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Guided Exercise: Managing Variables

In this exercise, you will define and use variables in a playbook.

Outcomes

You should be able to:

- Define variables in a playbook.
- Create tasks that use defined variables.

Log in to workstation as student using student as the password.

On workstation, run the `lab data-variables start` command. This function creates the `data-variables` working directory, and populates it with an Ansible configuration file and host inventory.

```
[student@workstation ~]$ lab data-variables start
```

Procedure 3.1. Instructions

1. On workstation, as the student user, change into the `/home/student/data-variables` directory.

```
[student@workstation ~]$ cd ~/data-variables  
[student@workstation data-variables]$
```

2. Over the next several steps, you will create a playbook that installs the Apache web server and opens the ports for the service to be reachable. The playbook queries the web server to ensure it is up and running.

Create the `playbook.yml` playbook and define the following variables in the `vars` section:

Table 3.2. Variables

Variable	Description
<code>web_pkg</code>	Web server package to install.
<code>firewall_pkg</code>	Firewall package to install.
<code>web_service</code>	Web service to manage.
<code>firewall_service</code>	Firewall service to manage.

Variable	Description
python_pkg	Required package for the uri module.
rule	The service name to open.

```
---
- name: Deploy and start Apache HTTPD service
  hosts: webserver
  vars:
    web_pkg: httpd
    firewall_pkg: firewalld
    web_service: httpd
    firewall_service: firewalld
    python_pkg: python3-PyMySQL
    rule: http
```

3. Create the tasks block and create the first task, which should use the `yum` module to make sure the latest versions of the required packages are installed.

```
tasks:
  - name: Required packages are installed and up to date
    yum:
      name:
        - "{{ web_pkg }}"
        - "{{ firewall_pkg }}"
        - "{{ python_pkg }}"
      state: latest
```

NOTE

You can use `ansible-doc yum` to review the syntax for the `yum` module. The syntax shows that its `name` directive can take a list of packages that the module should work with, so that you do not need separate tasks to make sure each package is up-to-date.

4. Create two tasks to make sure that the `httpd` and `firewalld` services are started and enabled.

```
- name: The {{ firewall_service }} service is started and enabled
  service:
    name: "{{ firewall_service }}"
    enabled: true
    state: started

- name: The {{ web_service }} service is started and enabled
  service:
    name: "{{ web_service }}"
    enabled: true
    state: started
```

NOTE

The `service` module works differently from the `yum` module, as documented by `ansible-doc service`. Its `name` directive takes the name of exactly one service to work with.

You can write a single task that ensures both services are started and enabled, using the `loop` keyword covered later in this course.

5. Add a task that ensures specific content exists in the `/var/www/html/index.html` file.

```
- name: Web content is in place
  copy:
    content: "Example web content"
    dest: /var/www/html/index.html
```

6. Add a task that uses the `firewalld` module to ensure the firewall ports are open for the `firewalld` service named in the `rule` variable.

```
- name: The firewall port for {{ rule }} is open
  firewalld:
    service: "{{ rule }}"
    permanent: true
    immediate: true
    state: enabled
```

7. Create a new play that queries the web service to ensure everything has been correctly configured. It should run on `localhost`. Because of that Ansible fact, Ansible does not have to change identity, so set the `become` module to `false`. You can use the `uri` module to check a URL. For this task, check for a status code of 200 to confirm the web server on `servera.lab.example.com` is running and correctly configured.

```
- name: Verify the Apache service
  hosts: localhost
  become: false
  tasks:
    - name: Ensure the webserver is reachable
      uri:
        url: http://servera.lab.example.com
        status_code: 200
```

8. When completed, the playbook should appear as follows. Review the playbook and confirm that both plays are correct.

```

---
- name: Deploy and start Apache HTTPD service
  hosts: webserver
  vars:
    web_pkg: httpd
    firewall_pkg: firewalld
    web_service: httpd
    firewall_service: firewalld
    python_pkg: python3-PyMySQL
    rule: http

  tasks:
    - name: Required packages are installed and up to date
      yum:
        name:
          - "{{ web_pkg }}"
          - "{{ firewall_pkg }}"
          - "{{ python_pkg }}"
        state: latest

    - name: The {{ firewall_service }} service is started and enabled
      service:
        name: "{{ firewall_service }}"
        enabled: true
        state: started

    - name: The {{ web_service }} service is started and enabled
      service:
        name: "{{ web_service }}"
        enabled: true
        state: started

    - name: Web content is in place
      copy:
        content: "Example web content"
        dest: /var/www/html/index.html

    - name: The firewall port for {{ rule }} is open
      firewalld:
        service: "{{ rule }}"
        permanent: true
        immediate: true
        state: enabled

- name: Verify the Apache service
  hosts: localhost
  become: false
  tasks:
    - name: Ensure the webserver is reachable
      uri:
        url: http://servera.lab.example.com
        status_code: 200

```

9. Before you run the playbook, use the `ansible-playbook --syntax-check` command to verify its syntax. If it reports any errors, correct them before moving to the next step. You should see output similar to the following:

```

[student@workstation data-variables]$ ansible-playbook --syntax-check playbook.yml

playbook: playbook.yml

```

0. Use the `ansible-playbook` command to run the playbook. Watch the output as Ansible installs the packages, starts and enables the services, and ensures the web server is reachable.

```
[student@workstation data-variables]$ ansible-playbook playbook.yml

PLAY [Deploy and start Apache HTTPD service] *****

TASK [Gathering Facts] *****
ok: [servera.lab.example.com]

TASK [Required packages are installed and up to date] *****
changed: [servera.lab.example.com]

TASK [The firewalld service is started and enabled] *****
ok: [servera.lab.example.com]

TASK [The httpd service is started and enabled] *****
changed: [servera.lab.example.com]

TASK [Web content is in place] *****
changed: [servera.lab.example.com]

TASK [The firewall port for http is open] *****
changed: [servera.lab.example.com]

PLAY [Verify the Apache service] *****

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

TASK [Ensure the webserver is reachable] *****
ok: [localhost]

PLAY RECAP *****
localhost                : ok=2    changed=0    unreachable=0    failed=0
servera.lab.example.com  : ok=6    changed=4    unreachable=0    failed=0
```

Finish

On workstation, run the `lab data-variables finish` script to clean up this exercise.

```
[student@workstation ~]$ lab data-variables finish
```

This concludes the guided exercise.

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