

Module 5: Case Study - Ansible

Problem Statement:

You are a DevOps Engineer and the organization you are working on needs to set up two configuration management server groups. One for Apache, another for NGINX. Being a DevOps Engineer it is your task to deal with this configuration management issue.

Let us see the tasks that you need to perform using Ansible:

1. Create two server groups. One for Apache and another for NGINX
2. Push two html files with their server information

Make sure that you don't forget to start the services once the installation is done. Also send post installation messages for both the server groups.

Using Ansible roles accomplish the above tasks. Also, once the Apache server configuration is done you need to install Java on that server group using Ansible role in a Playbook.

Solution:-

```
$ sudo mkdir ansible && cd ansible && sudo mkdir roles && cd roles
```

```
Server@Ansible-Server:/home/Server$ sudo mkdir ansible && cd ansible && sudo mkdir roles && cd roles
Server@Ansible-Server:/home/Server/ansible/roles$
```

```
roles$ sudo ansible-galaxy init Server.apache2
$ cd Server.apache2
$ cd tasks
```

```
Server@Ansible-Server:/home/Server/ansible/roles$ sudo ansible-galaxy init Server.apache2
- Role Server.apache2 was created successfully
Server@Ansible-Server:/home/Server/ansible/roles$ cd Server.apache2/
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2$ ls
README.md  defaults  files  handlers  meta  tasks  templates  tests  vars
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2$ cd tasks/
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/tasks$
```

```
$ cd ..
$ cd tasks
/etc/ansible/roles/Server.apache2/tasks$ sudo vi copy.yml
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2$ cd tasks/
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/tasks$ sudo vi copy.yml
```

```
---
- name: copying new index.html file
  copy:
    src=/home/Server/ansible/roles/Server.apache2/files/index.html dest=/var/www/html
```

```
---
- name: copying new index.html file
  copy: src=/home/Server/ansible/roles/Server.apache2/files/index.html dest=/var/www/html
```

```
Server.apache2/tasks$ sudo vi install.yml
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/tasks$ sudo vi install.yml
```

```
---  
- name: installing apache2  
  apt: name=apache2 state=latest
```

```
---  
- name: installing apache2  
  apt: name=apache2 state=latest
```

Server.apache2/tasks\$ sudo vi handler.yml

Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/tasks\$ sudo vi handler.yml

```
---  
- name: Restart Apache2  
  service: name=apache2 state=restarted
```

```
---  
- name: Restart Apache2  
  service: name=apache2 state=restarted
```

Server.apache2/tasks\$ sudo vi notifier.yml

Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/tasks\$ sudo vi notifier.yml

```
---  
- name: notifier  
  debug:  
    msg: "Notifying handler to restart Apache2 service."  
  notify:  
    - apache2: Restart Apache2
```

```
---  
- name: notifier  
  debug:  
    msg: "Notifying handler to restart Apache2 service."  
  notify:  
    - apache2: Restart Apache2
```

```
Server.apache2/tasks$ sudo vi main.yml
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/tasks$ sudo vi main.yml
```

```
---  
# tasks file for apache2  
- include_tasks: install.yml  
- include_tasks: copy.yml  
- include_tasks: notifier.yml  
- include_tasks: handler.yml
```

```
---  
# tasks file for apache2  
- include_tasks: install.yml  
- include_tasks: copy.yml  
- include_tasks: notifier.yml  
- include_tasks: handler.yml  
~
```

```
$ cd /home/Server/ansible/roles/Server.apache2/files
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/tasks$ cd ..  
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2$ cd files/  
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/files$ ls  
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/files$
```

```
$ sudo vi index.html
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.apache2/files$ sudo vi index.html
```

```
Press I  
Custom index.html for apache2.
```

```
Custom index.html for apache2.
```

```
roles$ sudo ansible-galaxy init Server.nginx
$ cd ..
$ cd tasks
/roles/Server.nginx/tasks$
$ sudo vi copy.yml
```

```
Server@Ansible-Server:/home/Server/ansible/roles$ sudo ansible-galaxy init Server.nginx
- Role Server.nginx was created successfully
Server@Ansible-Server:/home/Server/ansible/roles$ cd Server.nginx/t
tasks/      templates/ tests/
Server@Ansible-Server:/home/Server/ansible/roles$ cd Server.nginx/tasks/
Server@Ansible-Server:/home/Server/ansible/roles/Server.nginx/tasks$ sudo vi copy.yml
```

```
---
- name: copy custom html file
  copy:
    src=/home/Server/ansible/roles/Server.apache2/files/index.h
    tml dest=/var/www/html
```

```
---
- name: copy custom html file
  copy: src=/home/Server/ansible/roles/Server.nginx/files/index.html dest=/var/www/html
~
```

```
$ sudo vi install.yml
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.nginx/tasks$ sudo vi install.yml
```

```
---
- name: install nginx
  apt: name=nginx state=latest
```

```
---
- name: install nginx
  apt: name=nginx state=latest
~
```

```
$ sudo vi handler.yml
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.nginx/tasks$ sudo vi handler.yml
```

```
---  
- name: handler for nginx  
  service: name=nginx state=restarted
```

```
---  
- name: handler for nginx  
  service: name=nginx state=restarted
```

```
$ sudo vi notifier.yml
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.nginx/tasks$ sudo vi notifier.yml
```

```
---  
- name: notifier  
  debug:  
    msg: "Notifying handler to restart Nginx service."  
  notify:  
    - nginx: handler for nginx
```

```
---  
- name: notifier  
  debug:  
    msg: "Notifying handler to restart Nginx service."  
  notify:  
    - nginx: handler for nginx
```

```
$ sudo vi main.yml
```

```
---  
# tasks file for nginx  
- include_tasks: install.yml  
- include_tasks: copy.yml  
- include_tasks: notifier.yml  
- include_tasks: handler.yml
```

```
---  
# tasks file for nginx  
- include_tasks: install.yml  
- include_tasks: copy.yml  
- include_tasks: notifier.yml  
- include_tasks: handler.yml  
~
```

```
$ cd /home/Server/ansible/roles/Server.nginx/files
```

```
$ sudo vi index.html
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.nginx/files$ pwd  
/home/Server/ansible/roles/Server.nginx/files  
Server@Ansible-Server:/home/Server/ansible/roles/Server.nginx/files$ sudo vi index.html
```

```
Press I  
Custom index.html for apache2.  
:wq!
```

```
Custom index.html for NGINX.
```

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

```
Server@Ansible-Server:/home/Server/ansible$ ansible-playbook playbook.yml --syntax-check  
playbook: playbook.yml  
Server@Ansible-Server:/home/Server/ansible$
```



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

```
Server@Ansible-Server:/home/Server/ansible$ ansible-playbook playbook.yml --check

PLAY [installing apache2 on apache2_host] *****
*****
**

TASK [Gathering Facts] *****
*****
**
ok: [172.31.38.154]

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/install.yml for 172.31.38.154

TASK [Server.apache2 : installing apache2] *****
*****
**
ok: [172.31.38.154]

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/copy.yml for 172.31.38.154

TASK [Server.apache2 : copying new index.html file] *****
```



```

ok: [172.31.38.154]

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/copy.yml for 172.31.38.154

TASK [Server.apache2 : copying new index.html file] *****
*****
**
ok: [172.31.38.154]

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/notifier.yml for 172.31.38.154

TASK [Server.apache2 : notifier] *****
*****
**
ok: [172.31.38.154] => {
    "msg": "Notifying handler to restart Apache2 service."
}

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/handler.yml for 172.31.38.1

```

```

*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/handler.yml for 172.31.38.154

TASK [Server.apache2 : Restart Apache2] *****
*****
**
changed: [172.31.38.154]

PLAY [installing nginx on NGINX_host] *****
*****
**

TASK [Gathering Facts] *****
*****
**
ok: [172.31.38.192]

TASK [Server.nginx : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.nginx/tasks/install.yml for 172.31.38.192

TASK [Server.nginx : install nginx] *****
*****
**
ok: [172.31.38.192]

```

```

*****
**
included: /home/Server/ansible/roles/Server.nginx/tasks/notifier.yml for 172.31.38.192
2

TASK [Server.nginx : notifier] *****
*****
**
ok: [172.31.38.192] => {
  "msg": "Notifying handler to restart Nginx service."
}

TASK [Server.nginx : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.nginx/tasks/handler.yml for 172.31.38.192

TASK [Server.nginx : handler for nginx] *****
*****
**
changed: [172.31.38.192]

PLAY RECAP *****
*****
**
172.31.38.154      : ok=9    changed=1    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0
172.31.38.192     : ok=9    changed=1    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0

```

\$ ansible-playbook playbook.yml

```

Server@Ansible-Server:/home/Server/ansible$ ansible-playbook playbook.yml

PLAY [installing apache2 on apache2_host] *****
*****
**

TASK [Gathering Facts] *****
*****
**
ok: [172.31.38.154]

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/install.yml for 172.31.38.154

TASK [Server.apache2 : installing apache2] *****
*****
**
ok: [172.31.38.154]

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/copy.yml for 172.31.38.154

```



```

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/notifier.yml for 172.31.38.154

TASK [Server.apache2 : notifier] *****
*****
**
ok: [172.31.38.154] => {
  "msg": "Notifying handler to restart Apache2 service."
}

TASK [Server.apache2 : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.apache2/tasks/handler.yml for 172.31.38.154

TASK [Server.apache2 : Restart Apache2] *****
*****
**
changed: [172.31.38.154]

PLAY [installing nginx on NGINX_host] *****
*****
**

```

```

*****
**
changed: [172.31.38.154]

PLAY [installing nginx on NGINX_host] *****
*****
**

TASK [Gathering Facts] *****
*****
**
ok: [172.31.38.192]

TASK [Server.nginx : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.nginx/tasks/install.yml for 172.31.38.192

TASK [Server.nginx : install nginx] *****
*****
**
changed: [172.31.38.192]

TASK [Server.nginx : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.nginx/tasks/copy.yml for 172.31.38.192

TASK [Server.nginx : copy custom html file] *****

```

```

TASK [Server.nginx : copy custom html file] *****
*****
**
changed: [172.31.38.192]

TASK [Server.nginx : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.nginx/tasks/notifier.yml for 172.31.38.192

TASK [Server.nginx : notifier] *****
*****
**
ok: [172.31.38.192] => {
    "msg": "Notifying handler to restart Nginx service."
}

TASK [Server.nginx : include_tasks] *****
*****
**
included: /home/Server/ansible/roles/Server.nginx/tasks/handler.yml for 172.31.38.192

TASK [Server.nginx : handler for nginx] *****
*****
**
changed: [172.31.38.192]

```

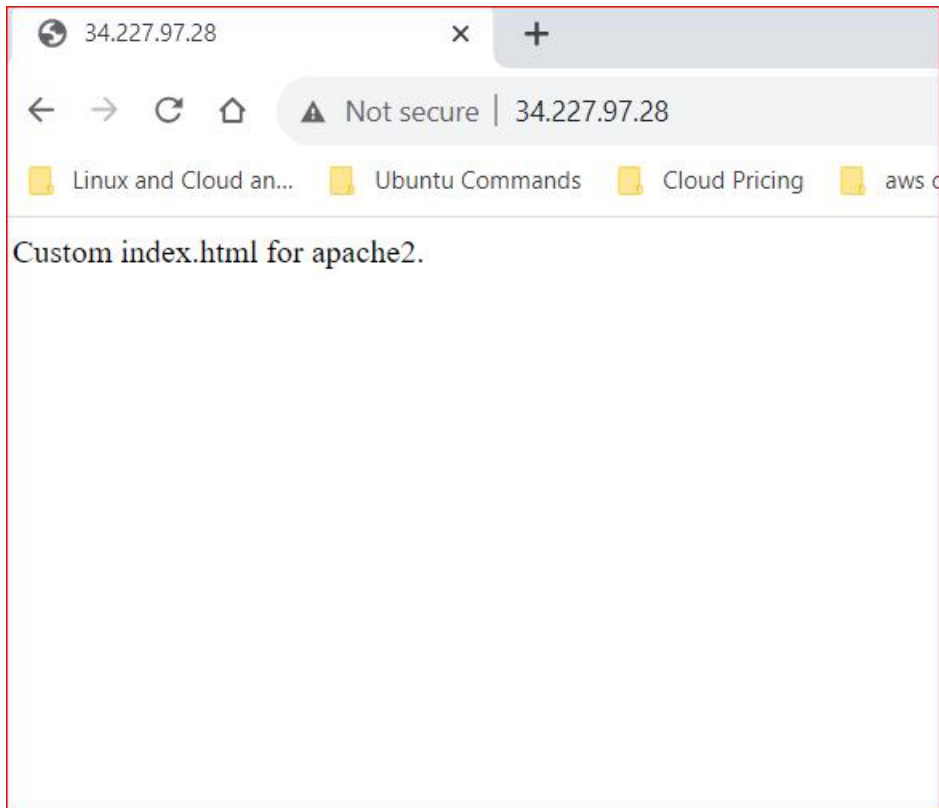
```

TASK [Server.nginx : handler for nginx] *****
*****
**
changed: [172.31.38.192]

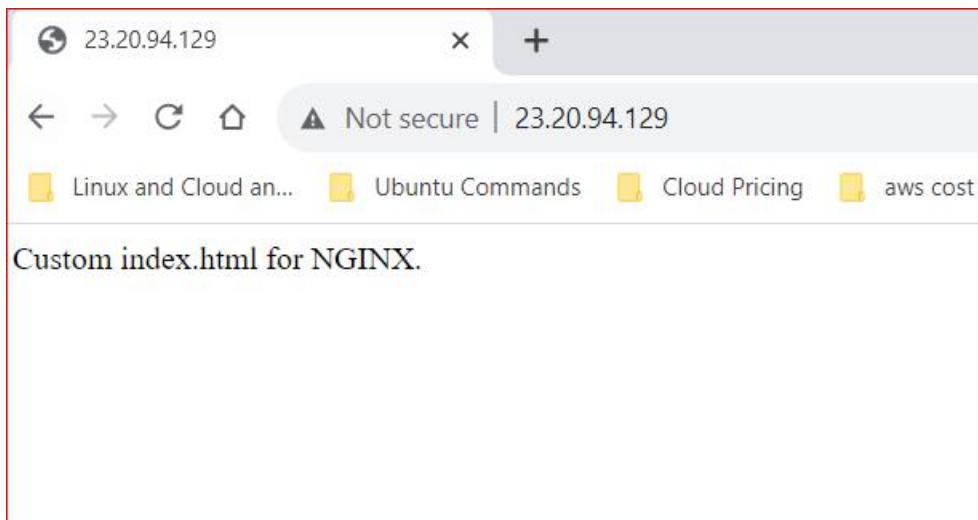
PLAY RECAP *****
*****
**
172.31.38.154      : ok=9    changed=1    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0
172.31.38.192      : ok=9    changed=3    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0

```

* Apache2 installed in node1:-



* NGINX installed in node2:-



```
$ cd ansible/roles/
```

```
Server@Ansible-Server:/home/Server$ cd ansible/roles/  
Server@Ansible-Server:/home/Server/ansible/roles$
```

```
$ sudo ansible-galaxy init Server.java
```

```
Server@Ansible-Server:/home/Server/ansible/roles$ sudo ansible-galaxy init Server.java  
- Role Server.java was created successfully  
Server@Ansible-Server:/home/Server/ansible/roles$ cd Server.java/tasks/  
Server@Ansible-Server:/home/Server/ansible/roles/Server.java/tasks$ sudo vi install_java.yml
```

```
$ cd Server.java/tasks/
```

```
Server@Ansible-Server:/home/Server/ansible/roles$ cd Server.java/tasks/  
Server@Ansible-Server:/home/Server/ansible/roles/Server.java/tasks$ ls  
install_java.yml  main.yml  
Server@Ansible-Server:/home/Server/ansible/roles/Server.java/tasks$
```

```
$ sudo vi main.yml
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.java/tasks$ sudo vi main.yml
```

```
---  
- name: Install Java  
  apt:  
    name: openjdk-8-jdk # Adjust the package name based on your  
                        preferred Java version  
    state: present  
    become: yes
```

```
---  
- name: Install Java  
  apt:  
    name: openjdk-8-jdk # Adjust the package name based on your preferred Java version  
    state: present  
    become: yes  
~  
~
```

```
$ cd ../../  
$ cd ..
```

```
Server@Ansible-Server:/home/Server/ansible/roles/Server.java/tasks$ cd ../../  
Server@Ansible-Server:/home/Server/ansible/roles$ cd ..  
Server@Ansible-Server:/home/Server/ansible$
```

```
$ sudo vi install_java.yml
```

```
Server@Ansible-Server:/home/Server/ansible$ sudo vi install_java.yml
```

```
---  
- name: Install Java on apache2_host  
  hosts: apache2_host  
  become: true  
  tasks:  
    - name: Install OpenJDK  
      apt: name=openjdk-11-jdk state=present
```

```
---  
- name: Install Java on apache2_host  
  hosts: apache2_host  
  become: true  
  tasks:  
    - name: Install OpenJDK  
      apt: name=openjdk-11-jdk state=present  
~  
~
```

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

```
Server@Ansible-Server:/home/Server/ansible$ ansible-playbook install_java.yml --syntax-check  
playbook: install_java.yml  
Server@Ansible-Server:/home/Server/ansible$
```



```
$ ansible-playbook install_java.yml --check
```

```
Server@Ansible-Server:/home/Server/ansible$ ansible-playbook install_java.yml --check

PLAY [Install Java on apache2_host] *****
*****
**

TASK [Gathering Facts] *****
*****
**
ok: [172.31.38.154]

TASK [Install OpenJDK] *****
*****
**
changed: [172.31.38.154]

PLAY RECAP *****
*****
**
172.31.38.154      : ok=2    changed=1    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0
```

```
$ ansible-playbook install_java.yml
```

```
Server@Ansible-Server:/home/Server/ansible$ ansible-playbook install_java.yml

PLAY [Install Java on apache2_host] *****
*****
**

TASK [Gathering Facts] *****
*****
**
ok: [172.31.38.154]

TASK [Install OpenJDK] *****
*****
**
changed: [172.31.38.154]

PLAY RECAP *****
*****
**
172.31.38.154      : ok=2    changed=1    unreachable=0    failed=0    skippe
d=0    rescued=0    ignored=0
```

```
$ java --version
```

```
Server@Apache2-Server:/home/Server$ java --version
openjdk 11.0.20 2023-07-18
OpenJDK Runtime Environment (build 11.0.20+8-post-Ubuntu-1ubuntu122.04)
OpenJDK 64-Bit Server VM (build 11.0.20+8-post-Ubuntu-1ubuntu122.04, mixed mode, sharing)
Server@Apache2-Server:/home/Server$
```