

Ansible

Lab Work Task. Day 1

Review

VMs provisioning with Ansible playbooks and ad-hoc commands.

Prerequisites:

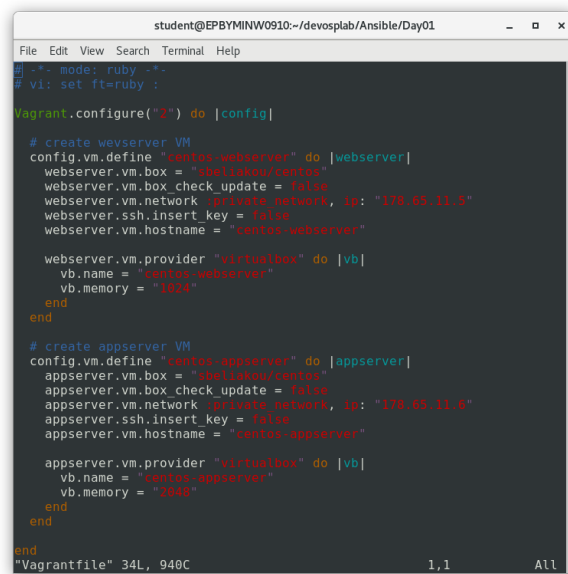
On Host Node (Control Machine):

1. Install Ansible v2.6.2 using pip. Report details where ansible has been installed.
2. Create folder ~/ansible/day1. Keep all tasks files over there (Vagrantfile, inventory, playbooks, etc)

Tasks:

A) Spin up 2 VMs using Vagrant and VirtualBox:

- webserver
- appserver



```
student@EPBYMINW0910:~/devoslab/Ansible/Day01
File Edit View Search Terminal Help
# -*- mode: ruby -*-
# vi: set ft=ruby :

Vagrant.configure("2") do |config|

  # create webserver VM
  config.vm.define "centos-webserver" do |webserver|
    webserver.vm.box = "shelllab/centos"
    webserver.vm.box_check_update = false
    webserver.vm.network :private_network, ip: "172.65.11.5"
    webserver.ssh.insert_key = false
    webserver.vm.hostname = "centos-webserver"

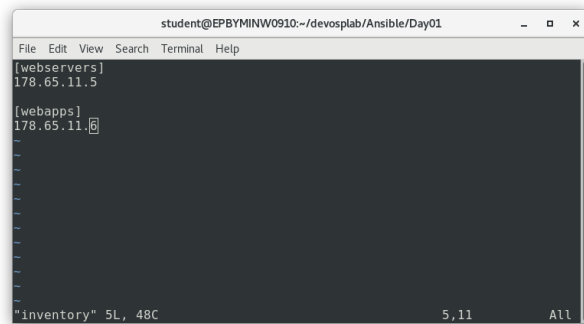
    webserver.vm.provider "virtualbox" do |vb|
      vb.name = "centos-webserver"
      vb.memory = "1024"
    end
  end

  # create appserver VM
  config.vm.define "centos-appserver" do |appserver|
    appserver.vm.box = "shelllab/centos"
    appserver.vm.box_check_update = false
    appserver.vm.network :private_network, ip: "172.65.11.6"
    appserver.ssh.insert_key = false
    appserver.vm.hostname = "centos-appserver"

    appserver.vm.provider "virtualbox" do |vb|
      vb.name = "centos-appserver"
      vb.memory = "2048"
    end
  end
end
"Vagrantfile" 34L, 940C                                1,1                                All
```

Picture 1 – Vagrantfile

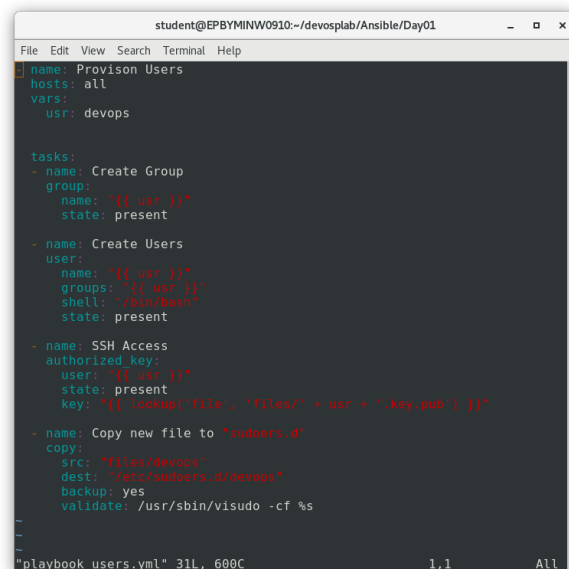
B) Create “inventory” file with all necessary connection options to both VMs (webserver, appserver). Create groups “webserver” and “appserver”.



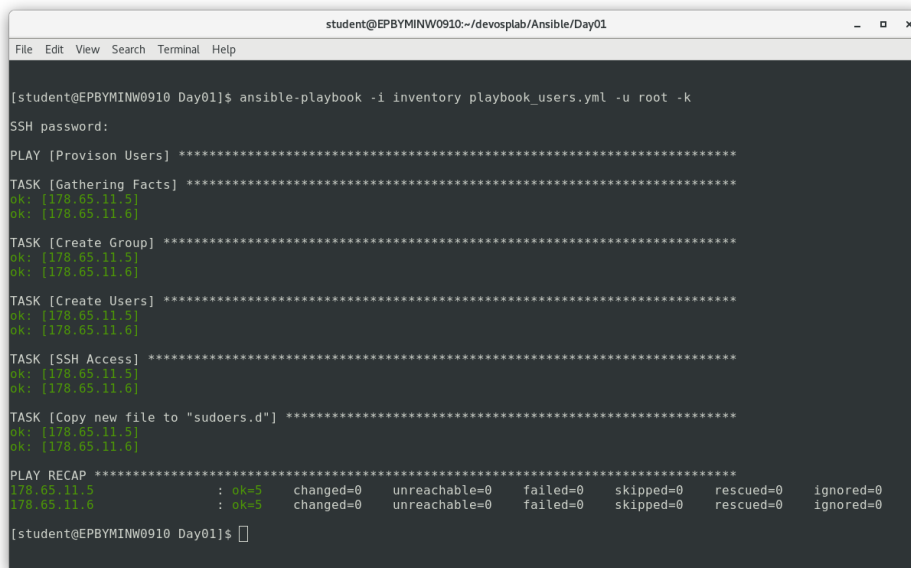
Picture 2

C) Bootstrap Maintenance user on both VMs (Create devops-bootstrap.yml playbook to):

- Create “devops:devops” user on both VMs
- Configure ssh access with ssh-keys from PC (Control Machine) to both VMs (place private key in ~/ansible/day1/devops.pem)
- Grant “devops” user all necessary system’s privileges (configure sudoers)
- Playbook should use hosts/groups from “inventory” file.

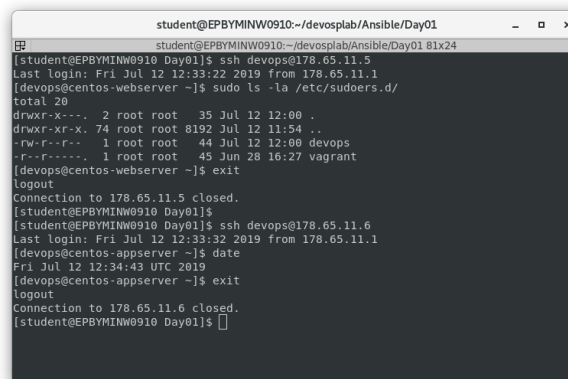


Picture 3.1 – Playbook



```
[student@EPBYMINW0910 Day01]$ ansible-playbook -i inventory playbook_users.yml -u root -k
SSH password:
PLAY [Provision Users] *****
TASK [Gathering Facts] *****
ok: [178.65.11.5]
ok: [178.65.11.6]
TASK [Create Group] *****
ok: [178.65.11.5]
ok: [178.65.11.6]
TASK [Create Users] *****
ok: [178.65.11.5]
ok: [178.65.11.6]
TASK [SSH Access] *****
ok: [178.65.11.5]
ok: [178.65.11.6]
TASK [Copy new file to "sudoers.d"] *****
ok: [178.65.11.5]
ok: [178.65.11.6]
PLAY RECAP *****
178.65.11.5      : ok=5    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
178.65.11.6      : ok=5    changed=0    unreachable=0    failed=0    skipped=0    rescued=0    ignored=0
[student@EPBYMINW0910 Day01]$
```

Picture 3.2 – Results



```
student@EPBYMINW0910:~/devosplab/Ansible/Day01 81x24
[student@EPBYMINW0910 Day01]$ ssh devops@178.65.11.5
Last login: Fri Jul 12 12:33:22 2019 from 178.65.11.1
[devops@centos-webserver ~]$ sudo ls -la /etc/sudoers.d/
total 20
drwxr-x---. 2 root root  35 Jul 12 12:00 .
drwxr-xr-x. 74 root root 8192 Jul 12 11:54 ..
-rw-r--r--. 1 root root  44 Jul 12 12:00 devops
-r--r-----. 1 root root  45 Jun 28 16:27 vagrant
[devops@centos-webserver ~]$ exit
logout
Connection to 178.65.11.5 closed.
[student@EPBYMINW0910 Day01]$
[student@EPBYMINW0910 Day01]$ ssh devops@178.65.11.6
Last login: Fri Jul 12 12:33:32 2019 from 178.65.11.1
[devops@centos-appserver ~]$ date
Fri Jul 12 12:34:43 UTC 2019
[devops@centos-appserver ~]$ exit
logout
Connection to 178.65.11.6 closed.
[student@EPBYMINW0910 Day01]$
```

Picture 3.3 – Test ssh connccetions

- D) Test ansible connectivity to the VM with ad-hoc command(s):
- ansible webservers -i inventory -m setup

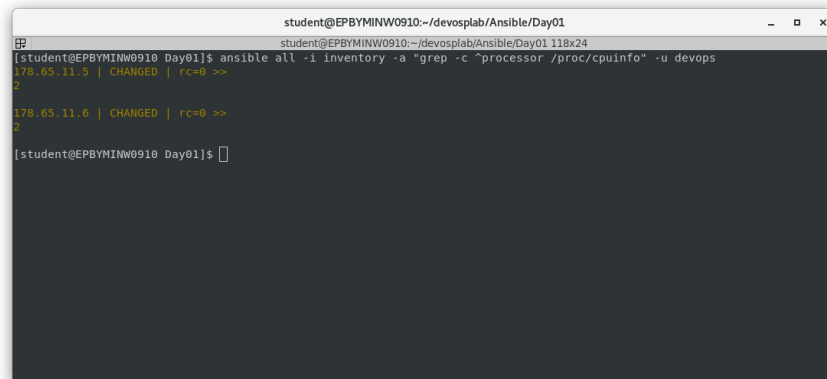


- Picture 4.1

- Number of CPU's

4

Instead “all” we can write name of node from inventory file, for example “webservers” or “webapps”

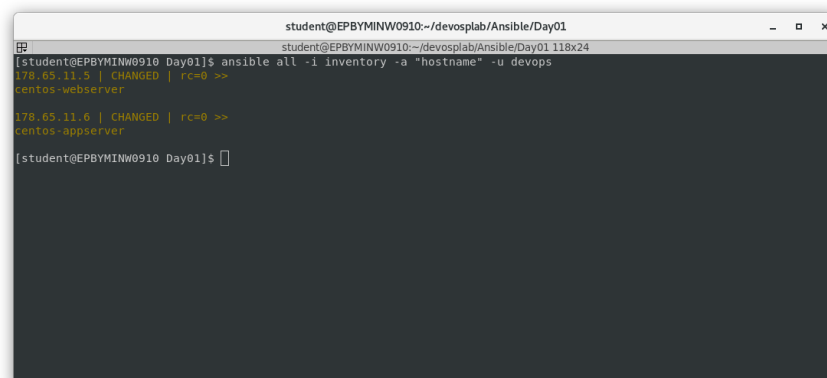


```
student@EPBYMINW0910:~/devoslab/Ansible/Day01
[student@EPBYMINW0910 Day01]$ ansible all -i inventory -a "grep -c 'processor /proc/cpuinfo' -u devops"
178.65.11.5 | CHANGED | rc=0 >>
2
178.65.11.6 | CHANGED | rc=0 >>
2
[student@EPBYMINW0910 Day01]$
```

Picture 4.2

- Host name

```
$ ansible all -i inventory -a "hostname" -u devops
```

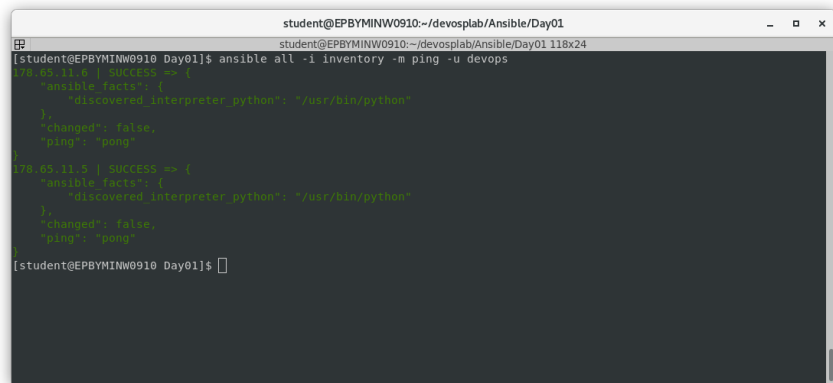


```
student@EPBYMINW0910:~/devoslab/Ansible/Day01
[student@EPBYMINW0910 Day01]$ ansible all -i inventory -a "hostname" -u devops
178.65.11.5 | CHANGED | rc=0 >>
centos-webserver
178.65.11.6 | CHANGED | rc=0 >>
centos-appserver
[student@EPBYMINW0910 Day01]$
```

Picture 4.3

- Host IP(s)

```
$ ansible all -i inventory -m ping -u devops
```

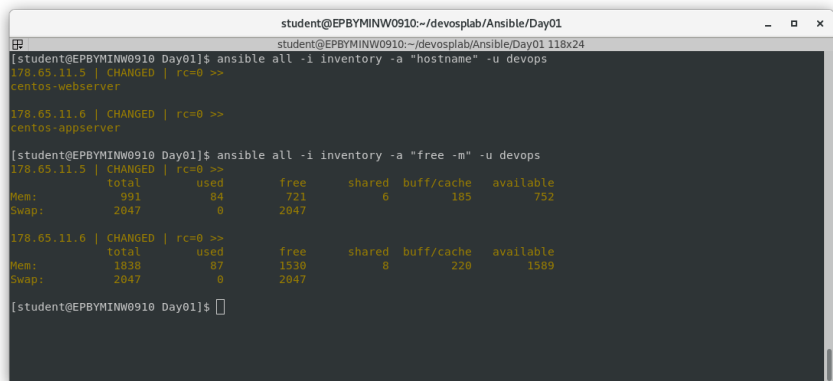


```
student@EPBYMINW0910:~/devosplab/Ansible/Day01
[student@EPBYMINW0910 Day01]$ ansible all -i inventory -m ping -u devops
178.65.11.6 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false,
  "ping": "pong"
}
178.65.11.5 | SUCCESS => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false,
  "ping": "pong"
}
[student@EPBYMINW0910 Day01]$
```

Picture 4.4

- Total RAM

```
$ ansible all -i inventory -a "free -m" -u devops
```



```
student@EPBYMINW0910:~/devosplab/Ansible/Day01
[student@EPBYMINW0910 Day01]$ ansible all -i inventory -a "hostname" -u devops
178.65.11.5 | CHANGED | rc=0 >>
centos-webserver
178.65.11.6 | CHANGED | rc=0 >>
centos-appserver

[student@EPBYMINW0910 Day01]$ ansible all -i inventory -a "free -m" -u devops
178.65.11.5 | CHANGED | rc=0 >>
total      used      free      shared  buff/cache   available
Mem:       991        84        721         6        185        752
Swap:      2047          0        2047

178.65.11.6 | CHANGED | rc=0 >>
total      used      free      shared  buff/cache   available
Mem:      1838         87       1530         8        220       1589
Swap:      2047          0        2047

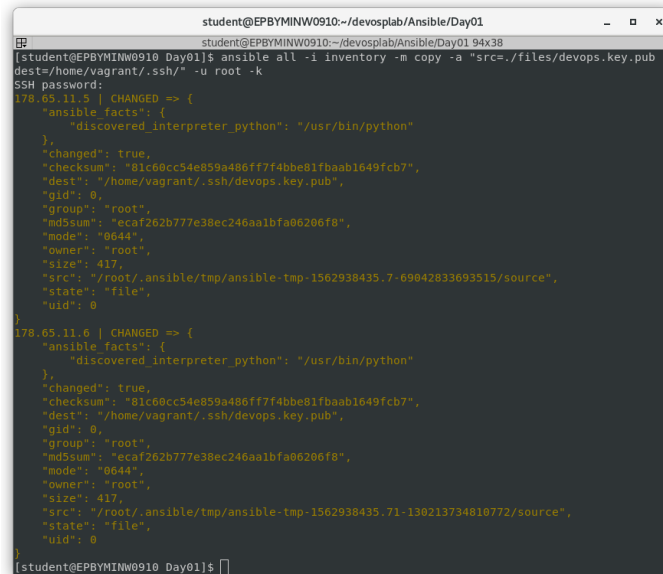
[student@EPBYMINW0910 Day01]$
```

Picture 4.5

E) Try to add host's ssh public key to authorized on Managed nodes using ad-hoc command.

For example, I used the module "copy" to take the ssh key to vagrant user

```
$ ansible all -i inventory -m copy -a "src=./files/devops.key.pub
dest=/home/vagrant/.ssh/ backup=yes" -u root -k
```



```
student@EPBYMINW0910:~/devoslab/Ansible/Day01
student@EPBYMINW0910:~/devoslab/Ansible/Day01 94x38
[student@EPBYMINW0910 Day01]$ ansible all -i inventory -m copy -a "src=./files/devops.key.pub
dest=/home/vagrant/.ssh/" -u root -k
SSH password:
178.65.11.5 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "checksum": "81c60cc54e859a406ff7f4bbe81fbaab1649fcb7",
  "dest": "/home/vagrant/.ssh/devops.key.pub",
  "gid": 0,
  "group": "root",
  "md5sum": "ecaf262b777e38ec246aa1bfa06206f8",
  "mode": "0644",
  "owner": "root",
  "size": 417,
  "src": "/root/.ansible/tmp/ansible-tmp-1562938435.7-69042833693515/source",
  "state": "file",
  "uid": 0
}
178.65.11.6 | CHANGED => {
  "ansible_facts": {
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": true,
  "checksum": "81c60cc54e859a406ff7f4bbe81fbaab1649fcb7",
  "dest": "/home/vagrant/.ssh/devops.key.pub",
  "gid": 0,
  "group": "root",
  "md5sum": "ecaf262b777e38ec246aa1bfa06206f8",
  "mode": "0644",
  "owner": "root",
  "size": 417,
  "src": "/root/.ansible/tmp/ansible-tmp-1562938435.71-130213734810772/source",
  "state": "file",
  "uid": 0
}
[student@EPBYMINW0910 Day01]$
```

Picture 5

F) Develop ansible playbook (provision.yml) to provision following configuration:

1. On “webserver”: install nginx, configure nginx to be a frontend web server for backend application server
2. On “appserver”: install Tomcat + all required dependencies (java, etc)
3. Use variables for all necessary parameters (s/w versions, etc)
4. Playbook should use hosts/groups from “inventory” file.
5. Use following modules (at least):
 - a) copy
 - b) file or template
 - c) get_url
 - d) group
 - e) service
 - f) shell
 - g) unarchive
 - h) user
 - i) yum

```
$ ansible-playbook -i inventory provision.yml -u devops -k
```

```
student@EPBYMINW0910:~/devoslab/Ansible/Day01
TASK [Gathering Facts] *****
ok: [178.65.11.5]

TASK [Add Epel-release Repo] *****
ok: [178.65.11.5]

TASK [Install NGINX] *****
ok: [178.65.11.5]

TASK [Configure NGINX] *****
ok: [178.65.11.5]

TASK [Set proxy to Tomcat] *****
ok: [178.65.11.5]

TASK [Start NGINX] *****
ok: [178.65.11.5]

PLAY [Install Tomcat to webapps] *****

TASK [Gathering Facts] *****
ok: [178.65.11.5]

TASK [Install Java from repo] *****
ok: [178.65.11.5]

TASK [Download Tomcat] *****
ok: [178.65.11.5]

TASK [Unarchive Tomcat] *****
changed: [178.65.11.6]

TASK [Shell operation with Tomcat] *****
changed: [178.65.11.6]

TASK [Add Tomcat web user] *****
changed: [178.65.11.6]

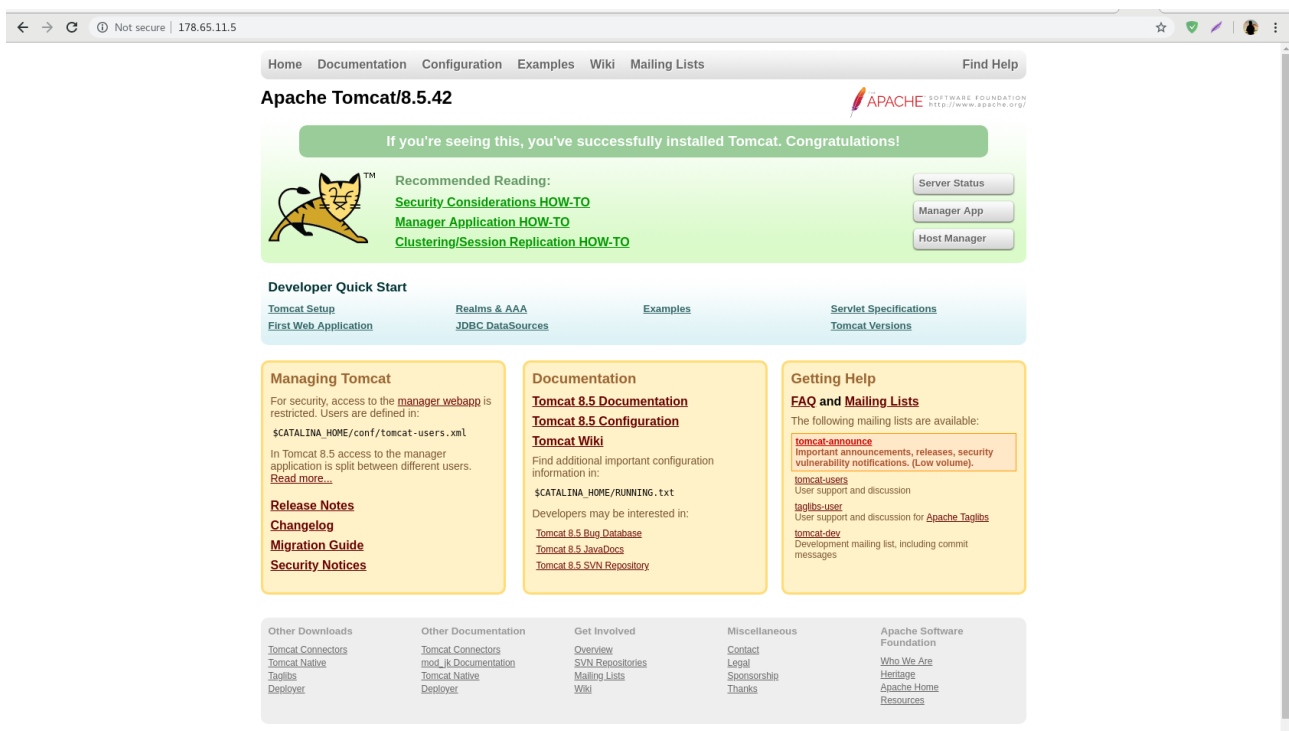
TASK [Context.xml setups] *****
changed: [178.65.11.6]

TASK [Create Tomcat servace] *****
changed: [178.65.11.6]

TASK [Start Tomcat] *****
changed: [178.65.11.6]

PLAY RECAP *****
178.65.11.5 : ok=6 changed=0 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
178.65.11.6 : ok=9 changed=6 unreachable=0 failed=0 skipped=0 rescued=0 ignored=0
```

Picture 6.1 – Console result



Picture 6.2 – Visit web-page