



DevOps Tools Day13



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Agenda



Playbooks and Roles



Hands-On Demonstration

Ansible Playbooks and Roles

Definition

- Playbooks define the relation between hosts and roles
- Roles has a set of tasks, handlers and variables defined under separate folders
- Roles also has required files arranged under /files and /templates
- As the playbook runs they use the design plan provided under roles to get desired state.

Ansible Playbooks and Roles

Definition

- Task in /tasks/main.yml is invoked as part of role.
- /tasks/main.yml can include other yml files under same folder:
- Any of these tasks can “notify” to invoke handlers
- Tasks and Handlers together can use variables
- Files kept under /files folder may be used by tasks and handlers.
- Files kept under /templates folder may be used by tasks to modify configuration files.



Hands-on Demonstration



Sensitivity: Internal & Restricted

Hands-On Demonstration

Node.js Role

- Create Tomcat Role:

```
$ ansible-galaxy init ./roles/nodejs
```

- Check the folder structure:

```
$ tree ./roles/nodejs
```

- Home directory for Node.js installation

```
$ mkdir nodejs
```

- Get Tomcat Tar file

```
$ ls /home/osgdev/Downloads/
```

Hands-On Demonstration

Node.js Role – Step:1

- Copy Downloaded file to nodejs folder:

```
$ cat nodejs/tasks/main.yml
---
# tasks file for ./roles/nodejs
- name: copy tar file to nodejs folder
  copy:
    src: /home/osgdev/Downloads/node-v8.11.1-linux-x64.tar.xz
    dest: /home/osgdev/ansilab/nodejs
```

- Run the playbook:

```
$ ansible-playbook ./roles/nodejs/node.yml
```

Hands-On Demonstration

Node.js Role – Step:2

- Unarchive contents to nodejs folder:

```
osgdev@TG-DevOps-OS144:~/ansilab$ cat nodejs/tasks/main.yml
---
# tasks file for ./roles/nodejs
- name: copy tar file to nodejs folder
  copy:
    src: /home/osgdev/Downloads/node-v8.11.1-linux-x64.tar.xz
    dest: /home/osgdev/ansilab/nodejs

- name: Extract the tar file
  unarchive:
    src: /home/osgdev/ansilab/nodejs/node-v8.11.1-linux-x64.tar.xz
    dest: /home/osgdev/ansilab/nodejs
```

- Run the playbook:

```
$ ansible-playbook ./roles/nodejs/node.yml
```


Hands-On Demonstration

Node.js Application

- Create Node.js Application

```
$ cat app.js
const http = require('http');

const hostname = '127.0.0.1';
const port = 3000;

const server = http.createServer((req, res) => {
  res.statusCode = 200;
  res.setHeader('Content-Type', 'text/plain');
  res.end('Hello World\n');
});

server.listen(port, hostname, () => {
  console.log(`Server running at http://${hostname}:${port}/`);
});
```



Hands-On Demonstration

Run Node.js Application

- Run Node.js Application

```
nodejs/node-v8.11.1-linux-x64/bin$ /node ../app.js  
Server running at http://127.0.0.1:3000/
```

Watch the output in browser:

<http://localhost:3000/>

Hands-On Demonstration

Tomcat Role

- Create Tomcat Role:

```
$ ansible-galaxy init ./roles/tomcat
```

- Check the folder structure:

```
$ tree ./roles/tomcat/
```

- Home directory for Tomcat installation

```
$ mkdir tomcat
```

- Get Tomcat Tar file

```
$ ls ../myDownloads/
```

Hands-On Demonstration

Task to copy the file

- Create Tomcat Playbook

```
$ cat ./roles/tomcat/tasks/main.yml
```

```
---
```

```
# tasks file for ./roles/tomcat
```

```
- name: Copy tar file to tomcat folder
```

```
  copy:
```

```
    src: /home/osgdev/myDownload/apache-tomcat-8.5.27.tar.gz
```

```
    dest: /home/osgdev/ansilab/tomcat
```

Hands-On Demonstration

Tomcat Playbook

- Create Tomcat Playbook

```
$ cat ./roles/tomcat/tomcat.yml
- hosts: localhost
  roles:
    - tomcat
```

- Run the playbook

```
$ ansible-playbook ./roles/tomcat/tomcat.yml
```

- Check the file being copied:

```
$ ls tomcat
```

Hands-On Demonstration

Get Tomcat

- Unarchive Tomcat tar file

```
$ cat ./roles/tomcat/tasks/main.yml
---
# tasks file for ./roles/tomcat
- name: Copy tar file to tomcat folder
  copy:
    src: /home/osgdev/myDownloads/apache-tomcat-8.5.27.tar.gz
    dest: /home/osgdev/ansilab/tomcat

- name: Extract tomcat tar file
  unarchive:
    src: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27.tar.gz
    dest: /home/osgdev/ansilab/tomcat
```

- Run the playbook

```
$ ansible-playbook ./roles/tomcat/tomcat.yml
```

Hands-On Demonstration

Get Tomcat from /files

- Copy tomcat tar file to /files folder:

```
$ cp /home/osgdev/myDownloads/apache-tomcat-8.5.27.tar.gz  
/home/osgdev/ansilab/roles/tomcat/files/
```

- Unarchive Tomcat tar file

```
$ cat ./roles/tomcat/tasks/main.yml  
---  
# tasks file for ./roles/tomcat  
# - name: Copy tar file to tomcat folder  
#   copy:  
#     src: /home/osgdev/myDownloads/apache-tomcat-8.5.27.tar.gz  
#     dest: /home/osgdev/ansilab/tomcat  
#  
- name: Extract tomcat tar file  
  unarchive:  
    src: apache-tomcat-8.5.27.tar.gz  
    dest: /home/osgdev/ansilab/tomcat
```

Hands-On Demonstration

Modify server.xml for specific port

- Copy server.xml to create template file:

```
$ cp /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27/conf/server.xml  
/home/osgdev/ansilab/roles/tomcat/files/
```

- Modify the port:

```
<Connector port="8080" protocol="HTTP/1.1"  
           connectionTimeout="20000"  
           redirectPort="8443" />
```

Change "Connector port" to 11011

```
<Connector port="11011" protocol="HTTP/1.1"  
           connectionTimeout="20000"  
           redirectPort="8443" />
```


Hands-On Demonstration

Modify server.xml for specific port

- Rename the file to j2

```
$ mv server.xml server.xml.j2
```

- Copy the j2 file to /templates folder

```
$ cp server.xml.j2 ../roles/tomcat/templates/
```

- Check the file:

```
$ ls ../roles/tomcat/templates/
```

Hands-On Demonstration

Create task to modify the port

- Create task

```
$ cat ./roles/tomcat/tasks/main.yml
```

```
---
```

```
# tasks file for ./roles/tomcat
```

```
- name: Extract tomcat tar file
```

```
  unarchive:
```

```
    src: apache-tomcat-8.5.27.tar.gz
```

```
    dest: /home/osgdev/ansilab/tomcat
```

```
- name: Change the tomcat port
```

```
  template:
```

```
    src: server.xml.j2
```

```
    dest: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27/conf/server.xml
```

Hands-On Demonstration

Create task to modify the port

- Run the playbook

```
$ ansible-playbook ./roles/tomcat/tomcat.yml
```

- Check for port modification

```
$ vi ./tomcat/apache-tomcat-8.5.27/conf/server.xml
```

Hands-On Demonstration

Start Tomcat Server

- Final Task file:

```
$ cat ./roles/tomcat/tasks/main.yml
```

```
---
```

```
# tasks file for ./roles/tomcat
- name: Extract tomcat tar file
  unarchive:
    src: apache-tomcat-8.5.27.tar.gz
    dest: /home/osgdev/ansilab/tomcat

- name: Change the tomcat port
  template:
    src: server.xml.j2
    dest: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27/conf/server.xml

- name: Start tomcat service
  shell: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27/bin/startup.sh
```

Hands-On Demonstration

Create variable and handler

- Variable File

```
$ cat ./roles/tomcat/vars/main.yml
---
# vars file for ./roles/tomcat
tomcat_home: /home/osgdev/ansilab/tomcat/apache-tomcat-8.5.27
```

- Handler File

```
$ cat ./roles/tomcat/handlers/main.yml
---
# handlers file for ./roles/tomcat
- name: Start tomcat service
  shell: "{{tomcat_home}}/bin/startup.sh"
```

Hands-On Demonstration

Modified task file

- Task File:

```
$ cat ./roles/tomcat/tasks/main.yml
---
# tasks file for ./roles/tomcat
- name: Extract tomcat tar file
  unarchive:
    src: apache-tomcat-8.5.27.tar.gz
    dest: /home/osgdev/ansilab/tomcat

- name: Change the tomcat port
  template:
    src: server.xml.j2
    dest: "{{tomcat_home}}/conf/server.xml"
  notify: Start tomcat service
```

Hands-On Demonstration

Modified task file

- Playbook:

```
$ cat ./roles/tomcat/tomcat.yml
- hosts: localhost
  roles:
    - tomcat
```

- Run the playbook:

```
$ ansible-playbook ./roles/tomcat/tomcat.yml
```

Hands-On Demonstration

Create MongoDB Role

- Download MongoDB Tar File:

```
$ ls /home/osgdev/Downloads/
```

- Create mongodb directory

```
$ mkdir mongodb
```

- Create mongodb role

```
$ ansible-galaxy init ./roles/mongodb
```

- Check the folder structure

```
$ tree ./roles/mongodb/
```


Hands-On Demonstration

Create MongoDB Playbook and Role

- Create MongoDB Playbook

```
$ cat ./roles/mongodb/mongodb.yml
- hosts: localhost
  roles:
    - mongodb
```

- Create MongoDB Role:

```
cat ./roles/mongodb/tasks/main.yml
```

- Run the playbook:

```
$ ansible-playbook ./roles/mongodb/mongodb.yml
```

Hands-On Demonstration

MongoDB Installation

- MongoDB Installation

```
/ansilab/mongodb/mongodb-linux-x86_64-ubuntu1604-3.6.4$ ls bin
bsondump          mongo      mongodump  mongofiles  mongoperf
mongorestore      mongostat
install_compass   mongod     mongoexport mongoimport mongoreplay
mongos             mongotop
```

Hands-On Demonstration

Use of MongoDB

- Create data directory

```
$ mkdir ./data/db
```

- Run Mongo Daemon

```
/mongodb/mongodb-linux-x86_64-ubuntu1604-3.6.4/bin$ ./mongod --dbpath  
/home/osgdev/ansilab/mongodb/data/db
```

