



IT Automation

CI/CD for IaC

【Practice】

※In this Document “Exastro IT Automation” will be written as “ITA”.

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1. Introduction

1.1 About this document

Main Menu

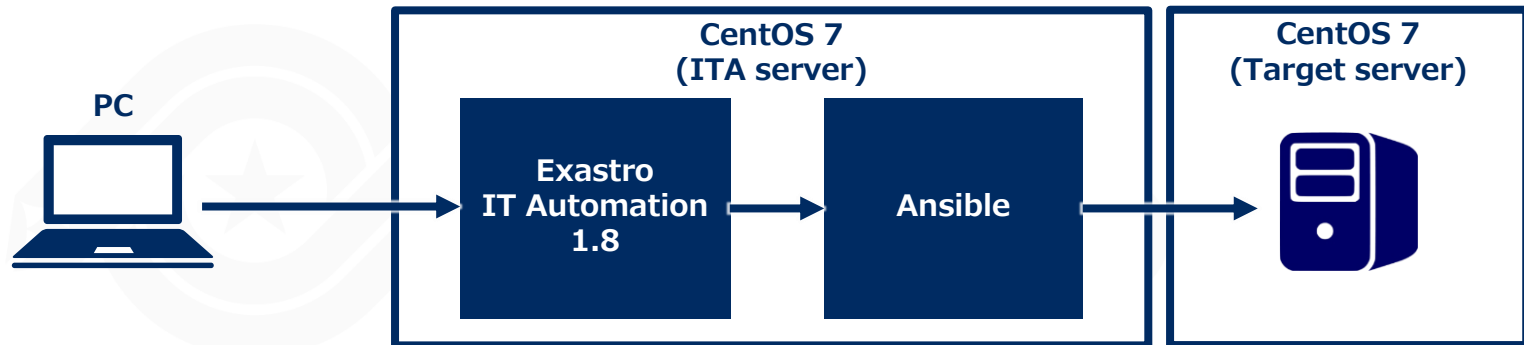
- This document aims to teach the reader about the CI/CD for IaC function by guiding them through a simple scenario.
- This document requires the reader to have finished the scenario in the "Quickstart" guide before they can follow this scenario.



1.2 Environment

Operation environment

- The environment used in this document is as follows.
- The user must have a GitHub account in addition to the ITA server and the Target server.

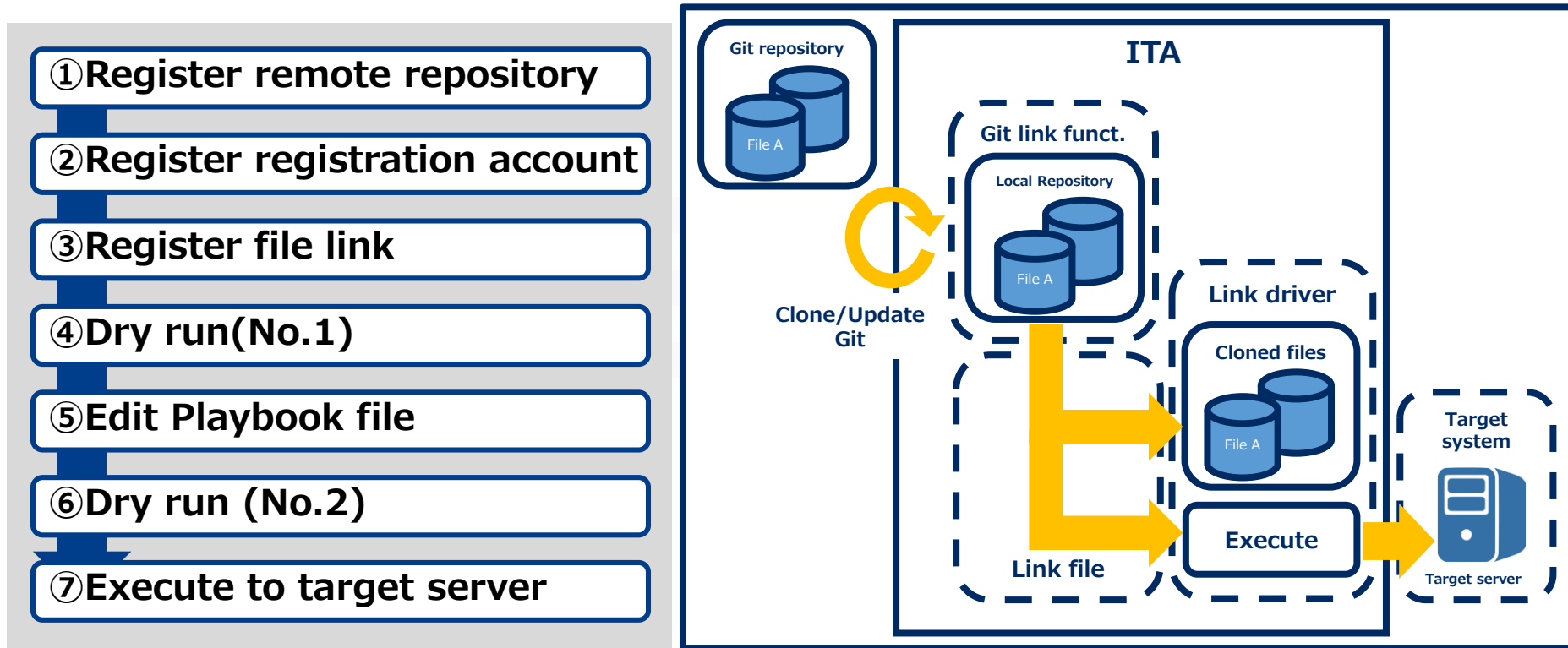


- Exastro IT Automation 1.8
- CentOS 7(for ITA server)
- CentOS 7(for Target machine)

1.3 Scenario

Scenario

- The figure below illustrates the steps and contents of this document's scenario.



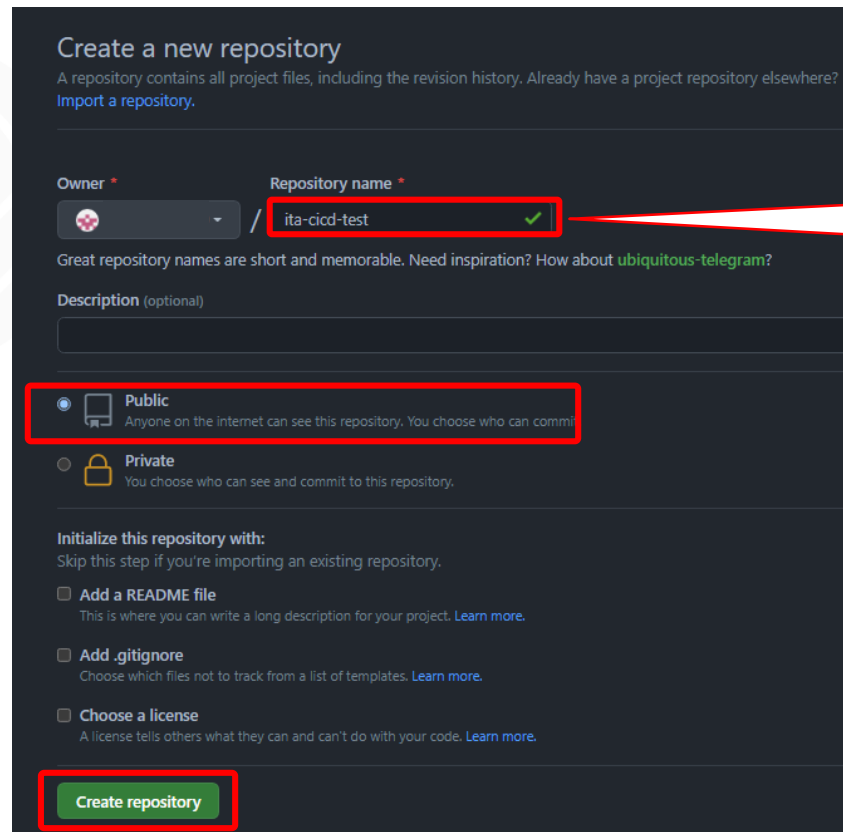
1.4 Preparation(1/3)

Prepare Git repository

- In this scenario, we will use GitHub.

Go to Repository and select “New” to create a new repository.


Input your desired repository name and select Public. Create the repository by pressing the “Create repository” button at the bottom of the screen.



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? [Import a repository.](#)

Owner ^{*} / Repository name ^{*}

 / ita-cicd-test ✓

Great repository names are short and memorable. Need inspiration? How about [ubiquitous-telegram?](#)

Description (optional)

☒ **Public**
Anyone on the internet can see this repository. You choose who can commit to it.

☐ **Private**
You choose who can see and commit to this repository.

Initialize this repository with:
Skip this step if you're importing an existing repository.

☐ **Add a README file**
This is where you can write a long description for your project. [Learn more.](#)

☐ **Add .gitignore**
Choose which files not to track from a list of templates. [Learn more.](#)

☐ **Choose a license**
A license tells others what they can and can't do with your code. [Learn more.](#)

Create repository

Select Public

Repository name

(Free name)

1.4 Preparation(2/3)

■ Prepare Playbook file

- In this scenario, we will use the following Playbook

yum_package_install_check.yml

```
- name: install the latest version of packages
  yum:
    name: "{{ item }}"
    state: latest
  with_items:
    - "{{ VAR_packages }}"

- name: Check yum list
  shell: yum list installed | grep "{{ item }}"
  register: result
  with_items:
    - "{{ VAR_packages }}"
```

Point

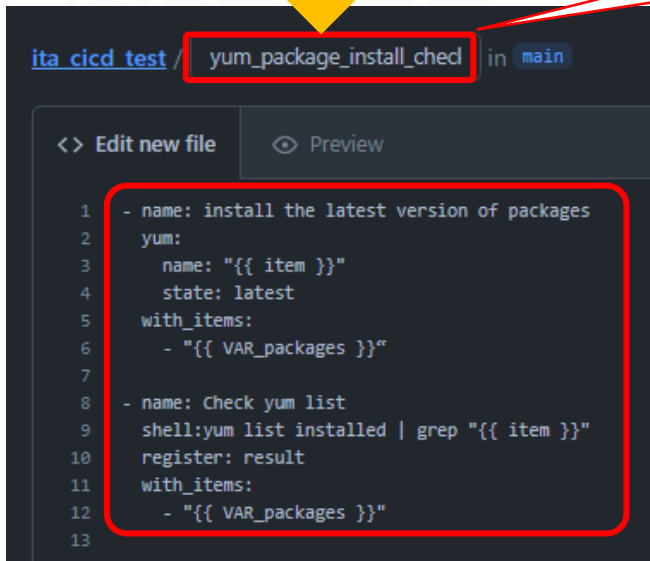
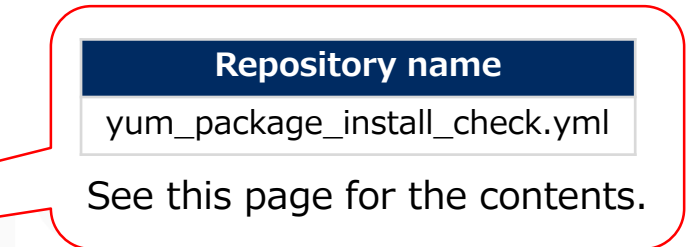
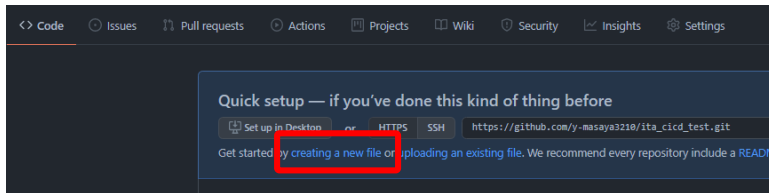
※The file has an invalid indent here on purpose.
We will fix it later as a part of the scenario.

1.4 Preparation(3/3)

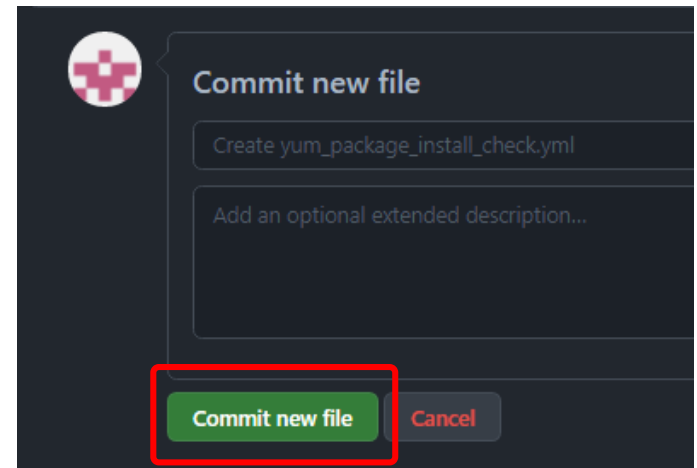
Upload Playbook

- Upload the Playbook to GitHub.

From the “Code” tab, click “Create a new file” and paste the contents of the playbook from the previous slide. Scroll down to the bottom of the page and press “Commit new file”.



Scroll down



2. Scenario

2.1 Register Remote repository

Register the Git repository information.

- In this step, we will register the information of the GitHub account we prepared earlier. In ITA, go to the "CI/CD for IaC" menu and click "Remote repository". Follow the table below and register a new item.

Exastro IT Automation CI/CD for IaC

User name [System Administrator] Login ID [administrator] [Change password](#) [Logout](#)

Menu

- Main menu
- Interface information
- Remote repository**
- Remote repository file
- Registered account
- File link

Description ▾Open

Display filter ▾Open

List/Update ▾Open

Register △Close

Item	Repository Name*	Remote Repository (URL)*	Branch	Protocol*	Visibility type	Git Account information		Last update date/time	Last updated by
						User	Password		
Auto-input	ita-cicd-test	https://github.com		https ▾	public ▾			Auto-input	Auto-input

※* is a required item.

[Back](#) [Register](#)

Remote Repository name	Remote Repository (URL)	Protocol	Visibility type	Remote repository sync info(Sync cycle)
(Name of the repository name)	(URL of the repository name)	https	public	Valid

2.2 Register Registered account

Register the account information needed to access the cloned files.

- Register a new item with the Exastro ITA account information.

In this scenario, we will use the “administrator” user

Press “Registered account” and follow the table below to create a new item.

Menu

- Main menu
- Interface information
- Remote repository
- Remote repository file
- Registered account**
- File link

Description ▾Open

Display filter ▾Open

List/Update ▾Open

Register △Close

Item number	Exastro IT Automation account		Access permission		Remarks	Last update date/time	Last updated by
	Login Id*	Login Password*	Setting	Role to allow access			
Auto-input	1:administrator ▾	••••••••••	Setting			Auto-input	Auto-input

※ * is a required item.

Back Register

Login ID	Login PW
administrator	(Password)

2.3 Register file link(1/2)

Register a file link for the source files and the cloned files.

- In this section, we will link the source files and the cloned files and register an Operation and a Movement that will check the validity of the cloned files. Go to the “file link” menu and create a new item using the table below.

Menu

Main menu

Interface information

Remote repository

Remote repository file

Registered account

File link

Description▽Open

Display filter▽Open

List/Update▽Open

Register△Close

Item number	Link file name*	Git Repository (From)		Link file type	Last update date/time	Last updated by
		Remote Repository*	File path*			
Auto-input	yum_package_install	ita-cicd-test ▾	yum_package_install_check.yml ▾	Ansible-Legacy console/Playbook files	Auto-input	Auto-input

※*is a required item.

BackRegister

Link destination file name	Remote repository	File path	Link destination file type	Execution login ID	Automatic synchronization
yum_package_install	ita_cicd_test	yum_package_install_check.yml	Ansible-Legacy console /Playbook files	1:administrator	Valid

2.3 Register file link(2/2)

Register Operation and Movement and select “Dry run”.

- After having filled out the items from the previous slide, scroll to the right and fill out the following 3 items and press “Register”.

Menu

Main menu

Interface Information

Remote repository

Remote repository file

Registered account

File link

Description▽Open

Display filter▽Open

List/Update△Close

Item number	ation information	Delivery Information			Access permission		Last update date/time	Last updated by
	nchronization	Operation	Movement	Dry run	Setting	Role to allow access		
1		OP2 ▾	Package install ▾	● ▾	Setting		Auto-input	Auto-input

※* is a required item.

BackUpdate

Operation	Movement	Dry run
Operation 2	Package install	●

2.4 Dry run (No.1)(1/2)

Check that the operation has dry run.

- Linking files will automatically start a dry run.

Go to the Ansible Legacy menu and click “Execution list”. From there, click “Filter” to see all executed operations. Find the operation we dry ran earlier and press the “Operation status check” to see the error contents.

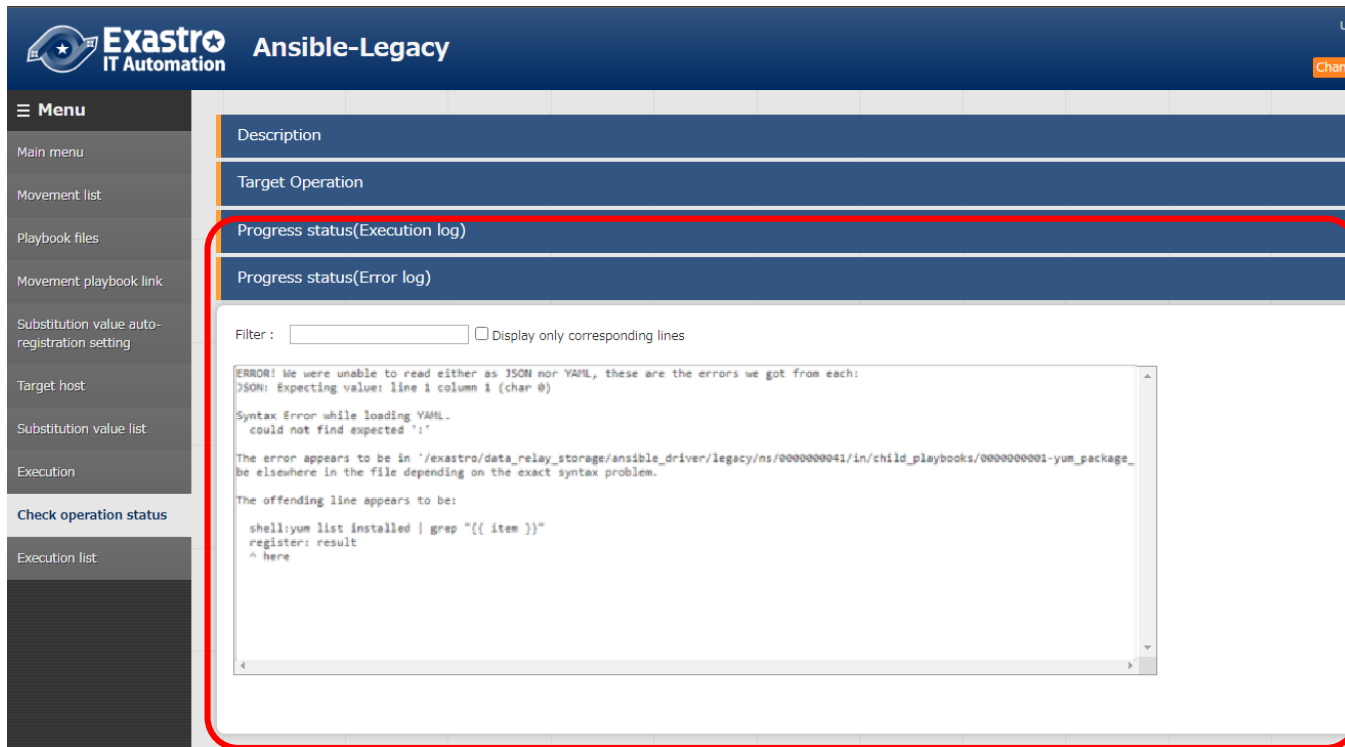
The screenshot shows the Ansible Legacy web interface. On the left is a sidebar menu with the following items: Menu, Main menu, Movement list, Playbook files, Movement playbook link, Substitution value auto-registration setting, Target host, Substitution value list, Execution, Check operation status, and Execution list (highlighted with a red box). The main content area has a 'Description' header with an 'Open' button. Below it is a 'Display filter' section with an 'Auto-filter' checkbox checked. The filter section includes a table with columns: Discard, Execution No., Execution type, Status, execution engine, Last update date/time, and Last updated by. Each column has a search dropdown. Below the filter table are 'Filter' and 'Clear filter' buttons. The 'List' section below shows a table of execution history. The first two rows are highlighted with a red box. The first row shows an 'Unexpected error' status, and the second row shows a 'Completed' status.

History	Execution No.	Check execution status	Execution type	Status	execution engine	virtualenv	Caller	Last update date/time	Last updated by
History	12	Check execution status	Normal	Unexpected error	Ansible Engine		InstallP	2021/12/09 13:36:39	Collection work procedure
History	11	Check execution status	Normal	Completed	Ansible Engine			2021/10/18 14:33:01	Collection work procedure
History	10	Check execution status	Normal	Completed	Ansible Engine			2021/09/02 13:13:57	Collection work procedure
History	9	Check execution status	Normal	Completed (error)	Ansible Engine			2021/09/02 13:11:56	Collection work procedure
History	8	Check execution status	Normal	Unexpected error	Ansible Engine			2021/09/02 13:09:45	Collection work procedure

2.4 Dry run (No.1)(2/2)

Check that the operation has dry run.

- Scroll down to see the Progress log. Users can use this to see the contents of the error. As mentioned earlier, the file contained an invalid indent which caused the error.



The screenshot displays the Exastro IT Automation Ansible-Legacy interface. The left sidebar contains a menu with options: Main menu, Movement list, Playbook files, Movement playbook link, Substitution value auto-registration setting, Target host, Substitution value list, Execution, Check operation status, and Execution list. The main content area shows the Progress status (Error log) section, which is highlighted with a red border. The error log displays the following text:

```
ERROR! We were unable to read either as JSON nor YAML, these are the errors we got from each:
JSON: Expecting value: line 1 column 1 (char 0)

Syntax Error while loading YAML.
could not find expected ':'

The error appears to be in '/exastro/data_relay_storage/ansible_driver/legacy/ns/0000000041/in/child_playbooks/0000000001-yum_package_
be elsewhere in the file depending on the exact syntax problem.

The offending line appears to be:

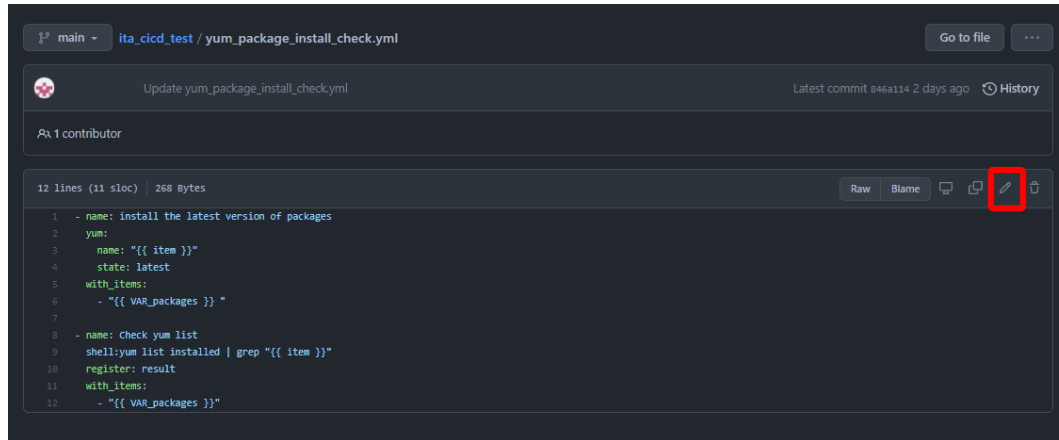
shell: yum list installed | grep "{ item }"
register: result
^ here
```


2.5 Edit Playbook

Access GitHub and edit the Playbook file.

- In this section, we will fix the error from the previous slide.

Access the GitHub file and press the edit icon. Follow the steps below and press "Commit changes".



This screenshot shows the GitHub interface for editing a file named 'yum_package_install_check.yml'. The file content is as follows:

```
1 - name: install the latest version of packages
2   yum:
3     name: "{{ item }}"
4     state: latest
5   with_items:
6     - "{{ VAR_packages }}"
7
8 - name: Check yum list
9   shell: yum list installed | grep "{{ item }}"
10  register: result
11  with_items:
12    - "{{ VAR_packages }}"
```

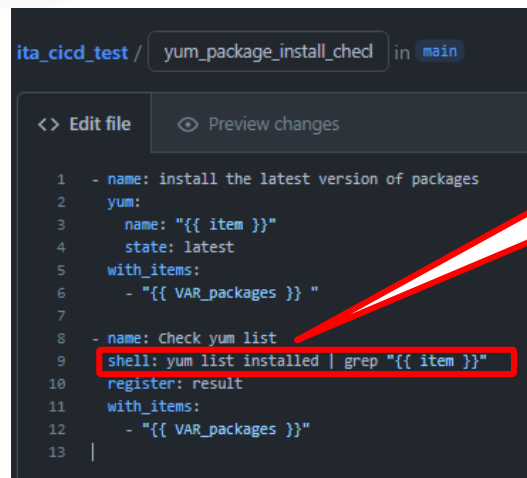
The edit icon (a pencil) in the top right corner of the code editor is highlighted with a red box.

Input a space between ":" and "y"

```
shell:yum list installed | grep "{{ item }}"
```

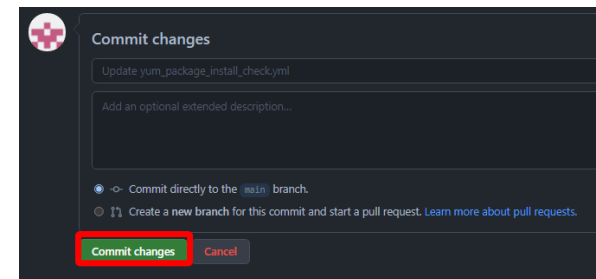


```
shell: yum list installed | grep "{{ item }}"
```



This screenshot shows the 'Edit file' interface in GitHub. The file content is the same as in the previous screenshot. The line `shell: yum list installed | grep "{{ item }}"` is highlighted with a red box. A yellow arrow points from the left towards this line.

Scroll down



This screenshot shows the 'Commit changes' dialog box. The commit message is 'Update yum_package_install_check.yml'. The 'Commit changes' button is highlighted with a red box.

2.6 Dry run (No.2)

Check that the operation has dry run.

- Updating the GitHub source file will automatically update and dry run the ITA Playbook clone file.

Do the same as Dry run(No.1) and go to “Ansible Legacy”-> “Execution list” and find the operation. The last dry run ended in an error, but this run should end successfully.

The screenshot shows the ITA Ansible Legacy interface. On the left, the 'Execution list' menu item is highlighted. The main area displays a filter section with a red box around the 'Filter' button and an 'Auto-filter' checkbox. Below the filter section is a table of execution records. The first row of the table is highlighted with a red box.

History	Execution No.	Check execution status	Execution type	Status	execution engine	virtualenv	Caller	Last update date/time	Last updated by
History	2	Check execution status	Normal	Completed	Ansible Engine			2021/09/01 13:28:31	Collection work procedure
History	6	Check execution status	Normal	Completed	Ansible Engine			2021/09/02 09:38:53	Collection work procedure
History	10	Check execution status	Normal	Completed	Ansible Engine			2021/09/02 13:13:57	Collection work procedure

2.7 Execute to Target server(1/2)

Run the operation and apply to the Target server.

- Now that we have used the Dry run to see that there are no problems with the Playbook, we can apply it to the target server. Go to Ansible Legacy > Execution. Here we can select what Movement and Operation that we want to run.

Menu

- Main menu
- Conductor interface information
- Conductor class list
- Conductor class edit
- Conductor execution**
- Conductor confirmation
- Conductor list
- Conductor Regularly execution

Description ▾Open

Scheduling △Close

Specify the scheduled date/time in (YYYY/MM/DD HH:MM) Immediately execute when blank.
Scheduled date/time:

Conductor [filter] ▾Open

Conductor [List] △Close

Select	Conductor class ID	Conductor name	Explanation	Access permission Role to allow access	Remarks	Last update date/time	Last updated by
<input type="radio"/>	1	InstallPackage				2021/12/09 13:09:33	System Administrator

Filter result count: 1

Operation [Filter] ▾Open

Operation [List] △Close

Select	No.	Operation ID	Operation name	Scheduled date for execution	Last execution date	Access permission Role to allow access	Last update date/time	Last updated by
<input type="radio"/>	5	5	OP1	2021/12/08 19:00			2021/12/07 19:01:04	System Administrator
<input type="radio"/>	6	6	OP2	2021/12/09 15:10			2021/12/08 14:48:13	System Administrator
<input type="radio"/>	7	7	Operation 1	2021/12/30 13:32	2021/12/09 13:35		2021/12/09 13:35:38	Legacy execution procedure
<input type="radio"/>	8	8	Operation 2	2021/12/14 14:21			2021/12/09 14:21:36	System Administrator

2.7 Execute to Target server(2/2)

Run the operation and apply to the Target server.

- After selecting the operation and Movement, press “Execute”.
Executing any operation will move the user to a screen where they can see the status of the running operation. If the operation status says “Completed”, the operation has ended successfully.

Operation [Filter]						
Operation [List]						
Select	No.	Operation ID	Operation name	Scheduled date for execution	Last execution date	Access Role to all
<input type="radio"/>	5	5	OP1	2021/12/08 19:00		
<input type="radio"/>	6	6	OP2	2021/12/09 15:10		
<input type="radio"/>	7	7	Operation 1	2021/12/30 13:32	2021/12/09 13:35	
<input checked="" type="radio"/>	8	8	Operation 2	2021/12/14 14:21		

Filter result count: 4

Movement ID 11
Movement Name Package install

Dry run

Execute

Item		Value
Execution No.		11
Execution type		Normal
Status		Completed
execution engine		Ansible Engine
Caller symphony		
Caller conductor		
Execution user		System Administrator
Movement	ID	11
	Name	Package install
	Delay timer (minutes)	
Operation	Dedicated information for ansible	Host specific format IP
	No.	8
	Name	Operation 2
Host management	ID	8
	confirmation	confirmation
	Substitution value	confirmation
Input data	Populated data	InputData 000000011.zip
Output data	Result data	ResultData 000000011.zip
Operation status	Scheduled date/time	
	Start date/time	2021/10/18 14:32:47
	End date/time	2021/10/18 14:32:53



Exastro