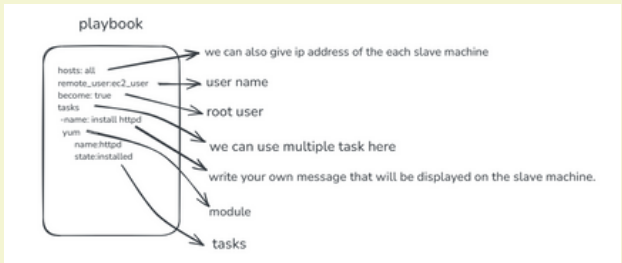


Ansible playbook

- An Ansible playbook is a YAML script used to automate system configurations, deployments, and management tasks.
- it is also used to execute multiple tasks.



playbook:

```
GNU nano 5.8                                app.yml
- hosts: all
  remote_user: ec2-user
  become: true
  tasks:
    - name: Install httpd
      yum:
        name: httpd
        state: present

    - name: Start httpd service
      service:
        name: httpd
        state: started
        enabled: yes

    - name: Copy index.html file
      copy:
        src: index.html
        dest: /var/www/html/index.html
```

Verify and correct the syntax of the Ansible playbook

`ansible-playbook --syntax-check app.yml`- The `ansible-playbook --syntax-check app.yml` command validates YAML syntax without executing the playbook.

```
[ec2-user@ip-172-31-33-218 ~]$ ansible-playbook --syntax-check app.yml
```

output:

```
[ec2-user@ip-172-31-33-218 ~]$ ansible-playbook --syntax-check app.yml
[WARNING]: log file at /var/log/ansible.log is not writeable and we cannot create it, aborting

[WARNING]: Unable to parse /home/ec2-user/.ansible/hosts as an inventory source
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'
```

To execute the Ansible playbook:

`ansible-playbook -i host app.yml`- The command runs the `app.yml` playbook using the specified host inventory for target machines.

```
[ec2-user@ip-172-31-33-218 ~]$ ansible-playbook -i host app.yml
```

output:

```
ok: [172.31.36.144]
[WARNING]: Platform linux on host 172.31.32.39 is using the discovered Python
interpreter at /usr/bin/python3.9, but future installation of another Python
interpreter could change the meaning of that path. See
https://docs.ansible.com/ansible-core/2.15/reference_appendices/interpreter_discovery.html for more information.
ok: [172.31.32.39]

TASK [Install httpd] *****
ok: [172.31.32.39]
ok: [172.31.36.144]

TASK [Start httpd service] *****
changed: [172.31.32.39]
changed: [172.31.36.144]

TASK [Copy index.html file] *****
ok: [172.31.36.144]
ok: [172.31.32.39]

PLAY RECAP *****
172.31.32.39      : ok=4    changed=1    unreachable=0    failed=0    s
Kipped=0    rescued=0    ignored=0
172.31.36.144   : ok=4    changed=1    unreachable=0    failed=0    s
Kipped=0    rescued=0    ignored=0
```

To uninstall software using an Ansible playbook:

`ansible all -i host -m yum -a "name=httpd state=absent autoremove=true" -b` - It removes httpd package from all hosts using yum with autoremove, running with become privileges.

```
$ ansible all -i host -m yum -a "name=httpd state=absent autoremove=true" -b
```

output:

```
    "discovered_interpreter_python": "/usr/bin/python3.9"
  },
  "changed": true,
  "msg": "",
  "rc": 0,
  "results": [
    "Removed: httpd-2.4.62-1.amzn2023.x86_64",
    "Removed: httpd-core-2.4.62-1.amzn2023.x86_64",
    "Removed: generic-logos-httpd-18.0.0-12.amzn2023.0.3.noarch",
    "Removed: httpd-filesystem-2.4.62-1.amzn2023.noarch",
    "Removed: httpd-tools-2.4.62-1.amzn2023.x86_64",
    "Removed: mailcap-2.1.49-3.amzn2023.0.3.noarch",
    "Removed: mod_http2-2.0.27-1.amzn2023.0.3.x86_64",
    "Removed: mod_lua-2.4.62-1.amzn2023.x86_64",
    "Removed: apr-1.7.5-1.amzn2023.0.2.x86_64",
    "Removed: apr-util-1.6.3-1.amzn2023.0.1.x86_64",
    "Removed: apr-util-openssl-1.6.3-1.amzn2023.0.1.x86_64",
    "Removed: libbrotli-1.0.9-4.amzn2023.0.2.x86_64"
  ]
}
```

●project 1

To install git software in playbook: steps:

1.Create an Ansible playbook named hello.yml

```
GNU nano 5.8                                hello.yml
- hosts: all
  remote_user: ec2-user
  become: true
  tasks:
    - name: Install git
      yum:
        name: git
        state: present
```

2.To check the syntax of ansible playbook

```
]$ ansible-playbook --syntax-check hello.yml
```

output:

```
[WARNING]: Unable to parse /home/ec2-user/.ansible/hosts as an inventory source
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'
```

3.To execute the playbook:

```
]$ ansible-playbook -i host hello.yml
```

output:

```
PLAY [all] ********************************************************************************
TASK [Gathering Facts] ********************************************************************************
[WARNING]: Platform linux on host 172.31.32.39 is using the discovered Python interpreter at /usr/bin/python3.9, but
future installation of another Python interpreter could change the meaning of that path. See
https://docs.ansible.com/ansible-core/2.15/reference\_appendices/interpreter\_discovery.html for more information.
ok: [172.31.32.39]
[WARNING]: Platform linux on host 172.31.36.144 is using the discovered Python interpreter at /usr/bin/python3.9, but
future installation of another Python interpreter could change the meaning of that path. See
https://docs.ansible.com/ansible-core/2.15/reference\_appendices/interpreter\_discovery.html for more information.
ok: [172.31.36.144]
TASK [Install git] ********************************************************************************
ok: [172.31.32.39]
ok: [172.31.36.144]
PLAY RECAP ********************************************************************************
172.31.32.39      : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
172.31.36.144    : ok=2    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
```

How to install ansible without pip:

1. `sudo amazon-linux-extras install ansible2` - This command installs Ansible 2 on Amazon Linux using the amazon-linux-extras repository with sudo.

```
[ec2-user@ip-172-31-42-148 ~]$ sudo amazon-linux-extras install ansible2
```

output:

```
Installed size: 551 M
Is this ok [y/N]: y
Downloading Packages:
(1/4): git-core-2.47.1-1.amzn2023.0.2.x86_64.rpm 30 MB/s | 4.7 MB 00:00
(2/4): ansible-core-2.15.3-1.amzn2023.0.7.x86_6 13 MB/s | 2.5 MB 00:00
(3/4): sshpass-1.09-6.amzn2023.0.1.x86_64.rpm 588 kB/s | 28 kB 00:00
(4/4): ansible-8.3.0-1.amzn2023.0.1.noarch.rpm 48 MB/s | 32 MB 00:00
-----
Total 55 MB/s | 40 MB 00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                : 1/1
  Installing               : 1/4
  Installing               : 2/4
  Installing               : 3/4
  Installing               : 4/4
  Running scriptlet: ansible-8.3.0-1.amzn2023.0.1.noarch 4/4
  Verifying               : 1/4
  Verifying               : 2/4
  Verifying               : 3/4
  Verifying               : 4/4
Installed:
  ansible-8.3.0-1.amzn2023.0.1.noarch  ansible-core-2.15.3-1.amzn2023.0.7.x86_64  git-core-2.47.1-1.amzn2023.0.2.x86_64
  sshpass-1.09-6.amzn2023.0.1.x86_64
```

```
Dependencies resolved.
=====
Package           Arch      Version                Repository      Size
=====
Installing:
ansible           noarch    8.3.0-1.amzn2023.0.1  amazonlinux    32 M
Installing dependencies:
ansible-core      x86_64    2.15.3-1.amzn2023.0.7  amazonlinux    2.5 M
git-core          x86_64    2.47.1-1.amzn2023.0.2  amazonlinux    4.7 M
sshpass           x86_64    1.09-6.amzn2023.0.1    amazonlinux     28 k
Transaction Summary
=====
Install 4 Packages

Total download size: 40 M
Installed size: 551 M
Is this ok [y/N]: y
Downloading Packages:
(1/4): git-core-2.47.1-1.amzn2023.0.2.x86_64.rpm 30 MB/s | 4.7 MB 00:00
(2/4): ansible-core-2.15.3-1.amzn2023.0.7.x86_6 13 MB/s | 2.5 MB 00:00
(3/4): sshpass-1.09-6.amzn2023.0.1.x86_64.rpm 588 kB/s | 28 kB 00:00
(4/4): ansible-8.3.0-1.amzn2023.0.1.noarch.rpm 48 MB/s | 32 MB 00:00
-----
```

2. `ansible --version` - We can check the Ansible version and the file that already contains the configuration.

configuration file:

```
ec2-user@ip-172-31-40-86 ~]$ ansible --version
ansible 2.9.23
  config file = /etc/ansible/ansible.cfg
  configured module search path = [u'/home/ec2-user/.ansible/plugins/modules', u'/usr/share/ansible/plugins/modules']
  ansible python module location = /usr/lib/python2.7/site-packages/ansible
  executable location = /usr/bin/ansible
  python version = 2.7.18 (default, Jan 23 2025, 17:44:13) [GCC 7.3.1 20180712 (Red Hat 7.3.1-17)]
```

configuration file

3. `sudo nano /etc/ansible/ansible.cfg` - This command opens Ansible's configuration file in the Nano editor with superuser privileges for editing.

```
user@ip-172-31-40-86 ~]$ sudo nano /etc/ansible/ansible.cfg
```

"Change the setting in the configuration file to `host_key_checking = False` so that we don't have to specify the inventory file each time."

```
GNU nano 2.9.8 /etc/ansible/ansible.cfg Modified
# prefix of 'ansible_'.
# This variable is set to True by default for backwards compatibility. It
# will be changed to a default of 'False' in a future release.
# ansible_facts.
# inject_facts_as_vars = True

# additional paths to search for roles in, colon separated
#roles_path = /etc/ansible/roles

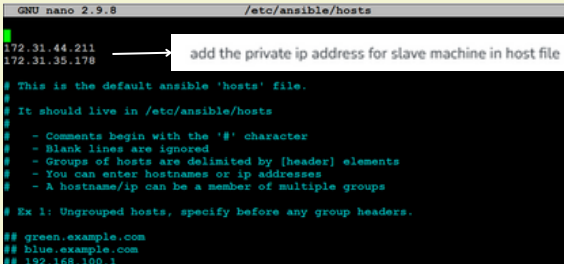
# uncomment this to disable SSH key host checking
host_key_checking = False

# change the default callback, you can only have one 'stdout' type enabled at a time
#stdout_callback = skippy

## Ansible ships with some plugins that require whitelisting,
## this is done to avoid running all of a type by default.
## These setting lists those that you want enabled for your system.
```

4. `sudo nano /etc/ansible/hosts` - This command opens the Ansible inventory file (`/etc/ansible/hosts`) in the Nano editor with superuser privileges,

```
72-31-33-151 ~]$ sudo nano /etc/ansible/hosts
```



```
GNU nano 2.9.8 /etc/ansible/hosts
172.31.44.211
172.31.35.178
# This is the default ansible 'hosts' file.
#
# It should live in /etc/ansible/hosts
#
# - Comments begin with the '#' character
# - Blank lines are ignored
# - Groups of hosts are delimited by [header] elements
# - You can enter hostnames or ip addresses
# - A hostname/ip can be a member of multiple groups
#
# Ex 1: Ungrouped hosts, specify before any group headers.
## green.example.com
## blue.example.com
## 192.168.100.1
```

5. `ansible all -i host -m ping` - used to check connectivity to all hosts listed in the inventory file.

```
[ec2-user@ip-172-31-33-151 ~]$ ansible all -m ping
```

output:



```
[WARNING]: Platform linux on host 172.31.35.178 is using the discovered Python
interpreter at /usr/bin/python, but future installation of another Python
interpreter could change this. See https://docs.ansible.com/ansible/2.9/referen
ce_appendices/interpreter_discovery.html for more information.
172.31.35.178 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false,
  "ping": "pong"
}
[WARNING]: Platform linux on host 172.31.44.211 is using the discovered Python
interpreter at /usr/bin/python, but future installation of another Python
interpreter could change this. See https://docs.ansible.com/ansible/2.9/referen
ce_appendices/interpreter_discovery.html for more information.
172.31.44.211 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false,
  "ping": "pong"
}
```

6. `ansible all -i host -m shell -a "mkdir sample"` - This Ansible command runs the `mkdir sample` shell command on all hosts in the host inventory, creating a directory named "sample".

```
ec2-user@ip-172-31-33-151 ~]$ ansible all -m shell -a "mkdir sample"
```

output:

```
ec2-user@ip-172-31-33-151 ~]$ ansible all -m shell -a "mkdir sample"
[WARNING]: Consider using the file module with state=directory rather than
running 'mkdir'. If you need to use command because file 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.
[WARNING]: Platform linux on host 172.31.44.211 is using the discovered Python
interpreter at /usr/bin/python, but future installation of another Python
interpreter could change this. See https://docs.ansible.com/ansible/2.9/referen
ce_appendices/interpreter_discovery.html for more information.
172.31.44.211 | CHANGED | rc=0 >>

[WARNING]: Platform linux on host 172.31.35.178 is using the discovered Python
interpreter at /usr/bin/python, but future installation of another Python
interpreter could change this. See https://docs.ansible.com/ansible/2.9/referen
ce_appendices/interpreter_discovery.html for more information.
172.31.35.178 | CHANGED | rc=0 >>
```

7. `ansible all -m package -a name=httpd state=installed -b` -install software in slave machine using package module

```
ec2-user@ip-172-31-33-151 ~]$ ansible all -m package -a "name=httpd state=installed" -b
```

output:

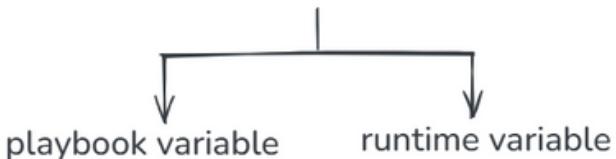
```
172.31.44.211 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "changes": {
    "installed": {
      "httpd"
    }
  },
  "msg": "",
  "rc": 0,
  "results": {
```

```
172.31.35.178 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "changes": {
    "installed": {
      "httpd"
    }
  },
  "msg": "",
  "rc": 0,
  "results": {
```


Ansible variables

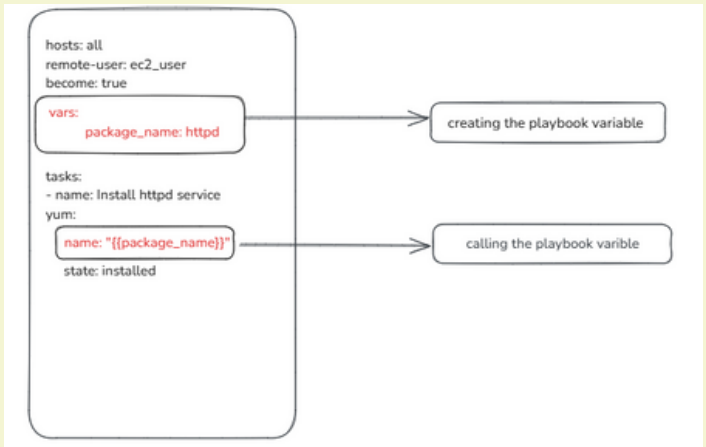
- Ansible variables control automation, including playbook, inventory, role, extra-vars, facts, environment, and registered values.
- In Ansible, variables are used to store values that can be referenced throughout playbooks, tasks, and roles.
- They allow for dynamic configurations and make playbooks reusable and flexible.

Ansible variables:



Playbook variables:

- Playbook variables in Ansible are variables defined directly within a playbook to store dynamic values.
- They help customize tasks and make playbooks reusable.
- In Ansible, variables allow you to store and reuse values dynamically, making playbooks more flexible and scalable.
- Variables can store information such as file paths, usernames, IP addresses, and configuration settings.



1.create a playbook:

```
GNU nano 2.9.8                                app.yml
- hosts: all
  remote_user: ec2-user
  become: true
  vars:
    package_name: httpd
  tasks:
    - name: Install httpd
      yum:
        name: "{{package_name}}"
        state: installed
```

2.To check the syntax of ansible playbook

```
ser@ip-172-31-33-151 ~]$ ansible-playbook --syntax-check app.yml
```

output:

```
[WARNING]: log file at /var/log/ansible.log is not writeable and we cannot create it, aborting
[WARNING]: Unable to parse /home/ec2-user/.ansible/hosts as an inventory source
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'
playbook: app.yml
```

3.To execute the playbook:

```
p-172-31-33-151 ~]$ ansible-playbook -i host app.yml
```

output:

```
TASK [Install httpd] *****
ok: [172.31.35.178]
ok: [172.31.44.211]

PLAY RECAP *****
172.31.35.178      : ok=2    changed=0    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
172.31.44.211    : ok=2    changed=0    unreachable=0    failed=0    s
kipped=0    rescued=0    ignored=0
```

● project 2

To deploy the index.html file on the slave machine

1.create a playbook:

```
- hosts: all
  remote_user: ec2-user
  become: true
  vars:
    package_name: httpd
  tasks:
    - name: Install httpd
      yum:
        name: "{{package_name}}"
        state: installed

    - name: Start httpd service
      service:
        name: "{{package_name}}"
        state: started
        enabled: yes

    - name: Copy index.html file
      copy:
        src: index.html
        dest: /var/www/html/index.html
```

2.To check the syntax of ansible playbook

```
[ec2-user@ip-172-31-33-151 ~]$ ansible-playbook --syntax-check appl.yml
```

```
[WARNING]: log file at /var/log/ansible.log is not writeable and we cannot create it, aborting
```

```
[WARNING]: Unable to parse /home/ec2-user/.ansible/hosts as an inventory source
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'
```

```
playbook: appl.yml
```

3.Create the index.html:

```
GNU nano 2.9.8 index.html
<h4> welcome to my class </h4>
```

4.To execute the playbook:

```
1-33-151 ~]$ ansible-playbook -i host app1.yml
```

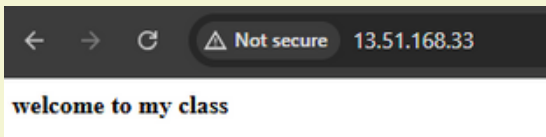
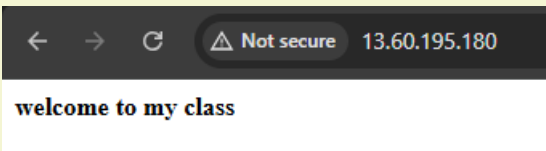
output:

```
PLAY [all] *****
TASK [Install httpd] *****
ok: [172.31.44.211]
ok: [172.31.35.178]

TASK [Start httpd service] *****
ok: [172.31.44.211]
ok: [172.31.35.178]

TASK [Copy index.html file] *****
changed: [172.31.44.211]
changed: [172.31.35.178]

PLAY RECAP *****
172.31.35.178 : ok=3 changed=1 unreachable=0 failed=0 s
kipped=0 rescued=0 ignored=0
172.31.44.211 : ok=3 changed=1 unreachable=0 failed=0 s
kipped=0 rescued=0 ignored=0
```



how to use more than one variable in playbook variables

1.Create the playbook :

```
GNU nano 2.9.8 app3.yml
- hosts: all
  remote_user: ec2-user
  become: true
  vars:
    package_name: httpd
    state_name: installed
  tasks:
    - name: Install httpd
      yum:
        name: "{{package_name}}"
        state: "{{state_name}}"
```

first variable
second variable

calling the first variable

calling the second variable

2.To execute the playbook:

```
$ ansible-playbook -i host app3.yml
```

output:

```
TASK [Gathering Facts] *****
[WARNING]: Platform linux on host 172.31.35.178 is using the discovered Python
interpreter at /usr/bin/python, but future installation of another Python
interpreter could change this. See https://docs.ansible.com/ansible/2.9/referen
ce_appendices/interpreter_discovery.html for more information.
ok: [172.31.35.178]
[WARNING]: Platform linux on host 172.31.44.211 is using the discovered Python
interpreter at /usr/bin/python, but future installation of another Python
interpreter could change this. See https://docs.ansible.com/ansible/2.9/referen
ce_appendices/interpreter_discovery.html for more information.
ok: [172.31.44.211]

TASK [Install httpd] *****
ok: [172.31.35.178]
ok: [172.31.44.211]

PLAY RECAP *****
172.31.35.178 : ok=2 changed=0 unreachable=0 failed=0 s
kipped=0 rescued=0 ignored=0
172.31.44.211 : ok=2 changed=0 unreachable=0 failed=0 s
kipped=0 rescued=0 ignored=0
```

Runtime Variable

- When a playbook is running, you can declare variables
- Runtime variables in Ansible are variables that are defined or provided when executing the playbook, rather than being pre-defined in the playbook or inventory files.

1.Create the playbook :

```
GNU nano 2.9.8 app2.yml
- hosts: all
  remote_user: ec2-user
  become: true

  tasks:
    - name: Install httpd
      yum:
        name: "{{package_name}}"
        state: installed
```

2.To execute the playbook:

Executing the Git software at runtime.



```
ansible-playbook app2.yml --extra-vars package_name=git
```

3.To check whether Ansible is installed on the slave machine or not.

```
[ec2-user@ip-172-31-33-151 ~]$ ansible all shell -m git --version
```

output:


```
[WARNING]: log file at /var/log/ansible.log is not writeable and we cannot create it, aborting
ansible 2.9.23
  config file = /home/ec2-user/.ansible.cfg
  configured module search path = [u'/home/ec2-user/.ansible/plugins/modules', u'/usr/share/ansible
plugins/modules']
  ansible python module location = /usr/lib/python2.7/site-packages/ansible
  executable location = /usr/bin/ansible
  python version = 2.7.18 (default, Jan 23 2025, 17:44:13) [GCC 7.3.1 20180712 (Red Hat 7.3.1-17)]
```

how to use more than one variable in playbook

1.Create the playbook :

```
GNU nano 2.9.8 app4.yml
- hosts: all
  remote_user: ec2-user
  become: true

  tasks:
    - name: Install httpd
      yum:
        name: "{{package_name}}"
        state: "{{(state_name)}}"
```



2.To check the syntax of ansible playbook

```
$ ansible-playbook --syntax-check app3.yml
```

output:

```
[WARNING]: log file at /var/log/ansible.log is not writeable and we cannot create it, aborting
[WARNING]: Unable to parse /home/ec2-user/.ansible/hosts as an inventory source
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'
```

3.To execute the playbook:

```
[ec2-user@ip-172-31-33-151 ~]$ ansible-playbook app.yml --extra-vars package_name=java --extra-vars state name=installed
```

output:

```
[WARNING]: log file at /var/log/ansible.log is not writeable and we cannot create it, aborting
[WARNING]: Unable to parse /home/ec2-user/.ansible/hosts as an inventory source
[WARNING]: No inventory was parsed, only implicit localhost is available
[WARNING]: provided hosts list is empty, only localhost is available. Note that the implicit localhost does not match 'all'

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

PLAY RECAP *****
```