



# **IT Automation Terraform Driver 【Classroom】**

In this Document, "IT Automation" will be written as "ITA".

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# 1. Introduction

# 1. Introduction

## Main Menu

- This document aims to introduce the Terraform functionality in ITA.
- The Practice document uses the ITA Screen to provide a hand-on experience, so we recommend reading both.

The screenshot displays the Exastro IT Automation Dashboard. The top navigation bar includes the Exastro logo, user information (System Administrator), and links for password change and logout. The main content area is divided into a left sidebar menu and a central dashboard.

**Main Menu:** A grid of icons representing various IT automation tools and functions. The 'Terraform' icon, located in the bottom row, is highlighted with a red rectangle. Other icons include Management Console, Basic Console, Export/Import, Symphony, Conductor, Create Menu, Input, Substitution value, Reference, Contrast, HostGroup management, Ansible Common, Ansible-Legacy, Ansible-Pioneer, Ansible-LegacyRole, Cobbler, and File control management.

**Dashboard Widgets:**

- Movement:** A donut chart showing 14 total movements, with 78.6% (11) in orange and 21.4% (3) in green. Below the chart is a table:

Movement	SUM
Ansible Legacy	11
Ansible Pioneer	1
Ansible Legacy Role	1
Terraform	1

- Work status:** A circular gauge showing 0 total status. Below the gauge is a table:

Status	CON	SYM	SUM
Executing	0	0	0
Unexecuted (schedule)	0	0	0
Unexecuted	0	0	0

- Work result:** A donut chart showing 8 total results, with 62.5% (5) in red and 37.5% (3) in green. Below the chart is a table:

Result	CON	SYM	SUM
Normal end	2	0	2
Abnormal end	0	0	0
Unexpected error	4	1	5
Emergency stop	0	0	0
Schedule cancellation	0	0	0

- Work history:** A table with columns for work history details, currently empty.

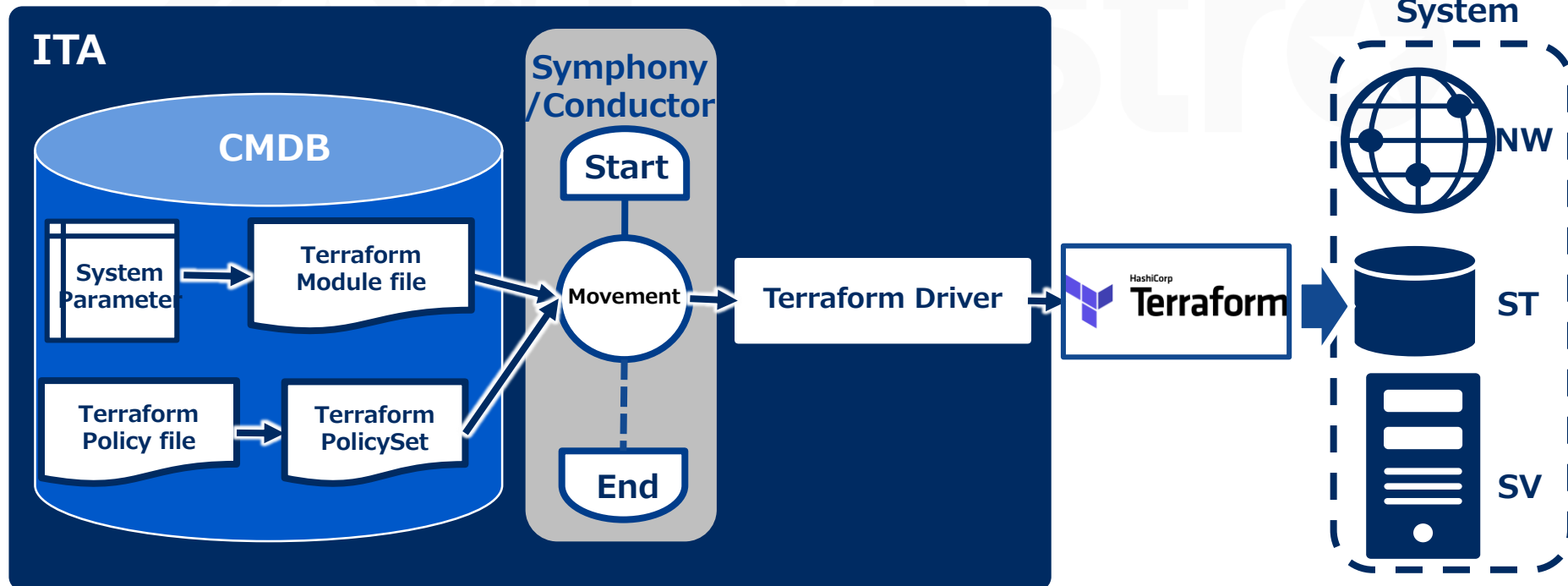
The bottom left corner of the dashboard features a 'Contact administrator' button.

## 2. Terraform Driver

## 2.1 Terraform Driver

**Terraform Driver allows us to link System parameters and IaC (Module) variables that are Centrally managed by ITA to Terraform and execute them.**

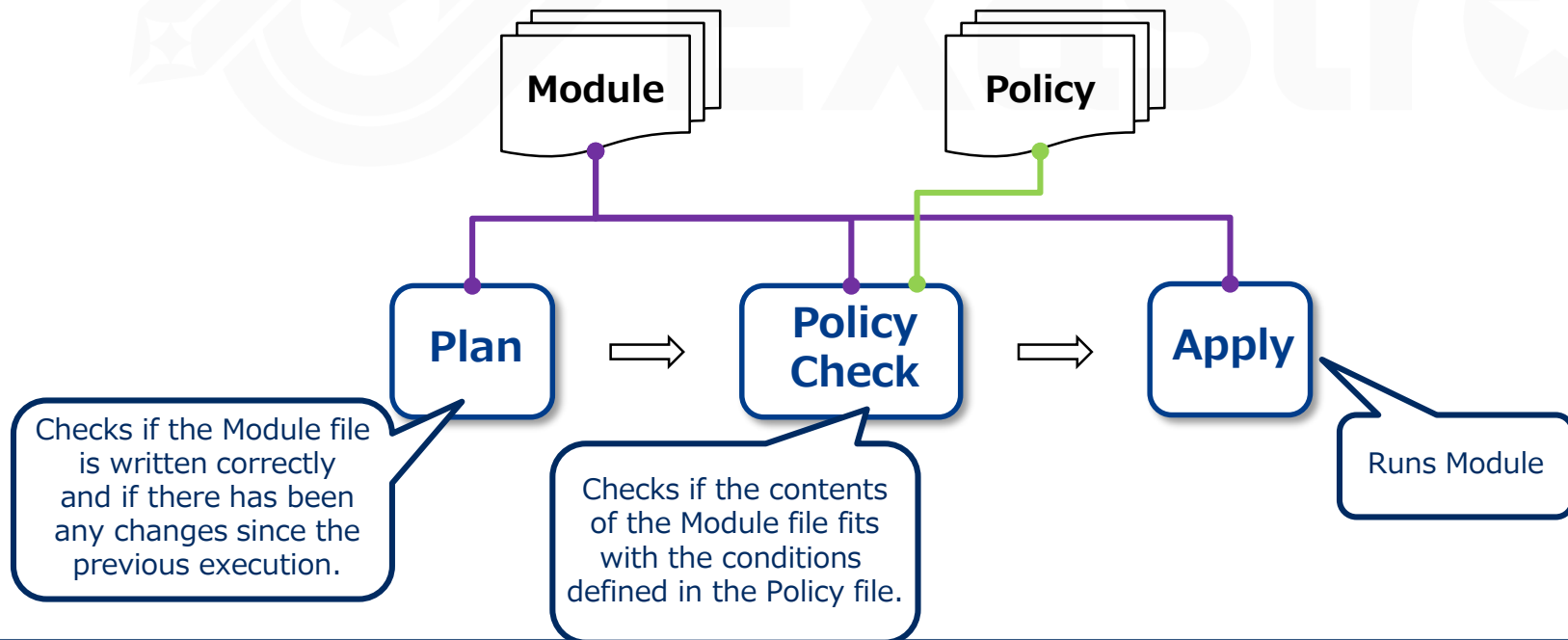
- Users can create Organization/Workspaces to ITA linked Terraform Enterprise or Terraform Cloud, as well execute operations (Play/PolicyCheck/Apply) and gather the operation logs.  
※We explain more about the differences between ITA + Terraform Enterprise and Terraform Cloud in Chapter 3, ITA×Terraform Application example.
- Any module files and policy files used for policy checks can be turned into parts by ITA and be reused.



## 2.2 Registration files

### Registration file types and their operations

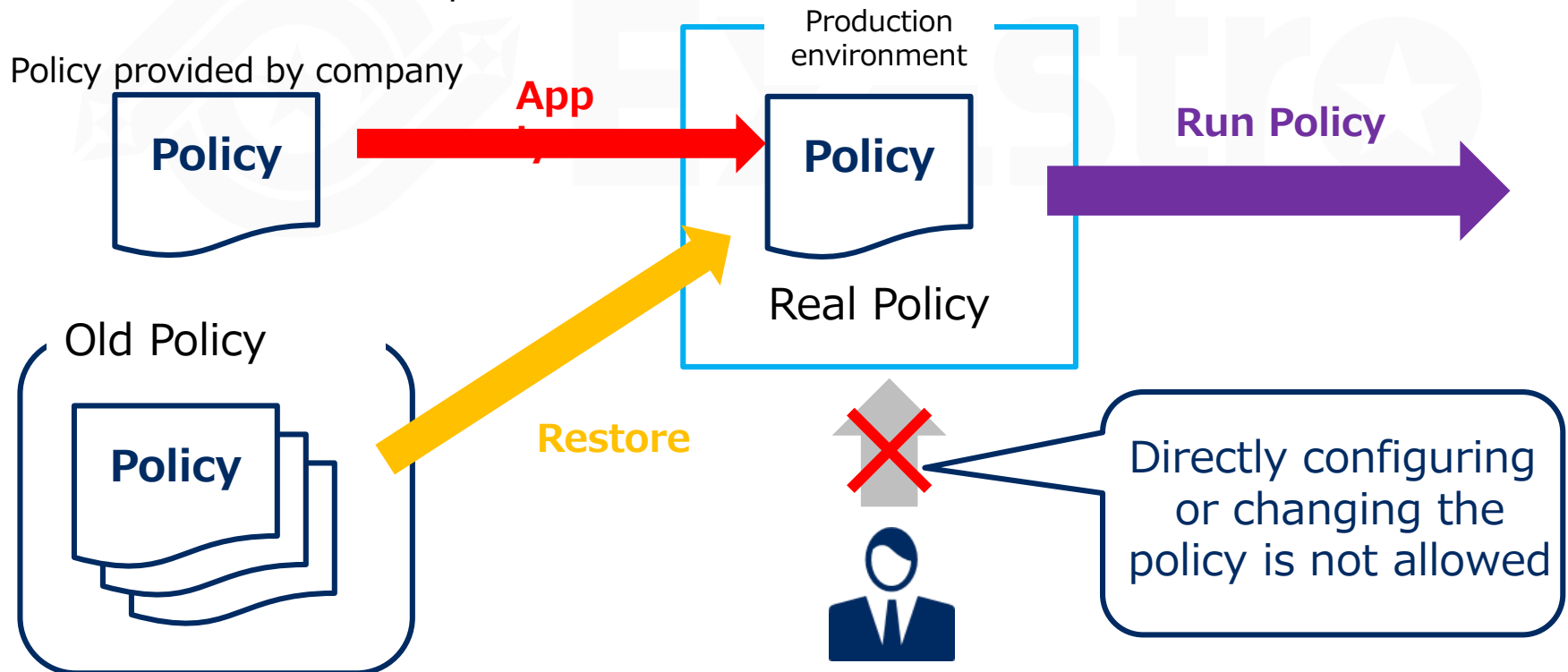
- There are two files that are registered to the Terraform Driver. Modules and Policies.
  - “Modules” are Terraform’s main execution files. They are written in HCL (Hashicop Config Language) and is used for provisioning for environments for Azure, AWS, GCP, Vmware and so on.
  - Policy files are files that define policies when executing Terraform.
- ※For more information regarding Policies, please see Chapter 2.3 Policy files.
- Terraform follows the following order[**Plan**]>[**PolicyCheck**]>[**Apply**]



## 2.3 Policy files

### Policy files(PaC)

- PaC(Policy as Code) manages policies as codes and are used in Terraform as "Sentinel".
- By applying coded policies to the environment and limiting the scope of changes, it is possible to ensure that the policies set by the organization (budget, corporate governance, security, laws, etc.) match the actual policies, which prevents errors in places such as setting permissions, etc. It also makes it easier for companies and users to return to old policies.



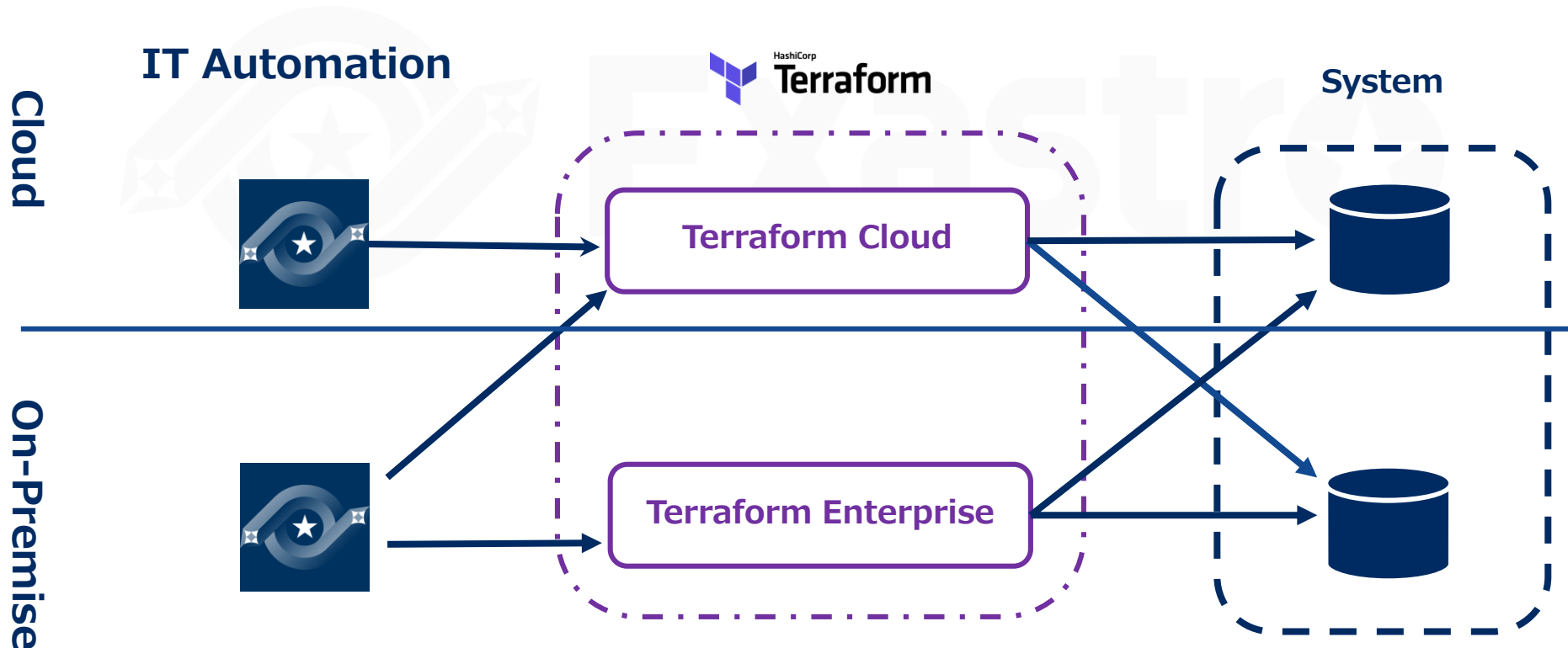


### 3. ITA×Terraform Application example

## 3.1 What types of Terraform can link with ITA?

### Linkable Terraforms

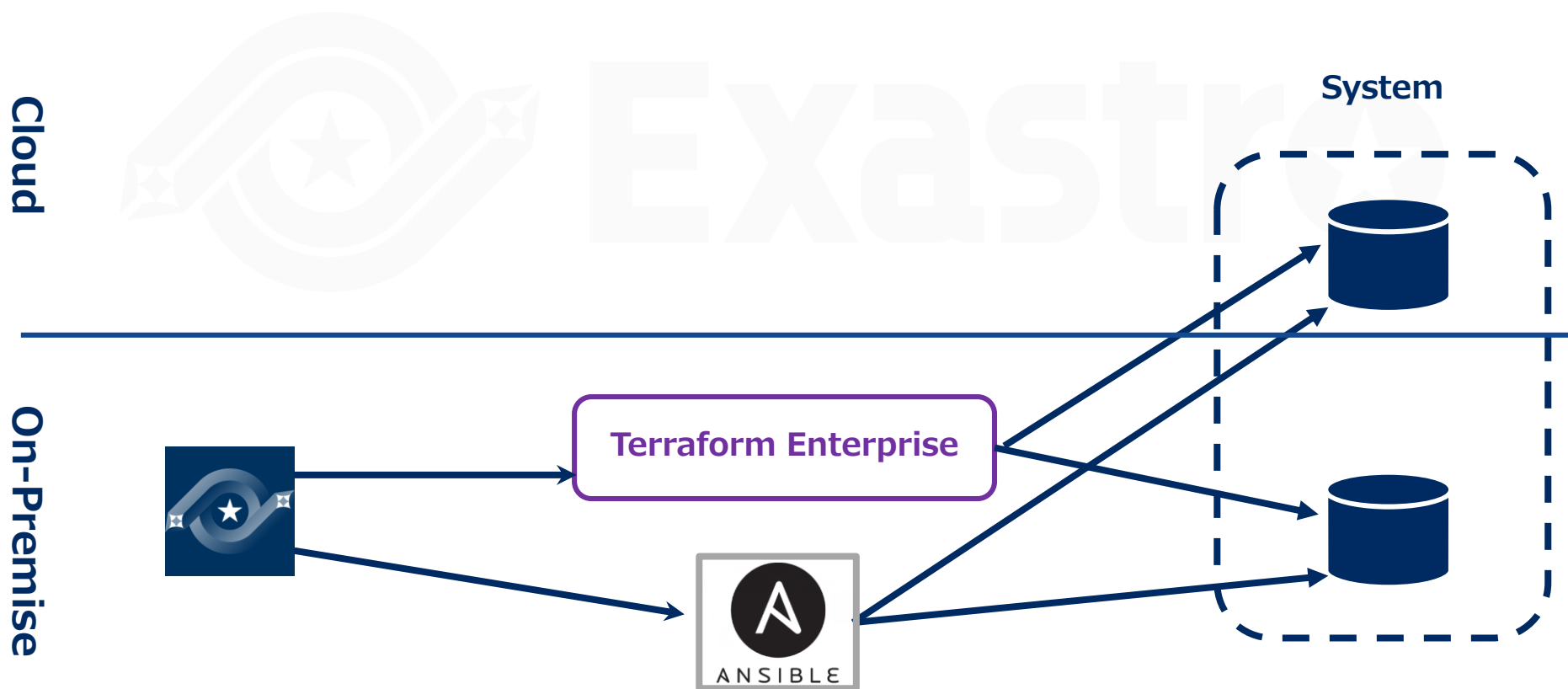
- ITA can connect to both “Terraform Enterprise” and “Terraform Cloud”
- In this document, we will combine ITA and “Terraform Enterprise”/“Terraform Cloud” and create an application example that creates a system on cloud or on-premise.



## 3.2 For Terraform Enterprise

- If you are using Terraform Enterprise, you can construct ITA on on-premise and you can provision systems on cloud/ on-premise.
- Additionally, by implementing Ansible, you can configure various settings for the created system.

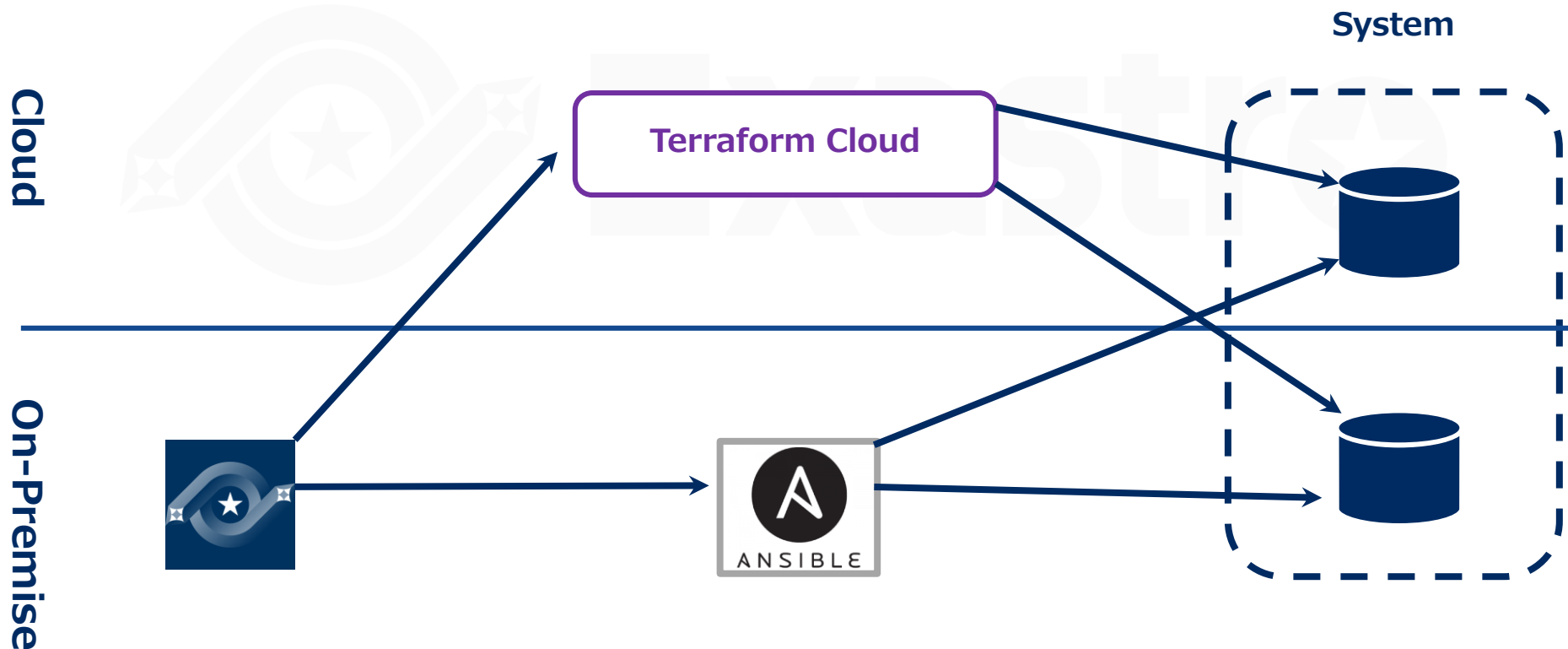
For more information about Ansible, please refer to [Exastro-ITA\\_User\\_Instruction\\_Manual\\_Ansible-driver](#).



## 3.3 For Terraform Cloud(1/3)

### Create on-premise ITA server.

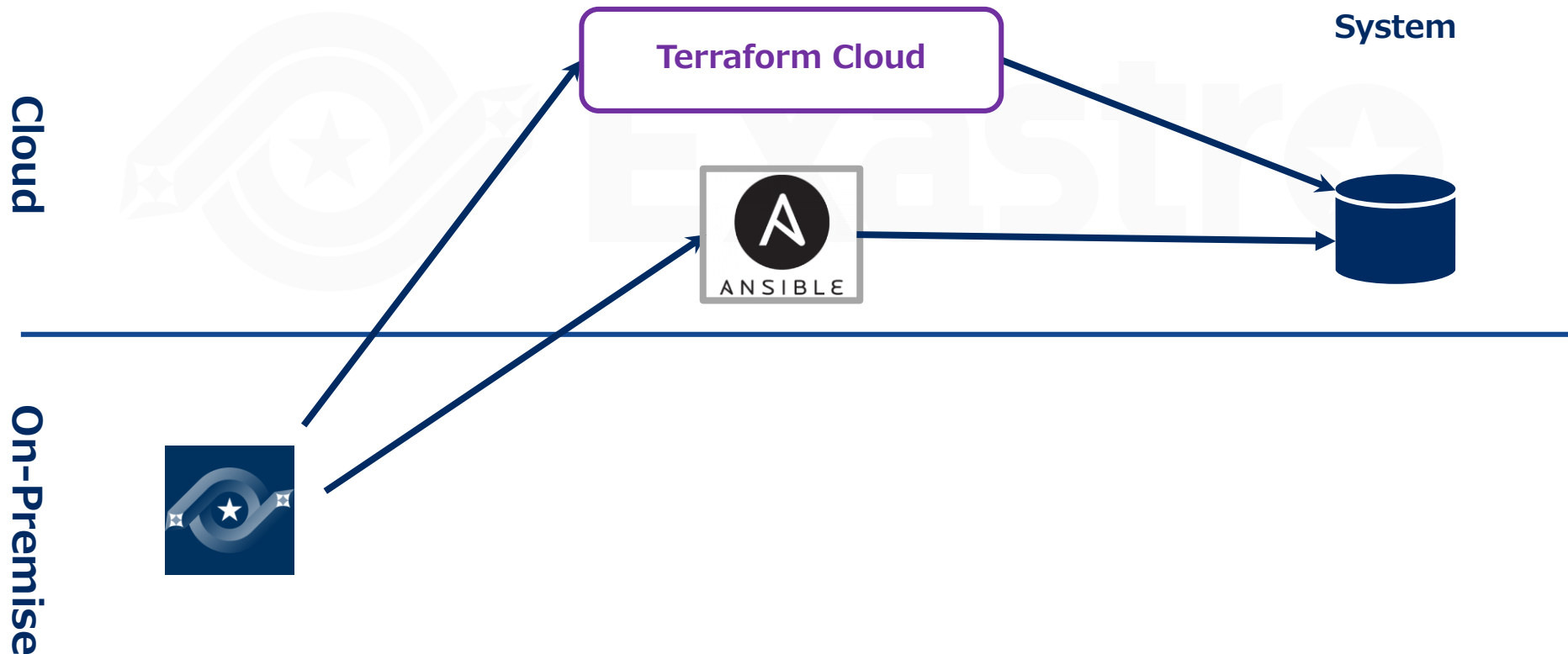
- If you are creating an ITA Server on on-premise, you can use Terraform Cloud to provision on-premise/cloud systems.
- You can use on-premise Ansible to configure both on-premise and cloud systems.



## 3.3 For Terraform Cloud(2/3)

### Create on-premise ITA server.

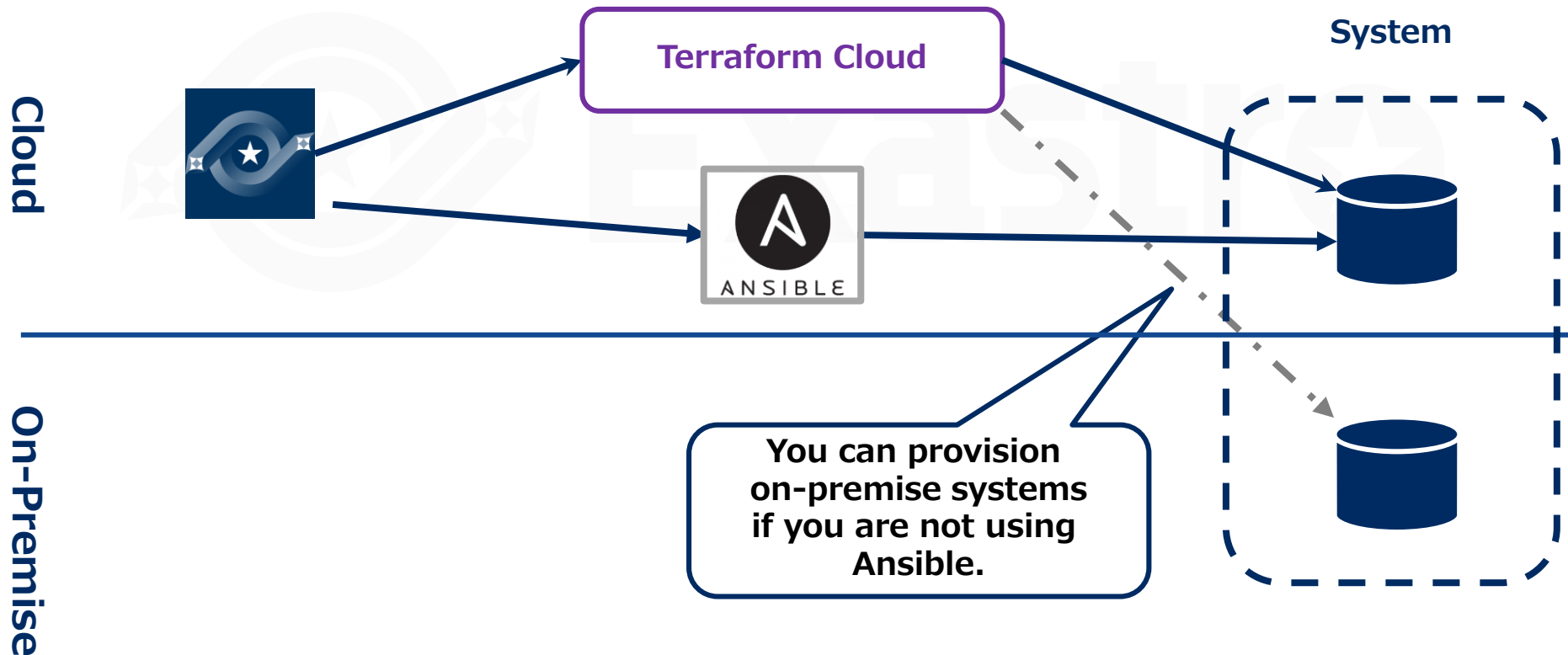
- If you implemented Ansible to the Cloud system side, you will only be able to provision and configure cloud systems.



### 3.3 For Terraform Cloud(3/3)

#### Create on-premise ITA server.

- If you are creating an ITA Server on cloud, you can use Terraform Cloud to provision cloud systems.
- If you are not using Ansible, you can also provision on-premise systems.



## 4. Terraform Driver Menu

# 4.1 Terraform Driver Menu overview(1/2)

## Menu functions

- **Interface information**

Manages the information of the Terraformed linked to ITA.

- **Organizations list**

Manages the Organization information used in Terraform.

- **Workspaces list**

Manages the Workspaces information used in Terraform.

- **Movement list**

Manages Movements that can register to Symphony/Conductor.

- **Module files**

Manages Module files.

- **Policies list**

Manages Policy files.

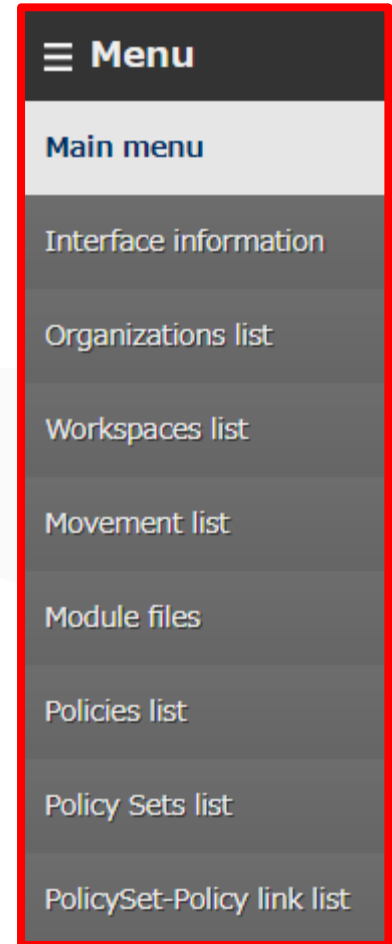
- **Policy Sets list**

Manages Policy Sets.

By linking Policy Sets to a Policy or a Workspace, users can activate Policy for the target Workspace when executing.

- **PolicySet-Policy link list**

Manages links between PolicySets and Policies.





# 4.1 Terraform Driver Menu overview(2/2)

## Menu functions

- **PolicySet-Workspace link list**

Manages links between PolicySets and Workspaces.

- **Movement-Module link**

Manages links between Movement and Module files.

- **Substitution value auto-registration setting**

Manages Movements and Variables that links values and items for each operation registered in parameter sheet menus.

- **Substitution value list**

Manages Substitution values.

- **Execution**

Allows the users to select and execute Movement and Operations.

- **Check operation status**

Allows the user to check the operation status.

- **Execution list**

Manages the Execution history.

- **Linked Terraform management**

Allows the user to view and delete Organizations, Workspaces, Policies and PolicySets registered to Terraform.

PolicySet-Workspace  
link list

Movement module link

Substitution value auto-  
registration setting

Substitution value list

Execution

Check operation status

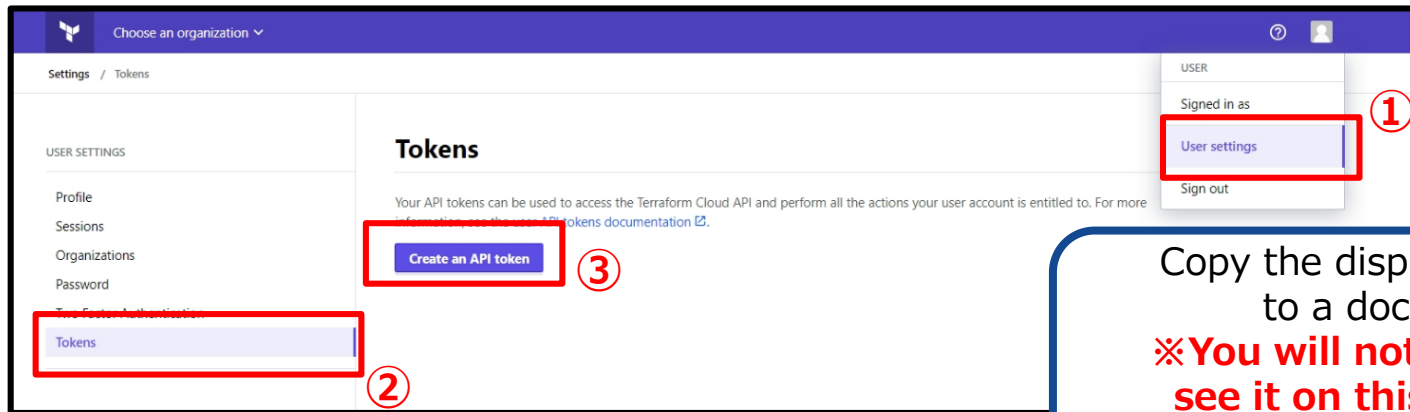
Execution list

Linked Terraform  
management

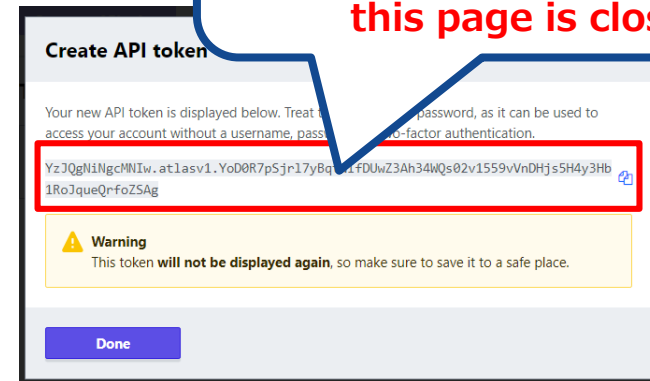
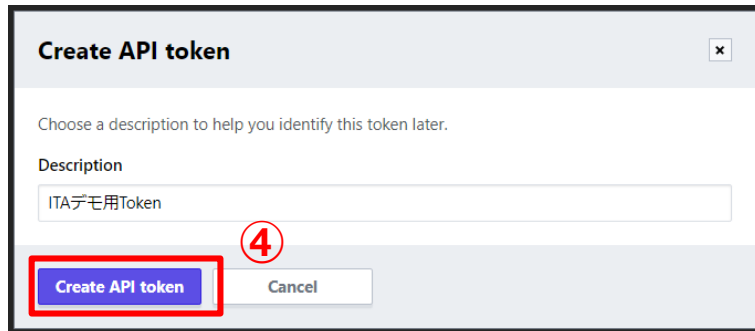
## 4.2 Terraform link(1/2)

### Creating Tokens that we will register to Interface information.

- In order to link the Terraform Driver and Terraform, we need to create a user token from Terraform.
- Use your browser to log in to Terraform and access the Token page by pressing the following buttons. [User Setting]→[Tokens]→[Create an API token]



Copy the displayed token  
to a document  
※You will not be able to  
see it on this site once  
this page is closed.



## 4.2 Terraform link(2/2)

### Interface Information

- Enter the Terraform Host name and the UserToken you created.

※Only 1 Terraform can be linked to ITA at once, so if you want to change, you will need to update all the items present from when you installed it.

The screenshot shows the ITA interface for linking Terraform. The left sidebar has a 'Menu' section with 'Interface information' highlighted. The main area shows a form with the following fields:

- Description
- Display filter
- No. (input field)
- Hostname (input field)
- Status monitoring cycle (milliseconds) (input field)
- Last (input field)
- Filter (button)
- Clear filter (button)
- Auto-filter (checkbox)
- List (button)
- History (button)
- Update (button)
- Filter result count: 1

Two callout boxes provide instructions:

- Input the Terraform host name here** (points to the Hostname field)
- Enter the User token you created in Terraform earlier** (points to the User Token field)

The form also includes a table with the following columns:

No.	Hostname*	User Token	Proxy	Status monitoring cycle (milliseconds)*	Number of rows to display progress	
1	Terraform Host name	*****	Address	Port	3000	1000

※\* is a required item.

Buttons: Back, Update

## 4.3 Organizations link

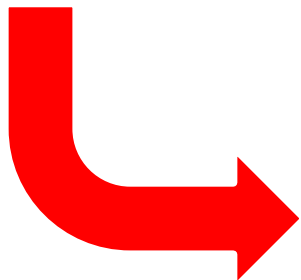
### Organization list

- After you have created the Organization item from the Organization list, You can use the “Check operation status” function to check if the added Organization is in the target Terraform or not.
- If it displays “ Nothing registered”, you can press the “Register” button to create an Organization in the Terraform.

List/Update										
History	Update	Discard	Organization ID	Organization Name	Email address	Terraform association				
						Status check	Association status	Register	update	Delete
History	Update	Discard	3	LearnTest1	ita-exastro@sample.com	Association status check	No registration	Register	update	Delete

Filter result count: 1

Output Excel



#### USER SETTINGS

Profile

**Organizations**

Password

Two Factor Authentication

Tokens

#### Organizations

You are a member of the following organizations:

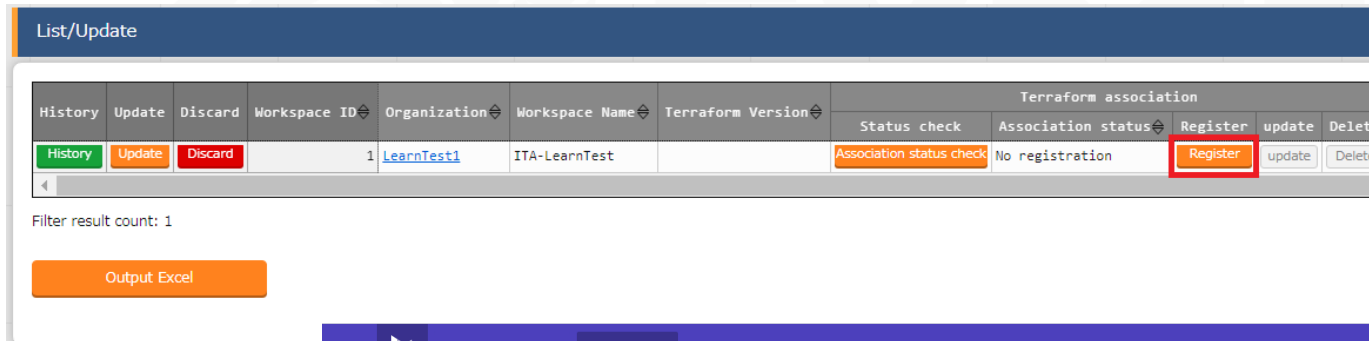
LearnTest1 OWNER

## 4.4 Workspaces link

### Workspaces list

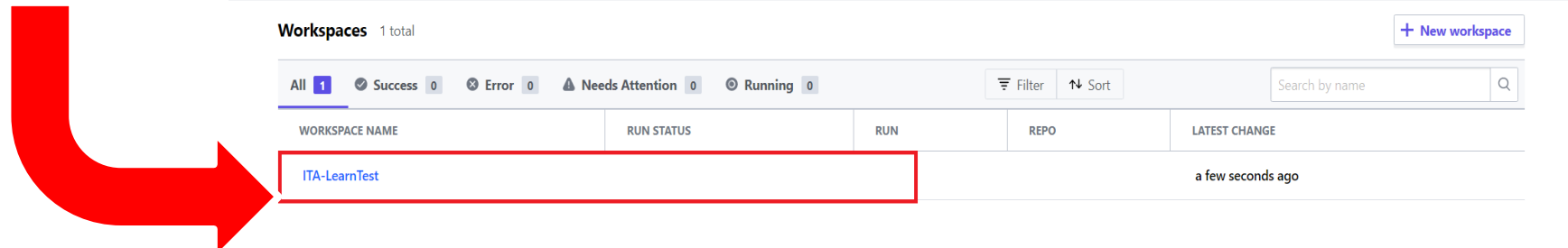
- After you have created the Workspace item from the Workspaces list, You can use the “Check operation status” function to check if the added Workspace is in the target Terraform or not.
- If it displays “ Nothing registered”, you can press the “Register” button to create Workspace in the Terraform.

✂As Workspaces are created in Organizations, you must create an Organization in Terraform first.



The screenshot shows the 'List/Update' view of the Terraform Workspaces list. It features a table with columns: History, Update, Discard, Workspace ID, Organization, Workspace Name, Terraform Version, and Terraform association. The 'Terraform association' sub-header includes Status check, Association status, Register, update, and Delete. A single workspace is listed with ID 1, Organization LearnTest1, and Name ITA-LearnTest. The 'Association status' is 'No registration', and the 'Register' button is highlighted with a red box. Below the table, there is a 'Filter result count: 1' and an 'Output Excel' button.

History	Update	Discard	Workspace ID	Organization	Workspace Name	Terraform Version	Terraform association				
							Status check	Association status	Register	update	Delete
History	Update	Discard	1	LearnTest1	ITA-LearnTest		Association status check	No registration	Register	update	Delete



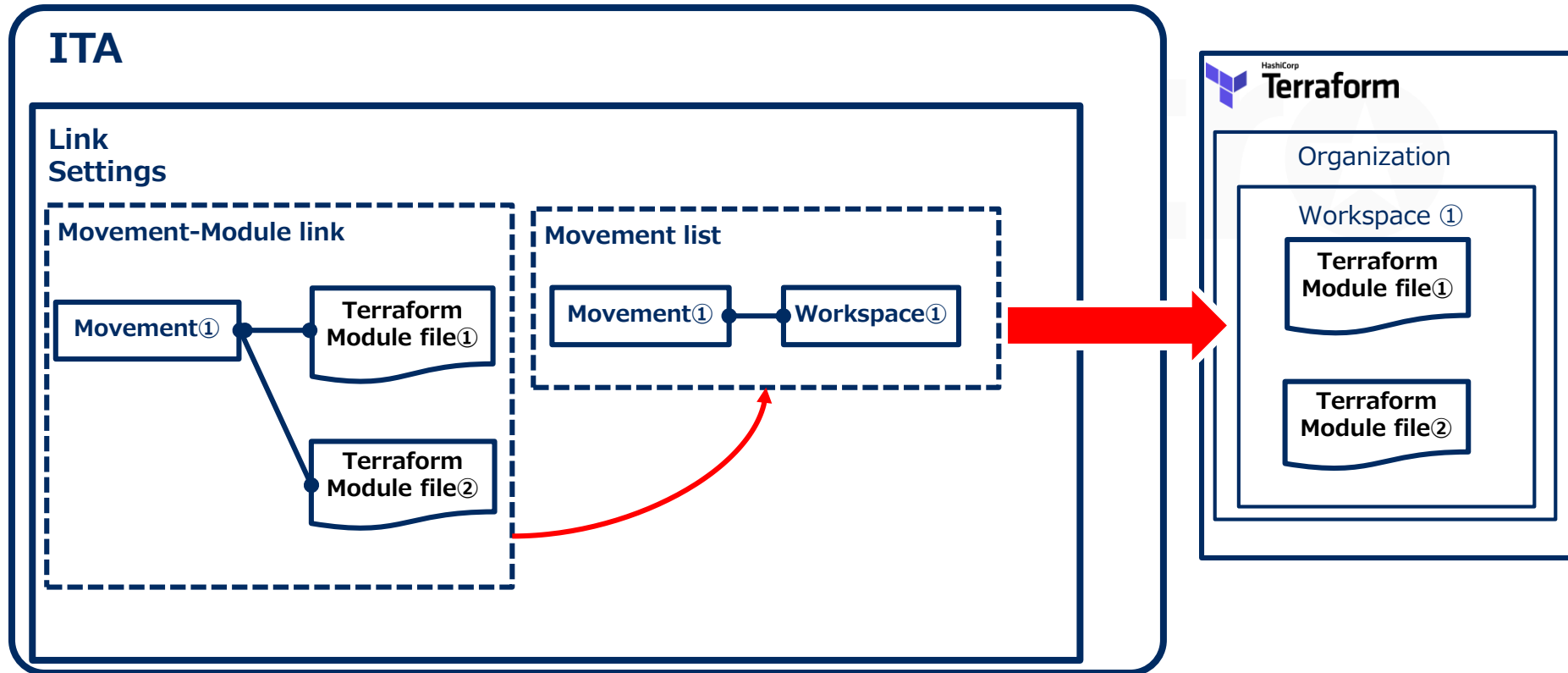
The screenshot shows the 'Workspaces' view of the Terraform Workspaces list. It features a table with columns: WORKSPACE NAME, RUN STATUS, RUN, REPO, and LATEST CHANGE. A single workspace is listed with Name ITA-LearnTest and Latest Change a few seconds ago. The 'ITA-LearnTest' text is highlighted with a red box, and a large red arrow points to it from the left. Above the table, there is a 'Filter' and 'Sort' section, and a 'Search by name' input field.

WORKSPACE NAME	RUN STATUS	RUN	REPO	LATEST CHANGE
ITA-LearnTest				a few seconds ago

## 4.5 Applying Modules

### Applying Modules

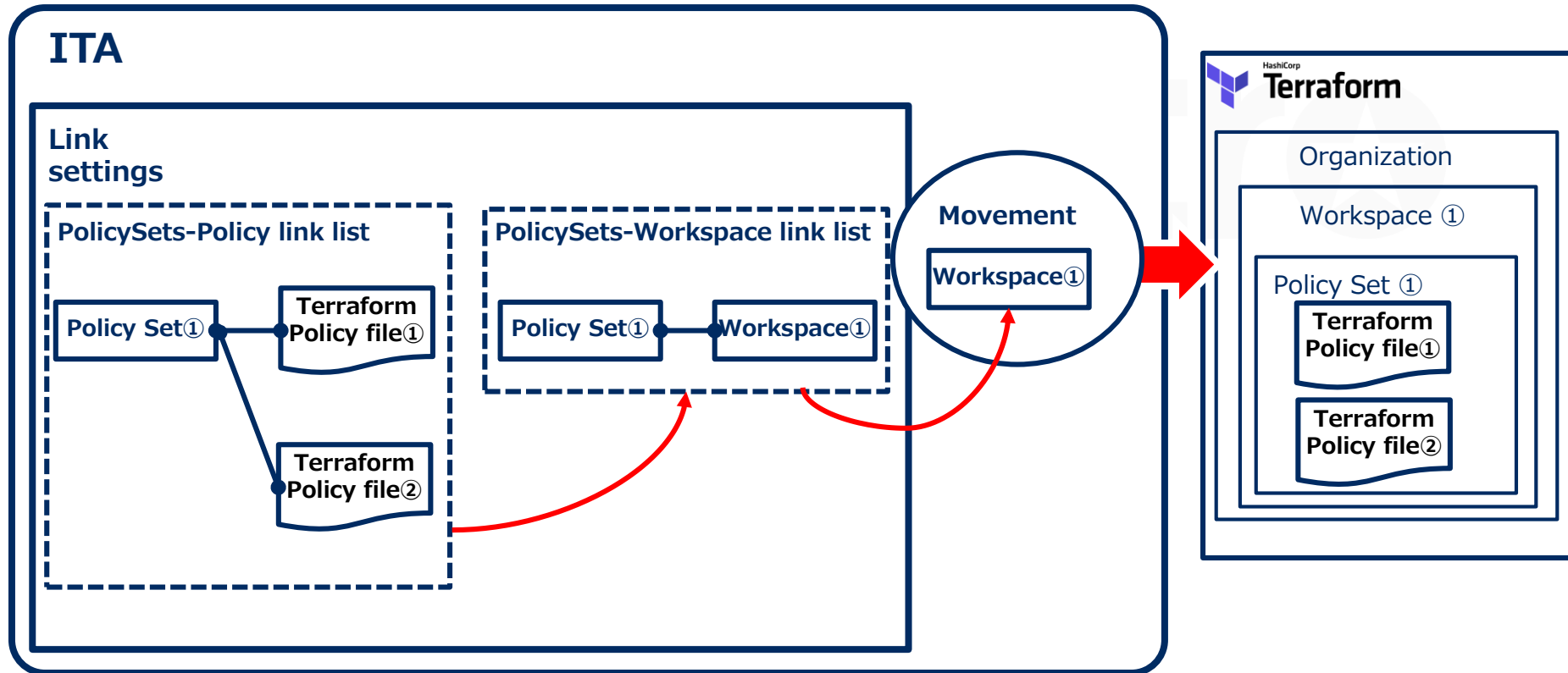
- In order to apply a Module to an operation, you will need to register all the settings related to the module and configure the different links.
- The Module is applied to the Workspace linked with the Movement when the operation is executed.



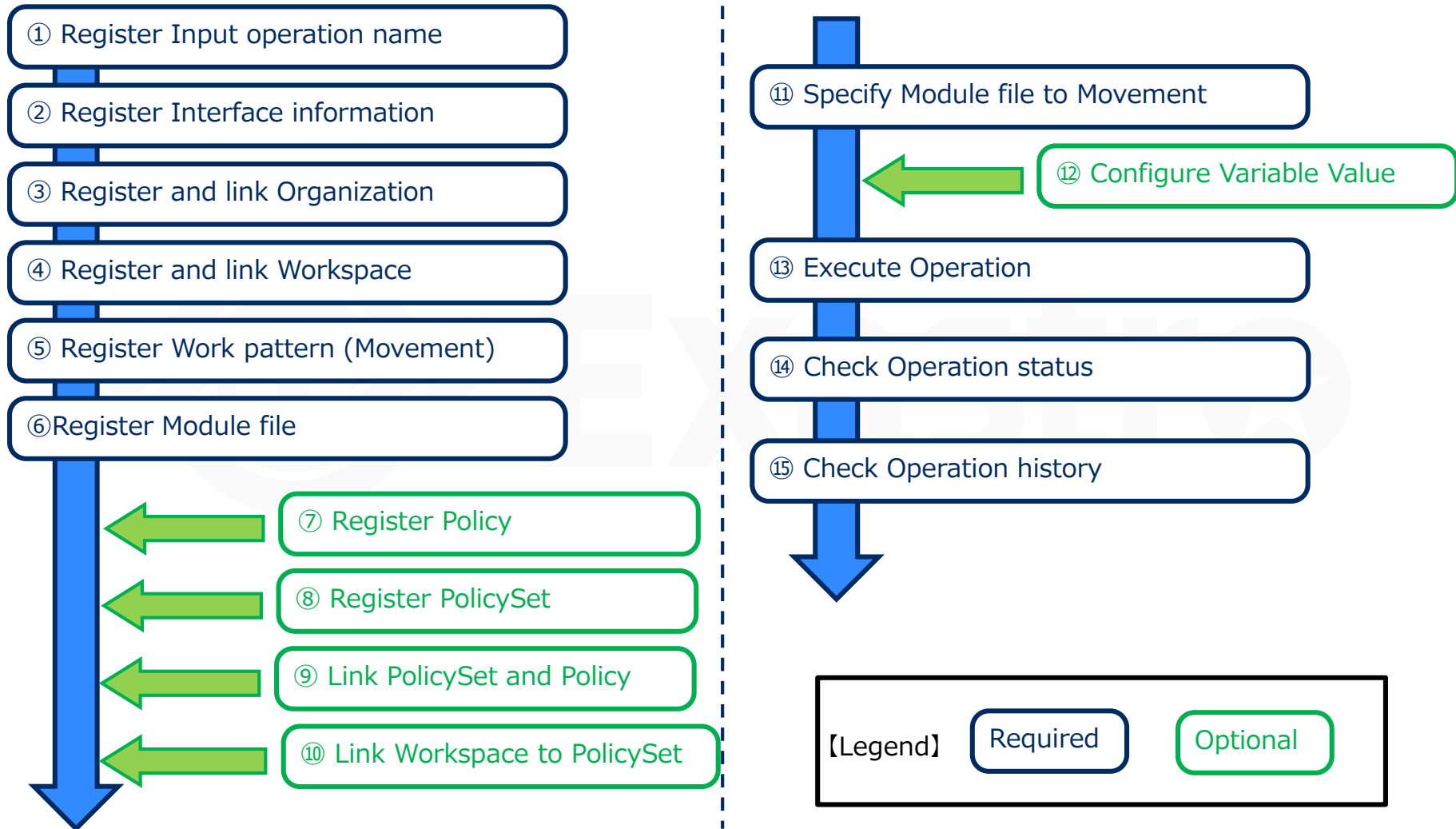
## 4.6 Applying Policies

### Applying Policies

- In order to apply a Policy to an operation, you will need to register all the settings related to Policy and configure different links.
- The PolicySet and the Policy linked to is applied to the Workspace linked with the Movement when the operation is executed.



## 4.7 Terraform Driver Workflow







**Exastro**