

Ansible

What is Ansible?

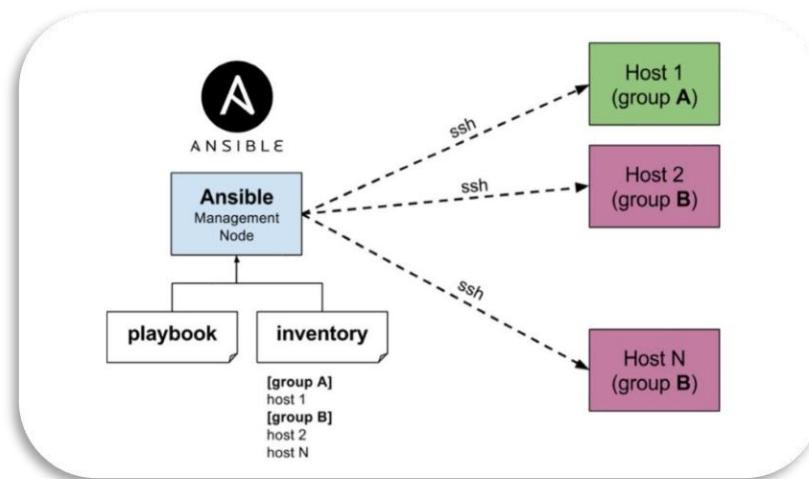
Ansible is an **automation, configuration management, and provisioning tool** used in DevOps to manage servers and infrastructure efficiently.

It helps automate:

- Server configuration
- Application deployment
- Cloud infrastructure
- Repetitive administrative tasks

☞ Instead of doing work manually on each server, Ansible lets you **write automation once and apply it everywhere**.

Ansible Architecture



Ansible Management Node (Control Node)

- This is the machine where Ansible is installed.
- It contains:
 - **Playbooks** (instructions)
 - **Inventory** (list of servers)

👉 All automation starts from here.

Inventory

- Inventory defines **which hosts Ansible will manage**.
- Hosts are grouped logically.

👉 This allows running tasks on **specific groups of servers**.

Playbook

- A playbook is a **YAML file**.
- It defines:
 - Which hosts to target
 - What tasks to perform
 - In what order

👉 Example:

- Install Nginx
- Start service
- Copy configuration file

SSH Connection (Very Important)

- Ansible connects to each host using **SSH**
- Default port: **22**
- No agent is installed on managed nodes

📌 This is why Ansible is called **agentless**.

Modules (Key Concept in the Slide)

- Ansible **pushes small programs called modules** to the target nodes.
- These modules:
 - Execute the task
 - Return the result
 - Are **removed automatically after execution**

👉 Examples:

- apt → install packages
- service → manage services
- copy → copy files

📌 No module stays permanently on the server.

○ Ansible config and host files, connect with host

Take Remote Access Using Ansible

Create EC2 Instances

The screenshot shows the AWS EC2 Instances page. It displays two instances: 'Host1' (Instance ID: i-058f9d8d2b3f5a133) and 'Ansible' (Instance ID: i-0700a85d7abc18c07). Both instances are listed as 'Running'. The 'Actions' dropdown menu is open, showing options like 'Connect', 'Launch instances', and others.

How Ansible Connects to EC2

Step-by-Step Flow

1. EC2 instances are created using a **key pair**
2. The **public key** is stored on the EC2 instances automatically
3. The **private key (.pem)** is downloaded to your local machine
4. This **same private key is copied to the Ansible server**
5. Ansible uses this private key to authenticate via **SSH (port 22)**

⌚ This enables **passwordless authentication**

Copy key to Ansible server

From your local system:

```
C:\Users\sjain403\Downloads>scp -i id_rsa_pvt id_rsa_pvt ubuntu@3.231.220.95:/home/ubuntu/
The authenticity of host '3.231.220.95 (3.231.220.95)' can't be established.
ED25519 key fingerprint is SHA256:BYaaSPdes2INxaG/4BDtKtXhpD8G8zRcI02sQ+f4lkQ.
This key is not known by any other names.
Are you sure you want to continue connecting (yes/no/[fingerprint])?
Warning: Permanently added '3.231.220.95' (ED25519) to the list of known hosts.
id_rsa_pvt
```

Set correct permissions (Very Important)

On Ansible server:

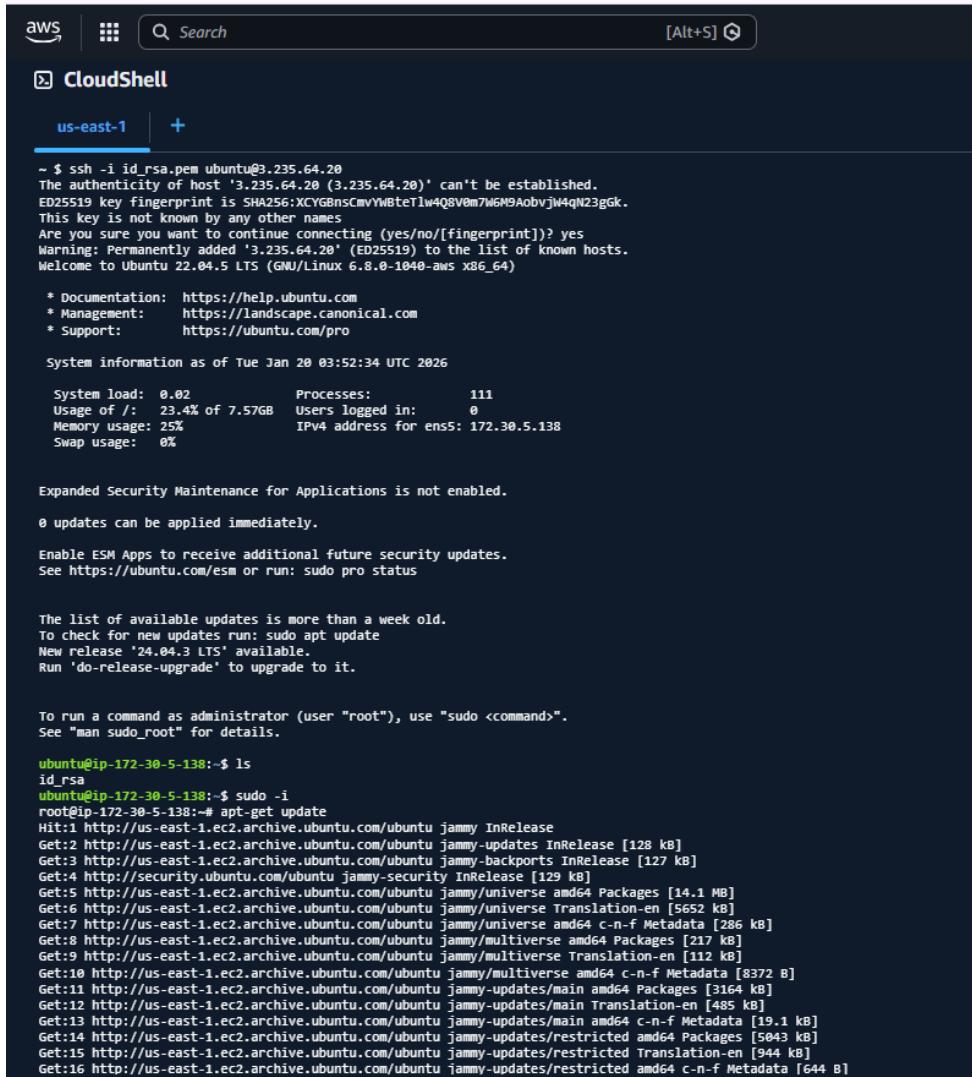
```
~ $ chmod 400 id_rsaprivate  
~ $ ssh -i id_rsaprivate ubuntu@3.231.220.95
```

Use this link do Download Ansible on Different operating system

[Ansible](#)

Installing Ansible on Ubuntu

```
$ sudo apt update  
$ sudo apt install software-properties-common  
$ sudo add-apt-repository --yes --update ppa:ansible/ansible  
$ sudo apt install ansible
```



The screenshot shows the AWS CloudShell interface with the region set to us-east-1. The terminal window displays the following output:

```
aws | [CloudShell] | Search [Alt+S] +  
  
us-east-1 | +  
  
~ $ ssh -i id_rsa.pem ubuntu@3.235.64.20  
The authenticity of host '3.235.64.20' (3.235.64.20) can't be established.  
ED25519 key fingerprint is SHA256:XCYGBnsCmVWtTeTlw4Q8v0m7WM9AobVjW4qN23gdk.  
This key is not known by any other names  
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes  
Warning: Permanently added '3.235.64.20' (ED25519) to the list of known hosts.  
Welcome to Ubuntu 22.04.5 LTS (GNU/Linux 6.8.0-1040-aws x86_64)  
  
* Documentation: https://help.ubuntu.com  
* Management: https://landscape.canonical.com  
* Support: https://ubuntu.com/pro  
  
System information as of Tue Jan 20 03:52:34 UTC 2026  
  
System load: 0.02 Processes: 111  
Usage of /: 23.4% of 7.57GB Users logged in: 0  
Memory usage: 25% IPV4 address for ens5: 172.30.5.138  
Swap usage: 0%  
  
Expanded Security Maintenance for Applications is not enabled.  
0 updates can be applied immediately.  
  
Enable ESM Apps to receive additional future security updates.  
See https://ubuntu.com/esm or run: sudo pro status  
  
The list of available updates is more than a week old.  
To check for new updates run: sudo apt update  
New release '24.04.3 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
To run a command as administrator (user "root"), use "sudo <command>".  
See "man sudo_root" for details.  
  
ubuntu@ip-172-30-5-138:~$ ls  
id_rsa  
ubuntu@ip-172-30-5-138:~$ sudo -i  
root@ip-172-30-5-138:~# apt-get update  
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease  
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease [128 kB]  
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease [127 kB]  
Get:4 http://security.ubuntu.com/ubuntu jammy-security InRelease [129 kB]  
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 Packages [14.1 MB]  
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe Translation-en [5652 kB]  
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 c-n-f Metadata [286 kB]  
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 Packages [217 kB]  
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse Translation-en [112 kB]  
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/multiverse amd64 c-n-f Metadata [8372 B]  
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 Packages [3164 kB]  
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main Translation-en [485 kB]  
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 c-n-f Metadata [19.1 kB]  
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 Packages [5843 kB]  
Get:15 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted Translation-en [944 kB]  
Get:16 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/restricted amd64 c-n-f Metadata [644 B]
```

```

root@ip-172-38-5-138:~# sudo apt install software-properties-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
software-properties-common is already the newest version (0.99.22.9).
software-properties-common set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 54 not upgraded.
root@ip-172-38-5-138:~# sudo add-apt-repository --yes --update ppa:ansible/ansible
Repository: deb https://ppa.launchpadcontent.net/ansible/ubuntu/ jammy main
Description:
Ansible is a radically simple IT automation platform that makes your applications and systems easier to deploy. Avoid writing scripts or custom code to deploy and update your applications and infrastructure - instead, describe what you want with code.
http://ansible.com/
If you face any issue while installing Ansible PPA, file an issue here:
https://github.com/ansible-community/ppa/issues
More info: https://lauchpad.net/~ansible/+archive/ubuntu/ansible
Adding repository...
Adding deb entry to /etc/apt/sources.list.d/ansible-ubuntu-ansible-jammy.list
Adding disabled deb-src entry to /etc/apt/sources.list.d/ansible-ubuntu-ansible-jammy.list
Adding key to /etc/apt/trusted.gpg.d/ansible-ubuntu-ansible.gpg with fingerprint 6125E2A8C77F2818FB7BD15B93C4A3FD7B89C367
Hit:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy InRelease
Hit:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates InRelease
Hit:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-backports InRelease
Hit:4 http://security.ubuntu.com/ubuntu jammy-security InRelease
Get:5 https://ppa.launchpadcontent.net/ansible/ubuntu jammy InRelease [18.0 kB]
Get:6 https://ppa.launchpadcontent.net/ansible/ubuntu jammy/main amd64 Packages [1124 B]
Get:7 https://ppa.launchpadcontent.net/ansible/ubuntu jammy/main Translation-en [752 B]
Fetched 19.9 kB in (23.5 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be installed:
  ansible-core python3-jmespath python3-kerberos python3-nacl python3-ntlm-auth python3-paramiko python3-requests-kerberos python3-requests-ntlm python3-resolve lib python3-winrm
Suggested packages:
  python3-gssapi python3-invoke
The following NEW packages will be installed:
  ansible ansible-core python3-jmespath python3-kerberos python3-nacl python3-ntlm-auth python3-paramiko python3-requests-kerberos python3-requests-ntlm python3-resolve lib python3-winrm
0 upgraded, 13 newly installed, 0 to remove and 54 not upgraded.
Need to get 19.2 MB of archives.
After this operation, 213 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-resolve lib all 0.8.1-1 [22.6 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 python3-jmespath all 0.10.0-1 [21.7 kB]
Get:3 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-kerberos amd64 1.1.14-3.1build5 [23.0 kB]
Get:4 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/main amd64 python3-nacl amd64 1.5.0-2 [63.1 kB]
Get:5 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-ntlm-auth all 1.4.8-1 [20.4 kB]
Get:6 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy-updates/main amd64 python3-paramiko all 2.9.3-ubuntui.3 [134 kB]
Get:7 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-requests-kerberos all 0.12.0-2 [11.9 kB]
Get:8 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-requests-ntlm all 0.11.1 [6168 B]
Get:9 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-resolve lib all 0.12.0-2 [12.6 kB]
Get:10 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 python3-winrm all 0.3.0-2 [21.7 kB]
Get:11 https://us-east-1.ec2.archive.ubuntu.com/ubuntu jammy/universe amd64 sshpass amd64 1.09-1 [11.7 kB]
Get:12 https://ppa.launchpadcontent.net/ansible/ubuntu jammy/main amd64 ansible-core all 2.17.14-1ppa-jammy [1817 kB]
Get:13 https://ppa.launchpadcontent.net/ansible/ubuntu jammy/main amd64 ansible all 2.17.14-1ppa-jammy [170 kB]

```

CloudShell

us-east-1 +

```

Selecting previously unselected package python3-jmespath.
Preparing to unpack .../03-python3-jmespath_0.10.0-1_all.deb ...
Unpacking python3-jmespath (0.10.0-1) ...
Selecting previously unselected package python3-kerberos.
Preparing to unpack .../04-python3-kerberos_1.1.14-3.1build5_amd64.deb ...
Unpacking python3-kerberos (1.1.14-3.1build5) ...
Selecting previously unselected package python3-nacl.
Preparing to unpack .../05-python3-nacl_1.5.0-2_amd64.deb ...
Unpacking python3-nacl (1.5.0-2) ...
Selecting previously unselected package python3-ntlm-auth.
Preparing to unpack .../06-python3-ntlm-auth_1.4.0-1_all.deb ...
Unpacking python3-ntlm-auth (1.4.0-1) ...
Selecting previously unselected package python3-paramiko.
Preparing to unpack .../07-python3-paramiko_2.9.3-ubuntui.3_all.deb ...
Unpacking python3-paramiko (2.9.3-ubuntui.3) ...
Selecting previously unselected package python3-requests-kerberos.
Preparing to unpack .../08-python3-requests-kerberos_0.12.0-2_all.deb ...
Unpacking python3-requests-kerberos (0.12.0-2) ...
Selecting previously unselected package python3-requests-ntlm.
Preparing to unpack .../09-python3-requests-ntlm_1.1.0-1.1_all.deb ...
Unpacking python3-requests-ntlm (1.1.0-1.1) ...
Selecting previously unselected package python3-xmldict.
Preparing to unpack .../10-python3-xmldict_0.12.0-2_all.deb ...
Unpacking python3-xmldict (0.12.0-2) ...
Selecting previously unselected package python3-winrm.
Preparing to unpack .../11-python3-winrm_0.3.0-2_all.deb ...
Unpacking python3-winrm (0.3.0-2) ...
Selecting previously unselected package sshpass.
Preparing to unpack .../12-sshpass_1.09-1_amd64.deb ...
Unpacking sshpass (1.09-1)...
Setting up python3-ntlm-auth (1.4.0-1) ...
Setting up python3-resolve lib (0.8.1-1) ...
Setting up python3-kerberos (1.1.14-3.1build5) ...
Setting up ansible-core (2.17.14-1ppa-jammy) ...
Setting up sshpass (1.09-1) ...
Setting up python3-xmldict (0.12.0-2) ...
Setting up python3-jmespath (0.10.0-1) ...
Setting up python3-requests-kerberos (0.12.0-2) ...
Setting up ansible (10.7.0-1ppa-jammy) ...
Setting up python3-nacl (1.5.0-2) ...
Setting up python3-requests-ntlm (1.1.0-1.1) ...
Setting up python3-winrm (0.3.0-2) ...
Setting up python3-paramiko (2.9.3-ubuntui.3) ...
Processing triggers for man-db (2.10.2-1) ...
Scanning processes...
Scanning linux images...

Running kernel seems to be up-to-date.

No services need to be restarted.

No containers need to be restarted.

No user sessions are running outdated binaries.

No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@ip-172-38-5-138:~#

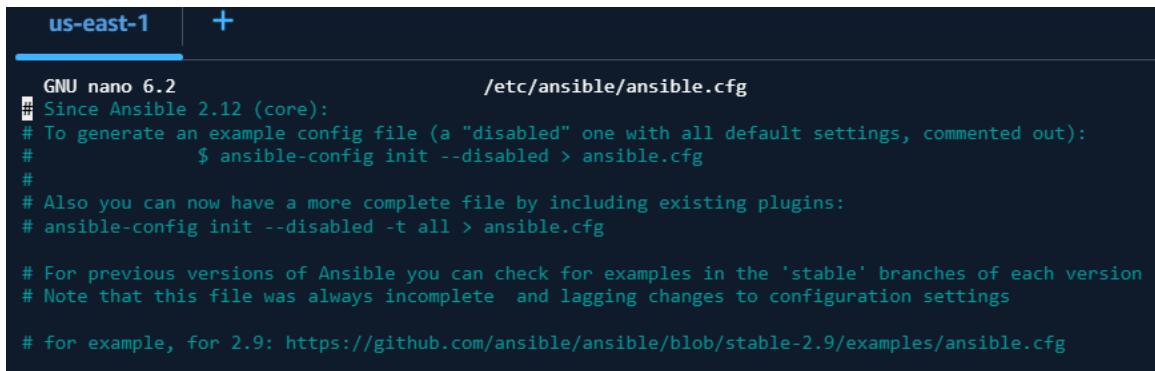
```

Check Ansible version

```
ubuntu@ip-172-30-5-138:~$ sudo -i
root@ip-172-30-5-138:~# ansible --version
ansible [core 2.17.14]
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/root/.ansible/plugins/modules', '/usr/share/ansible/plugins/module
s']
  ansible python module location = /usr/lib/python3/dist-packages/ansible
  ansible collection location = /root/.ansible/collections:/usr/share/ansible/collections
  executable location = /usr/bin/ansible
  python version = 3.10.12 (main, Aug 15 2025, 14:32:43) [GCC 11.4.0] (/usr/bin/python3)
  jinja version = 3.0.3
  libyaml = True
root@ip-172-30-5-138:~# ls /etc/ansible
ansible.cfg  hosts  roles
root@ip-172-30-5-138:~# ls /home/ubuntu
id_rsa
root@ip-172-30-5-138:~# nano /etc/ansible/ansible.cfg
```

Goto /etc/ansible/ansible.cfg file and copy

```
$ ansible-config init --disabled > ansible.cfg
```



The screenshot shows a terminal window titled "us-east-1" with a "+" icon. It displays the contents of the "/etc/ansible/ansible.cfg" file using the nano text editor. The file contains configuration options for Ansible, including host definitions and plugin settings. The terminal interface includes standard Linux-style command-line tools like "ls" and "cd".

```
GNU nano 6.2                               /etc/ansible/ansible.cfg
# Since Ansible 2.12 (core):
# To generate an example config file (a "disabled" one with all default settings, commented out):
#           $ ansible-config init --disabled > ansible.cfg
#
# Also you can now have a more complete file by including existing plugins:
# ansible-config init --disabled -t all > ansible.cfg

# For previous versions of Ansible you can check for examples in the 'stable' branches of each version
# Note that this file was always incomplete and lagging changes to configuration settings

# for example, for 2.9: https://github.com/ansible/ansible/blob/stable-2.9/examples/ansible.cfg
```

Take Access of Host1 machine Using Ansible

```
root@ip-172-30-5-138:~# cd /etc/ansible/
root@ip-172-30-5-138:/etc/ansible# ls
ansible.cfg  hosts  roles
root@ip-172-30-5-138:/etc/ansible# cd hosts
-bash: cd: hosts: Not a directory
root@ip-172-30-5-138:/etc/ansible# nano hosts
```

Copy Private IP of your host1 machine

```

# This is the default ansible 'hosts' file.
#
# It should live in /etc/ansible/hosts
#
# - Comments begin with the '#' character
# - Blank lines are ignored
# - Groups of hosts are delimited by [header] elements
# - You can enter hostnames or ip addresses
# - A hostname/ip can be a member of multiple groups
#
# Ex 1: Ungrouped hosts, specify before any group headers:
172.30.5.225
## green.example.com
## blue.example.com
## 192.168.100.1
## 192.168.100.10

# Ex 2: A collection of hosts belonging to the 'webservers' group:
## [webservers]
## alpha.example.org
## beta.example.org
## 192.168.1.100
## 192.168.1.110

# If you have multiple hosts following a pattern, you can specify
# them like this:
## www[001:006].example.com

^G Help      ^O Write Out   ^W Where Is    ^K Cut        ^T E
^X Exit      ^R Read File   ^\ Replace     ^U Paste      ^J J

```

Run

ansible -i hosts all -u ubuntu --private-key=/home/ubuntu/id_rsa -m shell -a hostname

```

root@ip-172-30-5-138:/etc/ansible# ansible -i hosts all -u ubuntu --private-key=/home/ubuntu/id_rsa -m shell -a hostname
The authenticity of host '172.30.5.225 (172.30.5.225)' can't be established.
ED25519 key fingerprint is SHA256:px7BlRyghOEBrNGD/MhTQRNEJZwCgjNHGvLndsguZI.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future
meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more
172.30.5.225 | CHANGED | rc=0 >
ip-172-30-5-225
root@ip-172-30-5-138:/etc/ansible#

```

Part	Meaning
-i hosts	Inventory file
all	All hosts
-u ubuntu	Remote user
--private-key	SSH private key
-m shell	Shell module
-a hostname	Command to execute

To Make your command shorter edit ansible.cfg file

```
GNU nano 6.2                               /etc/ansible/ansible.cfg
# Since Ansible 2.12 (core):
# To generate an example config file (a "disabled" one with all default settings, commented out):
#   $ ansible-config init --disabled > ansible.cfg
#
# Also you can now have a more complete file by including existing plugins:
# ansible-config init --disabled -t all > ansible.cfg

# For previous versions of Ansible you can check for examples in the 'stable' branches of each version
# Note that this file was always incomplete and lagging changes to configuration settings

# for example, for 2.9: https://github.com/ansible/ansible/blob/stable-2.9/examples/ansible.cfg
```

```
root@ip-172-30-5-138:~# ansible-config init -disabled > /etc/ansible/ansible.cfg
root@ip-172-30-5-138:~# nano /etc/ansible/ansible.cfg
```

Set Private-key Path

```
# (path) Option for connections using a certificate or key file to authenticate, rather than an agent or passwords, you can set
private_key_file=/home/ubuntu/id_rsa

# (boolean) By default, imported roles publish their variables to the play and other roles, this setting can avoid that.
```

Set Root user

```
# (string) Sets the login user for the target machines
# When blank it uses the connection plugin's default, normally the user currently executing Ansible.
remote_user=ubuntu
```



```
root@ip-172-30-5-138:/etc/ansible# ansible -i hosts all -m shell -a hostname
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future install
meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more inform
172.30.5.225 | CHANGED | rc=0 >>
ip-172-30-5-225
root@ip-172-30-5-138:/etc/ansible#
```

Change Hostname of Ansible server

```
Last login: Thu Jan 22 06:44:42 2026 from 35.174.242.87
ubuntu@ip-172-30-5-138:~$ sudo hostnamectl set-hostname ansible-server
ubuntu@ip-172-30-5-138:~$ bash
ubuntu@ansible-server:~$ cd /etc/ansible/
```

Change Hostname of Host Server

```
ubuntu@ip-172-30-5-225:~$ sudo hostnamectl set-hostname host1-server
ubuntu@ip-172-30-5-225:~$ bash
ubuntu@host1-server:~$
```

- write your playbook, local, global, file, prompt and register variables

Playbook:

The screenshot shows the VS Code interface with an 'Ansible' workspace named 'DEVOPS-TASK'. The left sidebar shows files for Ansible (sample.yaml), Terraform (main.tf, output.tf), and a PDF (Terraform Notes.pdf). The right pane displays the contents of 'sample.yaml' and a terminal window.

```

DEVS-TASK
  Ansible
    sample.yaml
  Terraform
    main.tf
    output.tf
    Terraform Notes.pdf
    variable.tf

sample.yaml
Ansible > sample.yaml
1 - name: my 1st playbook
2 hosts: all
3 tasks:
4   - name: Print tasks
5     debug:
6       msg: "This is my first Ansible playbook!"

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SPELL CHECKER POLYGLOT NOTEBOOK QUERY RESULTS ANSIBLE

deepa@Deepak-Lenovo-N48KJE5L MINGW64 ~/DevOps-Task (main)
● $ git add .
warning: in the working copy of 'Ansible/sample.yaml', LF will be replaced by CRLF the next time Git touches it

deepa@Deepak-Lenovo-N48KJE5L MINGW64 ~/DevOps-Task (main)
● $ git commit -m "Ansible Started"
[main f14084d] Ansible Started
1 file changed, 6 insertions(+)
create mode 100644 Ansible/sample.yaml

deepa@Deepak-Lenovo-N48KJE5L MINGW64 ~/DevOps-Task (main)
● $ git push origin main
Enumerating objects: 5, done.
Counting objects: 100% (5/5), done.
Delta compression using up to 8 threads
Compressing objects: 100% (3/3), done.
Writing objects: 100% (4/4), 448 bytes | 448.00 KiB/s, done.
Total 4 (delta 0), reused 0 (delta 0), pack-reused 0 (from 0)
To https://github.com/sakshijain19/Devops-Task.git
  8f81ff1..f14084d main -> main

```

Clone your GitHub repo into Ansible server

```

root@ansible-server:~# cd /etc/ansible
root@ansible-server:/etc/ansible# git clone https://github.com/sakshijain19/DevOps-Task.git
Cloning into 'DevOps-Task'...
remote: Enumerating objects: 226, done.
remote: Counting objects: 100% (226/226), done.
remote: Compressing objects: 100% (151/151), done.
remote: total 226 (delta 62), reused 200 (delta 44), pack-reused 0 (from 0)
Receiving objects: 100% (226/226), 7.03 MiB | 17.18 MiB/s, done.
Resolving deltas: 100% (62/62), done.
root@ansible-server:/etc/ansible# cd DevOps-Task/Ansible/
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ls
sample.yaml
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook sample.yaml

PLAY [my 1st playbook] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another Python meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [172.30.5.225]

TASK [Print tasks] ****
ok: [172.30.5.225] => {
    "msg": "This is my first Ansible playbook!"
}

PLAY RECAP ****
172.30.5.225 : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@ansible-server:/etc/ansible/DevOps-Task/Ansible#

```

Local & Global Variable

What are Local Variables?

Local variables are defined in a small scope and are accessible only within that scope. They do not affect other plays, hosts, or roles.

What are Global Variables?

Global variables are **accessible across multiple plays, hosts, and roles**.

They are used when the **same value is required everywhere**.

The screenshot shows a code editor interface with two tabs: 'sample.yaml' and 'var.txt'. The 'sample.yaml' tab contains the following Ansible playbook code:

```
Ansible > sample.yaml
1   - name: my 1st playbook
2     hosts: all
3     vars:
4       greeting: "Hello, World!" #Global variable
5     tasks:
6       - name: Print tasks
7         debug:
8           msg: "This is my first Ansible playbook!"
9       - name: my name
10         debug:
11           msg: "My name is {{ name}}"
12         vars:
13           name: "Sakshi Jain" #Local variable
14       - name: Print greeting
15         debug:
16           msg: "{{ greeting }}"
```

The 'var.txt' tab is empty.

Below the code editor is a terminal window showing the following command history:

```
deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git commit -m "Local & Global variable"
[main 8fccb9a] Local & Global variable
 1 file changed, 1 insertion(+), 1 deletion(-)

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git push origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Delta compression using up to 8 threads
Compressing objects: 100% (4/4), done.
```

Output:

```
ANSIBLESAMPLE.yaml | 2 +-
1 file changed, 1 insertion(+), 1 deletion(-)
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook sample.yaml

PLAY [my 1st playbook] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but f
meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html fo
ok: [172.30.5.225]

TASK [Print tasks] ****
ok: [172.30.5.225] => {
    "msg": "This is my first Ansible playbook!"
}
[WARNING]: Found variable using reserved name: name

TASK [my name] ****
ok: [172.30.5.225] => {
    "msg": "My name is Sakshi Jain"
}

TASK [Print greeting] ****
ok: [172.30.5.225] => {
    "msg": "Hello, World!"
}

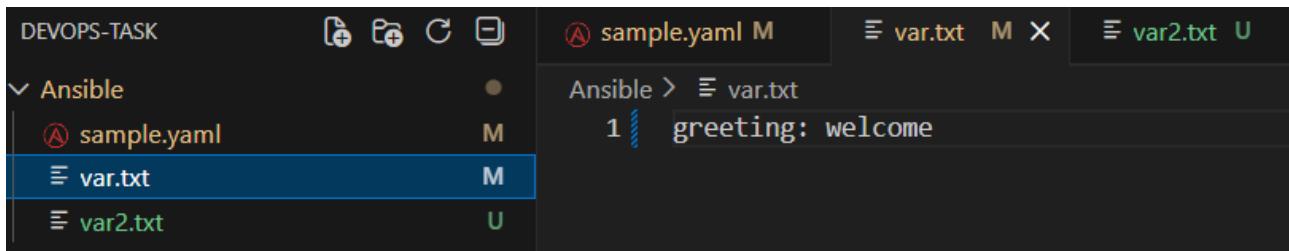
PLAY RECAP ****
172.30.5.225 : ok=4      changed=0      unreachable=0      failed=0      skipped=0      rescued=0      ignored=0
```

File Variable

In Ansible, a **file variable** means **variables stored in a separate YAML file** instead of writing them directly inside a playbook.

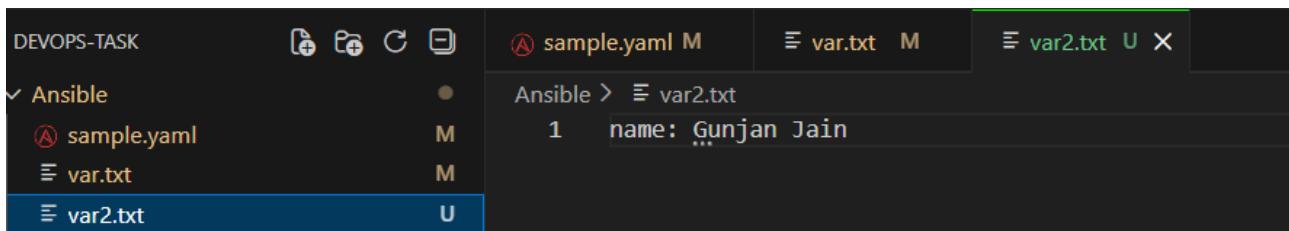
⌚ Purpose:

- Keep playbooks clean
- Reuse variables
- Manage environment-specific values (dev / qa / prod)



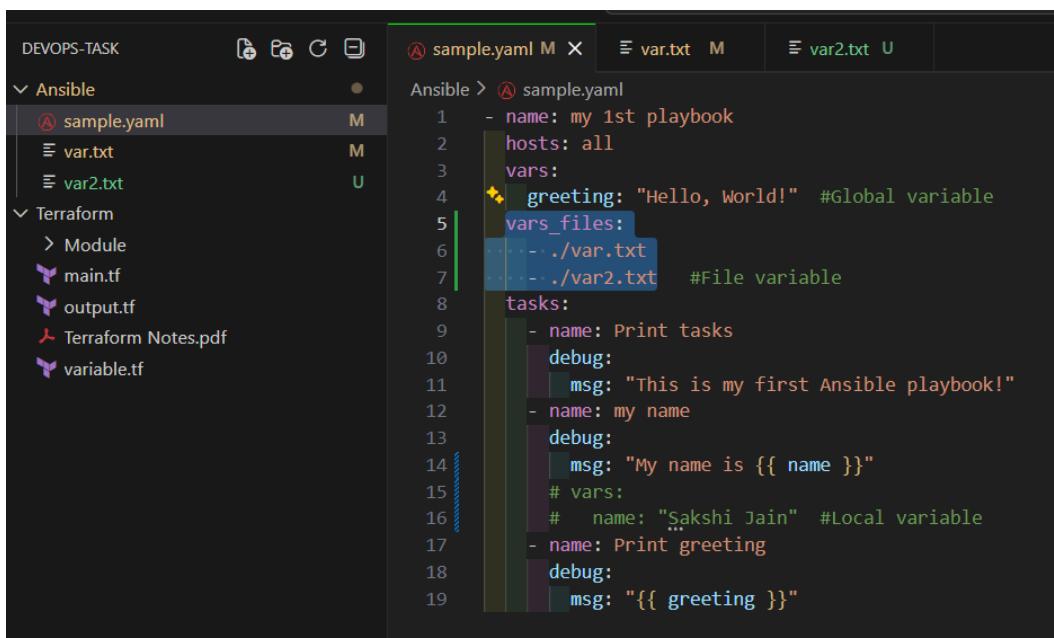
```
DEVOPS-TASK      ⌂ ⌂+ ⌂ C ⌂ ⌂ sample.yaml M ⌂ var.txt M X ⌂ var2.txt U
Ansible
  ⌂ sample.yaml M
  ⌂ var.txt M
  ⌂ var2.txt U
```

Ansible > ⌂ var.txt
1 greeting: welcome



```
DEVOPS-TASK      ⌂ ⌂+ ⌂ C ⌂ ⌂ sample.yaml M ⌂ var.txt M ⌂ var2.txt U X
Ansible
  ⌂ sample.yaml M
  ⌂ var.txt M
  ⌂ var2.txt U
```

Ansible > ⌂ var2.txt
1 name: Gunjan Jain



```
DEVOPS-TASK      ⌂ ⌂+ ⌂ C ⌂ ⌂ sample.yaml M X ⌂ var.txt M ⌂ var2.txt U
Ansible > ⌂ sample.yaml M
1 - name: my 1st playbook
2 hosts: all
3 vars:
4   greeting: "Hello, World!" #Global variable
5   vars_files:
6     - ./var.txt
7     - ./var2.txt #File variable
8 tasks:
9   - name: Print tasks
10    debug:
11      msg: "This is my first Ansible playbook!"
12   - name: my name
13    debug:
14      msg: "My name is {{ name }}"
15      # vars:
16      #   name: "Sakshi Jain" #Local variable
17   - name: Print greeting
18    debug:
19      msg: "{{ greeting }}"
```

Ansible > ⌂ sample.yaml M

Output:

```
remote: enumerating objects: 10, done.
remote: Counting objects: 100% (10/10), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 6 (delta 1), reused 6 (delta 1), pack-reused 0 (from 0)
Unpacking objects: 100% (6/6), 520 bytes | 520.00 KiB/s, done.
From https://github.com/sakshijain19/DevOps-Task
 * branch            main      -> FETCH_HEAD
   8fccb9a..f06699d main      -> origin/main
Updating 8fccb9a..f06699d
Fast-forward
 Ansible/sample.yaml | 9 ++++++---
 Ansible/var.txt     | 2 ++
 Ansible/var2.txt    | 1 +
 3 files changed, 8 insertions(+), 4 deletions(-)
 create mode 100644 Ansible/var2.txt
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook sample.yaml
[WARNING]: Found variable using reserved name: name

PLAY [my 1st playbook] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/
meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpre
ok: [172.30.5.225]

TASK [Print tasks] ****
ok: [172.30.5.225] => {
    "msg": "This is my first Ansible playbook!"
}

TASK [my name] ****
ok: [172.30.5.225] => {
    "msg": "My name is Gunjan Jain"
}

TASK [Print greeting] ****
ok: [172.30.5.225] => {
    "msg": "welcome"
}
```

Prompt Variable:

In Ansible, a **Prompt Variable** is a variable whose value is **asked from the user at runtime**—when the playbook starts executing.

```
DEVOPS-TASK
Ansible
  sample.yaml
  var.txt
  var2.txt
Terraform
  main.tf
  output.tf
  Terraform Notes.pdf
  variable.tf

Ansible > sample.yaml
4 | greeting: "Hello, World!" #Global variable
5 | # vars files:
6 | #   - ./var.txt
7 | #   - ./var2.txt #File variable
8 | vars_prompt:
9 |   - name: "name"
10 |   prompt: "Enter your name"
11 |   private: false #Prompt variable
12 | tasks:
13 |   - name: Print tasks
14 |     debug:
15 |       msg: "This is my first Ansible playbook!"
16 |   - name: my name
17 |     debug:
18 |       msg: "My name is {{ name }}"
19 |     # vars:
20 |
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SPELL CHECKER
deepak@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
$ git push origin main

deepak@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git add .
warning: in the working copy of 'Ansible/sample.yaml', LF will be replaced by CRLF
deepak@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git commit -m "prompt variable"
[main 8b7dad3] prompt variable
 1 file changed, 7 insertions(+), 3 deletions(-)

deepak@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git push origin main
```

the option **private: false** is used inside **vars_prompt** to **display (echo) the user's input on the screen** while typing.

Output:

```
Updating 100055d..10078d5
Fast-forward
Ansible/sample.yaml | 10 ++++++----
 1 file changed, 7 insertions(+), 3 deletions(-)
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook sample.yaml
Enter your name: Sakshiii
[WARNING]: Found variable using reserved name: name

PLAY [my 1st playbook] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python
https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information
ok: [172.30.5.225]

TASK [Print tasks] ****
ok: [172.30.5.225] => {
    "msg": "This is my first Ansible playbook!"
}

TASK [my name] ****
ok: [172.30.5.225] => {
    "msg": "My name is Sakshiii"
}

TASK [Print greeting] ****
ok: [172.30.5.225] => {
    "msg": "Hello, World!"}
```

Register Variable: work same as | cmd in Linux

In Ansible, a **register variable** is used to **store the output of a task** so that it can be **reused later** in the same playbook.

What Does a Register Variable Store?

A register variable stores a **dictionary (JSON-like object)**.

Common fields:

- stdout → command output
- stderr → error output
- rc → return code (0 = success)
- changed → whether task made changes

```

DEVOPS-TASK
Ansible > sample.yaml
  tasks:
    - name: Print tasks
      debug:
        msg: "This is my first Ansible playbook!"
    - name: my name
      debug:
        msg: "My name is {{ name }}"
      vars:
        name: "Sakshi Jain" #Local variable
    - name: Print greeting
      debug:
        msg: "{{ greeting }}"
    - name: Run Command
      command: hostname
      register: host_output
    - name: Show Hostname
      debug:
        msg: "The hostname is {{ host_output.stdout }}"

```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SPELL CHECKER 2

```

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git add .
warning: in the working copy of 'Ansible/sample.yaml', LF will be replaced by CRLF
deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git commit -m "Register variable"
[main e6cfb3a] Register variable
  1 file changed, 7 insertions(+), 1 deletion(-)

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git push origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
Delta compression using up to 8 threads
Compressing objects: 100% (4/4), done.

```

Output:

```

us-east-1 + 
Ansible/ansible | o *****
1 file changed, 7 insertions(+), 1 deletion(-)
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook sample.yaml
Enter your name: Sakshi jain
[WARNING]: Found variable using reserved name: name

PLAY [my 1st playbook] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future versions of Ansible will require Python 3.11 or later. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [172.30.5.225]

TASK [Print tasks] ****
ok: [172.30.5.225] => {
    "msg": "This is my first Ansible playbook!"
}

TASK [my name] ****
ok: [172.30.5.225] => {
    "msg": "My name is Sakshi jain"
}

TASK [Print greeting] ****
ok: [172.30.5.225] => {
    "msg": "Hello, World!"
}

TASK [Run Command] ****
changed: [172.30.5.225]

TASK [Show Hostname] ****
ok: [172.30.5.225] => {
    "msg": "The hostname is host1-server"
}

PLAY RECAP ****
172.30.5.225 : ok=6    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
root@ansible-server:/etc/ansible/DevOps-Task/Ansible#

```

CLI Variable:

In Ansible, a CLI Variable (also called Extra Variable) is a variable that **you pass directly from the command line** while running an Ansible command or playbook.

```
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook -e name=sakshi sample.yaml
[WARNING]: Found variable using reserved name: name

PLAY [my 1st playbook] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [172.30.5.225]

TASK [Print tasks] ****
ok: [172.30.5.225] => {
    "msg": "This is my first Ansible playbook!"
}

TASK [my name] ****
ok: [172.30.5.225] => {
    "msg": "My name is sakshi"
}

TASK [Print greeting] ****
ok: [172.30.5.225] => {
    "msg": "Hello, World!"
}

TASK [Run Command] ****
changed: [172.30.5.225]

TASK [Show Hostname] ****
ok: [172.30.5.225] => {
    "msg": "The hostname is host1-server"
}

PLAY RECAP ****
172.30.5.225 : ok=6    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

- Gathering facts, ansible modules, yum, apt, package, become, copy and when conditions

What is Fact Gathering?

In Ansible, fact gathering means **collecting system information** from managed nodes **before executing tasks**.

These facts include:

- OS name & version
- IP address
- CPU, memory
- Disk details
- Hostname

What is an Ansible Module?

An **Ansible module** is a **small program** that performs a **specific task** on managed nodes.

Examples:

- Install packages
- Copy files
- Manage services
- Create users

What is yum?

- Used for **Red Hat-based systems**
- Examples: RHEL, CentOS, Amazon Linux

What is apt?

- Used for **Debian-based systems**
- Examples: Ubuntu, Debian

The screenshot shows a Visual Studio Code (VS Code) interface with the following details:

- File Explorer:** Shows an "Ansible" folder containing files: copy.yaml, install.yaml, package.yaml, sample.yaml, var.txt, and var2.txt.
- Code Editor:** Displays the content of the "install.yaml" file. The code uses conditional logic based on the operating system family to install Apache and Httpd.

```
1 - name: Install Apache and Httpd
2 hosts: all
3 become: true
4 tasks:
5   - name: Install Apache on Debian-based systems
6     apt:
7       name: apache2
8       state: latest
9       when: ansible_os_family == "Debian"
10  - name: Install Httpd on RedHat-based systems
11    yum:
12      name: httpd
13      state: latest
14      when: ansible_os_family == "RedHat"
```

- Terminal:** Shows a command-line session where the user has committed changes and pushed them to a GitHub repository.

```
deepa@Deepak-Lenovo-NA8KJE5L MINGW64 ~/DevOps-Task (main)
$ git commit -m "Install and Package"

deepa@Deepak-Lenovo-NA8KJE5L MINGW64 ~/DevOps-Task (main)
● t git push origin main
```

```

root@ansible-server:/etc/ansible/DevOps-Task/Ansible# git pull origin main
remote: Enumerating objects: 7, done.
remote: Counting objects: 100% (7/7), done.
remote: Compressing objects: 100% (2/2), done.
remote: Total 4 (delta 2), reused 4 (delta 2), pack-reused 0 (from 0)
Unpacking objects: 100% (4/4), 378 bytes | 378.00 KiB/s, done.
From https://github.com/sakshijain19/DevOps-Task
 * branch      main    -> FETCH_HEAD
   b221f88..17531d9  main    -> origin/main
Updating b221f88..17531d9
Fast-forward
 Ansible/install.yaml | 2 +-
 1 file changed, 1 insertion(+), 1 deletion(-)
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook install.yaml

PLAY [Install Apache and Httpd] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [172.30.5.225]

TASK [Install Apache on Debian-based systems] ****
changed: [172.30.5.225]

TASK [Install Httpd on RedHat-based systems] ****
skipping: [172.30.5.225]

PLAY RECAP ****
172.30.5.225 : ok=2    changed=1    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# 

```

Make sure your Host machine having Http access

[EC2](#) > [Security Groups](#) > [sg-05e1613e213c2b4d3 - launch-wizard-2](#) > Edit inbound rules

Edit inbound rules [Info](#)

Inbound rules control the incoming traffic that's allowed to reach the instance.

Security group rule ID	Type	Protocol	Port range	Source	Description - optional
sgr-01c1be8b186998f5f	SSH	TCP	22	Custom	0.0.0.0/0
-	HTTP	TCP	80	Anywhere	0.0.0.0/0

[Add rule](#)

⚠ Rules with source of 0.0.0.0/0 or ::/0 allow all IP addresses to access your instance. We recommend setting security group rules to allow access from known IP addresses only.

[Cancel](#) [Preview changes](#) [Save rules](#)

[aws](#) [Search](#) [\[Alt+S\]](#) [Instances](#) [Sakshi Jain \(0950-7410-7161\) ▾](#) [Sakshi Jain](#)

EC2

- Dashboard
- EC2 Global View
- Events
- Instances**
 - Instances
 - Instance Types
 - Launch Templates
 - Spot Requests
 - Savings Plans
 - Reserved Instances
 - Dedicated Hosts
 - Capacity Reservations
 - Capacity Manager [New](#)
- Images**
 - AMIs
 - AMI Catalog

Instances (1/2) [Info](#)

Name	Instance ID	Instance state	Instance type	Status check	Alarm status	Availability Zone	Public IPv4
<input checked="" type="checkbox"/> Host1	i-068fc0e1d8a0c12f8	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1f	ec2-3-236-5
<input type="checkbox"/> Ansible	i-01161277130f443d9	Running	t3.micro	3/3 checks passed	View alarms +	us-east-1f	ec2-98-93-1

i-068fc0e1d8a0c12f8 (Host1)

Name	Security group rule ID	Port range	Protocol	Source	Security groups
-	sgr-0f35cd3b96846b978	80	TCP	0.0.0.0/0	launch-wizard-2
-	sgr-01c1be8b186998f5f	22	TCP	0.0.0.0/0	launch-wizard-2

[Outbound rules](#)

Copy and Hit Public IP of your host machine in browser



What is package?

- OS-independent module
- Automatically chooses yum or apt

What is become?

- become allows Ansible to run tasks as another user, usually root.
- Equivalent to sudo.

```

File Edit Selection View Go Run Terminal Help ⏪ ⏩ Q DevOps-Task
DEVOPS-TASK sample.yaml install.yaml package.yaml copy.yaml var.txt var2.txt
Ansible > package.yaml
1 - name: Install Apache and Httpd
2 hosts: all
3 become: true
4 tasks:
5   - name: Install Apache on Debian-based systems
6     package:
7       name: apache2
8       state: latest
9       when: ansible_os_family == "Debian"
10    - name: Install Httpd on RedHat-based systems
11      package:
12        name: httpd
13        state: latest
14        when: ansible_os_family == "RedHat"

```

```

root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook package.yaml
PLAY [Install Apache and Httpd] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future
meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more
ok: [172.30.5.225]

TASK [Install Apache on Debian-based systems] ****
ok: [172.30.5.225]

TASK [Install Httpd on RedHat-based systems] ****
skipping: [172.30.5.225]

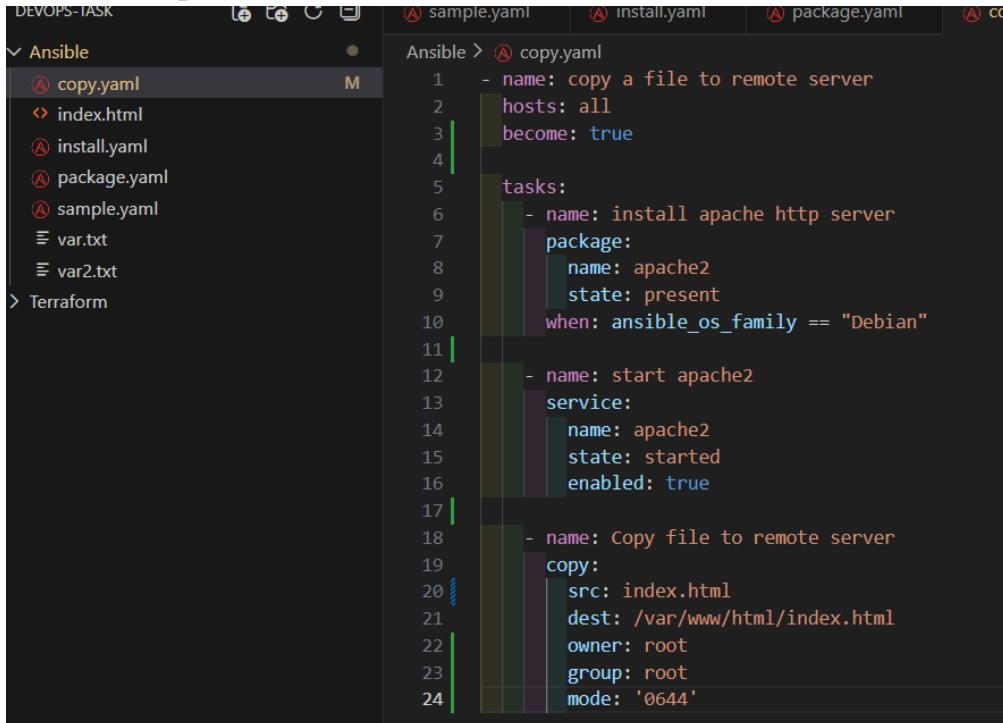
PLAY RECAP ****
172.30.5.225 : ok=2    changed=0    unreachable=0    failed=0    skipped=1    rescued=0    ignored=0

```

What is copy?

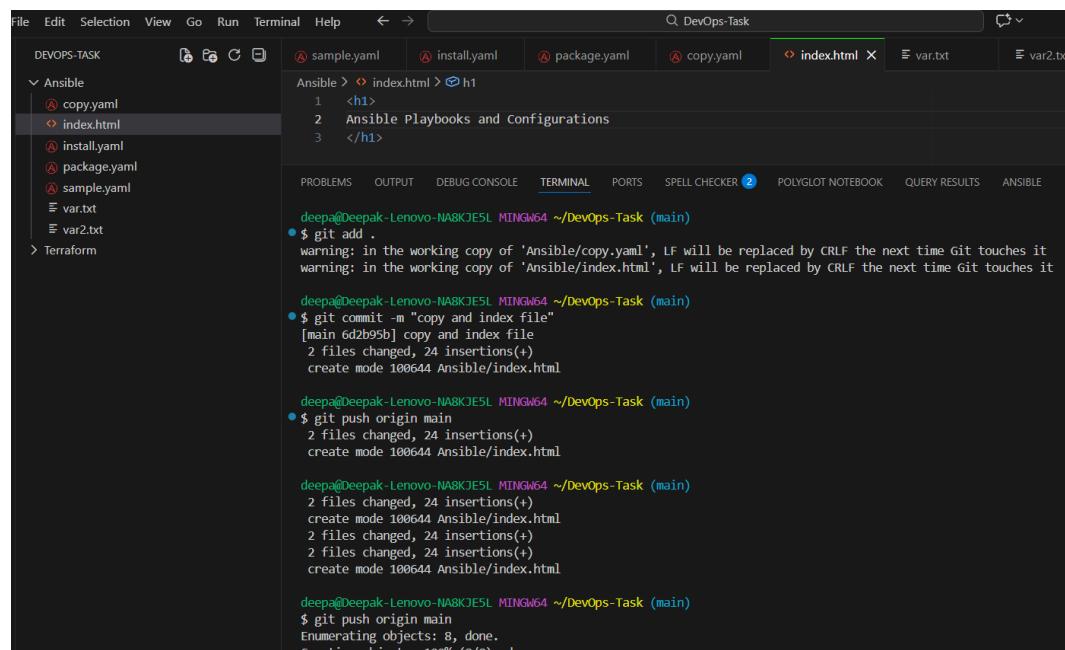
Used to **copy files from control node to managed nodes**.

- Copies local → remote
- Supports permissions
- Idempotent



The screenshot shows a code editor with several tabs at the top: sample.yaml, install.yaml, package.yaml, and copy.yaml. The copy.yaml tab is active, displaying the following Ansible playbook code:

```
Ansible > ⚡ copy.yaml
  1 - name: copy a file to remote server
  2 hosts: all
  3 become: true
  4
  5 tasks:
  6   - name: install apache http server
  7     package:
  8       name: apache2
  9       state: present
 10      when: ansible_os_family == "Debian"
 11
 12   - name: start apache2
 13     service:
 14       name: apache2
 15       state: started
 16       enabled: true
 17
 18   - name: Copy file to remote server
 19     copy:
 20       src: index.html
 21       dest: /var/www/html/index.html
 22       owner: root
 23       group: root
 24       mode: '0644'
```



The screenshot shows a terminal window with the title "DevOps-TASK". The terminal output shows the following sequence of commands:

```
File Edit Selection View Go Run Terminal Help ← → ⌂ DevOps-TASK
Ansible > ⚡ index.html > ↗ h1
  1 <h1>
  2 Ansible Playbooks and Configurations
  3 </h1>

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SPELL CHECKER 2 POLYGLOT NOTEBOOK QUERY RESULTS ANSIBLE

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git add .
warning: in the working copy of 'Ansible/copy.yaml', LF will be replaced by CRLF the next time Git touches it
warning: in the working copy of 'Ansible/index.html', LF will be replaced by CRLF the next time Git touches it
deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git commit -m "copy and index file"
[main 6d2b99b] copy and index file
 2 files changed, 24 insertions(+)
create mode 100644 Ansible/index.html

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git push origin main
 2 files changed, 24 insertions(+)
create mode 100644 Ansible/index.html

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
 2 files changed, 24 insertions(+)
create mode 100644 Ansible/index.html
 2 files changed, 24 insertions(+)
create mode 100644 Ansible/index.html
 2 files changed, 24 insertions(+)
create mode 100644 Ansible/index.html

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
$ git push origin main
Enumerating objects: 8, done.
Counting objects: 100% (8/8), done.
```

```
1 file changed, 9 insertions(+), 2 deletions(-)
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook copy.yaml

PLAY [copy a file to remote server] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.1
meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery
ok: [172.30.5.225]

TASK [install apache http server] ****
ok: [172.30.5.225]

TASK [start apache2] ****
ok: [172.30.5.225]

TASK [Copy file to remote server] ****
changed: [172.30.5.225]

PLAY RECAP ****
172.30.5.225 : ok=4    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignore=0
root@ansible-server:/etc/ansible/DevOps-Task/Ansible#
```

← → ⌂ ⚠ Not secure 3.236.56.197

Ansible Playbooks and Configurations

- Ansible `lineinfile`, `blockinfile`, `loop`, `tags`

`lineinfile` — Manage a Single Line

What it does

Ensures one specific line is present, absent, or modified in a file.

When to use

- Update a config value
- Add/replace a setting
- Comment/uncomment a line

DEVOPS-TASK

Ansible > copy.yaml

```

16   enabled: true
17
18   - name: Copy file to remote server
19     copy:
20       src: index.html
21       dest: /var/www/html/index.html
22       owner: root
23       group: root
24       mode: '0644' #permissions
25
26   - name: Add one line in index.html
27     lineinfile:
28       path: /var/www/html/index.html
29       regexp: '^<h1>'
30       insertafter: '</body>'
31       line: "<h1> Deployed using Ansible </h1>"
```

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SPELL CHECKER 3 PO

```

deepa@Deepak-Lenovo-NA8KJE5L MINGW64 ~/DevOps-Task (main)
$ git push origin main
```

```

● $ git add .
warning: in the working copy of 'Ansible/copy.yaml', LF will be replaced by CRLF
```

```

● $ git commit -m "line in file"
[main 0ac3bcd] line in file
 2 files changed, 3 insertions(+), 4 deletions(-)
```

```

● $ git push origin main
Enumerating objects: 9, done.
Counting objects: 100% (9/9), done.
Delta compression using up to 8 threads
```

```

from https://github.com/SarkarJitendra/DevOps-Task
 * branch            main      -> FETCH_HEAD
   27571d6..0ac3bcd  main      -> origin/main
Updating 27571d6..0ac3bcd
Fast-forward
  Ansible/copy.yaml | 3 +++
  Ansible/index.html | 4 +---
  2 files changed, 3 insertions(+), 4 deletions(-)
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook copy.yaml

PLAY [copy a file to remote server] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but
meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html
ok: [172.30.5.225]

TASK [install apache http server] ****
ok: [172.30.5.225]

TASK [start apache2] ****
ok: [172.30.5.225]

TASK [Copy file to remote server] ****
changed: [172.30.5.225]

TASK [Add one line in index.html] ****
changed: [172.30.5.225]

PLAY RECAP ****
172.30.5.225 : ok=5    changed=2    unreachable=0   failed=0    skipped=0    rescued=0    ignored=0

root@ansible-server:/etc/ansible/DevOps-Task/Ansible# curl 172.30.5.225
<h1> Deployed using Ansible </h1>
```

Option	Meaning
path	Target file
line	Desired line
regexp	Line to match/replace
state	present / absent
insertafter	Where to insert
insertbefore	Where to insert

blockinfile — Manage a Block of Lines

What it does

Adds, updates, or removes a **multi-line block** wrapped with markers.

When to use

- Insert large config sections
- Ensure grouped settings stay together
- Safer than many lineinfile tasks

```

DEVSOPS-TASK
Ansible
  copy.yaml
  index.html
  install.yaml
  package.yaml
  sample.yaml
  var.txt
  var2.txt
Terraform

Ansible > copy.yaml
24 mode: '0644' #permissions
25 - name: Add one line in index.html
26   lineinfile:
27     path: /var/www/html/index.html
28     regexp: '^<h1>'
29     insertafter: '</body>'
30     line: "<h1> Deployed using Ansible </h1>"
31 - name: add muti line in index.html
32   blockinfile:
33     path: /var/www/html/index.html
34     insertafter: '</body>'
35     block: |
36       <h1> Deployed using Ansible </h1>
37       <p> This is a sample paragraph added by Ansible. </p>

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SPELL CHECKER 6 POLYGLOT NOTEBOOK QUERY RESULTS
$ git push origin main
Enumerating objects: 9, done.

deepak@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git add .
warning: in the working copy of 'Ansible/copy.yaml', LF will be replaced by CRLF the next time Git writes to it.

deepak@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git commit -m "block in file"
[main 3cfaff5] block in file
 1 file changed, 8 insertions(+), 1 deletion(-)

deepak@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
● $ git push origin main
Enumerating objects: 7, done.
Counting objects: 100% (7/7), done.
  
```

```
us-east-1 | +  
+-----+  
| File changes, or insertions(-), or deletion(-)|  
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook copy.yaml  
  
PLAY [copy a file to remote server] *****  
  
TASK [Gathering Facts] *****  
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter  
meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendix/  
ok: [172.30.5.225]  
  
TASK [install apache http server] *****  
ok: [172.30.5.225]  
  
TASK [start apache2] *****  
ok: [172.30.5.225]  
  
TASK [Copy file to remote server] *****  
changed: [172.30.5.225]  
  
TASK [Add one line in index.html] *****  
changed: [172.30.5.225]  
  
TASK [add muti line in index.html] *****  
changed: [172.30.5.225]  
  
PLAY RECAP *****  
172.30.5.225 : ok=6    changed=3    unreachable=0    failed=0    skipped=  
  
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# curl 172.30.5.225  
<h1> Deployed using Ansible </h1>  
# BEGIN ANSIBLE MANAGED BLOCK  
<h1> Deployed using Ansible </h1>  
<p> This is a sample paragraph added by Ansible. </p>  
# END ANSIBLE MANAGED BLOCK  
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ]
```

← → ⌂ ⚠ Not secure 34.228.52.45

Deployed using Ansible

BEGIN ANSIBLE MANAGED BLOCK

Deployed using Ansible

This is a sample paragraph added by Ansible.

END ANSIBLE MANAGED BLOCK

Feature	lineinfile	blockinfile
Scope	Single line	Multiple lines
Best for	Small tweaks	Large config sections
Markers	✗	✓
Readability	Medium	High

loop — Run a Task Multiple Times

What it does

Executes the **same task** for **multiple items**.

When to use

- Install many packages
- Create multiple users
- Copy many files

```

DEVS-TASK
Ansible
  copy.yaml
  index.html
  install.yaml
  loop.yaml
  package.yaml
  sample.yaml
  var.txt
  var2.txt
Terraform

Ansible > loop.yaml
  - name: Loop used
    hosts: all
    become: true
    tasks:
      - name: Install multiple packages
        package:
          name: "{{ item }}"
          state: present
        loop:
          - git
          - curl
          - vim
          - htop

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SPELL CHECKER 5 POLYGLOT NOTEBOOK

deepa@Deepak-Lenovo-NA8KJE5L MINGW64 ~/DevOps-Task (main)
$ git push origin main
b4b8440..c0d17ed main -> main

deepa@Deepak-Lenovo-NA8KJE5L MINGW64 ~/DevOps-Task (main)
$ git add .
warning: in the working copy of 'Ansible/loop.yaml', LF will be replaced by CRLF the next time you commit.

deepa@Deepak-Lenovo-NA8KJE5L MINGW64 ~/DevOps-Task (main)
$ git commit -m "loop file added"
[main 5ef645c] loop file added
 1 file changed, 13 insertions(+)
 create mode 100644 Ansible/loop.yaml

deepa@Deepak-Lenovo-NA8KJE5L MINGW64 ~/DevOps-Task (main)
$ git push origin main
Enumerating objects: 6, done.

```

```

root@ansible-server:~# cd /etc/ansible/DevOps-Task/Ansible/
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# git pull origin main
remote: Enumerating objects: 6, done.
remote: Counting objects: 100% (6/6), done.
remote: Compressing objects: 100% (3/3), done.
remote: Total 4 (delta 1), reused 4 (delta 1), pack-reused 0 (from 0)
Unpacking objects: 100% (4/4), 477 bytes | 477.00 KiB/s, done.
From https://github.com/sakshi Jain19/DevOps-Task
 * branch      main      -> FETCH HEAD
   ccd17ed..5ef645c main      -> origin/main
Updating ccd17ed..5ef645c
Fast-forward
 Ansible/loop.yaml | 13 ++++++
 1 file changed, 13 insertions(+)
 create mode 100644 Ansible/loop.yaml
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook loop.yaml

PLAY [Loop used] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another Python meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [172.30.5.225]

TASK [Install multiple packages] ****
ok: [172.30.5.225] => (item=git)
ok: [172.30.5.225] => (item=curl)
ok: [172.30.5.225] => (item=vim)
ok: [172.30.5.225] => (item=http)

PLAY RECAP ****
172.30.5.225 : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# 

```

Ansible Tags

In Ansible, **tags** are labels you attach to **plays or tasks** so you can **run only specific parts** of a playbook (or skip them) without changing the code.

```

DEVOPS-TASK
Ansible > tags.yaml
  1 - name: tags used
  2 hosts: all
  3 become: true
  4 tags:
  5   - installation
  6 tasks:
  7     - name: Install Apache on Debian-based systems
  8       apt:
  9         name: apache2
 10        state: latest
 11        when: ansible_os_family == "Debian"
 12        tags:
 13          - installation
 14     - name: Install Httpd on RedHat-based systems
 15       yum:
 16         name: httpd
 17         state: latest
 18         when: ansible_os_family == "RedHat"
 19         tags:
 20           - installation
 21 ignore_errors: true

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS SPELL CHECKER 🔍 POLYGLOT NOTEBOOK QUERY RESULTS ANSIBLE

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
$ git add .

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
$ git commit -m "tags file added"
[main 0a88a71] tags file added
 1 file changed, 21 insertions(+)
 create mode 100644 Ansible/tags.yaml

deepa@Deepak-Lenovo-NA8KJESL MINGW64 ~/DevOps-Task (main)
$ git push origin main
Enumerating objects: 6, done.
Counting objects: 100% (6/6), done.

```

Why Do We Use Tags?

- Run **only required tasks** (faster execution)
- Skip **time-consuming or risky tasks**
- Support **partial deployments** (install vs config)
- Useful in **CI/CD pipelines**
- Great for **debugging**

```
Ansible/tags.yaml | 21 ++++++-----+
1 file changed, 21 insertions(+)
create mode 100644 Ansible/tags.yaml
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook tags.yaml

PLAY [tags used] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [172.30.5.225]

TASK [Install Apache on Debian-based systems] ****
ok: [172.30.5.225]

TASK [Install Httpd on RedHat-based systems] ****
skipping: [172.30.5.225]

PLAY RECAP ****
172.30.5.225 : ok=2    changed=0   unreachable=0   failed=0   skipped=1   rescued=0   ignored=0
root@ansible-server:/etc/ansible/DevOps-Task/Ansible#
```

Skip-tags

```
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook tags.yaml --skip-tag installation

PLAY [tags used] ****
PLAY RECAP ****
root@ansible-server:/etc/ansible/DevOps-Task/Ansible#
```

--tags

--list-tags

```
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook tags.yaml --tag installation

PLAY [tags used] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future installation of another meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more information.
ok: [172.30.5.225]

TASK [Install Apache on Debian-based systems] ****
ok: [172.30.5.225]

TASK [Install Httpd on RedHat-based systems] ****
skipping: [172.30.5.225]

PLAY RECAP ****
172.30.5.225 : ok=2    changed=0   unreachable=0   failed=0   skipped=1   rescued=0   ignored=0
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook tags.yaml --list-tags

playbook: tags.yaml

play #1 (all): tags used      TAGS: [installation]
  TASK TAGS: [installation]
root@ansible-server:/etc/ansible/DevOps-Task/Ansible#
```

- **Ansible role**

Ansible **roles** are a way to **organize playbooks into reusable, structured components**.

They make automation **clean, scalable, and maintainable**, especially for real projects.

What is an Ansible Role?

An **Ansible Role** is a **standard directory structure** that groups:

- tasks
- variables
- files
- templates
- handlers

Ansible Galaxy is the **official hub for Ansible roles and collections**. It lets you **discover, reuse, and share automation** instead of writing everything from scratch.

What is Ansible Galaxy?

Ansible Galaxy is:

- A **public repository** of ready-to-use **roles** and **collections**
- A **tool (ansible-galaxy)** to **create, install, and manage** them

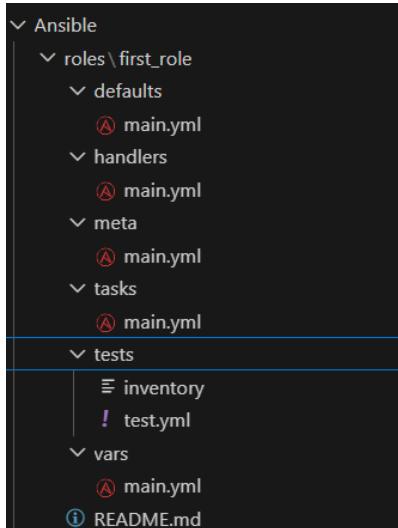
Why We Use Ansible Galaxy

- **Save time** (no need to reinvent the wheel)
- **Standardized best practices**
- **Faster project setup**
- **Consistent automation across teams**

```

root@ansible-server:/etc/ansible/DevOps-Task/Ansible# mkdir roles
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# cd roles
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles# ansible-galaxy role init first_role
- Role first_role was created successfully
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles# git add .
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles#
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles# git commit -m "role added"
[main 4a18095] role added
 8 files changed, 87 insertions(+)
create mode 100644 Ansible/roles/first_role/README.md
create mode 100644 Ansible/roles/first_role/defaults/main.yml
create mode 100644 Ansible/roles/first_role/handlers/main.yml
create mode 100644 Ansible/roles/first_role/meta/main.yml
create mode 100644 Ansible/roles/first_role/tasks/main.yml
create mode 100644 Ansible/roles/first_role/tests/inventory
create mode 100644 Ansible/roles/first_role/tests/test.yml
create mode 100644 Ansible/roles/first_role/vars/main.yml
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles# git push origin main
Username for 'https://github.com': sakshijain19
Password for 'https://sakshijain19@github.com':
Enumerating objects: 21, done.
Counting objects: 100% (21/21), done.
Delta compression using up to 2 threads
Compressing objects: 100% (8/8), done.
Writing objects: 100% (19/19), 2.33 KiB | 1.17 MiB/s, done.
Total 19 (delta 1), reused 0 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (1/1), completed with 1 local object.
To https://github.com/sakshijain19/DevOps-Task.git
  0a88a71..4a18095  main -> main
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles# 

```



```

ubuntu@ansible-server:~$ sudo -i
root@ansible-server:~# cd /etc/ansible/DevOps-Task/Ansible/roles/first_role/files/
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles/first_role/files# ls
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles/first_role/files# cat > index.html
<h1> Hello, this sample testing file </h1><C
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles/first_role/files# git add .
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles/first_role/files# git commit -m "index file added"
[main 29a7edc] index file added
 1 file changed, 0 insertions(+), 0 deletions(-)
 create mode 100644 Ansible/roles/first_role/files/index.html
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles/first_role/files# git push origin main
Username for 'https://github.com': sakshijain19
Password for 'https://sakshijain19@github.com':
Enumerating objects: 11, done.
Counting objects: 100% (11/11), done.
Delta compression using up to 2 threads
Compressing objects: 100% (4/4), done.
Writing objects: 100% (7/7), 499 bytes | 499.00 KiB/s, done.
Total 7 (delta 2), reused 2 (delta 0), pack-reused 0
remote: Resolving deltas: 100% (2/2), completed with 2 local objects.
To https://github.com/sakshijain19/DevOps-Task.git
  4a18095..29a7edc  main -> main
root@ansible-server:/etc/ansible/DevOps-Task/Ansible/roles/first_role/files# 

```

The screenshot shows the file structure of an Ansible role named 'first_role'. The 'tasks' directory contains a file named 'main.yml' which is currently selected. The code in this file defines two tasks: one to install Apache and another to copy an index.html file to the web server's directory. Both tasks have a 'when' condition that checks if the operating system is Debian.

```

Ansible > roles > first_role > tasks > main.yml
1 ---
2 # tasks file for first_role
3 - name: Install apache and httpd
4   package:
5     name: "{{pkg}}"
6     state: present
7     when: ansible_os_family == "Debian"
8 - name: Copy index.html to web server directory
9   copy:
10    src: index.html
11    dest: /var/www/html/index.html
12   notify:
13     - Restart apache service

```

The screenshot shows the 'vars' directory containing a file named 'main.yml'. This file contains a single variable 'pkg' which is set to 'apache2'. This variable is used in the 'package' task defined in the 'tasks/main.yml' file.

```

Ansible > roles > first_role > vars > main.yml
1 ---
2 # vars file for first_role
3 pkg: apache2

```

handlers are special tasks that run only when notified. Inside a **role**, handlers are used to **restart or reload services** *only if something actually changes*.

- A task that **does not run by default**
- Runs **only when a task sends a notify**
- Executed at the end of the play

The screenshot shows the 'handlers' directory containing a file named 'main.yml'. This file defines a handler named 'Restart apache service' which restarts the Apache service. It uses the variable 'pkg' defined in the 'vars/main.yml' file.

```

Ansible > roles > first_role > handlers > main.yml
1 ---
2 # handlers file for first_role
3 - name: Restart apache service
4   service:
5     name: "{{ pkg }}"
6     state: restarted

```

The screenshot shows the 'main.yml' file located in the root of the role. It contains a play that executes the 'first_role' role on all hosts with become: true.

```

Ansible > main.yml
1 - name: execute role first_role
2 hosts: all
3 become: true
4 roles:
5   - first_role

```

```
1 file changed, 1 deletion(-)
root@ansible-server:/etc/ansible/DevOps-Task/Ansible# ansible-playbook main.yaml

PLAY [execute role first_role] ****
TASK [Gathering Facts] ****
[WARNING]: Platform linux on host 172.30.5.225 is using the discovered Python interpreter at /usr/bin/python3.10, but future meaning of that path. See https://docs.ansible.com/ansible-core/2.17/reference_appendices/interpreter_discovery.html for more ok: [172.30.5.225]

TASK [first_role : Install apache and httpd] ****
ok: [172.30.5.225]

TASK [first_role : Copy index.html to web server directory] ****
changed: [172.30.5.225]

RUNNING HANDLER [first_role : Restart apache service] ****
changed: [172.30.5.225]

PLAY RECAP ****
172.30.5.225      : ok=4    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@ansible-server:/etc/ansible/DevOps-Task/Ansible#
```