Roles In Ansible

Roles in Ansible are a way to organize your playbook tasks, variables, files, templates, and handlers.

Using roles we can structure the ansible playbooks by breaking them into smaller, reusable components, improving efficiency, readability, and maintainability.

Instead of writing **100+ tasks** in a single playbook, we divide them into roles.

How to create roles/?  
ubuntu@ip-172-31-88-72:~$ ansible-galaxy role init test

- Role test was created successfully

ubuntu@ip-172-31-88-72:~$ cd test/

ubuntu@ip-172-31-88-72:~/test$ ls

README.md  defaults  files  handlers  meta  tasks  templates  tests  vars

→ Simple ansible program using roles

**Install and start nginx service**

**We are going to convert this playbook in to roles**

**---**

- name: Install and Start Nginx

  hosts: all

  become: true

  tasks:

    - name: Install Nginx package

      package:

        name: nginx

        state: present

    - name: Start Nginx service

      service:

        name: nginx

        state: started

        enabled: true

1. **Create role first**

Ansible-galaxy role init new

*ubuntu@ip-172-31-88-72:~$ ansible-galaxy role init new*

*- Role new was created successfully*

*ubuntu@ip-172-31-88-72:~$ cd new/*

*ubuntu@ip-172-31-88-72:~/new$ ls*

*README.md  defaults  files  handlers  meta  tasks  templates  tests  vars*

1. **Edit task yml file**

*ubuntu@ip-172-31-88-72:~/new$ cd tasks/*

*ubuntu@ip-172-31-88-72:~/new/tasks$ ls*

*main.yml*

*ubuntu@ip-172-31-88-72:~/new/tasks$ vim main.yml*

*ubuntu@ip-172-31-88-72:~/new/tasks$ cat main.yml*

*---*

*# tasks file for nginx*

*- name: Install Nginx package*

*package:*

*name: nginx*

*state: present*

*- name: Start Nginx service*

*service:*

*name: nginx*

*state: started*

*enabled: true*

1. **Edit meta yml file**

*---*

*# metadata for nginx role*

*galaxy\_info:*

*author: Your Name*

*description: "Ansible role to install and start Nginx"*

*company: Your Company*

*license: license\_name*

*min\_ansible\_version: "2.9"*

*dependencies: []*

*Note:* ***dependencies****: If your role depends on other roles, you can list them here.*

1. **Step 3: Create the Playbook**

*ubuntu@ip-172-31-88-72:~$ vim playbook.yml*

*ubuntu@ip-172-31-88-72:~$ cat playbook.yml*

*---*

*- name: Install and Start Nginx*

*hosts: all*

*become: true*

*roles:*

*- new*

1. **Create the inventory file**

*ubuntu@ip-172-31-88-72:~$ cat inventory.ini*

*[web\_server]*

*172.31.86.3*

*[db\_server]*

*172.31.81.84*

*[all\_servers:children]*

*web\_server*

*Db\_server*

1. **run the playbook**

*ansible-playbook -i inventory.ini playbook.yml*

1. *Nginx -v to check whether its installed or not*

**README.md**

* This file typically contains information about the role

**meta/**

* This file typically includes role metadata such as the role's author, description, dependencies, and minimum Ansible version. This file typically includes role metadata such as the role's author, description, dependencies, and minimum Ansible version.

**tasks/**

* The tasks directory is where the main logic of the role resides. It contains the tasks that will be executed on the target machine**.**

**file**

* files/ directory contains the files you want to copy from your control machine (the machine running Ansible) to the target machine (the remote machine).

Program to learn handlers.

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- name: Install and Start Nginx

  hosts: all

  become: true

  tasks:

    - name: Install Nginx package

      package:

        name: nginx

        state: present

      notify:

        - Start Nginx service  # Trigger the handler if the package was installed/updated

  handlers:

    - name: Start Nginx service

      service:

        name: nginx

        state: started

        enabled: true

Note:

If Nginx is not installed, the **Install Nginx package** task will install it, and it will notify the handler to start the Nginx service.

If Nginx is already installed, the task will skip (no change), and the handler will **not run**

**Handlers are special tasks in Ansible that are triggered only when notified by other tasks. They are generally used for tasks like starting or restarting services**

**Efficiency: Handlers allow us to avoid unnecessary work. For example, if a service is already running, there's no need to restart i**

**Role for the above playbook.**

1. **Create role first**

Ansible-galaxy role init new

ubuntu@ip-172-31-88-72:~$ ansible-galaxy role init new

- Role new was created successfully

ubuntu@ip-172-31-88-72:~$ cd new/

ubuntu@ip-172-31-88-72:~/new$ ls

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1. **Edit tasks/main.yml**

 # roles/nginx\_install/tasks/main.yml

---

- name: Install Nginx package

  package:

    name: nginx

    state: present

  notify:

    - Start Nginx service  # Notify the handler to start the service if the package was installed/updated

1. **Edit handlers/main.yml**

# roles/nginx\_install/handlers/main.yml

---

- name: Start Nginx service

  service:

    name: nginx

    state: started

    enabled: true

1. **Create playbook.**

# site.yml

---

- name: Install and Start Nginx using Role

  hosts: all

  become: true

  roles:

    - new

1. **Run playbook**

   ansible-playbook site.yml