ITA_User Instruction Manual

Terraform-driver

― Version 1.6 ―

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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 that streamlines the infrastructure provided by HashiCorp.

For the infrastructure configuration coded in the language called HCL (HashiCorp Configuration Language), generate an execution plan and then execute the construction.
Additionally, you can code and manage access policies with Policy as Code.

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

1.2 About Terrform driver

Terraform driver functions as an option for ITA systems, allowing Terraform Enterprise registered with ITA systems to create organizations, Workspaces and execute operations (Plan/PolicyCheck/Apply) and acquire operation logs.
Module files used to perform operations (Plan/Apply) and Polycy files for PolicyCheck can be managed so that they can be made in to components and reused on the ITA system.

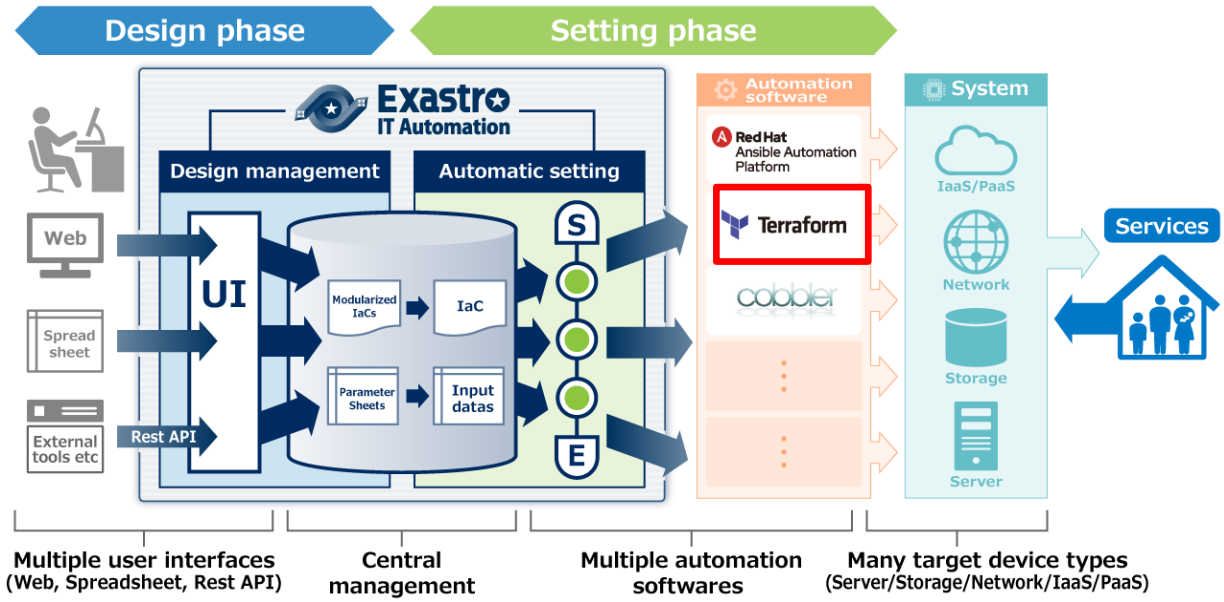


Figure 1.2-1 ITASystem Overview

In addition, Terraform driver can set variables in Module from the screen.For details, please refer to "Variable handling in Terraform driver" in this document.

2 Variable handling in Terraform driver

2.1 Variable type

In Terraform driver, user can set the specific value of the variable in module from the ITA configuring screen.

※For more information on the configuring method, please refer to "6.2.12 Substitution value list" in this document.

There is one type of variable in module that can be handled as an ITA variable:

Type	Content

Normal variable	A variable that allows you to define one specific value for the variable name.
	The variables in the Module should be written in the following format according to the variable rules of the HCL (HashiCorp Configuration Language). In this case, "xxx" is extracted from Module as a variable.
	variable “xxx” {
	~omission~
	}

2.2 Extraction of variables and registration of concrete values

User can register specific values by extrating variables out of module files uploaded to ITA.

For the specific value of the extracted variable, register the specific value in "6.2.11 substitution value automatic registration" and "6.2.12 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 configuration of the ITA console.
Please refer to the "First Step Guide" for information on how to log in to the web console and the components/basic operations of the menu screen.

3.1 Manu/Screen list

① ITA basic console menu

The menu list of ITA basic console used in 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	The input operation list can be maintained (browsing/register/update/abolish).

② **Console menu of Terraform driver**

The menu list for the 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 links with ITA.
2		Organizations list	Manage the Organization information used in Terraform Enterprise.
3		Workspaces list	Manage the Workspace information used in Terraform Enterprise.
4		Movement list	Manages the list of Movements that you want to register with Symphony.
5		Module files	Manage Module files.
6		Policies list	Manage policy files.
7		Policy Sets list	Manage Policy Set.Policy Set is linked with Polycy and Workspace to enable Polycy for the workspace of target when you execute work.
8		PolicySet-Policy link list	Manages the linking between PolicySet and Polycy.
9		PolicySet-Workspace link list	Manages the linking between PolicySet and Workspace.
10		Movement details	Manages the linking between Movement and Module files.
11		Substitution value automatic registration	Manage movements and variables that link items and values for each operation registered in the parameter sheet menu.
12		Substitution value list	Manages the subsituted value of a variable.
13		Operation execution	Select the Movement and Operation to execute and indicate the execution.
14		Check operation status	Displays the operation status.
15		Work list	Manage execution history.
16		Terraform Enterprise registration list	Users can list and delete Organizations, Workspaces, Policies and PolicySets that are registered in Terraform Enterprise.

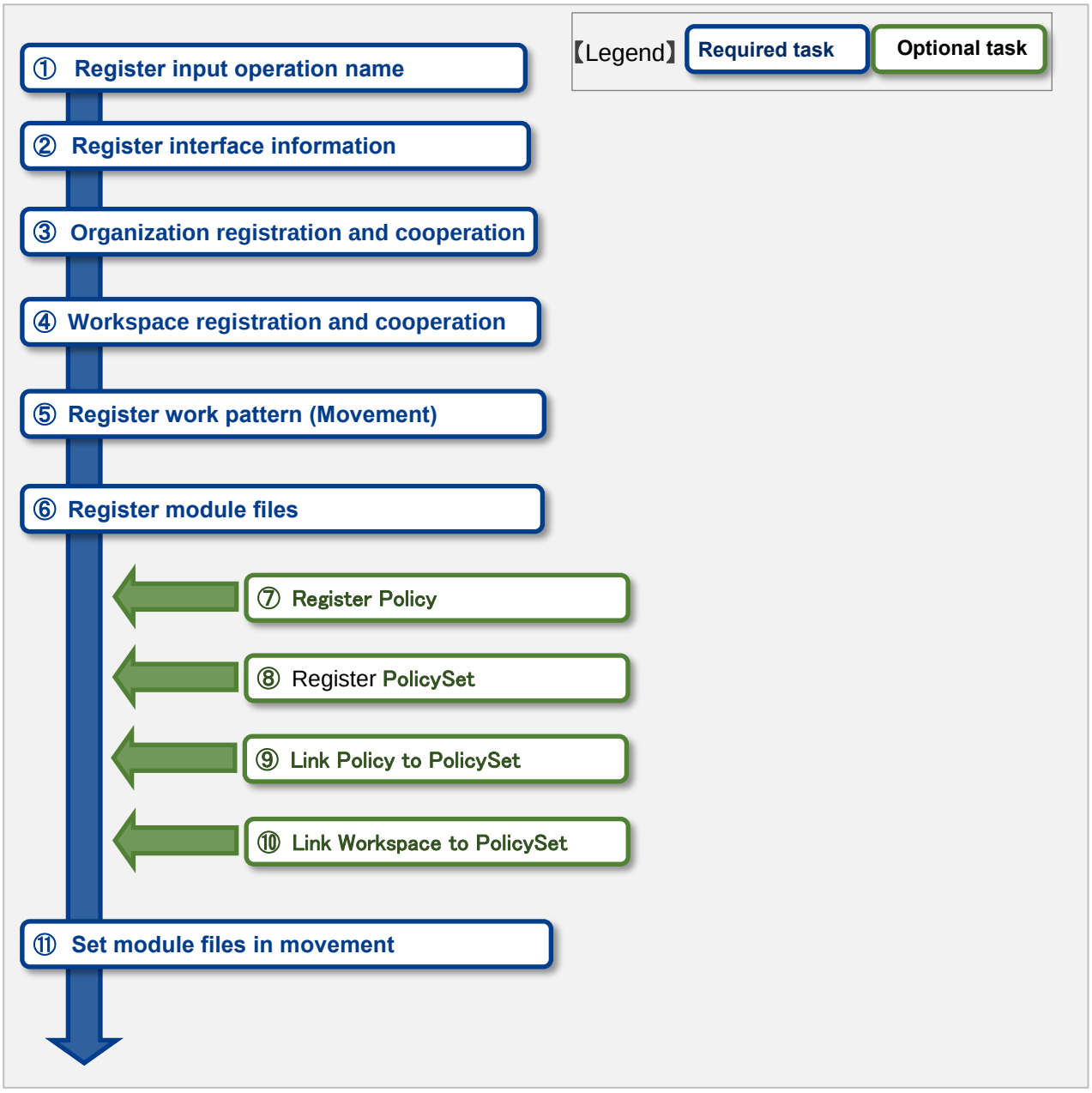
4 Terraform driver user instruction

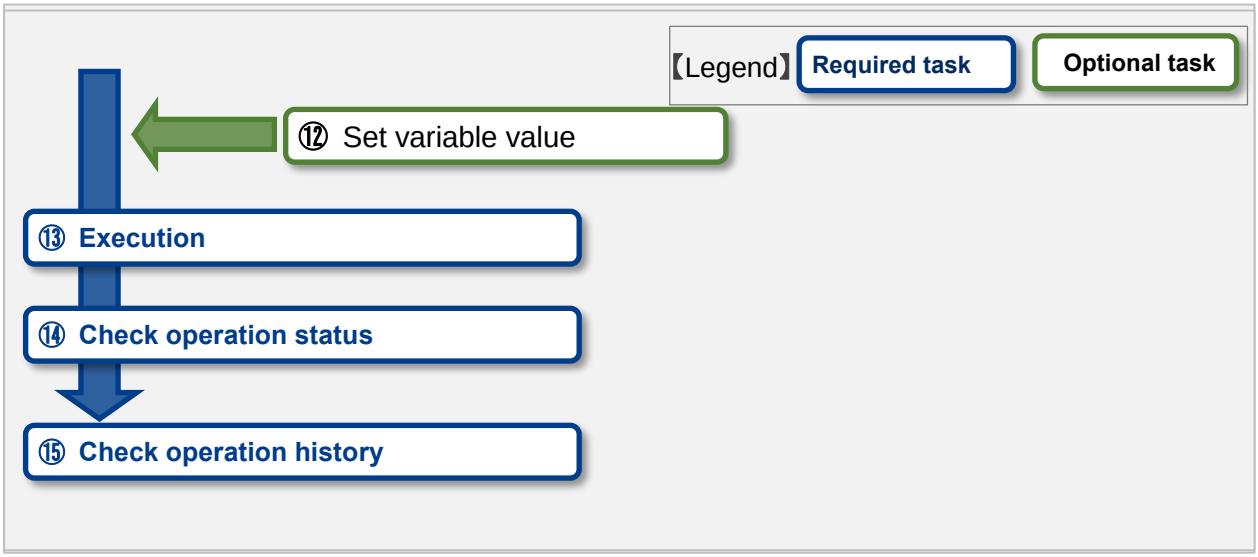
Description about user instruction of each Terraform console.

4.1 Terraform workflow

The standard work flow for each Terraform console is as follows.
Details of each operations are described in the next section.
For information on how to use the ITA Basic Console, please refer to "User Instruction Manual_Basic Console".

The flow to operation in Terraform are as follows.





- **Work flow details and references**

① **Register 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 **Register interface information**
Register the information of Terraform Enterprise that links 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 **Workspace Registration and cooperation**
Register Workspace information and link with Terraform Enterprise.
For details, refer to "6.2.3 Workspace list"

⑤ **Register work pattern (Movement)**
Register a movement for operation.
For details, refer to "6.2.4 Movement list".

⑥ **Register module files**
Register the Module file to be executed in the operation.
For details, refer to "6.2.5 Module files".

⑦ **Register policy (Execute if needed)**
Register the Polycy file to run with PolyCheck before you execute the work.
For details, refer to “6.2.6 Policies list”.

⑧ **Register PolicySet (Execute if needed)**
Register a PolyCySet to link to Workspace to which you want to apply Policy.

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

⑨ **Link Policy to PolicySet**
Register the linking between PolicySet and Policy.
For details, refer to "6.2.8 PolicySet-Policy link list".

⑩ **Link Workspace to PolicySet**
Register the linking between PolicySet and Workspace.
For details, refer to "6.2.9 PolicySet-Workspace link list".

⑪ **Set module files in Movement**
Specify the Module files in the registered Movement.
For details, refer to "6.2.10 Movement details".

⑫ **Set variable value (Execute if needed)**
Set the value of the variable defined in the Module files registered in Movement. If you are not using variables, user do not need to set them.
For details, refer to "6.2.12 Substitution value list".

⑬ **Execution**
Select and set the execution date and time, and the input operation to indicate the execution of the operation.
For details, refer to "6.2.13 Execution".

⑭ **Check operation status**
The status of the work executed is displayed in real time.
User can also monitor work emergency stops, execution logs and error logs.
For details, refer to "6.2.14 Check operation status".

⑮ **Check operation history**
A list of the work executed is displayed and the history can be checked.
For details, refer to "6.2.15 Execution list".

5 Policy operation in Terraform Driver

5.1 About link Policy/PolicySet/Workspace

In order to apply Policy, it is necessary to make a linking setting after each setting registration for Policy is made.

The first Polycy registered in "6.2.6 Policies list" and the PolyCySet registered with "6.2.7 Policy Sets list" will be linked with "6.2.8 PolicySet-Policy link list".

Next, workspace registered in "6.2.3 Workspaces list" and PolycySet registered with "6.2.7 Policy Sets list" will be linked with "6.2.9 PolicySet-Workspace link list".

PolicySet and its associated Polycy are applied to Workspace tied to Movement when you execute operation.

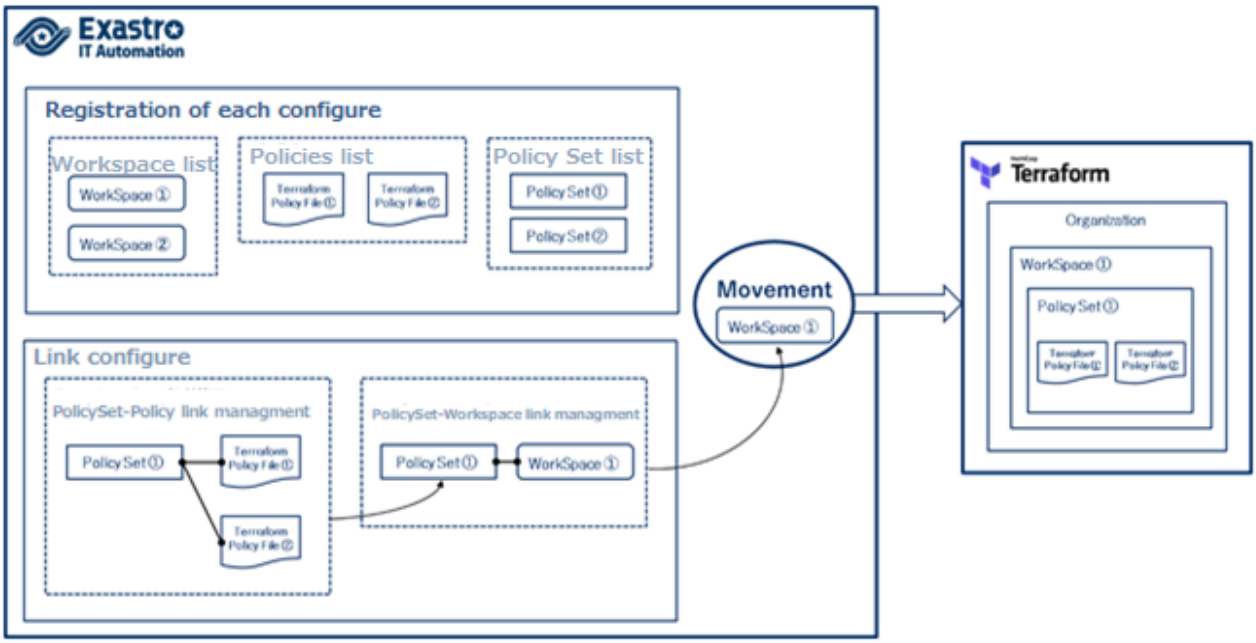


Figure 5.1-1 about linking Policy/PolicySet/Workspace

6 Terraform driver function and operation method explanation

This document explains each console function used in Terraform driver.

6.1 Basic console

This section describes the operation in the 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) The "Input operation list" screen manages the operations on the target host that the Orchestrator executes. Select the work from the menu in the ITA basic console.

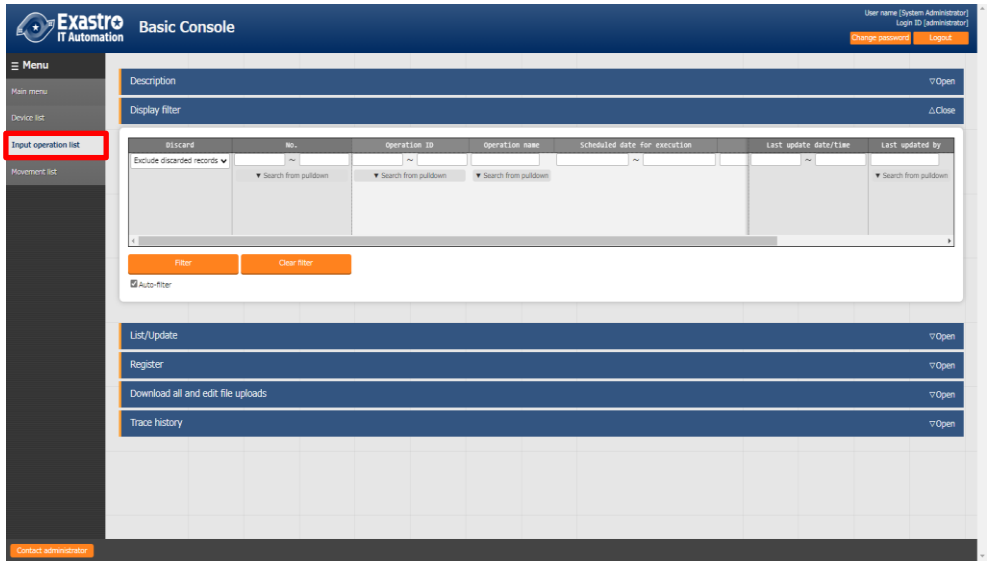


Figure 6.1.1-1 Submenu screen (list of input operations)

For details on the registration method, please refer to "User Instruction Manual_Basic Consol" 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], user can maintain (browsing/update) the information of Terraform Enterprise that is associated with the ITA system. User will need a User Token issued by Hostname of Terraform Enterprise and User of Terraform Enterprise to be targeted with.

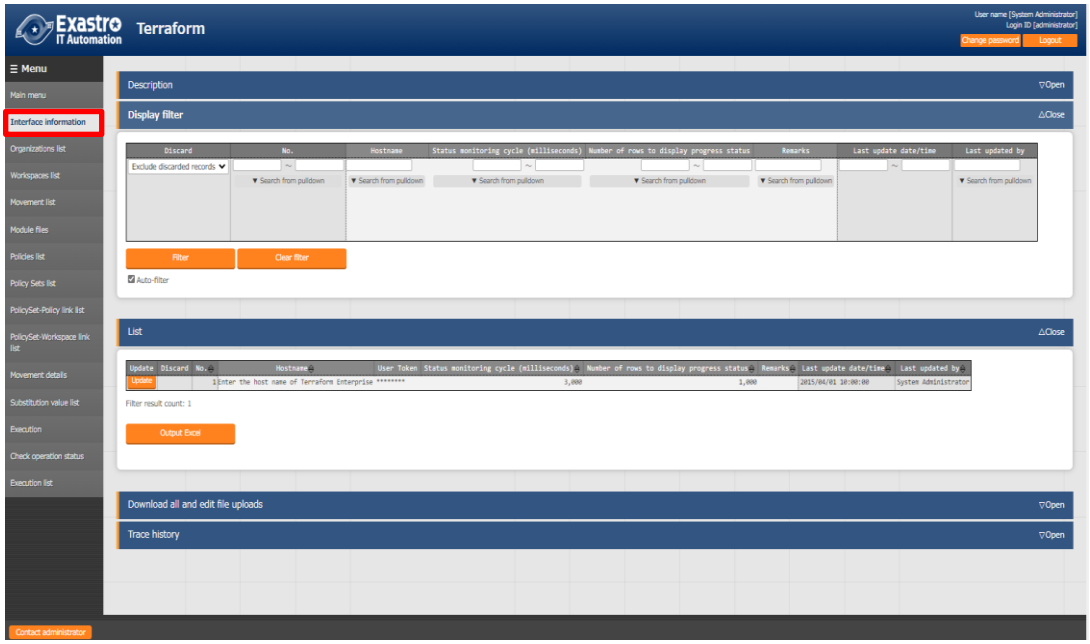


Figure 6.2.1–1 Submenu screen (Interface Information)

(2) Clicking the "List" button and then "Update" button will manage the registration of interface informations.
If you execute with interface information unregistered or multiple records registered, the work execution will be 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 Iteam list（interface information）

Item	Description	Input required	Input type	Restriction
Hostname	Enter hostname for Terraporrm Enterprise, which the target for link with the ITA system.	○	Manual input	Maximum length 256 bytes
User Token	Enter the User Token issued by User Settings in Terraform Enterprise.	○	Manual input	Maximum length 256 bytes
Condition observation period (Unit milli second)	Enter the refresh space for the log displayed in "6.2.14 Check operation status". Usally, about 3000 milliseconds is the recommended value.	○	Manual input	Minimum value 1000 ms
Number of lines progress status displayed	Enter the maximum number of lines to be displayed in the progress log and error log in "6.2.14 Check operation status ". Usally, about 1000 lines is the recommended value.	○	Manual input	-
NULL link	If the specific value of the parameter sheet in the " Substitution value auto-registration setting" is NULL(blank), users can set registrations to the list to have the value NULL(blank) or not. This value is applied when "NULL Link" (In the Substitution value auto-registration setting menu) is blank. ・ If "Enable", any value in the parameter sheet is registered in the substitution value list. ・ If "Disable", the value is registered in the value list only if the parameter sheet contains a value.	○	List selection	
Remarks	Free description field.	-	Manual input	Maximum length 4000 bytes

6.2.2 **Organizations list**

(1) In “Organizations list”, performs maintenance (browsing/registration/update/abolition) of the Organizations used in Terraform Enterprise is performed. In addition, the Organization registered with the ITA system can be linked (register/update/delete) to Terraform Enterprise.

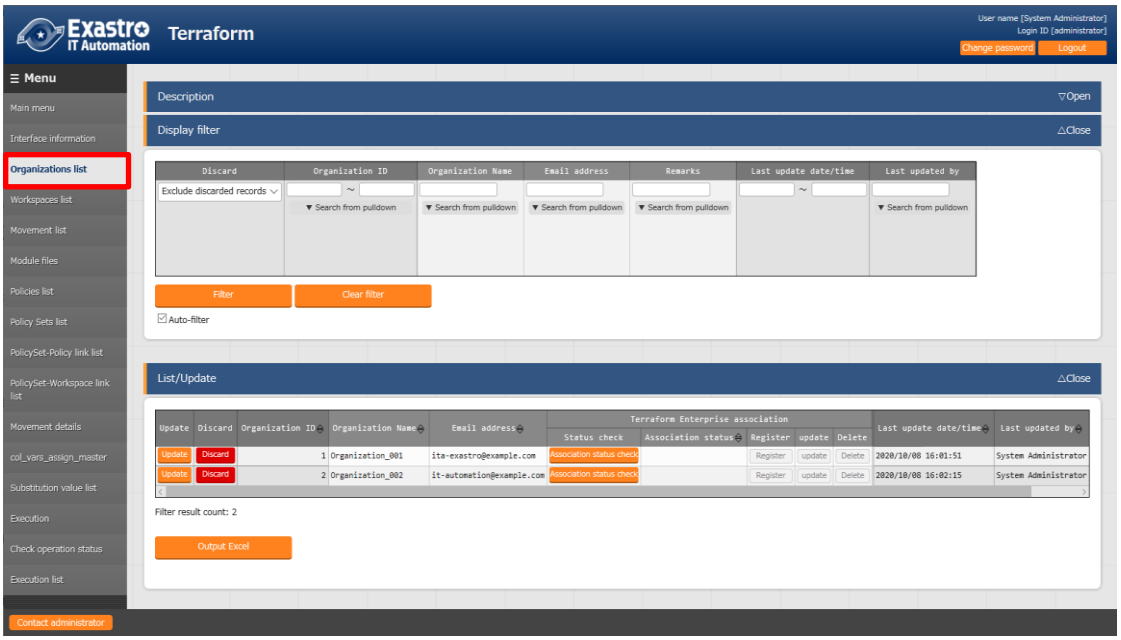


Figure 6.2.2-1 Submenu screen (Organizations list)

(2) Clicking the "Register" button and then "Start registration" button will register the Organization infornations.

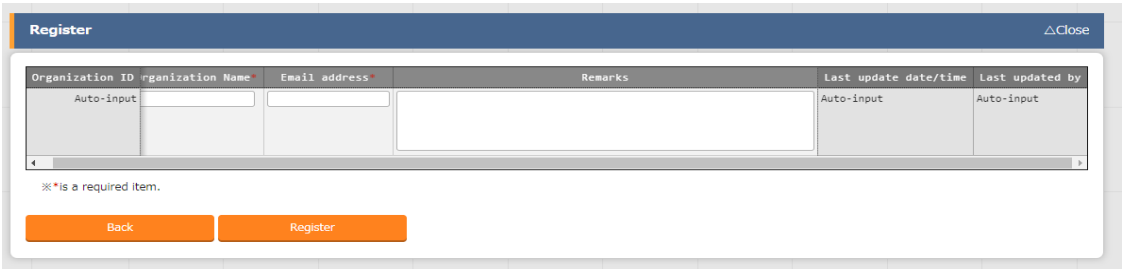


Figure 6.2.2-2 Registration screen（Organizations list）

(3) After registering your Organization, user can check the link status with Terraform Enterprise by clicking the "Check link status" button from "List/Update".
Depending on the link status, the Link to Terraform Enterprise (Register/ Update / Delete) button changes to active and you can perform the integration with Terraform Enterprise by clicking.
If the work is executed without the Organization being linked (registered) with Terraform Enterprise, the work execution will be an unexpected error.
If hostname 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”.

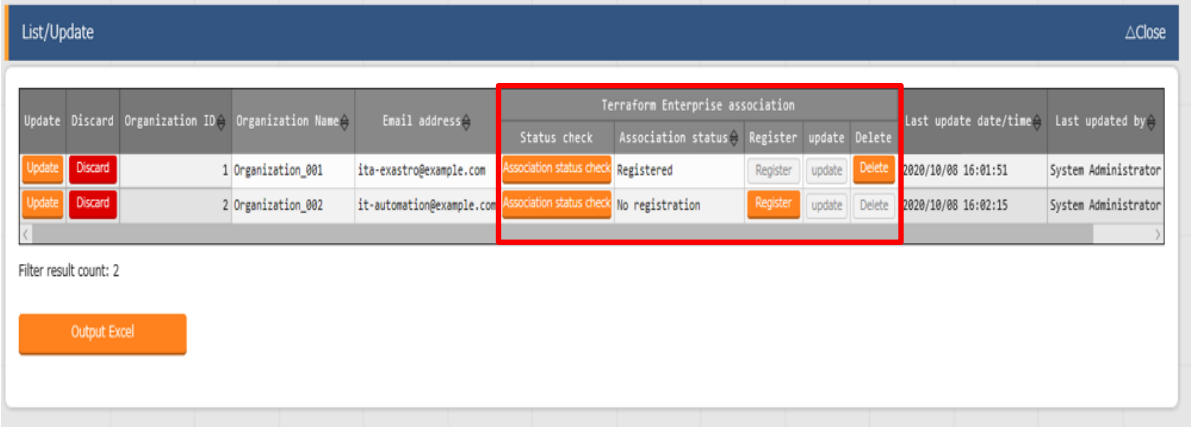


Figure 6.2.2-3 Terraform Enterprise link (Organizations list)

(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 the Organization. Alphanumeric characters and symbols (_ ,-) only (underbars and hyphens) are available.	○	Manual input	Maximum length 40 bytes
Email address		Enter the Email address of the Organization.	○	Manual input	Maximum length 128 bytes
Terraform Enterprise Link	Link status check	Button to execute the link status check.	-	-	
	Link status	For the target Organization, the status of link with Terraform Enterprise is displayed. If you are not registered with Terraform Enterprise, "No registration". If you are registered the difference email address, "Updated". If it is registered, it will be displayed as "Registered".	-	-	
	Registration	Button to execute registration. It is activated in the case of "No registration". Click to register the target organization in Terraform Enterprise.	-	-	
	Update	Button to execute update. It is activated in the case of "update". Click to update the email address of the target organization registered in Terraform Enterprise.	-	-	
	Delete	Button to executedelete. It is activated in the case of “registered”,"update". Click to delete the target organization registered in Terraform Enterprise. ※Deleted Organization cannot be restored. Workspace under the organization will also	-	-	

		be deleted.			
Remarks		Free description field.	-	Manual input	Maximum length 4000 bytes

6.2.3 **Workspaces list**

(1) In “Workspaces list”, performs maintenance (browsing/registration/update/abolition) of Workspace used in Terraform Enterprise.
Also, Workspace registered in the ITA system can be linked (register/update/delete) to Terraform Enterprise.
Workspace is linked to Organization, first it is necessary to register the target in "6.2.2 Organizations List".

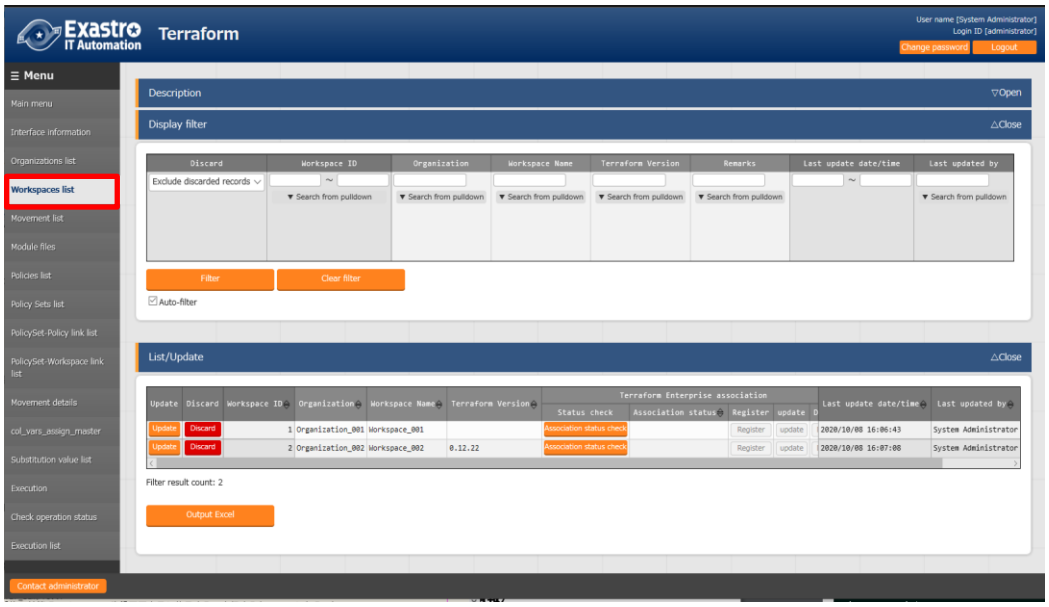


Figure 6.2.3-1 Submenu screen（Workspaces list）

(2) Clicking the "Register" button and then "Start registration" button will register the Workspace informations.

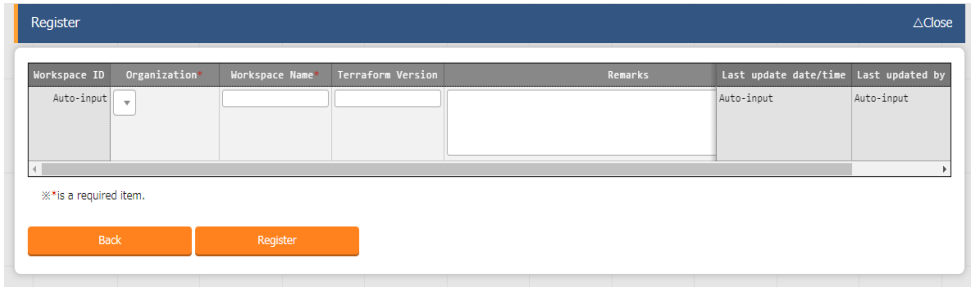


Figure 6.2.3-2 Registration screen（Workspaces list）

(3) After registering your Workspace, user can check the link status with Terraform Enterprise by clicking the "Check link status" button from "List/Update".
Depending on the link status, the Link to Terraform Enterprise (Register/ Update / Delete) button changes to active and you can perform the integration with Terraform Enterprise by clicking.
If the work is executed without the Organization being linked (registered) with Terraform Enterprise, the work execution will be an unexpected error.
If hostname 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”.
If the selected Organization is not connected (registered) to Terraform Enterprise, a similar message is displayed.

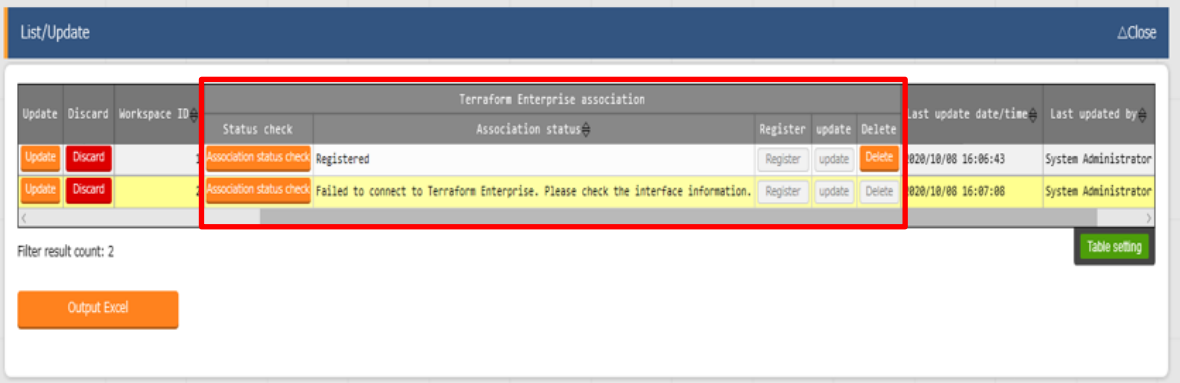


Figure 6.2.3-3 Terraform Enterprise link (Workspaces List)

(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".	○	List selection	
Workspace Name		Enter the name of the Workspace name. Alphanumeric characters and symbols (_ ,-) only (underbars and hyphens) are available.	○	Manual input	Maximum length 90 bytes
Terraform Version		Enter the version of Terraform. If it is blank, the new version will be automatically applied at the time of link (registration).		Manual input	
Terraform Enterprise Link	Check link status	Button to execute the integration check link status.	-	-	
	Link status	For the target Workspace, the status of link with Terraform Enterprise is displayed. If you are not registered with Terraform Enterprise, "No registration". If you are registered the difference Terraform version, "Updated". If it is registered, it will be displayed as "Registered".	-	-	
	Registration	Button to execute registration. It is activated in the case of "No registration". Click to register the target Workspace in Terraform Enterprise.	-	-	
	Update	Button to execute update. It is activated in the case of "update". Click to update the Terraform driver of the target Workspace registered in Terraform Enterprise.	-	-	
	Delete	Button to execute deletion. It is activated in the case of “registered”,"update". Click to delete the target Workspace registered in Terraform Enterprise.	-	-	

		※Deleted Workspace cannot be restored.			
Remarks		Free description field.	-	Manual input	Maximum length 4000 bytes

6.2.4 **Movement list**

(1) In “Movement list”, performs maintenance (browsing/registration/update/abolition) for Movement names.
Movement needs to be linked with Organization: Workspace as Terraform usage information, first it is necessary to register the target in "6.2.2 Organizations list" and "6.2.3 Workspaces list".

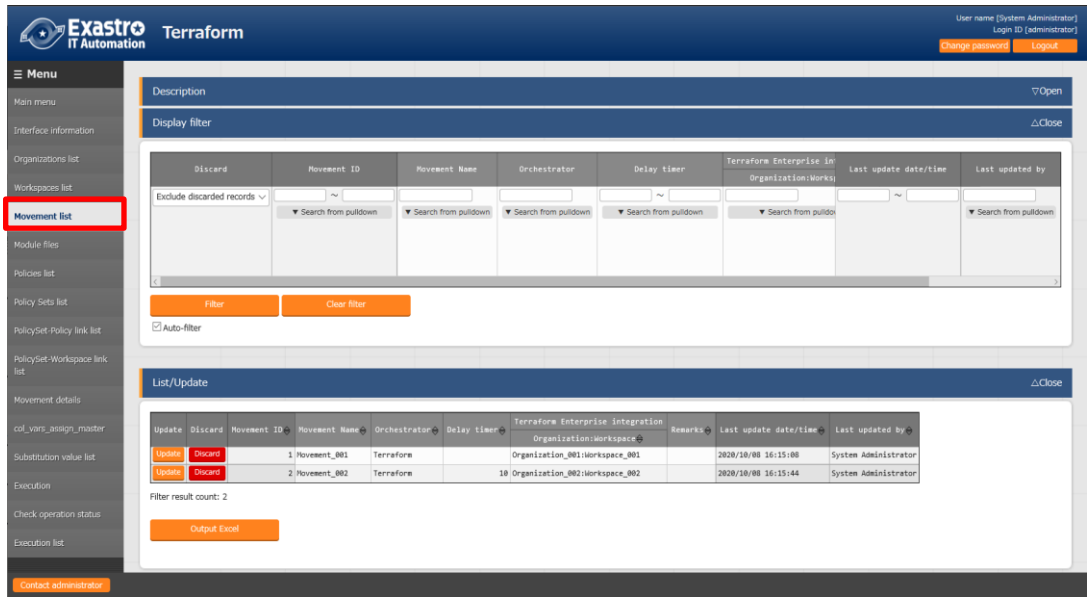


Figure 6.2.4-1 Submenu screen (Movement list)

(2) Clicking the "Register" button and then "Start registration" button will register the Movement infornations.

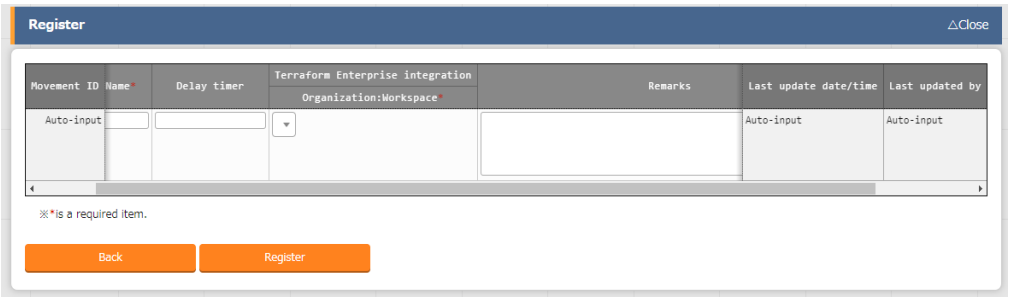


Figure 6.2.4-2 Registration screen (Movement list)

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

6.2.5 **Module files**

(1) In “Module files”, performs maintenance (browsing/registration/update/abolition) of the module created by the user.
For more information about Module description, refer to "7.1 Module description".

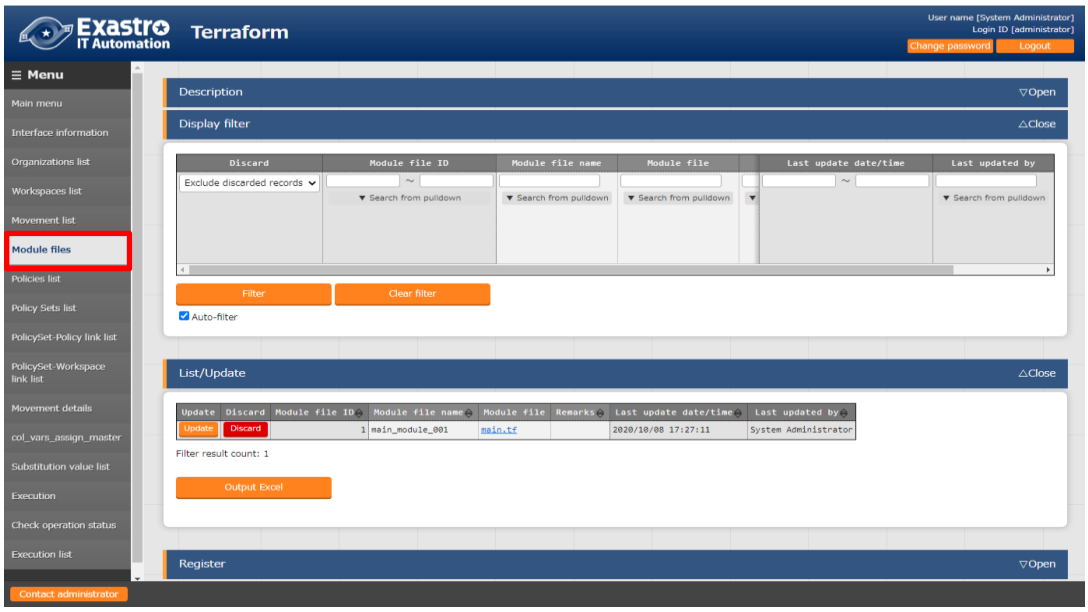


Figure 6.2.5-1 Submenu screen (Module files)

(2) Clicking the "Register" button and then "Start registration" button will register the Movement informations.

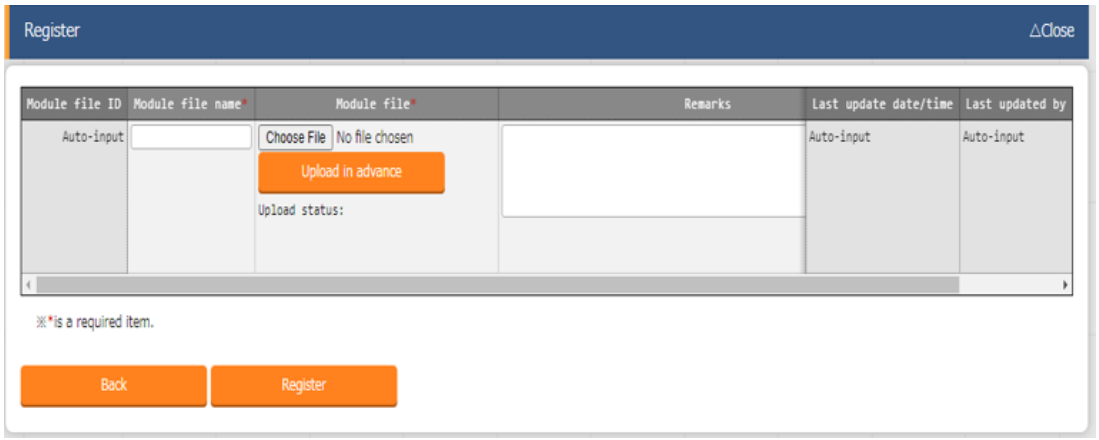
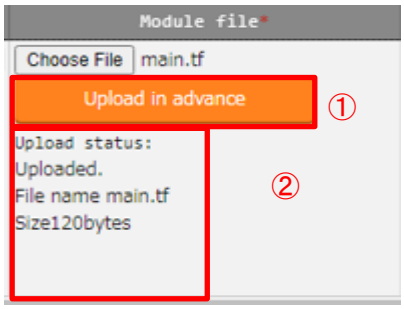


Figure 6.2.5-2 Registration screen (Module files)

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



(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	Enter the module file name that you want to list in ITA.	○	Manual input	Maximum length 256 bytes
Module files	Upload the created Module files.	○	File selection	Maximum size 4G bytes
Remarks	Free description field.	-	Manual input	Maximum length 4000 bytes

(4) The "BackYard" process extracts the variables defined in the Module file. The variables extracted can then have specific values registered to them in "6.2.11 Substitution value automatic registration" and "6.2.12 Subsitution value list".
The extraction is not happening in realtime, so it might take some time before users can handle the variables in "6.2.11 Substitution value automatic registration" and "6.2.12 Subsitution value list".

※Please refer to the timing of extraction is described in "(3) Change of starting period" of "8.2 About the maintenance method".

6.2.6 **Policies list**

(1) In “Policies list”, performs maintenance (browsing/registers/updates/abolition) of Policy created by the users.
For more information about Policy description, refer to "7.2 Policy description".

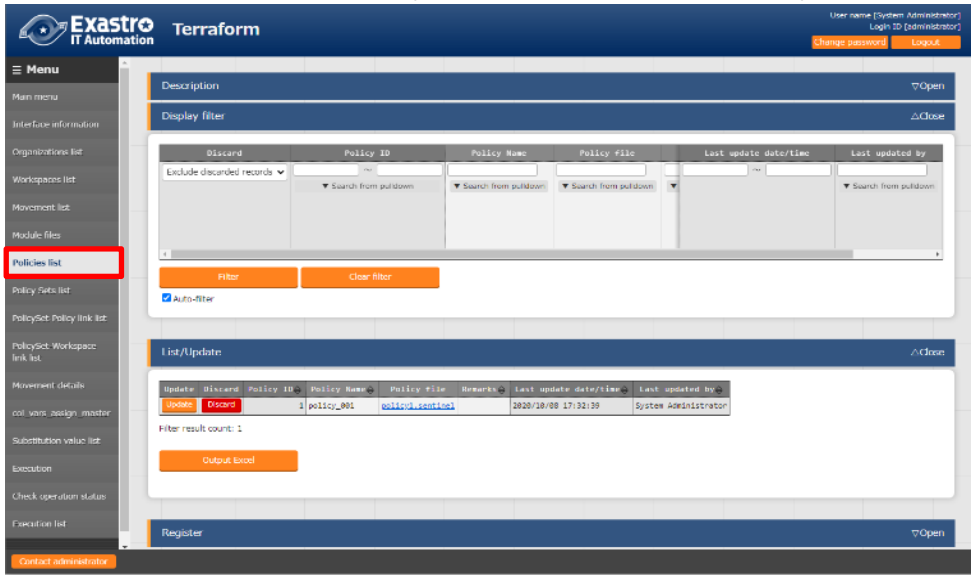


Figure 6.2.6-1 Submenu screen（Policies list）

(2) Clicking the "Register" button and then "Start registration" button will register the Policy.

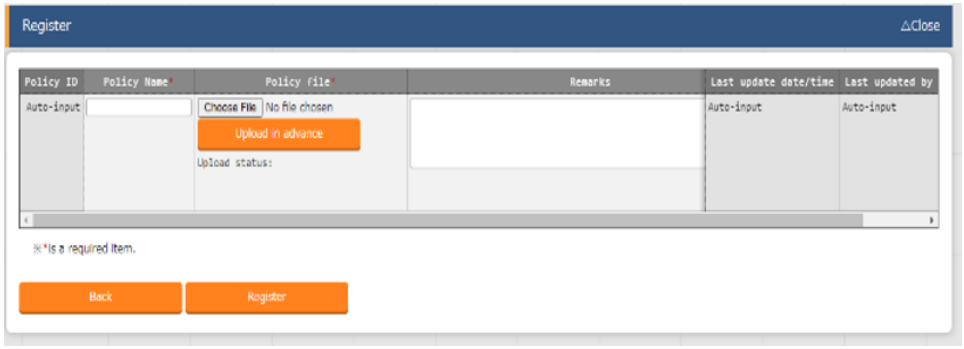
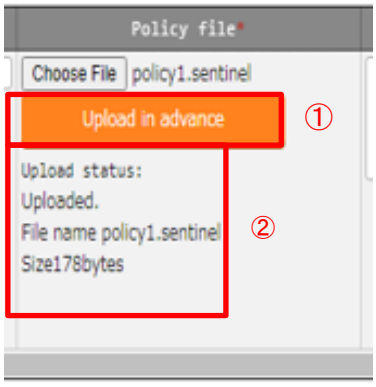


Figure 6.2.6-2 Regristration screen（Policies list）

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



(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	Enter the Polycy name that you want to list in the ITA.	○	Manual input	Maximum length 256 bytes
Policy file	Upload the created Module files.	○	File selection	Maximum size 4G bytes
Remarks	Free description field.	-	Manual input	Maximum length 4000 bytes

6.2.7 **Policy Sets list**

(1) In “Policy Sets list”, performs maintenance (browsing/register/update/abolish) of the Policy Sets. Policy Set is linked with Polycy and Workspace in "6.2.8 PolicySet-Policy link list" and "6.2.9 PolicySet-Workspace link list" to apply Polycy to Workspace at the time of operation executing.

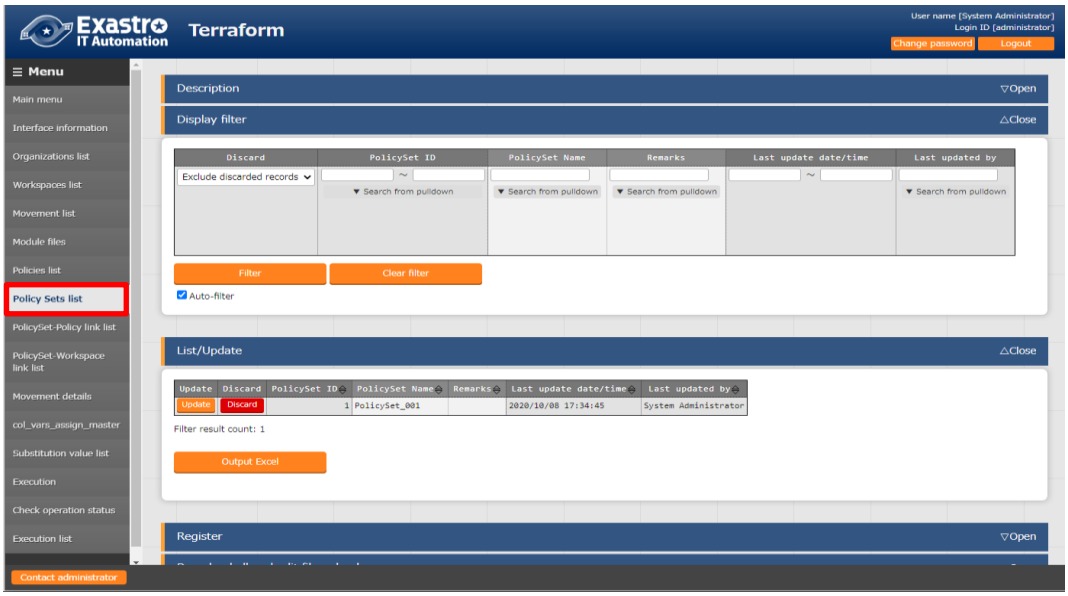


Figure 6.2.7-1 Submenu screen（Policy Sets list）

(2) Clicking the "Register" button and then "Start registration" button will register the PolicySet.

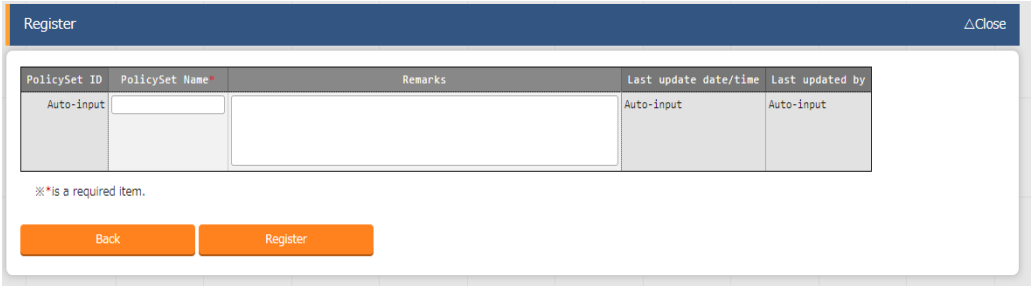


Figure 6.2.7-2 Registration（Policy Sets list）

(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 PolycySet name that you want to list in the ITA.	○	Manual input	Maximum length 256 bytes
Remarks	Free description field.	-	Manual input	Maximum length 4000 bytes

6.2.8 **PolicySet-Policy link list**

(1) In “PolicySet-Policy link list”, performs maintenance (browsing/registration/update/abolition) for the linking of Policy created in "6.2.6 Policies list" and PolicySet created in "6.2.7 Policy Sets list".

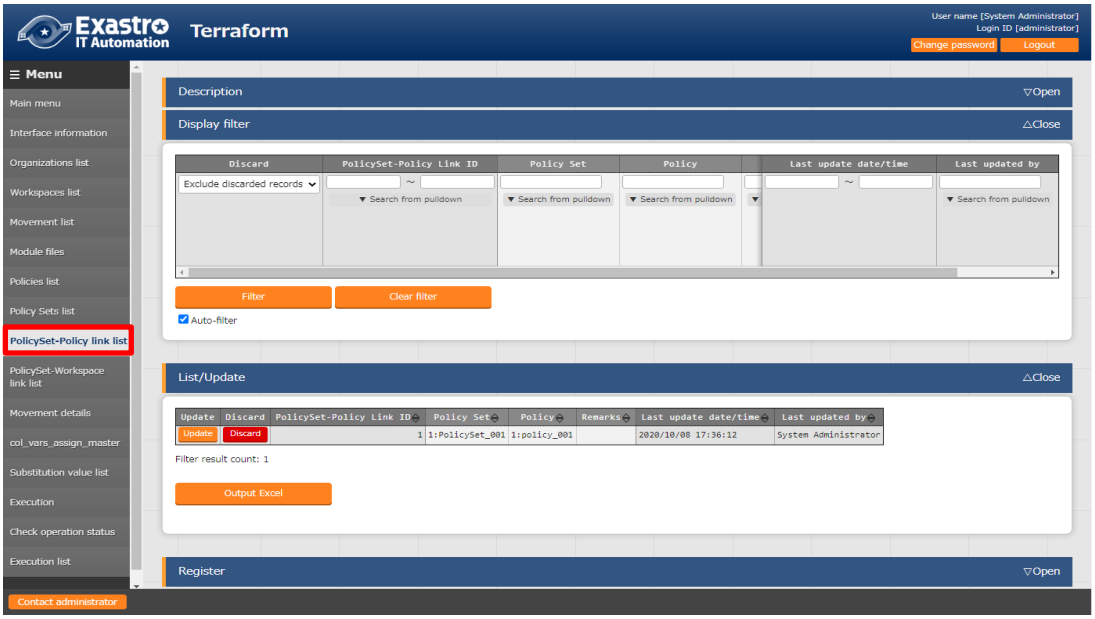


Figure 6.2.8-1 Submenu screen（PolicySet-Policy link list）

(2) Clicking the "Register" button and then "Start Registration" button will register the PolicySet-Policy link.

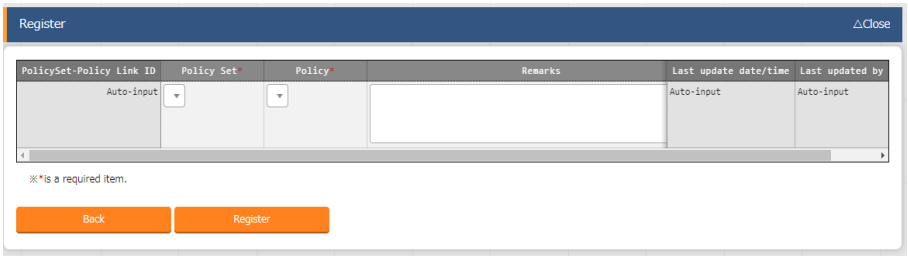


Figure 6.2.8-2 Registration screen（PolicySet-Policy link list）

(3) The list of items on the PolicySet-Policy link list is as follows.

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

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

6.2.9 **PolicySet-Workspace link list**

(1) In “PolicySet-Workspace link list”,performs maintenance (browsing/registration/update/abolition) for the linking of Workspace created in "6.2.3 Workspaces list" and PolicySet created in "6.2.7 Policy Sets list".

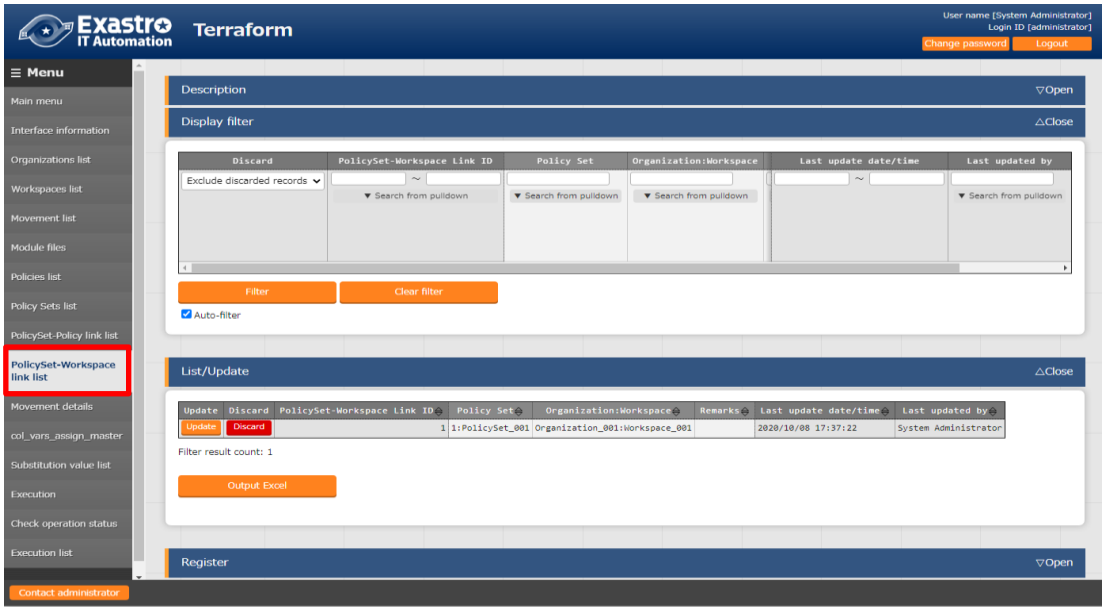


Figure 6.2.9-1 Submenu screen（PolicySet-Workspace link list）

(2) Clicking the "Register" button and then "Start Registration" button will manage register of PolicySet-Workspace link.

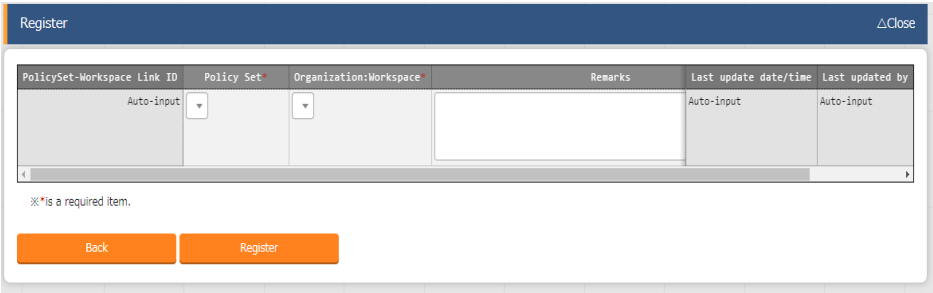


Figure 6.2.9-2 Registration screen（PolicySet-Workspace link list）

(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 selection	
Organization:Workspace	Select the Workspace registered (link to Organization) in "6.2.3 Workspaces list".	○	List selection	
Remarks	Free description field.	-	Manual input	Maximum length 4000 bytes

6.2.10 **Movement details**

(1) In “Movement details”, performs maintence (browsing/register/update/ abolition) of the module files executed in the Movement.
Multiple Module files can be linked to the Movement.

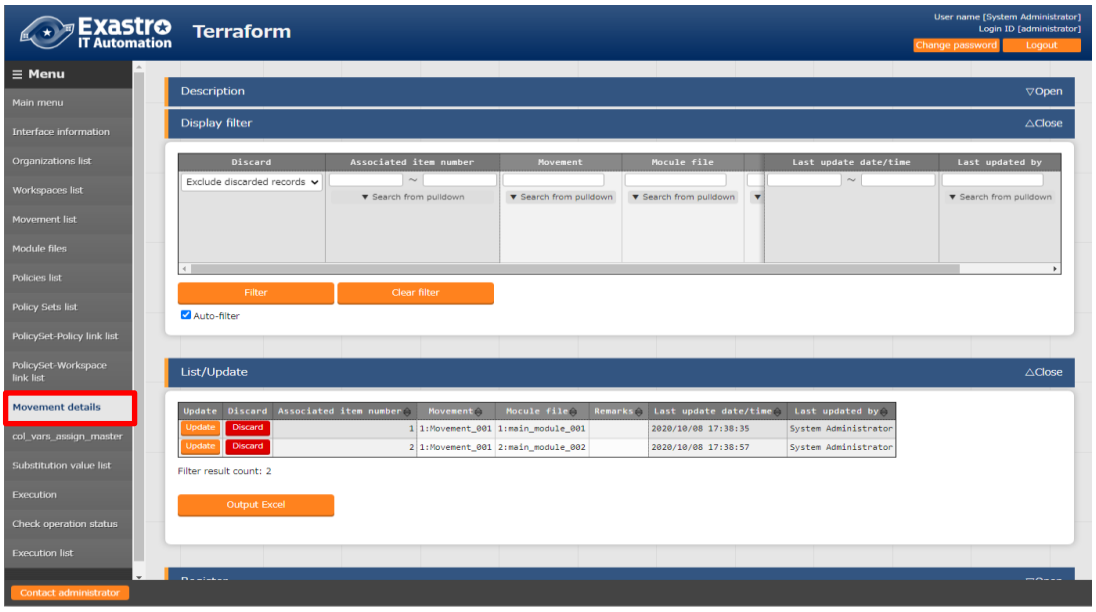


Figure 6.2.10-1 Submenu screen（Movement details）

(2) Clicking the "Register" button and then "Start Registration" button will manage the Movement details.

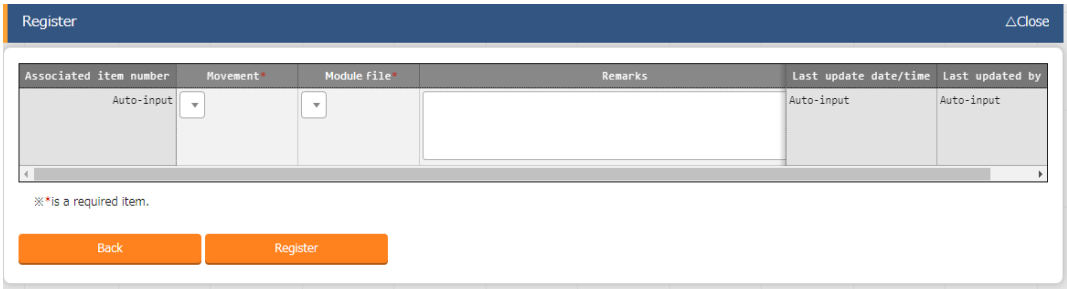


Figure 6.2.10-2 Registration screen（Movement details）

(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 selection	-
Module files	Select the Module file registered in "6.2.5 Module files".	○	List selection	-
Remarks	Free description field.	-	Manual	Maximum length 4000 bytes

6.2.11 **Substitution value automatic registration**

(1) In "Substitution value automatic registration", users can link Parameter sheets created with the Menu creation tool (With Operation) and Movement variables.
The registered information will be reflected to the Substitution value list by the BackYard Process.
The reflection rules is mentioned in 7.3 BackYard Content (2) substitution value automatic registration configuratio.

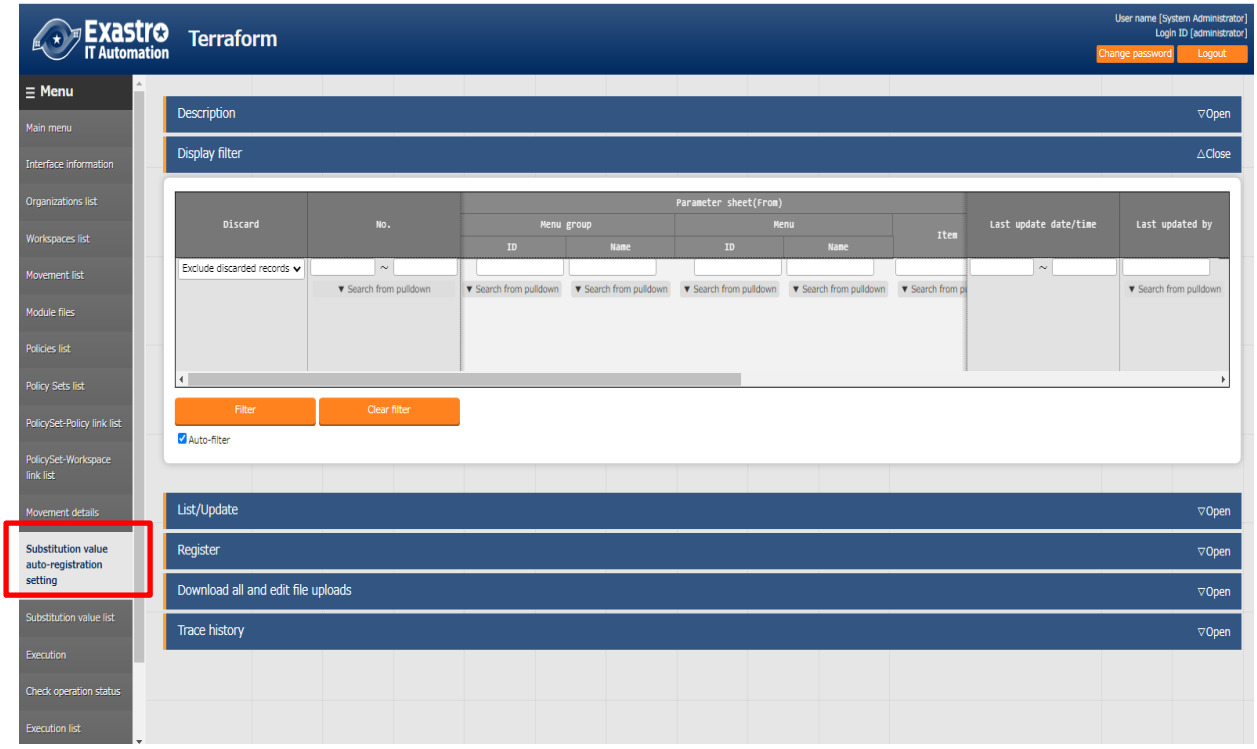


Figure 6.2.11-1 Sub-menu screen (Substitution value automatic registration)

(2) Clicking the "Register" button and then "Start Registration" button will manage the substitute values.

Figure 6.2.11-2 Registration Screen (Substitution value automatic registration)

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

Figure 6.2.11-1 Item list (Substitution value automatic registration)

Column		Description	Input required	Input type	Restriction
Menu group ：menu		The parameter sheet (with operation) created by the menu creation function is displayed. Select the appropriate parameter sheet.	○	List selection	
Item		The items in the selected parameter sheet are displayed.Select the target item.	○	List selection	
Registration method		Value Type: Select when you want the set value of the item to be the specified value of the linked variable. Key Type: Select when you want the name of the item to be the specified value of the linked variable. If the set value of an item is blank, it will not be linkable. Key-Value Type: Select when you want the name of the item (Key) and the set value (Value) to be used as the specified value of a linked variable.	○	List selection	
Movement		The movement registered in the Movement list is displayed.Select Movement.	○	List selection	
Key information	Variable name	The variables used in the materials registered in the Movement details are displayed. Select the variable you want to link to the specific value in the Key type.	○ OR ／	List selection	Required if the registration method is Key or Key-Value type.
Value information	Variable name	The variables used in the materials registered in the Movement details are displayed. Select the variable you want to link to the specific value in the Value type.	○ OR ／	List selection	Required if the registration method is Key or Key-Value type.
HCL setting		Select "OFF" or "ON". BackYard processing takes over the selected value when it is reflected in the subsititution value list.	○	List selection	

NULL link	If the specific value of the parameter sheet in the "Substitution value auto-registration setting" is NULL(blank), users can set registrations to the list to have the value NULL(blank) or not. This value is applied when "NULL Link"(In the Substitution value auto-registration setting menu) is blank. ・If "Enable", any value in the parameter sheet is registered in the substitution value list. ・If "Disable", the value is registered in the value list only if the parameter sheet contains a value. ・If it is blank, the "NULL link" value of the interface information is applied.	-	List selection	-
Remarks	Free description field.	-	Manual input	Maxumum length 4000 byte

6.2.12 **Substitution value list**

(1) In “Substitution value list”, substitute variables in Module used in the target Movement for each operation. Specific values can be maintained (browsing/register/update/abolition).

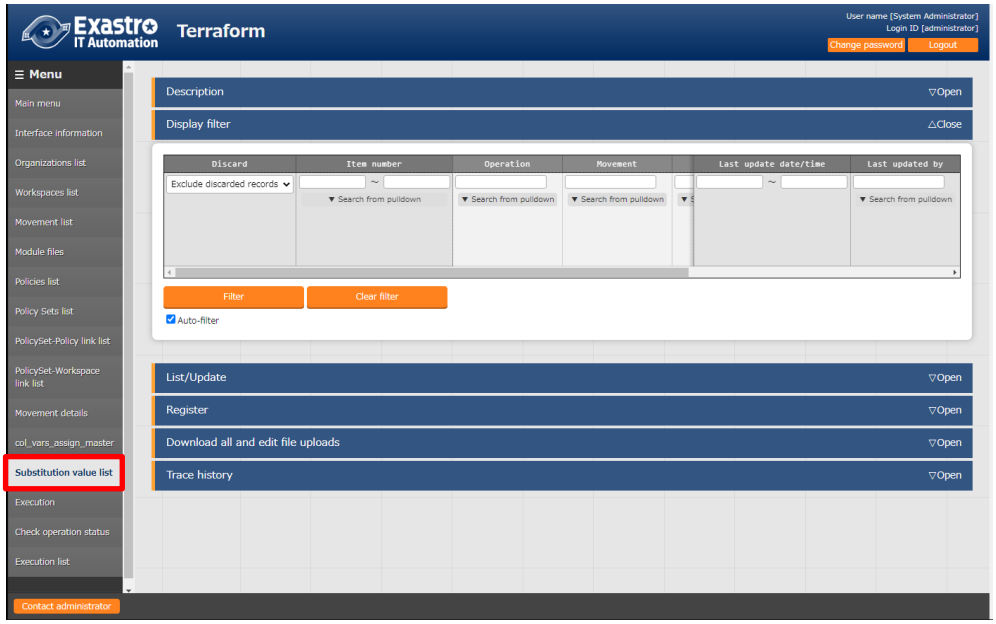


Figure 6.2.12-1 Submenu screen（Substitution value list）

(2) Clicking the "Register" button and then "Start Registration" button will manage the substitute values.

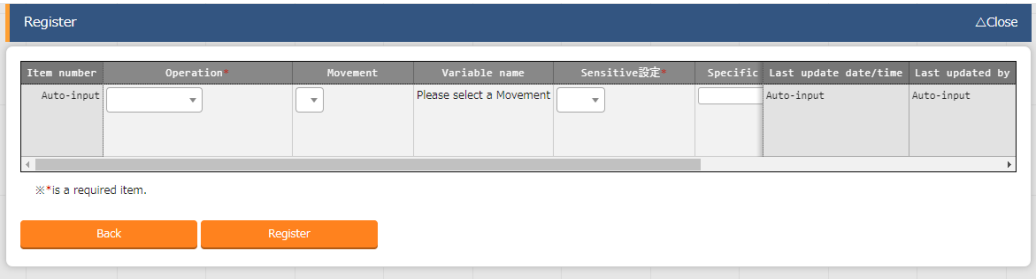


Figure 6.2.12-2 Registration screen（Substitution value list）

The variables in substitution value list are reflected from the file information registered in "6.2.5 Module files".

※Please refer to the timing of reflection is described in ″(3) Change of starting period″ of ″8.2 About the maintenance method″.

(3) For the variables registered in the substitution value list, the "variable name" is registered as "Key" and "Specific value" is registered as "Value" for the Variables managed in the Workspace on the Terraform Enterprise side when the operation is executed.
If "HCL settings" is set to "ON", it will be registered with "HCL" checked.
If "Sentive settings" is set to "ON", it will be registered with "Sentive" checked.

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

Table 6.2.12-1 Item list（Substitution value list）

Item	Description	Input required	Input type	Restriction
Operation	Select the target Operation.	○	List selection	-
Movement	Select the target Movement.	○	List selection	-
Variable name	From the Module files registered in the Movement details, the name of the variable attached to the selected Movement is displayed. Select a variable.	○	List selection	-
HCL settings	Select "OFF" or "ON". If "ON" is selected, "HCL" will be enabled for Variables when they are registered in the Workspace on the Terraform Enterprise side. Use this setting when configuring a variable to a value that is not a character string.	○	List selection	
Sensitive settings	Select “OFF” or “ON”. If "ON" is elected, the specific value will be encrypted won't be displayed on ITA. Also keep in mind that when registering any variables to the workspace on the Terraform Enterprise side, "Sensitive" for that variable will be enabled and specific values will not be displayed.	○	List selection	
Specific value	Enter the specific value of the variable to use in Operations/Movements.	○	Manual input	Maximum length 8192 bytes
Remarks	Free description field.	-	Manual input	Maximum length 4000 bytes

6.2.13 **Execution**

(1) Instructs to execute the operation. Select with the radio button from the Movement list and Operation list respectively, and when you press the execute button, it will move to "6.2.14 Check operation statu" and execute it.

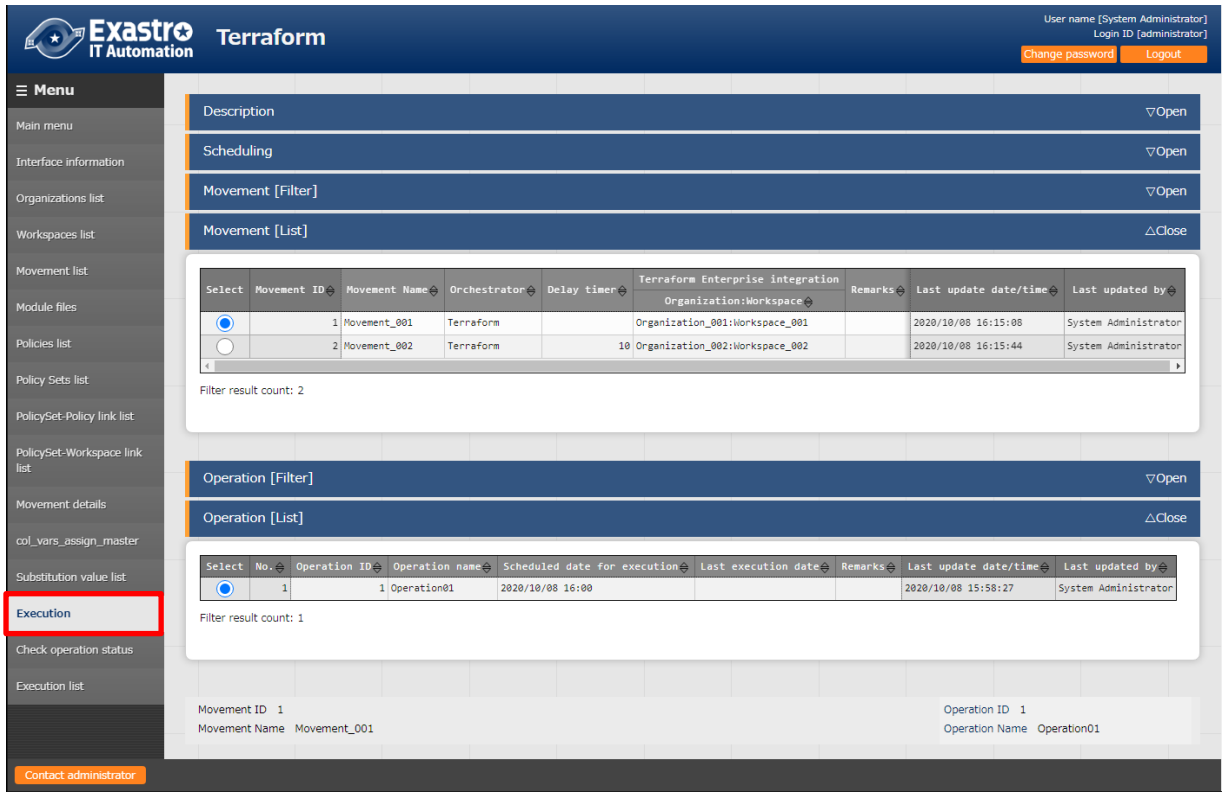


Figure 6.2.13-1 Submenu screen（Execution）

① **Specify scheduled date/time**
Users can reserve Execution and Plan confirmations by entering the "Scheduled date/time".
Only date/time can be registered for "Schedule date/time"

② **Specify Movement**
Select the Movement registered in the "6.2.4 Movement list".

③ **Specify Operation**
Select the Operation registered in the "6.1.1 Input Operations list".

④ **Execution**
Clicking the "Execute" button will move the user to ""6.2.14 Check Operation status"" and execute the operation.
"Apply" will automatically be executed after the Plan and/or the PolicyCheck are completed.

⑤ **Plan confirmation**
Clicking the "Plan Confirmation" button will similarly to clicking the "Execute" button, start the execution. However, "Discard Run" will be applied to RUN after the Plan and PolicyCheck are completed, and "Apply" will not be executed.

6.2.14 **Check operation status**

(1) Monitor the execution status of operation.

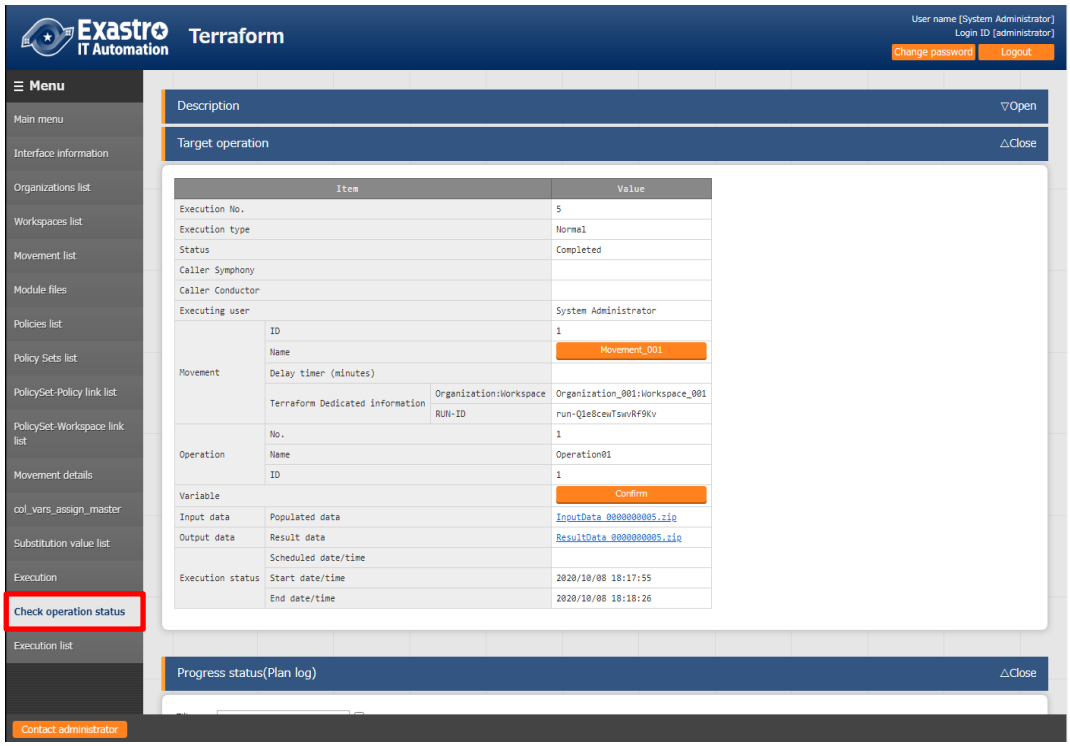


Figure 6.2.14-1 Submenu screen（Check operation status）

① **Display of execution status**

"Status" will be displayed to match the Execution status.
The "Execution Type" will contain "Plan Confirmation" for plan confirmations, and "Normal" for other cases.

Execution log for Progress (Plan Log), Progress (PolicyCheck Log) and Progress (Apply Log) executed in Terraform Enterprise are displayed in Plan/ PolicyCheck / Apply.

If the status ends with an unexpected error, there is no registration of "6.2.1 Interface information", "6.2.2 Organizations list" and "6.2.3 Workspaces list" with Terraform Enterprise.
Or if it is due to unregistration of other web content, a message will be displayed in "Progress (error log)".
For other errors, the progress (error log) does not display a message. Check the process logs as needed.
※Please refer to "④ Log file name" in "8.2 About maintenance method" for the process log.

In “Call Symphony”, displays which Symphony was executed. It is blank if you execute it directly from the Terraform driver or from Conductor.
In “Call Conductor”, displays which Conductor was executed. It is blank if you execute it directly from the Terraform driver or from Symphony.

"Execution user" displays the login user when the "Execute" button is pressed from the execution menu.

The "RUN-ID" displayed in "Terraform User Information" is an execution list ID managed by Terraform Enterprise and is used for linking with Terraform Enterprise with Backyard content.

② Substitution value confirmation

By clicking the "confirmation" button, "6.2.12 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 exeuction 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.

6.2.15 **Execution list**

(2) 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 "6.2.14 Check operation status" and the details of execution status can be viewed.

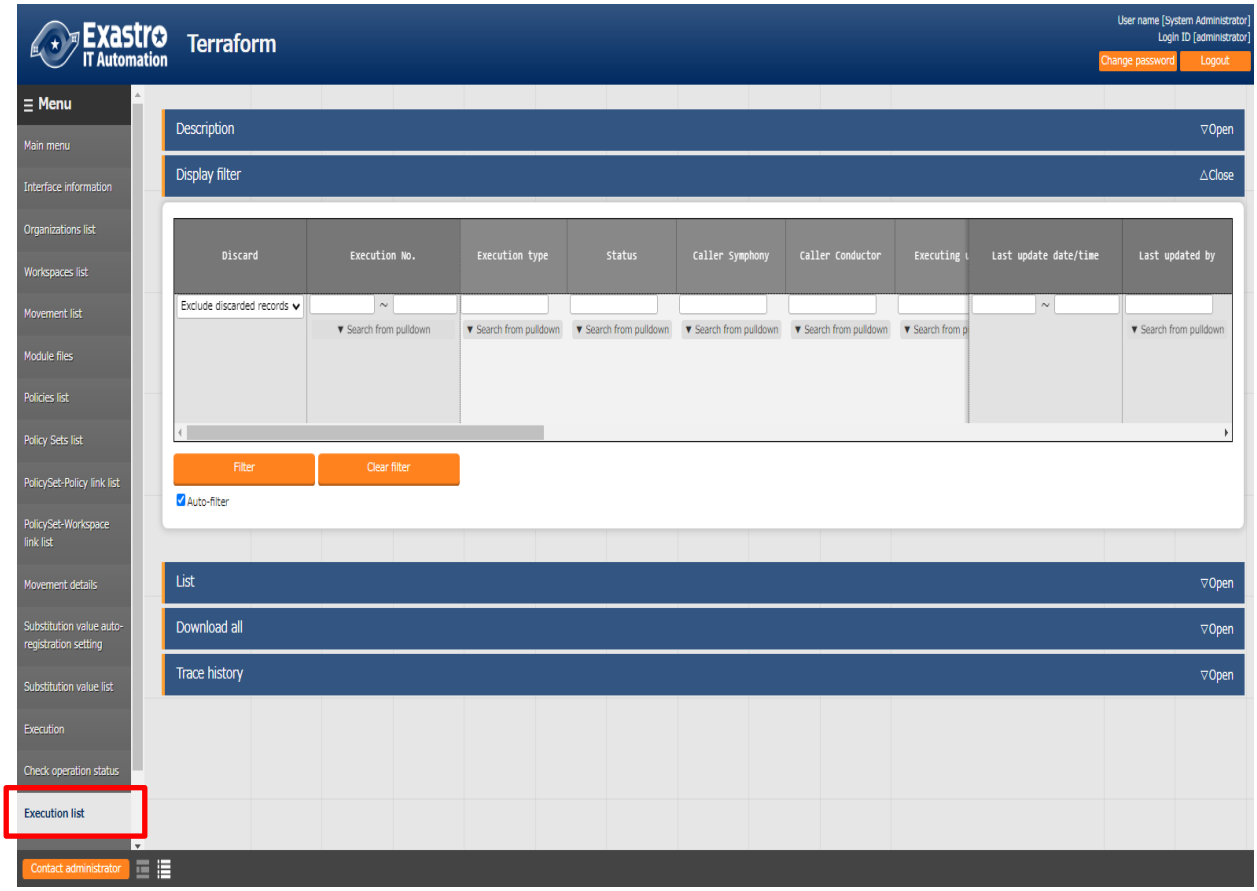


Figure 6.2.15-1 Submenu screen（Execution list）

6.2.16 **Terraform Enterprise registration list**

(1) Connect to Terraform Enterprise based on the information registered in "6.2.1 Interface Information" and register with Terraform Enterprise.
You can display a list of Organization/Workspace/ Policy/PolicySets respectively.
You can remove Targets from the display list from Terraform Enterprise.
It is also possible to unlink Workspaces and Policies that are linked to PolicySet.
※Operations performed on this page will not affect the registered targets on the ITA side.

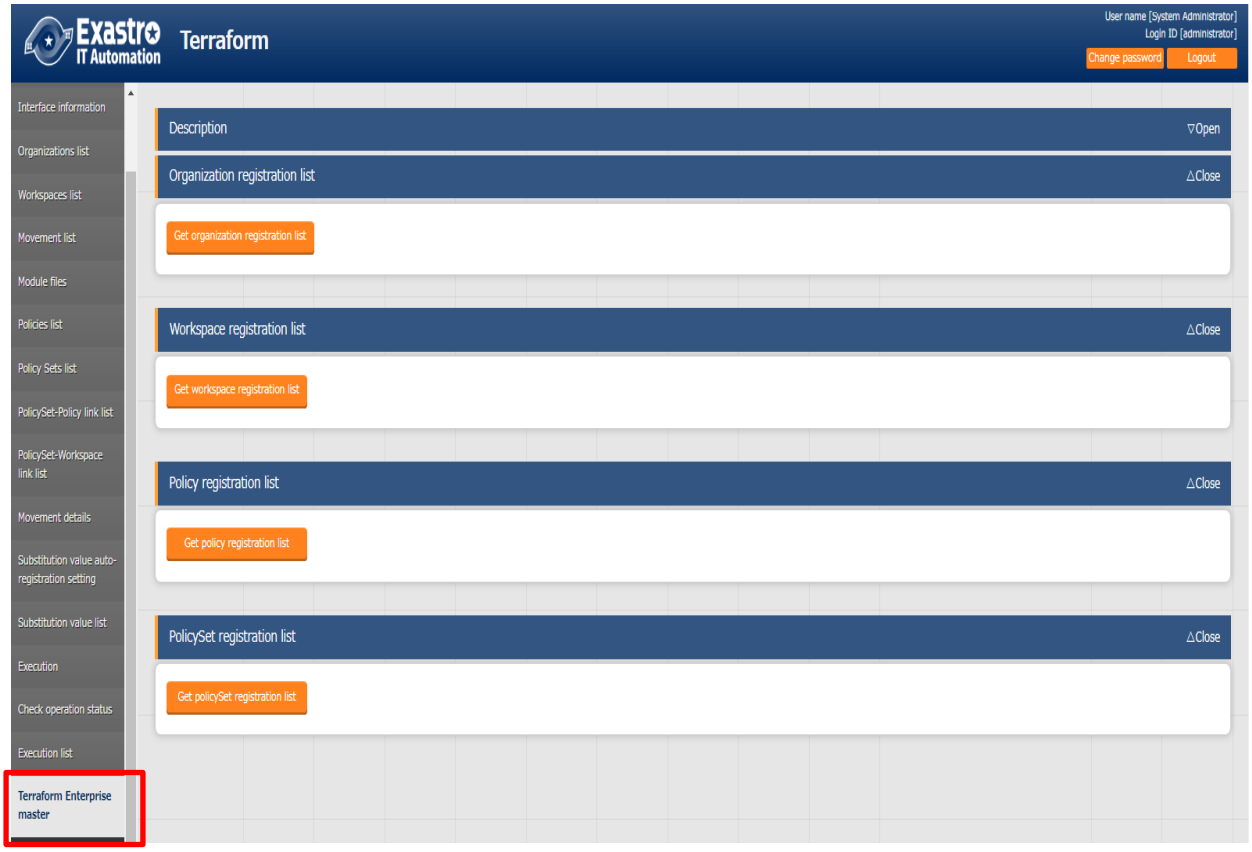


Figure 6.2.16-1 Sub-menu screen (Terraform Enterprise registration list)

(2) The list of items displayed by each list acquisition is as follows.

Table 6.2.16-1 Items list (Organization registration list)

Item	Description
Organization Name	Name of the Organization registered with Terraform Enterprise.
Email address	Email address registered in the Organization.
ITA registration status	If the target Organization Name is registered in "6.2.2 Organizations list", it will be displayed as "Registered". If it is not registered, it will be displayed as "Unregistered".
Deletion	Clicking this button will display a confirmation dialog box. Pressing OK will remove the target Organization from Terraform Enterprise. ※Deleted Organizations cannot be restored.

Table 6.2.16-2 Items list (Workspace registration list)

Item	Description
Organization Name	The name of the Organization linked with the target Workspace.
Workspace Name	Name of Workspace registered with Terraform Enterprise.
Terraform Version	Terraform version set to the target Workspace.
ITA registration status	If the target Workspace Name is registered in "6.2.3 Workspaces list", it will be displayed as "Registered". If it is not registered, it will be displayed as "Unregistered".
Deletion	Clicking this button will display a confirmation dialog box. Pressing OK will remove the target Workspace from Terraform Enterprise. ※Deleted Workspace cannot be restored.

Table 6.2.16-3 Items list (Policy registration list)

Item	Description
Organization Name	The name of the Organization linked with the target Policy.
Policy Name	Name of Policy registered with Terraform Enterprise.
ITA registration status	If the target Policy Name is registered in "6.2.6 Policies list", it will be displayed as "Registered". If it is not registered, it will be displayed as "Unregistered".
Download Policy Code	Click this link to download the Policy Code file of the target Policy.
Deletion	Clicking this button will display a confirmation dialog box. Pressing OK will remove the target Policy from Terraform Enterprise. ※Deleted Policy cannot be restored.

Table 6.2.16-4 Items list (PolicySet registration list)

Item	Description
Organization Name	The name of the Organization linked with the target PolicySet.
PolicySet Name	Name of the target PolycySet.
Link Workspace	The name of the Workspace linked with the target PolicySet.
Link Policy	The name of the Policy linked with the target PolicySet.
ITA registration status	If the target PolicySet Name is registered in "6.2.7 PolicySet list", it will be displayed as "Registered". If it is not registered, it will be displayed as "Unregistered".
Delete/Unlink	The "Delete" button is displayed for PolicySet Name and the "Un-link" button is displayed for linked Workspace and Policy. Clicking the "Delete" button will display a confirmation dialog box. Pressing OK will remove the target PolicySet from Terraform Enterprise. Clicking the "Un-link" button will display a confirmation dialog box. Pressing OK will remove the link to the target Workspace/Policy's PolicySet. ※Deleted PolicySets cannot be restored.

7 How to write construction code

Describes the description of Module and Policy in Terraform driver.

7.1 Module description

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 Policy description

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

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

7.3 BackYard Content

(1) Automatic variable registration

This function extracts variables from the Module files registered in "6.2.5 Module files".
Please refer to "2.1 Variable types" for more information regarding "Variable extraction rules".
Additionally, the timing of the extraction depends on the startup cycle of the "Automatic Terraform Variables Registration" process.

(2) Automatic Substitute Value Registration Settings

The Information from the movement and variables linked to the set values of Operation itens in the target parameter sheets is reflected in the Substitute Value list.
The timing of the extraction depends on the startup cycle of the "Terraform Auto Registration Settings" process.
The Substitute value list can be updated by multiple operators. If the last update was performed by another operator, it will not be reflected.
If you want to reflect the data of the Automatic Substitute value registration settings, please delete the corresponding record in the Substitute Value list.

The rules for reflecting the substitution value list are written below.

① **When the information registered in the Substitution value automatic registration is reflected in the Substitution value list**

Substitution value list status	Without applicable record	With applicable record			Record abolishing
		= Specific value	≠ Specific value		
			Last update		
			BackYard process	Other operators	
Reflected to substitution value list	Add new record	-	Update specific values for the applicable record	-	Abolition record revival

※Applicable record: Operation + Movement + Variable name + HCL configuration + Records with the same access permission.

② **Information not registered in substitution value automatic registration (registered only for the substitution value list) is reflected in the subsitution value list.**

Substitution value list status	With applicable record	
	Last update	
	BackYard process	Other operators
Reflected to substitution value list	Record abolishing	-

③ **About HCL settings**

The value of the "HCL setting" configured for substitution value automatic registration is set to the same value when reflected in the substitution value list.

④ **About Sensitive settings**

If the item in the Link-target parameter sheet is set to "Password", the "Sensitive settings" will be set to "ON" when reflected in the Substitution value list.

⑤ **About access permission roles**

The access permission role of the operation set in the record of the link-target parameter sheet and the access permission role of the Movement set in the record of automatic assignment value registration are referred to, and all matching access permission roles are set when reflected in the Substitute value list.

If no permission role is set for either of them (blank), the blank space will also be set when reflected in the Substitute Value list.

Additionally, if there are no single matching permission roles, no record will be created in the Substitute Value list.

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 Maintenance

The files required to start/stop/restart Terraform driver processes are as follows.

Description	Target file name
Terraform operation execution monitoring Execute the unexecuted Operation.	ky_terraform_execute-workflow.service
Terraform operation execution monitoring Check the status of executing work and acquire logs.	ky_terraform_checkcondition-workflow.service
Terraform variable automatic registration Remove variables from uploaded Module files.	ky_terraform_varsautolistup-workflow.service
Terraform auto registration settings The information configured for substitution value automatic registration is reflected in the substitution value list.	ky_terraform_valautosetup-workflow.service

The target file is stored in “/usr/ lib/ystemd/system”.
The method of Starting/Stopping/Restarting a process is as follows. Please execute the command with root permission.

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 replace each target file name with a start/stop/restart.

8.2 About the process of maintance

① Change to NORMAL level

Rewrite line 8 of the following file with "DEBUG" to NORMAL.

Log level configuration file: <installation directory> /ita-root/confs/backyardconfs/ita_env

② Change to DEBUG level

Rewrite line 8 of the following file with "DEBUG" to NORMAL.

Log level configuration file: <installation directory>/ita-root/confs/backyardconfs/ita_env

③ Change the startup period

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

With exceptions, use the default value for the startup period.

```
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, **it enables after the process is restarted.**

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
ky_terraform_valautosetup-workflow	ky_terraform_valautosetup-workflow_YYYYMMDD.log

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