Step By Step Guide for Ansible Installation

What is Ansible?

- Ansible is a popular Open Source Configuration Management tool which is widely being used across industry.
- It is primarily intended for IT professionals, who use it for application deployment, updates on workstations and servers, cloud provisioning, configuration management, intra-service orchestration, and nearly anything a systems administrator does on a weekly or daily basis
- It is agentless tool, i.e. it doesn't require any agent to be installed on nodes on which respective operations required to be performed.
- Because Ansible is all about automation, it requires instructions to accomplish each job. With everything written down in simple script form, it's easy to do version control.
- The practical result of this is a major contribution to the "infrastructure as code" movement in IT: the idea that the maintenance of server and client infrastructure can and should be treated the same as software development, with repositories of self-documenting, proven, and executable solutions capable of running an organization regardless of staff changes.
- While Ansible may be at the forefront of automation, systems administration, and DevOps, it's also useful to everyday users.
- Ansible allows you to configure not just one computer, but potentially a whole network of computers at once, and using it requires no programming skills. Instructions written for Ansible are human-readable. Whether you're entirely new to computers or an expert, Ansible files are easy to understand.

Steps for Ansible installation

Step 1:

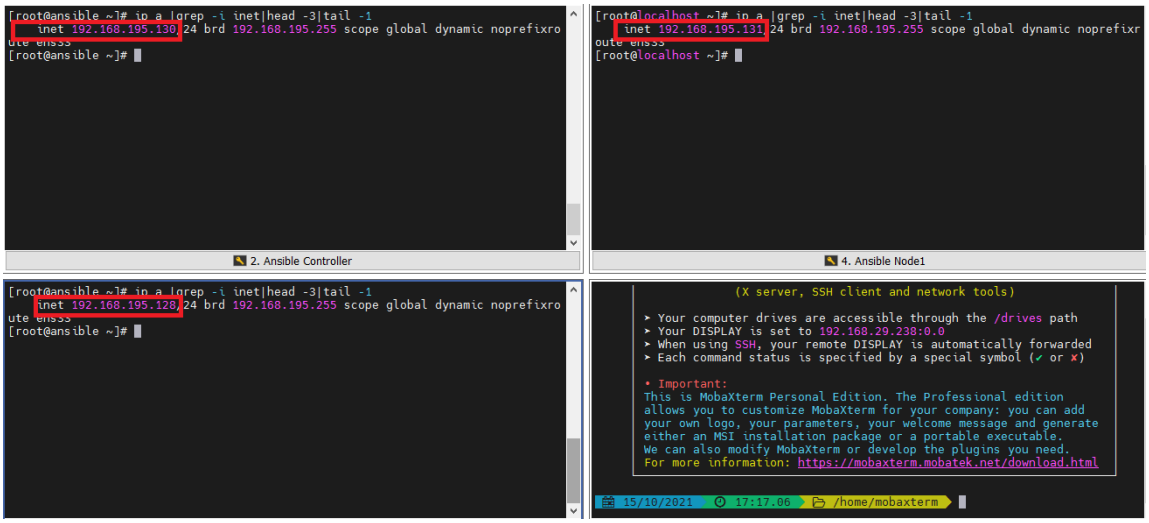
- Download Oracle Virtual Box or VMware workstation pro / player on your system.
- I have used CentOS for creating new VMs, if your system memory is well enough i.e. 8 GB and plus then you can deploy 3 Virtual Machines, else 2 VMs are enough
- We require minimum 2 VMs , as one of them will work as Master (here we are calling it as Controller) where Ansible will be installed and it will execute given task on other system to which we call as node.

Step 2:

- Once your VMs are ready just set hostname for all VMs using command **hostnamectl set-hostname *hostname of your choice***, in given example I have set hostname as ansible.controller.com , ansible.node2.com and ansible.node2.com

Step 3:

- Extract IP address on all 3 VMs using command as “ip a|grep –i inet|head -3|tail -1”, ip address highlighted in snapshot given below is your VM’s IP.



- Edit host file of all VMs using command **vim /etc/hosts** , if vim is not working on your VM, then kindly use vi. Add entries on last line of host file on all machines i.e. Controller and Node as mentioned in below given snapshot.

```
[student@ansible .ssh]$ cat /etc/hosts
127.0.0.1   localhost localhost.localdomain localhost
::1         localhost localhost.localdomain localhost
192.168.195.130 ansible.controller.com controller
192.168.195.131 ansible.node1.com node1
192.168.195.128 ansible.node2.com node2
```

- Format for above entry has been followed as ***IP Address hostname of respective VM another name for VM.***

Step 4:

- Once we are done with host entry setup, we need to setup sudoer rights for the our user, in my case I am using “student”, please use command as “vi /etc/sudoers”, go to 100th line and below that line, kindly add entry for user as mentioned below.

```
[root@ansible ~]# vi /etc/sudoers
Defaults    env_keep += "LC_MONETARY LC_NAME LC_NUMERIC LC_PAPER LC_TELEPHONE"
Defaults    env_keep += "LC_TIME LC_ALL LANGUAGE LINGUAS _XKB_CHARSET XAUTHORITY"

#
# Adding HOME to env_keep may enable a user to run unrestricted
# commands via sudo.
#
# Defaults   env_keep += "HOME"

Defaults    secure_path = /sbin:/bin:/usr/sbin:/usr/bin

## Next comes the main part: which users can run what software on
## which machines (the sudoers file can be shared between multiple
## systems).
## Syntax:
##
##      user    MACHINE=COMMANDS
##
## The COMMANDS section may have other options added to it.
##
## Allow root to run any commands anywhere
root    ALL=(ALL)       ALL
student ALL=(ALL)       NOPASSWD: ALL
```

Step 5:

- Login to student user using command as su student.
- Generate ssh-key on your Controller Machine or Master using command **ssh-keygen** and "student user"as per below given snapshot

```
[student@ansible ~]$ ssh-keygen
Generating public/private rsa key pair.



Enter file in which to save the key (/home/student/.ssh/id_rsa): Created directory '/home/student/.ssh'.
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/student/.ssh/id_rsa.
Your public key has been saved in /home/student/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:FwEht38THW1ewYaDWu0pQE7LBjUpiCLjPdeACVP1AgM student@ansible.controller.com
The key's randomart image is:
+---[RSA 3072]----+
| E++=.o.*Bo o +o.|
|o..+oo.+=+o+ = ++|
|o.o  .o.o== o =o.|
| . o ....o o +  .|
|    o   S o +    |
|         . . .   |
|                 |
|                 |
|                 |
+----[SHA256]-----+
[student@ansible ~]$
```

- Please note: ssh-key need to be created only on controller VM and not other VMs
- Once we have generated ssh key we need to copy the same on all respective nodes to make ssh connection live between Controller and Nodes, unless and until ssh connection is live, Ansible will not be able to perform required operations on node machines
- For copying authorization key (ssh key) from master to other nodes, kindly use command **ssh-copy-id username@IP_Address** as mentioned in below given snapshot.

```
[student@ansible ~]$ ssh-copy-id student@192.168.195.128
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/home/student/.ssh/id_rsa.pub"
The authenticity of host '192.168.195.128 (192.168.195.128)' can't be established.
ECDSA key fingerprint is SHA256:NuC8xWtbxR8uQWQFTRusOky1TZBdVrm3eF1kp29TXgM.
Are you sure you want to continue connecting (yes/no/[fingerprint])? 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 prompted now it is to install the new keys
student@192.168.195.128's password:
```

- Please note while using above given command password needs to be provided once, once execution on above command is successful kindly try to login on node VM from Controller, you should be able to login without password.
- Here we have just established password less ssh communication between Controller VM and Node VM.

Step 6:

- Please check if on Controller VM Python is installed using any Adhoc python command, if that command returns you error as command not found, then please use "**sudo dnf install epel-release**" command first as given below.

```
[student@ansible root]$ sudo dnf install epel-release
Last metadata expiration check: 1:05:45 ago on Fri 15 Oct 2021 04:46:15 AM PDT.
Dependencies resolved.
================================================================================
 Package                 Architecture            Version
================================================================================
Installing:
 epel-release            noarch                  8-11.el8

Transaction Summary
================================================================================
Install  1 Package

Total download size: 24 k
Installed size: 35 k
Is this ok [y/N]: y
Downloading Packages:
epel-release-8-11.el8.noarch.rpm
--------------------------------------------------------------------------------
Total
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing        :
  Installing       : epel-release-8-11.el8.noarch
  Running scriptlet: epel-release-8-11.el8.noarch
  Verifying        : epel-release-8-11.el8.noarch
Installed products updated.
```

- After successful execution of above step kindly execute command "**sudo dnf install ansible**" as below.

```
student@ansible:/root
[student@ansible root]$ sudo dnf install ansible
Extra Packages for Enterprise Linux Modular 8 - x86_64
Extra Packages for Enterprise Linux 8 - x86_64
Last metadata expiration check: 0:00:01 ago on Fri 15 Oct 2021 05:55:40 AM PDT.
Dependencies resolved.
================================================================================
 Package                 Architecture            Version
================================================================================
Installing:
 ansible                 noarch                  2.9.25-1.el8
Installing dependencies:
 libsodium               x86_64                  1.0.18-2.el8
 python3-babel           noarch                  2.5.1-5.el8
 python3-bcrypt          x86_64                  3.1.6-2.el8.1
 python3-cffi            x86_64                  1.11.5-5.el8
 python3-cryptography    x86_64                  3.2.1-4.el8
 python3-jinja2          noarch                  2.10.1-2.el8_0
 python3-jmespath        noarch                  0.9.0-11.el8
 python3-markupsafe      x86_64                  0.23-19.el8
 python3-pyasn1          noarch                  0.3.7-6.el8
 python3-pycparser       noarch                  2.14-14.el8
 python3-pynacl          x86_64                  1.3.0-5.el8
 sshpass                 x86_64                  1.06-9.el8
Installing weak dependencies:
 python3-paramiko        noarch                  2.4.3-1.el8

Transaction Summary
================================================================================
Install  14 Packages

Total download size: 24 M
Installed size: 126 M
Is this ok [y/N]: y
```

- Once Ansible is installed on Controller successfully, kindly go to host file of Ansible using command as **vi /etc/ansible/hosts** and add hostname of your all machines at the start of the file or end of the file.
- Kindly check version of ansible using command as "**ansible –version"** , you should get below given output.

```
[student@ansible root]$ ansible --version
ansible 2.9.25
  config file = /etc/ansible/ansible.cfg
  configured module search path = ['/home/student/.ansible/plugins/modules', '/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python3.6/site-packages/ansible
  executable location = /usr/bin/ansible
  python version = 3.6.8 (default, Sep 21 2021, 20:17:36) [GCC 8.4.1 20200928 (Red Hat 8.4.1-1)]
[student@ansible root]$
```

- Please verify, if ansible is working or not using command "**ansible all –m ping**", you should get below given output.

```
[student@ansible .ssh]$  ansible all -m ping
ansible.node2.com | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/libexec/platform-python"
    },
    "changed": false,
    "ping": "pong"
}
ansible.controller.com | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/libexec/platform-python"
    },
    "changed": false,
    "ping": "pong"
}
ansible.node1.com | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/libexec/platform-python"
    },
    "changed": false,
    "ping": "pong"
}
```