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Course/Section: CPE 212- CPE31S2	Date Submitted: 10/2/24
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Activity 6: Targeting Specific Nodes and Managing Services	
1. Objectives: 1.1 Individualize hosts 1.2 Apply tags in selecting plays to run 1.3 Managing Services from remote servers using playbooks	
2. Discussion: <p>In this activity, we try to individualize hosts. For example, we don't want apache on all our servers, or maybe only one of our servers is a web server, or maybe we have different servers like database or file servers running different things on different categories of servers and that is what we are going to take a look at in this activity.</p> <p>We also try to manage services that do not automatically run using the automations in playbook. For example, when we install web servers or httpd for CentOS, we notice that the service did not start automatically.</p> <p>Requirement: In this activity, you will need to create another Ubuntu VM and name it Server 3. Likewise, you need to activate the second adapter to a host-only adapter after the installation. Take note of the IP address of Server 3. Make sure to use the command <i>ssh-copy-id</i> to copy the public key to Server 3. Verify if you can successfully SSH to Server 3.</p>	
Task 1: Targeting Specific Nodes	
1. Create a new playbook and named it site.yml. Follow the commands as shown in the image below. Make sure to save the file and exit.	

```

---
- hosts: all
  become: true
  tasks:

    - name: install apache and php for Ubuntu servers
      apt:
        name:
          - apache2
          - libapache2-mod-php
        state: latest
        update_cache: yes
        when: ansible_distribution == "Ubuntu"

    - name: install apache and php for CentOS servers
      dnf:
        name:
          - httpd
          - php
        state: latest
        when: ansible_distribution == "CentOS"

```

2. Edit the inventory file. Remove the variables we put in our last activity and group according to the image shown below:

```

[web_servers]
192.168.56.120
192.168.56.121

[db_servers]
192.168.56.122

[file_servers]
192.168.56.123

```

Make sure to save the file and exit.

```

punopaughey@workstation:~/CPE212_Activity6$ cat inventory
[web_servers]
server1
server2

[db_servers]
server3

[file_servers]
centos
punopaughey@workstation:~/CPE212_Activity6$

```

Right now, we have created groups in our inventory file and put each server in its own group. In other cases, you can have a server be a member of multiple groups, for example you have a test server that is also a web server.

3. Edit the *site.yml* by following the image below:

```
---
- hosts: all
  become: true
  pre_tasks:
    - name: install updates (CentOS)
      dnf:
        update_only: yes
        update_cache: yes
        when: ansible_distribution == "CentOS"
    - name: install updates (Ubuntu)
      apt:
        upgrade: dist
        update_cache: yes
        when: ansible_distribution == "Ubuntu"

- hosts: web_servers
  become: true
  tasks:
    - name: install apache and php for Ubuntu servers
      apt:
        name:
          - apache2
          - libapache2-mod-php
        state: latest
        when: ansible_distribution == "Ubuntu"
    - name: install apache and php for CentOS servers
      dnf:
        name:
          - httpd
          - php
        state: latest
        when: ansible_distribution == "CentOS"
```

Make sure to save the file and exit.

```

punopaughey@workstation:~/CPE212_Activity6$ cat site.yml
---

- hosts: all
  become: true
  pre_tasks:

    - name: install updates (CentOS)
      dnf:
        update_only: yes
        update_cache: yes
        when: ansible_distribution == "CentOS"

    - name: install updates (Ubuntu)
      dnf:
        upgrade: dist
        update_cache: yes
        when: ansible_distribution == "Ubuntu"

- hosts: web_servers
  become: true
  tasks:

    - name: install apache and php for ubuntu servers
      apt:
        name:
          - apache2
          - libapache2-mod-php
        state: latest
        update_cache: yes
        when: ansible_distribution == "Ubuntu"

```

The *pre-tasks* command tells the ansible to run it before any other thing. In the *pre-tasks*, CentOS will install updates while Ubuntu will upgrade its distribution package. This will run before running the second play, which is targeted at *web_servers*. In the second play, apache and php will be installed on both Ubuntu servers and CentOS servers.

Run the *site.yml* file and describe the result.

```

PLAY RECAP *****
centos                : ok=2    changed=0    unreachable=0    failed=0    skipped=1
  rescued=0    ignored=0
server1               : ok=4    changed=0    unreachable=0    failed=0    skipped=2
  rescued=0    ignored=0
server2               : ok=4    changed=0    unreachable=0    failed=0    skipped=2
  rescued=0    ignored=0
server3               : ok=2    changed=0    unreachable=0    failed=0    skipped=1
  rescued=0    ignored=0

```

4. Let's try to edit again the *site.yml* file. This time, we are going to add plays targeting the other servers. This time we target the *db_servers* by adding it on the current *site.yml*. Below is an example: (Note add this at the end of the playbooks from task 1.3.

```
- hosts: db_servers
  become: true
  tasks:

  - name: install mariadb package (CentOS)
    yum:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "CentOS"

  - name: "Mariadb- Restarting/Enabling"
    service:
      name: mariadb
      state: restarted
      enabled: true

  - name: install mariadb package (Ubuntu)
    apt:
      name: mariadb-server
      state: latest
    when: ansible_distribution == "Ubuntu"
```

Make sure to save the file and exit.

```

GNU nano 2.9.3                                     site.yml

  dnf:
    name:
      - httpd
      - php
    state: latest
    when: ansible_distribution == "CentOS"
- hosts: db_servers
  become: true
  tasks:

    - name: install mariadb package (CentOS)
      yum:
        name: mariadb-server
        state: latest

    - name: "Mariadb- Restarting/Enabling"
      service:
        name: mariadb
        state: restarted
        enabled: true

    - name: install mariadb package (Ubuntu)
      apt:
        name: mariadb-server
        state: latest
        when: ansible_distribution == "Ubuntu"

^G Get Help  ^O Write Out ^W Where Is  ^K Cut To
^X Exit      ^R Read File ^\ Replace   ^U Uncut

```

Run the *site.yml* file and describe the result.

```

TASK [install mariadb package (CentOS)] *****
ok: [server3]

TASK [Mariadb- Restarting/Enabling] *****
changed: [server3]

TASK [install mariadb package (Ubuntu)] *****
ok: [server3]

PLAY RECAP *****
centos      : ok=2    changed=0    unreachable=0    failed=0    skipped=1    rescued=
server1     : ok=4    changed=0    unreachable=0    failed=0    skipped=2    rescued=
server2     : ok=4    changed=0    unreachable=0    failed=0    skipped=2    rescued=
server3     : ok=6    changed=1    unreachable=0    failed=0    skipped=1    rescued=

punopaughey@workstation:~/CPE212_Activity6$

```

5. Go to the remote server (Ubuntu) terminal that belongs to the db_servers group and check the status for mariadb installation using the command: *systemctl status mariadb*. Do this on the CentOS server also.

Describe the output.

6. Edit the *site.yml* again. This time we will append the code to configure installation on the *file_servers* group. We can add the following on our file.

```
- hosts: file_servers
  become: true
  tasks:

  - name: install samba package
    package:
      name: samba
      state: latest
```

Make sure to save the file and exit.

Run the *site.yml* file and describe the result.

```
TASK [install samba package] *****
changed: [centos]

PLAY RECAP *****
centos                : ok=4    changed=1    unreachable=0    failed=0    skipped=1
  rescued=0    ignored=0
server1               : ok=4    changed=0    unreachable=0    failed=0    skipped=2
  rescued=0    ignored=0
server2               : ok=4    changed=0    unreachable=0    failed=0    skipped=2
  rescued=0    ignored=0
server3               : ok=6    changed=1    unreachable=0    failed=0    skipped=1
  rescued=0    ignored=0

punopaughey@workstation:~/CPE212_Activity6$
```

The testing of the *file_servers* is beyond the scope of this activity, and as well as our topics and objectives. However, in this activity we were able to show that we can target hosts or servers using grouping in ansible playbooks.

Task 2: Using Tags in running playbooks

In this task, our goal is to add metadata to our plays so that we can only run the plays that we want to run, and not all the plays in our playbook.

1. Edit the *site.yml* file. Add tags to the playbook. After the name, we can place the tags: *name_of_tag*. This is an arbitrary command, which means you can use any name for a tag.

```

---
- hosts: all
  become: true
  pre_tasks:

    - name: install updates (CentOS)
      tags: always
      dnf:
        update_only: yes
        update_cache: yes
        when: ansible_distribution == "CentOS"

    - name: install updates (Ubuntu)
      tags: always
      apt:
        upgrade: dist
        update_cache: yes
        when: ansible_distribution == "Ubuntu"

```

```

- hosts: web_servers
  become: true
  tasks:

    - name: install apache and php for Ubuntu servers
      tags: apache,apache2,ubuntu
      apt:
        name:
          - apache2
          - libapache2-mod-php
        state: latest
        when: ansible_distribution == "Ubuntu"

    - name: install apache and php for CentOS servers
      tags: apache,centos,httpd
      dnf:
        name:
          - httpd
          - php
        state: latest
        when: ansible_distribution == "CentOS"

```



```
- hosts: db_servers
  become: true
  tasks:

    - name: install mariadb package (CentOS)
      tags: centos, db, mariadb
      dnf:
        name: mariadb-server
        state: latest
        when: ansible_distribution == "CentOS"

    - name: "Mariadb- Restarting/Enabling"
      service:
        name: mariadb
        state: restarted
        enabled: true

    - name: install mariadb package (Ubuntu)
      tags: db, mariadb, ubuntu
      apt:
        name: mariadb-server
        state: latest
        when: ansible_distribution == "Ubuntu"

- hosts: file_servers
  become: true
  tasks:

    - name: install samba package
      tags: samba
      package:
        name: samba
        state: latest
```

Make sure to save the file and exit.

Run the *site.yml* file and describe the result.

```
PLAY RECAP *****
*
centos                : ok=4    changed=0    unreachable=0    failed=0
skipped=1            rescued=0    ignored=0
server1              : ok=4    changed=0    unreachable=0    failed=0
skipped=2            rescued=0    ignored=0
server2              : ok=4    changed=0    unreachable=0    failed=0
skipped=2            rescued=0    ignored=0
server3              : ok=6    changed=1    unreachable=0    failed=0
skipped=1            rescued=0    ignored=0

punopaughey@workstation:~/CPE212_Activity6$
```

The playbook installed the samba package but ignored the tags

2. On the local machine, try to issue the following commands and describe each result:

2.1 *ansible-playbook --list-tags site.yml*

```
punopaughey@workstation:~/CPE212_Activity6$ ansible-playbook --list-tags site.yml

playbook: site.yml

play #1 (all): all    TAGS: []
TASK TAGS: []

play #2 (web_servers): web_servers    TAGS: []
TASK TAGS: []

play #3 (db_servers): db_servers    TAGS: []
TASK TAGS: [centos, db, mariadb, ubuntu]

play #4 (file_servers): file_servers    TAGS: []
TASK TAGS: [samba]

punopaughey@workstation:~/CPE212_Activity6$
```

This command lists all of the tags included in the code instead of executing the playbook.

2.2 *ansible-playbook --tags centos --ask-become-pass site.yml*

```
PLAY [web_servers] *****
TASK [Gathering Facts] *****
ok: [server1]
ok: [server2]

PLAY [db_servers] *****
TASK [Gathering Facts] *****
ok: [server3]

TASK [install mariadb package (CentOS)] *****
ok: [server3]

PLAY [file_servers] *****
TASK [Gathering Facts] *****
ok: [centos]

PLAY RECAP *****
centos                : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0
server1              : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0
server2              : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0
server3              : ok=3    changed=0    unreachable=0    failed=0    skipped=0    rescued=0

punopaughey@workstation:~/CPE212_Activity6$
```

the playbook ran specific plays with the tag centos included in it which is the install apache, php and mariadb package for CentOS

2.3 *ansible-playbook --tags db --ask-become-pass site.yml*

```
TASK [Gathering Facts] *****
*****
ok: [server3]

TASK [install mariadb package (CentOS)] *****
*****
ok: [server3]

TASK [install mariadb package (Ubuntu)] *****
*****
ok: [server3]

PLAY [file_servers] *****
*****

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

PLAY RECAP *****
*****
centos                : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
rescued=0    ignored=0
server1          : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
rescued=0    ignored=0
server2          : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
rescued=0    ignored=0
server3          : ok=4    changed=0    unreachable=0    failed=0    skipped=0    r
rescued=0    ignored=0

punopaughey@workstation:~/CPE212_Activity6$
```

The playbook executed specific plays with the db tag, which is the install mariadb for both CentOS and Ubuntu.

2.4 *ansible-playbook --tags apache --ask-become-pass site.yml*

```
PLAY [web_servers] *****
*****

TASK [Gathering Facts] *****
*****
ok: [server1]
ok: [server2]

PLAY [db_servers] *****
*****

TASK [Gathering Facts] *****
*****
ok: [server3]

PLAY [file_servers] *****
*****

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

PLAY RECAP *****
*****
centos                : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
rescued=0    ignored=0
server1          : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
rescued=0    ignored=0
server2          : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
rescued=0    ignored=0
server3          : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
rescued=0    ignored=0

punopaughey@workstation:~/CPE212_Activity6$
```

The playbook ran specific plays with the tag apache, which is the install apache and php for both Ubuntu and CentOS servers

2.5 *ansible-playbook --tags "apache,db" --ask-become-pass site.yml*

```
PLAY [web_servers] *****
TASK [Gathering Facts] *****
ok: [server1]
ok: [server2]

PLAY [db_servers] *****
TASK [Gathering Facts] *****
ok: [server3]

TASK [install mariadb package (CentOS)] *****
ok: [server3]

TASK [install mariadb package (Ubuntu)] *****
ok: [server3]

PLAY [file_servers] *****
TASK [Gathering Facts] *****
ok: [centos]

PLAY RECAP *****
centos                : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
escued=0    ignored=0
server1               : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
escued=0    ignored=0
server2               : ok=2    changed=0    unreachable=0    failed=0    skipped=0    r
escued=0    ignored=0
server3               : ok=4    changed=0    unreachable=0    failed=0    skipped=0    r
escued=0    ignored=0

punopaughey@workstation:~/CPE212_Activity6$
```

The playbook executed the plays with tags apache and db, which is the install mariadb and php for both Ubuntu and CentOS servers and the install mariadb for both Ubuntu and CentOS servers.

Task 3: Managing Services

1. Edit the file site.yml and add a play that will automatically start the httpd on CentOS server.

```
- name: install apache and php for CentOS servers
  tags: apache,centos,httpd
  dnf:
    name:
      - httpd
      - php
    state: latest
    when: ansible_distribution == "CentOS"

- name: start httpd (CentOS)
  tags: apache, centos,httpd
  service:
    name: httpd
    state: started
    when: ansible_distribution == "CentOS"
```

Figure 3.1.1

Make sure to save the file and exit.

You would also notice from our previous activity that we already created a module that runs a service.

```
- hosts: db_servers
  become: true
  tasks:

  - name: install mariadb package (CentOS)
    tags: centos, db,mariadb
    dnf:
      name: mariadb-server
      state: latest
      when: ansible_distribution == "CentOS"

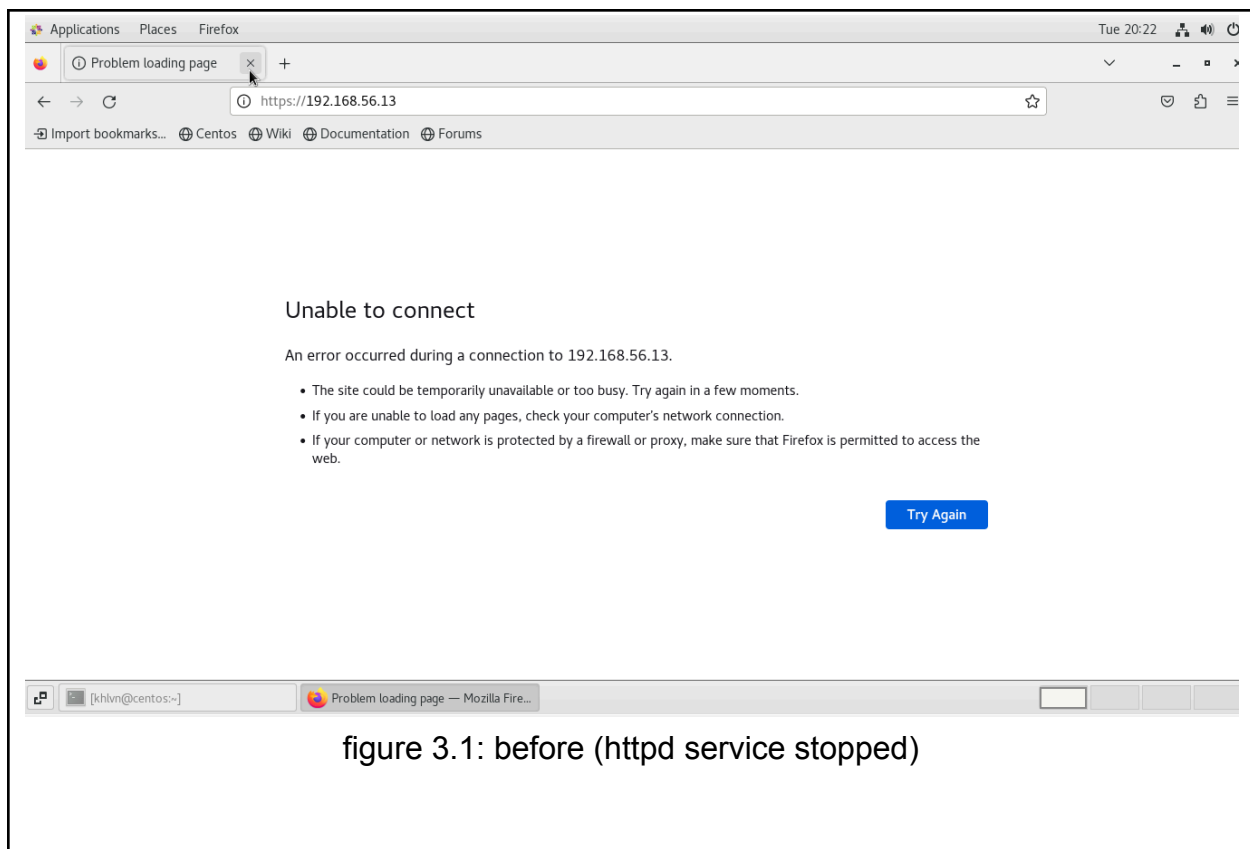
  - name: "Mariadb- Restarting/Enabling"
    service:
      name: mariadb
      state: restarted
      enabled: true
```

Figure 3.1.2

This is because in CentOS, installed packages' services are not run automatically. Thus, we need to create the module to run it automatically.

2. To test it, before you run the saved playbook, go to the CentOS server and stop the currently running httpd using the command `sudo systemctl stop httpd`. When prompted, enter the sudo password. After that, open the browser and enter the CentOS server's IP address. You should not be getting a display because we stopped the httpd service already.
3. Go to the local machine and this time, run the `site.yml` file. Then after running the file, go again to the CentOS server and enter its IP address on the browser. Describe the result.

To automatically enable the service every time we run the playbook, use the command `enabled: true` similar to Figure 7.1.2 and save the playbook.



```

TASK [install apache and php for ubuntu servers] *****
ok: [server2]
ok: [server1]

TASK [install apache and php for CentOS servers] *****
skipping: [server1]
skipping: [server2]

TASK [start httpd (CentOS)] *****
skipping: [server1]
skipping: [server2]

PLAY [db_servers] *****

TASK [Gathering Facts] *****
ok: [server3]

PLAY [file_servers] *****

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

PLAY RECAP *****
centos                : ok=3    changed=0    unreachable=0    failed=0    skipped=1    r
escued=0    ignored=0
server1          : ok=4    changed=0    unreachable=0    failed=0    skipped=3    r
escued=0    ignored=0
server2          : ok=4    changed=0    unreachable=0    failed=0    skipped=3    r
escued=0    ignored=0
server3          : ok=3    changed=0    unreachable=0    failed=0    skipped=1    r
escued=0    ignored=0

punopaughey@workstation:~/CPE212_Activity6$

```

figure 3.2: running the playbook

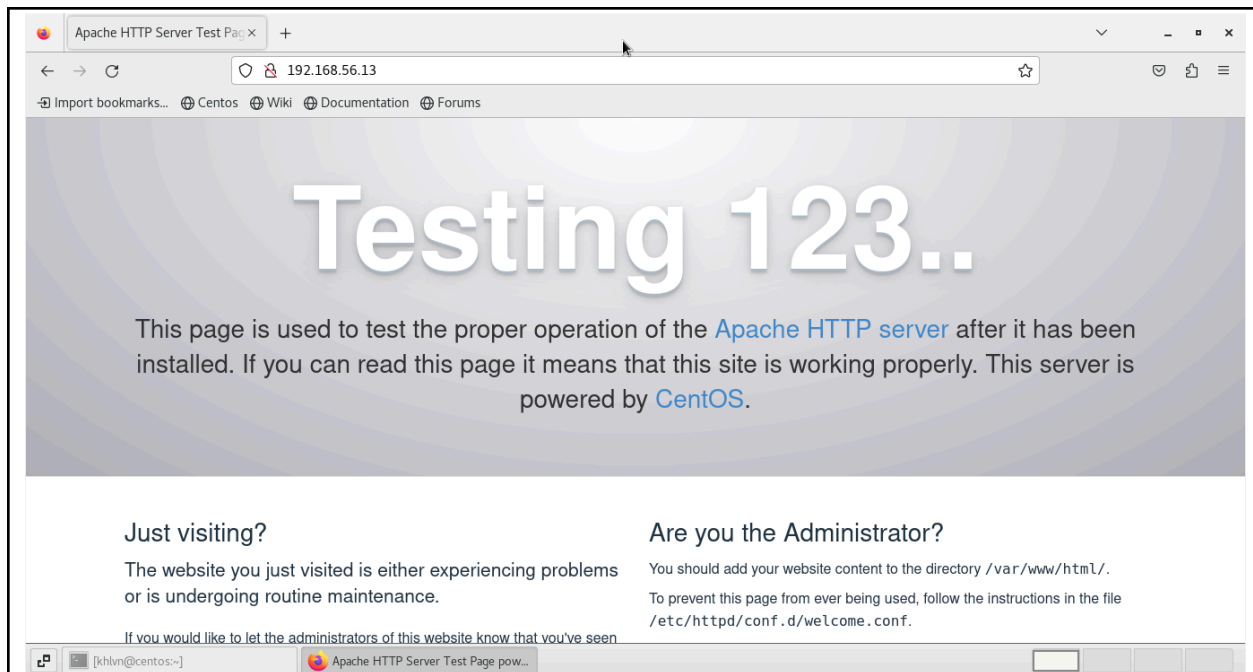


figure 3.3: after (httpd service started)

Reflections:

Answer the following:

1. What is the importance of putting our remote servers into groups?

- We can organize our remote servers by its purpose (db server, web server), and/or by its operating system.

2. What is the importance of tags in playbooks?

- To classify the play's name according to its task

3. Why do you think some services need to be managed automatically in playbooks?

- To reduce the time taken by configuring it automatically in the playbook instead of manually managing the remote servers.

github link: https://github.com/KHLVN/CPE212_Activity6

