Lesson 06 Demo 03

Setting up Apache Web Server Using Ansible

Objective: To set up Apache web server by utilizing an Ansible YAML script for installation and configuration

Tools required: Ansible

Prerequisites: You need to have Ansible installed to proceed with this demo. If you don't have it installed, refer to Demo 1 of Lesson 6.

Steps to be followed:

1. Install Ansible on Ubuntu
2. Establish connectivity between Ansible controller and node machine
3. Create an Ansible playbook to install Apache web server
4. Run the Ansible playbook

Step 1: Install Ansible on Ubuntu

1.1 Use the below commands on Ubuntu terminal to install ansible software:

sudo apt-get install -f
sudo apt-get install software-properties-common
sudo apt-add-repository ppa:ansible/ansible
sudo apt-get update
sudo apt-get install ansible

```
manikumarsimpli@ip-172-31-71-23:~$ sudo apt-get install ansible
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  ieee-data python3-argcomplete python3-crypto python3-dnspython python3-kerberos python3-libcloud python3-netaddr
  python3-ntlm-auth python3-requests-kerberos python3-requests-ntlm python3-selinux python3-winrm python3-xmltodict
Suggested packages:
  cowsay sshpass ipython3 python-netaddr-docs
The following NEW packages will be installed:
  ansible ieee-data python3-argcomplete python3-crypto python3-dnspython python3-kerberos python3-libcloud python3-netaddr
  python3-ntlm-auth python3-requests-kerberos python3-requests-ntlm python3-selinux python3-winrm python3-xmltodict
0 upgraded, 14 newly installed, 0 to remove and 58 not upgraded.
Need to get 9607 kB of archives.
After this operation, 90.0 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 python3-crypto amd64 2.6.1-13ubuntu2 [237 kB]
Get:2 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 python3-dnspython all 1.16.0-1build1 [89.1 kB]
Get:3 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 ieee-data all 20180805.1 [1589 kB]
Get:4 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/main amd64 python3-netaddr all 0.7.19-3 [235 kB]
Get:5 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 ansible all 2.9.6+dfsg-1 [5794 kB]
Get:6 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-argcomplete all 1.8.1-1.3ubuntu1 [27.2 kB]
Get:7 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-kerberos amd64 1.1.14-3.1build1 [22.6 kB]
Get:8 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-libcloud all 2.8.0-1 [1403 kB]
Get:9 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-ntlm-auth all 1.1.0-1 [19.6 kB]
Get:10 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-kerberos all 0.12.0-2 [11.9 kB]
Get:11 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-requests-ntlm all 1.1.0-1 [6004 B]
Get:12 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-selinux amd64 3.0-1build2 [139 kB]
Get:13 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-xmltodict all 0.12.0-1 [12.6 kB]
Get:14 http://us-east-1.ec2.archive.ubuntu.com/ubuntu focal/universe amd64 python3-winrm all 0.3.0-2 [21.7 kB]
Fetched 9607 kB in 0s (67.7 MB/s)
Selecting previously unselected package python3-crypto.
(Reading database ... 190629 files and directories currently installed.)
Preparing to unpack .../00-python3-crypto_2.6.1-13ubuntu2_amd64.deb ...
Unpacking python3-crypto (2.6.1-13ubuntu2) ...
Selecting previously unselected package python3-dnspython.
```

Step 2: Establish connectivity between ansible controller and node machine

2.1 Establish SSH key pair in linux system to have SSH connectivity with localhost using the following commands:

ssh-keygen -t rsa (Press Enter when asked for an input**)**

cat .ssh/id_rsa.pub >> .ssh/authorized_keys

ssh localhost -p 42006

```
The key's randomart image is:
+---[RSA 3072]----+
|         +o=++.o..|
|          *o*.+ . |
|         o =.+    |
|        o . o     |
|       . S o oo. +|
|        . o  *=..*|
|         o  o.B.o*|
|          .  E.=o=|
|             +oo=|
+----[SHA256]-----+
manikumarsimpli@ip-172-31-71-23:~$ cat .ssh/id_rsa.pub >> .ssh/authorized_keys
manikumarsimpli@ip-172-31-71-23:~$ ssh localhost -p 42006
Welcome to Ubuntu 20.04.2 LTS (GNU/Linux 5.8.0-1035-aws x86_64)

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

  System information as of Thu Jul  1 08:03:16 UTC 2021

  System load:  0.0                Processes:             279
  Usage of /:   26.4% of 29.02GB   Users logged in:       1
  Memory usage: 14%                IPv4 address for ens5: 172.31.71.23
  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

63 updates can be applied immediately.
27 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable


Last login: Thu Jul  1 07:24:09 2021 from 127.0.0.1
manikumarsimpli@ip-172-31-71-23:~$
```

2.2 Now, add the localhost in ansible file **/etc/ansible/hosts**

sudo vi /etc/ansible/hosts

```
Last login: Thu Feb  8 04:13:03 2024 from 127.0.0.1
labsuser@ip-172-31-32-128:~$ sudo vi /etc/ansible/hosts
```

2.3 When the file opens, add the below two lines of code at the end of the file:

[webservers]

localhost:42006

```
## db-[99:101]-node.example.com

# Ex 3: A collection of database servers in the 'dbservers' group:

## [dbservers]
##
## db01.intranet.mydomain.net
## db02.intranet.mydomain.net
## 10.25.1.56
## 10.25.1.57


# Ex4: Multiple hosts arranged into groups such as 'Debian' and 'openSUSE':

## [Debian]
## alpha.example.org
## beta.example.org

## [openSUSE]
## green.example.com
## blue.example.com
[webservers]
localhost:42006
"/etc/ansible/hosts" 56L, 1204B
```

2.4 Execute the below command to validate the host inventory file:

ansible -m ping webservers

```
manikumarsimpli@ip-172-31-71-23:~$ ansible -m ping webservers
[DEPRECATION WARNING]: Distribution Ubuntu 20.04 on host localhost 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.
localhost | SUCCESS => {
    "ansible_facts": {
        "discovered_interpreter_python": "/usr/bin/python"
    },
    "changed": false,
    "ping": "pong"
}
manikumarsimpli@ip-172-31-71-23:~$
```

Step 3: Create an Ansible playbook to install Apache web server

3.1 Create and open the file using the below command:

sudo vi apache2.yaml

3.2 Add the following code in the apache2.yaml file and proceed with execution:

```
---
- hosts: webservers
  become: true
  tasks:
    - name: install apache2
      apt: name=apache2 update_cache=no state=latest


    - name: enabled mod_rewrite
      apache2_module: name=rewrite state=present
      notify:
         - restart apache2


  handlers:
    - name: restart apache2
      service: name=apache2 state=restarted
```

- hosts: webservers
become: true
tasks:
- name: install apache2
apt: name=apache2 update_cache=no state=latest

- name: enabled mod_rewrite
apache2_module: name=rewrite state=present
notify:
- restart apache2

handlers:

- name: restart apache2
service: name=apache2 state=restarted

Step 4: Run Ansible Playbook

4.1 Run **apache.yaml** file using the below command:
ansible-playbook apache2.yaml

```
manikumarsimpli@ip-172-31-71-23:~$ ansible-playbook apache2.yaml

PLAY [webservers] ***********************************************************************************************************************

TASK [Gathering Facts] ******************************************************************************************************************
[DEPRECATION WARNING]: Distribution Ubuntu 20.04 on host localhost 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: [localhost]

TASK [install apache2] ******************************************************************************************************************
changed: [localhost]

TASK [enabled mod_rewrite] **************************************************************************************************************
changed: [localhost]

RUNNING HANDLER [restart apache2] *******************************************************************************************************
changed: [localhost]

PLAY RECAP ******************************************************************************************************************************
localhost                  : ok=4    changed=3    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

manikumarsimpli@ip-172-31-71-23:~$
```

4.2 Validate the installation using the command:
ansible -m shell -a "service apache2 status" webservers

```
manikumarsimpli@ip-172-31-71-23:~$ ansible -m shell -a "service apache2 status" webservers
[WARNING]: Consider using the service module rather than running 'service'.  If you need to use command because service 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 20.04 on host localhost 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.
localhost | CHANGED | rc=0 >>
● apache2.service - The Apache HTTP Server
     Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2021-07-01 08:11:55 UTC; 1min 6s ago
       Docs: https://httpd.apache.org/docs/2.4/
    Process: 14459 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
   Main PID: 14463 (apache2)
      Tasks: 55 (limit: 18846)
     Memory: 6.2M
     CGroup: /system.slice/apache2.service
             ├─14463 /usr/sbin/apache2 -k start
             ├─14464 /usr/sbin/apache2 -k start
             └─14465 /usr/sbin/apache2 -k start
manikumarsimpli@ip-172-31-71-23:~$
```

By following the above steps, you have successfully set up an Apache web server by utilizing Ansible for installation and configuration.