Ansible Playbooks

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WAY TO REINVENT YOURSELF

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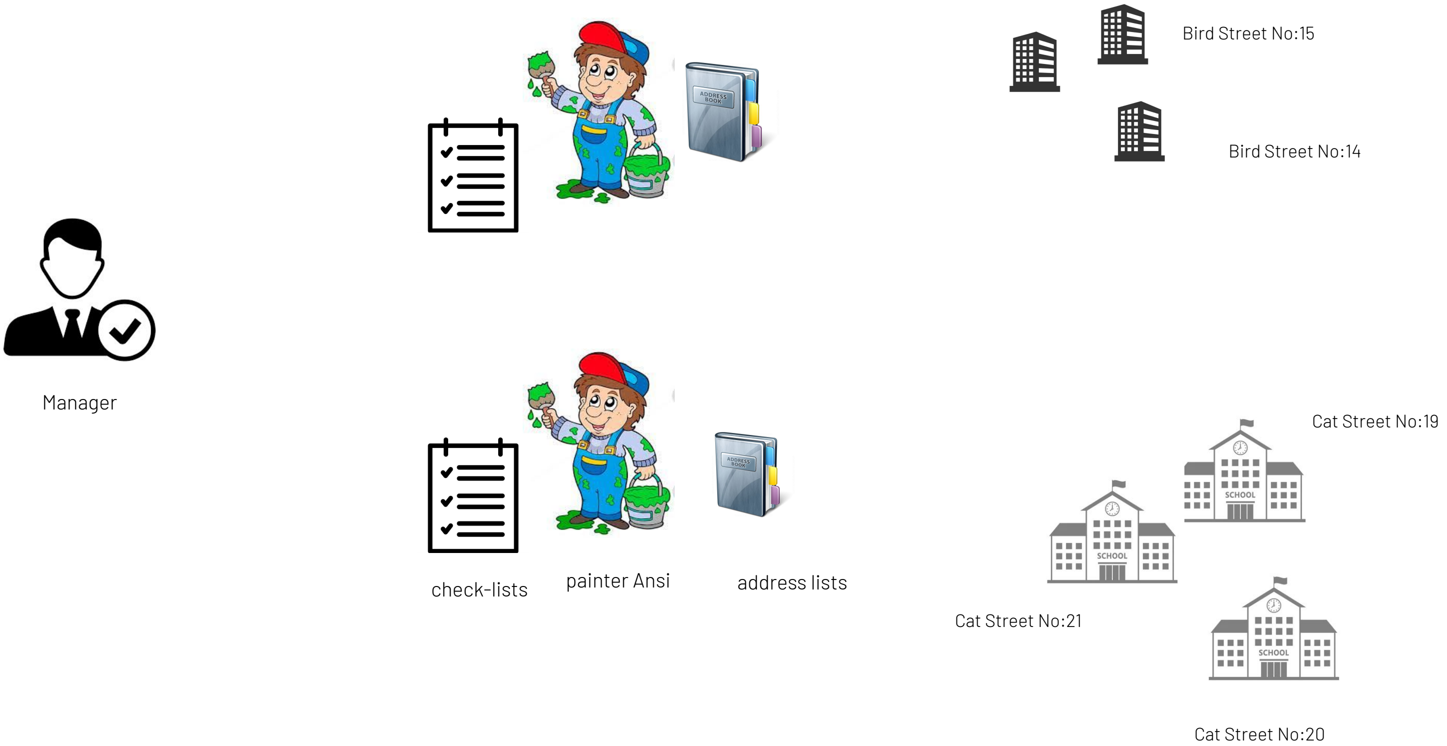


Bird Street No:15

Bird Street No:14

Manager

Cat Street No:19

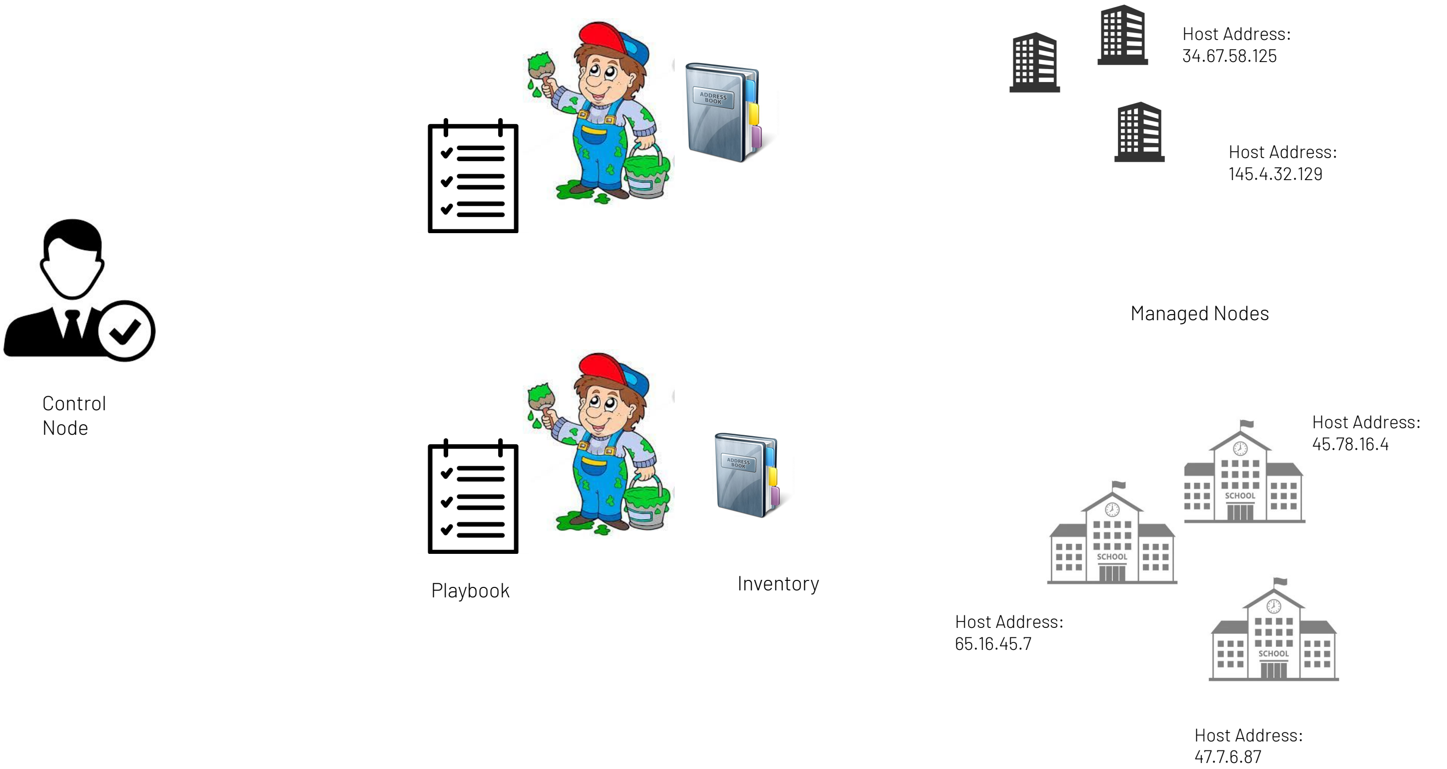
check-lists

painter Ansi

address lists

Cat Street No:21

Cat Street No:20



Host Address:
34.67.58.125

Host Address:
145.4.32.129

Control
Node

Managed Nodes

Host Address:
45.78.16.4

Playbook

Inventory

Host Address:
65.16.45.7

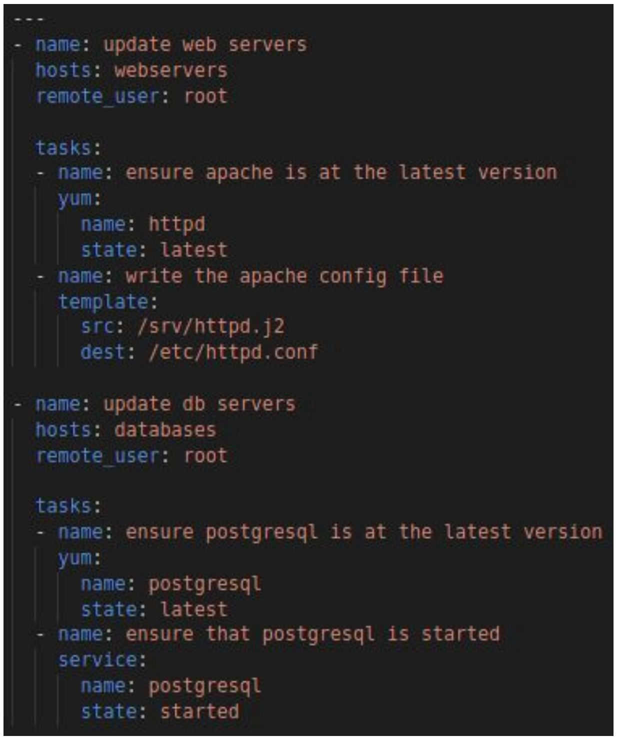
Host Address:
47.7.6.87

1 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.



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  tasks:
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    service:
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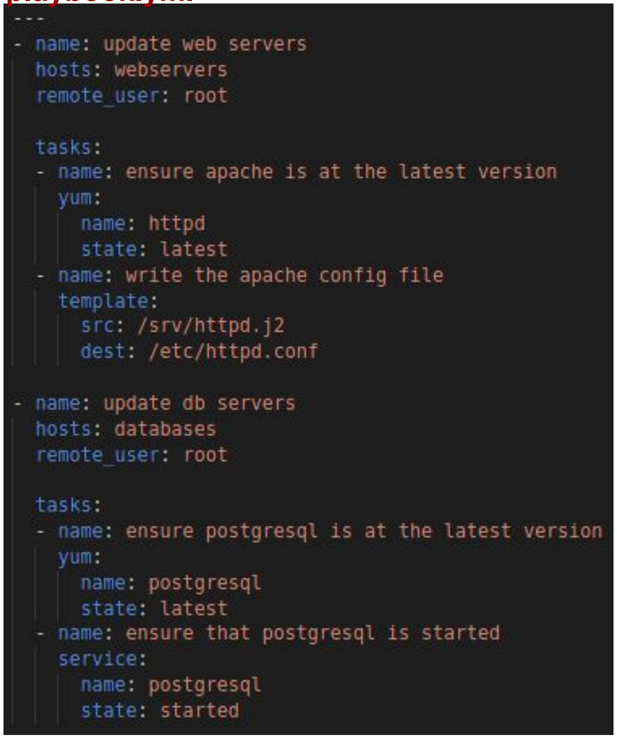
Playbooks

playbook.yml



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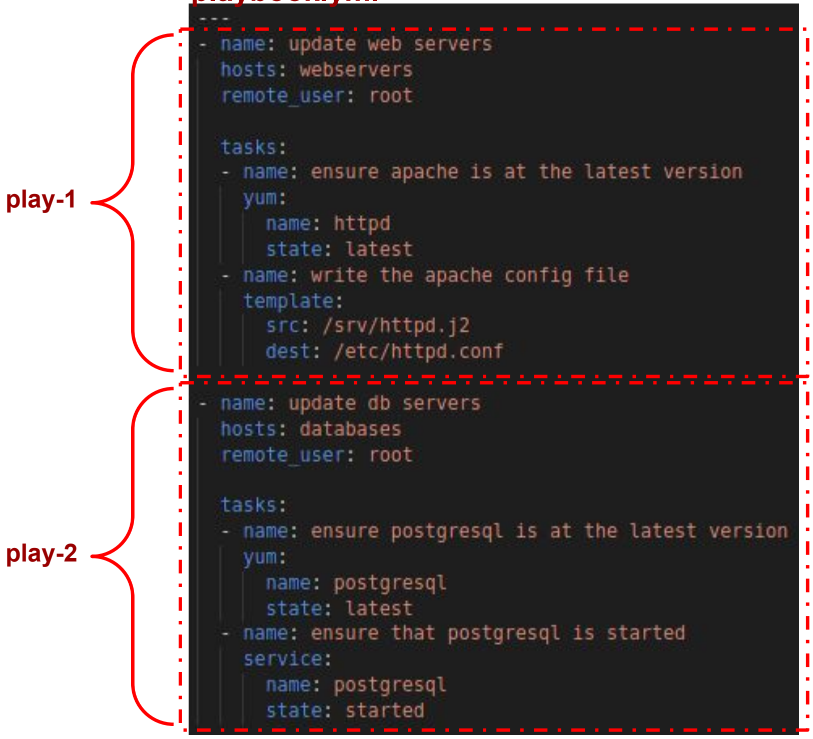

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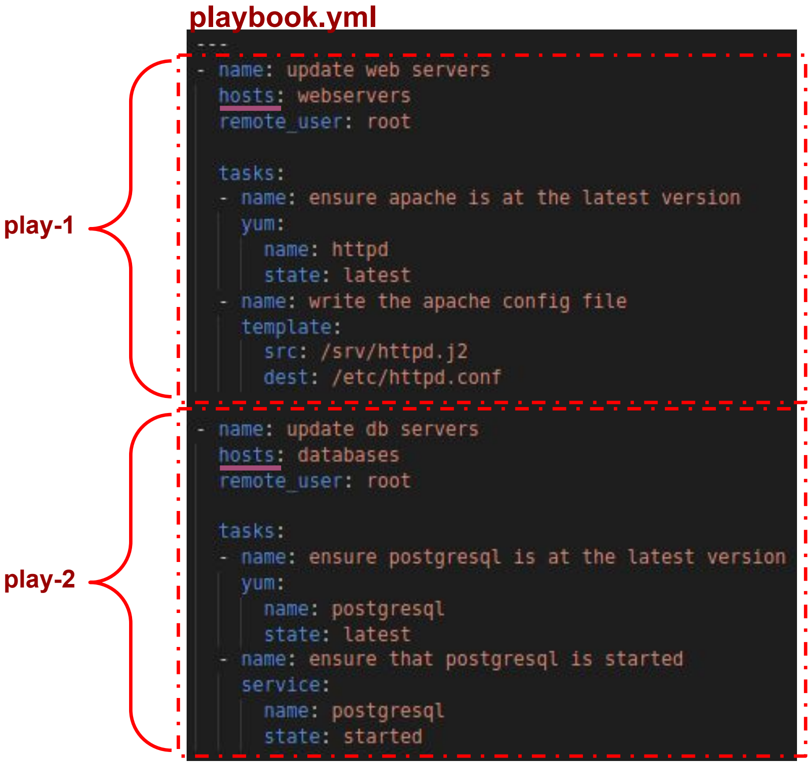

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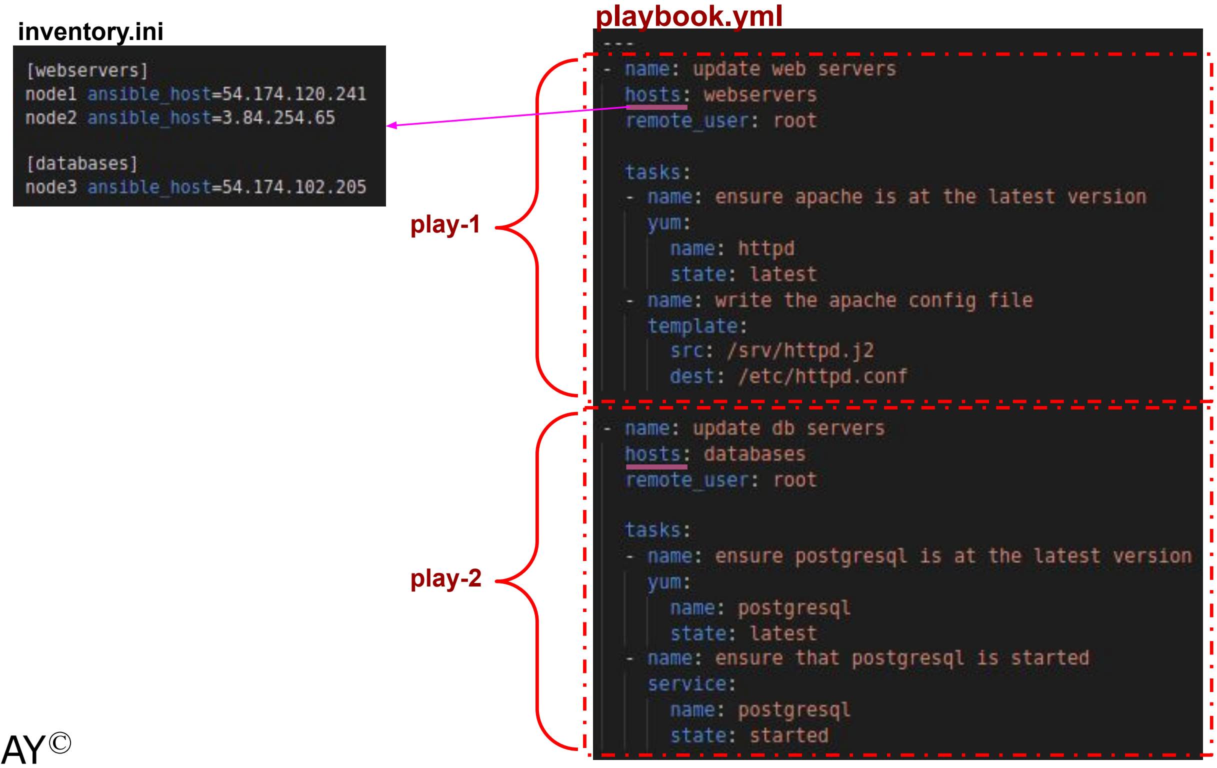

inventory.ini

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

[databases]
node3 ansible_host=54.174.102.205
```

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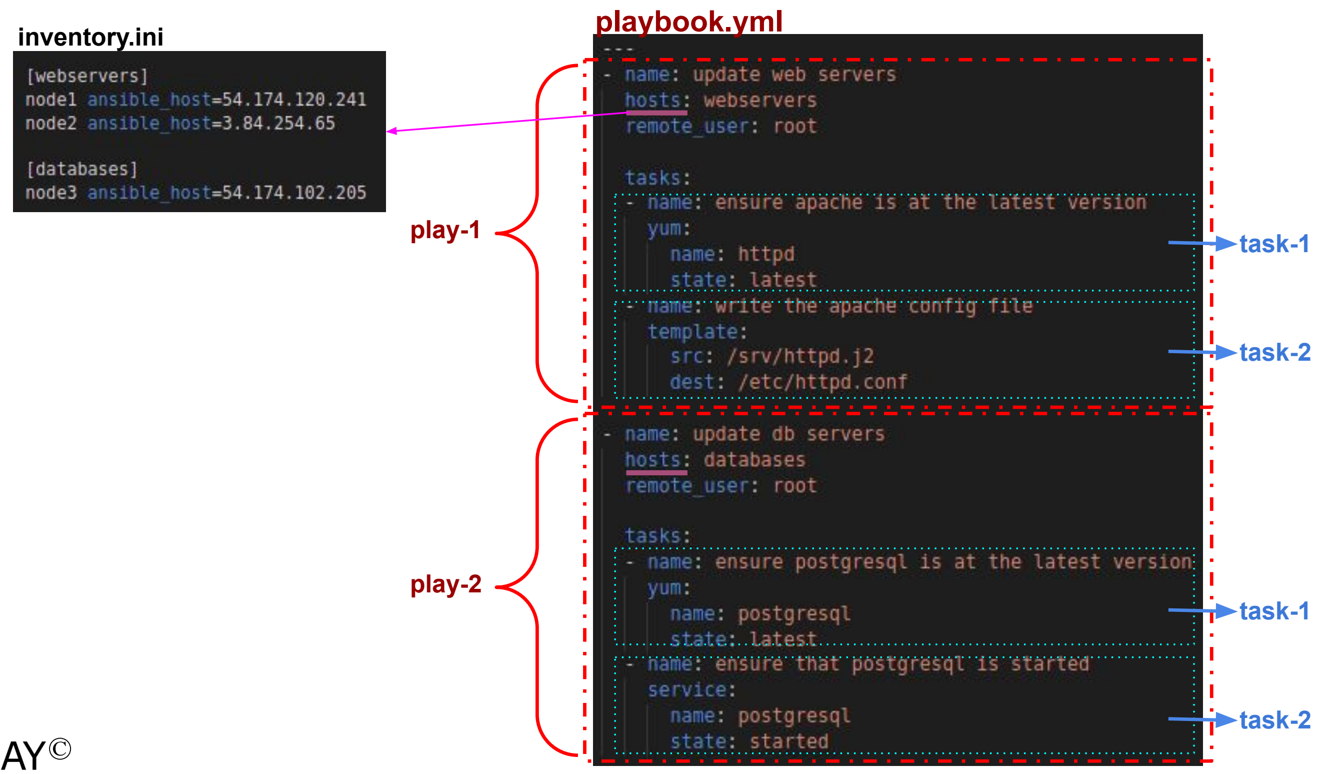

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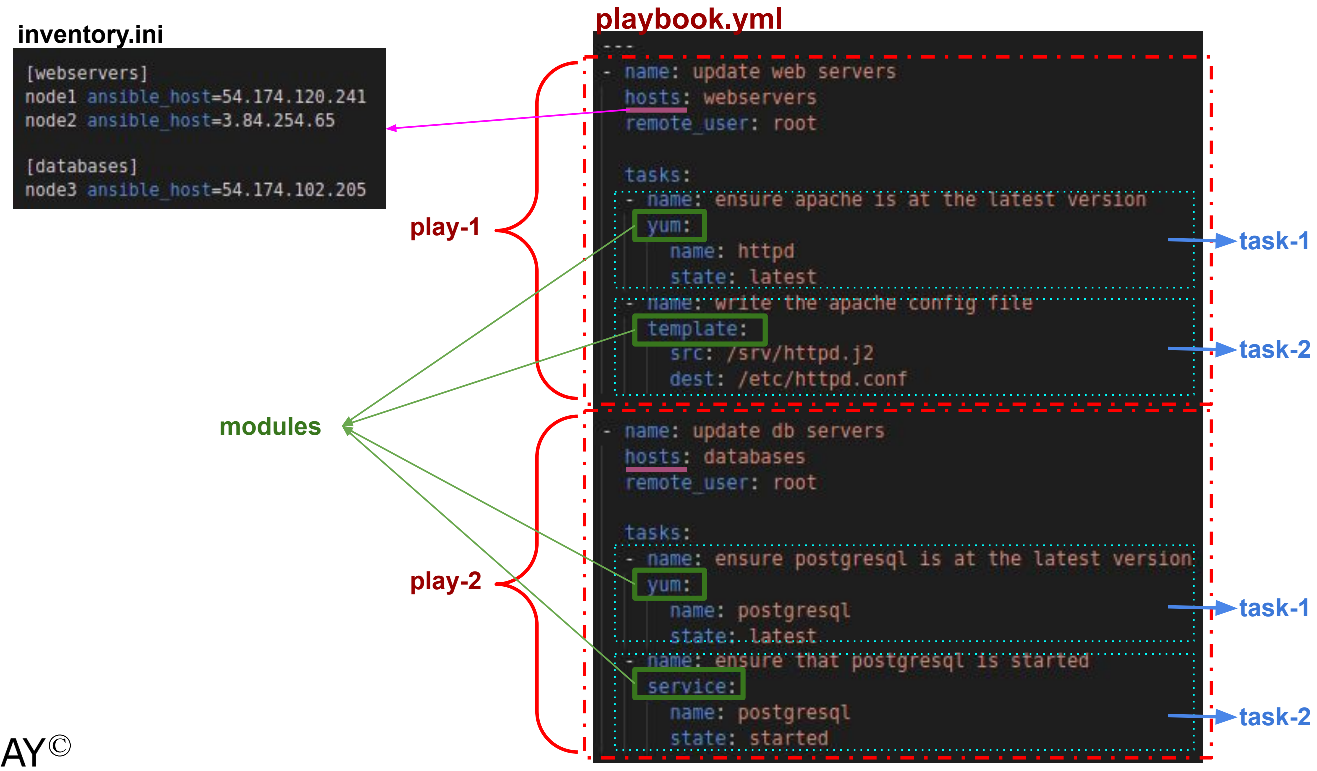

inventory.ini

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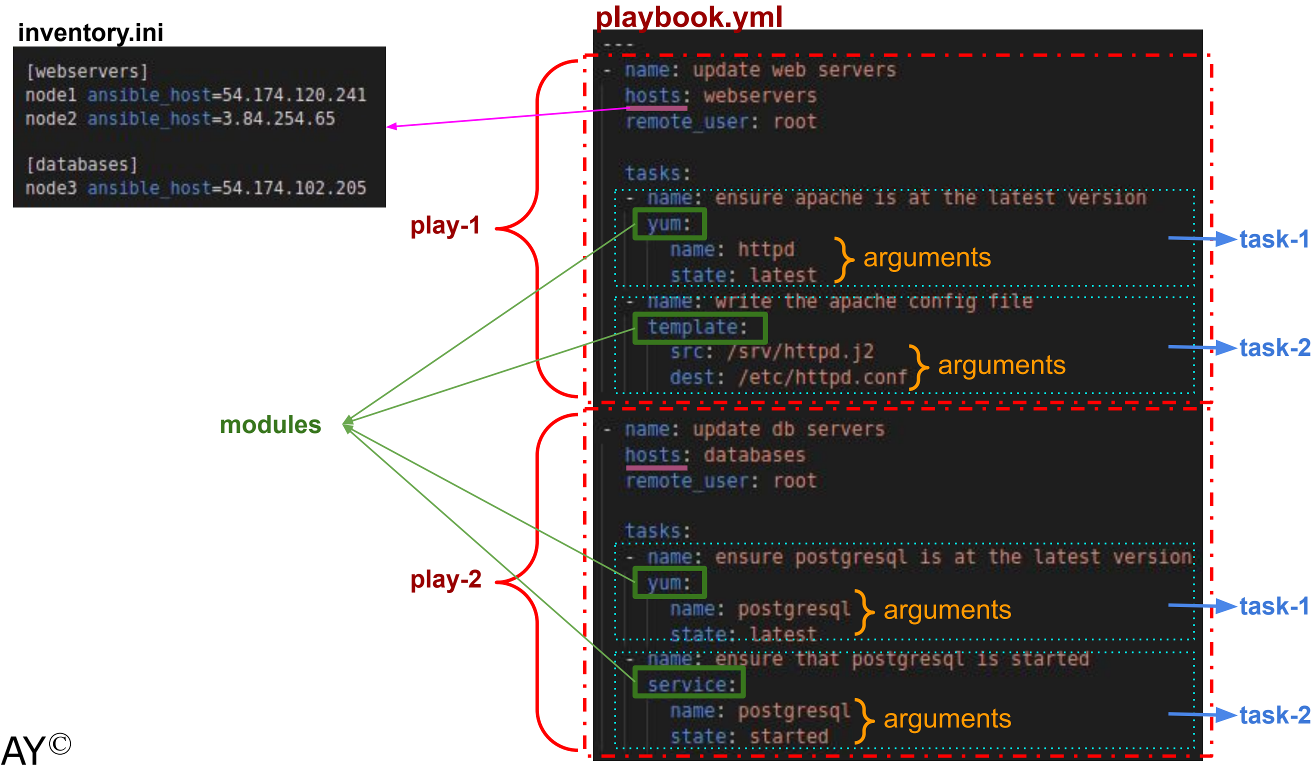

inventory.ini

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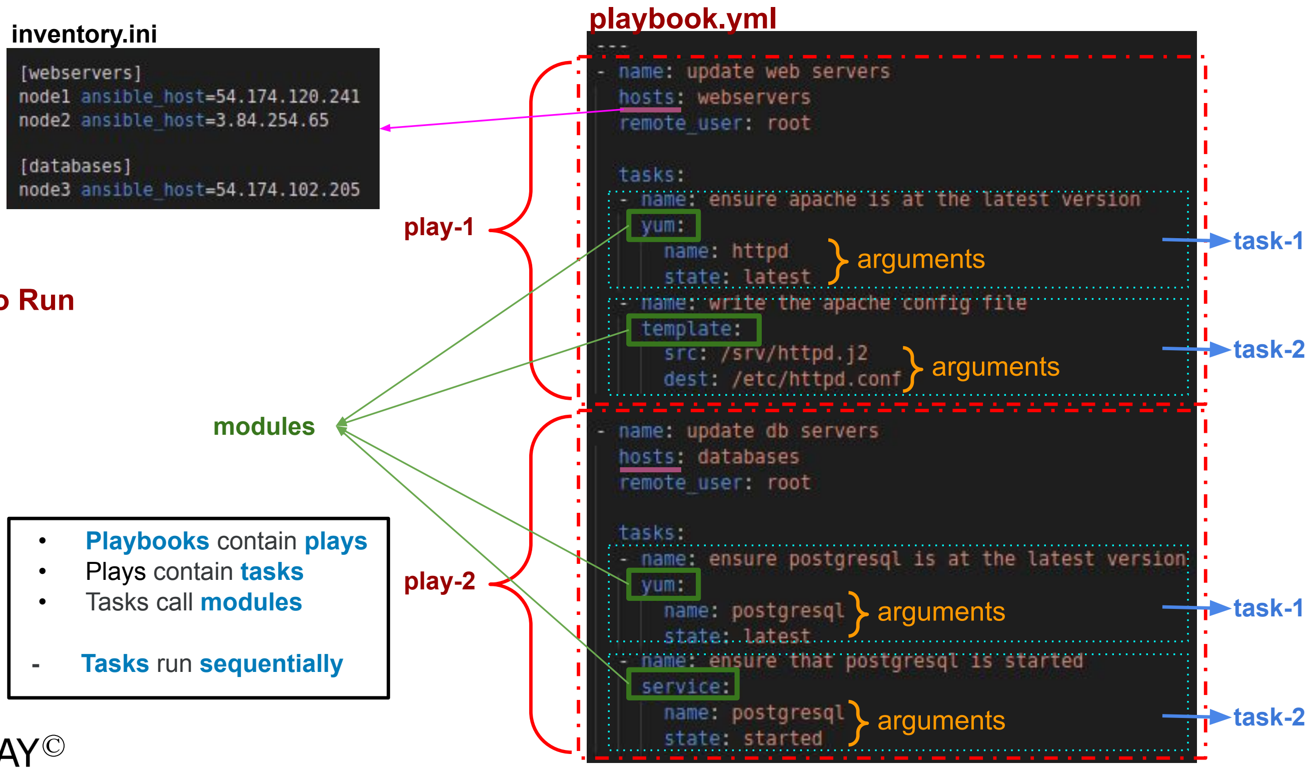

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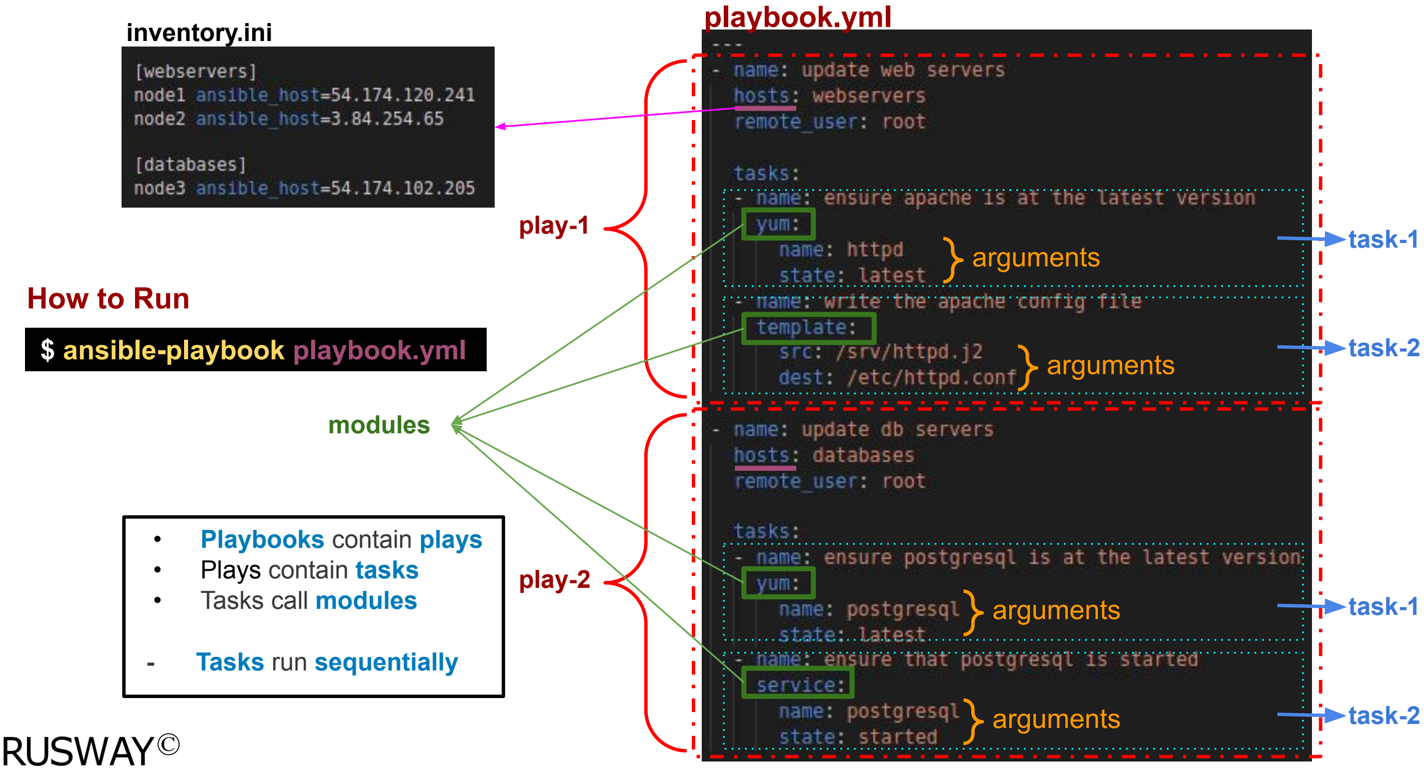
How to Run

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

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

Playbooks



inventory.ini

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playbook.yml

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How to Run

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

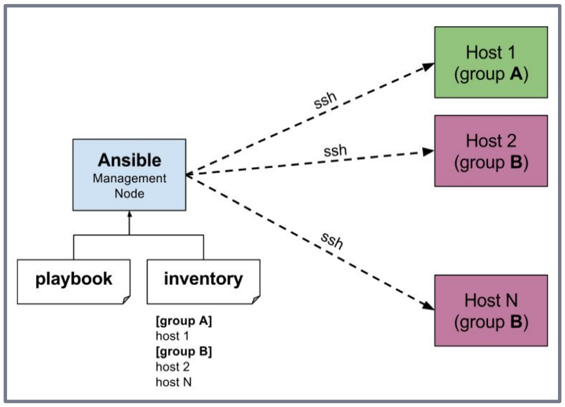
- **Playbooks** contain **plays**
- Plays contain **tasks**
- Tasks call **modules**

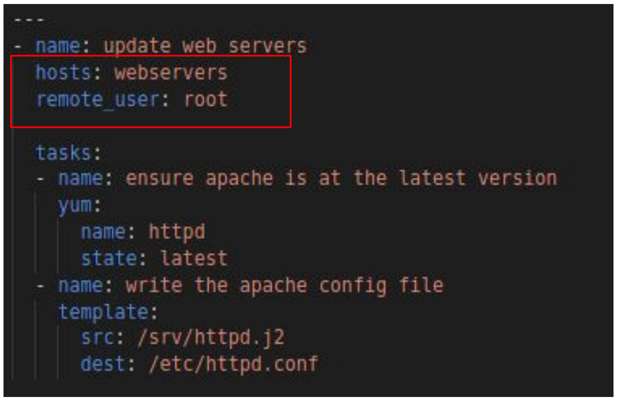
- **Tasks** run **sequentially**

2 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.





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      state: latest
  - name: write the apache config file
    template:
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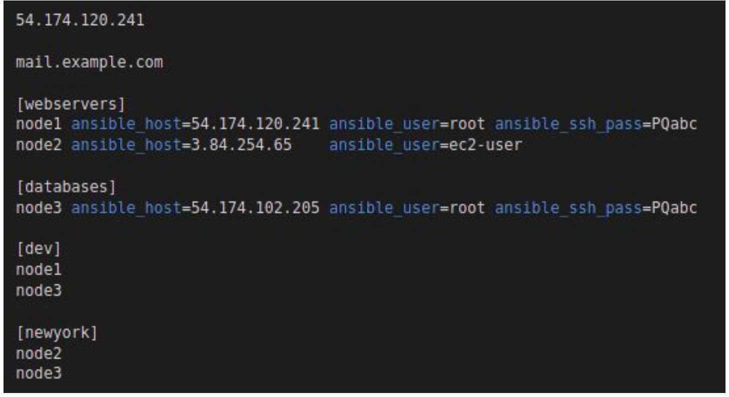
      dest: /etc/httpd.conf
```

3 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

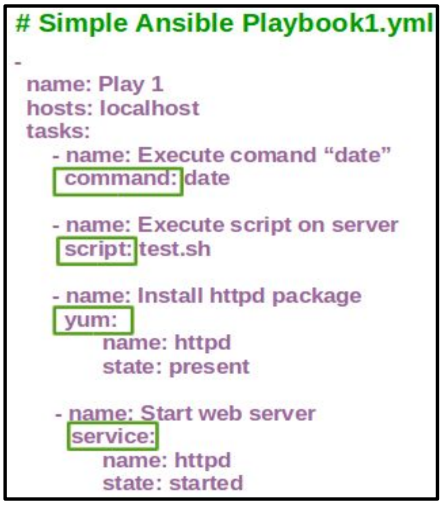
[dev]
node1
node3

[newyork]
node2
node3
```

4 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
```

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5 Modules

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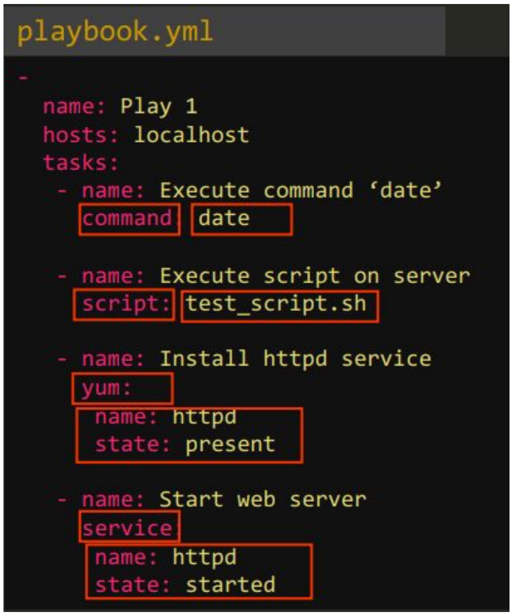
Modules

- **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
```

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6 Handlers

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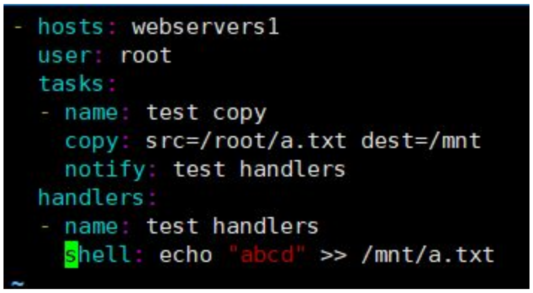
Handlers

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.

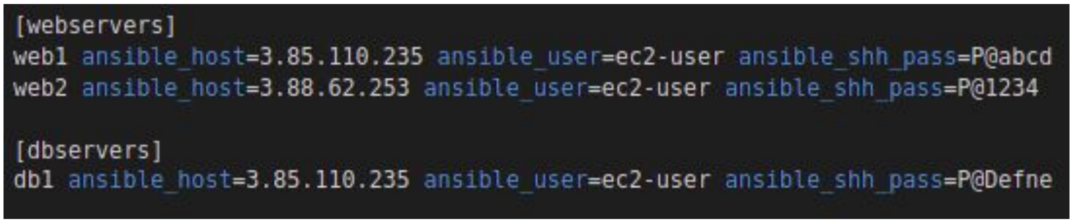


```
- hosts: webservers1
  user: root
  tasks:
  - name: test copy
    copy: src=/root/a.txt dest=/mnt
    notify: test handlers
  handlers:
  - name: test handlers
    shell: echo "abcd" >> /mnt/a.txt
~
```

7 Variables

Variables

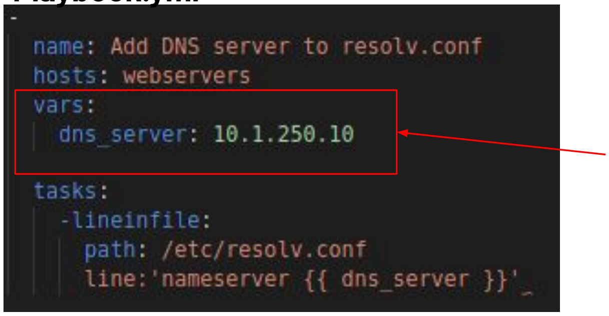
- **Variables** are used to store values that varies with different items.



```
[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
```

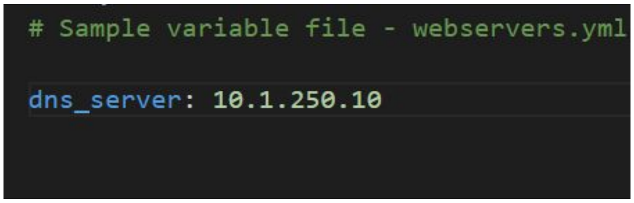
Playbook.yml



```
-
  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
```

8 Conditionals

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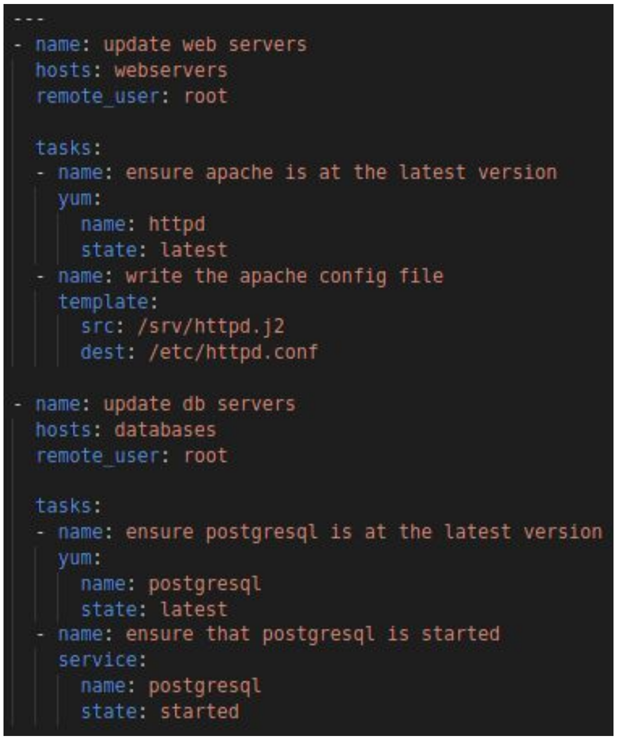

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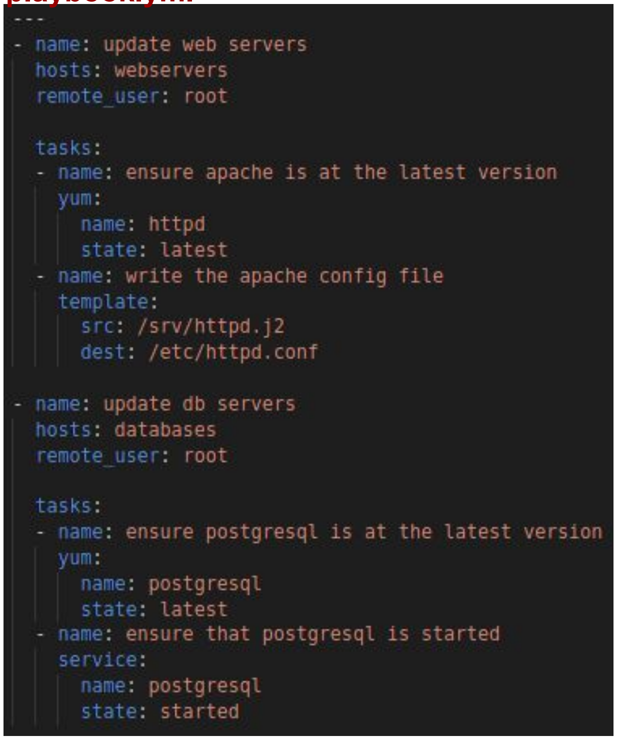

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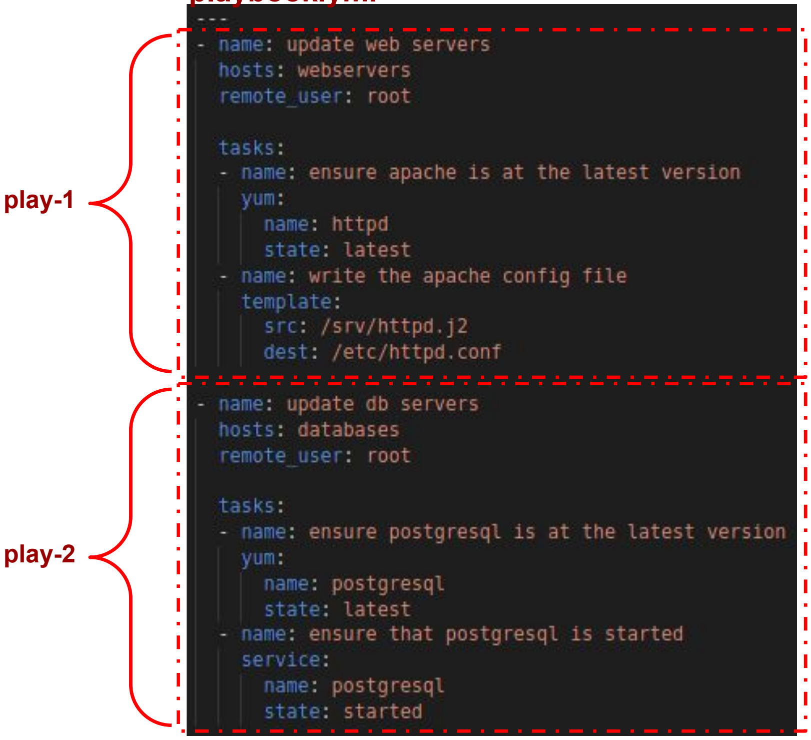

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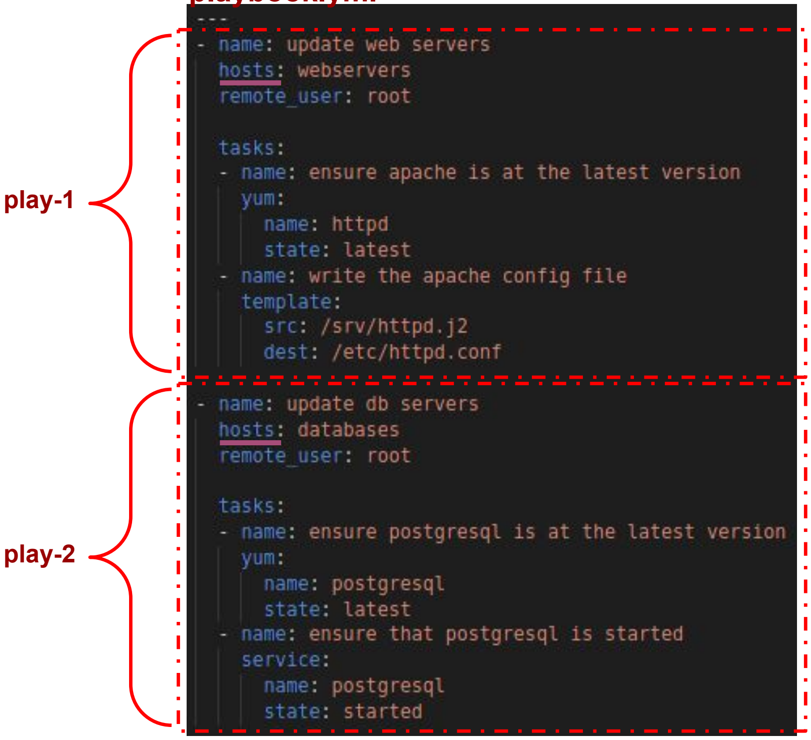

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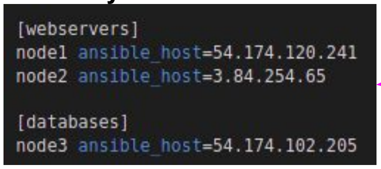
inventory.ini



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```
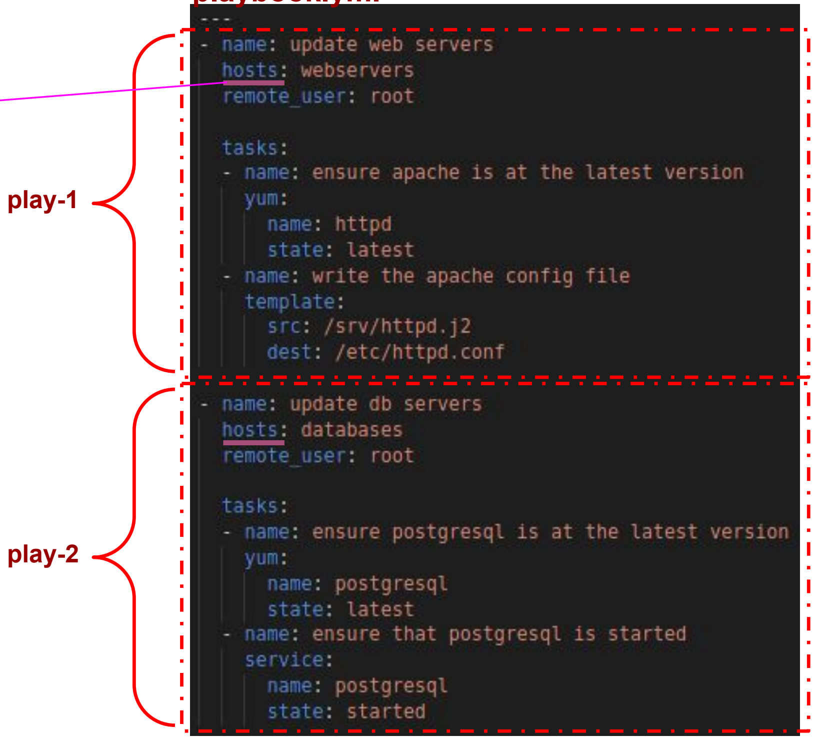
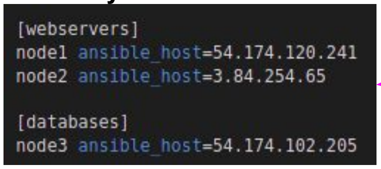

playbook.yml



```
---
- 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
```

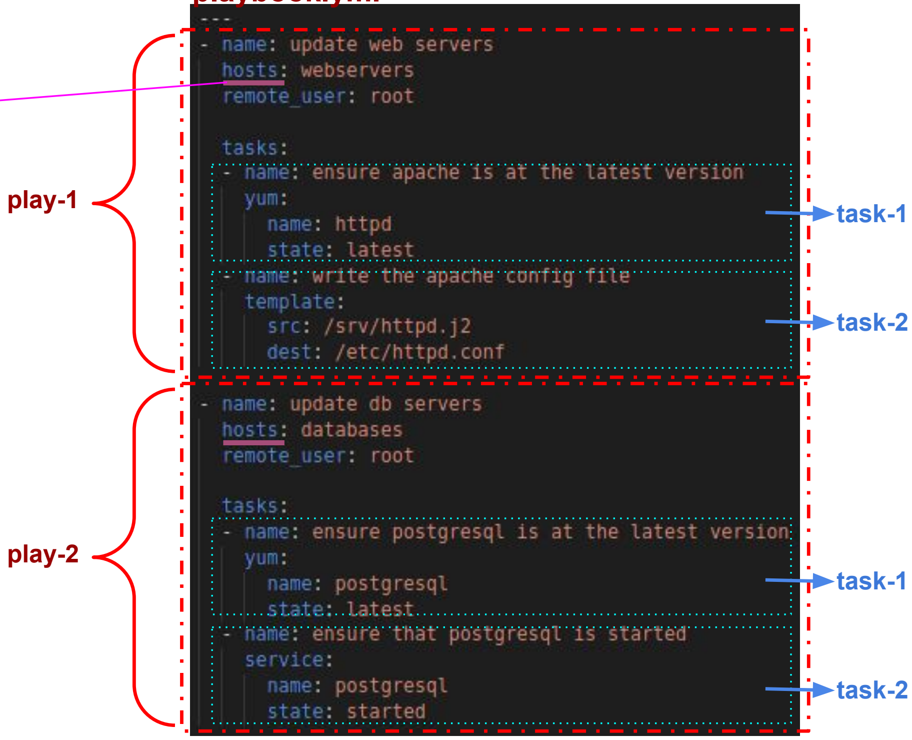
Playbooks

inventory.ini



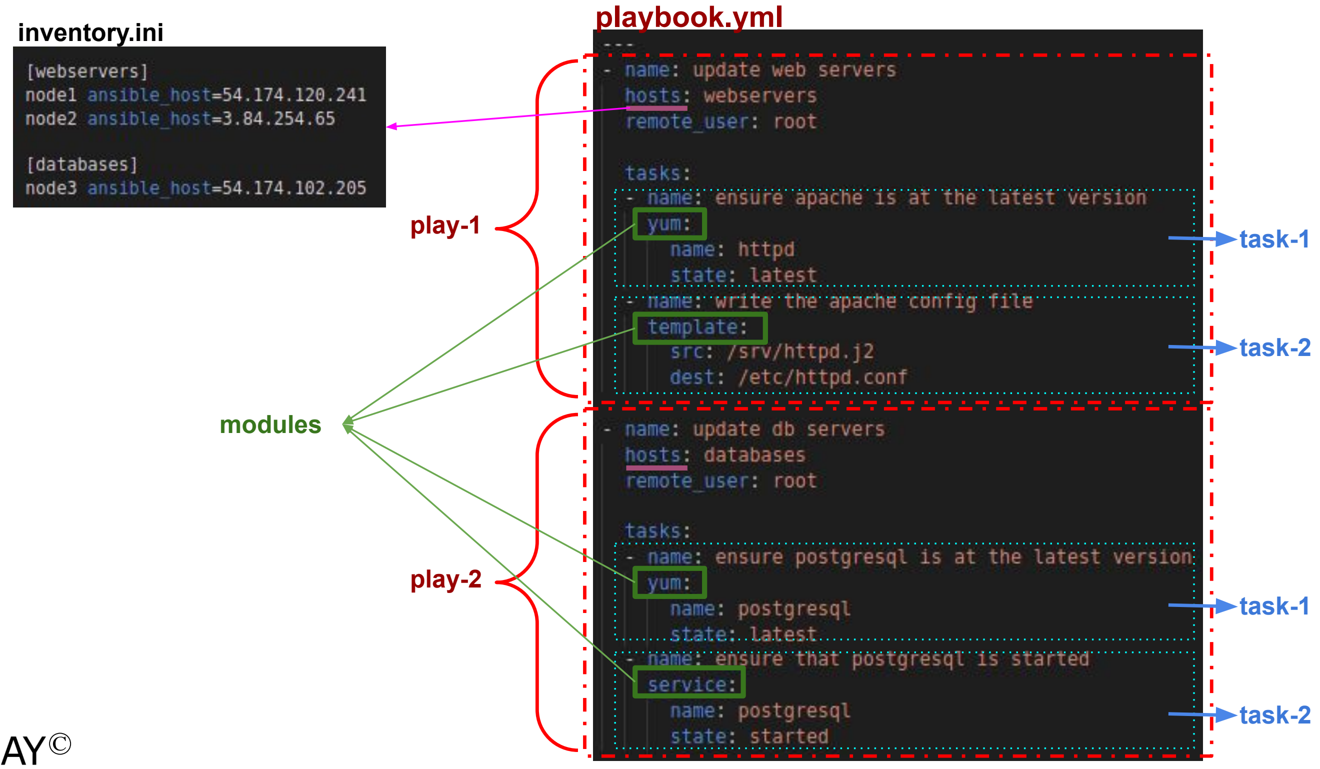
```
[webservers]
node1 ansible_host=54.174.120.241
node2 ansible_host=3.84.254.65

[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

```
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- name: update web servers
  hosts: webservers
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    template:
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      dest: /etc/httpd.conf

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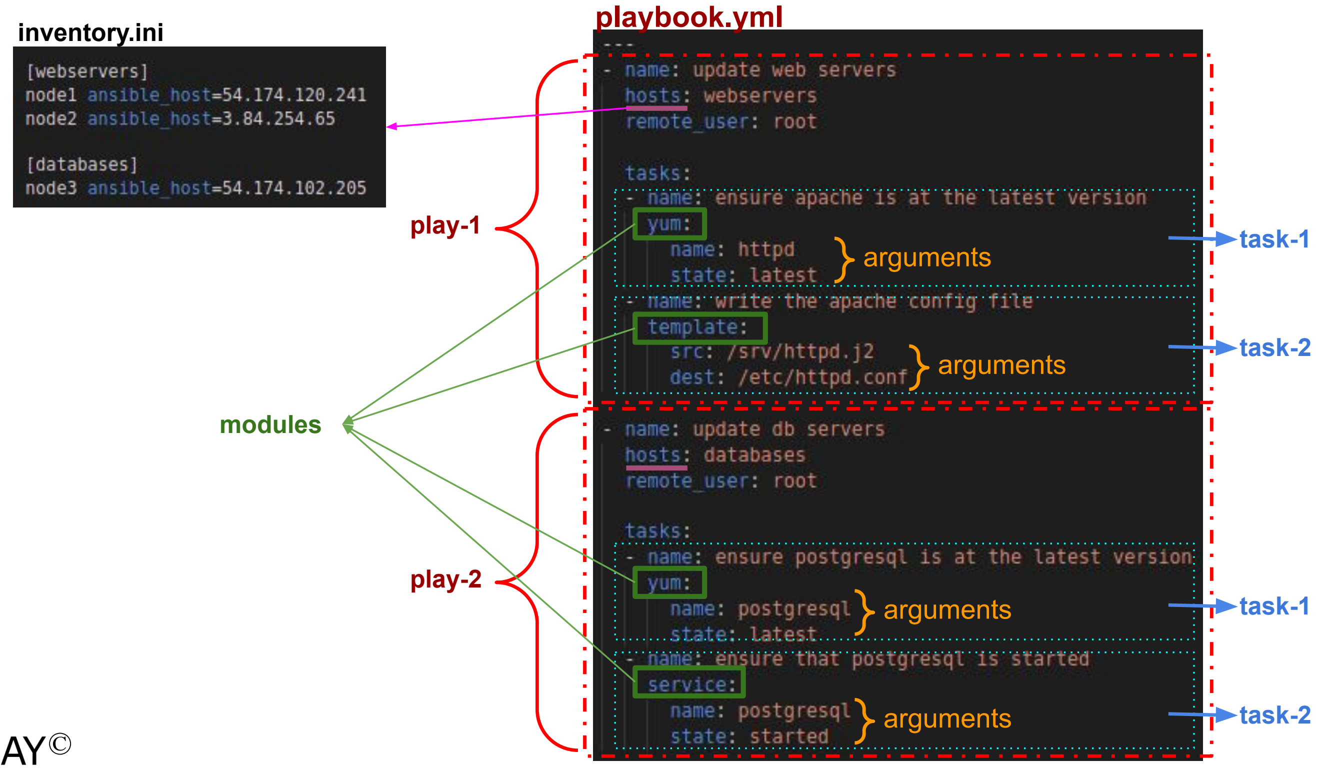

Playbooks



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
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      name: httpd
      state: latest
  - name: write the apache config file
    template:
      src: /srv/httpd.j2
      dest: /etc/httpd.conf

- name: update db servers
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  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
```
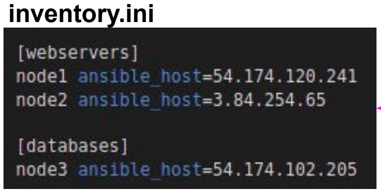
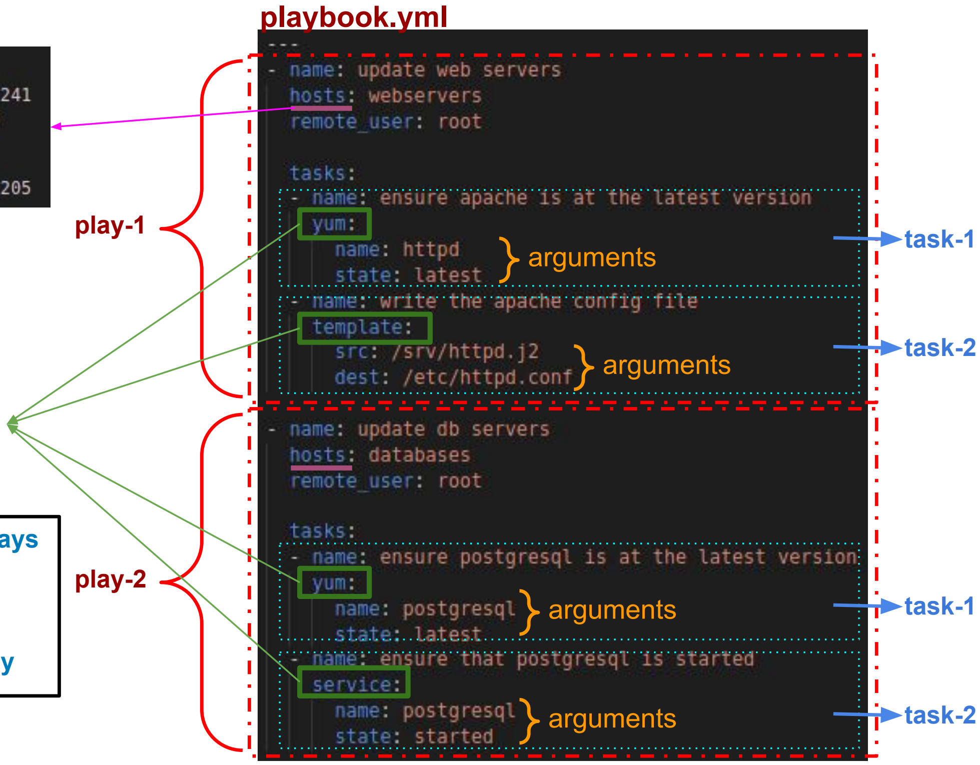

Playbooks

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**

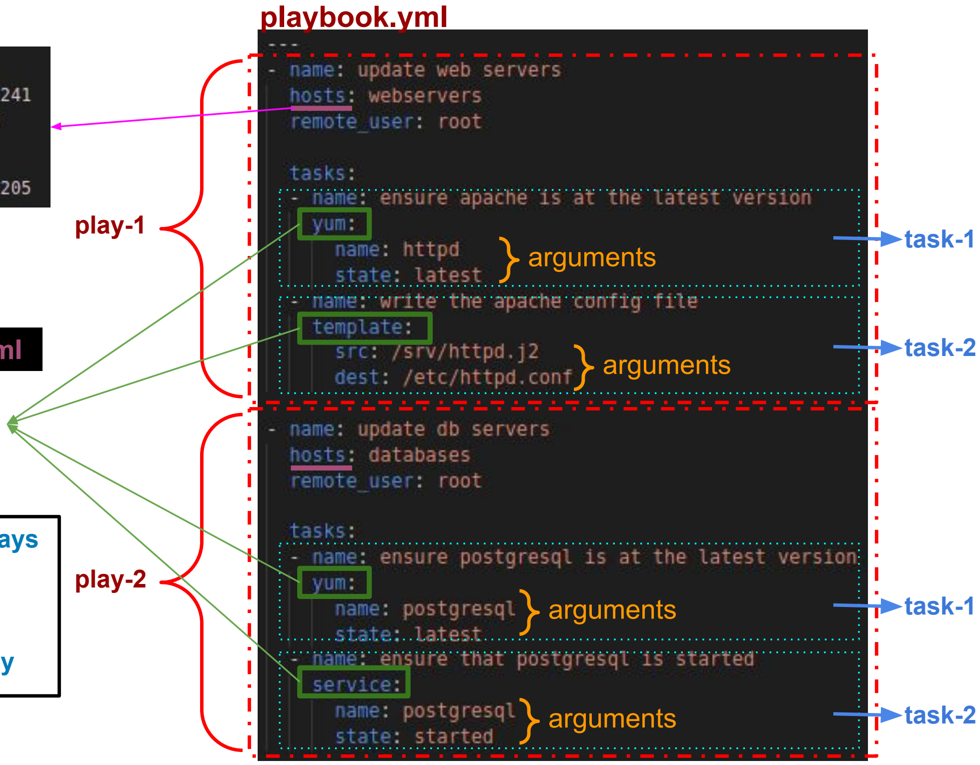
- **Tasks** run **sequentially**

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
```

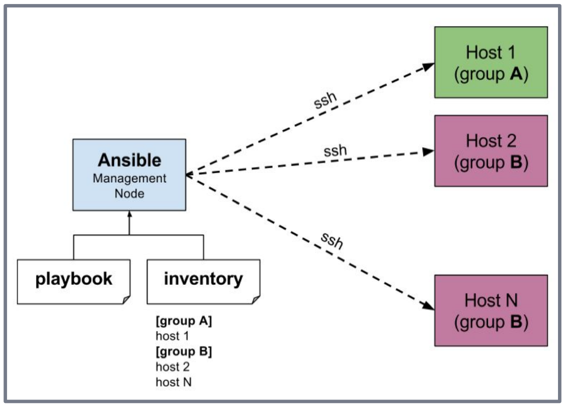
- **Playbooks** contain **plays**
- Plays contain **tasks**
- Tasks call **modules**

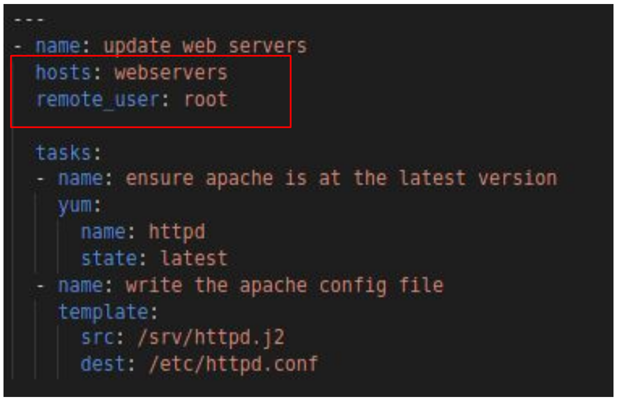
- **Tasks** run **sequentially**

2 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.





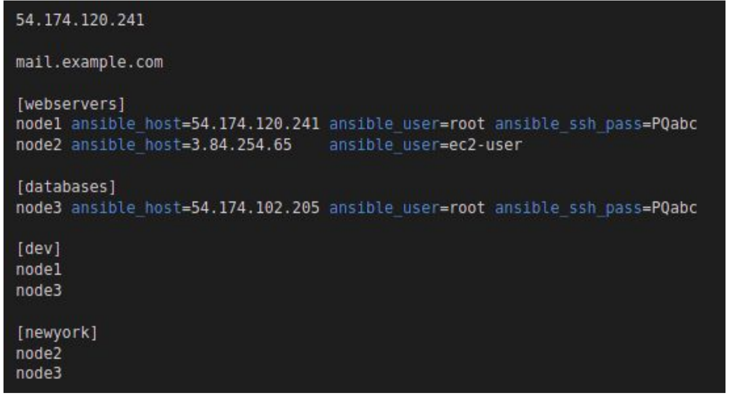
```
---
- name: update web servers
  hosts: webservers
  remote_user: root

  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
```

3 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

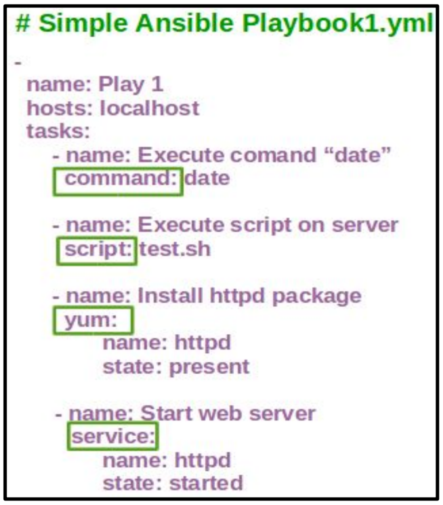


```
54.174.120.241

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
```

4 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
```

5

Modules

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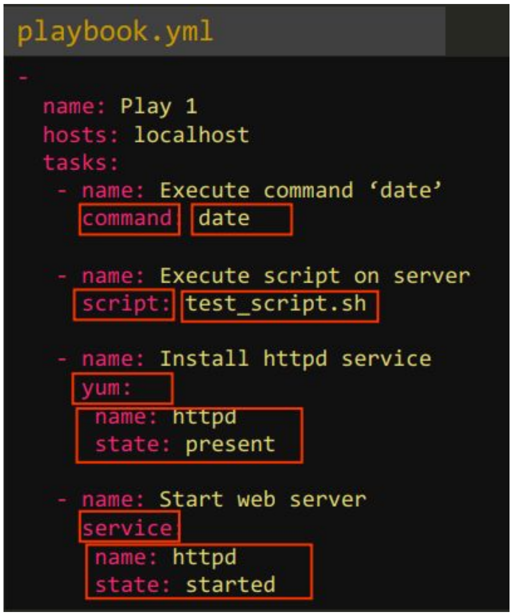
WAY TO REINVENT YOURSELF

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.



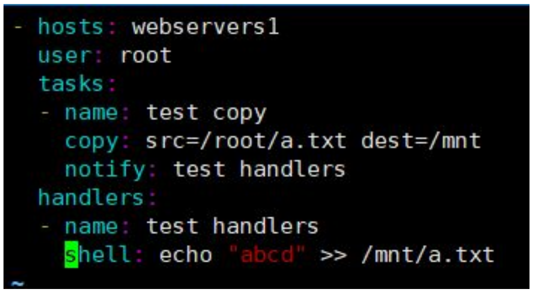
```
playbook.yml
-
  name: Play 1
  hosts: localhost
  tasks:
    - name: Execute command ‘date’
      command: date

    - 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
```

CLARUSWAY©
WAY TO REINVENT YOURSELF

6 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.



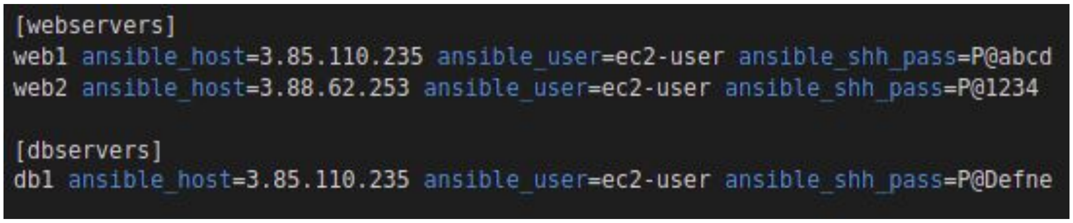
```
- hosts: webservers1
  user: root
  tasks:
  - name: test copy
    copy: src=/root/a.txt dest=/mnt
    notify: test handlers
  handlers:
  - name: test handlers
    shell: echo "abcd" >> /mnt/a.txt
~
```

7

Variables

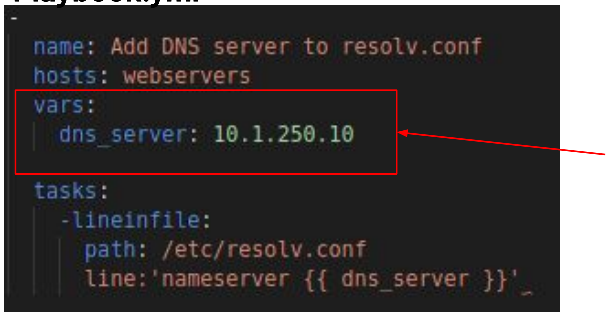
Variables

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



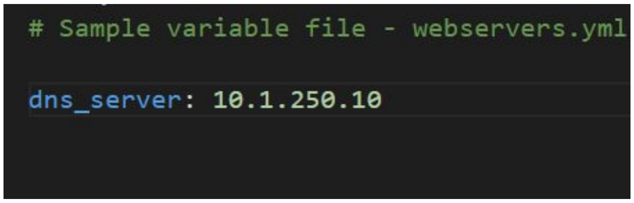
```
[webservers]
web1 ansible_host=3.85.110.235 ansible_user=ec2-user ansible_shh_pass=P@abcd
web2 ansible_host=3.88.62.253 ansible_user=ec2-user ansible_shh_pass=P@1234

[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

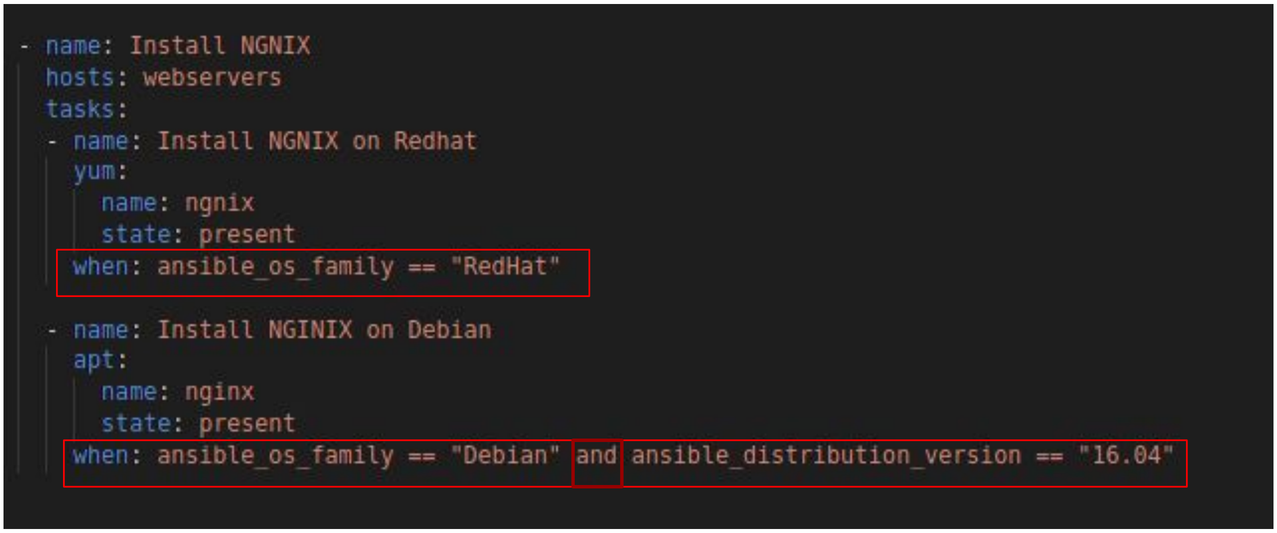


```
# Sample variable file - webservers.yml

dns_server: 10.1.250.10
```

8

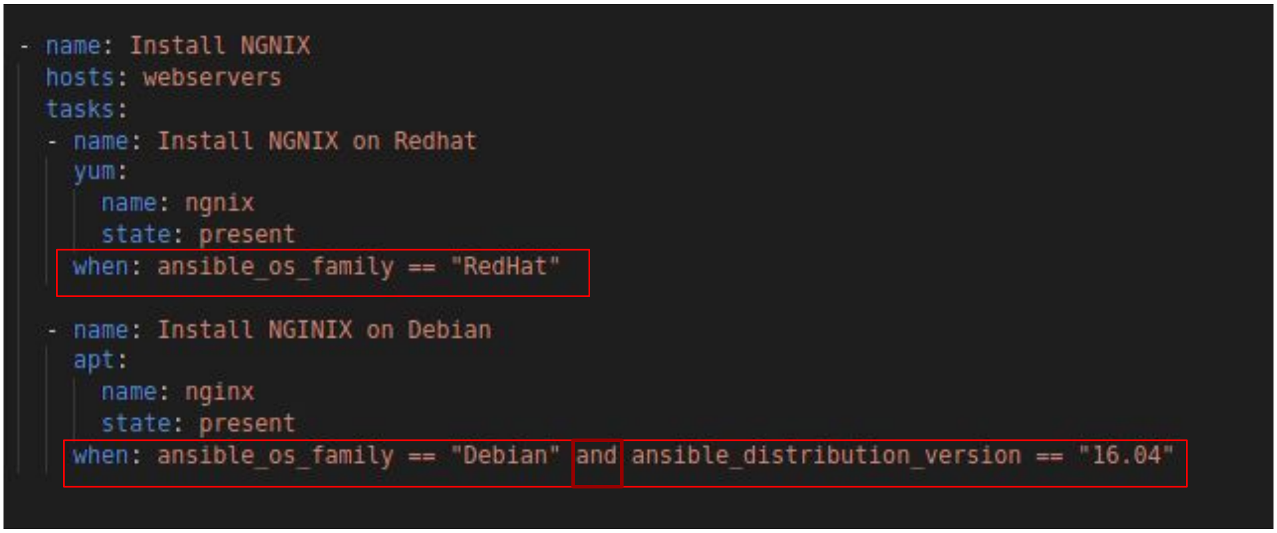
Conditionals

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"
```

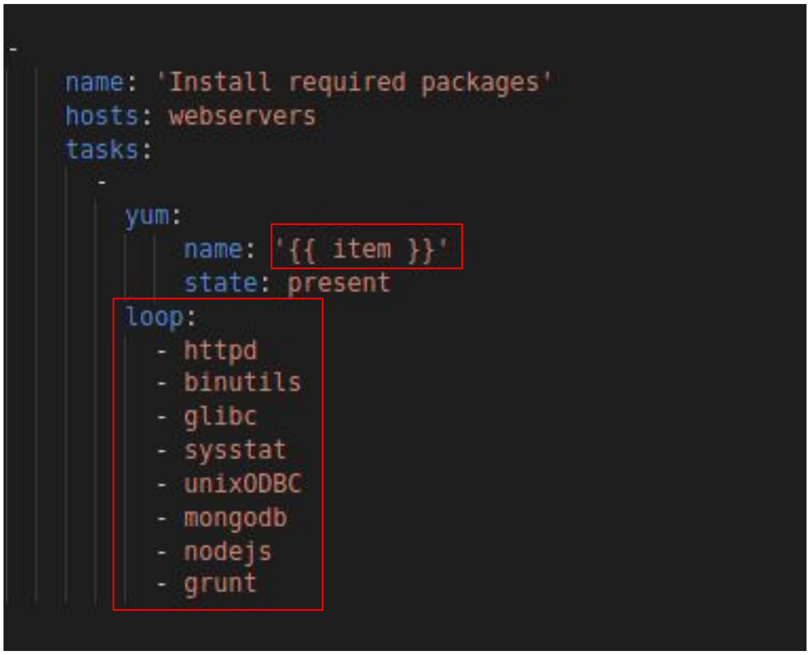
Conditionals



```
- 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"
```

9 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?

You can find me at:

- timothy@clarusway.com
- oliver@clarusway.com
- walter@clarusway.com