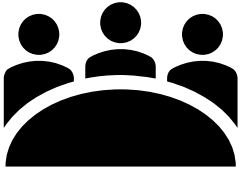# Linux RedHat Certified Engineer (RHCE - EX294)

## Simplify Playbooks with Roles

# Roles

- Roles simplifies long playbooks by grouping tasks into smaller playbooks
OR
- The role are the way of breaking a playbook into multiple playbook files.  This simplifies writing complex playbooks, and it makes them easier to reuse

- Writing ansible code to manage the same service for multiple environments creates more complexity and it becomes difficult to manage everything in one ansible playbook.  Also sharing code among other teams become difficult. That is where Ansible Role helps solve these problems

- Roles are like templates that are most of the time static and can be called by the playbooks

- Roles allow the entire configuration to be grouped in:
    - Tasks
    - Modules
    - Variables
    - Handlers

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# Roles

## Task list for east-webservers

```
---
- name: Setup httpd webserver
  hosts: east-webservers
  tasks:
1 - name: Install httpd packages
    yum:
      name: httpd
      state: present

2 - name: Start httpd
    service:
      name: httpd
      state: started

3 - name: Open port http on firewall
    firewalld:
      service: http
      permanent: true
      state: enabled

4 - name: Restart firewalld
    service:
      name: firewalld
      state: reloaded
```

## Task list for west-webservers

```
---
- name: Setup httpd webserver
  hosts: west-webservers
  tasks:
1 - name: Install httpd packages
    yum:
      name: httpd
      state: present

2 - name: Start httpd
    service:
      name: httpd
      state: started
```

# vim byrole.yml

## Combined tasks

```
---
- name: Setup httpd webserver
  hosts: east-webservers
  tasks:
1 - name: Install httpd packages
    yum:
      name: httpd
      state: present

2 - name: Start httpd
    service:
      name: httpd
      state: started

3 - name: Open port http on firewall
    firewalld:
      service: http
      permanent: true
      state: enabled

4 - name: Restart firewalld
    service:
      name: firewalld
      state: restarted

  hosts: west-webservers
  tasks:
5 - name: Install httpd packages
    yum:
      name: httpd
      state: present

6 - name: Start httpd
    service:
      name: httpd
      state: started
```

# Roles

```
---
- name: Setup httpd webserver
  hosts: east-webservers
  tasks:
  - name: Install htppd packages    (1)
    yum:
     name: httpd
     state: present

  - name: Start httpd               (2)
    service:
     name: httpd
     state: started

  - name: Open port http on firewall  (3)
    firewalld:
     service: http
     permanent: true
     state: enabled

  - name: Restart firewalld         (4)
    service:
     name: firewalld
     state: restarted


  hosts: west-webservers
  tasks:
  - name: Install httpd packages    (5)
    yum:
     name: httpd
     state: present

  - name: Start httpd               (6)
    service:
     name: httpd
     state: started
```

```
---
- name: Setup full httpd webserver
  tasks:
  - name: Install httpd packages
    yum:
     name: httpd
     state: present

  - name: Start httpd
    service:

  - name: port 80 for http access
    firewalld:
     service: http
     permanent: true
     state: enabled

  - name: Restart firewalld
    service:
     name: firewalld
     state: restarted
```

**Roles Playbook: fullinstall**

```
---
- name: Setup basic httpd webser
  tasks:
  - name: Install
    yum:

  - name: httpd
    service:
     name: httpd
     state: started
```
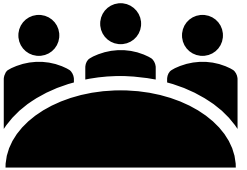
**Roles Playbook: basicinstall**

```
---
- name: Full install
  hosts: east-webservers
  roles:
  - fullinstall

- name: Basic install
  hosts: west-webservers
  roles:
  - basicinstall
```

Very simplified version of playbook

# Roles

- Please note roles can be grouped by type of servers, type of applications or organizational requirement

- To create roles
  ```
  # Go to ControlNode
  # cd /etc/ansible/roles
  ```

  Make directory for each role
  ```
  # e.g mkdir [rolenames]
  # mkdir basicinstall
  # mkdir fullinstall
  ```

  You can also create roles based on the type of servers:
  ```
  e.g. # mkdir webservers
  # mkdir dbservers
  # mkdir appservers
  ```

  Create sub-directory **tasks** within each directory
  ```
  # mkdir basicinstall/tasks
  # mkdir fullinstall/tasks
  ```

  Create yml files within these sub-directories
  ```
  # touch basicinstall/tasks/main.yml
  # touch fullinstall/tasks/main.yml
  ```

# Roles

`# vim fullinstall/tasks/main.yml`

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

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

- name: Open port for http
  firewalld:
   service: http
   permanent: true
   state: enabled

- name: Restart firewalld
  service:
   name: firewalld
   state: reloaded
```

`# vim basicinstall/tasks/main.yml`

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

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

`# vim /etc/ansible/playbooks/byrole.yml`

```
---
- name: Full install
  hosts: all
  roles:
   - fullinstall

- name: Basic install
  hosts: localhosts
  roles:
   - basicinstall
```

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# Roles by Application

```
---
- name: Install packages
  hosts: all
  tasks:
    - name: Install Apache package        (1)
      yum:
        name: httpd
        state: present

    - name: Install Time package          (2)
      yum:
        name: ntpd or chrony
        state: present

    - name: Install DNS package           (3)
      yum:
        name: named
        state: present
```

- To create roles
  ```
  # Go to ControlNode
  # cd /etc/ansible/roles
  ```

  Make directory for each role
  ```
  # mkdir apache
  # mkdir ntpd
  # mkdir named
  ```

  Create sub-directory **tasks** within each directory
  ```
  # mkdir apache/tasks
  # mkdir ntpd/tasks
  # mkdir named/tasks
  ```

  Create yml files within these sub-directories
  ```
  # touch apache/tasks/main.yml
  # touch ntpd/tasks/main.yml
  # touch named/tasks/main.yml
  ```

```
---
- name: Install packages
  hosts: all
  roles:
    - apache
    - ntpd
    - named
```

# Roles on Ansible Galaxy

- You can find a ton of resources on roles through Ansible galaxy

- You can download pre-defined or pre-written roles from the Ansible galaxy

- www.galaxy.ansible.com