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TO : GAMUTIANS

FROM : GEETHA

SUBJECT : **ANSIBLE NOTES**

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1. Introduction to Ansible
2. Architecture of Ansible
3. Test Environment Setup
    a. Setup a Target Server Using Docker
    b. Create ssh-trust between management and target servers
    c. Install required Softwares in management and target servers
4. ADHOC COMMANDS

Adhoc Commands: About Management Server and Client Servers

Adhoc commands: Module Setup-Filter

Adhoc Commands: Lists files and folders

Adhoc commands: Module Package- APT

Adhoc commands: Managing users and groups

5. Playbooks

Playbook 1: Write a playbook to install package "tree" and check the version in remote/target servers

Playbook 2: Write a playbook to copy a file to remote servers from Management server

Playbook 3: Declare variables in a playbook

Playbook 4: Defining/calling "vars" files in a playbook

Playbook 5: Write a playbook to update the packages and install "git" package

Playbook 6: Target Section

Playbook 7: tasks Section

Playbook 8: Handler Section

Playbook 9: date/time stamp and debug

Playbook 10: Create list of users in a target/remote servers using loops concept

Playbook 11: Delete a list of users in a target/remote servers using loops concept

Playbook 12: Install list of packages using loops concepts

Playbook 13: Create User in target/remote server

Playbook 14: Check the condition of OS family and install the package using appropriate module

Playbook 15: Error Handling

Playbook 16: Vault

Playbook: 17 – Prompt

6. Includes
7. Roles

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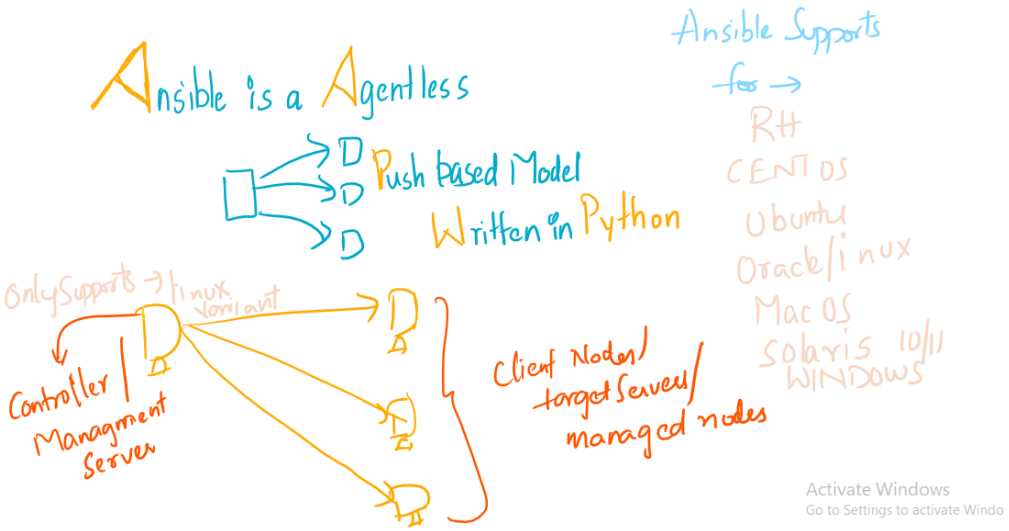
Introduction to Ansible

- Ansible is a IT Automation configuration Management and Orchestration Software.
- Orchestration, is a automated arrangement, coordination, and Management of computer systems, middleware and services
- Ansible is majorly used by DevOps and System administrators
- Ansible is a opensource and easy to use.
- Ansible is founded in Feb- 2012, Redhat acquired in Oct-2015
- As a configuration management tool, the primary responsibility of Ansible is to maintain Defined State(some times called Desired State) mentioned in the code while running on any node.

Architecture of Ansible



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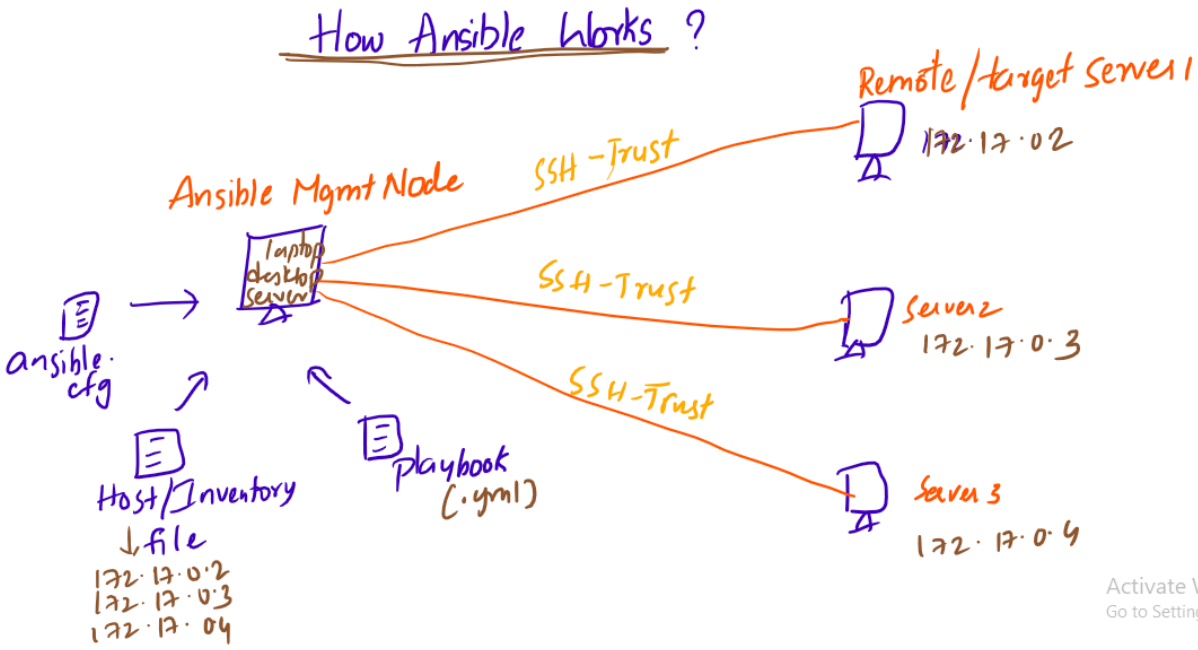

TEST ENVIRONMENT SETUP

Setup Target Servers using Docker:

Step 1:

Install Docker using below commands, Also can Refer URL :

https://docs.docker.com/install/linux/docker-ce/ubuntu/

```
sudo apt-get update
sudo apt-get install \
    apt-transport-https \
    ca-certificates \
    curl \
    gnupg-agent \
    software-properties-common

curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -

sudo apt-key fingerprint 0EBFCD88
```

```
sudo add-apt-repository \
  "deb [arch=amd64] https://download.docker.com/linux/ubuntu \
  $(lsb_release -cs) \
  stable"

sudo apt-get update
sudo apt-get install docker-ce docker-ce-cli containerd.io
```

root@ubuntu:~# docker --version

Docker version 19.03.5, build 633a0ea838

Step 2:

Create Docker File with basic softwares :

root@ubuntu:~/weekend_gamut/docker# cat Dockerfile

```
FROM ubuntu:16.04
RUN apt-get update
RUN apt-get install -y openssh-server
RUN apt-get install -y vim
RUN apt-get install net-tools
RUN apt-get update
ENTRYPOINT service ssh start &&bash
```

Step 3:

Build the Image

```
root@ubuntu:~/weekend_gamut/docker# docker build -t bareimage .
Sending build context to Docker daemon  2.048kB
Step 1/7 : FROM ubuntu:16.04
 ---> c6a43cd4801e
Step 2/7 : RUN apt-get update
 ---> Using cache
 ---> dd85ad15f876
Step 3/7 : RUN apt-get install -y openssh-server
 ---> Using cache
 ---> d2ac2673a1ed
Step 4/7 : RUN apt-get install -y vim
 ---> Using cache
 ---> d21ca38421cc
Step 5/7 : RUN apt-get install net-tools
 ---> Using cache
 ---> 5895fdb281c1
Step 6/7 : RUN apt-get update
 ---> Using cache
 ---> 2359342f25c1
Step 7/7 : ENTRYPOINT service ssh start &&bash
 ---> Using cache
 ---> 97eac6bcb4b1
Successfully built 97eac6bcb4b1
Successfully tagged bareimage:latest
root@ubuntu:~/weekend_gamut/docker#
```

Step 4:

Create the Container as below –

```
root@ubuntu:~/weekend_gamut/docker# docker run -itd --name targetserver3 bareimage /bin/bash
```

Step 5:

Connect to the Container - $ docker attach <containerID>

And

Set the root password in Containers, Using command "passwd" and Now lets connect through ssh with password ->

root@cbd3b3931412:~# ssh root@172.17.0.3

The authenticity of host '172.17.0.3 (172.17.0.3)' can't be established.

ECDSA key fingerprint is SHA256:jApvJc2pWx9gJdxHc162QvnlxLAgo1xVuS5QQDvxzh4.

Are you sure you want to continue connecting (yes/no)? yes

Warning: Permanently added '172.17.0.3' (ECDSA) to the list of known hosts.

root@172.17.0.3's password:

Permission denied, please try again.

If we are getting "**Permission denied, please try again" error m**eans, In /etc/ssh/sshd_config file, change PermitRootLogin to yes as show as below. And restart the ssh server.

vi /etc/ssh/sshd_config

Authentication:

LoginGraceTime 120

PermitRootLogin yes

StrictModes yes

root@83010918f53e:/# service ssh restart

* Restarting OpenBSD Secure Shell server sshd

[OK]

Now, Let's connect and see…

```
root@ubuntu:~/weekend_gamut/docker# ssh root@172.17.0.3
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.15.0-74-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

Last login: Sat Jan 18 12:35:57 2020 from 172.17.0.1
```

b. Create ssh-trust between management and target servers

Step 1: Generate a New SSH Key:

The simplest way to generate a key pair is to run ssh-keygen without arguments. In this case, it will prompt for the file in which to store keys. Here's an example:

```
root@ubuntu:~/.ssh# pwd
/root/.ssh
root@ubuntu:~/.ssh# ls -ltra
total 8
drwx------ 8 root root 4096 Jan 18 03:30 ..
drwx------ 2 root root 4096 Feb  7 20:53 .
root@ubuntu:~/.ssh# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:/iWvLNXsjcJ051GyEMYlz8ktuPN67Y85H7fL1bqdDYg root@ubuntu
The key's randomart image is:
+---[RSA 2048]----+
|             ....|
|              +* o|
|             ...* .|
|              .....|
|         S   oo. + |
|        .   o.+++ .|
|         .+Eoo=o++|
|         .oo+o.**O|
|           .+oo.=XO|
+----[SHA256]-----+
root@ubuntu:~/.ssh#
```

It will generate “id_rsa.pub and id_rsa” files at .ssh folder.

```
root@ubuntu:~/.ssh# ls -ltra
total 16
drwx------ 8 root root 4096 Jan 18 03:30 ..
-rw------- 1 root root 1675 Feb  7 21:05 id_rsa
-rw-r--r-- 1 root root  393 Feb  7 21:05 id_rsa.pub
drwx------ 2 root root 4096 Feb  7 21:05 .
root@ubuntu:~/.ssh#
root@ubuntu:~/.ssh#
root@ubuntu:~/.ssh#
root@ubuntu:~/.ssh#
root@ubuntu:~/.ssh#
root@ubuntu:~/.ssh# cat id_rsa.pub
ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDFtjgfXCa4toZR4AWlrw6tQQ4G9SeqW9YPodQkCIADS+f/84Uozvt7LAOrdaPAeyWeY/Aolx3L1Hjh61UPNDlDOsaCSxHX64rWODVeWqHhz72MfVNoKAOm8it99C
KJAWUrVoX3U5A5ca9hSYidnhpkTVl6WjM4K4qdUjS7Y8mPd/MdgzNXpUGIA9nGvAvmPngqcttuix+rJNpj0QJewzW1T5rt1Txpkk8T8NHs0DsO9KinXr+x2LbgyzBYje09KnuT23uBNZRgYoLKgFJzkpIbqSI72mTY
v41DmgfQXOhQTh1JJNwpzBb7fVhuw9D39GZGjxku3epDsfsk9akfqxRd root@ubuntu
```

Step 2: Copying the Public Key to the Server:

We have to copy id_rsa.pub key to the target servers “authorized_keys” file. Lets do the same as below for two target servers(docker containers) :

```
root@ubuntu:~/.ssh# ssh-copy-id root@172.17.0.2
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
The authenticity of host '172.17.0.2 (172.17.0.2)' can't be established.
ECDSA key fingerprint is SHA256:jApvJc2pWx9gJdxHc162QvnlxLAgo1xVuS5QQDvxzh4.
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 prompted now it is to install the new keys
root@172.17.0.2's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'root@172.17.0.2'"
and check to make sure that only the key(s) you wanted were added.

root@ubuntu:~/.ssh#
```

```
root@ubuntu:~/.ssh# ssh-copy-id root@172.17.0.3
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
The authenticity of host '172.17.0.3 (172.17.0.3)' can't be established.
ECDSA key fingerprint is SHA256:jApvJc2pWx9gJdxHc162QvnlxLAgo1xVuS5QQDvxzh4.
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 prompted now it is to install the new keys
root@172.17.0.3's password:

Number of key(s) added: 1

Now try logging into the machine, with:   "ssh 'root@172.17.0.3'"
and check to make sure that only the key(s) you wanted were added.

root@ubuntu:~/.ssh#
```

Step 3: Now lets try to connect to server with passwordless login:

```
root@ubuntu:~# ssh root@172.17.0.2
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.15.0-76-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

Last login: Fri Jan 31 15:37:32 2020 from 172.17.0.1
root@83010918f53e:~#
root@83010918f53e:~#
```

```
root@ubuntu:~# ssh root@172.17.0.3
Welcome to Ubuntu 16.04.6 LTS (GNU/Linux 4.15.0-76-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

Last login: Fri Jan 31 15:37:32 2020 from 172.17.0.1
root@cbd3b3931412:~#
```

c Install required Softwares in management and target servers

1. Install Ansible in Management Server using below commands in Ubuntu 16.04

URL: https://docs.ansible.com/ansible/latest/installation_guide/intro_installation.html

$ sudo apt update

$ sudo apt install software-properties-common

$ sudo apt-add-repository --yes --update ppa:ansible/ansible

$ sudo apt install ansible

2. Install Python 3 in Target Servers using below commands:

RUN apt-get update \

&& apt-get install -y python3-pip python3-dev \

&& cd /usr/local/bin \

&& ln -s /usr/bin/python3 python \

&& pip3 install --upgrade pip

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Inventory file

A hosts/Inventory file consists of host groups and hosts within those groups.

```
root@ubuntu:/etc/ansible# cat hosts
[dev]
172.17.0.2
[qa]
172.17.0.3
```

Adhoc Commands: About Management Server and Client Servers:

1. check the connection from management to target servers

```
root@ubuntu:~# ansible -m ping all
172.17.0.2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
172.17.0.3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
root@ubuntu:~#
```

2. Ping only one server:

```
root@ubuntu:~# ansible -m ping 172.17.0.2
172.17.0.2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
```

3. Ping a specific group

```
root@ubuntu:~# ansible -m ping qa
172.17.0.3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
root@ubuntu:~#
```

4. Get the facts of the target server

```
root@ubuntu:~# ansible 172.17.0.2 -m setup --tree /tmp/facts
172.17.0.2 | SUCCESS => {
    "ansible_facts": {
        "ansible_all_ipv4_addresses": [
            "172.17.0.2"
        ],
        "ansible_all_ipv6_addresses": [],
        "ansible_apparmor": {
            "status": "disabled"
        },
        "ansible_architecture": "x86_64",
        "ansible_bios_date": "07/02/2015",
        "ansible_bios_version": "6.00",
        "ansible_cmdline": {
            "BOOT_IMAGE": "/boot/vmlinuz-4.15.0-76-generic",
            "auto": true,
            "find_preseed": "/preseed.cfg",
            "locale": "en_US",
            "noprompt": true,
            "priority": "critical",
            "quiet": true,
            "ro": true,
            "root": "UUID=253ec954-d82e-4d48-ae8d-b937773189f5"
        },
        "ansible_date_time": {
            "date": "2020-02-08",
            "day": "08"
```

Also, it will generate the facts file at /tmp/facts

```
root@ubuntu:/tmp/facts# ls -ltra
total 24
-rw-r--r--  1 root root 12345 Feb  7 22:58 172.17.0.2
drwxrwxrwt 13 root root  4096 Feb  7 22:58 ..
drwxr-xr-x  2 root root  4096 Feb  7 22:58 .
root@ubuntu:/tmp/facts#
```

Adhoc commands: Module Setup-Filter

```
root@ubuntu:/tmp/facts# ansible all -m setup -a 'filter=*.ipv4'
172.17.0.2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false
}
172.17.0.3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false
}
root@ubuntu:/tmp/facts#
```

ADHOC COMMANDS: Lists files and folders

```
root@ubuntu:/tmp/facts# ansible all -a "ls -l /etc/ssh/sshd_config"
172.17.0.2 | CHANGED | rc=0 >>
-rw-r--r-- 1 root root 2529 Jan 18 11:51 /etc/ssh/sshd_config

172.17.0.3 | CHANGED | rc=0 >>
-rw-r--r-- 1 root root 2529 Jan 18 11:49 /etc/ssh/sshd_config

root@ubuntu:/tmp/facts#
```

1. Cat a file

```
root@ubuntu:/tmp/facts# ansible all -a "cat /root/sample.txt"
172.17.0.2 | CHANGED | rc=0 >>
Gamut Gurus---Ansible Session

172.17.0.3 | CHANGED | rc=0 >>
Hello!

root@ubuntu:/tmp/facts#
```

2. Copy a file from control server to target servers

```
root@ubuntu:~/ansible_demo# ansible all -m copy -a "src=testfile.txt dest=/var/tmp/"
172.17.0.2 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "checksum": "07499c8c990eb8b03ae9bf9fed965a3efccec1cc",
    "dest": "/var/tmp/testfile.txt",
    "gid": 0,
    "group": "root",
    "md5sum": "e1d40457c4ff17c7889e110bececcd8c",
    "mode": "0644",
    "owner": "root",
    "size": 29,
    "src": "/root/.ansible/tmp/ansible-tmp-1581146200.96-126302448324699/source",
    "state": "file",
    "uid": 0
}
172.17.0.3 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "checksum": "07499c8c990eb8b03ae9bf9fed965a3efccec1cc",
    "dest": "/var/tmp/testfile.txt",
    "gid": 0,
    "group": "root",
    "md5sum": "e1d40457c4ff17c7889e110bececcd8c",
    "mode": "0644",
    "owner": "root",
    "size": 29,
    "src": "/root/.ansible/tmp/ansible-tmp-1581146200.92-104264747874316/source",
    "state": "file",
    "uid": 0
}
root@ubuntu:~/ansible_demo#
```

```
root@ubuntu:~/ansible_demo# ansible all -a "cat /var/tmp/testfile.txt"
172.17.0.2 | CHANGED | rc=0 >>
Hello this is a test file...

172.17.0.3 | CHANGED | rc=0 >>
Hello this is a test file...

root@ubuntu:~/ansible_demo#
```

Adhoc commands: Module Package- APT

ad-hoc task to install, update, or remove packages on managed nodes using a package management module like apt. To ensure a package is installed without updating it:

$ ansible all -m apt -a "name=git state=latest"

```
root@ubuntu:~/weekday_gamut/playbooks# ansible all -m apt -a "name=git state=latest"

172.17.0.3 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "cache_update_time": 1579789965,
    "cache_updated": false,
    "changed": false
}
172.17.0.2 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "cache_update_time": 1580483447,
    "cache_updated": false,
    "changed": false
}
root@ubuntu:~/weekday_gamut/playbooks#
```

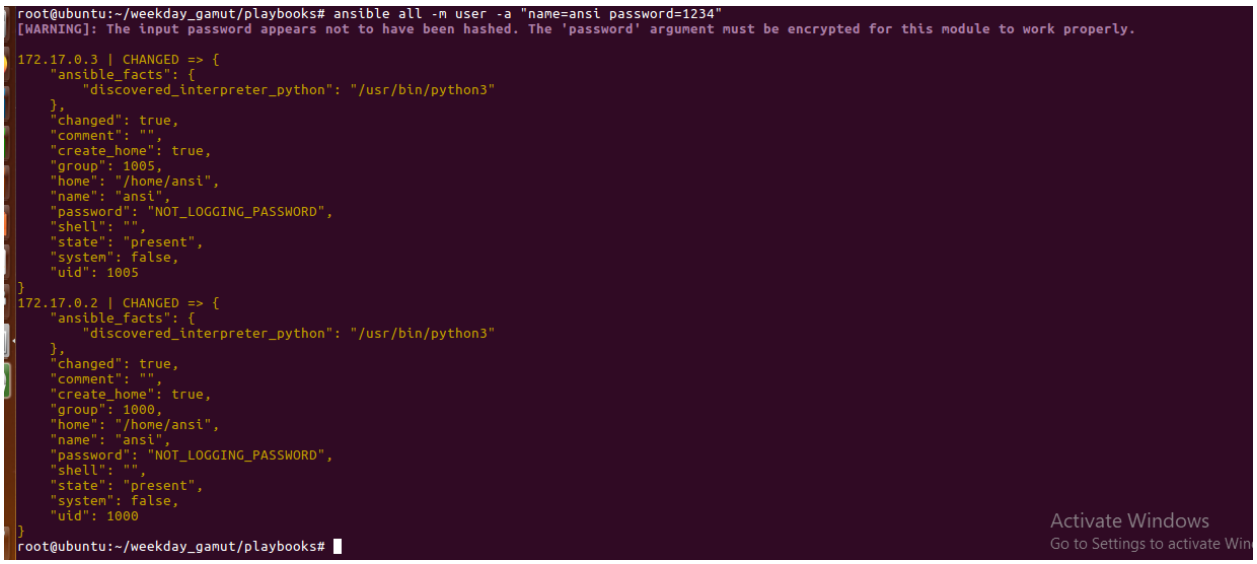
To ensure a package is not installed:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible all -m apt -a "name=git state=absent"
172.17.0.2 | CHANGED => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": true,
    "stderr": "",
    "stderr_lines": [],
    "stdout": "Reading package lists...\nBuilding dependency tree...\nReading state information...\nThe following p
 longer required:\n  git-man less libcurl3-gnutls liberror-perl libpopt0 librtmp1 rsync\nUse 'apt autoremove' to re
VED:\n  git\n0 upgraded, 0 newly installed, 1 to remove and 14 not upgraded.\nAfter this operation, 24.1 MB disk sp
ading database ... 5%\r(Reading database ... 10%\r(Reading database ... 15%\r(Reading database ... 20%\r(Reading da
ding database ... 35%\r(Reading database ... 40%\r(Reading database ... 45%\r(Reading database ... 50%\r(Reading da
ding database ... 65%\r(Reading database ... 70%\r(Reading database ... 75%\r(Reading database ... 80%\r(Reading da
ding database ... 95%\r(Reading database ... 100%\r(Reading database ... 21377 files and directories currently inst
.\r\n",
    "stdout_lines": [
        "Reading package lists...",
        "Building dependency tree...",
        "Reading state information...",
        "The following packages were automatically installed and are no longer required:",
        "  git-man less libcurl3-gnutls liberror-perl libpopt0 librtmp1 rsync",
```

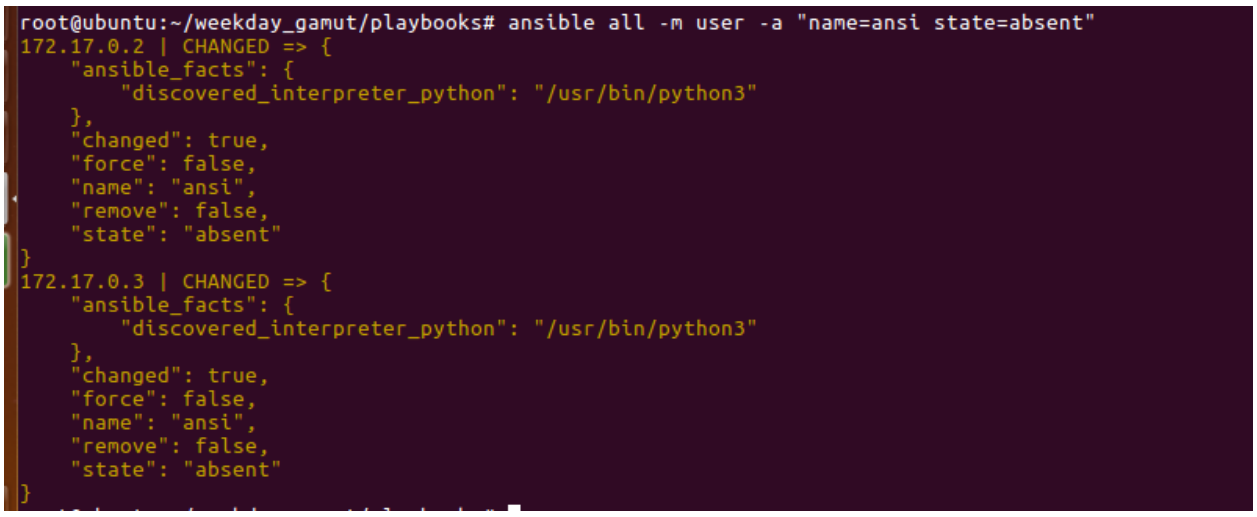
Adhoc commands: Managing users and groups

You can create, manage, and remove user accounts on your managed nodes with ad-hoc tasks:

ansible all -m user -a "name=ansi password=1234"



To remove the user -
ansible all -m user -a "name=ansi state=absent"



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Playbooks

Playbooks can be used to manage configurations of and deployments to remote machines.

Playbook 1: Write a playbook to install package "tree" and check the version in remote/target servers

```
root@ubuntu:~/weekday_gamut/playbooks# cat 1_treePkgInstall.yml
---
- hosts: all
  tasks:
   - name: Intall the tree package
     apt:
      name: tree
      state: present
   - name: check the package version
     command: 'tree --version'
root@ubuntu:~/weekday_gamut/playbooks#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 1_treePkgInstall.yml

PLAY [all] *********************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [172.17.0.2]
ok: [172.17.0.3]

TASK [Intall the tree package] *************************************************************************************
ok: [172.17.0.2]
ok: [172.17.0.3]

TASK [check the package version] ***********************************************************************************
changed: [172.17.0.2]
changed: [172.17.0.3]

PLAY RECAP *********************************************************************************************************
172.17.0.2                 : ok=3    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.3                 : ok=3    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Playbook 2: Write a playbook to copy a file to remote servers from Management server

```
root@ubuntu:~/weekday_gamut/playbooks# cat 2_copyfile.yml
---
- hosts: all
  tasks:
  - name: copying gamutgurus.war file to target servers
    copy: src=/root/weekday_gamut/playbooks/gamutgurus.war dest=/tmp/tomcat/
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 2_copyfile.yml

PLAY [all] *********************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [172.17.0.2]
ok: [172.17.0.3]

TASK [copying gamutgurus.war file to target servers] ***************************************************************
changed: [172.17.0.3]
changed: [172.17.0.2]

PLAY RECAP *********************************************************************************************************
172.17.0.2                 : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.3                 : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Playbook 3: Declare variables in a playbook

```
root@ubuntu:~/weekday_gamut/playbooks# cat 3_variableDeclare.yml
---
- hosts: all
  vars:
   srcpath: /root/weekday_gamut/playbooks/gamutgurus.war
   destpath: /tmp/tomcat/vars/
  tasks:
  - name: copying gamutgurus.war file to target servers
    copy: src={{ srcpath }} dest={{ destpath }}
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 3_variableDeclare.yml

PLAY [all] *********************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [172.17.0.2]
ok: [172.17.0.3]

TASK [copying gamutgurus.war file to target servers] ***************************************************************
changed: [172.17.0.3]
changed: [172.17.0.2]

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

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook 4: Defining/calling "vars" files in a playbook

```
root@ubuntu:~/weekday_gamut/playbooks# cat vars.yml
srcpath: /root/weekday_gamut/playbooks/gamutgurus.war
destpath: /tmp/tomcat/vars/
```

```
root@ubuntu:~/weekday_gamut/playbooks# cat 4_callVarsFile.yml
---
- hosts: all
  vars_files:
    - vars.yml
  tasks:
  - name: copying gamutgurus.war file to target servers
    copy: src={{ srcpath }} dest={{ destpath }}
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 4_callVarsFile.yml

PLAY [all] *********************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [172.17.0.3]
ok: [172.17.0.2]

TASK [copying gamutgurus.war file to target servers] ***************************************************************
ok: [172.17.0.2]
ok: [172.17.0.3]

PLAY RECAP *********************************************************************************************************
172.17.0.2                 : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.3                 : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Playbook 5: Write a playbook to update the packages and install "git" package

```
root@ubuntu:~/weekday_gamut/playbooks# cat 5_installUpdateGit.yml
---
- hosts: all
  tasks:
   - name: Intall Git packages
     apt:
      name: git
      state: present
      update_cache: true
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 5_installUpdateGit.yml

PLAY [all] *********************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************
ok: [172.17.0.3]
ok: [172.17.0.2]

TASK [Intall Git packages] *****************************************************************************************
changed: [172.17.0.3]
changed: [172.17.0.2]

PLAY RECAP *********************************************************************************************************
172.17.0.2                 : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.3                 : ok=2    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Playbook 6: Target Section

```
root@ubuntu:~/weekday_gamut/playbooks# cat 6_targetSection.yml
---
- hosts: all
  user: root
  connection: ssh
  become: yes
  gather_facts: no
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 6_targetSection.yml

PLAY [all] *********************************************************************************************************

PLAY RECAP *********************************************************************************************************

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook 7: tasks Section

```
root@ubuntu:~/weekday_gamut/playbooks# cat 7_taskSection.yml
---
- hosts: 172.17.0.2
  user: root
  become: yes
  connection: ssh
  gather_facts: no
  vars:
   packagename: apache2
  tasks:
  - name: updating the packages
    apt: update_cache=yes
  - name: installing apache2
    apt: name={{ packagename }} state=present
  - name: start the {{ packagename }} server
    service: name={{ packagename }} state=started
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 7_taskSection.yml

PLAY [172.17.0.2] **************************************************************************************************

TASK [updating the packages] ***************************************************************************************
changed: [172.17.0.2]

TASK [installing apache2] ******************************************************************************************
ok: [172.17.0.2]

TASK [start the apache2 server] ************************************************************************************
changed: [172.17.0.2]

PLAY RECAP *********************************************************************************************************
172.17.0.2                 : ok=3    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Playbook 8: Handler Section

```
root@ubuntu:~/weekday_gamut/playbooks# cat 8_handlerSection.yml
---
- hosts: 172.17.0.3
  user: root
  become: yes
  connection: ssh
  gather_facts: no
  vars:
   packagename: apache2
  tasks:
  - name: updating the packages
    apt: update_cache=yes
  - name: installing apache2
    apt: name={{ packagename }} state=present
    notify: restartserver
  handlers:
  - name: restartserver
    service: name={{ packagename }} state=restarted
root@ubuntu:~/weekday_gamut/playbooks#
```

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 8_handlerSection.yml

PLAY [172.17.0.3] ***************************************************************************************************

TASK [updating the packages] ****************************************************************************************
ok: [172.17.0.3]

TASK [installing apache2] *******************************************************************************************
ok: [172.17.0.3]

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

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook 9: date/time stamp and debug

```
root@ubuntu:~/weekday_gamut/playbooks# cat 9_dateTimestamp.yml
---
- hosts: 172.17.0.3
  user: root
  become: yes
  connection: ssh
  gather_facts: no
  vars:
   packagename: apache2
  tasks:
  - name: date/timestamp for when playbook starts
    command: date
    register: timestamp_start
  - debug: var=timestamp_start
  - name: updating the packages
    apt: update_cache=yes
  - name: installing apache2
    apt: name={{ packagename }} state=present
    notify: restartserver
  - name: date/timestamp for when playbook ends
    command: date
    register: timestamp_ends
  - debug: var=timestamp_ends
  handlers:
  - name: restartserver
    service: name={{ packagename }} state=restarted
root@ubuntu:~/weekday_gamut/playbooks#
```

Execution:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 9_dateTimestamp.yml

PLAY [172.17.0.3] ************************************************************************************************

TASK [date/timestamp for when playbook starts] *******************************************************************
changed: [172.17.0.3]

TASK [debug] *****************************************************************************************************
ok: [172.17.0.3] => {
    "timestamp_start": {
        "ansible_facts": {
            "discovered_interpreter_python": "/usr/bin/python3"
        },
        "changed": true,
        "cmd": [
            "date"
        ],
        "delta": "0:00:00.035999",
        "end": "2020-02-10 13:21:18.978219",
        "failed": false,
        "rc": 0,
        "start": "2020-02-10 13:21:18.942220",
        "stderr": "",
        "stderr_lines": [],
        "stdout": "Mon Feb 10 13:21:18 UTC 2020",
        "stdout_lines": [
            "Mon Feb 10 13:21:18 UTC 2020"
        ]
    }

TASK [updating the packages] *************************************************************************************
ok: [172.17.0.3]

TASK [installing apache2] ****************************************************************************************
ok: [172.17.0.3]

TASK [date/timestamp for when playbook ends] *********************************************************************
changed: [172.17.0.3]

TASK [debug] *****************************************************************************************************
ok: [172.17.0.3] => {
    "timestamp_ends": {
        "changed": true,
        "cmd": [
            "date"
        ],
        "delta": "0:00:00.004155",
        "end": "2020-02-10 13:21:37.905836",
        "failed": false,
        "rc": 0,
        "start": "2020-02-10 13:21:37.901681",
        "stderr": "",
        "stderr_lines": [],
        "stdout": "Mon Feb 10 13:21:37 UTC 2020",
        "stdout_lines": [
            "Mon Feb 10 13:21:37 UTC 2020"
        ]
    }
}

PLAY RECAP *******************************************************************************************************
172.17.0.3                 : ok=6    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Playbook 10: Create list of users in a target/remote servers using loops concept

```
root@ubuntu:~/weekday_gamut/playbooks# cat 10_loops_createUsers.yml
---
- hosts: 172.17.0.2
  user: root
  connection: ssh
  gather_facts: no
  tasks:
  - name: create list of users
    user: name={{ item }}  state=present
    with_items:
     - user1
     - user2
     - user3
     - user4
     - user5
root@ubuntu:~/weekday_gamut/playbooks#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 10_loops_createUsers.yml

PLAY [172.17.0.2] **************************************************************************************************

TASK [create list of users] ****************************************************************************************
changed: [172.17.0.2] => (item=user1)
changed: [172.17.0.2] => (item=user2)
changed: [172.17.0.2] => (item=user3)
changed: [172.17.0.2] => (item=user4)
changed: [172.17.0.2] => (item=user5)

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

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook 11: Delete a list of users in a target/remote servers using loops concept

```
root@ubuntu:~/weekday_gamut/playbooks# cat 11_loops_deleteUsers.yml
---
- hosts: 172.17.0.2
  user: root
  connection: ssh
  gather_facts: no
  tasks:
  - name: create list of users
    user: name={{ item }}  state=absent
    with_items:
     - user1
     - user2
     - user3
     - user4
     - user5
root@ubuntu:~/weekday_gamut/playbooks#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 11_loops_deleteUsers.yml

PLAY [172.17.0.2] ***********************************************************************************************************

TASK [create list of users] *************************************************************************************************
changed: [172.17.0.2] => (item=user1)
changed: [172.17.0.2] => (item=user2)
changed: [172.17.0.2] => (item=user3)
changed: [172.17.0.2] => (item=user4)
changed: [172.17.0.2] => (item=user5)

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

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook 12: Install list of packages using loops concepts

```
root@ubuntu:~/weekday_gamut/playbooks# cat 12_loops_installpkgs.yml
---
- hosts: 172.17.0.2
  user: root
  connection: ssh
  gather_facts: no
  tasks:
  - name: install pakgs
    apt: name={{ item }} update_cache=yes state=present
    with_items:
    - git
    - nano
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 12_loops_installpkgs.yml

PLAY [172.17.0.2] ***********************************************************************************************************

TASK [install pakgs] ********************************************************************************************************
[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: ['git', 'nano']` 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: [172.17.0.2] => (item=[u'git', u'nano'])

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

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook 13: Create User in target/remote server

```
root@ubuntu:~/weekday_gamut/playbooks# cat 13_createUser.yml
---
- hosts: all
  user: root
  connection: ssh
  gather_facts: no
  tasks:
  - name: create user
    user: name=user1 state=present

root@ubuntu:~/weekday_gamut/playbooks#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 13_createUser.yml

PLAY [all] *****************************************************************************************************************************

TASK [create user] *********************************************************************************************************************
ok: [172.17.0.3]
changed: [172.17.0.2]

PLAY RECAP *****************************************************************************************************************************
172.17.0.2                 : ok=1    changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.3                 : ok=1    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook 14: Check the condition of OS family and install the package using appropriate module

```
root@ubuntu:~/weekday_gamut/playbooks# cat 14_conditions.yml
---
- hosts: all
  gather_facts: yes
  tasks:
  - name: install pacakge appropriate to distribution debian/ubuntu
    command: apt-get -y install git
    when: ansible_os_family == "Debian"
  - name: install package appropriate to distribution redhat/centos
    command: yum -y install git
    when: ansible_os_family == "Redhat"


root@ubuntu:~/weekday_gamut/playbooks#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 14_conditions.yml

PLAY [all] *****************************************************************************************************************************

TASK [Gathering Facts] *****************************************************************************************************************
ok: [172.17.0.3]
ok: [172.17.0.2]

TASK [install pacakge appropriate to distribution debian/ubuntu] ***********************************************************************
[WARNING]: Consider using the apt module rather than running 'apt-get'.  If you need to use command because apt 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.

changed: [172.17.0.2]
changed: [172.17.0.3]

TASK [install package appropriate to distribution redhat/centos] ***********************************************************************
skipping: [172.17.0.3]
skipping: [172.17.0.2]

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

root@ubuntu:~/weekday_gamut/playbooks#
```


Playbook 15: Error Handling

```
root@ubuntu:~/weekday_gamut/playbooks# cat 15_error_handling.yml
---
- hosts: all
  user: root
  connection: ssh
  become: yes
  gather_facts: no
  tasks:
    - name: update the packages
      apt: update_cache=yes
    - name: install the packages telnet
      shell: apt-get install -y telnet
    - name: cat the log file
      command: cat telnet.log
      ignore_errors: yes
    - name: check the installed path
      raw: which telnet
      register: resultlog
    - debug: var=resultlog

root@ubuntu:~/weekday_gamut/playbooks#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 15_error_handling.yml

PLAY [all] *********************************************************************************************************************************************************************

TASK [update the packages] *****************************************************************************************************************************************************
ok: [172.17.0.2]
ok: [172.17.0.3]

TASK [install the packages telnet] *********************************************************************************************************************************************
[WARNING]: Consider using the apt module rather than running 'apt-get'.  If you need to use command because apt 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.

changed: [172.17.0.3]
changed: [172.17.0.2]

TASK [cat the log file] ********************************************************************************************************************************************************
fatal: [172.17.0.3]: FAILED! => {"changed": true, "cmd": ["cat", "telnet.log"], "delta": "0:00:00.008545", "end": "2020-02-10 13:52:58.791861", "msg": "non-zero r
eturn code", "rc": 1, "start": "2020-02-10 13:52:58.783316", "stderr": "cat: telnet.log: No such file or directory", "stderr_lines": ["cat: telnet.log: No such fi
le or directory"], "stdout": "", "stdout_lines": []}
...ignoring
fatal: [172.17.0.2]: FAILED! => {"changed": true, "cmd": ["cat", "telnet.log"], "delta": "0:00:00.005470", "end": "2020-02-10 13:52:58.876785", "msg": "non-zero r
eturn code", "rc": 1, "start": "2020-02-10 13:52:58.871315", "stderr": "cat: telnet.log: No such file or directory", "stderr_lines": ["cat: telnet.log: No such fi
le or directory"], "stdout": "", "stdout_lines": []}
...ignoring

TASK [check the installed path] ************************************************************************************************************************************************
changed: [172.17.0.3]
changed: [172.17.0.2]
```

```
TASK [debug] *******************************************************************************************************************************************************************
ok: [172.17.0.3] => {
    "resultlog": {
        "changed": true,
        "failed": false,
        "rc": 0,
        "stderr": "Shared connection to 172.17.0.3 closed.\r\n",
        "stderr_lines": [
            "Shared connection to 172.17.0.3 closed."
        ],
        "stdout": "/usr/bin/telnet\r\n",
        "stdout_lines": [
            "/usr/bin/telnet"
        ]
    }
}
ok: [172.17.0.2] => {
    "resultlog": {
        "changed": true,
        "failed": false,
        "rc": 0,
        "stderr": "Shared connection to 172.17.0.2 closed.\r\n",
        "stderr_lines": [
            "Shared connection to 172.17.0.2 closed."
        ],
        "stdout": "/usr/bin/telnet\r\n",
        "stdout_lines": [
            "/usr/bin/telnet"
        ]
    }
}

PLAY RECAP *********************************************************************************************************************************************************************
172.17.0.2                 : ok=5    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=1
172.17.0.3                 : ok=5    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=1

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook 16: Vault

Encrypted File:secure.yml

```
root@ubuntu:~/weekday_gamut/playbooks# cat secure.yml
$ANSIBLE_VAULT;1.1;AES256
62336466623636646438373063383935346234653732303433666343234306663343763623866303 2
64643332336131316431353636306662353033333653364620a3634323837613639323031376132 30
39326638313864393965356434623636626130623063386565613930326663323238376335363666
66386131343934623 40a346561653036313434633635383738303939363130303463373436616562
32313337386539653832376538643434616332353632336164346233343239326362
root@ubuntu:~/weekday_gamut/playbooks#
```

```
root@ubuntu:~/weekday_gamut/playbooks# cat 16_vaultdemowq.yml
---
- hosts: all
  vars_files:
  - secure.yml
  tasks:
  - name: creating a file
    command: touch {{ filename }}
root@ubuntu:~/weekday_gamut/playbooks#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 16_vaultdemowq.yml --ask-vault-pass
Vault password:

PLAY [all] *********************************************************************************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************************************************************************
ok: [172.17.0.3]
ok: [172.17.0.2]

TASK [creating a file] *********************************************************************************************************************************************************
[WARNING]: Consider using the file module with state=touch rather than running 'touch'.  If you need to use command because file 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.

changed: [172.17.0.2]
changed: [172.17.0.3]

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

root@ubuntu:~/weekday_gamut/playbooks#
```

Playbook: 17 – Prompt

```
root@ubuntu:~/weekday_gamut/playbooks# cat 17_prompt.yml
---
- hosts: all
  user: root
  become: yes
  connection: ssh
  gather_facts: no
  vars_prompt:
  - name: packtoinstall
    prompt: Please enter the package name to install?
    default: tree
    private: no
  tasks:
   - name: install the package
     apt: pkg={{ packtoinstall }} state=present
     register: resultlog
   - debug: var=resultlog
root@ubuntu:~/weekday_gamut/playbooks#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks# ansible-playbook 17_prompt.yml
Please enter the package name to install? [tree]: git

PLAY [all] *********************************************************************************************************************************

TASK [install the package] *****************************************************************************************************************
ok: [172.17.0.3]
ok: [172.17.0.2]

TASK [debug] *******************************************************************************************************************************
ok: [172.17.0.3] => {
    "resultlog": {
        "ansible_facts": {
            "discovered_interpreter_python": "/usr/bin/python3"
        },
        "cache_update_time": 1581340325,
        "cache_updated": false,
        "changed": false,
        "failed": false
    }
}
ok: [172.17.0.2] => {
    "resultlog": {
        "ansible_facts": {
            "discovered_interpreter_python": "/usr/bin/python3"
        },
        "cache_update_time": 1581342050,
        "cache_updated": false,
        "changed": false,
        "failed": false
    }
}

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

Includes:

```
root@ubuntu:~/weekday_gamut/playbooks/includes# tree
.
├── files
├── handlers
│   └── handlers.yml
├── master.yml
├── packages
│   └── package.yml
└── vars
    └── vars.yml

4 directories, 4 files
root@ubuntu:~/weekday_gamut/playbooks/includes# cat handlers/handlers.yml
- name: restartserver
  service: name={{ packagename }} state=restarted

root@ubuntu:~/weekday_gamut/playbooks/includes# cat packages/package.yml
- name: updating the packages
  apt: update_cache=yes
- name: installing apache2
  apt: name={{ packagename }} state=present
  notify: restartserver
root@ubuntu:~/weekday_gamut/playbooks/includes# cat vars/vars.yml
packagename: apache2
root@ubuntu:~/weekday_gamut/playbooks/includes# cat master.yml
---
- hosts: all
  user: root
  connection: ssh
  become: yes
  gather_facts: no
  vars_files:
  - vars/vars.yml
  tasks:
  - include: packages/package.yml
  handlers:
  - include: handlers/handlers.yml
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks/includes# ansible-playbook master.yml

PLAY [all] *********************************************************************************************************

TASK [updating the packages] ***************************************************************************************
ok: [172.17.0.3]
changed: [172.17.0.2]

TASK [installing apache2] ******************************************************************************************
ok: [172.17.0.2]
ok: [172.17.0.3]

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

root@ubuntu:~/weekday_gamut/playbooks/includes#
```

Roles: Create a role nginx

```
root@ubuntu:~/weekday_gamut/playbooks/roles# ansible-galaxy init nginx --offline
- Role nginx was created successfully
root@ubuntu:~/weekday_gamut/playbooks/roles#
```

```
root@ubuntu:~/weekday_gamut/playbooks/roles# tree
.
├── master.yml
└── nginx
    ├── defaults
    │   └── main.yml
    ├── files
    │   └── gamutgurus.html
    ├── handlers
    │   └── main.yml
    ├── meta
    │   └── main.yml
    ├── README.md
    ├── tasks
    │   └── main.yml
    ├── templates
    ├── tests
    │   ├── inventory
    │   └── test.yml
    └── vars
        └── main.yml

9 directories, 10 files
root@ubuntu:~/weekday_gamut/playbooks/roles# cat nginx/tasks/main.yml
---
# tasks file for nginx
- name: install the pacakge
  apt: name=nginx state=present
  notify: restartnginx
- name: deploy gamutgurus.html in nginx
  copy: src=files/gamutgurus.html dest=/var/www/html/gamutgurus.html
  notify: restartnginx
root@ubuntu:~/weekday_gamut/playbooks/roles# cat nginx/handlers/main.yml
---
# handlers file for nginx
- name: restartnginx
  service: name=nginx state=restarted
```

```
root@ubuntu:~/weekday_gamut/playbooks/roles# cat master.yml
---
- hosts: all
  user: root
  connection: ssh
  become: yes
  gather_facts: no
  roles:
   - nginx
root@ubuntu:~/weekday_gamut/playbooks/roles#
```

Execute:

```
root@ubuntu:~/weekday_gamut/playbooks/roles# ansible-playbook master.yml

PLAY [all] *********************************************************************************************************************

TASK [nginx : install the pacakge] *********************************************************************************************
ok: [172.17.0.3]
ok: [172.17.0.2]

TASK [nginx : deploy gamutgurus.html in nginx] *********************************************************************************
ok: [172.17.0.2]
ok: [172.17.0.3]

PLAY RECAP *********************************************************************************************************************
172.17.0.2                 : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.17.0.3                 : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

Thank You All…