Create Ansible roles using the Ansible Galaxy command and use those roles in the playbook.

List of roles:

1. Install Zip, Unzip, Wget

Step1 - create a role ‘utils ’ by using **ansible-galaxy init** command.

Step2- create an inventory file for ssh connection.

Step-3- under in-built main.yml of tasks , write the code.

```
Last login: Wed Apr  5 07:16:55 2023 from 192.168.0.103
osboxes@ansiblecontroller:~$ mkdir assignment1.1
osboxes@ansiblecontroller:~$ cd assignment1.1/
osboxes@ansiblecontroller:~/assignment1.1$ cat > inventory.txt
target1 ansible_host=192.168.0.102 ansible_ssh_pass=psboxes.org
^C
osboxes@ansiblecontroller:~/assignment1.1$ mkdir roles
osboxes@ansiblecontroller:~/assignment1.1$ cd roles
osboxes@ansiblecontroller:~/assignment1.1/roles$ ansible-galaxy init utils
- Role utils was created successfully
osboxes@ansiblecontroller:~/assignment1.1/roles$ tree
.
└── utils
    ├── defaults
    │   └── main.yml
    ├── handlers
    │   └── main.yml
    ├── meta
    │   └── main.yml
    ├── README.md
    ├── tasks
    │   └── main.yml
    ├── tests
    │   ├── inventory
    │   └── test.yml
    └── vars
        └── main.yml

7 directories, 8 files
osboxes@ansiblecontroller:~/assignment1.1/roles$ cd utils/tasks/
```

Step 4- create playbook.yml and under roles: mention **utils**

tasks/main.yml-

```
- name: install wget, zip and unzip
  become: true
  become_method: sudo
  apt: name=' {{ item }}' state=present
  loop:
    - zip
    - unzip
    - wget
~
~
~
```

Playbook.yml -

```
osboxes@ansiblecontroller:~/assignment1.1$ cat playbooks.yaml
---
- name: Install Zip, Unzip and wget
  hosts: all
  roles:
     - utils
```

Step5 - run it.

```
osboxes@ansiblecontroller:~/assignment1.1$ ansible-playbook playbooks.yaml -i inventory.txt --extra-vars "ansible_sudo_pass=osboxes.org"

PLAY [Install Zip, Unzip and wget] *********************************************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************************************************************
ok: [target1]

TASK [utils : install wget, zip and unzip] *************************************************************************************************************************
ok: [target1] => (item=zip)
ok: [target1] => (item=unzip)
ok: [target1] => (item=wget)

PLAY RECAP *********************************************************************************************************************************************************
target1                    : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

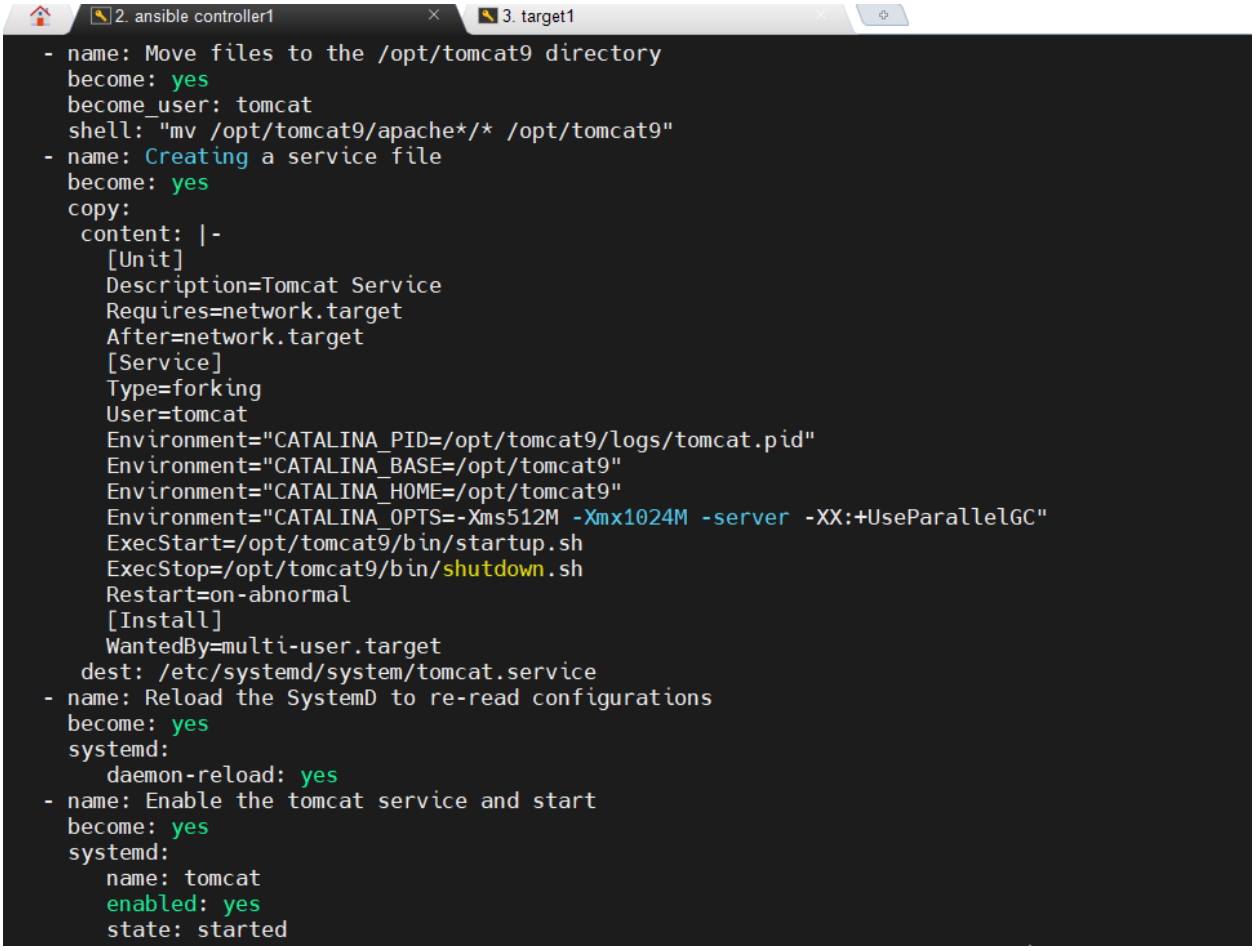
2. Install Tomcat (Download the war file and install as a Service)

Step1- create the role for tomcat ,and edit the yaml file in the tasks

```
osboxes@ansiblecontroller:/etc/ansible/roles$ sudo ansible-galaxy init tomcat
[sudo] password for osboxes:
- Role tomcat was created successfully
osboxes@ansiblecontroller:/etc/ansible/roles$ tree
.
├── nginx
│   ├── defaults
│   │   └── main.yml
│   ├── files
│   ├── handlers
│   │   └── main.yml
│   ├── meta
│   │   └── main.yml
│   ├── README.md
│   ├── tasks
│   │   └── main.yml
│   ├── templates
│   ├── tests
│   │   ├── inventory
│   │   └── test.yml
│   └── vars
│       └── main.yml
└── tomcat
    ├── defaults
    │   └── main.yml
    ├── files
    ├── handlers
    │   └── main.yml
    ├── meta
    │   └── main.yml
    ├── README.md
    ├── tasks
    │   └── main.yml
    ├── templates
    ├── tests
    │   ├── inventory
    │   └── test.yml
    └── vars
        └── main.yml

18 directories, 16 files
osboxes@ansiblecontroller:/etc/ansible/roles$
```

2. ansible controller1 | 3. target1

```
osboxes@ansiblecontroller:/etc/ansible/roles/tomcat/tasks$ cat main.yml
---
# tasks file for tomcat
   - name: Download Open JDK
     become: yes
     apt:
      name: openjdk-8-jre-headless
      update_cache: yes
      state: present

   - name: validate if Java is availble
     shell:
      java -version

   - name: Create the group
     become: yes
     group:
      name: tomcat
      state: present
   - name: Create the user
     become: yes
     user:
        name: tomcat
        state: present
   - name: Create a Directory /opt/tomcat9
     become: yes
     file:
       path: /opt/tomcat9
       state: directory
       mode: 0755
       owner: tomcat
       group: tomcat
   - name: Download Tomcat using unarchive
     become: yes
     unarchive:
       src: https://dlcdn.apache.org/tomcat/tomcat-9/v9.0.73/bin/apache-tomcat-9.0.73.tar.gz
       dest: /opt/tomcat9
       mode: 0755
       remote_src: yes
       group: tomcat
       owner: tomcat
```



Step2- write the inventory.txt and playbook.yml

```
osboxes@ansiblecontroller:/assignment1$ cat playbook.yml
---
- name: Install tomcat as a service
  hosts: all
  become: yes
  roles:
    - tomcat
```

Step3 - run and verify.

```
osboxes@ansiblecontroller:/assignment1$ ansible-playbook playbook.yml -i inventory --extra-vars "ansible_sudo_pass=osboxes.org"

PLAY [Install tomcat as a service] *********************************************************************************************************************************************

TASK [Gathering Facts] *********************************************************************************************************************************************************
ok: [target1]

TASK [tomcat : Download Open JDK] **********************************************************************************************************************************************
ok: [target1]

TASK [tomcat : validate if Java is availble] ***********************************************************************************************************************************
changed: [target1]

TASK [tomcat : Create the group] ***********************************************************************************************************************************************
ok: [target1]

TASK [tomcat : Create the user] ************************************************************************************************************************************************
ok: [target1]

TASK [tomcat : Create a Directory /opt/tomcat9] ********************************************************************************************************************************
changed: [target1]

TASK [tomcat : Download Tomcat using unarchive] ********************************************************************************************************************************
changed: [target1]

TASK [tomcat : Move files to the /opt/tomcat9 directory] ***********************************************************************************************************************
changed: [target1]

TASK [tomcat : Creating a service file] ****************************************************************************************************************************************
changed: [target1]

TASK [tomcat : Reload the SystemD to re-read configurations] *******************************************************************************************************************
ok: [target1]

TASK [tomcat : Enable the tomcat service and start] ****************************************************************************************************************************
changed: [target1]
```



```
ok: [target1]

PLAY RECAP *********************************************************************************************************************************************************************
target1                    : ok=12   changed=6    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

osboxes@ansiblecontroller:/assignment1$
```

3. Install Nginx (Download the war file and install as a Service)

Step1 - create a role ‘nginx ’

```
osboxes@ansiblecontroller:~$ ls
assignment1
osboxes@ansiblecontroller:~$ cd ass
-bash: cd: ass: No such file or directory
osboxes@ansiblecontroller:~$ cd assignment1/
osboxes@ansiblecontroller:~/assignment1$ ls
inventory.txt
osboxes@ansiblecontroller:~/assignment1$ ansible target1  -m ping -i inventory.txt
target1 | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python3"
    },
    "changed": false,
    "ping": "pong"
}
osboxes@ansiblecontroller:~/assignment1$ vi playbook.yml
osboxes@ansiblecontroller:~/assignment1$ ls
inventory.txt  playbook.yml
osboxes@ansiblecontroller:~/assignment1$ ansible-galaxy init nginx
- Role nginx was created successfully
```

Step2- write the tasks/main.yml file to install nginx

```yaml
---
# tasks file for nginx
 - name: Install required dependencies for Nginx
   apt:
    name:
      - build-essential
      - libpcre3
      - libpcre3-dev
      - zlib1g
      - zlib1g-dev
      - libssl-dev
      - libgd-dev
      - libxml2
      - libxml2-dev
      - uuid-dev
 - name: Download the Source File and extract
   unarchive:
    src: http://nginx.org/download/nginx-1.22.1.tar.gz
    dest: /tmp/
    remote_src: true
 - name: Configure and install nginx
   shell:
    cmd: |
      ./configure \
      --prefix=/etc/nginx \
      --conf-path=/etc/nginx/nginx.conf \
      --error-log-path=/var/log/nginx/error.log \
      --http-log-path=/var/log/nginx/access.log \
      --pid-path=/run/nginx.pid \
      --sbin-path=/usr/sbin/nginx \
      --with-http_ssl_module \
      --with-http_v2_module \
      --with-http_stub_status_module \
      --with-http_realip_module \
      --with-file-aio \
      --with-threads \
      --with-stream \
      --with-stream_ssl_preread_module
      make
      make install
    chdir: /tmp/nginx-1.22.1
```

```yaml
- name: copy nginx sevice file
  copy:
   src: /etc/nginx.service
   dest: /etc/systemd/system/
   mode: 0755
- name: create nginx service
  systemd:
   name: nginx.service
   enabled: yes
   state: started
```

Step3- write playbook.yaml and include *nginx role*

```
---
- name: Install Nsinx as a service
  hosts: all
  become: yes
  roles:
    - nginx
~
~
~
~
~
```

Step4 - run and verify.

```
PLAY [install command-utils] ***************************************************************************

TASK [Gathering Facts] *********************************************************************************
ok: [target1]

TASK [install_nginx : Install required dependencies for Nginx] *****************************************
ok: [target1]

TASK [install_nginx : Download the Source File and extract] ********************************************
ok: [target1]

TASK [install_nginx : Configure and install nginx] *****************************************************
changed: [target1]

TASK [install_nginx : copy nginx sevice file] **********************************************************
ok: [target1]

TASK [install_nginx : create nginx service] ************************************************************
changed: [target1]

PLAY RECAP *********************************************************************************************
target1                    : ok=6    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```