- Ansible Roles
- EC2 instance using Ansible Playbook
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Ansible Roles

- An Ansible Role is a directory structure contains directories: `defaults, vars, tasks, files, templates, meta, handlers`.
- Each directory must contain a main.yml file which contains relevant content. Let's look little closer to each directory.
    - `tasks`: `main.yml` file contains the role's task definitions
    - `defaults`: `main.yml` file contains the default values of role. Variables in default have the lowest priority so they are easy to override.
    - `vars`: `main.yml` file defines the role's variable values.Variables in vars have higher priority than variables in defaults directory.
    - `files`: This directory contains static files that are referenced by role tasks.
    - `templates`: This directory contains static files that are referenced by role tasks.
    - `meta`: `main.yml` file contains metadata of role like an author, support platforms, dependencies.
    - `handlers`: The main.yml file contains handlers which can be invoked by "notify" directives and are associated with service.
- Structuring Ansible playbooks with roles:
    - Use of Ansible roles has the following benefits:
        - Roles group content, allowing easy sharing of code with others
        - Roles can be written that define the essential elements of a system type: web server, database server, git repository, or other purpose.
        - Roles make larger projects more manageable.
        - Roles can be developed in parallel by different administrators.
- Create a roles in project directory and Create a directory structure using `ansible-galaxy` command.

```
sudo yum install tree -y
mkdir roles
ansible-galaxy init roles/webserver
# This will empty files awith a specific directory structure
tree roles/webserver
# Output as below
roles/webserver/
├── defaults
│   └── main.yml
├── files
├── handlers
│   └── main.yml
├── meta
│   └── main.yml
├── README.md
```

```
├── tasks
│   └── main.yml
├── templates
├── tests
│   ├── inventory
│   └── test.yml
└── vars
    └── main.yml

8 directories, 8 files
```

- Create below files
- tasks/main.yml

```
---
# tasks file for roles/webserver
- import_tasks: install.yml
- import_tasks: configure.yml
- import_tasks: service.yml
```

- tasks/install.yml

```
---
- name: Install httpd Package
  yum: name=httpd state=latest
```

- tasks/configure.yml

```
---
- name: Copy index.j2 template to destination
  template: src=templates/index.j2 dest=/var/www/html/index.html
  notify:
  - restart webserver
```

- tasks/service.yml

```
---
- name: Start and Enable httpd service
  service: name=httpd state=started enabled=yes
```

- templates/index.j2

```
<html>
<head><title>My Page</title></head>
<body>
<h1>
Welcome to {{ inventory_hostname }}.
</h1>
<h2>A new feature added.</h2>
</body>
</html>
```

- `handlers/main.yml`

```
---
- name: restart webserver
  service: name=httpd state=restarted
```

- To Execute the Ansible Role, make sure you are inside the main project directory, create below file as:
- `execute_role.yml`

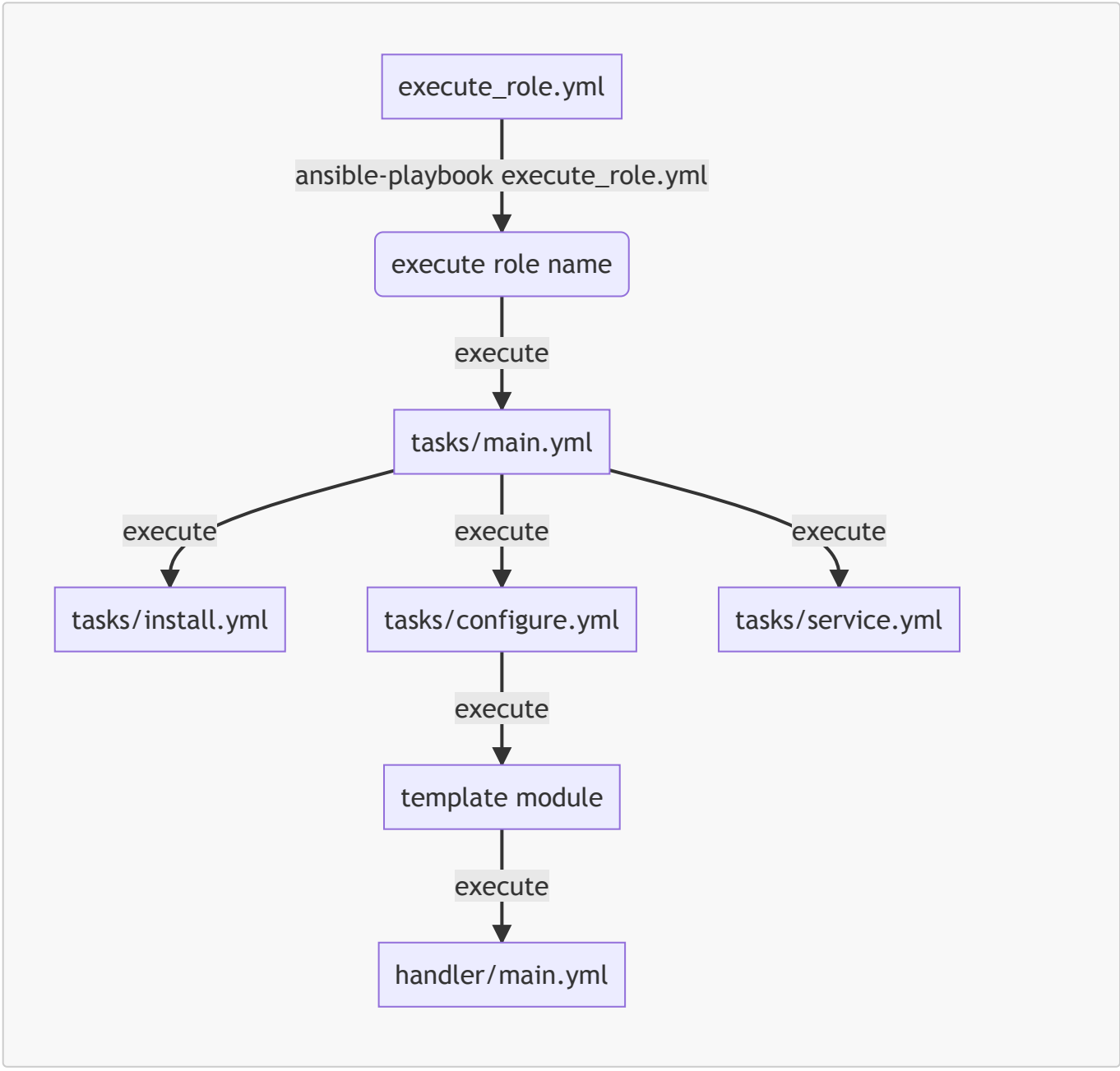
```
---
- hosts: dev
  pre_tasks:
    - debug:
        msg: "Task before any role is applied"
  roles:
   - webserver
  post_tasks:
    - debug:
        msg: "Task after all role is completed"
```

- Verify the directory structure `tree`
- Execute the role

```
ansible-playbook execute_role.yml
```

- In summary, Ansible executes your playbook in the following order:
    - `pre_tasks` will run first.
    - statically imported roles listed under roles will run.
    - tasks listed under the `tasks` section.
    - handlers triggered by `roles` or `tasks`.
    - `post_tasks` will run last.

```
[ec2-user@control-node ansible-demo]$ ansible-playbook execute_role.yml

PLAY [web] ***********************************************************************************************************************************************

TASK [Gathering Facts] ***********************************************************************************************************************************
[WARNING]: Platform linux on host managed-node-02.example.com 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/reference_appendices/interpreter_discovery.html for more information.
ok: [managed-node-02.example.com]

TASK [debug] *********************************************************************************************************************************************
ok: [managed-node-02.example.com] => {
    "msg": "Task before any role is applied"
}

TASK [webserver : Install httpd Package] *****************************************************************************************************************
changed: [managed-node-02.example.com]

TASK [webserver : Copy index.j2 template to destination] *************************************************************************************************
ok: [managed-node-02.example.com]

TASK [webserver : Start and Enable httpd service] ********************************************************************************************************
changed: [managed-node-02.example.com]

TASK [debug] *********************************************************************************************************************************************
ok: [managed-node-02.example.com] => {
    "msg": "Task after all role is completed"
}

PLAY RECAP ***********************************************************************************************************************************************
managed-node-02.example.com : ok=6    changed=2    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0

[ec2-user@control-node ansible-demo]$
```



EC2 instance using Ansible Playbook

- To launch a new ec2 instance using ansible-playbook.
- Ansible provides multiple cloud modules for multiple services.
- Attach EC2-Role to the control node, so that it can launch ec2 instance using ansible

```
sudo yum install python-pip
sudo pip install boto
```

- Executing EC2 Ansible Playbook to create and start or stop instance with `ec2` module.

Enable Ansible logging

- By default, Ansible is not configured to log its output anywhere. To change this behavior by setting the `log_path` configuration setting in your Ansible configuration file (`ansible.cfg`) to allow Ansible to log its output to a specific destination.
- When you add below property in `ansible.cfg` file under `defaults` section

```
[defaults]
log_path = playbooks.log
```

- This would enable Ansible playbooks and ad-hoc commands to log its output to a file named `playbooks.log` in your project directory.
- Now when you execute a playbook the output that will be either successful or error execution will be written in log file.