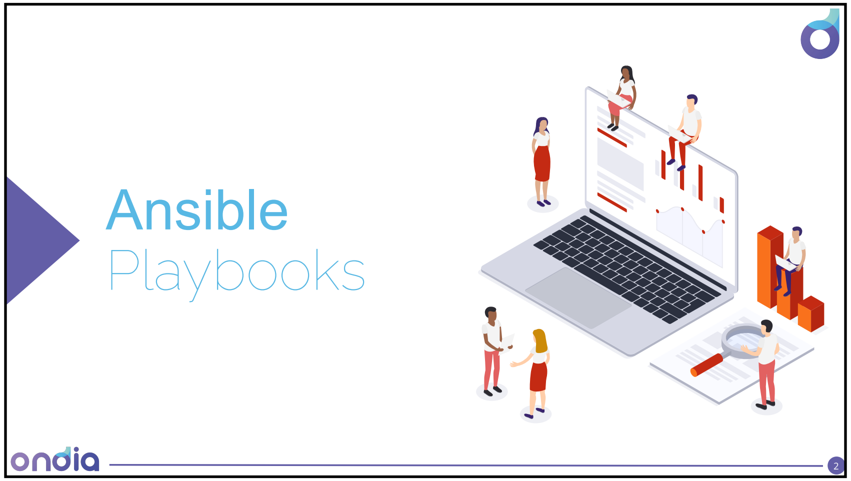
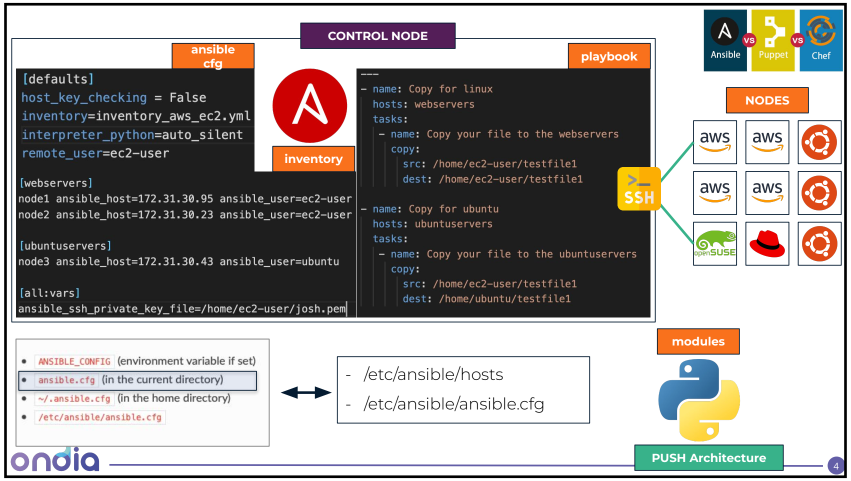
ondia



Ansible Playbooks

AGENDA

- Playbooks
- Hosts and Users
- Inventory File
- Modules
- Tasks
- Handlers
- Conditionals and Loops



ansible cfg

```
[defaults]
host_key_checking = False
inventory=inventory_aws_ec2.yml
interpreter_python=auto_silent
remote_user=ec2-user
```

inventory

```
[webservers]
node1 ansible_host=172.31.30.95 ansible_user=ec2-user
node2 ansible_host=172.31.30.23 ansible_user=ec2-user

[ubuntuservers]
node3 ansible_host=172.31.30.43 ansible_user=ubuntu

[all:vars]
ansible_ssh_private_key_file=/home/ec2-user/josh.pem
```

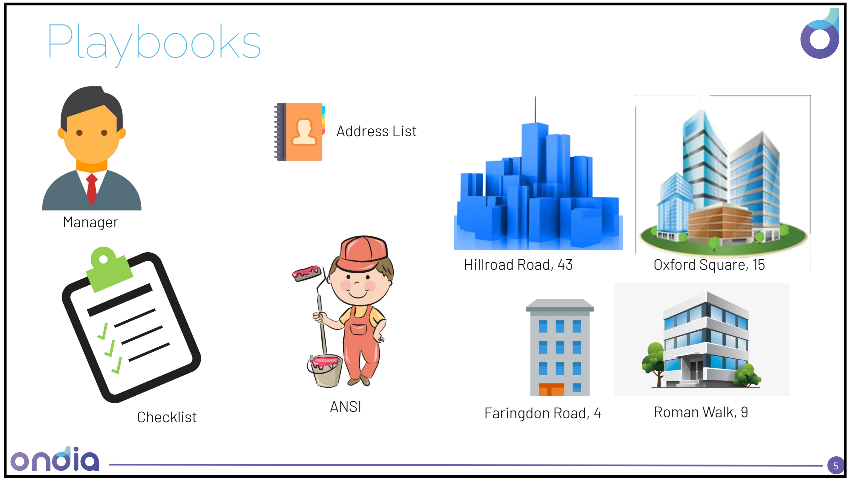
playbook

```
---
- name: Copy for linux
  hosts: webservers
  tasks:
    - name: Copy your file to the webservers
      copy:
        src: /home/ec2-user/testfile1
        dest: /home/ec2-user/testfile1

- name: Copy for ubuntu
  hosts: ubuntuservers
  tasks:
    - name: Copy your file to the ubuntuservers
      copy:
        src: /home/ec2-user/testfile1
        dest: /home/ubuntu/testfile1
```

- `ANSIBLE_CONFIG` (environment variable if set)
- `ansible.cfg` (in the current directory)
- `~/.ansible.cfg` (in the home directory)
- `/etc/ansible/ansible.cfg`

↔

- /etc/ansible/hosts
- /etc/ansible/ansible.cfg



Playbooks

Manager

Address List

Hillroad Road, 43

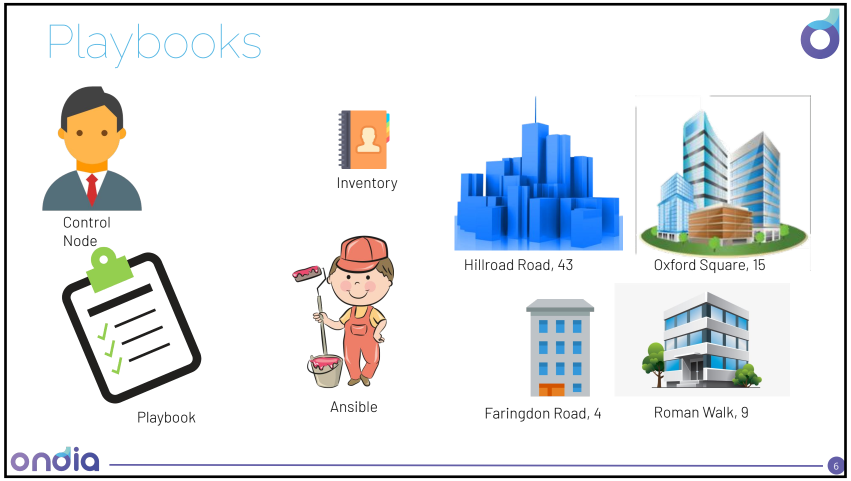
Oxford Square, 15

Checklist

ANSI

Faringdon Road, 4

Roman Walk, 9



Playbooks

Control
Node

Inventory

Hillroad Road, 43

Oxford Square, 15

Playbook

Ansible

Faringdon Road, 4

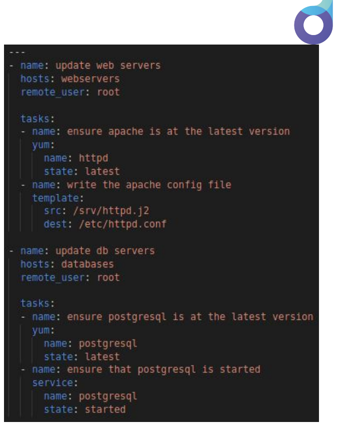
Roman Walk, 9

Playbooks

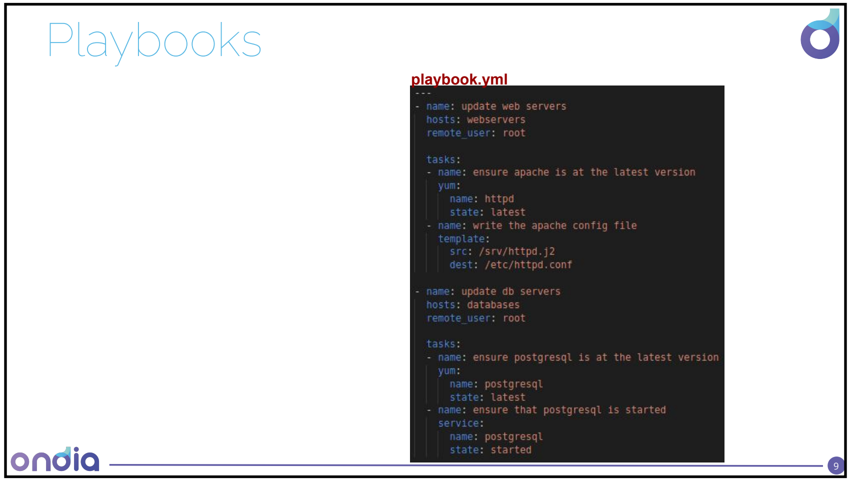
Playbooks

Playbooks

- Plain-text **YAML** files that defines a set of activities (tasks) to be run on hosts.
- Human and machine readable.
- Can be used to build and configure entire application environments.



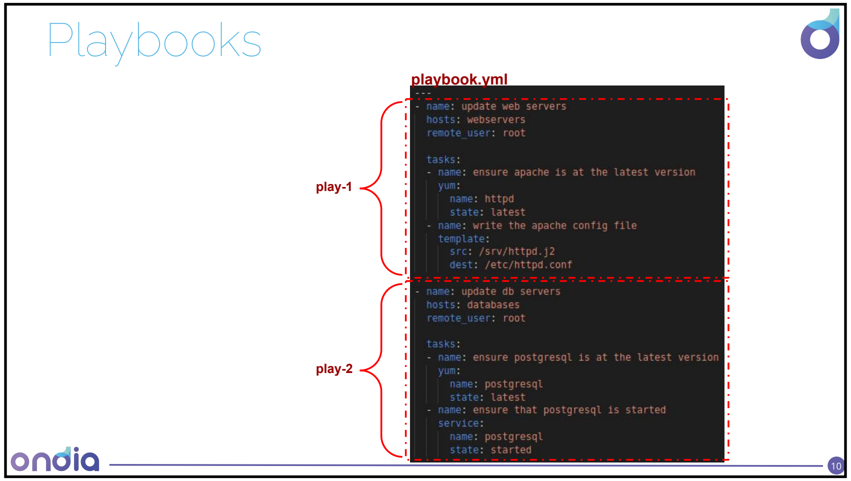
```yaml
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```



Playbooks

playbook.yml

```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```



Playbooks

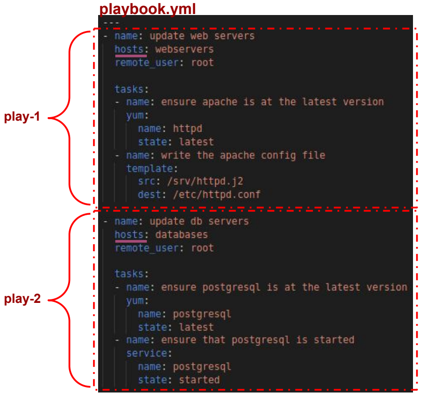
playbook.yml

play-1

play-2

```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

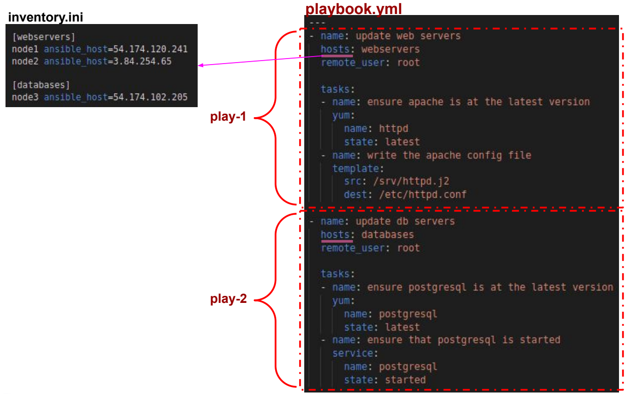
Playbooks



playbook.yml

```yaml
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf
- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

Playbooks

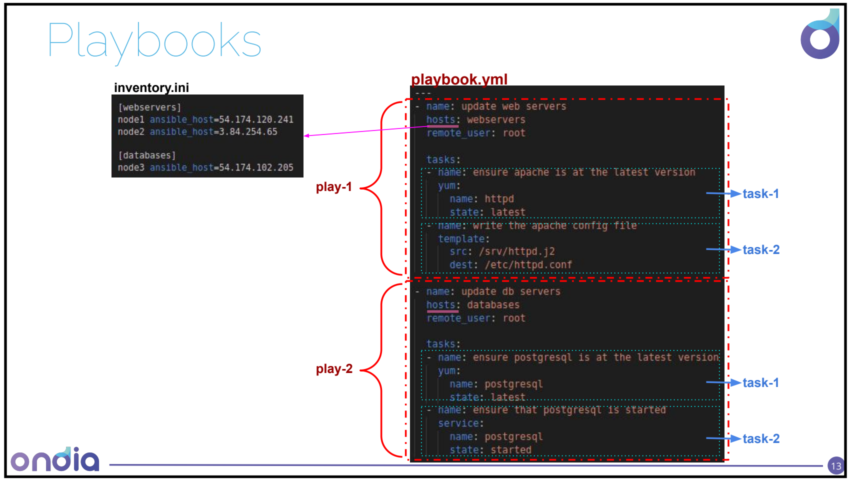


inventory.ini

```ini
[webservers]
node1 ansible_host=54.174.120.241
node2 ansible_host=3.84.254.65

[databases]
node3 ansible_host=54.174.102.205
```

playbook.yml

```yaml
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf
- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```



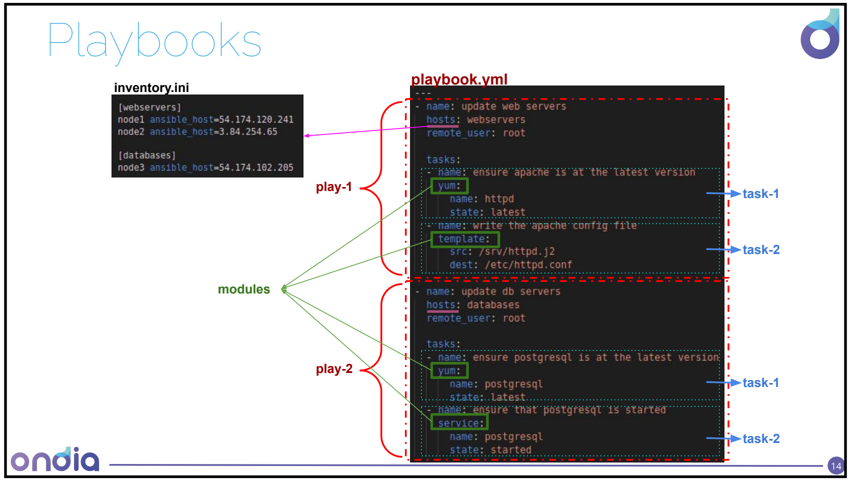
Playbooks

inventory.ini

```
[webservers]
node1 ansible_host=54.174.120.241
node2 ansible_host=3.84.254.65

[databases]
node3 ansible_host=54.174.102.205
```

playbook.yml

```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf
- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```



Playbooks

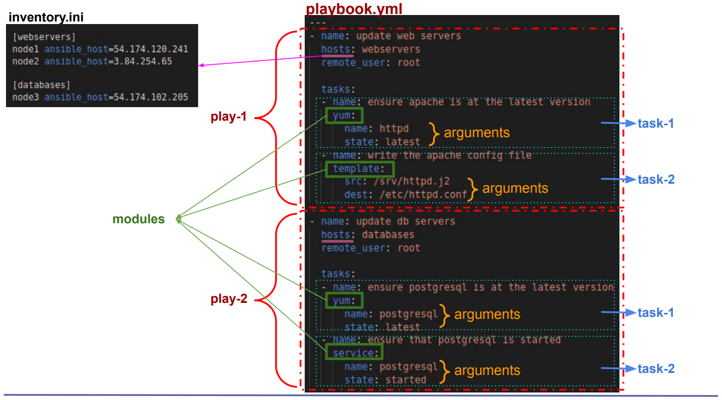
inventory.ini

```
[webservers]
node1 ansible_host=54.174.120.241
node2 ansible_host=3.84.254.65

[databases]
node3 ansible_host=54.174.102.205
```

playbook.yml

```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf
- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

Playbooks



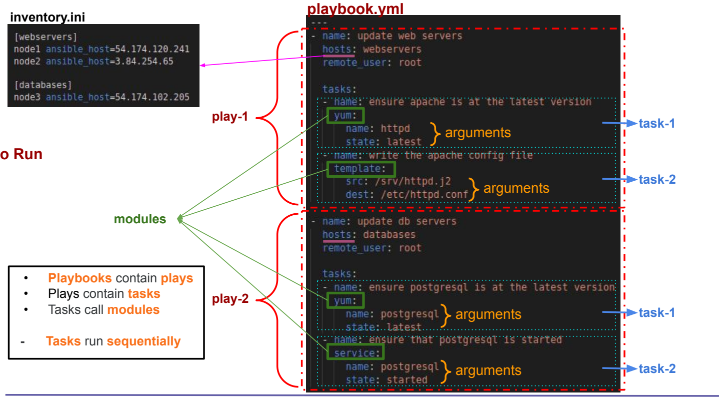
inventory.ini

```
[webservers]
node1 ansible_host=54.174.120.241
node2 ansible_host=3.84.254.65

[databases]
node3 ansible_host=54.174.102.205
```

playbook.yml

```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

Playbooks



inventory.ini

```
[webservers]
node1 ansible_host=54.174.120.241
node2 ansible_host=3.84.254.65

[databases]
node3 ansible_host=54.174.102.205
```

playbook.yml

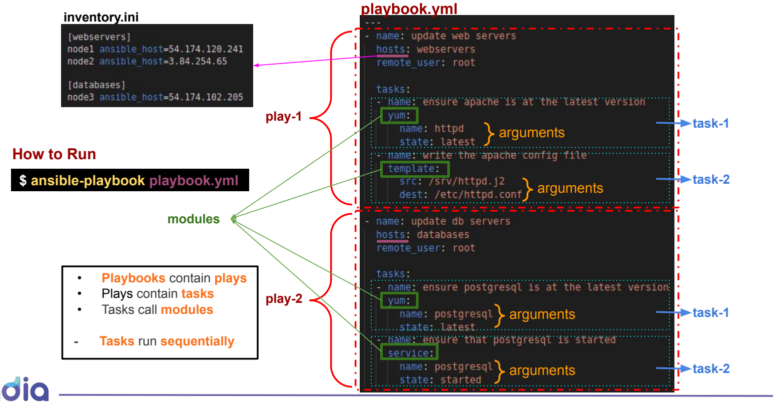
```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

How to Run

- Playbooks contain plays
- Plays contain tasks
- Tasks call modules

- Tasks run sequentially

Playbooks



inventory.ini

```
[webservers]
node1 ansible_host=54.174.120.241
node2 ansible_host=3.84.254.65

[databases]
node3 ansible_host=54.174.102.205
```

playbook.yml

```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf
- name: update db servers
  hosts: databases
  remote_user: root

  tasks:
  - name: ensure postgresql is at the latest version
    yum:
      name: postgresql
      state: latest
  - name: ensure that postgresql is started
    service:
      name: postgresql
      state: started
```

How to Run

```
$ ansible-playbook playbook.yml
```

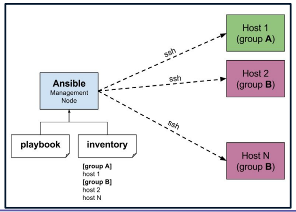
- **Playbooks** contain **plays**
- Plays contain **tasks**
- Tasks call **modules**

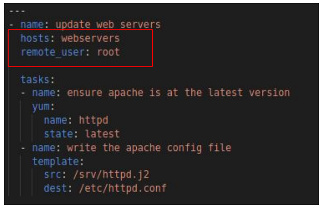
- **Tasks** run **sequentially**

Hosts and Users

Hosts and Users

- For each play in a playbook, you get to choose which machines in your infrastructure to target and what remote user to complete the steps (called tasks) as.
- The host defined in the inventory file must match the host used in the playbook and all connection information for the host is retrieved from the inventory file.





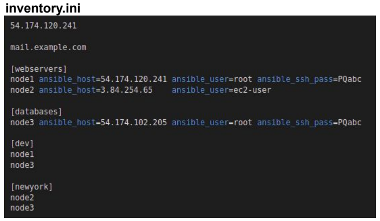
```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  tasks:
  - name: ensure apache is at the latest version
    yum:
      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf
```

Inventory File

Inventory File

- Ansible works against multiple managed nodes or “hosts” in your infrastructure at the same time, using a list or group of lists know as **inventory.**
- The default location for inventory is a file called **/etc/ansible/hosts.**
- You can specify a different inventory file at the command line using the **-i < path >** option.

inventory.ini

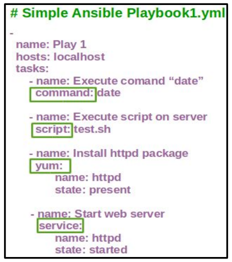


```
54.174.120.241

mail.example.com

[webservers]
node1 ansible_host=54.174.120.241 ansible_user=root ansible_ssh_pass=PQabc
node2 ansible_host=3.84.254.65    ansible_user=ec2-user

[databases]
node3 ansible_host=54.174.102.205 ansible_user=root ansible_ssh_pass=PQabc

[dev]
node1
node3

[newyork]
node2
node3
```

Tasks

Tasks

- Each play contains a list of tasks. Tasks are executed in order, one at a time, against all machines matched by the host pattern, before moving on to the next task.
- The goal of each task is to execute a module, with very specific arguments. Variables can be used in arguments to modules.

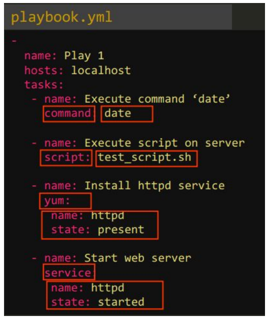


```
# Simple Ansible Playbook1.yml
-
  name: Play 1
  hosts: localhost
  tasks:
      - name: Execute comand “date”
        command: date

      - name: Execute script on server
        script: test.sh

      - name: Install httpd package
        yum:
              name: httpd
              state: present

      - name: Start web server
        service:
              name: httpd
              state: started
```

Modules

Modules

- **Modules** (also referred to as “task plugins” or “library plugins”) are discrete units of code that can be used from the command line or in a playbook task.
- Ansible executes each module, usually on the remote target node, and collects return values.
- Modules should be **idempotent**, and should avoid making any changes if they detect that the current state matches the desired final state.



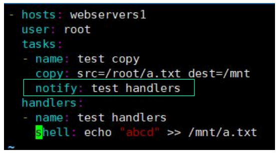
playbook.yml

```
-
  name: Play 1
  hosts: localhost
  tasks:
   - name: Execute command ‘date’
     command: date

   - name: Execute script on server
     script: test_script.sh

   - name: Install httpd service
     yum:
      name: httpd
      state: present

   - name: Start web server
     service:
      name: httpd
      state: started
```

Handlers

Handlers

Handlers are lists of tasks, not really any different from regular tasks, that are referenced by a globally unique name, and are notified by notifiers. If nothing notifies a handler, it will not run.

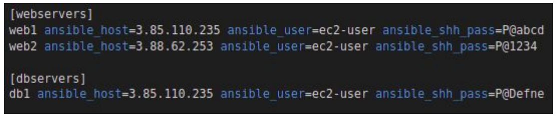


```
- hosts: webservers1
  user: root
  tasks:
  - name: test copy
    copy: src=/root/a.txt dest=/mnt
    notify: test handlers
  handlers:
  - name: test handlers
    shell: echo "abcd" >> /mnt/a.txt
~
```

Variables

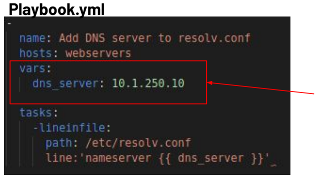
Variables

- **Variables** are used to store values that varies with different items.



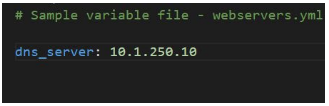
```
[webservers]
web1 ansible_host=3.85.110.235 ansible_user=ec2-user ansible_shh_pass=P@abcd
web2 ansible_host=3.88.62.253 ansible_user=ec2-user ansible_shh_pass=P@1234

[dbservers]
db1 ansible_host=3.85.110.235 ansible_user=ec2-user ansible_shh_pass=P@Defne
```

Playbook.yml



```
-
  name: Add DNS server to resolv.conf
  hosts: webservers
  vars:
    dns_server: 10.1.250.10

  tasks:
    -lineinfile:
      path: /etc/resolv.conf
      line:'nameserver {{ dns_server }}'
```

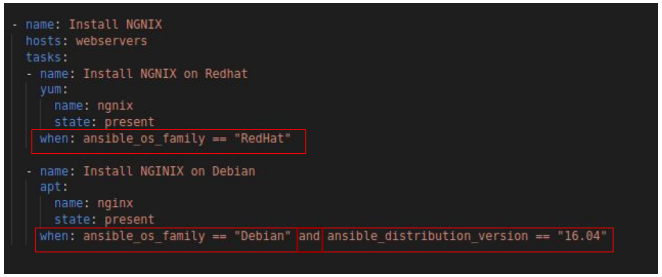
OR



```
# Sample variable file - webservers.yml

dns_server: 10.1.250.10
```

Conditionals

Conditionals



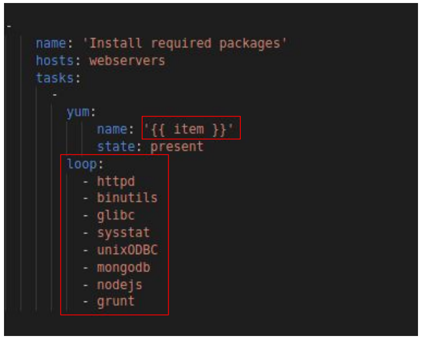
```
- name: Install NGNIX
  hosts: webservers
  tasks:
  - name: Install NGNIX on Redhat
    yum:
      name: ngnix
      state: present
    when: ansible_os_family == "RedHat"

  - name: Install NGINIX on Debian
    apt:
      name: nginx
      state: present
    when: ansible_os_family == "Debian" and ansible_distribution_version == "16.04"
```

Conditionals

OS_FAMILY	ansible_os_family == "RedHat"	ansible_os_family == "SUSE"	ansible_os_family == "Debian" or ansible_distribution_version == "20.04"
USER	Recep Alex James Oliver	David Polat	Tomy Robin
NODES	Node1 Node2	-	Node3

Loops

Loops



```
-
  name: 'Install required packages'
  hosts: webservers
  tasks:
    -
      yum:
        name: '{{ item }}'
        state: present
      loop:
        - httpd
        - binutils
        - glibc
        - sysstat
        - unixODBC
        - mongodb
        - nodejs
        - grunt
```

THANKS!

Any questions?

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