

17th June

Ansible is a config mgmt. tool

- What is Configuration Management?
 - Advantages of Configuration Management
 - Provisioning of Servers
 - Idempotent
 - Creating Controller and Managed Nodes
-

Configuration Management

This is process of configuring remote servers from one point of control.

Ex: Netflix have 1000 instances.

You want to install a software in 1000 instances to perform install and configuration by config mgmt. tool in devops

Advantages

1) Provisioning of servers

The applications that should be installed on servers can be done very quickly from a single centralized location.

2) Idempotent

Configuration management tools are used to bring the server to a particular state, called as desired state.

If a server already in the desired state, configuration management tools will not reconfigure that server.

Note: Configuration management tools cannot be used for installing OS from the scratch.

They can be used only for managing the applications on top of the OS.

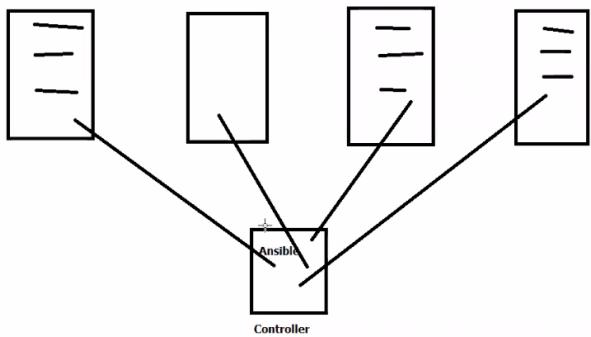
Configuration management tools - Ansible, chef, puppet, salt etc

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Ansible -- It is a open source configuration management tool, created using Python.

Main machine in which ansible is installed, is called as controller.

Remote servers that Ansible configures, are called as managed nodes.



Ansible uses agent less policy for configures remote servers ie Ansible is installed only on 1 machine, and we do not require any client side software to be installed on the remote servers.

Ansible performs configuration management through password less ssh.

Create 4 Servers (Ubuntu 18)

1 is controller

3 are managed nodes

Name the instances as

Controller

Server1

Server2

Server3

Ubuntu machines default come with Python3

Ansible supports Python2

We need to downgrade the machines from python3 to Python2

Connect server1

Check the version

\$ python3 --version

```
ubuntu@ip-172-31-7-134:~$ python3 --version
Python 3.6.9
ubuntu@ip-172-31-7-134:~$
```

To Install Python2

```
$ sudo apt-get update
```

```
ubuntu@ip-172-31-7-134:~$ python3 --version
Python 3.6.9
ubuntu@ip-172-31-7-134:~$ sudo apt-get update
Hit:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease
Get:2 http://security.ubuntu.com/ubuntu bionic-security InRelease [88.7 kB]
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 Packages [8570 kB]
Get:6 http://security.ubuntu.com/ubuntu bionic-security/main amd64 Packages [1753 kB]
20% [5 Packages 1286 kB/8570 kB 15%] [6 Packages 163 kB/1753 kB 9%]
```

```
$ sudo apt-get dist-upgrade ( It will point to older apt repository where python2 is available)
```

```
ubuntu@ip-172-31-7-134:~$ 
ubuntu@ip-172-31-7-134:~$ sudo apt-get dist-upgrade
Reading package lists... Done
Building dependency tree
Reading state information... Done
Calculating upgrade... Done
The following NEW packages will be installed
```

```
$ sudo apt-get install -y python2.7 python-pip
```

```
ubuntu@ip-172-31-7-134:~$ 
ubuntu@ip-172-31-7-134:~$ sudo apt-get install -y python2.7 python-pip
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential cpp cpp-7
  dpkg-dev fakeroot g++ g++-7 gcc gcc-7 gcc-7-base libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan4 libatomic1
  libbinutils libc-dev-bin libc6-dev libcc1-0 libcilkrt5 libdpkg-perl
  libexpat1-dev libfakeroot libfile-fcntllock-perl libgcc-7-dev libgomp1
  libisl19 libitm1 liblsan0 libmpc3 libmpx2 libpython-all-dev libpython-dev
  libpython-stdlib libpython2.7 libpython2.7-dev libpython2.7-minimal
  libpython2.7-stdlib libquadmath0 libstdc++-7-dev libtsan0 libubsan0
```

```
$ sudo apt-get install python3-pip
```

Now check the version of python

```
$ python --version
```

```
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$ python --version  
Python 2.7.17  
ubuntu@ip-172-31-7-134:~$
```

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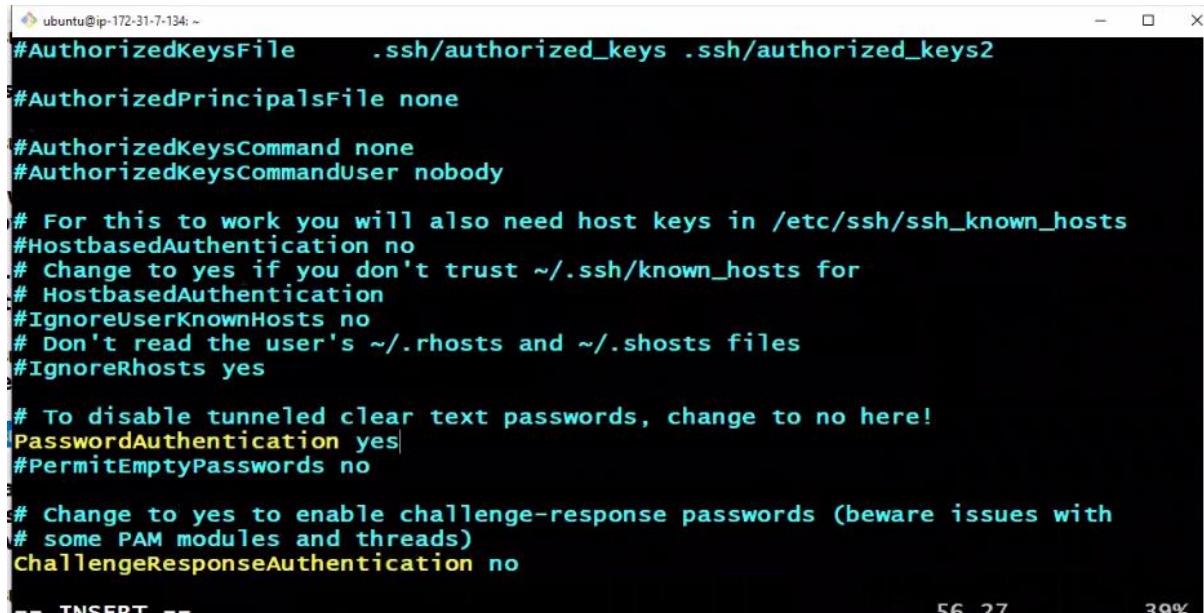
Establish password less ssh connection

```
$ sudo passwd ubuntu
```

(let's give the password as Ubuntu only)

```
ubuntu@ip-172-31-7-134:~$ sudo passwd ubuntu  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$ |
```

```
$ sudo vim /etc/ssh/sshd_config
```



The screenshot shows a terminal window with the command `sudo vim /etc/ssh/sshd_config` running. The Vim editor is displaying the configuration file. The cursor is positioned at the end of the line `#PasswordAuthentication yes`. The status bar at the bottom right shows "56.27" and "39%".

```
ubuntu@ip-172-31-7-134:~#  
#AuthorizedKeysFile      .ssh/authorized_keys .ssh/authorized_keys2  
#AuthorizedPrincipalsFile none  
  
#AuthorizedKeysCommand none  
#AuthorizedKeysCommandUser nobody  
  
# For this to work you will also need host keys in /etc/ssh/ssh_known_hosts  
#HostbasedAuthentication no  
# Change to yes if you don't trust ~/.ssh/known_hosts for  
# HostbasedAuthentication  
#IgnoreUserKnownHosts no  
# Don't read the user's ~/.rhosts and ~/.shosts files  
#IgnoreRhosts yes  
  
# To disable tunneled clear text passwords, change to no here!  
#PasswordAuthentication yes  
#PermitEmptyPasswords no  
  
# Change to yes to enable challenge-response passwords (beware issues with  
# some PAM modules and threads)  
ChallengeResponseAuthentication no  
-- INSERT --
```

change

```
>PasswordAuthentication yes
```

Save and QUIT

```
$ sudo service ssh restart
```

```
ubuntu@ip-172-31-7-134:~  
de  
Setting up python-secretstorage (2.3.1-2) ...  
Setting up python-keyring (10.6.0-1) ...  
Setting up build-essential (12.4ubuntu1) ...  
Processing triggers for man-db (2.8.3-2ubuntu0.1) ...  
Processing triggers for mime-support (3.60ubuntu1) ...  
Processing triggers for libc-bin (2.27-3ubuntu1.4) ...  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$ python --version  
Python 2.7.17  
ubuntu@ip-172-31-7-134:~$ sudo passwd ubuntu  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$ sudo vim /etc/ssh/sshd_config  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$ sudo service ssh restart  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$
```

```
$ exit
```

```
MINGW64/c/Users/admin/Desktop/sunil  
ubuntu@ip-172-31-7-134:~$ sudo passwd ubuntu  
Enter new UNIX password:  
Retype new UNIX password:  
passwd: password updated successfully  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$ sudo vim /etc/ssh/sshd_config  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$ sudo service ssh restart  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$  
ubuntu@ip-172-31-7-134:~$ exit  
logout  
Connection to ec2-13-233-12-5.ap-south-1.compute.amazonaws.com closed.  
  
admin@DESKTOP-CV8R5E MINGW64 ~/Desktop/sunil  
$  
  
admin@DESKTOP-CV8R5E MINGW64 ~/Desktop/sunil  
$  
  
admin@DESKTOP-CV8R5E MINGW64 ~/Desktop/sunil  
$
```

```
=====
```

Repeat the same steps in server2 and server3

```
+++++
```

Now, Connect to controller

Even in controller also python2 version should be available

(So, run the same commands)

```
$ sudo apt-get update
```

```
$ sudo apt-get dist-upgrade
```

```
$ sudo apt-get install -y python2.7 python-pip
```

Now check the version of python

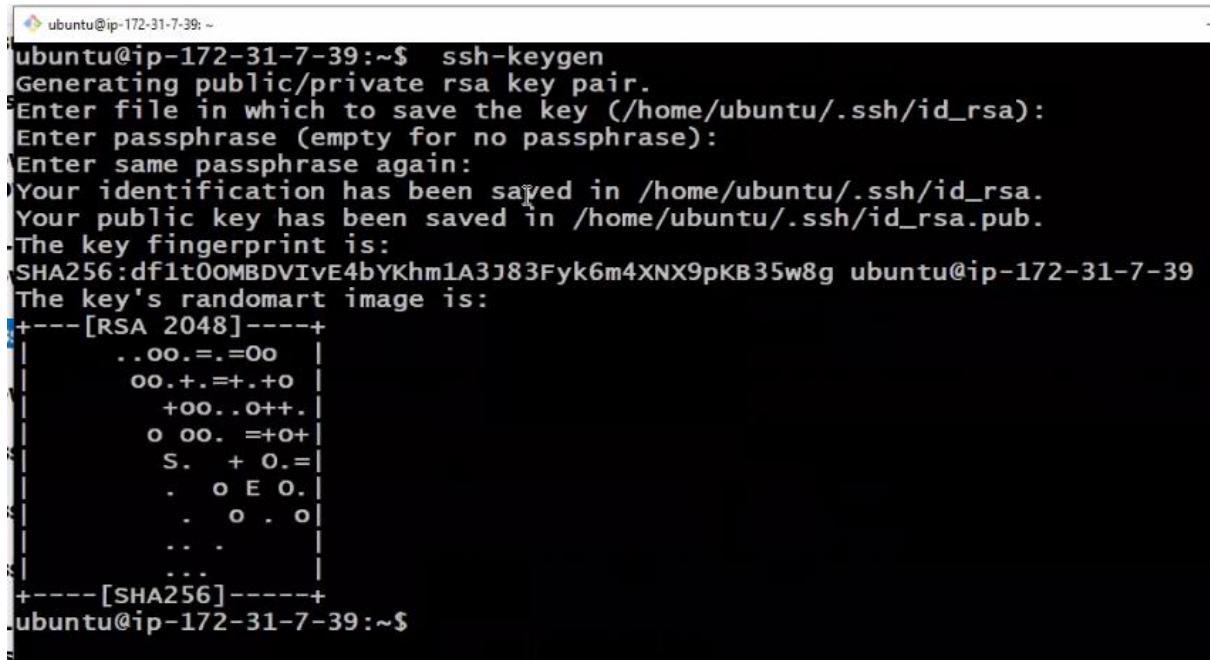
```
$ python --version
```

```
+++++
```

Connect to controller

Now , We need to generate ssh connections

```
$ ssh-keygen
```



```
ubuntu@ip-172-31-7-39:~$ ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/home/ubuntu/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/ubuntu/.ssh/id_rsa.
Your public key has been saved in /home/ubuntu/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:df1t0OMBIVIvE4bYKhm1A3J83Fyk6m4XNX9pKB35w8g ubuntu@ip-172-31-7-39
The key's randomart image is:
+---[RSA 2048]---+
 .oo.=.=oo |
 oo.+.=+.+o |
 +oo..o++.|
```

Now copy the key to managed nodes

```
$ ssh-copy-id ubuntu@172.31.0.98 ( private Ip of server1 )
```

```
ubuntu@ip-172-31-7-39:~$ ssh-copy-id ubuntu@172.31.7.134
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ubuntu/.ssh/id_rsa.pub"
The authenticity of host '172.31.7.134 (172.31.7.134)' can't be established.
ECDSA key fingerprint is SHA256:xeBVkumhI/o2XGvaepEezmf8uLYBrm2owW6tyjbR9is.
Are you sure you want to continue connecting (yes/no)? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter
out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompt
ed now it is to install the new keys
ubuntu@172.31.7.134's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'ubuntu@172.31.7.134'"
and check to make sure that only the key(s) you wanted were added.

ubuntu@ip-172-31-7-39:~$ |
```

```
$ ssh-copy-id ubuntu@172.31.1.183 ( private Ip of server2 )
```

```
ubuntu@ip-172-31-7-39:~$ ssh-copy-id ubuntu@172.31.3.46
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ubuntu/.ssh/id_rsa.pub"
The authenticity of host '172.31.3.46 (172.31.3.46)' can't be established.
ECDSA key fingerprint is SHA256:pKfqSX+NzGJNMTZuhN2QPQ03sIYuxQpT9JYUy4sg2C8.
Are you sure you want to continue connecting (yes/no)? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter
out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompt
ed now it is to install the new keys
ubuntu@172.31.3.46's password:           ↑

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'ubuntu@172.31.3.46'"
and check to make sure that only the key(s) you wanted were added.

ubuntu@ip-172-31-7-39:~$ |
```

```
$ ssh-copy-id ubuntu@172.31.14.179 ( private Ip of server3 )
```

```
ubuntu@ip-172-31-7-39:~$ ssh-copy-id ubuntu@172.31.2.140
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/ubuntu/.ssh/id_rsa.pub"
The authenticity of host '172.31.2.140 (172.31.2.140)' can't be established.
ECDSA key fingerprint is SHA256:z09BQK2pdQ2U3wRoJ+Xtrq309+L6v/Ls4Y4Yz79zQqs.
Are you sure you want to continue connecting (yes/no)? yes
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter
out any that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompt
ed now it is to install the new keys
ubuntu@172.31.2.140's password:

Number of key(s) added: 1

Now try logging into the machine, with: "ssh 'ubuntu@172.31.2.140'"
and check to make sure that only the key(s) you wanted were added.

ubuntu@ip-172-31-7-39:~$ ubuntu@ip-172-31-7-39:~$ |
```

```
+++++
```

Installing ansible now

Connect to controller.

```
$ sudo apt-get install software-properties-common
```

(software-properties-common , is a base package which is required to install ansible)

```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ sudo apt-get install software-properties-common  
Reading package lists... Done  
Building dependency tree  
Reading state information... Done  
software-properties-common is already the newest version (0.96.24.32.14).  
software-properties-common set to manually installed.  
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.  
ubuntu@ip-172-31-7-39:~$ |
```

```
$ sudo apt-add-repository ppa:ansible/ansible
```

```
ubuntu@ip-172-31-7-39:~$ |  
ubuntu@ip-172-31-7-39:~$ | sudo apt-add-repository ppa:ansible/ansible  
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—automate in a language that approaches plain English, using SSH, with no agents to install on remote systems.  
  
http://ansible.com/  
More info: https://launchpad.net/~ansible/+archive/ubuntu/ansible  
Press [ENTER] to continue or Ctrl-c to cancel adding it.  
  
Get:1 http://ppa.launchpad.net/ansible/ansible/ubuntu bionic InRelease [15.9 kB]  
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease  
Hit:3 http://security.ubuntu.com/ubuntu bionic-security InRelease  
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]  
Get:5 http://ppa.launchpad.net/ansible/ansible/ubuntu bionic/main amd64 Packages [820 B]  
Get:6 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]  
Get:7 http://ppa.launchpad.net/ansible/ansible/ubuntu bionic/main Translation-en [476 B]  
Fetched 180 kB in 1s (172 kB/s)
```

```
$ sudo apt-get update
```

```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ sudo apt-get update  
Hit:1 http://ppa.launchpad.net/ansible/ansible/ubuntu bionic InRelease  
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic InRelease  
Hit:3 http://security.ubuntu.com/ubuntu bionic-security InRelease  
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic-updates InRelease [88.7 kB]  
Get:5 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic-backports InRelease [74.6 kB]  
Fetched 163 kB in 1s (144 kB/s)  
Reading package lists... Done  
ubuntu@ip-172-31-7-39:~$
```

```
$ sudo apt-get install -y ansible
```

```
ubuntu@ip-172-31-7-39:~$ sudo apt-get install -y ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  python-httplib2 python-jinja2 python-markupsafe python-paramiko
  python-pyasn1 python-yaml sshpass
Suggested packages:
  python-jinja2-doc python-gssapi
The following NEW packages will be installed:
  ansible python-httplib2 python-jinja2 python-markupsafe python-paramiko
  python-pyasn1 python-yaml sshpass
0 upgraded, 8 newly installed, 0 to remove and 0 not upgraded.
Need to get 6229 kB of archives.
After this operation, 60.3 MB of additional disk space will be used.
Get:1 http://ppa.launchpad.net/ansible/ubuntu bionic/main amd64 ansible
  all 2.9.22-1ppa~bionic [5804 kB]
0% [Waiting for headers] [1 ansible 2622 B/5804 kB 0%]
```

+++++

To check the version of ansible

```
$ ansible --version
```

```
ubuntu@ip-172-31-7-39:~$ ansible --version
ansible 2.9.22
  config file = /etc/ansible/ansible.cfg
  configured module search path = [u'/home/ubuntu/.ansible/plugins/modules', u'/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python2.7/dist-packages/ansible
  executable location = /usr/bin/ansible
  python version = 2.7.17 (default, Feb 27 2021, 15:10:58) [GCC 7.5.0]
ubuntu@ip-172-31-7-39:~$
```

Now controller can communicate nodes and perform configuration.

How does controller know to how many machines to be configured?

From the inventory file-hosts.

Edit the host file Write the ip address of each node to configure in the inventory file of controller.

We can create multiple inventory files why soon...

```
$ cd /etc/ansible
```

```
$ ls
```

```
ubuntu@ip-172-31-7-39:~$ cd /etc/ansible
ubuntu@ip-172-31-7-39:~/etc/ansible$ ls
ansible.cfg hosts roles
ubuntu@ip-172-31-7-39:/etc/ansible$ |
```

```
$ sudo vim hosts
```

Insert the private ip address of 3 servers

Save and quit

```
ubuntu@ip-172-31-7-39: /etc/ansible
172.31.7.134
172.31.3.46
172.31.2.140
# 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.

## 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]
```

\$ ls -la (to see the list in the current machine)

```
ubuntu@ip-172-31-7-39:/etc/ansible$ 
ubuntu@ip-172-31-7-39:/etc/ansible$ 
ubuntu@ip-172-31-7-39:/etc/ansible$ 
ubuntu@ip-172-31-7-39:/etc/ansible$ ls -la
total 36
drwxr-xr-x  3 root root  4096 Jun 17 05:46 .
drwxr-xr-x 94 root root  4096 Jun 17 05:41 ..
-rw-r--r--  1 root root 19985 May 24 21:17 ansible.cfg
-rw-r--r--  1 root root 1054  Jun 17 05:46 hosts
drwxr-xr-x  2 root root  4096 May 24 21:18 roles
ubuntu@ip-172-31-7-39:/etc/ansible$ 
ubuntu@ip-172-31-7-39:/etc/ansible$
```

\$ ansible all -a 'ls -la' (you will get the list of the files in all managed nodes)

```
ubuntu@ip-172-31-7-39: ~
-rw-ru@ip-172-31-7-39:/etc/ansible$ 
ubuntu@ip-172-31-7-39:/etc/ansible$ 
ubuntu@ip-172-31-7-39:/etc/ansible$ cd
ubuntu@ip-172-31-7-39: ~$ 
ubuntu@ip-172-31-7-39: ~$ 
ubuntu@ip-172-31-7-39: ~$ ansible all -a 'ls -la'
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED | rc=0 >>
total 44
```

Node1: lists

```
ubuntu@ip-172-31-7-39:~ [DEPRECATION WARNING]: distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.  
172.31.7.134 | CHANGED | rc=0 >>  
total 44  
drwxr-xr-x 6 ubuntu ubuntu 4096 Jun 17 05:47 .  
drwxr-xr-x 3 root root 4096 Jun 17 05:20 ..  
drwx----- 3 ubuntu ubuntu 4096 Jun 17 05:47 .ansible  
-rw----- 1 ubuntu ubuntu 11 Jun 17 05:26 .bash_history  
-rw-r--r-- 1 ubuntu ubuntu 220 Apr 4 2018 .bash_logout  
-rw-r--r-- 1 ubuntu ubuntu 3771 Apr 4 2018 .bashrc  
drwx----- 2 ubuntu ubuntu 4096 Jun 17 05:21 .cache  
drwx----- 3 ubuntu ubuntu 4096 Jun 17 05:21 .gnupg  
-rw-r--r-- 1 ubuntu ubuntu 807 Apr 4 2018 .profile  
drwx----- 2 ubuntu ubuntu 4096 Jun 17 05:20 .ssh  
-rw-r--r-- 1 ubuntu ubuntu 0 Jun 17 05:22 .sudo_as_admin_successful  
-rw----- 1 root root 867 Jun 17 05:25 .viminfo  
[DEPRECATION WARNING]: distribution Ubuntu 18.04 on host 172.31.2.140 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the
```

Node2:

```
172.31.2.140 | CHANGED | rc=0 >>  
total 44  
drwxr-xr-x 6 ubuntu ubuntu 4096 Jun 17 05:47 .  
drwxr-xr-x 3 root root 4096 Jun 17 05:21 ..  
drwx----- 3 ubuntu ubuntu 4096 Jun 17 05:47 .ansible  
-rw----- 1 ubuntu ubuntu 11 Jun 17 05:35 .bash_history  
-rw-r--r-- 1 ubuntu ubuntu 220 Apr 4 2018 .bash_logout  
-rw-r--r-- 1 ubuntu ubuntu 3771 Apr 4 2018 .bashrc  
drwx----- 2 ubuntu ubuntu 4096 Jun 17 05:31 .cache  
drwx----- 3 ubuntu ubuntu 4096 Jun 17 05:31 .gnupg  
-rw-r--r-- 1 ubuntu ubuntu 807 Apr 4 2018 .profile  
drwx----- 2 ubuntu ubuntu 4096 Jun 17 05:21 .ssh  
-rw-r--r-- 1 ubuntu ubuntu 0 Jun 17 05:31 .sudo_as_admin_successful  
-rw----- 1 root root 867 Jun 17 05:34 .viminfo
```

Node3:

```
ubuntu@ip-172-31-7-39:~ [DEPRECATION WARNING]: distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.  
172.31.3.46 | CHANGED | rc=0 >>  
total 44  
drwxr-xr-x 6 ubuntu ubuntu 4096 Jun 17 05:47 .  
drwxr-xr-x 3 root root 4096 Jun 17 05:21 ..  
drwx----- 3 ubuntu ubuntu 4096 Jun 17 05:47 .ansible  
-rw----- 1 ubuntu ubuntu 11 Jun 17 05:31 .bash_history  
-rw-r--r-- 1 ubuntu ubuntu 220 Apr 4 2018 .bash_logout  
-rw-r--r-- 1 ubuntu ubuntu 3771 Apr 4 2018 .bashrc  
drwx----- 2 ubuntu ubuntu 4096 Jun 17 05:26 .cache  
drwx----- 3 ubuntu ubuntu 4096 Jun 17 05:26 .gnupg  
-rw-r--r-- 1 ubuntu ubuntu 807 Apr 4 2018 .profile  
drwx----- 2 ubuntu ubuntu 4096 Jun 17 05:21 .ssh  
-rw-r--r-- 1 ubuntu ubuntu 0 Jun 17 05:27 .sudo_as_admin_successful  
-rw----- 1 root root 867 Jun 17 05:30 .viminfo  
ubuntu@ip-172-31-7-39:~$ |
```

Can see list of all files for all nodes in controller

Free command: in controller

```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ free  
total used free shared buff/cache available  
Mem: 1002072 143764 181784 768 676524 691192  
Swap: 0 0 0  
ubuntu@ip-172-31-7-39:~$ |
```

Memory info all managed nodes from controller:

See memory info of node 1, 2, and 3

\$ansible all -a free

```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ clear  
ubuntu@ip-172-31-7-39:~$ ansible all -a 'free'  
  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should  
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility  
with prior Ansible releases. A future Ansible release will default to using the  
discovered platform python for this host. See https://docs.ansible.com/ansible  
/2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.2.140 | CHANGED | rc=0 >>  
total used free shared buff/cache available  
Mem: 1002072 146304 132028 764 723740 692260  
Swap: 0 0 0  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should  
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility  
with prior Ansible releases. A future Ansible release will default to using the  
discovered platform python for this host. See https://docs.ansible.com/ansible  
/2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.7.134 | CHANGED | rc=0 >>
```

```
ubuntu@ip-172-31-7-39:~$  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should  
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility  
with prior Ansible releases. A future Ansible release will default to using the  
discovered platform python for this host. See https://docs.ansible.com/ansible  
/2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.7.134 | CHANGED | rc=0 >>  
total used free shared buff/cache available  
Mem: 1002072 147280 143304 764 711488 693292  
Swap: 0 0 0  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use  
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with  
prior Ansible releases. A future Ansible release will default to using the  
discovered platform python for this host. See https://docs.ansible.com/ansible  
/2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.3.46 | CHANGED | rc=0 >>  
total used free shared buff/cache available  
Mem: 1002072 146452 146900 764 708720 691676  
Swap: 0 0 0  
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$
```

18th June

- Ways of performing Configuration
 - Using adhoc commands
 - Using Playbooks
- Modules in Ansible
- Creating new Inventory file
- Working with shell Module
- Working with user Module
- Working with apt module

2 Ways ansible can

- 1) adhoc commands
- 2) playbooks

adhoc commands-----

Important modules in ansible

Below moudles are used to configuration.

- 1) command - This module is used for executing basic linux commands on managed nodes.
- 2) shell - This module is used to execute commands in shell modules which involved redirection and piping and to execute shell scripts on managed nodes.
- 3) ping -- This module is used to check if the remote server is pingable or not.
- 4) user -- This module is used for user management like create user, setting password, assign home directory etc
- 5) copy -- This module is used to copy the files and folders from controller to managed nodes
- 6) fetch -- This module is used to copy files and folder from managed nodes to controller
- 7) file -- This module is used for creating or deleting files and folders on managed nodes.
- 8) stat -- Used to capture detailed information about files and folders present in managed nodes.
- 9) debug -- Used to display output of any module

- 10) apt -- Used for performing package management on managed nodes ie installing softwares / upgrading repositories etc . It works on ubuntu, debain flavours of linux.
 - 11) yum -- similar to apt module. It works on Red hat linux, centos etc
 - 12) git -- used to perform git version controlling on managed nodes
 - 13) replace -- This is used to replace specific text in configuration file with some other text.
 - 14) service -- used for starting / stoping / restarting services on managed nodes.
 - 15) include -- Used for calling child play books from parent play book
 - 16) uri -- useful in checking if remote url is reachable or not.
 - 17) docker_container -- used to execute docker commands related to container management on managed nodes
 - 18) docker_image -- used to execute commands related to docker images on managed nodes.
 - 19) docker_login -- used to login to docker hub from managed nodes.
 - 20) setup -- used to capturing system information related to the managed nodes.
-

Below command run in inventory file in manager to get mem info for all nodes

```
$ ansible all -i /etc/ansible/hosts -m command -a 'free'
```

```
ubuntu@ip-172-31-7-39:~$ ansible all -i /etc/ansible/hosts -m command -a 'free'
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | CHANGED | rc=0 >>
              total        used        free      shared  buff/cache   available
Mem:       1002072     149684     223928       756      628460     708632
Swap:          0          0          0
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED | rc=0 >>
```

```
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
```

```
172.31.2.140 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:    1002072     150556     214388       756     637128    708528
Swap:        0          0          0
```

```
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
```

```
172.31.7.134 | CHANGED | rc=0 >>
```

```
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
```

```
172.31.7.134 | CHANGED | rc=0 >>
```

```
      total        used        free      shared  buff/cache   available
Mem:    1002072     150572     215408       756     636092    708848
Swap:        0          0          0
```

```
ubuntu@ip-172-31-7-39:~$ |
```

```
$ ansible all -i /etc/ansible/hosts -m command -a 'touch file1'
```

It will create file 1 in all nodes in inventory file.

The result will be in yellow color and changed when it is executed successfully and came across that there was changed in manager so effected in all nodes.

```
ubuntu@ip-172-31-7-39: ~
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
```

```
172.31.7.134 | CHANGED | rc=0 >>
```

```
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
```

```
172.31.3.46 | CHANGED | rc=0 >>
```

```
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
```

```
172.31.2.140 | CHANGED | rc=0 >>
```

```
ubuntu@ip-172-31-7-39:~$ |
```

To check the file which is created

```
$ ssh 172.31.7.134 ( this command will go that machine without asking pwd bcz pwd less communication established )
```

```
ubuntu@ip-172-31-7-39:~$ ssh 172.31.7.134
```

```
$ ls
```

```
System information as of Fri Jun 18 05:15:14 UTC 2021

System load: 0.0          Processes:      94
Usage of /: 26.1% of 7.69GB  Users logged in:  0
Memory usage: 19%          IP address for eth0: 172.31.7.134
Swap usage:  0%

* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

  https://ubuntu.com/blog/microk8s-memory-optimisation

0 updates can be applied immediately.

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Fri Jun 18 05:13:52 2021 from 172.31.7.39
ubuntu@ip-172-31-7-134:~$
```

```
ubuntu@ip-172-31-7-134:~$ ls
file1
```

```
$ exit ( to come back to controller )
```

```
Usage of /: 26.1% of 7.69GB  Users logged in:  0
Memory usage: 19%          IP address for eth0: 172.31.7.134
Swap usage:  0%

* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

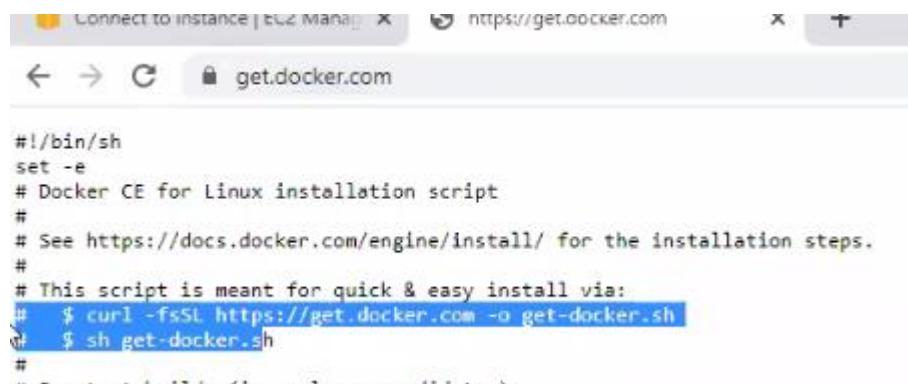
  https://ubuntu.com/blog/microk8s-memory-optimisation

0 updates can be applied immediately.

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

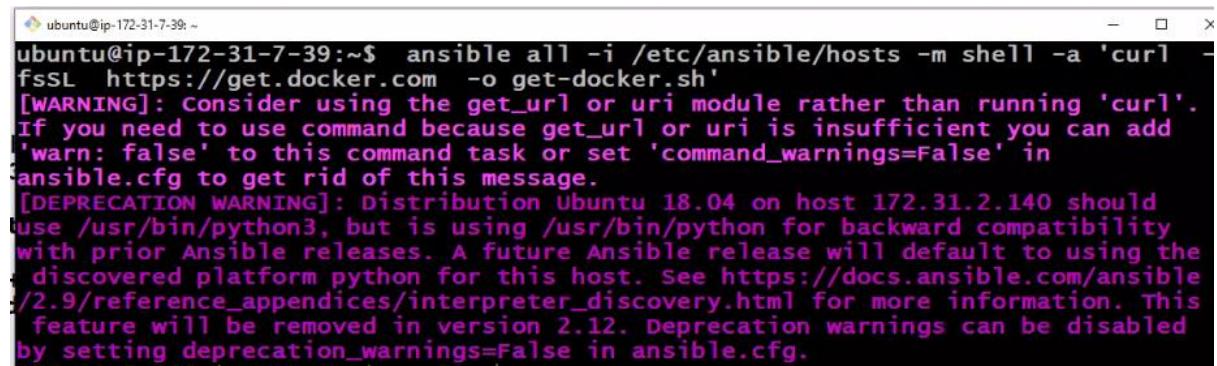
Last login: Fri Jun 18 05:13:52 2021 from 172.31.7.39
ubuntu@ip-172-31-7-134:~$
```

To install docker in all managed nodes

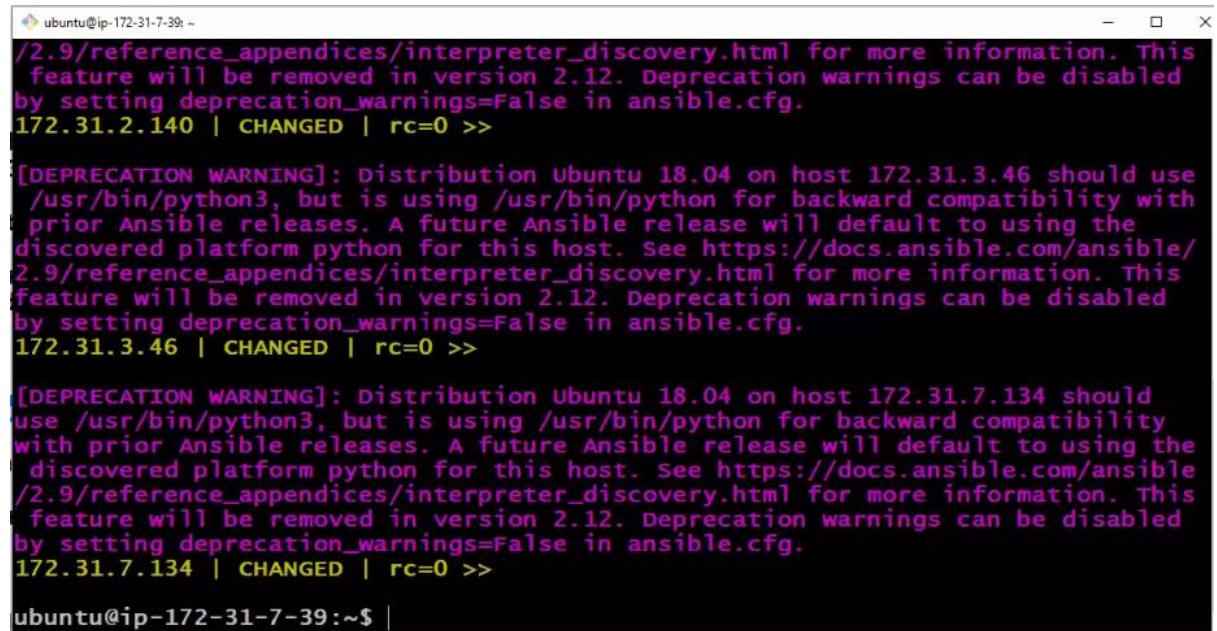


```
#!/bin/sh
set -e
# Docker CE for Linux installation script
#
# See https://docs.docker.com/engine/install/ for the installation steps.
#
# This script is meant for quick & easy install via:
# $ curl -fsSL https://get.docker.com -o get-docker.sh
# $ sh get-docker.sh
#
# ... etc.
```

```
$ ansible all -i /etc/ansible/hosts -m shell -a 'curl -fsSL https://get.docker.com -o get-docker.sh'
```



```
ubuntu@ip-172-31-7-39:~$ ansible all -i /etc/ansible/hosts -m shell -a 'curl -fsSL https://get.docker.com -o get-docker.sh'
[WARNING]: Consider using the get_url or uri module rather than running 'curl'.
If you need to use command because get_url or uri is insufficient you can add
'warn: false' to this command task or set 'command_warnings=False' in
ansible.cfg to get rid of this message.
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
```



```
ubuntu@ip-172-31-7-39:~$ /2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED | rc=0 >>

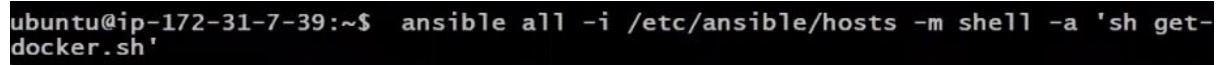
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | CHANGED | rc=0 >>

[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED | rc=0 >>
```

```
ubuntu@ip-172-31-7-39:~$ |
```

```
$ ansible all -i /etc/ansible/hosts -m shell -a 'sh get-docker.sh'
```

This will take few minutes to gets installed on 1,2, and 3 nodes.



```
ubuntu@ip-172-31-7-39:~$ ansible all -i /etc/ansible/hosts -m shell -a 'sh get-
```

```
ubuntu@ip-172-31-7-39: ~
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED | rc=0 >>
# Executing docker install script, commit: 7cae5f8b0decc17d6571f9f52eb840fbc13b2
737
client: Docker Engine - Community
  Version:           20.10.7
  API version:      1.41
  Go version:       go1.13.15
  Git commit:       f0df350
  Built:            wed Jun  2 11:56:40 2021
  OS/Arch:          linux/amd64
  Context:          default
  Experimental:    true

Server: Docker Engine - Community
  Engine:
    Version:          20.10.7
    API version:     1.41 (minimum version 1.12)
    Go version:      go1.13.15
```

```
ubuntu@ip-172-31-7-39: ~
bionic stable" > /etc/apt/sources.list.d/docker.list
+ sudo -E sh -c apt-get update -qq >/dev/null
+ [ -n ]
+ sudo -E sh -c apt-get install -y -qq --no-install-recommends docker-ce >/dev/n
ull
+ [ -n 1 ]
+ sudo -E sh -c DEBIAN_FRONTEND=noninteractive apt-get install -y -qq docker-ce-
rootless-extras >/dev/null
+ sudo -E sh -c docker version
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED | rc=0 >>
# Executing docker install script, commit: 7cae5f8b0decc17d6571f9f52eb840fbc13b2
737
client: Docker Engine - Community
  Version:           20.10.7
  API version:      1.41
  Go version:       go1.13.15
  Git commit:       f0df350
```

```
ubuntu@ip-172-31-7-39: ~
+ sudo -E sh -c DEBIAN_FRONTEND=noninteractive apt-get install -y -qq docker-ce-
rootless-extras >/dev/null
+ sudo -E sh -c docker version
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | CHANGED | rc=0 >>
# Executing docker install script, commit: 7cae5f8b0decc17d6571f9f52eb840fbc13b2
737
client: Docker Engine - Community
  Version:           20.10.7
  API version:      1.41
  Go version:       go1.13.15
  Git commit:       f0df350
  Built:            wed Jun  2 11:56:40 2021
  OS/Arch:          linux/amd64
  Context:          default
  Experimental:    true

Server: Docker Engine - Community
```

To check docker is installed or not

Go to any node private ip and access from controller.

```
$ ssh 172.31.2.173
```

```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ ssh 172.31.2.140  
|
```

```
$ docker --version
```

```
ubuntu@ip-172-31-2-140:~$ docker --version  
Docker version 20.10.7, build f0df350  
ubuntu@ip-172-31-2-140:~$
```

```
$ Exit (to come back to controller)
```

```
+++++
```

Notes:

Ansible performs remote configurations in 2 ways

1) using adhoc commands

2) using play books

Syntax of adhoc commands

```
$ ansible all/group_name/ipaddress -i path_of_inventory_file -m modulename -a 'arguments'
```

I=inventory file

All means all nodes

Group_name: grouping the nodes in multiple groups so we can give group name.

Acc to syntax we have to frame command

Default inventory=host file

```
++++++
```

Ansible command module to check the memory info on all managed nodes

```
$ ansible all -i /etc/ansible/hosts -m command -a 'free'
```

```
++++++
```

To open the default inventory file

```
$ sudo vim /etc/ansible/hosts
```

```
ubuntu@ip-172-31-7-39: ~
172.31.7.134
172.31.3.46
172.31.2.140
# 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.

## 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]
"/etc/ansible/hosts" 47L, 1054C
```

3,12

(Observation: 3 ip address are available)

+++++

Now, I copy the first two IP address (in a new notepad file)

quit the inventory file

+++++

Create my own inventory file

\$ vim myinventory (myinventory = can be anything)

go to insert mode

```
ubuntu@ip-172-31-7-39: ~
172.31.7.134
172.31.3.46|
~
```

paste two ip address

save and quit

++++++

To check the inventory file

\$ cat myinventory

++++++

\$ ansible all -i myinventory -m command -a 'free'

Compare below commands which are default and own inventory files

\$ ansible all -i /etc/ansible/hosts -m command -a 'free'

\$ ansible all -i myinventory -m command -a 'free'

```
ubuntu@ip-172-31-7-39:~$ ansible all -i myinventory -m command -a 'free'
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:       1002072       213544       84344          788       704184       644552
Swap:          0           0           0
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:       1002072       214100       85276          788       702696       644548
Swap:          0           0           0
ubuntu@ip-172-31-7-39:~$ |
```

Observation: free command works on only two machines

++++++

If you do not mention the inventory file, it takes default inventory file is host file.

```
$ ansible all -i myinventory -m command -a 'free'  
ex: $ ansible all -m command -a 'free'
```

```
$ ansible all -m command -a 'free'
```

```
[*] ubuntu@ip-172-31-7-39: ~  
ubuntu@ip-172-31-7-39:~$ ansible all -m command -a 'free'|
```

```
[*] ubuntu@ip-172-31-7-39: ~  
Swap: 0 0 0  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should  
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility  
with prior Ansible releases. A future Ansible release will default to using the  
discovered platform python for this host. See https://docs.ansible.com/ansible  
/2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.7.134 | CHANGED | rc=0 >>  
    total      used      free      shared  buff/cache   available  
Mem: 1002072     213820     85388       788     702864     644872  
Swap: 0 0 0  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should  
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility  
with prior Ansible releases. A future Ansible release will default to using the  
discovered platform python for this host. See https://docs.ansible.com/ansible  
/2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.2.140 | CHANGED | rc=0 >>  
    total      used      free      shared  buff/cache   available  
Mem: 1002072     211784     89120       788     701168     646804  
Swap: 0 0 0  
ubuntu@ip-172-31-7-39:~$
```

```
+++++
```

Command module is the default module in ansible (when you don't mention any module name)

```
$ ansible all -m command -a 'free'  
$ ansible all -a 'free'
```

```
$ ansible all -a 'free'
```

```
[*] ubuntu@ip-172-31-7-39: ~  
ubuntu@ip-172-31-7-39:~$ ansible all -a 'free'|
```

```

ubuntu@ip-172-31-7-39: ~
Swap:          0          0          0
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED | rc=0 >>
      total      used      free      shared  buff/cache   available
Mem:    1002072     214044     84868       788    703160     644644
Swap:          0          0          0
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED | rc=0 >>
      total      used      free      shared  buff/cache   available
Mem:    1002072     212104     88568       788    701400     646472
Swap:          0          0          0
ubuntu@ip-172-31-7-39:~$ |

```

+++++

Note:

The defult inventory file is /etc/ansible/hosts and when using this inventory file, we need not use -i option.

ex:

\$ ansible all -m command -a 'free'

The default module is module. When using command module we need not use -m option

ex:

\$ ansible all -a 'free'

Shell Module

ansible command to execute ls -la and store the output into file1 on all the managed nodes.

Create file 2

\$ ansible all -m shell -a 'ls -la > file2'

>-- whenever redirection is involved we use shell command

```

ubuntu@ip-172-31-7-39: ~
ubuntu@ip-172-31-7-39:~$ ansible all -m shell -a 'ls -la > file2'

```

```
ubuntu@ip-172-31-7-39:~  
2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.3.46 | CHANGED | rc=0 >>  
  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should  
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility  
with prior Ansible releases. A future Ansible release will default to using the  
discovered platform python for this host. See https://docs.ansible.com/ansible  
/2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.2.140 | CHANGED | rc=0 >>  
  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should  
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility  
with prior Ansible releases. A future Ansible release will default to using the  
discovered platform python for this host. See https://docs.ansible.com/ansible  
/2.9/reference_appendices/interpreter_discovery.html for more information. This  
feature will be removed in version 2.12. Deprecation warnings can be disabled  
by setting deprecation_warnings=False in ansible.cfg.  
172.31.7.134 | CHANGED | rc=0 >>  
ubuntu@ip-172-31-7-39:~$ |
```

To check the file which is created

```
$ ssh 172.31.12.239
```

```
ubuntu@ip-172-31-2-140:~  
* Documentation: https://help.ubuntu.com  
* Management: https://landscape.canonical.com  
* Support: https://ubuntu.com/advantage  
  
System information as of Fri Jun 18 05:28:34 UTC 2021  
  
System Load: 0.0 Processes: 100  
Usage of /: 32.8% of 7.69GB Users logged in: 0  
Memory usage: 26% IP address for eth0: 172.31.2.140  
Swap usage: 0% IP address for docker0: 172.17.0.1  
  
* Super-optimized for small spaces - read how we shrank the memory  
footprint of MicroK8s to make it the smallest full K8s around.  
  
https://ubuntu.com/blog/microk8s-memory-optimisation  
  
0 updates can be applied immediately.  
  
New release '20.04.2 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Fri Jun 18 05:28:04 2021 from 172.31.7.39  
ubuntu@ip-172-31-2-140:~$ |
```

```
$ ls
```

```
ubuntu@ip-172-31-2-140:~$ ls  
file1 file2 get-docker.sh  
ubuntu@ip-172-31-2-140:~$
```

```
$ exit ( to come back to controller )
```

command to install docker on all managed nodes

```
$ ansible all -m shell -a 'curl -fsSL https://get.docker.com -o get-docker.sh'  
$ ansible all -m shell -a 'sh get-docker.sh'  
+++++
```

User Module:

(From controller)

Whenever the user is created and all the list of users available in password file.

Ex : in Linux

```
ubuntu@ip-172-31-7-39:~$ sudo useradd sai  
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ vim /etc/passwd  
ubuntu@ip-172-31-7-39:~$
```

To create new user

```
$ sudo useradd sai
```

```
$ vim /etc/passwd ( User will be created in this file )
```

```
root:x:0:0:root:/root:/bin/bash  
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin  
bin:x:2:2:bin:/usr/sbin/nologin  
sys:x:3:3:sys:/dev:/usr/sbin/nologin  
sync:x:4:65534:sync:/bin:/bin/sync  
games:x:5:60:games:/usr/games:/usr/sbin/nologin  
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin  
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin  
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin  
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin  
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin  
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin  
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin  
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin  
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin  
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin  
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin  
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin  
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin  
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin  
"/etc/passwd" [readonly] 31L, 1596c
```

1,1

Top

```
ubuntu@ip-172-31-7-39:~$ cat /etc/passwd
proxy:x:13:13:proxy:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin
syslog:x:102:106::/home/syslog:/usr/sbin/nologin
messagebus:x:103:107::/nonexistent:/usr/sbin/nologin
_apt:x:104:65534::/nonexistent:/usr/sbin/nologin
1xd:x:105:65534::/var/lib/1xd/:/bin/false
uuidd:x:106:110::/run/uuidd:/usr/sbin/nologin
dnsmasq:x:107:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
landscape:x:108:112::/var/lib/landscape:/usr/sbin/nologin
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
pollinate:x:110:1::/var/cache/pollinate:/bin/false
ubuntu:x:1000:1000:Ubuntu:/home/ubuntu:/bin/bash
sai:x:1001:1001:/home/sai:/bin/sh
```

31,1

Bot

To set the password

```
$ sudo passwd sai ( sai is the username)
```

```
ubuntu@ip-172-31-7-39:~$ sudo passwd sai
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
ubuntu@ip-172-31-7-39:~$ |
```

Now, i want to create user in all managed nodes

```
$ ansible all -m user -a 'name=anu password=sunil'
```

(we get error : permission denied)

-m user=module

```
ubuntu@ip-172-31-7-39:~$ ansible all -m user -a 'name=anu password=sunil'
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | FAILED! => {
    "changed": false,
    "msg": "useradd: Permission denied.\nuseradd: cannot lock /etc/passwd; try again later.\n",
    "name": "anu",
    "rc": 1
}
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | FAILED! => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "msg": "useradd: Permission denied.\nuseradd: cannot lock /etc/passwd; try again later.\n",
    "name": "anu",
    "rc": 1
}
ubuntu@ip-172-31-7-39:~$
```

```
$ ansible all -m user -a 'name=anu password=sunil' -b ( become , for higher privileges on managed nodes )
```

-b=become

Eventhough there is no permissions ansible will create the user n all nodes like a root user even we dnt have privileges, permissions.

```
ubuntu@ip-172-31-7-39:~$ [DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.  
172.31.7.134 | CHANGED => {  
    "ansible_facts": {  
        "discovered_interpreter_python": "/usr/bin/python"  
    },  
    "changed": true,  
    "comment": "",  
    "create_home": true,  
    "group": 1001,  
    "home": "/home/anu",  
    "name": "anu",  
    "password": "NOT_LOGGING_PASSWORD",  
    "shell": "/bin/sh",  
    "state": "present",  
    "system": false,  
    "uid": 1001  
}  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use
```

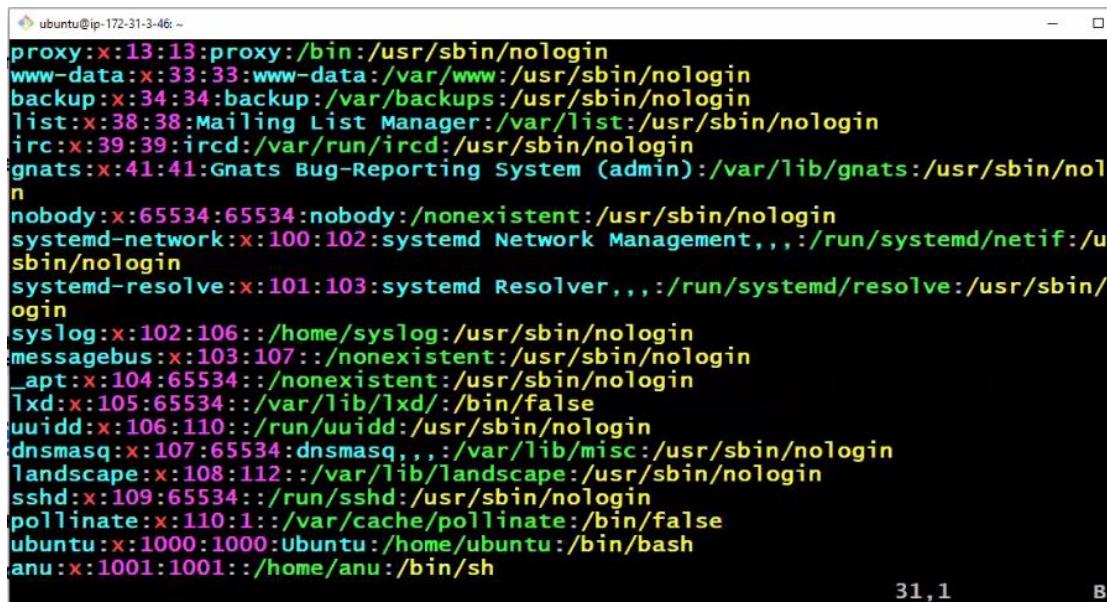
```
ubuntu@ip-172-31-7-39:~$ -b  
[WARNING]: The input password appears not to have been hashed. The 'password' argument must be encrypted for this module to work properly.  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.  
172.31.2.140 | CHANGED => {  
    "ansible_facts": {  
        "discovered_interpreter_python": "/usr/bin/python"  
    },  
    "changed": true,  
    "comment": "",  
    "create_home": true,  
    "group": 1001,  
    "home": "/home/anu",  
    "name": "anu",  
    "password": "NOT_LOGGING_PASSWORD",  
    "shell": "/bin/sh",  
    "state": "present",  
    "system": false,
```

To check if user is create or not

```
$ ssh 172.31.12.239
```

```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ ssh 172.31.3.46|
```

```
$ vim /etc/passwd
```



```
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/login
syslog:x:102:106::/home/syslog:/usr/sbin/nologin
messagebus:x:103:107::/nonexistent:/usr/sbin/nologin
_apt:x:104:65534::/nonexistent:/usr/sbin/nologin
lxde:x:105:65534::/var/lib/lxde/:/bin/false
uuidd:x:106:110::/run/uuidd:/usr/sbin/nologin
dnsmasq:x:107:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
landscape:x:108:112::/var/lib/landscape:/usr/sbin/nologin
sshd:x:109:65534::/run/sshd:/usr/sbin/nologin
pollinate:x:110:1::/var/cache/pollinate:/bin/false
ubuntu:x:1000:1000:Ubuntu:/home/ubuntu:/bin/bash
anu:x:1001:1001::/home/anu:/bin/sh
```

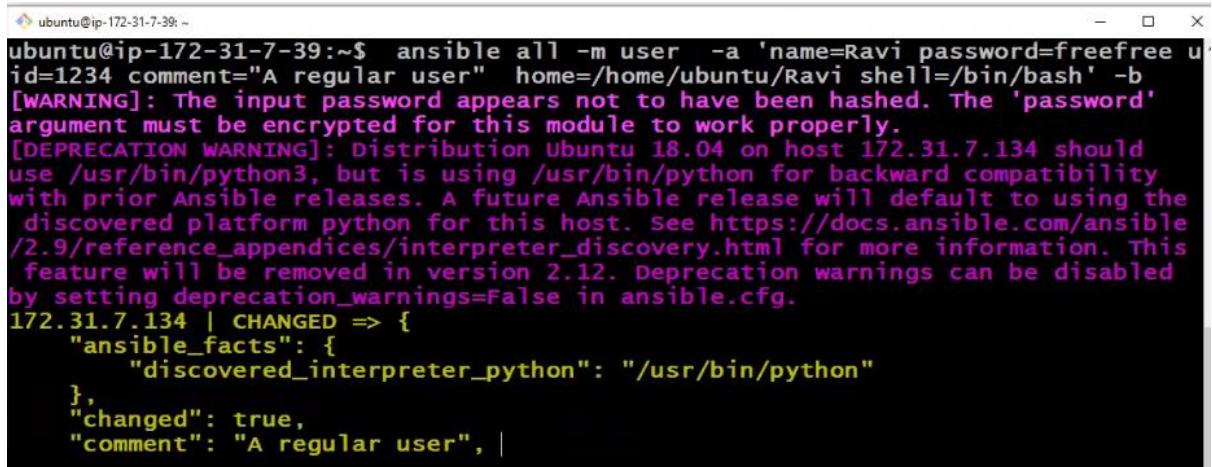
31,1 B

```
$ exit
```

Command to create user and set home directory, user id, default working shell etc

Another example

```
$ ansible all -m user -a 'name=Ravi password=freefree uid=1234 comment="A regular user" home=/home/ubuntu/Ravi shell=/bin/bash' -b
```



```
ubuntu@ip-172-31-7-39:~$ ansible all -m user -a 'name=Ravi password=freefree uid=1234 comment="A regular user" home=/home/ubuntu/Ravi shell=/bin/bash' -b
[WARNING]: The input password appears not to have been hashed. The 'password' argument must be encrypted for this module to work properly.
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": true,
    "comment": "A regular user", |
```

To check for the new user

```
$ ssh 172.31.44.218
```

```
$ vim /etc/passwd
```

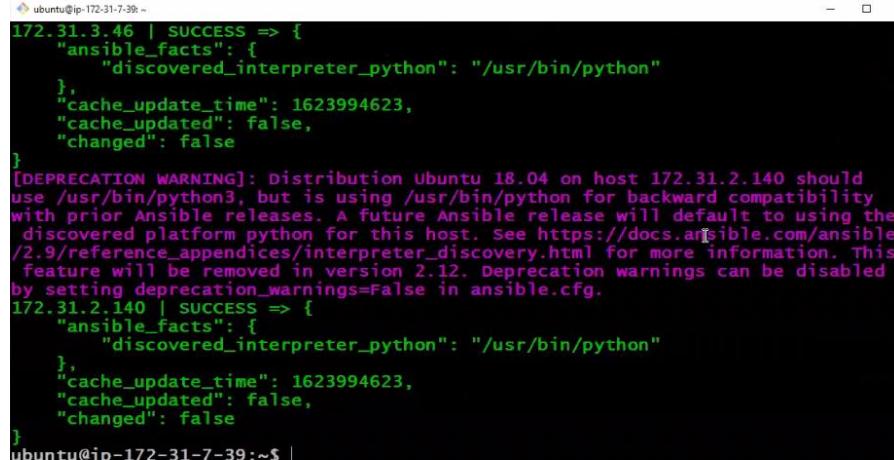
Install git in all managed nodes

Apt modules for installing soft wares

Greenclor and changed=false because the git already is present in all nodes.

state=present'= installation

```
$ ansible all -m apt -a 'name=git state=present' -b
```



```
ubuntu@ip-172-31-7-39:~$ 172.31.3.46 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "cache_update_time": 1623994623,
  "cache_updated": false,
  "changed": false
}
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "cache_update_time": 1623994623,
  "cache_updated": false,
  "changed": false
}
ubuntu@ip-172-31-7-39:~$
```

Observation:

We get "changed": false

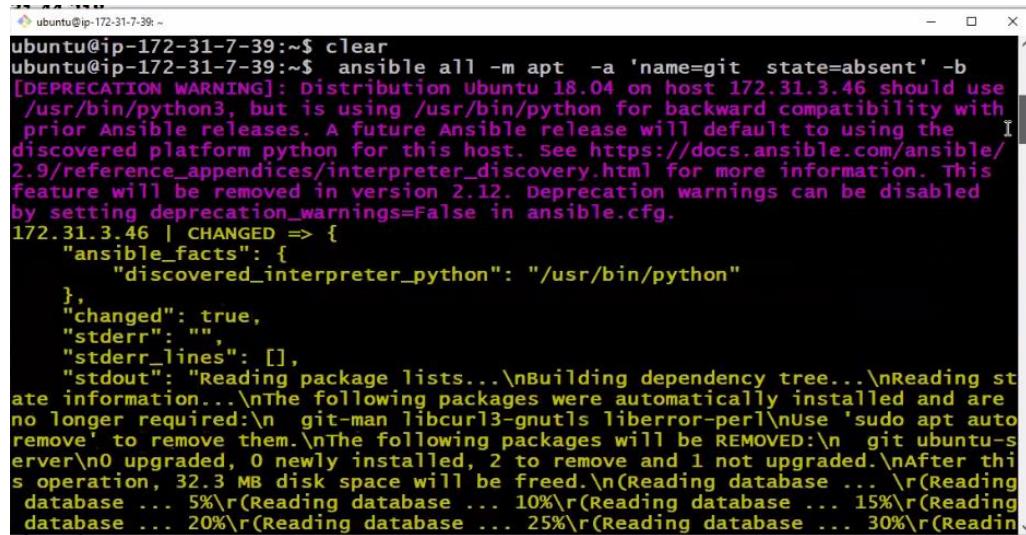
(That means git is already installed on it. The command has no effect in the nodes)

Now , run the below command

```
$ ansible all -m apt -a 'name=git state=absent' -b
```

(absent means - uninstall)

Latest=upgradation



```
ubuntu@ip-172-31-7-39:~$ clear
ubuntu@ip-172-31-7-39:~$ ansible all -m apt -a 'name=git state=absent' -b
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "stderr": "",
  "stderr_lines": [],
  "stdout": "Reading package lists...\nBuilding dependency tree...\nReading state information...\n\nThe following packages were automatically installed and are no longer required:\n  git-man libcurl3-gnutls liberror-perl\nUse 'sudo apt autoremove' to remove them.\n\nThe following packages will be REMOVED:\n  git ubuntu-server\n\n0 upgraded, 0 newly installed, 2 to remove and 1 not upgraded.\nAfter this operation, 32.3 MB disk space will be freed.\n\n(Reading database ... \r(Reading database ... 10%\r(Reading database ... 15%\r(Reading database ... 20%\r(Reading database ... 25%\r(Reading database ... 30%\r(Reading database ... 35%\r(Reading database ... 40%\r(Reading database ... 45%\r(Reading database ... 50%\r(Reading database ... 55%\r(Reading database ... 60%\r(Reading database ... 65%\r(Reading database ... 70%\r(Reading database ... 75%\r(Reading database ... 80%\r(Reading database ... 85%\r(Reading database ... 90%\r(Reading database ... 95%\r(Reading database ... 100%\r\n\nRemove complete.\n\n"
}
```

output, we get in yellow color

(scroll up) we get "changed":true

(The command is effected the instance)

Now if we run the below command (with present option)

```
$ ansible all -m apt -a 'name=git state=present' -b
```

we get "changed":true

Notes:

apt module -- This is used for package management.

1) `ansible all -m apt -a 'name=git state=present' -b`

`state=present` is for installation

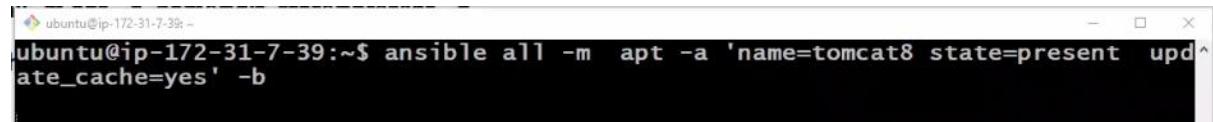
`state=latest` for upgradation

`state=absent` for uninstallation

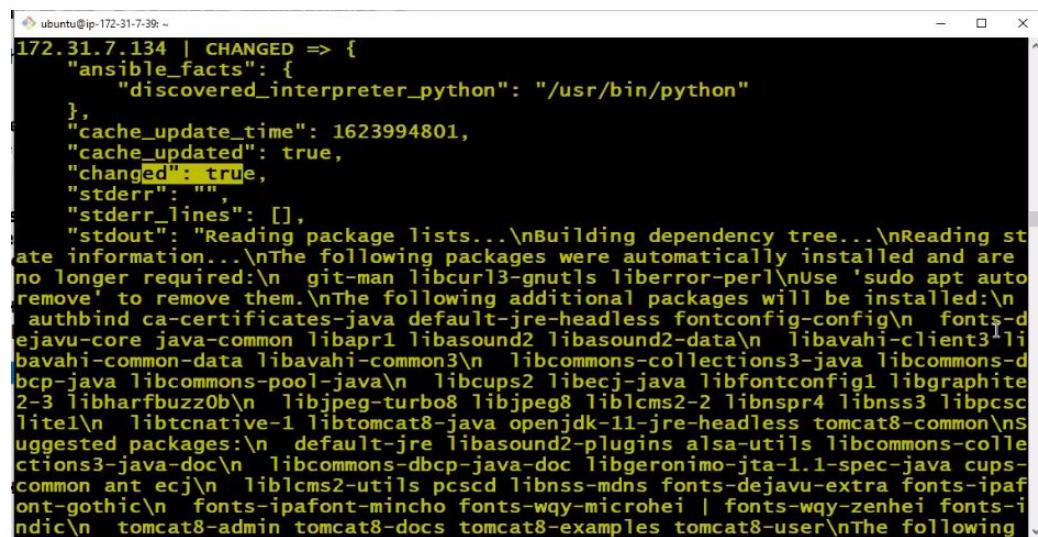
```
+++++
```

I wan to update apt-repository and install tomcat8

```
ansible all -m apt -a 'name=tomcat8 state=present update_cache=yes' -b
```



```
ubuntu@ip-172-31-7-39:~$ ansible all -m apt -a 'name=tomcat8 state=present update_cache=yes' -b
```



```
172.31.7.134 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "cache_update_time": 1623994801,
    "cache_updated": true,
    "changed": true,
    "stderr": "",
    "stderr_lines": [],
    "stdout": "Reading package lists...\nBuilding dependency tree...\nReading state information...\n\nThe following packages were automatically installed and are no longer required:\n  git-man libcurl3-gnutls liberror-perl\nUse 'sudo apt autoremove' to remove them.\n\nThe following additional packages will be installed:\n  authbind ca-certificates-java default-jre-headless fontconfig-config\n  fonts-dejavu-core java-common libapr1 libasound2 libasound2-data\n  libavahi-client3 libavahi-common-data libavahi-common3 libcommons-collections3-jar libcommons-dbc-pool\n  libcommons-pool-jar libcurl3 libcups2 libecj-jar libfontconfig1 libgraphite2-2.3 libharfbuzz0b\n  libjpeg-turbo8 libjpeg8 liblcms2-2 libnspr4 libnss3 libpcsc-lite1 libtcnative-1 libtomcat8-jar openjdk-11-jre-headless tomcat8-common\n\nSuggested packages:\n  default-jre libasound2-plugins alsamixer libcommons-collections3-jar libcommons-dbcp-jar libgeronimo-jta-1.1-spec-jar cups-common ant ecj liblcms2-utils pcscd libnss-mdns fonts-dejavu-extra fonts-ipafont-gothic\n  fonts-ipafont-mincho fonts-wqy-microhei fonts-wqy-zenhei fonts-indic\n  tomcat8-admin tomcat8-docs tomcat8-examples tomcat8-user\n\nThe following NEW packages will be installed:\n  tomcat8
```

The above command will update apt repository and install tomcat8

To update apt-repository on managed nodes update cache=yes is used

Note: we can use public ip but all nodes are in aws cloud so communication will be happened in private ip address

22nd june

- File Module
- Copy Module
- Fetch Module
- Git Module
- Service Module
- Replace Module
- Uri Module
- Performing related operations using multiple Module
- Introduction to playbooks
- Creating a playbook and running it

File module

This is used to create files and folder on managed nodes

```
ansible all -m file -a 'name=/tmp/file5 state=touch'
```

all-all nodes

/tmp/-path

```
ubuntu@ip-172-31-7-39:~$ ansible all -m file -a 'name=/tmp/file5 state=touch'
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": true,
    "dest": "/tmp/file5",
    "gid": 1000,
    "group": "ubuntu",
    "mode": "0664",
    "owner": "ubuntu",
    "size": 0,
    "state": "file",
    "uid": 1000
}
```

```

ubuntu@ip-172-31-7-39:~$ 
    "uid": 1000
}
[DEPRECATION WARNING]: distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": true,
    "dest": "/tmp/file5",
    "gid": 1000,
    "group": "ubuntu",
    "mode": "0664",
    "owner": "ubuntu",
    "size": 0,
    "state": "file",
    "uid": 1000
}
ubuntu@ip-172-31-7-39:~$ 

[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information.
This feature will be removed in version 2.12. Deprecation warnings can be
disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": true,
    "dest": "/tmp/file5",
    "gid": 1000,
    "group": "ubuntu",
    "mode": "0664",
    "owner": "ubuntu",
    "size": 0,
    "state": "file",
    "uid": 1000
}

```

To check the file which is created

\$ ssh 172.31.12.239

\$ cd /tmp

\$ ls

\$ exit

```

ubuntu@ip-172-31-7-134:/tmp$ 
* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

  https://ubuntu.com/blog/microk8s-memory-optimisation

1 update can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Tue Jun 22 05:11:09 2021 from 172.31.7.39
ubuntu@ip-172-31-7-134:~$ 
ubuntu@ip-172-31-7-134:~$ 
ubuntu@ip-172-31-7-134:~$ cd /tmp
ubuntu@ip-172-31-7-134:/tmp$ ls
file5
hsperfdata_tomcat8
systemd-private-df0c58608f7f4116a7db2b93764232e4-systemd-resolved.service
systemd-private-df0c58608f7f4116a7db2b93764232e4-systemd-timesyncd.service
6
tomcat8-tomcat8-tmp
ubuntu@ip-172-31-7-134:/tmp$ 

```

TO create a directory

```
ansible all -m file -a 'name=/tmp/dir1 state=directory'
```

To check the directory

```
$ ssh 172.31.39.33
```

```
$ cd /tmp
```

```
$ ls
```

```
$ exit
```

```
ubuntu@ip-172-31-7-39:~$ ansible all -m file -a 'name=/tmp/dir1 state=directory'
```

```
ubuntu@ip-172-31-7-39:~$ {"size": 4096, "state": "directory", "uid": 1000} [DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg. 172.31.3.46 | CHANGED => { "ansible_facts": { "discovered_interpreter_python": "/usr/bin/python" }, "changed": true, "gid": 1000, "group": "ubuntu", "mode": "0775", "owner": "ubuntu", "path": "/tmp/dir1", "size": 4096, "state": "directory", "uid": 1000 } }
```

To delete the file

```
ansible all -m file -a 'name=/tmp/file5 state=absent'
```

```
ubuntu@ip-172-31-7-39:~$ for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg. 172.31.2.140 | CHANGED => { "ansible_facts": { "discovered_interpreter_python": "/usr/bin/python" }, "changed": true, "path": "/tmp/file5", "state": "absent" } [DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg. 172.31.7.134 | CHANGED => { "ansible_facts": { "discovered_interpreter_python": "/usr/bin/python" }, "changed": true, "path": "/tmp/file5", "state": "absent" } 
```

Notes:

Command to create a file on all managed nodes

```
ansible all -m file -a 'name=/tmp/file1 state=touch'
```

state=touch is to create files

state=directory is to create directory

state=absent is for deleting file/directory

Now,

To know the current user

```
$ whoami
```

```
ubuntu@ip-172-31-7-39:~$ whoami
ubuntu
ubuntu@ip-172-31-7-39:~$
```

```
$ ansible all -m file -a 'name=file1 state=touch'
```

File1 created

```
ubuntu@ip-172-31-7-39:~$ whoami
ubuntu
ubuntu@ip-172-31-7-39:~$ ansible all -m file -a 'name=file1 state=touch'
```

```
ubuntu@ip-172-31-7-39:~$ 
{
  "size": 0,
  "state": "file",
  "uid": 1000
}
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should be using /usr/bin/python3, but is using /usr/bin/python for backward compatibility with Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg
172.31.7.134 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "dest": "file1",
  "gid": 1000,
  "group": "ubuntu",
  "mode": "0664",
  "owner": "ubuntu",
  "size": 0,
  "state": "file",
  "uid": 1000
}
ubuntu@ip-172-31-7-39:~$
```

Now go to managed nodes and check the permission of the file

```
$ ssh 172.31.12.239
```

```
ubuntu@ip-172-31-7-134:~$
```

```
System information as of Tue Jun 22 05:15:59 UTC 2021
```

```
System load: 0.0          Processes:           102
Usage of /: 36.4% of 7.69GB  Users logged in:      0
Memory usage: 34%          IP address for eth0: 172.31.7.134
Swap usage: 0%             IP address for docker0: 172.17.0.1
```

```
* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.
```

```
https://ubuntu.com/blog/microk8s-memory-optimisation
```

```
1 update can be applied immediately.
To see these additional updates run: apt list --upgradable
```

```
New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.
```

```
Last login: Tue Jun 22 05:15:29 2021 from 172.31.7.39
ubuntu@ip-172-31-7-134:~$
```

```
ubuntu@ip-172-31-7-134:~$
```

```
ubuntu@ip-172-31-7-134:~$ ls
Ravi  file1  file2  get-docker.sh
```

```
$ ls -l file1
```

```
ubuntu@ip-172-31-7-134:~$ ls -l
total 24
drwxr-xr-x 2 Ravi  Ravi    4096 Jun 18 05:35 Ravi
-rw-rw-r-- 1 ubuntu  ubuntu     0 Jun 22 05:15 file1
-rw-rw-r-- 1 ubuntu  ubuntu   837 Jun 18 05:28 file2
-rw-rw-r-- 1 ubuntu  ubuntu 14750 Jun 18 05:16 get-docker.sh
ubuntu@ip-172-31-7-134:~$
```

owner=ubuntu group= ubuntu

Observe the permissions are rw-rw-r--

Now, I want to change the permissions from controller

```
$ exit ( will come back to controller )
```

```
$ ansible all -m file -a 'name=file1 state=touch owner=Anu group=Ravi mode=700' -b
```

The above command will execute only if Anu user and Ravi group is available in all nodes.

Notes:

File module can be used to change the ownership, group ownership and permissions on the file.

Copy Module

Is used to copy the file from a controller to managing nodes.

This is used for copying the files from controller into managed nodes.

We know in the file /etc/passwd we have all the information about users

```
$ Vi file/etc/passwd
```

```

ubuntu@ip-172-31-7-39: ~
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin
syslog:x:102:106:/:/home/syslog:/usr/sbin/nologin
messagebus:x:103:107:/:/nonexistent:/usr/sbin/nologin
_apt:x:104:65534:/:/nonexistent:/usr/sbin/nologin
lxd:x:105:65534:/:/var/lib/lxd/:/bin/false
uuidd:x:106:110:/:/run/uuidd:/usr/sbin/nologin
dnsmasq:x:107:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
landscape:x:108:112:/:/var/lib/landscape:/usr/sbin/nologin
sshd:x:109:65534:/:/run/sshd:/usr/sbin/nologin
pollinate:x:110:1:/:/var/cache/pollinate:/bin/false
ubuntu:x:1000:1000:Ubuntu:/home/ubuntu:/bin/bash
sai:x:1001:1001:/:/home/sai:/bin/sh

```

31,1 Bot

Now I want to copy the file into all nodes

\$ ansible all -m copy -a 'src=/etc/passwd dest=/tmp'

Passwd file is copied into the temp of all nodes.

```

[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": true,
    "checksum": "85d4886ad8634789ef93794911a70d73d9a08ad3",
    "dest": "/tmp/passwd",
    "gid": 1000,
    "group": "ubuntu",
    "md5sum": "01305045ff3fc586b04d861aa9474849",
    "mode": "0664",
    "owner": "ubuntu",
    "size": 1596,
    "src": "/home/ubuntu/.ansible/tmp/ansible-tmp-1624339206.33-2150-145560470205831/sou
rce",
    "state": "file",
    "uid": 1000
}
ubuntu@ip-172-31-7-39:~$
```

To check the file which is copies

\$ ssh 172.31.12.239

\$ cd /tmp

\$ ls

\$ exit

Scenario:

I want to create tomcat users file in controller and copy the file in all the nodes

\$ sudo vim tomcat-users.xml

Created a file tomcat-users.xml

Go to Insert mode and copy the below code

```
<tomcat-users>
```

```
  <user username="training" password="freefree" roles="manager-script"/>
```

```
<tomcat-users>
```

```
:wq
```

```
ubuntu@ip-172-31-7-39: ~
<tomcat-users>
  <user username="training" password="freefree" roles="manager-script"/>
<tomcat-users>
~
```

```
$ ansible all -m copy -a 'src=tomcat-users.xml dest=/etc/tomcat8' -b
```

```
ubuntu@ip-172-31-7-39: ~$ sudo vim tomcat-users.xml
ubuntu@ip-172-31-7-39: ~$ ansible all -m copy -a 'src=tomcat-users.xml dest=/etc/tomcat8' -b
```

```
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "checksum": "c71aab26778a4df6df470fc91eaac72cd028eb11",
  "dest": "/etc/tomcat8/tomcat-users.xml",
  "gid": 115,
  "group": "tomcat8",
  "md5sum": "e577ee2b2d946d51ff87d5f20407a863",
  "mode": "0640",
  "owner": "root",
  "size": 107,
  "src": "/home/ubuntu/.ansible/tmp/ansible-tmp-1624339323.61-2242-130403953124046/source",
  "state": "file",
  "uid": 0
}
ubuntu@ip-172-31-7-39: ~$
```

To check the file

```
$ ssh 172.31.12.239
```

```
$ cd /etc/tomcat8
```

```
$ ls
```

Open that file to check the contents

```
$ sudo cat tomcat-users.xml
```

```
+++++
```

Ansible command to copy /etc/passwd file to all the managed nodes

```
$ ansible all -m copy -a 'src=/etc/passwd dest=/tmp'
```

```
+++++
```

Create a tomcat-users.xml file on controller and copy it into all managed nodes into default location of tomcat ie /etc/tomcat8

```
$ sudo vim tomcat-users.xml
```

Go to Insert mode

```
<tomcat-users>  
  <user username="training" password="freefree" roles="manager-script"/>
```

```
</tomcat-users>
```

```
:wq
```

```
$ ansible all -m copy -a 'src=tomcat-users.xml dest=/etc/tomcat8' -b
```

```
+++++
```

Create a file on the controller machine

```
$ cat > newfile1
```

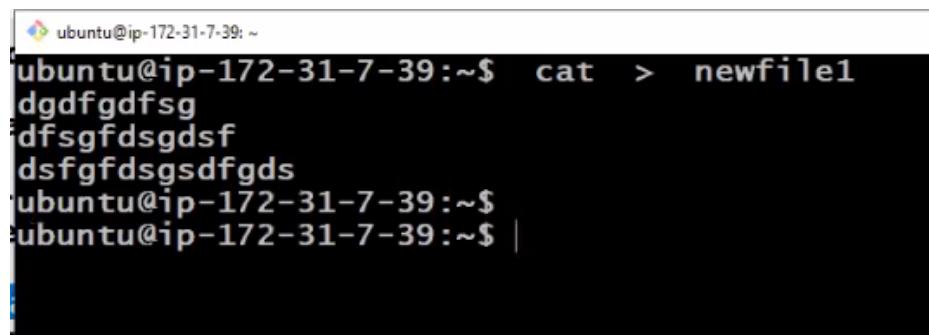
```
aaaa
```

```
bbbbbb
```

```
cccccc
```

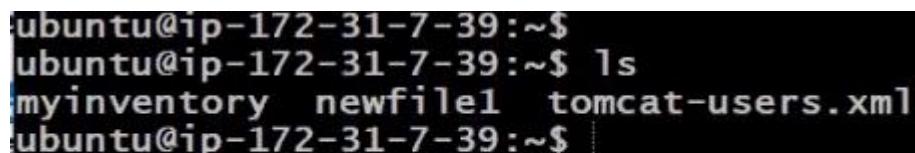
```
ddddd
```

```
Ctrl+d
```



```
ubuntu@ip-172-31-7-39:~$ cat > newfile1  
aaaa  
bbbbbb  
cccccc  
ddddd  
ubuntu@ip-172-31-7-39:~$ |
```

```
$ ls -l newfile1
```



```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ ls  
myinventory  newfile1  tomcat-users.xml  
ubuntu@ip-172-31-7-39:~$ |
```



```
ubuntu@ip-172-31-7-39:~$ ls -l  
total 12  
-rw-rw-r-- 1 ubuntu ubuntu 25 Jun 18 05:23 myinventory  
-rw-rw-r-- 1 ubuntu ubuntu 37 Jun 22 05:23 newfile1  
-rw-r--r-- 1 root root 107 Jun 22 05:21 tomcat-users.xml  
ubuntu@ip-172-31-7-39:~$ |
```

we get the permissions Ubuntu Ubuntu (owner & group)

rw-rw-r--

When we copy the file we have the same permissions

```
$ ansible all -m copy -a 'src=newfile1 dest=/home/ubuntu'
```

```
ubuntu@ip-172-31-7-39:~$ ansible all -m copy -a 'src=newfile1 dest=/home/ubuntu'
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.

172.31.7.134 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": true,
    "checksum": "4f5bcaaee7c40373cd318bef03a4608d1c07bb26f",
    "dest": "/home/ubuntu/newfile1",
    "gid": 1000,
    "group": "ubuntu",
    "md5sum": "aabc168b455c9ac5d1d05ab61593e046",
    "mode": "0664",
    "owner": "ubuntu",
    "size": 37,
    "src": "/home/ubuntu/.ansible/tmp/ansible-tmp-1624339451.59-2334-188964770556439/source",
    "state": "file",
    "uid": 1000
}
ubuntu@ip-172-31-7-39:~ |
```

To go to managed node and check the permissions on the file. It remains the same

```
$ ssh 172.31.39.33
```

```
ubuntu@ip-172-31-7-39:~$ ssh 172.31.7.134
ubuntu@ip-172-31-7-134:~$ * Management:      https://landscape.canonical.com
* Support:         https://ubuntu.com/advantage

System information as of Tue Jun 22 05:24:36 UTC 2021

System load:  0.0          Processes:           101
Usage of /:   36.4% of 7.69GB  Users logged in:     0
Memory usage: 34%
Swap usage:   0%          IP address for eth0:  172.31.7.134
                           IP address for docker0: 172.17.0.1

* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

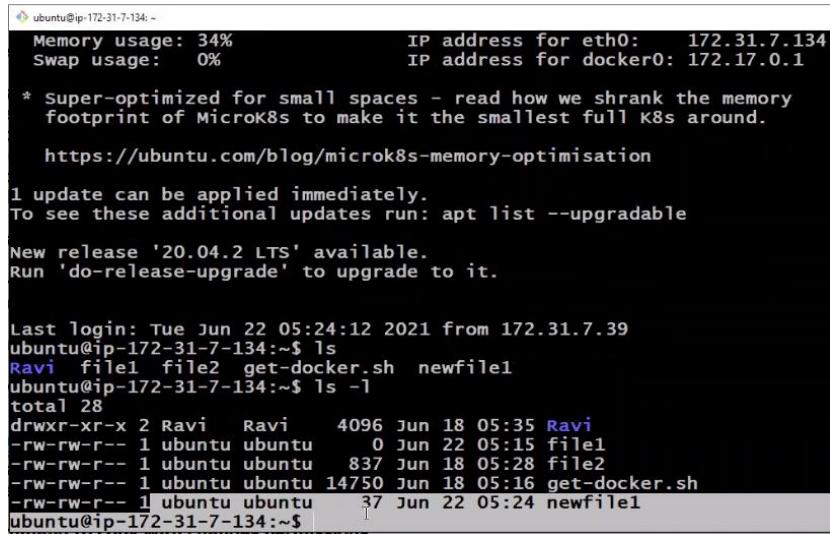
  https://ubuntu.com/blog/microk8s-memory-optimisation

1 update can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Tue Jun 22 05:24:12 2021 from 172.31.7.39
ubuntu@ip-172-31-7-134:~$ ls
Ravi  file1  file2  get-docker.sh  newfile1
ubuntu@ip-172-31-7-134:~$
```

```
$ ls -l newfile1
```



```
ubuntu@ip-172-31-7-134:~$ ls -l
Memory usage: 34%           IP address for eth0:  172.31.7.134
Swap usage:  0%           IP address for docker0: 172.17.0.1
* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.
  https://ubuntu.com/blog/microk8s-memory-optimisation

1 update can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

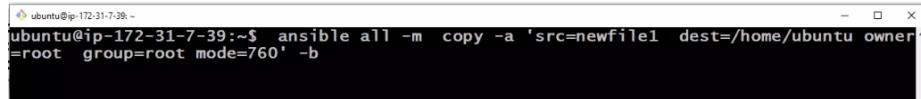
Last login: Tue Jun 22 05:24:12 2021 from 172.31.7.39
ubuntu@ip-172-31-7-134:~$ ls
Ravi  file1  file2  get-docker.sh  newfile1
ubuntu@ip-172-31-7-134:~$ ls -l
total 28
drwxr-xr-x 2 Ravi    Ravi       4096 Jun 18 05:35 Ravi
-rw-rw-r-- 1 ubuntu  ubuntu        0 Jun 22 05:15 file1
-rw-rw-r-- 1 ubuntu  ubuntu      837 Jun 18 05:28 file2
-rw-rw-r-- 1 ubuntu  ubuntu   14750 Jun 18 05:16 get-docker.sh
-rw-rw-r-- 1 ubuntu  ubuntu       37 Jun 22 05:24 newfile1
ubuntu@ip-172-31-7-134:~$
```

Observe meta data like owner & user is same while copying the files no changes occurred

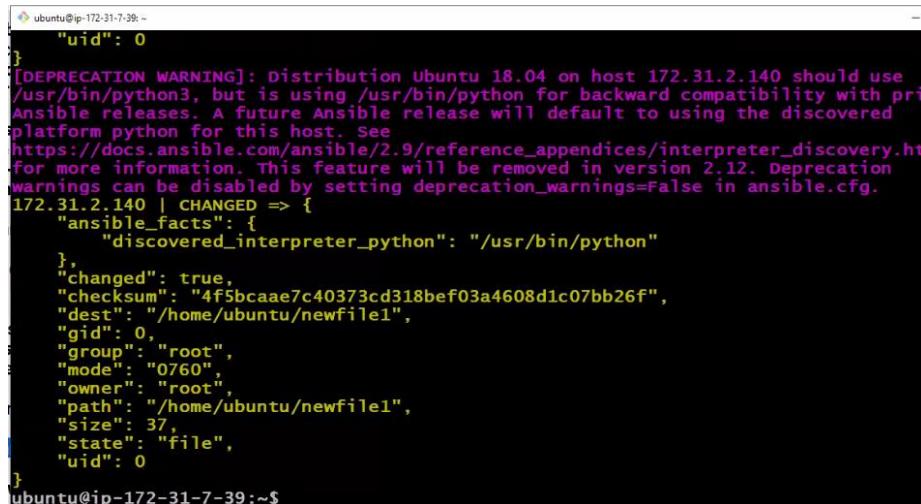
```
$ exit
```

Command to copy with changes permissions

```
$ ansible all -m copy -a 'src=newfile1 dest=/home/ubuntu owner=root group=root mode=760' -b
```



```
ubuntu@ip-172-31-7-39:~$ ansible all -m copy -a 'src=newfile1 dest=/home/ubuntu owner^
=root group=root mode=760' -b
```



```
ubuntu@ip-172-31-7-39:~$ 
  "uid": 0
}
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior
Ansible releases. A future Ansible release will default to using the discovered
platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html
for more information. This feature will be removed in version 2.12. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "checksum": "4f5bc当地7c40373cd318bef03a4608dic07bb26f",
  "dest": "/home/ubuntu/newfile1",
  "gid": 0,
  "group": "root",
  "mode": "0760",
  "owner": "root",
  "path": "/home/ubuntu/newfile1",
  "size": 37,
  "state": "file",
  "uid": 0
}
ubuntu@ip-172-31-7-39:~$
```

Now, go to node and check the permissions

```
$ ssh 172.31.35.79
```

```
$ ls -l newfile1
```

```
ubuntu@ip-172-31-7-134: ~
* Management:      https://landscape.canonical.com
* Support:        https://ubuntu.com/advantage

System information as of Tue Jun 22 05:25:56 UTC 2021

System load: 0.0          Processes:           101
Usage of /: 36.4% of 7.69GB  Users logged in:   0
Memory usage: 33%          IP address for eth0: 172.31.7.134
Swap usage: 0%             IP address for docker0: 172.17.0.1

* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

  https://ubuntu.com/blog/microk8s-memory-optimisation

1 update can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Tue Jun 22 05:25:35 2021 from 172.31.7.39
ubuntu@ip-172-31-7-134:~$ ls -l newfile1
-rwxrw---- 1 root root 37 Jun 22 05:24 newfile1
ubuntu@ip-172-31-7-134:~$
```

\$ exit

Notes:

Copy module is used to change the ownership, group ownership and permissions of the files that are copied to managed nodes.

```
$ ansible all -m copy -a 'src=newfile1 dest=/home/ubuntu owner=root group=root mode=760' -b
+++++
```

To copy the file , by replacing the old content with new content

```
$ ansible all -m copy -a 'content="sunil\n" dest=newfile1' -b
```

TO to managed node and check the content

```
$ ssh 172.31.11.96
```

```
$ sudo cat newfile1
```

```
$ exit
```

Notes: Copy module can also send content into the file

```
$ ansible all -m copy -a 'content="sunil\n" dest=newfile1' -b
+++++
```

Fetch Module (opposite of copy module)

Fetch some files from all the nodes to controller.

Go to managed node

```
$ ssh 172-31-35-79
```

```
ubuntu@ip-172-31-7-39:~$ ssh 172.31.7.134
```

```
$ cd /etc/tomcat8
```

```
ubuntu@ip-172-31-7-134:/etc/tomcat8$ * Documentation: https://help.ubuntu.com  
* Management: https://landscape.canonical.com  
* Support: https://ubuntu.com/advantage  
  
System information as of Tue Jun 22 05:27:43 UTC 2021  
  
System load: 0.0 Processes: 99  
Usage of /: 36.4% of 7.69GB Users logged in: 0  
Memory usage: 33% IP address for eth0: 172.31.7.134  
Swap usage: 0% IP address for docker0: 172.17.0.1  
  
* super-optimized for small spaces - read how we shrank the memory  
footprint of MicroK8s to make it the smallest full K8s around.  
  
https://ubuntu.com/blog/microk8s-memory-optimisation  
  
1 update can be applied immediately.  
To see these additional updates run: apt list --upgradable  
  
New release '20.04.2 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Tue Jun 22 05:25:57 2021 from 172.31.7.39  
ubuntu@ip-172-31-7-134:~$ cd /etc/tomcat8  
ubuntu@ip-172-31-7-134:/etc/tomcat8$ |
```

```
$ ls
```

```
ubuntu@ip-172-31-7-134:/etc/tomcat8$ System information as of Tue Jun 22 05:27:43 UTC 2021  
  
System load: 0.0 Processes: 99  
Usage of /: 36.4% of 7.69GB Users logged in: 0  
Memory usage: 33% IP address for eth0: 172.31.7.134  
Swap usage: 0% IP address for docker0: 172.17.0.1  
  
* Super-optimized for small spaces - read how we shrank the memory  
footprint of MicroK8s to make it the smallest full K8s around.  
  
https://ubuntu.com/blog/microk8s-memory-optimisation  
  
1 update can be applied immediately.  
To see these additional updates run: apt list --upgradable  
  
New release '20.04.2 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Tue Jun 22 05:25:57 2021 from 172.31.7.39  
ubuntu@ip-172-31-7-134:~$ cd /etc/tomcat8  
ubuntu@ip-172-31-7-134:/etc/tomcat8$ ls  
catalina jaspic-providers.xml server.xml  
catalina.properties logging.properties tomcat-users.xml  
context.xml policy.d web.xml  
ubuntu@ip-172-31-7-134:/etc/tomcat8$ |
```

There is server.xml file in node1, node2, and in 3.

I want to fetch the file (server.xml) from node to controller

```
$ exit ( come back to controller )
```

```
ubuntu@ip-172-31-7-134:/etc/tomcat8$  
ubuntu@ip-172-31-7-134:/etc/tomcat8$ exit  
logout  
Connection to 172.31.7.134 closed.  
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$
```

```
$ ansible all -m fetch -a 'src=/etc/tomcat8/server.xml dest=/tmp' -b
```

```
ubuntu@ip-172-31-7-39:~$ ansible all -m fetch -a 'src=/etc/tomcat8/server.xml' -b
```

```
tmp' -b
172.31.7.134 | CHANGED => {
  "changed": true,
  "checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "dest": "/tmp/172.31.7.134/etc/tomcat8/server.xml",
  "md5sum": "a8b44ad6308de3b7fabb90fefef1b829d",
  "remote_checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "remote_md5sum": null
}
172.31.3.46 | CHANGED => {
  "changed": true,
  "checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "dest": "/tmp/172.31.3.46/etc/tomcat8/server.xml",
  "md5sum": "a8b44ad6308de3b7fabb90fefef1b829d",
  "remote_checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "remote_md5sum": null
}
172.31.2.140 | CHANGED => {
  "changed": true,
  "checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "dest": "/tmp/172.31.2.140/etc/tomcat8/server.xml",
  "md5sum": "a8b44ad6308de3b7fabb90fefef1b829d",
  "remote_checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "remote_md5sum": null
}
ubuntu@ip-172-31-7-39:~$ |
```

Now to got tmp folder

```
$ cd /tmp
```

```
$ ls
```

```
ubuntu@ip-172-31-7-39:/tmp
"remote_md5sum": null
}
172.31.3.46 | CHANGED => {
  "changed": true,
  "checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "dest": "/tmp/172.31.3.46/etc/tomcat8/server.xml",
  "md5sum": "a8b44ad6308de3b7fabb90fefef1b829d",
  "remote_checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "remote_md5sum": null
}
172.31.2.140 | CHANGED => {
  "changed": true,
  "checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "dest": "/tmp/172.31.2.140/etc/tomcat8/server.xml",
  "md5sum": "a8b44ad6308de3b7fabb90fefef1b829d",
  "remote_checksum": "c25f380d2c7acc83caec5c6dde5bc7e2cc7b7f3b",
  "remote_md5sum": null
}
ubuntu@ip-172-31-7-39:~$ cd /tmp
ubuntu@ip-172-31-7-39:/tmp$ ls
172.31.2.140
172.31.3.46
172.31.7.134
systemd-private-dedb4a051f7c4a6bb6c39808c72140ad-systemd-resolved.service-1dxcqk
systemd-private-dedb4a051f7c4a6bb6c39808c72140ad-systemd-timesyncd.service-fjsui5
ubuntu@ip-172-31-7-39:/tmp$
```

Created directory

Inside directory server.xml available

You will find three folders. The names of the folders are IP address of managed nodes

```
$ cd 172.31.35.102
```

```
$ ls
```

```
$ cd etc  
$ ls  
$ cd tomcat8  
$ ls
```

```
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140/etc/tomcat8$  
ubuntu@ip-172-31-7-39:/tmp$ cd 172.31.2.140  
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140$  
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140$ ls  
etc  
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140$ cd etc/  
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140/etc$  
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140/etc$ ls  
tomcat8  
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140/etc$ cd tomcat8/  
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140/etc/tomcat8$ ls  
server.xml  
ubuntu@ip-172-31-7-39:/tmp/172.31.2.140/etc/tomcat8$
```

Notes:

Fetch module is used to copy files from managed nodes to controller.

Command to copy tomcat-server.xml file from all managed nodes into /tmp folder on the controller.

```
$ ansible all -m fetch -a 'src=/etc/tomcat8/server.xml dest=/tmp' -b
```

Git Modules

Used to download the files from the git repository

This is used to perform git version controlling on the managed nodes.

```
ansible all -m git -a 'repo=https://github.com/sunildevops77/repo1.git dest=/tmp/mygit' -b
```

```
ubuntu@ip-172-31-7-39:~$ ansible all -m git -a 'repo=https://github.com/sunildevops77^/repo1.git dest=/tmp/mygit' -b|
```

```

ubuntu@ip-172-31-7-39:~$ ansible all -m git -a 'repo=https://github.com/sunildevops77/rep1.git dest=/tmp/mygit' -b
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | FAILED! => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "msg": "Failed to find required executable git in paths: /usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin"
}
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use

```

The above command will download the files in all managed nodes.

Go to managed node and check

```
$ ssh 172.31.35.79
```

```
$ cd /tmp
```

```
$ ls
```

```
$ cd mygit
```

```
$ ls
```

```
$ exit
```

Notes:

Ansible command to clone remote git repository into all managed nodes

```
ansible all -m git -a 'repo=https://github.com/sunildevops77/rep1.git dest=/tmp/mygit' -b
```

```
+++++
```

Service Module

This is used for starting/ stoping / restarting the services.

Ansible command to restart tomcat8 on all managed nodes

```
$ ansible all -m service -a 'name=tomcat8 state=restarted' -b
```

```

ubuntu@ip-172-31-7-39:~$ ansible all -m service -a 'name=tomcat8 state=restarted' -b

```

```

ubuntu@ip-172-31-7-39: ~
"TimeoutStopusec": "5min",
"TimerSlackNsec": "50000",
"Transient": "no",
"Type": "forking",
"UID": "[not set]",
"UMask": "reset": "enabled",
"UnitFilestate": "generated",
"UtmpMode": "init",
"WantedBy": "graphical.target multi-user.target",
"Wants": "network-online.target",
"WatchdogTimestamp": "Tue 2021-06-22 04:59:42 UTC",
"WatchdogTimestampMonotonic": "17713277",
"Watchdogusec": "0"
}
}
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior
Ansible releases. A future Ansible release will default to using the discovered
platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html
for more information. This feature will be removed in version 2.12. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },

```

state=restarted is for restarting a service

state=stopped is for stopping a running service

state=started is for starting a stopped service

Replace module

Go to managed node

\$ ssh 172.31.36.52

```

ubuntu@ip-172-31-3-46: ~
* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:       https://ubuntu.com/advantage

System information as of Tue Jun 22 05:38:47 UTC 2021

System load: 0.05          Processes:           100
Usage of /: 36.4% of 7.69GB  Users logged in:      0
Memory usage: 33%          IP address for eth0:   172.31.3.46
Swap usage: 0%              IP address for docker0: 172.17.0.1

* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

  https://ubuntu.com/blog/microk8s-memory-optimisation

1 update can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Tue Jun 22 05:37:09 2021 from 172.31.7.39
ubuntu@ip-172-31-3-46:~$ |

```

```
$ cd /etc/tomcat8/
```

```
$ ls
```

```
ubuntu@ip-172-31-3-46: /etc/tomcat8
System load: 0.05          Processes: 100
Usage of /: 36.4% of 7.69GB  Users logged in: 0
Memory usage: 33%          IP address for eth0: 172.31.3.46
Swap usage: 0%              IP address for docker0: 172.17.0.1

* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

  https://ubuntu.com/blog/microk8s-memory-optimisation

1 update can be applied immediately.
To see these additional updates run: apt list --upgradable

New release '20.04.2 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

Last login: Tue Jun 22 05:37:09 2021 from 172.31.7.39
ubuntu@ip-172-31-3-46:~$ cd /etc/tomcat8/
ubuntu@ip-172-31-3-46:/etc/tomcat8$
ubuntu@ip-172-31-3-46:/etc/tomcat8$ ls
Catalina          jaspic-providers.xml    server.xml
catalina.properties  logging.properties   tomcat-users.xml
context.xml        policy.d               web.xml
ubuntu@ip-172-31-3-46:/etc/tomcat8$ |
```

Server.xml contains port number where tomcat runs

```
$ sudo vim server.xml
```

Look for connector port , to see the port number in which it is running. (line 74)

```
Documentation at /docs/config/service.html
-->
<Service name="Catalina">

  <!--The connectors can use a shared executor, you can define one or more named thread pools-->
  <!--
  <Executor name="tomcatThreadPool" namePrefix="catalina-exec-"
            maxThreads="150" minSpareThreads="4"/>
  -->

  <!-- A "Connector" represents an endpoint by which requests are received
       and responses are returned. Documentation at :
       Java HTTP Connector: /docs/config/http.html
       Java AJP Connector: /docs/config/ajp.html
       APR (HTTP/AJP) Connector: /docs/apr.html
       Define a non-SSL/TLS HTTP/1.1 Connector on port 8080
  -->
  <Connector port="8080" protocol="HTTP/1.1"
             connectionTimeout="20000"
             redirectPort="8443" />
  <!-- A "Connector" using the shared thread pool-->
  <!--
  <Connector executor="tomcatThreadPool"
```

69_1

34%

Now, we want to change the port number on all managed nodes, in this scenario

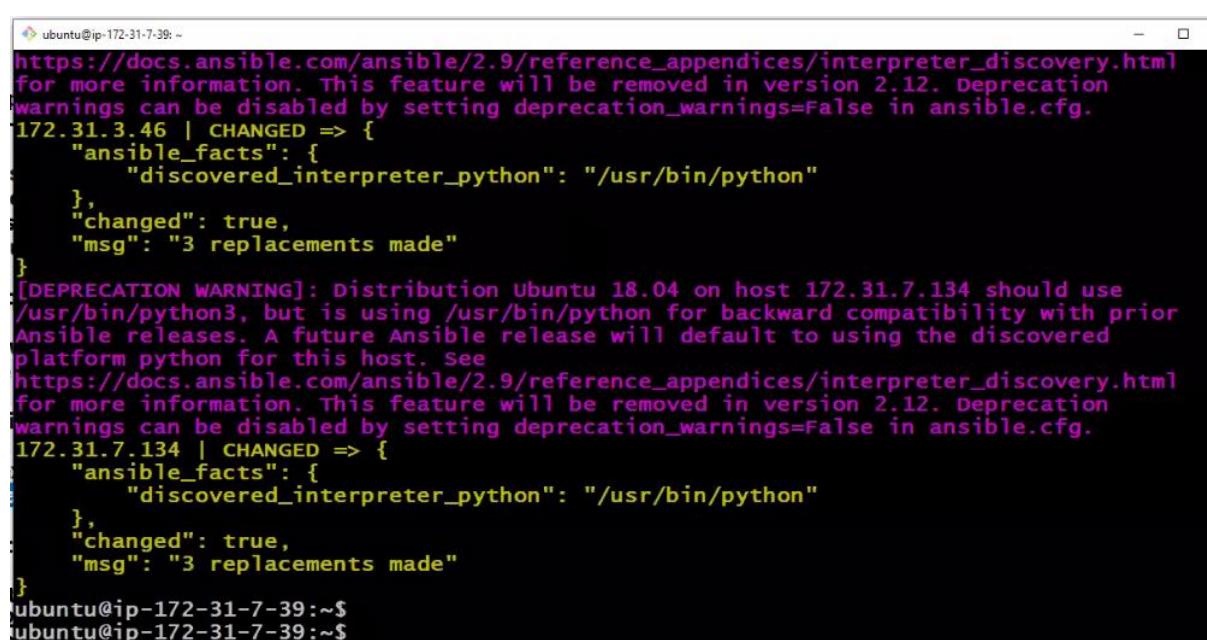
we use replace module.

Quit the server.xml file

```
$ exit ( to come back to controller )  
$ ansible all -m replace -a 'regexp=8080 replace=9090 path=/etc/tomcat8/server.xml' -b  
'regexp=regular expression'
```

Should mention complete path of the file()

Lets check tomcat is responding on 9090 port in managed node



```
ubuntu@ip-172-31-7-39:~$ https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html  
for more information. This feature will be removed in version 2.12. Deprecation  
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.  
172.31.3.46 | CHANGED => {  
    "ansible_facts": {  
        "discovered_interpreter_python": "/usr/bin/python"  
    },  
    "changed": true,  
    "msg": "3 replacements made"  
}  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use  
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior  
Ansible releases. A future Ansible release will default to using the discovered  
platform python for this host. See  
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html  
for more information. This feature will be removed in version 2.12. Deprecation  
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.  
172.31.7.134 | CHANGED => {  
    "ansible_facts": {  
        "discovered_interpreter_python": "/usr/bin/python"  
    },  
    "changed": true,  
    "msg": "3 replacements made"  
}  
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$
```

Get public DNS from aws

ec2-13-251-114-207.ap-southeast-1.compute.amazonaws.com

ec2-13-234-48-168.ap-south-1.compute.amazonaws.com

Open Browser

URL --- ec2-13-251-114-207.ap-southeast-1.compute.amazonaws.com:9090

We will not get the page, because we need to restart the service

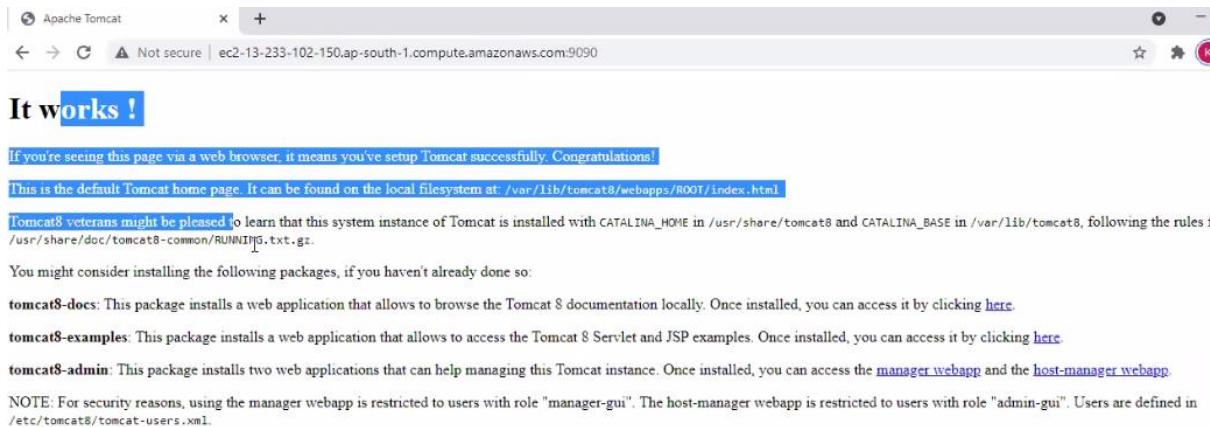
```
$ ansible all -m service -a 'name=tomcat8 state=restarted' -b
```

```

ubuntu@ip-172-31-7-39: ~
},
"changed": true,
"msg": "3 replacements made"
}
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior
Ansible releases. A future Ansible release will default to using the discovered
platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html
for more information. This feature will be removed in version 2.12. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "msg": "3 replacements made"
}
ubuntu@ip-172-31-7-39: ~$ 
ubuntu@ip-172-31-7-39: ~$ 
ubuntu@ip-172-31-7-39: ~$ 
ubuntu@ip-172-31-7-39: ~$ 
ubuntu@ip-172-31-7-39: ~$ ansible all -m service -a 'name=tomcat8 state=restarted'
' -b

```

Now, try the above URL --- it Works!!—runs On 9090 port



replace module

This is used for replacing a specific string with other string.

Ex:

Ansible command to change the port number of tomcat from 8080 to 9090

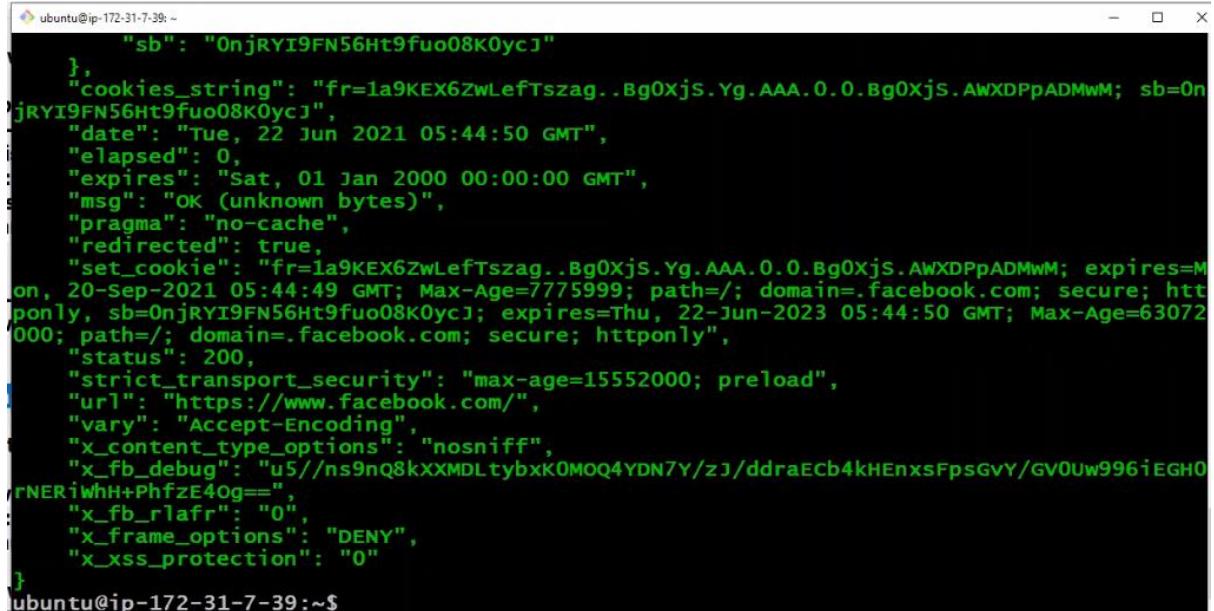
```
$ ansible all -m replace -a 'regexp=8080 replace=9090 path=/etc/tomcat8/server.xml' -b
```

uri module

cant able to check multiple sites with single argument so in this case we use playbooks

I want to check facebook is reachable for not in all managed nodes.

```
$ ansible all -m uri -a 'url=http://facebook.com'
```



```
ubuntu@ip-172-31-7-39:~$ ansible all -m uri -a 'url=http://facebook.com'
{
    "body": "OnjRYI9FN56Ht9fuo08k0ycJ",
    "cookies_string": "fr=la9KEX6ZwLeftszag..Bg0Xjs.Yg.AAA.O.O.Bg0Xjs.AWXDPpADMwM; sb=OnjRYI9FN56Ht9fuo08k0ycJ",
    "date": "Tue, 22 Jun 2021 05:44:50 GMT",
    "elapsed": 0,
    "expires": "Sat, 01 Jan 2000 00:00:00 GMT",
    "msg": "OK (unknown bytes)",
    "pragma": "no-cache",
    "redirected": true,
    "set_cookie": "fr=la9KEX6ZwLeftszag..Bg0Xjs.Yg.AAA.O.O.Bg0Xjs.AWXDPpADMwM; expires=Mon, 20-Sep-2021 05:44:49 GMT; Max-Age=7775999; path=/; domain=.facebook.com; secure; httponly, sb=OnjRYI9FN56Ht9fuo08k0ycJ; expires=Thu, 22-Jun-2023 05:44:50 GMT; Max-Age=63072000; path=/; domain=.facebook.com; secure; httponly",
    "status": 200,
    "strict_transport_security": "max-age=15552000; preload",
    "url": "https://www.facebook.com/",
    "vary": "Accept-Encoding",
    "x_content_type_options": "nosniff",
    "x_fb_debug": "u5//ns9nQ8kXXMDLtybxK0MOQ4YDN7Y/zJ/ddraEcb4kHENxsFpsGvY/GV0Uw996iEGH0rNERiWhH+PhfzE40g==",
    "x_fb_rlafr": "0",
    "x_frame_options": "DENY",
    "x_xss_protection": "0"
}
ubuntu@ip-172-31-7-39:~$
```

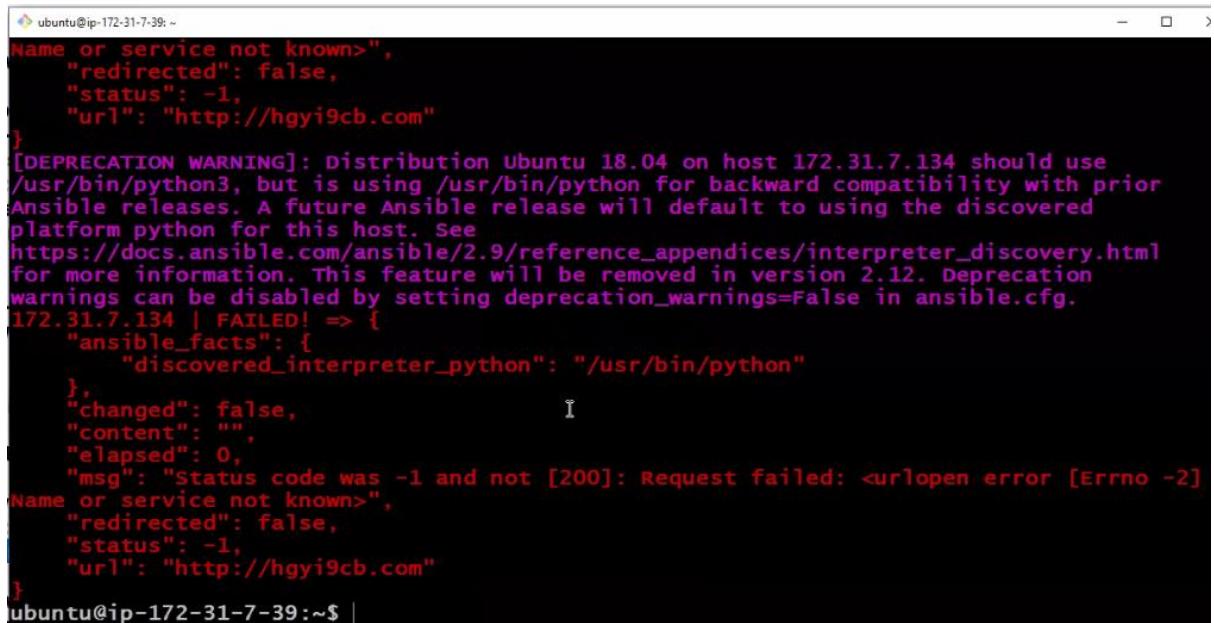
In the output (green color) status - 200

200=perfect reachable

Give a invalid url , we get status as -1

Ex:

```
$ ansible all -m uri -a 'url=http://hgyi9cb.com'
```



```
ubuntu@ip-172-31-7-39:~$ ansible all -m uri -a 'url=http://hgyi9cb.com'
{
    "body": "Name or service not known",
    "changed": false,
    "content": "",
    "elapsed": 0,
    "msg": "Status code was -1 and not [200]: Request failed: <urlopen error [Errno -2] Name or service not known>",
    "redirected": false,
    "status": -1,
    "url": "http://hgyi9cb.com"
}
ubuntu@ip-172-31-7-39:~$ |
```

Status=-1 not reachable

Now, I want to stop tomcat in all managed nodes (Just repeat)

```
$ ansible all -m service -a 'name=tomcat8 state=stopped' -b
```

Notes:

url module is used to check if the url is reachable or not.

Command to check if facebook.com is reachable on all managed nodes.

```
$ ansible all -m uri -a 'url=http://facebook.com status=200'
```

+++++

Lets have an example of all modules

Requirement: I want to install tomcat all manages nodes , then i want to copy users.xml in all managed nodes,

I want to change port number of tomcat , then i want to restart the service, finally i want to check url is reachable or not.

1st we need to uninstall tomcat in all managed nodes.

```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$  ansible all -m apt -a 'name=tomcat8 state=absent purge=yes'  
' -b
```

```
$ ansible all -m apt -a 'name=tomcat8 state=absent purge=yes' -b
```

Installing tomcat8

```
$ ansible all -m apt -a 'name=tomcat8 state=present' -b
```

Copy the users.xml file in managed nodes

```
$ ansible all -m copy -a 'src=tomcat-users.xml dest=/etc/tomcat8' -b
```

Change the port no.

```
$ ansible all -m replace -a 'regexp=8080 replace=9090 path=/etc/tomcat8/server.xml' -b
```

Restart the service

```
$ ansible all -m service -a 'name=tomcat8 state=restarted' -b
```

To check tomcat is running individually on all servers,

take the private ip of all nodes

172.31.11.96

172.31.6.207

172.31.12.138

```
$ ansible all -m uri -a 'url=http://172.31.11.96:9090'
```

It returns status as 200

Similarly check the other two nodes

```
$ ansible all -m uri -a 'url=http://172.31.6.207:9090'
```

```
$ ansible all -m uri -a 'url=http://172.31.12.138:9090'
```

+++++

Notes:

Requirement.

I want to install tomcat all modules. Copy tomcat-users.xml in all managed nodes.

Change port number of tomcat from 8080 to 9090. Restart the tomcat8 service.

Finally i want to check url is reachable or not.

```
$ ansible all -m apt -a 'name=tomcat8 state=present' -b
```

```
$ ansible all -m copy -a 'src=tomcat-users.xml dest=/etc/tomcat8' -b
```

```
$ ansible all -m replace -a 'regexp=8080 replace=9090 path=/etc/tomcat8/server.xml' -b
```

```
$ ansible all -m service -a 'name=tomcat8 state=restarted' -b
```

To check tomcat is running individually on all servers,
take the private ip of all nodes

172.31.11.96

172.31.6.207

172.31.12.138

```
$ ansible all -m uri -a 'url=http://172.31.11.96:9090 status=200'
```

It returns status as 200

Similarly check the other two nodes

```
$ ansible all -m uri -a 'url=http://172.31.6.207:9090 status=200'
```

```
$ ansible all -m uri -a 'url=http://172.31.12.138:9090 status=200'
```

Play books

Notes:

Adhoc commands are capable of working only on one module and one set of arguments.

When we want to perform complex configuration management activities,

adhoc commands will be difficult to manage.

In such scenarios, we use play books.

Play book is combination of plays.

Each play (each module) is designed to do some activity on the managed nodes.

These plays are created to work on single host or a group of hosts or all the hosts.

The main advantage of play books is reusability.

Play books are created using yaml files.

```
$ mkdir playbooks
```

```
ubuntu@ip-172-31-7-39:~$ mkdir playbooks
ubuntu@ip-172-31-7-39:~$ 
ubuntu@ip-172-31-7-39:~$ 
ubuntu@ip-172-31-7-39:~$ |
```

```
$ cd playbooks
```

```
ubuntu@ip-172-31-7-39:~/playbooks
ubuntu@ip-172-31-7-39:~$ ls
myinventory  newfile1  tomcat-users.xml
ubuntu@ip-172-31-7-39:~$ mkdir playbooks
ubuntu@ip-172-31-7-39:~$ 
ubuntu@ip-172-31-7-39:~$ 
ubuntu@ip-172-31-7-39:~$ cd playbooks/
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ls
ubuntu@ip-172-31-7-39:~/playbooks$ |
```

```
$ vim playbook1.yml (name of activity what it does)
```

INSERT mode

(Install git = 1st task and clone a remote repository=2nd task then apt module state :present so git installed

Host all=all managed nodes

Which helps in downloading the repository to all the nodes)

```
---
```

```
- name: Install git and clone a remote repository (name of theplaybook)
```

```
  hosts: all
```

```
  tasks:
```

```
    - name: Install git (name of theplay)
```

```
      apt:
```

```
        name: git
```

```
        state: present
```

```
        update_cache: yes
```

```
    - name: clone remote git repository (name of 2nd play)
```

```
      git:
```

```
repo: https://github.com/sunilkumark11/git-9am-batch.git (url)
```

```
dest: /home/ubuntu/newgit (where we want to clone)
```

```
...
```

```
ubuntu@ip-172-31-7-39: ~/playbooks
-----
- name: Install git and clone a remote repository
  hosts: all
  tasks:
    - name: Install git
      apt:
        name: git
        state: present
        update_cache: yes
    - name: clone remote git repository
      git:
        repo: https://github.com/sunilkumark11/git-9am-batch.git
        dest: /home/ubuntu/newgit
...
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
~
:wg
```

```
ubuntu@ip-172-31-7-39:~/playbooks
ubuntu@ip-172-31-7-39:~$ ls
myinventory  newfile1  tomcat-users.xml
ubuntu@ip-172-31-7-39:~$ mkdir playbooks
ubuntu@ip-172-31-7-39:~$
ubuntu@ip-172-31-7-39:~$
ubuntu@ip-172-31-7-39:~$ cd playbooks/
ubuntu@ip-172-31-7-39:~/playbooks$
ubuntu@ip-172-31-7-39:~/playbooks$ ls
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook1.yml
ubuntu@ip-172-31-7-39:~/playbooks$
ubuntu@ip-172-31-7-39:~/playbooks$ ls
playbook1.yml
ubuntu@ip-172-31-7-39:~/playbooks$
```

To check the syntax:

```
$ ansible-playbook playbook1.yml --syntax-check
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
myinventory newfile1 tomcat-users.xml
ubuntu@ip-172-31-7-39:~$ mkdir playbooks
ubuntu@ip-172-31-7-39:~$ 
ubuntu@ip-172-31-7-39:~$ cd playbooks/
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ls
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook1.yml
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ls
playbook1.yml
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook1.yml --syntax-check
playbook: playbook1.yml
ubuntu@ip-172-31-7-39:~/playbooks$ |
```

(Do not use tab when creating yml file)

To run the playbook

```
$ ansible-playbook playbook1.yml -b
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook1.yml -b
PLAY [Install git and clone a remote repository] ****
TASK [Gathering Facts] ****
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.2.140]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior
```

Play: install git and clone a remote repository== if some one runs then able to know what it does so we can give name like this

Taks gathering facts: on which ip address it install like node1,2,3

```
ubuntu@ip-172-31-7-39: ~/playbooks
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior
Ansible releases. A future Ansible release will default to using the discovered
platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html
for more information. This feature will be removed in version 2.12. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior
Ansible releases. A future Ansible release will default to using the discovered
platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html
for more information. This feature will be removed in version 2.12. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.2.140]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior
Ansible releases. A future Ansible release will default to using the discovered
platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html
for more information. This feature will be removed in version 2.12. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [Install git] ****
```

Task: install git

```
ubuntu@ip-172-31-7-39: ~/playbooks
Ansible releases. A future Ansible release will default to using the discovered
platform python for this host. See
https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html
for more information. This feature will be removed in version 2.12. Deprecation
warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [Install git] ****
changed: [172.31.2.140]
changed: [172.31.3.46]
changed: [172.31.7.134]

TASK [clone remote git repository] ****
changed: [172.31.7.134]
changed: [172.31.3.46]
changed: [172.31.2.140]

PLAY RECAP ****
172.31.2.140 : ok=3    changed=2    unreachable=0    failed=0    skipped=0
                rescued=0   ignored=0
172.31.3.46  : ok=3    changed=2    unreachable=0    failed=0    skipped=0
                rescued=0   ignored=0
172.31.7.134 : ok=3    changed=2    unreachable=0    failed=0    skipped=0
                rescued=0   ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |
```

Task: clone remote git repository

Play recap:

Used for reusability if saved palybook

+++++

23rd June

- Playbook to configure tomcat8

- Variables in Playbook

- Global scope variables

- Host scope variables

- Play scope variables

- Working with Global Scope variables

- Working with Play scope variables

- Adding a new Node

- Grouping of Inventory file

How to check git version of all nodes

```
ubuntu@ip-172-31-7-39:~$ ansible all -m command -a 'git --version'
```

```
ubuntu@ip-172-31-7-39:~$ /2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED | rc=0 >>
git version 2.17.1
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED | rc=0 >>
git version 2.17.1
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | CHANGED | rc=0 >>
git version 2.17.1
ubuntu@ip-172-31-7-39:~$
```

2nd example on playbook

In last example we have created palybook1

```
ubuntu@ip-172-31-7-39: ~/playbooks
ubuntu@ip-172-31-7-39:~$ ls
myinventory  newfile1  playbooks  tomcat-users.xml
ubuntu@ip-172-31-7-39:~$ cd playbooks/
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ls
playbook1.yml
ubuntu@ip-172-31-7-39:~/playbooks$
```

Create user on all managed nodes and I want to copy passwd file.

```
$ vim playbook2.yml
```

```
---
- name: Create user and copy passwd file      (user)
  hosts: all
  tasks:
    - name: User creation (user)
      user:
        name: kiran
        password: sunilsunil
        uid: 6779
        home: /home/kiran
    - name: Copy password into users home dir
      copy:          (module)
        src: /etc/passwd
        dest: /home/kiran
...
```

Save and quit

```

ubuntu@ip-172-31-7-39: ~/playbooks

- name: Create user and copy passwd file
  hosts: all
  tasks:
    - name: User creation
      user:
        name: kiran
        password: sunilsunil
        uid: 6779
        home: /home/kiran
    - name: Copy password into users home dir
      copy:
        src: /etc/passwd
        dest: /home/kiran
...

```

\$:wq

Check the syntax:

\$ ansible-playbook playbook2.yml --syntax-check

```

ubuntu@ip-172-31-7-39:~/playbooks
ls
myinventory newfile1 playbooks tomcat-users.xml
cd playbooks/
ls
playbook1.yml
vim playbook2.yml
ls
ansible-playbook playbook2.yml --syntax-check
playbook: playbook2.yml

```

To run

\$ ansible-playbook playbook2.yml -b

```

ubuntu@ip-172-31-7-39:~/playbooks
ansible-playbook playbook2.yml --syntax-check
playbook: playbook2.yml
clear
ansible-playbook playbook2.yml -b
PLAY [Create user and copy passwd file] ****
TASK [Gathering Facts] ****
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.2.140]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled

```

```

ubuntu@ip-172-31-7-39: ~/playbooks
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [User creation] *****
[WARNING]: The input password appears not to have been hashed. The 'password' argument must be encrypted for this module to work properly.
changed: [172.31.2.140]
changed: [172.31.3.46]
changed: [172.31.7.134]

TASK [Copy password into users home dir] *****
changed: [172.31.3.46]
changed: [172.31.7.134]
changed: [172.31.2.140]

PLAY RECAP *****
172.31.2.140      : ok=3    changed=2    unreachable=0    failed=0    s
kipped=0  rescued=0  ignored=0
172.31.3.46      : ok=3    changed=2    unreachable=0    failed=0    s
kipped=0  rescued=0  ignored=0
172.31.7.134      : ok=3    changed=2    unreachable=0    failed=0    s
kipped=0  rescued=0  ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |

```

We see user creation, copy pwd into users home dir, play recap all successfully completed.

TO check user is created in managed nodes:

```
$ ssh 172.31.2.173
```

```
$ vim /etc/passwd
```

To check if passwd file is copied to /home/kiran

```
$ cd /home/kiran
```

```
$ ls
```

```
$ exit
```

Ex 3: Playbook to configure tomcat8 (earlier example)

Note:tomcat already installed so if u try to install tomcat again it shows in green color means already installed in all nodes.

Changed =false

```

ubuntu@ip-172-31-7-39: ~/playbooks
discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false
}
[DEPRECATION WARNING]: distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false
}
ubuntu@ip-172-31-7-39:~/playbooks$ |

```

1st uninstall tomcat

```
$ ansible all -m apt -a 'name=tomcat8 state=absent purge=yes' -b
```

```
$ vim playbook3.yml
```

```

ubuntu@ip-172-31-7-39: ~/playbooks
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ls
playbook1.yml  playbook2.yml
ubuntu@ip-172-31-7-39:~/playbooks$  vim playbook3.yml|

```

```

- name: Configure tomcat8
  hosts: all
  tasks:
    - name: Install tomcat8
      apt:
        name: tomcat8
        state: present
    - name: copy tomcat-users.xml file
      copy:
        src: /home/ubuntu/tomcat-users.xml
        dest: /etc/tomcat8

```

```
- name: change port of tomcat from 8080 to 9090
```

```
replace:
```

```
regexp: 8080
```

```
replace: 9090
```

```
path: /etc/tomcat8/server.xml
```

```
- name: restart tomcat8
```

```
service:
```

```
name: tomcat8
```

```
state: restarted
```

```
- name: check url response of server 1
```

```
uri:
```

```
url: http://172.31.7.134:9090
```

```
- name: check url response of server 2
```

```
uri:
```

```
url: http://172.31.3.46:9090
```

```
...
```

```
ubuntu@ip-172-31-7-39: ~/playbooks
apt:
  name: tomcat8
  state: present
- name: copy tomcat-users.xml file
  copy:
    src: /home/ubuntu/tomcat-users.xml
    dest: /etc/tomcat8
- name: change port of tomcat from 8080 to 9090
  replace:
    regexp: 8080
    replace: 9090
    path: /etc/tomcat8/server.xml
- name: restart tomcat8
  service:
    name: tomcat8
    state: restarted
- name: check url response of server 1
  uri:
    url: http://172.31.7.134:9090
- name: check url response of server 2
  uri:
    url: http://172.31.3.46:9090
...
-- INSERT --
```

```
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$ ls  
playbook1.yml playbook2.yml  
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook3.yml  
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$ ls  
playbook1.yml playbook2.yml playbook3.yml  
ubuntu@ip-172-31-7-39:~/playbooks$
```

\$ ansible-playbook playbook3.yml --syntax-check

```
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$ ls  
playbook1.yml playbook2.yml  
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook3.yml  
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$ ls  
playbook1.yml playbook2.yml playbook3.yml  
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook3.yml --syntax-check  
playbook: playbook3.yml  
ubuntu@ip-172-31-7-39:~/playbooks$
```

\$ ansible-playbook playbook3.yml -b

```
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook3.yml -b
```

```
ubuntu@ip-172-31-7-39:~/playbooks$  
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook3.yml -b  
PLAY [Configure tomcat8] *****  
TASK [Gathering Facts] *****
```

```
ubuntu@ip-172-31-7-39: ~/playbooks
discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.2.140]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [Install tomcat8] ****

```

```
ubuntu@ip-172-31-7-39: ~/playbooks
TASK [Install tomcat8] ****
changed: [172.31.2.140]
changed: [172.31.7.134]
changed: [172.31.3.46]

TASK [copy tomcat-users.xml file] ****
changed: [172.31.7.134]
changed: [172.31.3.46]
changed: [172.31.2.140]

TASK [change port of tomcat from 8080 to 9090] ****
[WARNING]: The value 9090 (type int) in a string field was converted to u'9090' (type string). If this does not look like what you expect, quote the entire value to ensure it does not change.
[WARNING]: The value 8080 (type int) in a string field was converted to u'8080' (type string). If this does not look like what you expect, quote the entire value to ensure it does not change.
changed: [172.31.7.134]
changed: [172.31.2.140]
changed: [172.31.3.46]

TASK [restart tomcat8] ****

```

```
ubuntu@ip-172-31-7-39: ~/playbooks
TASK [restart tomcat8] ****
changed: [172.31.3.46]
changed: [172.31.2.140]
changed: [172.31.7.134]

TASK [check url response of server 1] ****
ok: [172.31.3.46]
ok: [172.31.7.134]
ok: [172.31.2.140]

TASK [check url response of server 2] ****
ok: [172.31.2.140]
ok: [172.31.7.134]
ok: [172.31.3.46]

PLAY RECAP ****
172.31.2.140 : ok=7    changed=4    unreachable=0    failed=0    s
kippe
d=0    rescued=0    ignored=0
172.31.3.46 : ok=7    changed=4    unreachable=0    failed=0    s
kippe
d=0    rescued=0    ignored=0
172.31.7.134 : ok=7    changed=4    unreachable=0    failed=0    s
kippe
d=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$
```

url is checking so it is in green color , if any changes made we see in yellow color

+++++

Requirment:

Install apache2 in all managed nodes, Place our own content in default homepage

```
$ cd playbooks
```

```
$ vim playbook4.yml
```

```
---
```

```
- name: configuring apache2
  hosts: all
  tasks:
    - name: Install apache2
      apt:
        name: apache2
        state: present
```

Save and quit

```
$ ansible-playbook playbook4.yml -b
```

To check apache2 is installed

```
$ ssh 172.31.12.239
```

(Homepage of apache2 is present in /var/www/html)

```
$ cd /var/www/html
```

```
$ ls
```

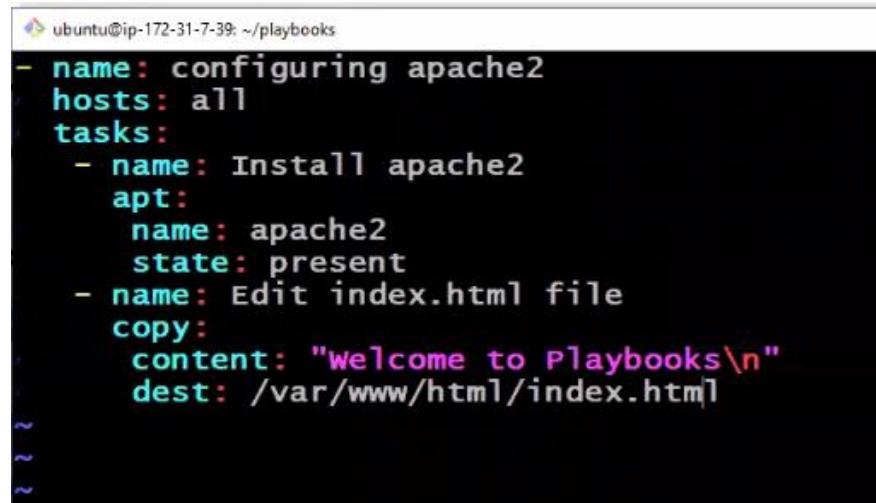
we get index.html (this html file is default homepage of apache)

Editing the index.html page

This is possible using copy module.

```
$ exit
```

```
$ vim playbook4.yml
```



```
ubuntu@ip-172-31-7-39: ~/playbooks
- name: configuring apache2
  hosts: all
  tasks:
    - name: Install apache2
      apt:
        name: apache2
        state: present
    - name: Edit index.html file
      copy:
        content: "Welcome to Playbooks\n"
        dest: /var/www/html/index.html
```

```
- name: configuring apache2
  hosts: all
  tasks:
    - name: Install apache2
      apt:
        name: apache2
        state: present
    - name: Edit index.html file
      copy:
        content: "Welcome to Playbooks\n"
        dest: /var/www/html/index.html
```

save and quit

```
$ ansible-playbook playbook4.yml -b
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook4.yml
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook4.yml -b
PLAY [configuring apache2] ****
TASK [Gathering Facts] ****
```

```
ubuntu@ip-172-31-7-39:~/playbooks
discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.2.140]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [Install apache2] ****
```

```
ubuntu@ip-172-31-7-39:~/playbooks
/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [Install apache2] ****
changed: [172.31.2.140]
changed: [172.31.7.134]
changed: [172.31.3.46]

TASK [Edit index.html file] ****
changed: [172.31.3.46]
changed: [172.31.7.134]
changed: [172.31.2.140]

PLAY RECAP ****
172.31.2.140 : ok=3    changed=2    unreachable=0    failed=0    s
kippe=0    rescued=0    ignored=0
172.31.3.46 : ok=3    changed=2    unreachable=0    failed=0    s
kippe=0    rescued=0    ignored=0
172.31.7.134 : ok=3    changed=2    unreachable=0    failed=0    s
kippe=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$
```

Apache 2 install in all nodes and index.html gets modified.

+++++

How to open url in terminal?

by using elinks

Ex:

```
$ elinks http://google.com
```

We get error (elinks not found)

```
ubuntu@ip-172-31-7-39:~/playbooks$ elinks http://google.com
Command 'elinks' not found, but can be installed with:
sudo apt install elinks
ubuntu@ip-172-31-7-39:~/playbooks$
```

Let's install elinks

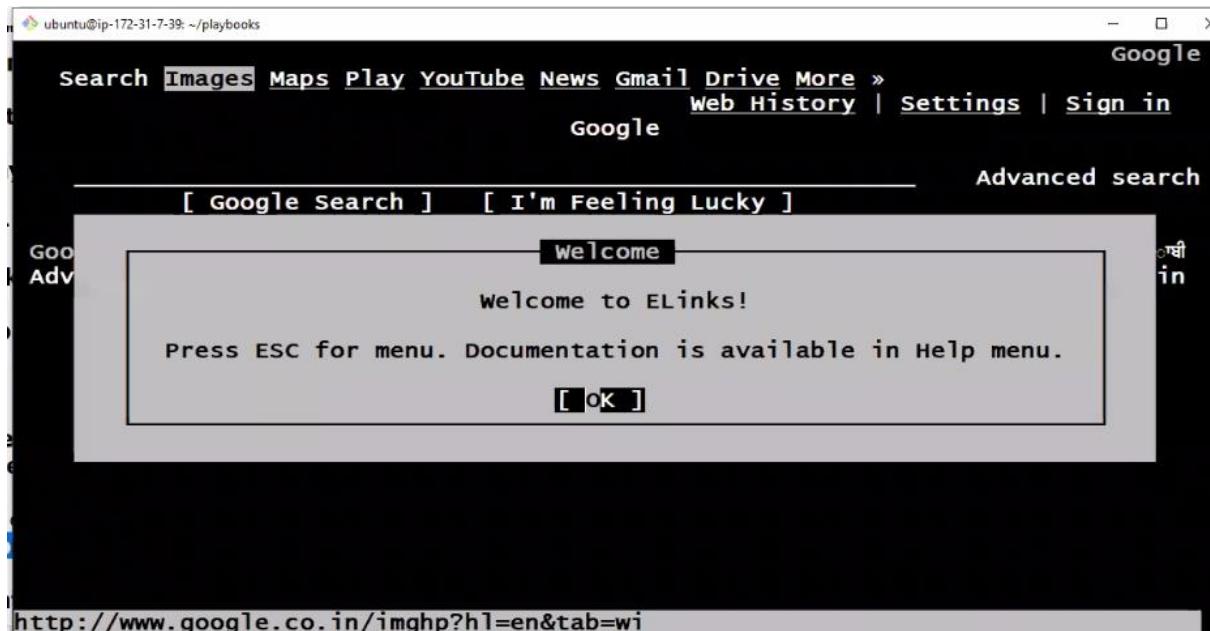
```
$ sudo apt-get install -y elinks
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ elinks http://google.com
Command 'elinks' not found, but can be installed with:
sudo apt install elinks
ubuntu@ip-172-31-7-39:~/playbooks$ sudo apt-get install -y elinks
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  elinks-data libfsplib0 liblua5.1-0 libtre5
Suggested packages:
  elinks-doc tre-agrep
The following NEW packages will be installed:
  elinks elinks-data libfsplib0 liblua5.1-0 libtre5
0 upgraded, 5 newly installed, 0 to remove and 6 not upgraded.
Need to get 1062 kB of archives.
After this operation, 3777 kB of additional disk space will be used.
Get:1 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 libfsplib0 amd64 0.11-2 [13.1 kB]
Get:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu bionic/universe amd64 liblua5.1-0 amd64 5.1.5-8.1build2 [100 kB]
5% [2 liblua5.1-0 0 B/100 kB 0%]
```

Now run the command

```
$ elinks http://google.com
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ elinks http://google.com
```



:q -exit

Now we want to look at index.html file in managed nodes

\$ elinks http://15.207.99.5

After editing the index.html file, i need to restart the service and check the url response



\$ vim playbook4.yml

- name: configuring apache2

hosts: all

tasks:

- name: Install apache2
 - apt:
 - name: apache2
 - state: present
 - name: Edit index.html file
 - copy:
 - content: "Welcome to playbooks\n"
 - dest: /var/www/html/index.html
 - name: Restart apache2
 - service:
 - name: apache2
 - state: restarted
 - name: check url response of server1
 - uri:
 - url: http://172.31.7.134
 - status: 200
 - name: check url response of server2
 - uri:
 - url: http://172.31.3.46
 - status: 200
 - name: check url response of server3
 - uri:
 - url: http://172.31.2.140
 - status: 200

...

```

ubuntu@ip-172-31-7-39: ~/playbooks
  name: apache2
  state: present
- name: Edit index.html file
  copy:
    content: "Welcome to playbooks\n"
    dest: /var/www/html/index.html
- name: Restart apache2
  service:
    name: apache2
    state: restarted
- name: check url response of server1
  uri:
    url: http://172.31.7.134
    status: 200
- name: check url response of server2
  uri:
    url: http://172.31.3.46
    status: 200
- name: check url response of server3
  uri:
    url: http://172.31.2.140
    status: 200
...
:wq

```

ansible-playbook playbook4.yml -b

```

ubuntu@ip-172-31-7-39: ~/playbooks
ubuntu@ip-172-31-7-39: ~/playbooks$ vim playbook4.yml
ubuntu@ip-172-31-7-39: ~/playbooks$ 
ubuntu@ip-172-31-7-39: ~/playbooks$ ansible-playbook playbook4.yml -b
PLAY [configuring apache2] ****
TASK [Gathering Facts] ****

```

```

ubuntu@ip-172-31-7-39: ~/playbooks
discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]
[DEPRECATION WARNING]: distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]
[DEPRECATION WARNING]: distribution Ubuntu 18.04 on host 172.31.2.140 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.2.140]

TASK [Install apache2] ****

```

```
ubuntu@ip-172-31-7-39: ~/playbooks
TASK [Install apache2] ****
ok: [172.31.2.140]
ok: [172.31.3.46]
ok: [172.31.7.134]

TASK [Edit index.html file] ****
changed: [172.31.3.46]
changed: [172.31.2.140]
changed: [172.31.7.134]

TASK [Restart apache2] ****
changed: [172.31.2.140]
changed: [172.31.3.46]
changed: [172.31.7.134]

TASK [check url response of server1] ****
fatal: [172.31.2.140]: FAILED! => {"changed": false, "msg": "Unsupported parameters for (uri) module: status Supported parameters include: attributes, backup, body, body_format, client_cert, client_key, content, creates, delimiter, dest, directory_mode, follow, follow_redirects, force, force_basic_auth, group, headers, http_agent, method, mode, owner, regexp, remote_src, removes, return_content, slevel, serole, setype, seuser, src, status_code, timeout, unix_socket, unsafe_writes, url, url_password, url_username, use_proxy, validate_certs"}
```

```
ubuntu@ip-172-31-7-39: ~/playbooks
fatal: [172.31.3.46]: FAILED! => {"changed": false, "msg": "Unsupported parameters for (uri) module: status Supported parameters include: attributes, backup, body, body_format, client_cert, client_key, content, creates, delimiter, dest, directory_mode, follow, follow_redirects, force, force_basic_auth, group, headers, http_agent, method, mode, owner, regexp, remote_src, removes, return_content, slevel, serole, setype, seuser, src, status_code, timeout, unix_socket, unsafe_writes, url, url_password, url_username, use_proxy, validate_certs"}
fatal: [172.31.7.134]: FAILED! => {"changed": false, "msg": "Unsupported parameters for (uri) module: status Supported parameters include: attributes, backup, body, body_format, client_cert, client_key, content, creates, delimiter, dest, directory_mode, follow, follow_redirects, force, force_basic_auth, group, headers, http_agent, method, mode, owner, regexp, remote_src, removes, return_content, slevel, serole, setype, seuser, src, status_code, timeout, unix_socket, unsafe_writes, url, url_password, url_username, use_proxy, validate_certs"}

PLAY RECAP ****
172.31.2.140      : ok=4    changed=2    unreachable=0    failed=1    s
skipped=0    rescued=0    ignored=0
172.31.3.46      : ok=4    changed=2    unreachable=0    failed=1    s
skipped=0    rescued=0    ignored=0
172.31.7.134      : ok=4    changed=2    unreachable=0    failed=1    s
skipped=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |
```

url is not responding so we need to remove status checks:200 in yaml file and edit the playbook and lets update the new yaml file for getting without any errors.

```
ubuntu@ip-172-31-7-39: ~/playbooks
ubuntu@ip-172-31-7-39:~/playbooks$ vi playbook4.yml |
```

```
ubuntu@ip-172-31-7-39: ~/playbooks
tasks:
  - name: Install apache2
    apt:
      name: apache2
      state: present
  - name: Edit index.html file
    copy:
      content: "Welcome to playbooks\n"
      dest: /var/www/html/index.html
  - name: Restart apache2
    service:
      name: apache2
      state: restarted
  - name: check url response of server1
    uri:
      url: http://172.31.7.134
  - name: check url response of server2
    uri:
      url: http://172.31.3.46
  - name: check url response of server3
    uri:
      url: http://172.31.2.140
...|
```

```
ubuntu@ip-172-31-7-39: ~/playbooks
ubuntu@ip-172-31-7-39:~/playbooks$ vi playbook4.yml
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook4.yml -b
```

```
ubuntu@ip-172-31-7-39: ~/playbooks
ubuntu@ip-172-31-7-39:~/playbooks$ vi playbook4.yml
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook4.yml -b
PLAY [configuring apache2] ****
TASK [Gathering Facts] ****
```

```
ubuntu@ip-172-31-7-39: ~/playbooks
discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.2.140]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]
TASK [Install apache2] ****
```

```

ubuntu@ip-172-31-7-39:~/playbooks
TASK [check url response of server1] ****
ok: [172.31.3.46]
ok: [172.31.2.140]
ok: [172.31.7.134]

TASK [check url response of server2] ****
ok: [172.31.3.46]
ok: [172.31.2.140]
ok: [172.31.7.134]

TASK [check url response of server3] ****
ok: [172.31.3.46]
ok: [172.31.2.140]
ok: [172.31.7.134]

PLAY RECAP ****
172.31.2.140 : ok=7    changed=1    unreachable=0    failed=0    s
kipped=0    rescued=0   ignored=0
172.31.3.46 : ok=7    changed=1    unreachable=0    failed=0    s
kipped=0    rescued=0   ignored=0
172.31.7.134 : ok=7    changed=1    unreachable=0    failed=0    s
kipped=0    rescued=0   ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |

```

Now url is ok .

Notes:

Ex: Ansible playbook for configure apache2

+++++

Creating reusable playbooks using variables

3 Types of variables

- 1) Global scope variables (highest priority) - we pass values from command prompt
- 2) Host scope variables
- 3) play scope variables (least priority)

Ex of Global scope variables

\$ vim playbook5.yml

```

- name: Install software packages-----
  hosts: all
  tasks:
    - name: Install/uninstall/update etc      -----
      apt:           -----installing software
        name: tree      (package=tree)
        state: present (install =present)

```

```
update_cache: yes
```

```
...
```

If we run the above play book 10 times, what happens? tree package will install 10 times.

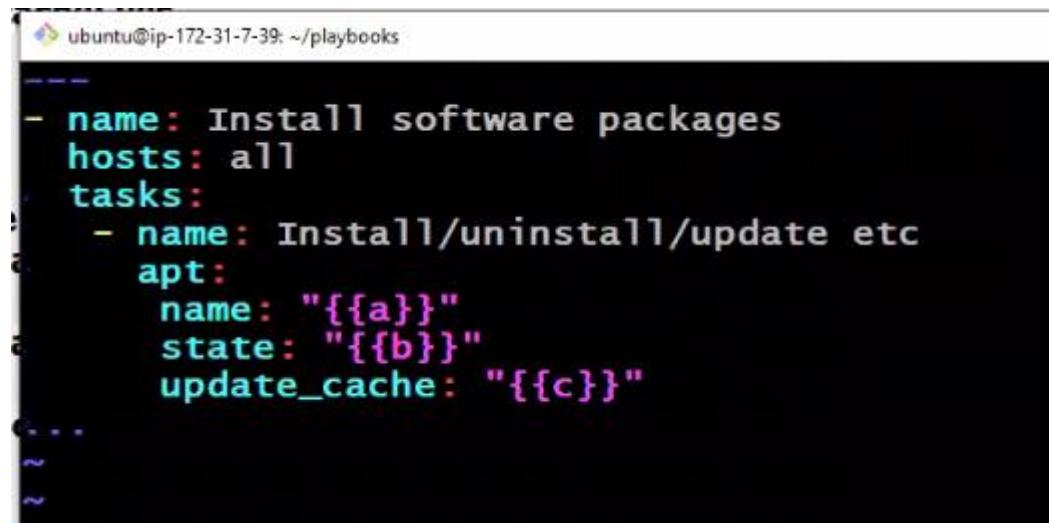
The above play book is not reusable.

we make small changes to the above code

```
$ vim playbook5.yml
```

```
---
```

```
- name: Install software packages
  hosts: all
  tasks:
    - name: Install/uninstall/update etc
      apt:
        name: "{{a}}"
        state: "{{b}}"
        update_cache: "{{c}}"
...
```



```
ubuntu@ip-172-31-7-39: ~/playbooks
---
- name: Install software packages
  hosts: all
  tasks:
    - name: Install/uninstall/update etc
      apt:
        name: "{{a}}"
        state: "{{b}}"
        update_cache: "{{c}}"
```

To run the playbook by passing values to the variables

```
$ ansible-playbook playbook5.yml --extra-vars "a=git b=absent c=no" -b  
--extra-vars== syntax of variables
```

A=git

B= absent means git uninstall

C=no means update cache no

-b= highest privileges

The image shows two terminal windows side-by-side. The left window shows the command being run: `ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook5.yml`, followed by the command `ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook5.yml --extra-vars "a=git b=absent c=no" -b`. The right window shows the execution output:

```
PLAY [Install software packages] ****  
TASK [Gathering Facts] ****  
  
ok: [172.31.2.140]  
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.  
ok: [172.31.7.134]  
  
TASK [Install/uninstall/update etc] ****  
ok: [172.31.2.140]  
ok: [172.31.3.46]  
ok: [172.31.7.134]  
  
PLAY RECAP ****  
172.31.2.140 : ok=2    changed=0    unreachable=0    failed=0    s  
kipped=0    rescued=0    ignored=0  
172.31.3.46 : ok=2    changed=0    unreachable=0    failed=0    s  
kipped=0    rescued=0    ignored=0  
172.31.7.134 : ok=2    changed=0    unreachable=0    failed=0    s  
kipped=0    rescued=0    ignored=0  
  
ubuntu@ip-172-31-7-39:~/playbooks$ |
```

Greencolor means already there no changes.

Terminate playbook while executing -ctrl+c

(The above command will uninstall git from all nodes)

Run the same playbook with diffrent values means uninstall

```
$ ansible-playbook playbook5.yml --extra-vars "a=tree b=present c=no" -b
```

The image shows a single terminal window displaying the command and its execution output:

```
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook5.yml --extra-vars "a=tree b=present c=no" -b  
PLAY [Install software packages] ****  
TASK [Gathering Facts] ****
```

```

ubuntu@ip-172-31-7-39: ~/playbooks
ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [Install/uninstall/update etc] ****
ok: [172.31.2.140]
ok: [172.31.3.46]
ok: [172.31.7.134]

PLAY RECAP ****
172.31.2.140 : ok=2    changed=0    unreachable=0    failed=0    s
skipped=0    rescued=0   ignored=0
172.31.3.46  : ok=2    changed=0    unreachable=0    failed=0    s
skipped=0    rescued=0   ignored=0
172.31.7.134: ok=2    changed=0    unreachable=0    failed=0    s
skipped=0    rescued=0   ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |

```

+++++

Before going to host scope variables,

lets discuss play scope variables

Playscope variables are defined within the playbook and they can effect only in one single play.

Ex:

\$ vim playbook7.yml

- name: Using play scope variable

hosts: all

vars:

- a: tomcat8

- b: present

- c: no

tasks:

- name: Install tomcat8

```

apt:
  name: "{{a}}"
  state: "{{b}}"
  update_cache: "{{c}}"

...

```

In Vars we can mention variables and its task and in tasks mentioned same variables rather then run after creating playbooks.

```

ubuntu@ip-172-31-7-39: ~/playbooks
-----
- name: Using play scope variable
  hosts: all
  vars:
    - a: tomcat8
    - b: present
    - c: no
  tasks:
    - name: Install tomcat8
      apt:
        name: "{{a}}"
        state: "{{b}}"
        update_cache: "{{c}}"
...
~
```

\$ ansible-playbook playbook7.yml -b

```

ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook7.yml
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook7.yml -b
PLAY [Using play scope variable] ****
TASK [Gathering Facts] ****
```

```

ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [Install tomcat8] ****
ok: [172.31.2.140]
ok: [172.31.3.46]
ok: [172.31.7.134]

PLAY RECAP ****
172.31.2.140 : ok=2    changed=0    unreachable=0    failed=0    s
kippe=0    rescued=0    ignored=0
172.31.3.46 : ok=2    changed=0    unreachable=0    failed=0    s
kippe=0    rescued=0    ignored=0
172.31.7.134 : ok=2    changed=0    unreachable=0    failed=0    s
kippe=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$
```

(It will install tomcat8)

We can run by using extra vars from command line but writing below values tree, present no taking higher priority bcz they are global scope variable

```
$ ansible-playbook playbook7.yml --extra-vars "a=tree b=present c=no" -b
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook7.yml --extra-vars "a=tree b=present c=no" -b
PLAY [Using play scope variable] ****
TASK [Gathering Facts] ****
```

```
ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [Install tomcat8] ****
ok: [172.31.2.140]
ok: [172.31.3.46]
ok: [172.31.7.134]

PLAY RECAP ****
172.31.2.140 : ok=2    changed=0    unreachable=0    failed=0    s
skipped=0    rescued=0   ignored=0
172.31.3.46 : ok=2    changed=0    unreachable=0    failed=0    s
skipped=0    rescued=0   ignored=0
172.31.7.134: ok=2    changed=0    unreachable=0    failed=0    s
skipped=0    rescued=0   ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |
```

The above command will install tree because global scope variables have higher priority

Notes:

Playscope variables

These variables are defined at level of individual plays and they can effect only one play.

Ex:

- name: Using play scope variable

hosts: all

vars:

```
- a: tomcat8
```

```
- b: present
```

```
- c: no
```

tasks:

```
- name: Install tomcat8
```

```
apt:
```

```
  name: "{{a}}"
```

```
  state: "{{b}}"
```

```
  update_cache: "{{c}}"
```

```
---
```

Note: The above playbook works like a template, who's default behaviour is to install tomcat8

But, we can bypass that behaviour and make it work in some other software by passing the variables as extra vars

```
$ ansible-playbook playbook7.yml -b --extra-vars "a=tree b=present c=no" -b
```

The above command will install tree because global scope variables have higher priority

Notes:

Playscope variables

These variables are defined at level of individual plays and they can effect only one play.

Ex:

```
---
```

```
- name: Using play scope variable
```

```
hosts: all
```

```
vars:
```

```
- a: tomcat8
```

```
- b: present
```

```
- c: no
```

tasks:

```
- name: Install tomcat8
```

```
apt:  
  name: "{{a}}"  
  state: "{{b}}"  
  update_cache: "{{c}}"  
...  
...
```

Note: The above playbook works like a template, who's default behaviour is to install tomcat8

But, we can bypass that behaviour and make it work in some other software by passing the variables as extra vars

Today we will discuss about host scope variables

Lets create one more managed node.

So, we will have 1 controller 4 nodes.

In step 6 -- Add rule -- All Traffic -- Anywhere

Check the version in the new node

```
$ python3 --version
```

We need to downgrade the machines from python3 to Python2

To downgrade

```
$ sudo apt-get update
```

```
$ sudo apt-get dist-upgrade ( It will point to older apt repository where python2 is available)
```

```
$ sudo apt-get install -y python2.7 python-pip
```

Now check the version of python

```
$ python --version
```

Establish password less ssh connection

```
$ sudo passwd ubuntu
```

```
( lets give the password as ubuntu only )
```

```
$ sudo vim /etc/ssh/sshd_config
```

change

PasswordAuthentication yes

Save and QUIT

```
$ sudo service ssh restart
```

```
$ exit
```

++++++

Now, Connect to controller

Now , We need to generate ssh connections

```
$ ssh-keygen
```

Now copy the key to managed nodes

```
$ ssh-copy-id ubuntu@172.31.6.241 ( private Ip of server4 )
```

++++++

Now, we need to add the information of managed nodes in the inventory file.

Location of inventory file /etc/ansible

```
$ cd /etc/ansible
```

```
$ ls
```

```
$ sudo vim hosts
```

insert the private ip addresss of 4th server

save and quit

```
$ ansible all -a 'ls -la' ( you will get the list of the files in all managed nodes )
```

We can do grouping using [groupname]

Grouping dev,qa,prod inventory file.

Ex:

To do grouping

\$ sudo vim hosts

```
ubuntu@ip-172-31-7-39:~$  
ubuntu@ip-172-31-7-39:~$ cd /etc/ansible  
ubuntu@ip-172-31-7-39:/etc/ansible$  
ubuntu@ip-172-31-7-39:/etc/ansible$ ls  
ansible.cfg  hosts  roles  
ubuntu@ip-172-31-7-39:/etc/ansible$ sudo vim hosts|
```

```
ubuntu@ip-172-31-7-39:/etc/ansible  
172.31.7.134  
172.31.3.46  
172.31.2.140  
172.31.6.241  
# 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.  
## 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
```

[webserver]

172.31.11.96

172.31.6.207

[appserver]

172.31.12.138

[dbserver]

172.31.31.161

```

ubuntu@ip-172-31-7-39:/etc/ansible
[webserver]
172.31.7.134
172.31.3.46
[appserver]
172.31.2.140
[dbserver]
172.31.6.241
# 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.

## green.example.com
## blue.example.com
## 192.168.100.1
## 192.168.100.10
-- INSERT --

```

Save nd wq

+++++

\$ ansible appserver -a 'free' (It runs on one machine 172.31.12.138)

```

ubuntu@ip-172-31-7-39:/etc/ansible$ ansible appserver -a 'free'
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:     1002072      292568     191044        1064      518460      566068
Swap:          0          0          0
ubuntu@ip-172-31-7-39:/etc/ansible$ 

```

\$ ansible webserver -a 'free' (It runs on two machines)

```

ubuntu@ip-172-31-7-39:/etc/ansible$ ansible webserver -a 'free'
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.3.46 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:     1002072      293772     193532        1072      514768      563328
Swap:          0          0          0
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.7.134 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:     1002072      560760     164536        1076      276776      298772
Swap:          0          0          0
ubuntu@ip-172-31-7-39:/etc/ansible$ 

```

\$ ansible all -a 'free'

```

ubuntu@ip-172-31-7-39:/etc/ansible
Swap:      0       0       0
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.6.241 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.6.241 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:    1002072     154388     135356       772     712328     686064
Swap:      0         0         0
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.2.140 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
172.31.2.140 | CHANGED | rc=0 >>
      total        used        free      shared  buff/cache   available
Mem:    1002072     292748     190784      1064     518540     565892
Swap:      0         0         0
ubuntu@ip-172-31-7-39:/etc/ansible$ |

```

+++++

We can perform grouping on groups

\$ sudo vim hosts

[webserver]

172.31.11.96

172.31.6.207

[appserver]

172.31.12.138

[dbserver]

172.31.31.161

[india:children]-----Parent group

webserver

dbserver

Parent group: when you run particular tasks it will run in web server and db server.

\$ ansible india -a 'free'

Grouping in inventory file

\$ sudo vim /etc/ansible/hosts

[webserver]

172.31.11.96

172.31.6.207

[appserver]

172.31.12.138

[dbserver]

172.31.31.161

[india:children]

webserver

dbserver

June 24th

- Host scope variables
- Implementing loops
- Multiple modules with multiple with_items
- Handlers
- Error Handling

Host scope variables

These variables are classified into 2 types

- 1) Variables to work on group of hosts
- 2) Variables to work on single hosts

Variables to work on group of hosts

These variables are designed to work on group of machines (hosts.)

They are defined in a folder called group_vars

This group_vars folder should be present in the same folder where all the playbooks are present.

In this group_vars folder, we should create a file who's name is same as group_name in Inventory file.

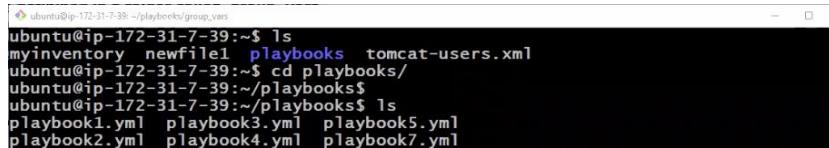
In this file we create variables.

Variable which works on group of hosts

```
$ cd ( enter)
```

```
$ cd playbooks
```

```
$ ls
```



```
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ ls
myinventory newfile1 playbooks tomcat-users.xml
ubuntu@ip-172-31-7-39:~/playbooks$
```

Variables which work in group of hosts are divided into two types

1) Variables which work in group of machines

2) Variables which work on one machine

Variables which work in group of machines

```
playbooks$ mkdir group_vars
```

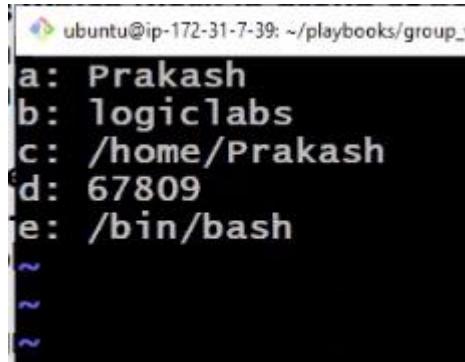
Note: group_vars folder should be present in the same location of playbook files.



```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
myinventory newfile1 playbooks tomcat-users.xml
ubuntu@ip-172-31-7-39:~/playbooks$ cd playbooks/
ubuntu@ip-172-31-7-39:~/playbooks$ ls
playbook1.yml playbook3.yml playbook5.yml
playbook2.yml playbook4.yml playbook7.yml
ubuntu@ip-172-31-7-39:~/playbooks$ mkdir group_vars
ubuntu@ip-172-31-7-39:~/playbooks$ cd group_vars
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$
```

```
$ cd group_vars
```

```
$ vim webserver
```



```
a: Prakash
b: logiclabs
c: /home/Prakash
d: 67809
e: /bin/bash
```

A,b,c,d, are the defines different variables

File name should be same as group name because it should map with variables in playbook when you run playbook

a: Prakash

b: logiclabs

c: /home/Prakash

d: 67809

e: /bin/bash

Save and Quit

\$ cd ..

```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
myinventory newfile1 playbooks tomcat-users.xml
ubuntu@ip-172-31-7-39:~/playbooks$ cd playbooks/
ubuntu@ip-172-31-7-39:~/playbooks$ ls
playbook1.yml playbook3.yml playbook5.yml
playbook2.yml playbook4.yml playbook7.yml
ubuntu@ip-172-31-7-39:~/playbooks$ mkdir group_vars
ubuntu@ip-172-31-7-39:~/playbooks$ cd group_vars/
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ vim webserver
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ 
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ cd ..
ubuntu@ip-172-31-7-39:~/playbooks$ |
ubuntu@ip-172-31-7-39:~/playbooks$ |
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
myinventory newfile1 playbooks tomcat-users.xml
ubuntu@ip-172-31-7-39:~/playbooks$ cd playbooks/
ubuntu@ip-172-31-7-39:~/playbooks$ ls
playbook1.yml playbook3.yml playbook5.yml
playbook2.yml playbook4.yml playbook7.yml
ubuntu@ip-172-31-7-39:~/playbooks$ mkdir group_vars
ubuntu@ip-172-31-7-39:~/playbooks$ cd group_vars/
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ vim webserver
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ 
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ cd ..
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars playbook2.yml playbook4.yml playbook7.yml
playbook1.yml playbook3.yml playbook5.yml
ubuntu@ip-172-31-7-39:~/playbooks$
```

playbooks\$ vim playbook8.yml

- name: Using host scope variables

hosts: webserver-----only run on webserver is a group

tasks:

```
- name: User creation
```

```
  user:
```

```
    name: "{{a}}"
```

```
    password: "{{b}}"
```

```
    home: "{{c}}"
```

```
    uid: "{{d}}"
```

```
    shell: "{{e}}"
```

```
...
```

save and quit

```
ubuntu@ip-172-31-7-39:~/playbooks
- name: Using host scope variables
  hosts: webserver
  tasks:
    - name: User creation
      user:
        name: "{{a}}"
        password: "{{b}}"
        home: "{{c}}"
        uid: "{{d}}"
        shell: "{{e}}"
...
~
~
~
```

TO run the playbook

```
$ ansible-playbook playbook8.yml -b ( It runs on two machines)
```

```
ubuntu@ip-172-31-7-39:~/playbooks
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars  playbook2.yml  playbook4.yml  playbook7.yml
playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook8.yml -b
PLAY [Using host scope variables] ****
TASK [Gathering Facts] ****
```

```
ubuntu@ip-172-31-7-39:~/playbooks
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.7.134 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]

TASK [User creation] ****
[WARNING]: The input password appears not to have been hashed. The 'password'
argument must be encrypted for this module to work properly.
changed: [172.31.3.46]
changed: [172.31.7.134]

PLAY RECAP ****
172.31.3.46 : ok=2    changed=1    unreachable=0    failed=0    s
172.31.7.134 : ok=2    changed=1    unreachable=0    failed=0    s
changed=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ ++++++
```

Lets add few more variables

```
$ cd group_vars
```

```
$ vim webserver
```

```
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ ls
group_vars    playbook2.yml  playbook4.yml  playbook7.yml
playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ cd group_vars/
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ ls
webserver
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$
```

```
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ ls
group_vars    playbook2.yml  playbook4.yml  playbook7.yml
playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ cd group_vars/
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ ls
webserver
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ vi webserver
```

```
ubuntu@ip-172-31-7-39:~/playbooks/group_vars
```

```
a: Prakash
b: logiclabs
c: /home/Prakash
d: 67809
e: /bin/bash
```

Add f g h variables and save

a: Prakash

b: durgasoft

c: /home/Prakash

d: 67809

e: /bin/bash

```
f: tree
```

```
g: present
```

```
h: no
```

```
save and quit
```

```
ubuntu@ip-172-31-7-39: ~/playbooks/group_vars$ vim playbook9.yml
a: Prakash
b: logiclabs
c: /home/Prakash
d: 67809
e: /bin/bash
f: tree
g: present
h: no
:wq
```

```
$ cd ..
```

```
$ vim playbook9.yml
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars  playbook2.yml  playbook4.yml  playbook7.yml
playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ cd group_vars/
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ ls
webserver
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ vi webserver
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ ls
webserver
ubuntu@ip-172-31-7-39:~/playbooks/group_vars$ cd ..
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars  playbook2.yml  playbook4.yml  playbook7.yml
playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook9.yml
```

```
---
```

```
- name: Using host scope variables
```

```
hosts: webserver
```

```
tasks:
```

```
- name: Install software
```

```
apt:
```

```
  name: "{{f}}"
```

```

state: "{{g}}"
update_cache: "{{h}}"

...

```

```

- name: Using host scope variables
  hosts: webserver
  tasks:
    - name: Install software
      apt:
        name: "{{f}}"
        state: "{{g}}"
        update_cache: "{{h}}"
...
~ 
~ 

```

Observe, its not necessary to use all variables we can use any one of them as per requirements.

\$ ansible-playbook playbook9.yml -b

```

ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook9.yml -b
PLAY [Using host scope variables] *****
TASK [Gathering Facts] *****

[2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.7.134]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]

TASK [Install software] *****
ok: [172.31.3.46]
ok: [172.31.7.134]

PLAY RECAP *****
172.31.3.46 : ok=2    changed=0    unreachable=0    failed=0    s
kiped=0    rescued=0    ignored=0
172.31.7.134 : ok=2    changed=0    unreachable=0    failed=0    s
kiped=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ 

```

```

ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars  playbook2.yml  playbook4.yml  playbook7.yml  playbook9.yml
playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ 

```

These variable whose values defined in separate file is called host scope variables.

Directory name can be anything

File name should be matched with group name.(hosts: webserver,, vim webserver)

+++++

Variables to work on single hosts

Variables to work on single hosts

These variables are designed on single machine.

That are created in folder called host vars

This host_wars folder should be created in the same location of where the playbooks are present.

```
playbooks$ mkdir host_vars
```

```
$ cd host_vars
```

```
$ vim 172.31.6.241      ( 172.31.6.241 private ip of server4 )
```

The variables which defined in particular file and specific to the particular server because mentioned servers ip address

```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars      playbook2.yml  playbook4.yml  playbook7.yml  playbook9.yml
playbook1.yml   playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ mkdir host_vars
ubuntu@ip-172-31-7-39:~/playbooks$ cd host_vars/
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ ls
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ vim 172.31.6.241
```

a: firewalld

b: present

c: yes

save and quit

```
ubuntu@ip-172-31-7-39:~/playbooks/host_vars
a: firewalld
b: present
c: yes
~
```

```
$ cd ..
```

```
$ vim playbook10.yml
```

```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars      playbook2.yml  playbook4.yml  playbook7.yml  playbook9.yml
playbook1.yml   playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ mkdir host_vars
ubuntu@ip-172-31-7-39:~/playbooks$ cd host_vars/
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ ls
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ vim 172.31.6.241
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ 
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ cd ..
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars      playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
host_vars       playbook2.yml  playbook4.yml  playbook7.yml  playbook9.yml
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook10.yml
```

- name: Use host scope variables

hosts: 172.31.6.241-----one particular machine

tasks:

- name: Install firewall

apt:

name: "{{a}}"

state: "{{b}}"

update_cache: "{{c}}"

...

```
ubuntu@ip-172-31-7-39:~/playbooks
-----
  - name: Use host scope variables
    hosts: 172.31.6.241
    tasks:
      - name: Install firewall
        apt:
          name: "{{a}}"
          state: "{{b}}"
          update_cache: "{{c}}"
...
~
```

save and quit

\$ ansible-playbook playbook10.yml -b

```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars  playbook2.yml  playbook4.yml  playbook7.yml  playbook9.yml
playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
ubuntu@ip-172-31-7-39:~/playbooks$ mkdir host_vars
ubuntu@ip-172-31-7-39:~/playbooks$ cd host_vars/
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ ls
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ vim 172.31.6.241
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ 
ubuntu@ip-172-31-7-39:~/playbooks/host_vars$ cd ..
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars  playbook1.yml  playbook3.yml  playbook5.yml  playbook8.yml
host_vars  playbook2.yml  playbook4.yml  playbook7.yml  playbook9.yml
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook10.yml
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook10.yml -b
PLAY [Use host scope variables] ****
TASK [Gathering Facts] ****
```

```

ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook10.yml -b
PLAY [Use host scope variables] ****
TASK [Gathering Facts] ****
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.6.241 should
use /usr/bin/python3, but is using /usr/bin/python for backward compatibility
with prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible
/2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.6.241]

TASK [Install firewall] ****
[WARNING]: updating cache and auto-installing missing dependency: python-apt
changed: [172.31.6.241]

PLAY RECAP ****
172.31.6.241 : ok=2    changed=1    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |

```

Implementing loops

Notes: Modules in ansible can be executed multiple times using loops.

\$ vim playbook11.yml

```

ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook11.yml

```

```

- name: Install software packages
  hosts: webserver
  tasks:
    - name: Install software
      apt:
        name: "{{item}}"
        state: present
        update_cache: no
    with_items:
      - tree
      - git
      - default-jdk
      - apache2
  ...

```

```

ubuntu@ip-172-31-7-39:~/playbooks
- name: Install software packages
  hosts: webserver
  tasks:
    - name: Install software
      apt:
        name: "{{item}}"
        state: present
        update_cache: no
    with_items:
      - tree
      - git
      - default-jdk
      - apache2
...
~
```

Item is keyword used to loops ; **With_items**= beginning of below loop and the playbook will execute 4 times as mentioned below.

tree

- git
- default-jdk
- apache2

\$ ansible-playbook playbook11.yml -b

```

ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook11.yml
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook11.yml -b
PLAY [Install software packages] ****
TASK [Gathering Facts] ****
```

```

ok: [172.31.7.134]
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use
/usr/bin/python3, but is using /usr/bin/python for backward compatibility with
prior Ansible releases. A future Ansible release will default to using the
discovered platform python for this host. See https://docs.ansible.com/ansible/
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]

TASK [Install software] ****
[DEPRECATION WARNING]: Invoking "apt" only once while using a loop via
squash_actions is deprecated. Instead of using a loop to supply multiple items
and specifying 'name: "{{item}}"', please use 'name: ['tree', 'git', 'default-
jdk', 'apache2']' and remove the loop. This feature will be removed in version
2.11. Deprecation warnings can be disabled by setting
deprecation_warnings=False in ansible.cfg.
[DEPRECATION WARNING]: Invoking "apt" only once while using a loop via
squash_actions is deprecated. Instead of using a loop to supply multiple items
and specifying 'name: "{{item}}"', please use 'name: ['tree', 'git', 'default-
jdk', 'apache2']' and remove the loop. This feature will be removed in version
2.11. Deprecation warnings can be disabled by setting
deprecation_warnings=False in ansible.cfg.
```

```

ubuntu@ip-172-31-7-39:~/playbooks$ 
TASK [Install software] ****
[DEPRECATION WARNING]: Invoking "apt" only once while using a loop via
squash_actions is deprecated. Instead of using a loop to supply multiple items
and specifying name: "{{item}}", please use name: ['tree', 'git', 'default-
jdk', 'apache2'] and remove the loop. This feature will be removed in version
2.11. Deprecation warnings can be disabled by setting
deprecation_warnings=False in ansible.cfg.
[DEPRECATION WARNING]: Invoking "apt" only once while using a loop via
squash_actions is deprecated. Instead of using a loop to supply multiple items
and specifying name: "{{item}}", please use name: ['tree', 'git', 'default-
jdk', 'apache2'] and remove the loop. This feature will be removed in version
2.11. Deprecation warnings can be disabled by setting
deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46] => (item=[u'tree', u'git', u'default-jdk', u'apache2'])
ok: [172.31.7.134] => (item=[u'tree', u'git', u'default-jdk', u'apache2'])

PLAY RECAP ****
172.31.3.46 : ok=2    changed=0    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
172.31.7.134 : ok=2    changed=0    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |

```

Ex: Playbook to install different s/w packages

\$ vim playbook11.yml

- name: Install software packages

hosts: webserver

tasks:

- name: Install software

apt:

name: "{{item}}"

state: present

update_cache: no

with_items:

- tree

- git

- default-jdk

- apache2

...

+++++

Requirement:

Tree needs to be installed

Git needs to be uninstalled

jdk needs to be updated

Apache needs to be installed and update cache

```
$ cd playbooks
```

```
$ vim playbook12.yml
```

```
[root@ip-172-31-7-39:~/playbooks]$ ls
group_vars      playbook10.yml  playbook3.yml  playbook7.yml
host_vars       playbook11.yml  playbook4.yml  playbook8.yml
playbook1.yml   playbook2.yml  playbook5.yml  playbook9.yml
[root@ip-172-31-7-39:~/playbooks$  vim playbook11.yml]
```

```
- name: Install software packages
```

```
hosts: webserver
```

```
tasks:
```

```
  - name: Install software
```

```
    apt:
```

```
      name: "{{item.a}}"
```

```
      state: "{{item.b}}"
```

```
      update_cache: "{{item.c}}"
```

```
    with_items:
```

```
      - {a: tree,b: present,c: no}
```

```
      - {a: git,b: absent,c: no}
```

```
      - {a: default-jdk,b: absent,c: no}
```

```
      - {a: apache2,b: present,c: yes}
```

...

save and quit

```

ubuntu@ip-172-31-7-39: ~/playbooks
```
- name: Install software packages
 hosts: webserver
 tasks:
 - name: Install software
 apt:
 name: "{{item.a}}"
 state: "{{item.b}}"
 update_cache: "{{item.c}}"
 with_items:
 - {a: tree,b: present,c: no}
 - {a: git,b: absent,c: no}
 - {a: default-jdk,b: absent,c: no}
 - {a: apache2,b: present,c: yes}
```
~|
```

loop with variable ex:item.a

\$ ansible-playbook playbook12.yml -b

```

ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars      playbook10.yml  playbook3.yml  playbook7.yml
host_vars       playbook11.yml  playbook4.yml  playbook8.yml
playbook1.yml   playbook2.yml  playbook5.yml  playbook9.yml
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook11.yml
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook12.yml
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook12.yml -b
PLAY [Install software packages] ****
TASK [Gathering Facts] ****
```

```

ubuntu@ip-172-31-7-39:~/playbooks
2.9/reference_appendices/interpreter_discovery.html for more information. This
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]

TASK [Install software] ****
ok: [172.31.7.134] => (item={'a': 'tree', 'c': False, 'b': 'present'})
ok: [172.31.3.46] => (item={'a': 'tree', 'c': False, 'b': 'present'})
changed: [172.31.3.46] => (item={'a': 'git', 'c': False, 'b': 'absent'})
changed: [172.31.7.134] => (item={'a': 'git', 'c': False, 'b': 'absent'})
changed: [172.31.3.46] => (item={'a': 'default-jdk', 'c': False, 'b': 'absent'})
changed: [172.31.7.134] => (item={'a': 'default-jdk', 'c': False, 'b': 'absent'})
ok: [172.31.3.46] => (item={'a': 'apache2', 'c': True, 'b': 'present'})
ok: [172.31.7.134] => (item={'a': 'apache2', 'c': True, 'b': 'present'})

PLAY RECAP ****
172.31.3.46      : ok=2    changed=1    unreachable=0    failed=0    s
kiped=0  rescued=0  ignored=0
172.31.7.134     : ok=2    changed=1    unreachable=0    failed=0    s
kiped=0  rescued=0  ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$
```

+++++

Ex: For working on multiple modules with multiple with_items.

Requirement: To create multiple users and files/directories in user's home directories.

```
$ vim playbook13.yml
```

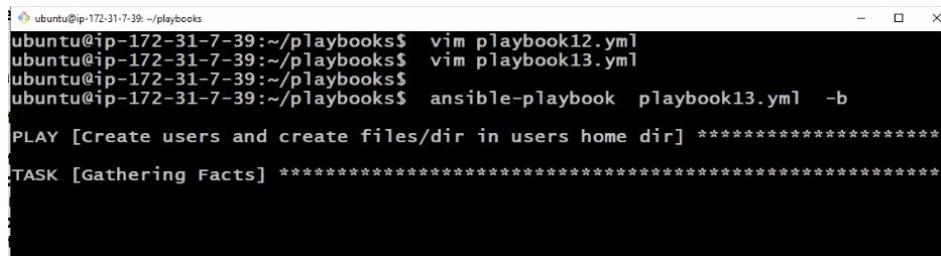
```
ubuntu@ip-172-31-7-39: ~/playbooks
-----
- name: Create users and create files/dir in users home dir
  hosts: all
  tasks:
    - name: Create multiple users
      user:
        name: "{{item.a}}"
        password: "{{item.b}}"
        home: "{{item.c}}"
      with_items:
        - {a: Farhan,b: durgasoft,c: /home/Farhan}
        - {a: Ravi,b: durgasoft,c: /home/ubuntu/Ravi}
    - name: creating files and directories in users home dir
      file:
        name: "{{item.a}}"
        state: "{{item.b}}"
      with_items:
        - {a: /home/Farhan/file1,b: touch}
        - {a: /home/ubuntu/Ravi/dir1,b: directory}
....
```

```
-----
- name: Create users and create files/dir in users home dir
  hosts: all
  tasks:
    - name: Create multiple users
      user:-----module1
        name: "{{item.a}}"
        password: "{{item.b}}"
        home: "{{item.c}}"
      with_items:-----loop for module1
        - {a: Farhan,b: durgasoft,c: /home/Farhan}
        - {a: Ravi,b: durgasoft,c: /home/ubuntu/Ravi}
    - name: creating files and directories in users home dir
      file:----- module2
        name: "{{item.a}}"
        state: "{{item.b}}"
      with_items:
        - {a: /home/Farhan/file1,b: touch}
```

```
- {a: /home/ubuntu/Ravi/dir1,b: directory}
```

...

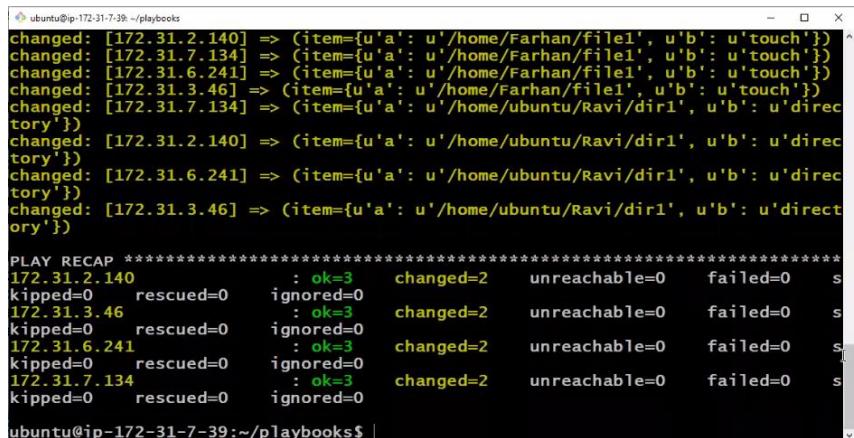
save and quit



```
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook12.yml
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook13.yml
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook13.yml -b
PLAY [Create users and create files/dir in users home dir] ****
TASK [Gathering Facts] ****
```

variables belongs to particular loop in module only

```
$ ansible-playbook playbook13.yml -b
```



```
ubuntu@ip-172-31-7-39:~/playbooks$ 
changed: [172.31.2.140] => (item={'a': '/home/Farhan/file1', 'b': 'touch'}) 
changed: [172.31.7.134] => (item={'a': '/home/Farhan/file1', 'b': 'touch'}) 
changed: [172.31.6.241] => (item={'a': '/home/Farhan/file1', 'b': 'touch'}) 
changed: [172.31.3.46] => (item={'a': '/home/Farhan/file1', 'b': 'touch'}) 
changed: [172.31.7.134] => (item={'a': '/home/ubuntu/Ravi/dir1', 'b': 'directory'}) 
changed: [172.31.2.140] => (item={'a': '/home/ubuntu/Ravi/dir1', 'b': 'directory'}) 
changed: [172.31.6.241] => (item={'a': '/home/ubuntu/Ravi/dir1', 'b': 'directory'}) 
changed: [172.31.3.46] => (item={'a': '/home/ubuntu/Ravi/dir1', 'b': 'directory'}) 

PLAY RECAP ****
172.31.2.140 : ok=3    changed=2    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
172.31.3.46 : ok=3    changed=2    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
172.31.6.241 : ok=3    changed=2    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
172.31.7.134 : ok=3    changed=2    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$
```

To check , user is created or not?

```
$ ssh 172.31.11.96
```

```
$ vim /etc/passwd
```

TO check files and dir are created or not

```
$ cd /home/Farhan
```

```
$ ls ( we can see the file)
```

```
$ cd
```

```
$ pwd
```

```
$ cd Ravi
```

```
$ ls ( we can see the dir )
```

```
$ exit  
+++++
```

Handlers

Handler is a piece of code which is executed, if some other module is executed successfully executed and it has made some changes.

Handlers are always executed only after all the tasks are executed.(2 sections 1.handler section, 2.task scetion)

Handlers are executed in the order that are mentioned in the handler section, and not in the order they are called in the tasks section.

Even if handler is called multiple times in the tasks section, it will be executed only once.

Requirement:

```
$ vim playbook14.yml
```

```
---
```

```
- name: Configure apache2 using handlers  
  hosts: all  
  tasks:  
    - name: Install apache2  
      apt:-----module1  
        name: apache2  
        state: present  
    - name: Edit index.html file  
      copy: -----module2  
        content: "Logilabs\n"  
        dest: /var/www/html/index.html  
      notify: Restart apache2-----related to copy module and link to handler  
      bcz name same  
    handlers:-----this only when copy module is successful  
      - name: Restart apache2-----  
        service:
```

```
name: apache2
```

```
state: restarted
```

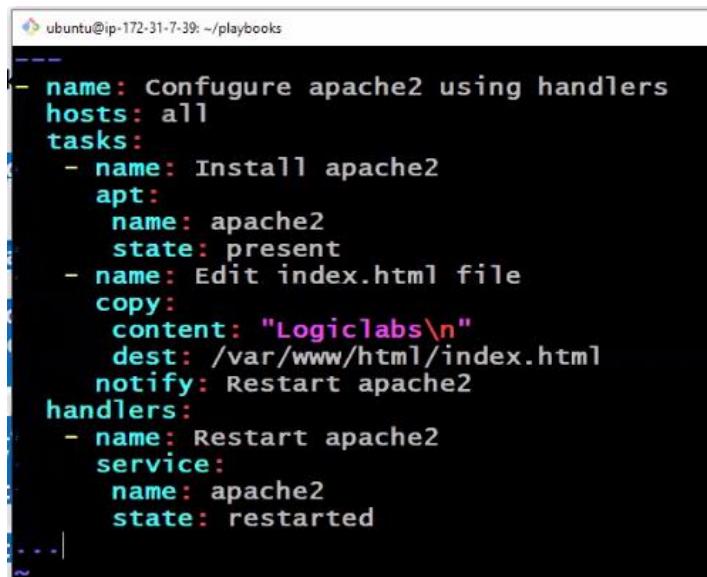
```
...
```

handlers Piece of code which gets executed when other module is successful

handler is linked to copy module

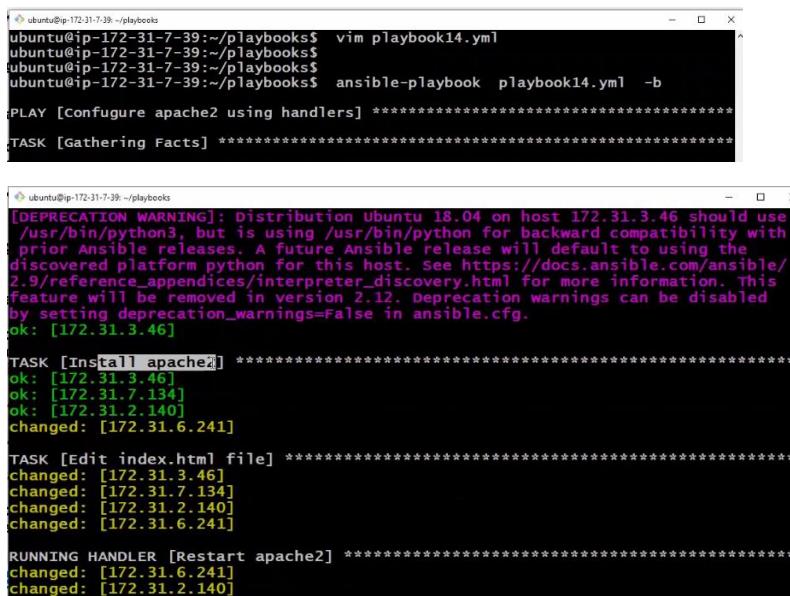
handler name is **Restart apache2**, which is mentioned in copy module bcz we mentioned with handle name

so when copy module is successful then only handler will execute.



```
ubuntu@ip-172-31-7-39:~/playbooks
└─ name: Configure apache2 using handlers
    hosts: all
    tasks:
      - name: Install apache2
        apt:
          name: apache2
          state: present
      - name: Edit index.html file
        copy:
          content: "Logiclabs\n"
          dest: /var/www/html/index.html
          notify: Restart apache2
    handlers:
      - name: Restart apache2
        service:
          name: apache2
          state: restarted
  ... |
```

```
$ ansible-playbook playbook14.yml -b
```



```
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook14.yml
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook14.yml -b
PLAY [Configure apache2 using handlers] ****
TASK [Gathering Facts] ****
[DEPRECATION WARNING]: Distribution Ubuntu 18.04 on host 172.31.3.46 should use /usr/bin/python3, but is using /usr/bin/python for backward compatibility with prior Ansible releases. A future Ansible release will default to using the discovered platform python for this host. See https://docs.ansible.com/ansible/2.9/reference_appendices/interpreter_discovery.html for more information. This feature will be removed in version 2.12. Deprecation warnings can be disabled by setting deprecation_warnings=False in ansible.cfg.
ok: [172.31.3.46]
TASK [Install apache2] ****
ok: [172.31.3.46]
ok: [172.31.7.134]
ok: [172.31.2.140]
changed: [172.31.6.241]
TASK [Edit index.html file] ****
changed: [172.31.3.46]
changed: [172.31.7.134]
changed: [172.31.2.140]
changed: [172.31.6.241]
RUNNING HANDLER [Restart apache2] ****
changed: [172.31.6.241]
changed: [172.31.2.140]
```

Already installed apache in 3 nodes shows in green

4th now installed so in yellow and changed

```

ubuntu@ip-172-31-7-39: ~/playbooks
feature will be removed in version 2.12. Deprecation warnings can be disabled
by setting deprecation_warnings=False in ansible.cfg.

ok: [172.31.3.46]

TASK [Install apache2] *****
ok: [172.31.3.46]
ok: [172.31.7.134]
ok: [172.31.2.140]
changed: [172.31.6.241]

TASK [Edit index.html file] *****
changed: [172.31.3.46]
changed: [172.31.7.134]
changed: [172.31.2.140]
changed: [172.31.6.241]

RUNNING HANDLER [Restart apache2] *****
changed: [172.31.6.241]
changed: [172.31.2.140]
changed: [172.31.7.134]
changed: [172.31.3.46]

PLAY RECAP *****
172.31.2.140 : ok=4    changed=2    unreachable=0    failed=0

```

Note:

As editing the index.html file is successfully, handler is executed.

If you re run the playbook, handler is not executed.

```

ubuntu@ip-172-31-7-39: ~/playbooks
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook14.yml -b
IC
PLAY [Configure apache2 using handlers] *****
TASK [Gathering Facts] *****

ubuntu@ip-172-31-7-39: ~/playbooks
TASK [Install apache2] *****
ok: [172.31.2.140]
ok: [172.31.3.46]
ok: [172.31.7.134]
ok: [172.31.6.241]

TASK [Edit index.html file] *****
ok: [172.31.7.134]
ok: [172.31.6.241]
ok: [172.31.2.140]
ok: [172.31.3.46]

PLAY RECAP *****
172.31.2.140 : ok=3    changed=0    unreachable=0    failed=0
kipped=0    rescued=0   ignored=0
172.31.3.46 : ok=3    changed=0    unreachable=0    failed=0
kipped=0    rescued=0   ignored=0
172.31.6.241 : ok=3    changed=0    unreachable=0    failed=0
kipped=0    rescued=0   ignored=0
172.31.7.134 : ok=3    changed=0    unreachable=0    failed=0
kipped=0    rescued=0   ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$ |

```

Restart apache not executed bcz task has not changed. So all are in green color.

+++++

Error Handling

If any module fails in ansible, the execution of the playbook terminates over there.

When we know that certain module might fail, and still we want to continue playbook execution, we can use error handling.

The section of code which might generate an error should be given in block section.

If it generates an error, the control comes to rescue section.

Always section is executed every time, irrespective of whether the block is successfull or failure.

```
$ vim playbook15.yml
```

```
---
```

```
- name: Error handling
```

```
hosts: all
```

```
tasks:
```

```
- block:
```

```
- name: Install apache1
```

```
apt:
```

```
name: apache1----- control failes outadated not available
```

```
state: present
```

```
rescue:----- it will comes to rescue section to install apache2
```

```
- name: Install apache2
```

```
apt:
```

```
name: apache2
```

```
state: present
```

```
always:
```

```
- name: Check url response
```

```
uri:
```

```
url: "{{item}}"
```

```
with_items:
```

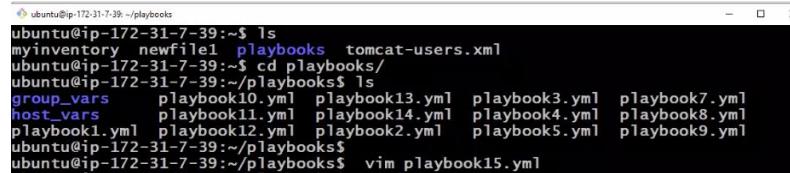
```
- http://172.31.7.134
```

```
- http://172.31.3.46
```

```
- http://172.31.2.140
```

```
- http://172.31.6.241
```

```
...
```



```
ubuntu@ip-172-31-7-39:~/playbooks$ ls
myinventory newfile1 playbooks tomcat-users.xml
ubuntu@ip-172-31-7-39:~/cd playbooks/
ubuntu@ip-172-31-7-39:~/playbooks$ ls
group_vars playbook10.yml playbook13.yml playbook3.yml playbook7.yml
host_vars playbook11.yml playbook14.yml playbook4.yml playbook8.yml
playbook1.yml playbook12.yml playbook2.yml playbook5.yml playbook9.yml
ubuntu@ip-172-31-7-39:~/playbooks$ 
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook15.yml
```

```

ubuntu@ip-172-31-7-39: ~/playbooks
- name: Error handling
  hosts: all
  tasks:
    - block:
        - name: Install apache1
          apt:
            name: apache1
            state: present
      rescue:
        - name: Install apache2
          apt:
            name: apache2
            state: present
    always:
      - name: Check url response
        uri:
          url: "{{item}}"
        with_items:
          - http://172.31.7.134
          - http://172.31.3.46
          - http://172.31.2.140
          - http://172.31.6.241
...
-- INSERT (paste) --

```

25,4

B

\$ ansible-playbook playbook15.yml -b

```

ubuntu@ip-172-31-7-39:~/playbooks
ls
myinventory newfile1 playbooks tomcat-users.xml
ubuntu@ip-172-31-7-39:~/playbooks/
ls
group_vars playbook10.yml playbook13.yml playbook3.yml playbook7.yml
host_vars playbook11.yml playbook14.yml playbook4.yml playbook8.yml
playbook1.yml playbook12.yml playbook2.yml playbook5.yml playbook9.yml
ubuntu@ip-172-31-7-39:~/playbooks$
ubuntu@ip-172-31-7-39:~/playbooks$ vim playbook15.yml
ubuntu@ip-172-31-7-39:~/playbooks$
ubuntu@ip-172-31-7-39:~/playbooks$ ansible-playbook playbook15.yml -b
PLAY [Error handling] ****
TASK [Gathering Facts] ****

```

```

ok: [172.31.7.134]

TASK [Install apache1] ****
fatal: [172.31.3.46]: FAILED! => {"changed": false, "msg": "No package matching 'apache1' is available"}
fatal: [172.31.7.134]: FAILED! => {"changed": false, "msg": "No package matching 'apache1' is available"}
fatal: [172.31.6.241]: FAILED! => {"changed": false, "msg": "No package matching 'apache1' is available"}
fatal: [172.31.2.140]: FAILED! => {"changed": false, "msg": "No package matching 'apache1' is available"}

TASK [Install apache2] ****
ok: [172.31.2.140]
ok: [172.31.7.134]
ok: [172.31.3.46]
ok: [172.31.6.241]

TASK [Check url response] ****
ok: [172.31.6.241] => (item=http://172.31.7.134)
ok: [172.31.7.134] => (item=http://172.31.7.134)
ok: [172.31.2.140] => (item=http://172.31.7.134)
ok: [172.31.3.46] => (item=http://172.31.7.134)

```

Apache 1 failed rescue section installed apache2 and then checked url response.

```
ubuntu@ip-172-31-7-39:~/playbooks
.6.241"]
ok: [172.31.6.241] => (item=http://172.31.6.241)
failed: [172.31.2.140] (item=http://172.31.6.241) => {"ansible_loop_var": "item"
, "changed": false, "content": "", "elapsed": 0, "item": "http://172.31.6.241",
"msg": "Status code was -1 and not [200]: Request failed: <urlopen error [Errno
113] No route to host>", "redirected": false, "status": -1, "url": "http://172.3
1.6.241"}
failed: [172.31.7.134] (item=http://172.31.6.241) => {"ansible_loop_var": "item"
, "changed": false, "content": "", "elapsed": 0, "item": "http://172.31.6.241",
"msg": "Status code was -1 and not [200]: Request failed: <urlopen error [Errno
113] No route to host>", "redirected": false, "status": -1, "url": "http://172.3
1.6.241"}

PLAY RECAP ****
172.31.2.140 : ok=2    changed=0    unreachable=0    failed=1    s
kipped=0  rescued=1  ignored=0
172.31.3.46   : ok=2    changed=0    unreachable=0    failed=1    s
kipped=0  rescued=1  ignored=0
172.31.6.241  : ok=3    changed=0    unreachable=0    failed=0    s
kipped=0  rescued=1  ignored=0
172.31.7.134  : ok=2    changed=0    unreachable=0    failed=1    s
kipped=0  rescued=1  ignored=0

ubuntu@ip-172-31-7-39:~/playbooks$
```