

Ansible

Lab Work Task. Day 1

Review

VMs provisioning with Ansible playbooks and ad-hoc commands.

Prerequisites:

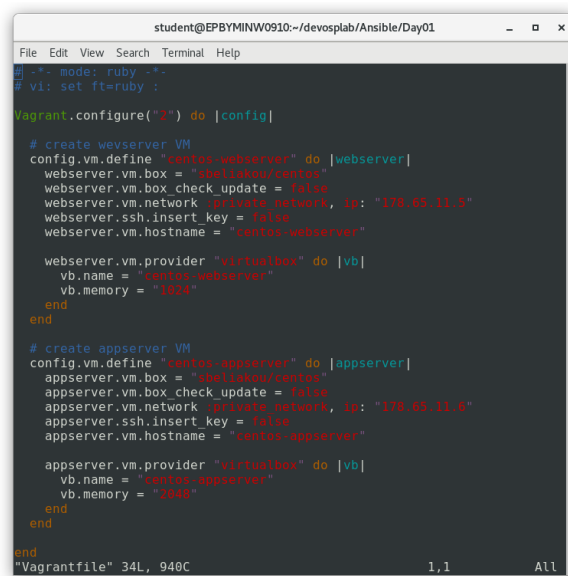
On Host Node (Control Machine):

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: "178.65.11.5"
    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

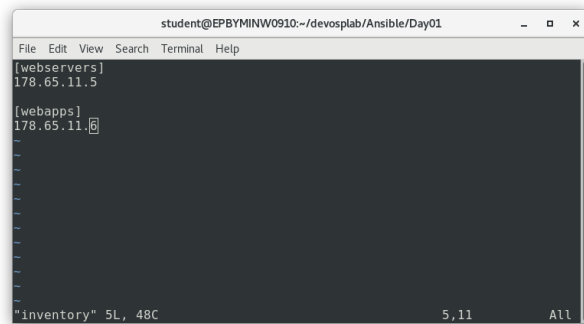
  # create appserver VM
  config.vm.define "centos-appserver" do |appserver|
    appserver.vm.box = "shelllab/centos"
    appserver.vm.box_check_update = false
    appserver.vm.network :private_network, ip: "178.65.11.6"
    appserver.ssh.insert_key = false
    appserver.vm.hostname = "centos-appserver"

    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

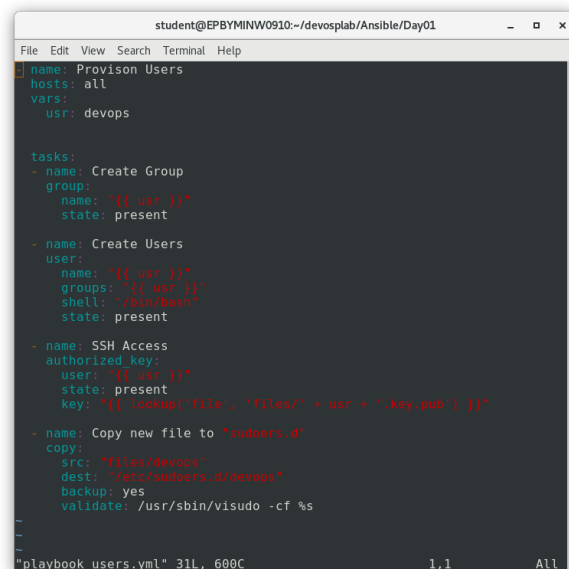
B) Create “inventory” file with all necessary connection options to both VMs (webserver, appserver). Create groups “webserver” and “appserver”.



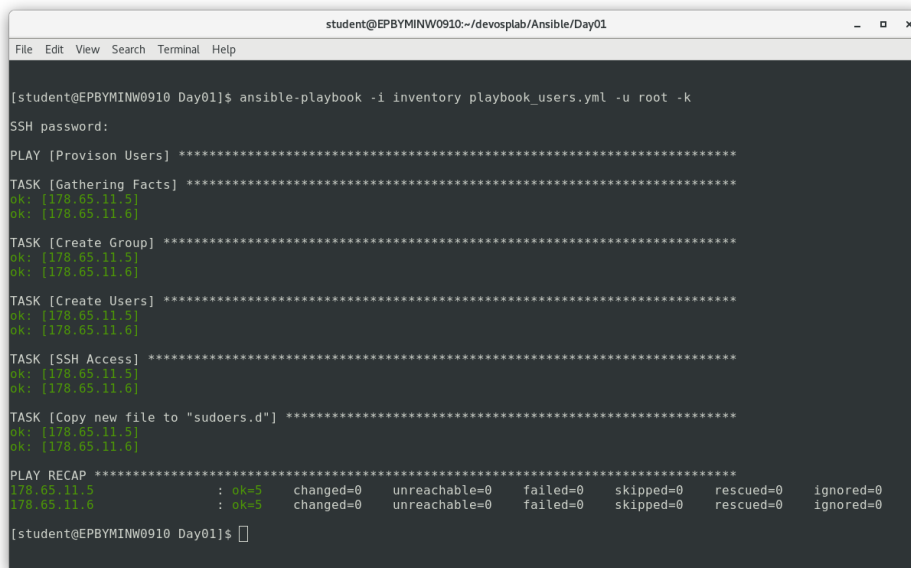
Picture 2

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.

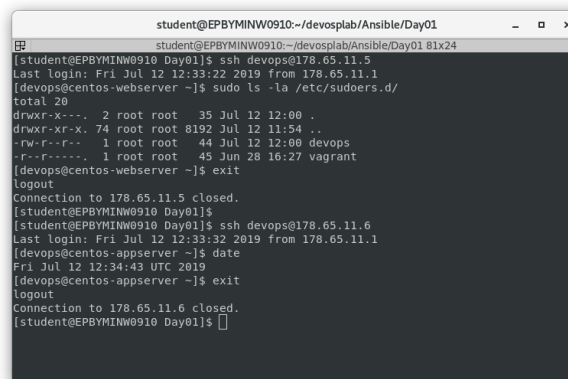


Picture 3.1 – Playbook



```
[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

```

student@EPBYMINW0910:~/devoslab/Ansible/Day01
student@EPBYMINW0910:~/devoslab/Ansible/Day01 109x39
{
  "ansible_selinux_python_present": true,
  "ansible_service_mgr": "systemd",
  "ansible_ssh_host_key_ecdsa_public": "AAAAE2VjZmhlLnV1bWl2dHAyNTYAAAAIbWl2dHAyNTYAAABBDUeXfae8K
08UPd57Y1CvY1+q5FAT6N15K18/Wfmsq4VJ8aF24/DKpNHVg13W2P6ndwERA4jRQH1PXEPL0e=",
  "ansible_ssh_host_key_rsa_public": "AAAC3N2aC11ZD1INTE5AAAAIH0p1qPF1/VP/42n7wMc1Lx9Bgvvs7fCYtH
9lvzIv",
  "ansible_ssh_host_key_rsa_public": "AAAB3N2aC1yc2EAAAADABAAQACwEwY1K0ZS113B0Z1L5C06/xjfh0LpXIAMH
AJUBw0RKT30f7YARYa1kh/vsp00m70Edu/vv3ZNPXysuF5K05qgzs83f2Kamg2LCPG15f16BLK7f9pAMW02Pq1G58VjXPHtBuHs3w1d1c1
e9KkP4e5d/Gsf57JBfK7Qb+HvB1VtYK1YKZj1t1g7XKdwI2+TZxjHk7x8t1Br1g017J3R0zyVNRmKHCx1BR50B2B+wyyle910m4RAYUBs
KZ1rBkABefhWY778/24Y5b+bxYEN798ETwFyz05v8x0ocfXFKCS11CF83nU1Nzy9Jv7CAw31q117Y0KX0ENUVbb",
  "ansible_swapfree_mb": 2047,
  "ansible_swaptotal_mb": 2047,
  "ansible_system": "linux",
  "ansible_system_capabilities": [
    ""
  ],
  "ansible_system_capabilities_enforced": "True",
  "ansible_system_vendor": "innotek GmbH",
  "ansible_uptime_seconds": 5000,
  "ansible_user_dir": "/home/devops",
  "ansible_user_gecos": "",
  "ansible_user_gid": 100,
  "ansible_user_id": "devops",
  "ansible_user_shell": "/bin/bash",
  "ansible_user_uid": 1001,
  "ansible_userspace_architecture": "x86_64",
  "ansible_userspace_bits": "64",
  "ansible_virtualization_role": "guest",
  "ansible_virtualization_type": "virtualbox",
  "discovered_interpreter_python": "/usr/bin/python",
  "gather_subset": [
    "all"
  ],
  "module_setup": true,
  "changed": false
}
[student@EPBYMINW0910 Day01]$ ansible webserver -i inventory -m setup -u devops

```

Picture 4.1

- `ansible appservers -i inventory -m setup`

```

student@EPBYMINW0910:~/devoslab/Ansible/Day01
student@EPBYMINW0910:~/devoslab/Ansible/Day01 109x39
{
  "ansible_selinux_python_present": true,
  "ansible_service_mgr": "systemd",
  "ansible_ssh_host_key_ecdsa_public": "AAAAE2VjZmhlLnV1bWl2dHAyNTYAAAAIbWl2dHAyNTYAAABBDUeXfae8K
08UPd57Y1CvY1+q5FAT6N15K18/Wfmsq4VJ8aF24/DKpNHVg13W2P6ndwERA4jRQH1PXEPL0e=",
  "ansible_ssh_host_key_rsa_public": "AAAC3N2aC11ZD1INTE5AAAAIH0p1qPF1/VP/42n7wMc1Lx9Bgvvs7fCYtH
9lvzIv",
  "ansible_ssh_host_key_rsa_public": "AAAB3N2aC1yc2EAAAADABAAQACwEwY1K0ZS113B0Z1L5C06/xjfh0LpXIAMH
AJUBw0RKT30f7YARYa1kh/vsp00m70Edu/vv3ZNPXysuF5K05qgzs83f2Kamg2LCPG15f16BLK7f9pAMW02Pq1G58VjXPHtBuHs3w1d1c1
e9KkP4e5d/Gsf57JBfK7Qb+HvB1VtYK1YKZj1t1g7XKdwI2+TZxjHk7x8t1Br1g017J3R0zyVNRmKHCx1BR50B2B+wyyle910m4RAYUBs
KZ1rBkABefhWY778/24Y5b+bxYEN798ETwFyz05v8x0ocfXFKCS11CF83nU1Nzy9Jv7CAw31q117Y0KX0ENUVbb",
  "ansible_swapfree_mb": 2047,
  "ansible_swaptotal_mb": 2047,
  "ansible_system": "linux",
  "ansible_system_capabilities": [
    ""
  ],
  "ansible_system_capabilities_enforced": "True",
  "ansible_system_vendor": "innotek GmbH",
  "ansible_uptime_seconds": 4027,
  "ansible_user_dir": "/home/devops",
  "ansible_user_gecos": "",
  "ansible_user_gid": 100,
  "ansible_user_id": "devops",
  "ansible_user_shell": "/bin/bash",
  "ansible_user_uid": 1001,
  "ansible_userspace_architecture": "x86_64",
  "ansible_userspace_bits": "64",
  "ansible_virtualization_role": "guest",
  "ansible_virtualization_type": "virtualbox",
  "discovered_interpreter_python": "/usr/bin/python",
  "gather_subset": [
    "all"
  ],
  "module_setup": true,
  "changed": false
}
[student@EPBYMINW0910 Day01]$ ansible webapps -i inventory -m setup -u devops

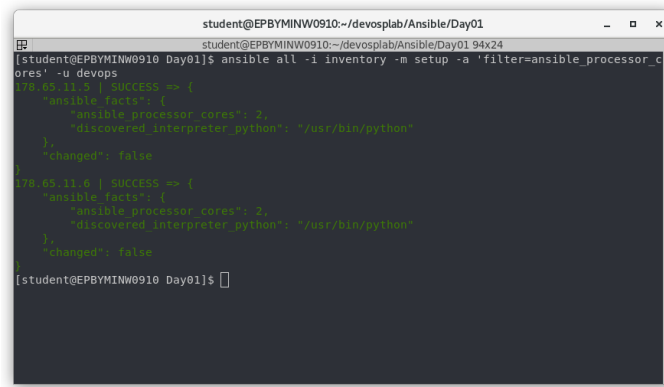
```

Picture 4.1

Figure out host details:

- Number of CPU's

```
$ ansible all -i inventory -m setup -a 'filter=ansible_processor_cores' -u devops
```

A terminal window titled 'student@EPBYMINW0910:~/devoslab/Ansible/Day01' showing the execution of an Ansible command. The command is 'ansible all -i inventory -m setup -a 'filter=ansible_processor_cores' -u devops'. The output shows two hosts, 178.65.11.5 and 178.65.11.6, both reporting success with 2 processor cores and the discovered interpreter path as '/usr/bin/python'.

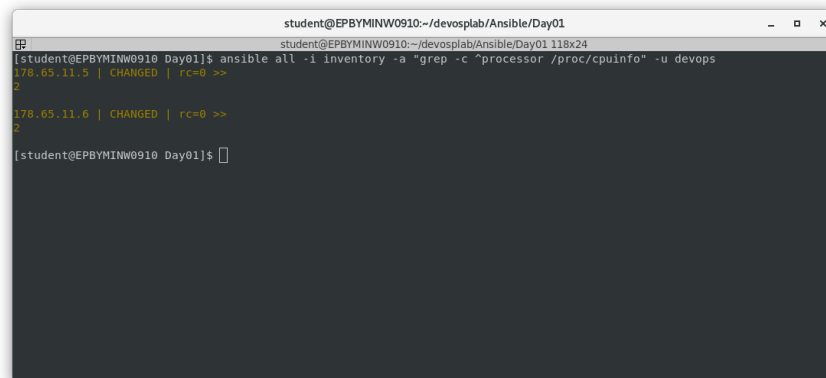
```
student@EPBYMINW0910:~/devoslab/Ansible/Day01
[student@EPBYMINW0910 Day01]$ ansible all -i inventory -m setup -a 'filter=ansible_processor_cores' -u devops
178.65.11.5 | SUCCESS ==> {
  "ansible_facts": {
    "ansible_processor_cores": 2,
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
178.65.11.6 | SUCCESS ==> {
  "ansible_facts": {
    "ansible_processor_cores": 2,
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[student@EPBYMINW0910 Day01]$
```

Picture 4.2

OR:

```
$ ansible all -i inventory -a "grep -c ^processor /proc/cpuinfo" -u devops
```

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

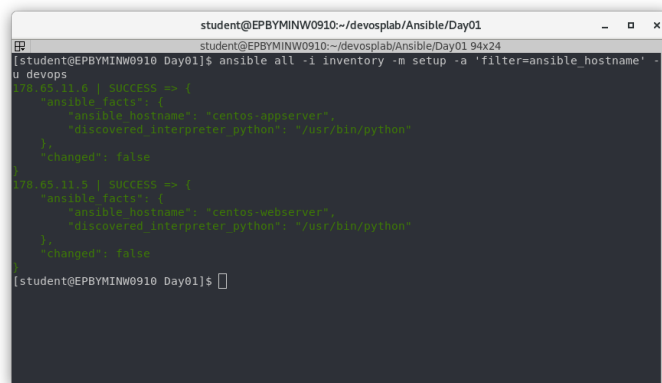
A terminal window titled 'student@EPBYMINW0910:~/devoslab/Ansible/Day01' showing the execution of an Ansible command with a filter. The command is 'ansible all -i inventory -a "grep -c ^processor /proc/cpuinfo" -u devops'. The output shows two hosts, 178.65.11.5 and 178.65.11.6, both reporting success with 2 processor cores and the discovered interpreter path as '/usr/bin/python'.

```
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 4.3

- Host name

```
$ ansible all -i inventory -m setup -a 'filter=ansible_hostname' -u devops
```

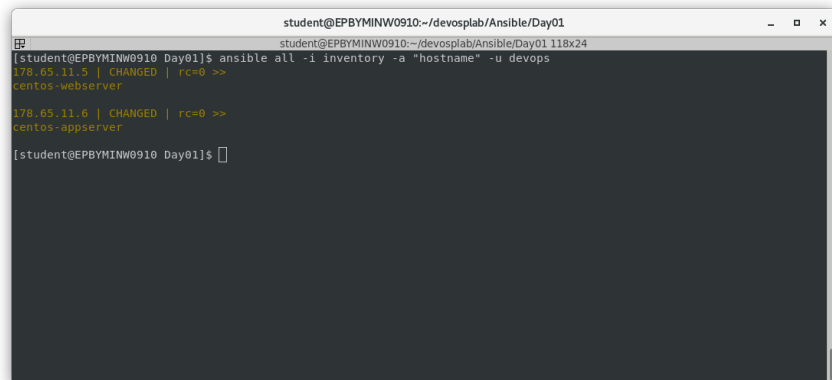


```
student@EPBYMINW0910:~/devosplab/Ansible/Day01
[student@EPBYMINW0910 Day01]$ ansible all -i inventory -m setup -a 'filter=ansible_hostname' -u devops
178.65.11.6 | SUCCESS ==> {
  "ansible_facts": {
    "ansible_hostname": "centos-appserver",
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
178.65.11.5 | SUCCESS ==> {
  "ansible_facts": {
    "ansible_hostname": "centos-webserver",
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
[student@EPBYMINW0910 Day01]$
```

Picture 4.4

OR:

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

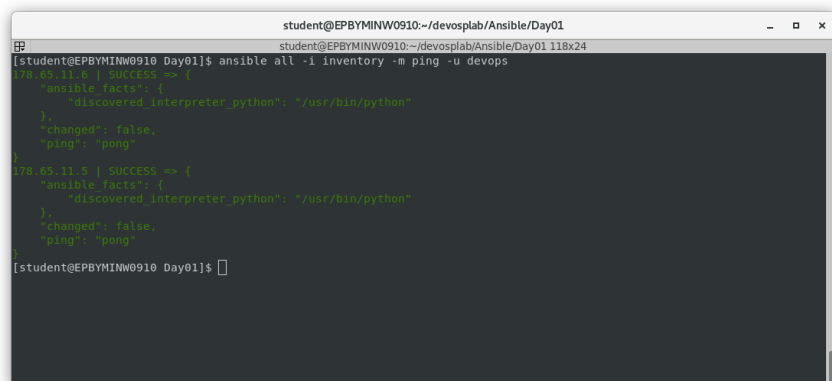


```
student@EPBYMINW0910:~/devosplab/Ansible/Day01
[student@EPBYMINW0910 Day01]$ ansible all -i inventory -a "hostname" -u devops
178.65.11.5 | CHANGED | rc=0 ==>
centos-webserver
178.65.11.6 | CHANGED | rc=0 ==>
centos-appserver
[student@EPBYMINW0910 Day01]$
```

Picture 4.5

- 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 4.6

- Total RAM

```
$ ansible all -i inventory -m setup -a 'filter=ansible_memory_mb' -u devops
```

```
student@EPBYMINW0910:~/devoslab/Ansible/Day01
student@EPBYMINW0910:~/devoslab/Ansible/Day01 94x44
178.65.11.6 | SUCCESS ==> {
  "ansible_facts": {
    "ansible_memory_mb": {
      "nocache": {
        "free": 1451,
        "used": 387
      },
      "real": {
        "free": 743,
        "total": 1838,
        "used": 1895
      },
      "swap": {
        "cached": 0,
        "free": 2047,
        "total": 2047,
        "used": 0
      }
    },
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
178.65.11.5 | SUCCESS ==> {
  "ansible_facts": {
    "ansible_memory_mb": {
      "nocache": {
        "free": 842,
        "used": 148
      },
      "real": {
        "free": 434,
        "total": 991,
        "used": 557
      },
      "swap": {
        "cached": 0,
        "free": 2047,
        "total": 2047,
        "used": 0
      }
    },
    "discovered_interpreter_python": "/usr/bin/python"
  },
  "changed": false
}
```

Picture 4.7

OR:

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

```
student@EPBYMINW0910:~/devoslab/Ansible/Day01
student@EPBYMINW0910:~/devoslab/Ansible/Day01 118x24
[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]$
```

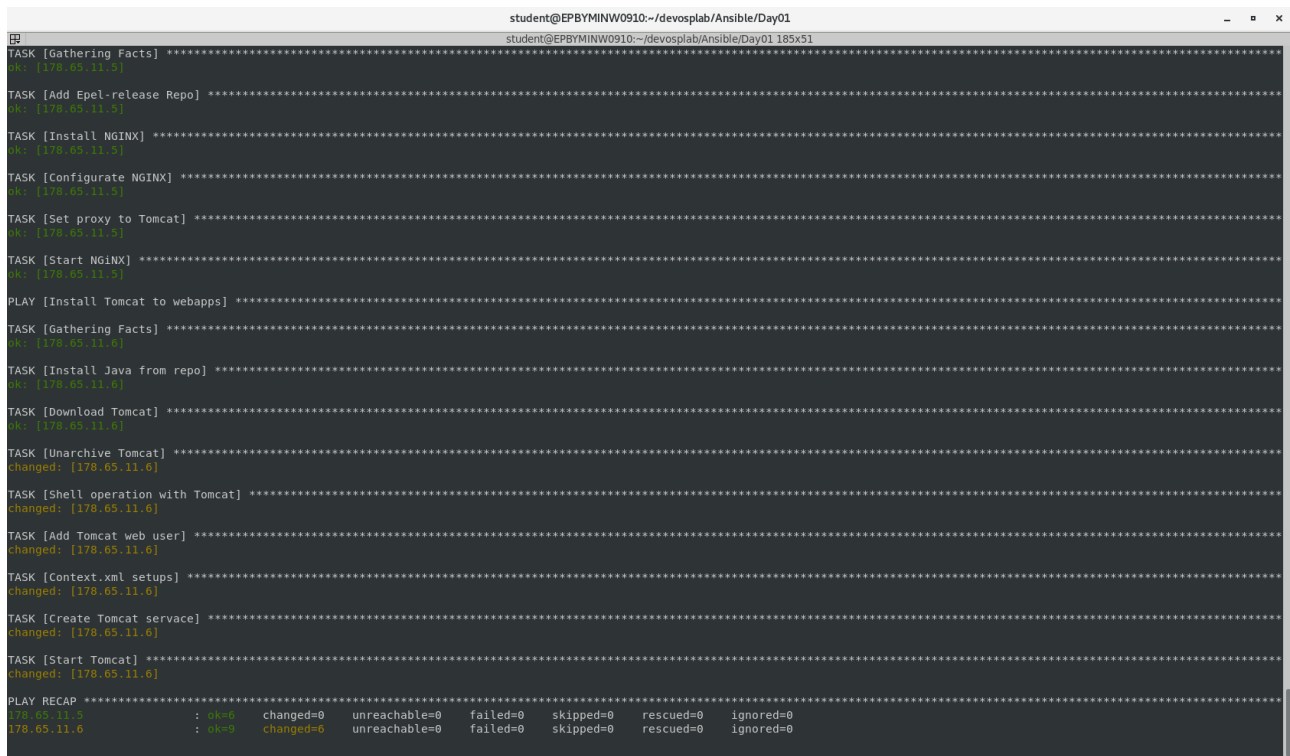
Picture 4.8

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

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
student@EPBYMINW0910:~/devoslab/Ansible/Day01 185x51

TASK [Gathering Facts] *****
ok: [178.65.11.6]

TASK [Add Epel-release Repo] *****
ok: [178.65.11.6]

TASK [Install NGINX] *****
ok: [178.65.11.6]

TASK [Configure NGINX] *****
ok: [178.65.11.6]

TASK [Set proxy to Tomcat] *****
ok: [178.65.11.6]

TASK [Start NGINX] *****
ok: [178.65.11.6]

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

TASK [Gathering Facts] *****
ok: [178.65.11.6]

TASK [Install Java from repo] *****
ok: [178.65.11.6]

TASK [Download Tomcat] *****
ok: [178.65.11.6]

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]

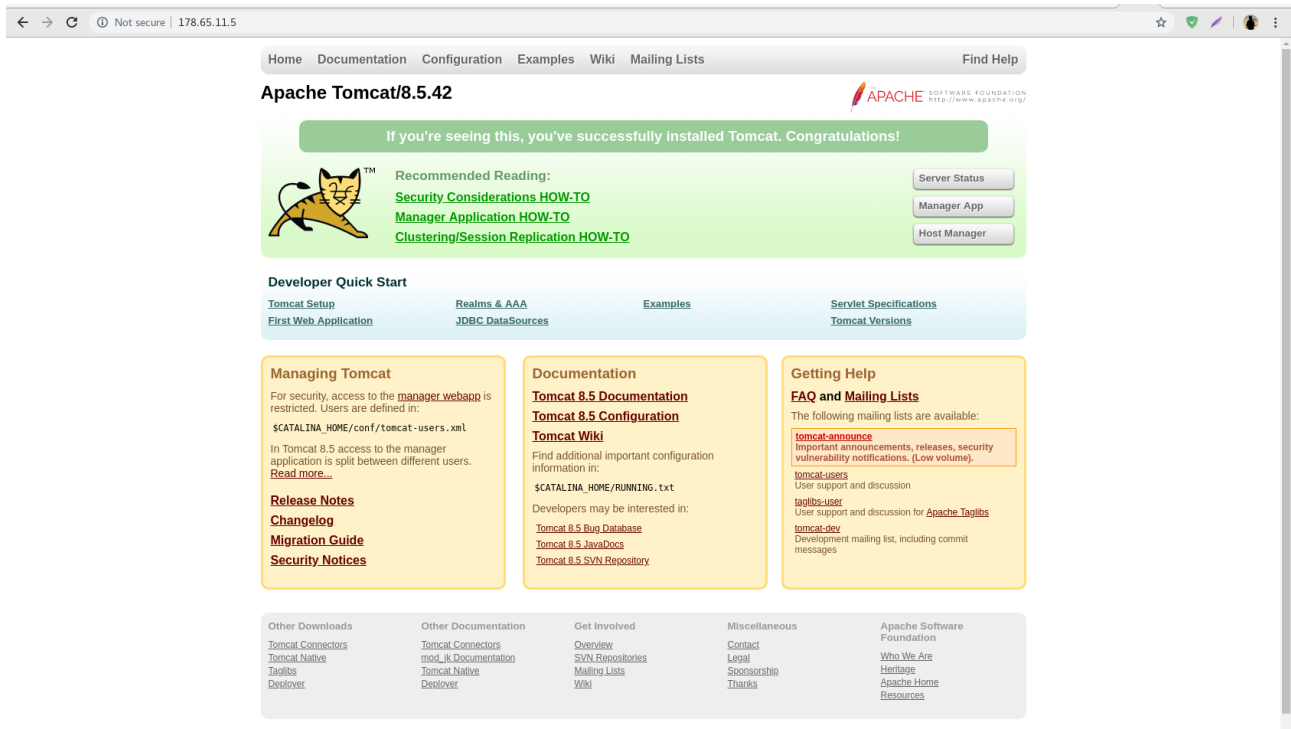
TASK [Context.xml setups] *****
changed: [178.65.11.6]

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

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

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

Picture 6.1 – Console result



Picture 6.2 – Visit web-page