

Name: Juanson, Aliya Dane P.	Date Performed: October 1, 2024
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Instructor: Sir Robin Valenzuela	Semester and SY: 2024-2025
Activity 6: Targeting Specific Nodes and Managing Services	
<p>1. Objectives:</p> <ul style="list-style-type: none"> 1.1 Individualize hosts 1.2 Apply tags in selecting plays to run 1.3 Managing Services from remote servers using playbooks 	
<p>2. Discussion:</p> <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:</p> <p>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 installations. Take note of the IP address of the 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	
<ul style="list-style-type: none"> 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.

```
Juanson_LocalMachine [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities Terminal Wed 09:26
qadjuanson@workstation: ~/Activity6_Juanson
File Edit View Search Terminal Help
GNU nano 2.9.3 inventory
#[servers]
#192.168.56.112
#192.168.56.114
#192.168.56.115
[web_servers]
192.168.56.112
[db_servers]
192.168.56.114
[file_servers]
192.168.56.115
[ Read 13 lines ]
^G Get Help ^O Write Out ^W Where Is ^K Cut Text ^J Justify
^X Exit ^R Read File ^\ Replace ^U Uncut Text ^T To Spell
```

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"

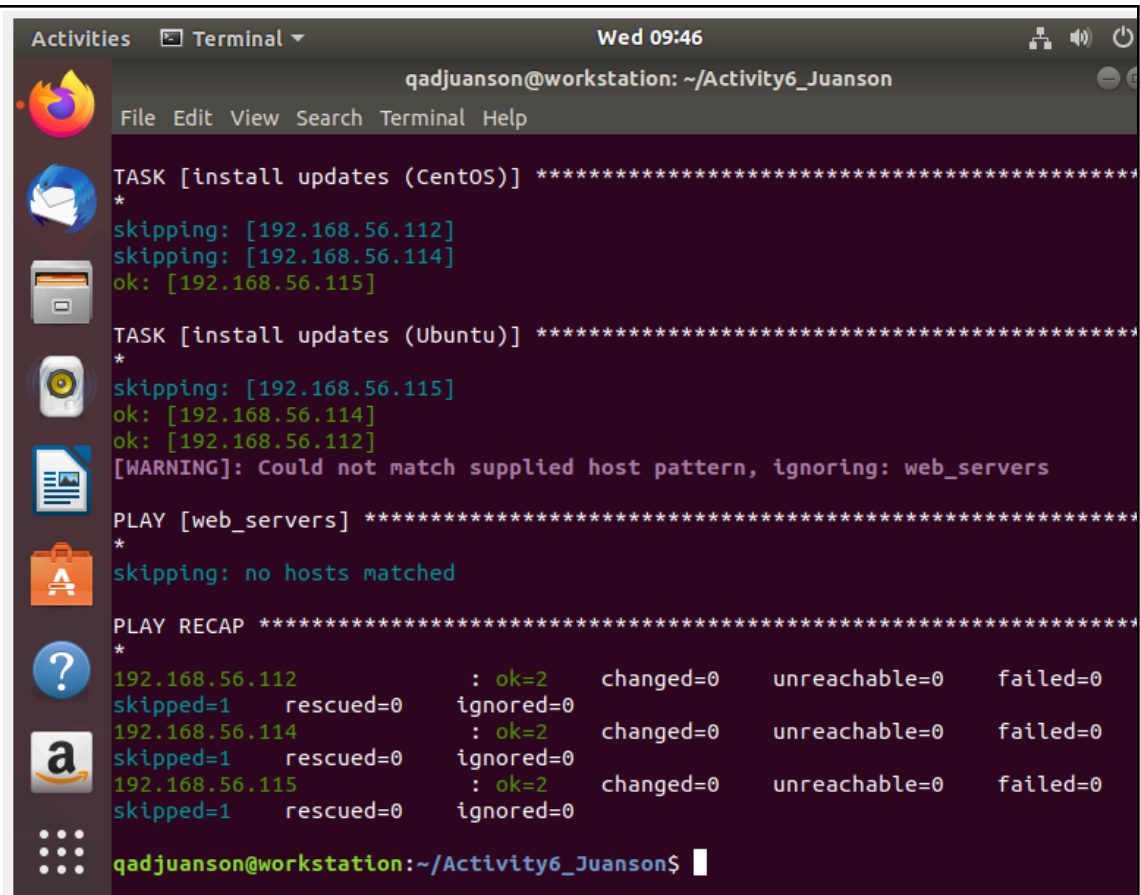
    - name: install apache and php for CentOS servers
      dnf:
        name:
          - httpd
          - php
        state: latest
        when: ansible_distribution == "CentOS"

```

Make sure to save the file and exit.

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.



```
qadjuanson@workstation: ~/Activity6_Juanson
TASK [install updates (CentOS)] *****
*
skipping: [192.168.56.112]
skipping: [192.168.56.114]
ok: [192.168.56.115]

TASK [install updates (Ubuntu)] *****
*
skipping: [192.168.56.115]
ok: [192.168.56.114]
ok: [192.168.56.112]
[WARNING]: Could not match supplied host pattern, ignoring: web_servers

PLAY [web_servers] *****
*
skipping: no hosts matched

PLAY RECAP *****
*
192.168.56.112      : ok=2    changed=0    unreachable=0    failed=0
skipped=1    rescued=0    ignored=0
192.168.56.114      : ok=2    changed=0    unreachable=0    failed=0
skipped=1    rescued=0    ignored=0
192.168.56.115      : ok=2    changed=0    unreachable=0    failed=0
skipped=1    rescued=0    ignored=0

qadjuanson@workstation:~/Activity6_Juanson$
```

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:

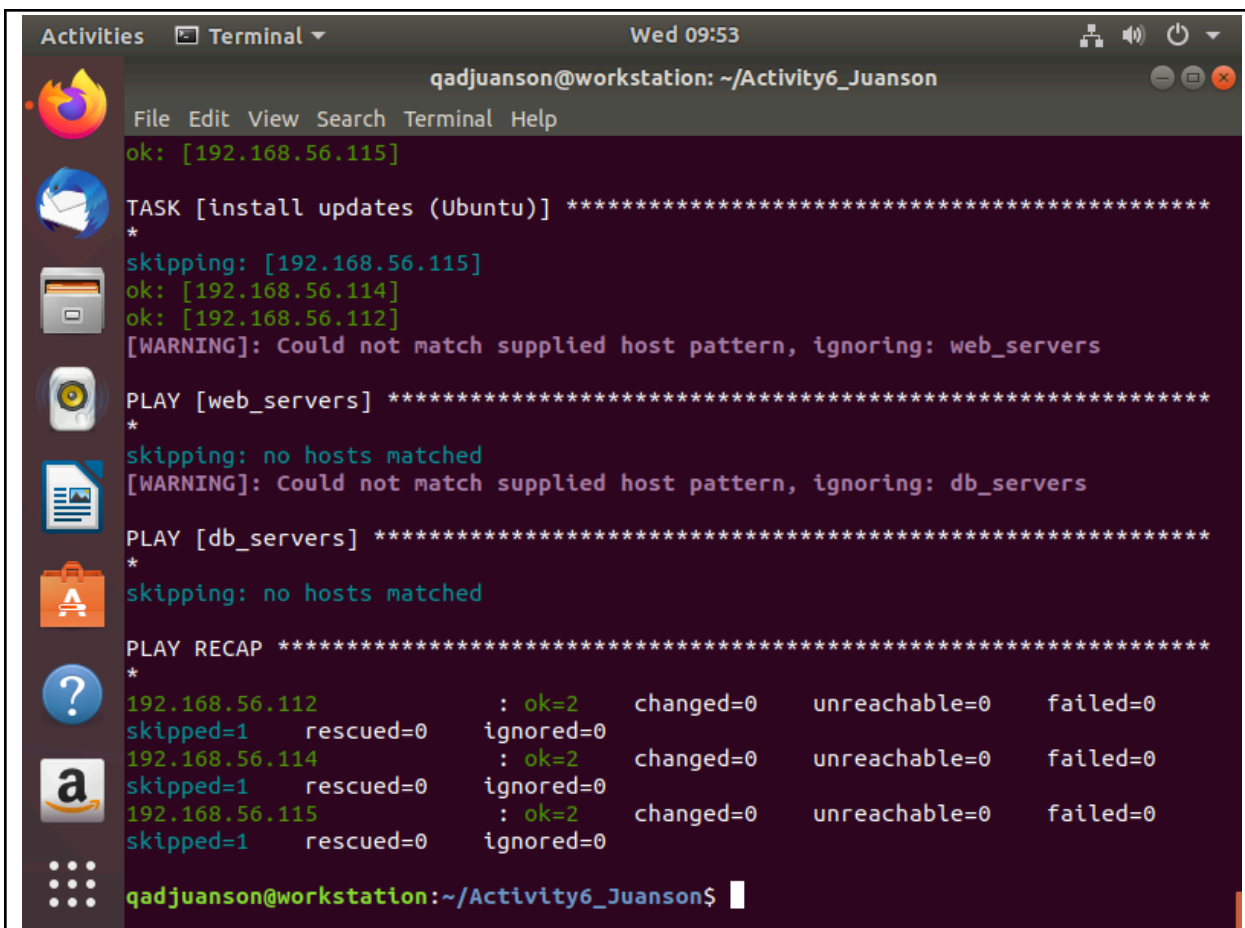
    - name: install mariadb package (CentOS)
      yum:
        name: mariadb-server
        state: latest
      when: ansible_distribution == "CentOS"

    - 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.

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



The screenshot shows a terminal window titled "qadjuanson@workstation: ~/Activity6_Juanson". The terminal output displays the results of an Ansible run. It starts with a task to install updates on Ubuntu, which is successful for three hosts. Then, it plays the 'web_servers' role, which is skipped for all hosts because no hosts matched the supplied host pattern. Next, it plays the 'db_servers' role, which is also skipped for all hosts for the same reason. Finally, it shows a recap of the results for three hosts, all of which were skipped.

```
qadjuanson@workstation: ~/Activity6_Juanson
File Edit View Search Terminal Help
ok: [192.168.56.115]
TASK [install updates (Ubuntu)] *****
*
skipping: [192.168.56.115]
ok: [192.168.56.114]
ok: [192.168.56.112]
[WARNING]: Could not match supplied host pattern, ignoring: web_servers
PLAY [web_servers] *****
*
skipping: no hosts matched
[WARNING]: Could not match supplied host pattern, ignoring: db_servers
PLAY [db_servers] *****
*
skipping: no hosts matched
PLAY RECAP *****
*
192.168.56.112      : ok=2    changed=0    unreachable=0    failed=0
skipped=1    rescued=0    ignored=0
192.168.56.114      : ok=2    changed=0    unreachable=0    failed=0
skipped=1    rescued=0    ignored=0
192.168.56.115      : ok=2    changed=0    unreachable=0    failed=0
skipped=1    rescued=0    ignored=0
qadjuanson@workstation:~/Activity6_Juanson$
```

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.

The screenshot shows a terminal window titled 'qadjuanson@workstation: ~/Activity6_Juanson'. The terminal output displays the results of an Ansible playbook. It shows two tasks: 'install mariadb package (CentOS)' and 'install mariadb package (Ubuntu)'. The CentOS task shows a failure on 192.168.56.114 and success on 192.168.56.115. The Ubuntu task shows success on 192.168.56.115. A 'PLAY RECAP' section summarizes the results for three hosts: 192.168.56.112, 192.168.56.114, and 192.168.56.115.

```
qadjuanson@workstation: ~/Activity6_Juanson
File Edit View Search Terminal Help
ok: [192.168.56.114]
ok: [192.168.56.115]

TASK [install mariadb package (CentOS)] *****
*
skipping: [192.168.56.114]
ok: [192.168.56.115]

TASK [Mariadb- Restarting/Enabling] *****
*
fatal: [192.168.56.114]: FAILED! => {"changed": false, "msg": "Could not find the requested service mariadb: host"}
changed: [192.168.56.115]

TASK [install mariadb package (Ubuntu)] *****
*
skipping: [192.168.56.115]

PLAY RECAP *****
*
192.168.56.112 : ok=3    changed=0    unreachable=0    failed=1
skipped=1     rescued=0    ignored=0
192.168.56.114 : ok=3    changed=0    unreachable=0    failed=1
skipped=2     rescued=0    ignored=0
192.168.56.115 : ok=7    changed=1    unreachable=0    failed=0
skipped=3     rescued=0    ignored=0

qadjuanson@workstation:~/Activity6_Juanson$
```

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.

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.

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

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

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

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

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

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

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.

Reflections:

Answer the following:

1. What is the importance of putting our remote servers into groups?
2. What is the importance of tags in playbooks?
3. Why do think some services need to be managed automatically in playbooks?