

Ansible – Lab2

Inventory file:

```
! inventory.yml > ...
Ansible Inventory - Ansible inventory files (inventory.json)
1  all:
2    hosts:
3      172.17.0.3:
4      172.17.0.4:
5      ansible_python_interpreter: /usr/local/bin/python3.9
6
7
8
9
10
```

ansible.cfg file:

```
⚙ ansible.cfg
1  [defaults]
2  inventory = ./inventory.yml
3  private_key_file = ~/key
4  remote_user = iti
5  #ansible_python_interpreter = /usr/local/bin/python3.9
6
7  [privilege_escalation]
8  become = true
9  become_method = sudo
10 become_ask_pass = true
11
```

Ubuntu Docker file:

```
🐳 Dockerfile > ...
1  FROM ubuntu
2
3  RUN apt update && apt install -y ssh sudo
4
5  RUN adduser iti
6
7  RUN echo "iti:123" | chpasswd
8
9  RUN usermod -aG sudo iti
10
11 ENTRYPOINT service ssh start && bash
```

Centos Docker file:

```
Dockerfile2 > ...
1 FROM centos
2
3 # Update repository configurations to use CentOS Vault
4 RUN sed -i 's/mirrorlist/#mirrorlist/g' /etc/yum.repos.d/CentOS-* && \
5     sed -i 's|#baseurl=http://mirror.centos.org|baseurl=http://vault.centos.org|g' /etc/yum.repos.d/CentOS-*
6
7 # Install necessary packages
8 RUN yum -y update && yum -y install openssh-server sudo && yum clean all
9
10
11 RUN useradd iti && echo "iti:123" | chpasswd && usermod -aG wheel iti
12
13 # Configure SSH
14 RUN ssh-keygen -A && \
15     sed -i 's/#PermitRootLogin yes/PermitRootLogin yes/' /etc/ssh/sshd_config && \
16     sed -i 's/#UsePAM yes/UsePAM yes/' /etc/ssh/sshd_config
17
18
19 ENTRYPOINT ["/usr/sbin/sshd", "-D"]
20
21
```

Write simple playbook file

Add two tasks (apt update – apt install nginx)

Add tags to first task: update

Add tags to second task: install

Run only the (apt update) task

Example: ansible-playbook my-playbook.yml --tags update

Add one task with “tags: always” and run the previous command again

TAGS

```
! labtag.yml > {} 0 > [ ] tasks > {} 2 > [ ] tags
1 ---
2 - name: Manage Nginx Installation
3   hosts: all
4   become: true
5   tasks:
6     - name: Update package list
7       apt:
8         update_cache: yes
9       tags:
10        - update
11
12    - name: Install Nginx
13      apt:
14        name: nginx
15        state: present
16      tags:
17        - install
18
19    - name: Always run this task
20      debug:
21        msg: "This task runs every time."
22      tags:
23        - always
```

```

shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$ ansible-playbook labtag.yml
BECOME password:

PLAY [Manage Nginx Installation] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.17.0.3 is using the discovered Python interpreter at /usr/bin/python3.12, but future installation of another Python
interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.18/reference_appendices/interpreter_discovery.html for more
information.
ok: [172.17.0.3]

TASK [Update package list] *****
changed: [172.17.0.3]

TASK [Install Nginx] *****
ok: [172.17.0.3]

TASK [Always run this task] *****
ok: [172.17.0.3] => {
  "msg": "This task runs every time."
}

PLAY RECAP *****
172.17.0.3 : ok=4  changed=1  unreachable=0  failed=0  skipped=0  rescued=0  ignored=0

shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$

```

Define these variables (package_name, package_version)

on playbook level

on inventory level

on command line level

Use apt module with the package name and version from your variables

VARIABLES

```

! labvariable.yml > {} 0 > [src] hosts
1  ---
2  - name: Install a specific package version
3    hosts: all
4    become: true
5    vars:
6      package_name: nginx
7      package_version: latest
8    tasks:
9
10   - name: Update package cache
11     apt:
12       update_cache: yes
13
14
15   - name: install latest nginx
16     apt:
17       name: "{{ package_name }}"
18       state: "{{ package_version }}"
19
20

```

```

shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$ ansible-playbook labvariable.yml
BECOME password:

PLAY [Install a specific package version] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.17.0.3 is using the discovered Python interpreter at /usr/bin/python3.12, but future installation of another Python
interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.18/reference_appendices/interpreter_discovery.html for more
information.
ok: [172.17.0.3]

TASK [Update package cache] *****
ok: [172.17.0.3]

TASK [install latest nginx] *****
ok: [172.17.0.3]

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

shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$

```

Loop over a list of packages and install latest versions.

Loop over a list of packages and perform different actions as per input.

LOOPS

```
! labloops.yml > {} 0 > [ ] tasks > {} 1 > [ ] loop
1 ---
2 - name: Install Latest Versions of Packages
3   hosts: all
4   become: true
5   vars:
6     packages_to_install:
7       - nginx
8       - git
9       - apache2
10
11     packages_with_actions:
12       - name: nginx
13         | action: present
14       - name: git
15         | action: latest
16       - name: apache2
17         | action: absent
18
19   tasks:
20     - name: Install latest versions of packages
21       package:
22         name: "{{ item }}"
23         state: latest
24         loop: "{{ packages_to_install }}"
25
26     - name: Manage packages based on specified actions
27       package:
28         name: "{{ item.name }}"
29         state: "{{ item.action }}"
30         loop: "{{ packages_with_actions }}"
```

```
shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$ ansible-playbook labloops.yml
BECOME password:

PLAY [Install Latest Versions of Packages] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.17.0.3 is using the discovered Python interpreter at /usr/bin/python3.12, but future installation of another Python
interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.18/reference_appendices/interpreter_discovery.html for more
information.
ok: [172.17.0.3]

TASK [Install latest versions of packages] *****
ok: [172.17.0.3] => (item=nginx)
ok: [172.17.0.3] => (item=git)
changed: [172.17.0.3] => (item=apache2)

TASK [Manage packages based on specified actions] *****
ok: [172.17.0.3] => (item={'name': 'nginx', 'action': 'present'})
ok: [172.17.0.3] => (item={'name': 'git', 'action': 'latest'})
changed: [172.17.0.3] => (item={'name': 'apache2', 'action': 'absent'})

PLAY RECAP *****
172.17.0.3 : ok=3 changed=2 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0

shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$
```


Install nginx or apache2 depending on distribution

Restart nginx service if distribution is ubuntu and variable value is true

WHEN

```
! labwhen.yml > {} 0 > [ ] tasks > {} 1 > {} service > use
1  ---
2  - name: Install web server and restart if necessary
3    hosts: all
4    gather_facts: true
5    become: true
6
7    tasks:
8
9      - name: Install nginx or httpd based on distribution
10        package:
11          name: "{{ 'nginx' if ansible_distribution == 'Ubuntu' else 'httpd' }}"
12          state: latest
13          when: ansible_distribution in ['Ubuntu', 'CentOS']
14
15      - name: Restart nginx if the distribution is Ubuntu
16        service:
17          name: nginx
18          state: restarted
19          use: sysvinit
20          when: ansible_distribution == 'Ubuntu'
21
22
23      - name: Restart httpd if the distribution is CentOS
24        service:
25          name: httpd
26          use: sysvinit
27          state: restarted
28          when: ansible_distribution == 'CentOS'
29
30
```

```
shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$ ansible-playbook labwhen.yml
BECOME password:

PLAY [Install web server and restart if necessary] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.17.0.3 is using the discovered Python interpreter at /usr/bin/python3.12, but future installation of another Python
interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.18/reference_appendices/interpreter_discovery.html for more
information.
ok: [172.17.0.3]
ok: [172.17.0.4]

TASK [Install nginx or httpd based on distribution] *****
fatal: [172.17.0.4]: FAILED! => {"changed": false, "module_stderr": "Shared connection to 172.17.0.4 closed.\r\n", "module_stdout": "\r\nTraceback (most recent call
last):\r\n  File \"<stdin>\", line 12, in <module>\r\n  File \"<frozen importlib._bootstrap>\", line 971, in find_and_load\r\n  File \"<frozen importlib._bootstrap>
\", line 951, in find_and_load_unlocked\r\n  File \"<frozen importlib._bootstrap>\", line 894, in find_spec\r\n  File \"<frozen importlib._bootstrap_external>\", l
ine 1157, in find_spec\r\n  File \"<frozen importlib._bootstrap_external>\", line 1131, in get_spec\r\n  File \"<frozen importlib._bootstrap_external>\", line 1112,
in _legacy_get_spec\r\n  File \"<frozen importlib._bootstrap>\", line 441, in spec_from_loader\r\n  File \"<frozen importlib._bootstrap_external>\", line 544, in sp
ec_from_file_location\r\n  File \"<frozen importlib._bootstrap_external>\", line 544, in spec_from_file_location\r\n  File \"<frozen importlib._bootstrap_external>\", line 544, in spec_from_file_location\r\n
SyntaxError: future feature annotations is not defined\r\n", "msg": "MODULE FAILURE: No start of json char found\r\nSee stdout/stderr for the exact error", "rc": 1}
ok: [172.17.0.3]

TASK [Restart nginx if the distribution is Ubuntu] *****
changed: [172.17.0.3]

TASK [Restart httpd if the distribution is CentOS] *****
skipping: [172.17.0.3]

PLAY RECAP *****
172.17.0.3 : ok=3 changed=1 unreachable=0 failed=0 skipped=1 rescued=0 ignored=0
172.17.0.4 : ok=1 changed=0 unreachable=0 failed=1 skipped=0 rescued=0 ignored=0

shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$
```

View the value of your register variable using debug module

Restart service if the installation task was changed or was not failed

REGISTER & WHEN

```
! labregister.yml > {} 0 > [ ] tasks > {} 2 > when
1 ---
2 - name: Install web server and restart if necessary
3   hosts: all
4   gather_facts: true
5   tasks:
6     - name: Install the package
7       apt:
8         name: nginx
9         state: latest
10        register: install_result
11        ignore_errors: yes
12
13    - name: View the value of the register variable
14      debug:
15        var: install_result
16
17    - name: Restart the service if the installation task was changed or did not fail
18      service:
19        name: nginx
20        state: restarted
21        use: service
22      when: install_result.changed or install_result.failed == false
```

```
shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$ ansible-playbook labregister.yml
BECOME password:

PLAY [Install web server and restart if necessary] *****

TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.17.0.3 is using the discovered Python interpreter at /usr/bin/python3.12, but future installation of another Python
interpreter could change the meaning of that path. See https://docs.ansible.com/ansible-core/2.18/reference_appendices/interpreter_discovery.html for more
information.
ok: [172.17.0.3]

TASK [Install the package] *****
ok: [172.17.0.3]

TASK [View the value of the register variable] *****
ok: [172.17.0.3] => {
  "install_result": {
    "cache_update_time": 1738618595,
    "cache_updated": false,
    "changed": false,
    "failed": false
  }
}

TASK [Restart the service if the installation task was changed or did not fail] *****
changed: [172.17.0.3]

PLAY RECAP *****
172.17.0.3      : ok=4   changed=1    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

shehab-gamal@shehab-gamal-Lenovo-ideapad-520-15IKB:~/Ansible Labs/Ansible-Lab1/Playbooks$
```