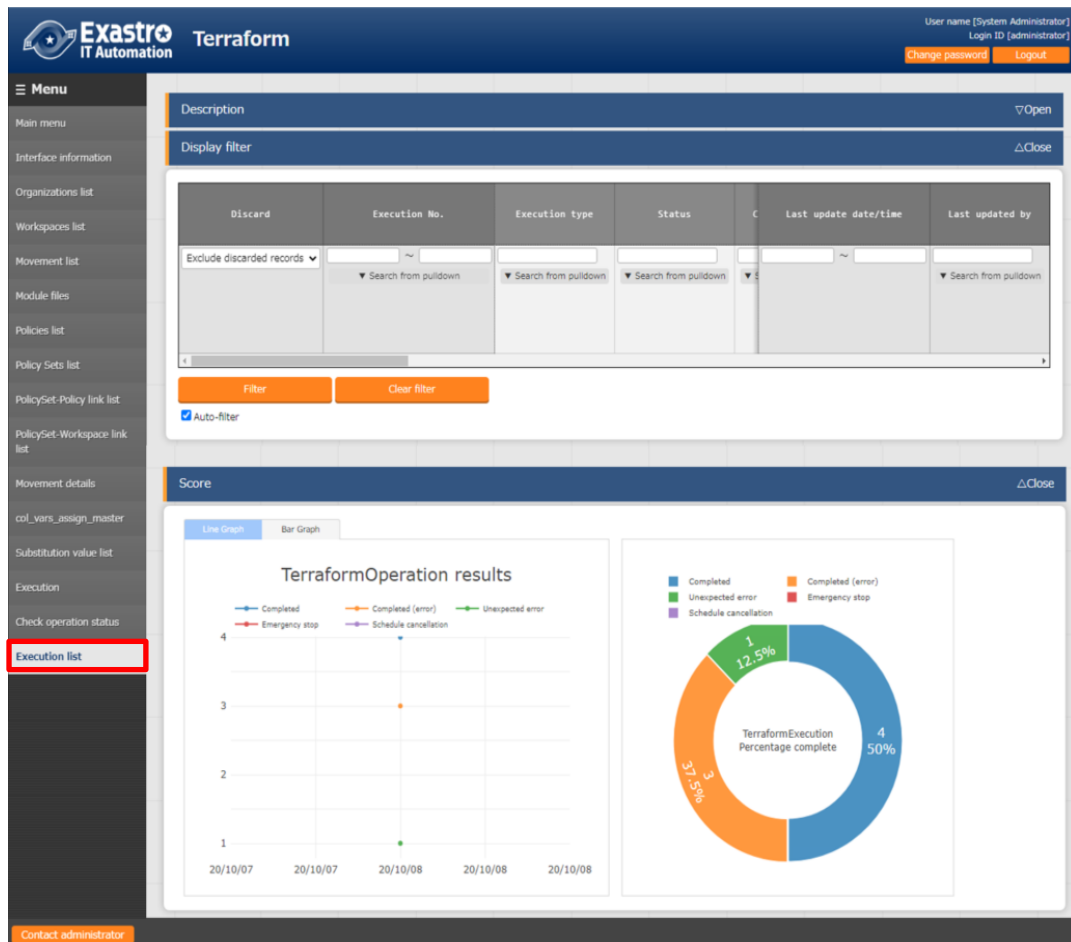


Figure 6.2.14-1 Submenu screen (Execution list)

7 How to write construction code

Describes the description of Module and Policy in Terraform driver.

7.1 Description of module

Module files are written in HashiCorp's own language called HCL (HashiCorp Configuration Language).

For more information on HCL, see the Terraform product documentation.

7.2 Descriptions of policy

The Policy file is written in HashiCorp's own language called Sentinel language.

For more information on the Sentinel language, see the Terraform product documentation.

8 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.

8.1 Maintance

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

Description	Target file name
Terraform work execution monitoring Execute the unexecuted Operation.	ky_terraform_execute-workflow.service
Terraform work execution monitoring Check the status of running work and acquire logs.	ky_terraform_checkcondition-workflow.service
Terraform variable automatic registration Extract variables from the uploaded Module files.	ky_terraform_varsautolistup-workflow.service

The target file is stored in “/usr/ lib/systemd/system”.

The process of start/stop/restart method are as follows.

Please execute the command with root privileges.

① Start process

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

② Stop process

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

③ Restart Process

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

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

8.2 About the process of maintance

① Change to NORMAL level

Rewrite the 8th line "DEBUG" in the following file to "NORMAL".

Log level setting file: <installation directory> /ita-root/conf/itabackyardconf/ita_env

② Change to DEBUG level

Rewrite the 8th line "NORMAL" in the following file to "DEBUG".

Log level setting file: <installation directory>/ita-root/conf/itabackyardconf/ita_env

③ Change the startup cycle

Change the 5th parameter of ExecStart of each target file. (Unit: seconds)

Please use the default value of startup cycle excluding exceptions.

```
ExecStart=/bin/sh    ${ITA_ROOT_DIR}/backyards/common/ky_loopcall-php-procedure.sh  
/bin/php    /bin/php    ${ITA_ROOT_DIR}/backyards/terraform_driver/ky_terraform_execute-  
workflow.php ${ITA_ROOT_DIR}/logs/backyardlogs 5 ${ITA_LOG_LEVEL} > /dev/null 2>&1
```

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

④ Log file name

Process name	Log file name
ky_terraform_execute-workflow	ky_terraform_execute-workflow_YYYYMMDD.log
ky_terraform_checkcondition-workflow	ky_terraform_checkcondition-workflow_YYYYMMDD.log
ky_terraform_varsautolistup-workflow	ky_terraform_varsautolistup-workflow_YYYYMMDD.log

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

