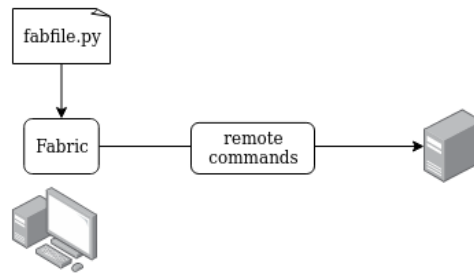


# Python Fabric Project

This project explains the step-by-step procedure to launch three Vagrant vm's and shows script to execute commands from one vm to multiple vm using Python Fabric.



1. Place the below script in a vagrant file - 'Vagrantfile' and do vagrantup and launch 3 instances(scriptbox, web01 and web02)

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

  config.vm.define "scriptbox" do |scriptbox|
    scriptbox.vm.box = "ubuntu/bionic64"
    scriptbox.vm.hostname = "scriptbox"
    scriptbox.vm.network "private_network", ip: "192.168.10.2"
  end

  config.vm.define "web01" do |web01|
    web01.vm.box = "centos/7"
    web01.vm.hostname = "web01"
    web01.vm.network "private_network", ip: "192.168.10.3"
    web01.vm.provider "virtualbox" do |vb|
      vb.memory = "1024"
    end
  end

  config.vm.define "web02" do |web02|
    web02.vm.box = "centos/7"
    web02.vm.hostname = "web02"
    web02.vm.network "private_network", ip: "192.168.10.4"
  end

end
```

2. Ssh into scriptbox,

```
vagrant@ubuntu-bionic: ~  
satzw@LAPTOP-C4RG1671 MINGW64 /e/devops/python  
$ vagrant ssh scriptbox  
Welcome to Ubuntu 18.04.6 LTS (GNU/Linux 4.15.0-192-generic x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
System information as of Thu Oct 13 10:57:22 UTC 2022
```

3. Download pip(not install) using the below commands,

wget <https://bootstrap.pypa.io/get-pip.py>

curl -O https://bootstrap.pypa.io/pip/2.7/get-pip.py <- use this

```
root@ubuntu-bionic: /opt/pyscripts  
vagrant@ubuntu-bionic:~$ sudo -i  
root@ubuntu-bionic:~# cd /opt/pyscripts/  
root@ubuntu-bionic:/opt/pyscripts# wget https://bootstrap.pypa.io/get-pip.py
```

4. Install Python 2. Fabric supports python2

apt install python

5. Install pip using python.

python get-pip.py

6. To install fabric.

pip install 'fabric<2.0'

7. Create a fabfile with the below content and execute from shell

```
root@ubuntu-bionic: /opt/pyscripts/fabric  
root@ubuntu-bionic:/opt/pyscripts# mkdir fabric  
root@ubuntu-bionic:/opt/pyscripts# cd fabric/  
root@ubuntu-bionic:/opt/pyscripts/fabric# vi fabfile.py
```

```
def greeting(msg):  
    print "Good %s"% msg
```

To list the functions defined in the fabfile

fab -l

To execute the function with value,

fab greeting:Evening

To execute local system commands,

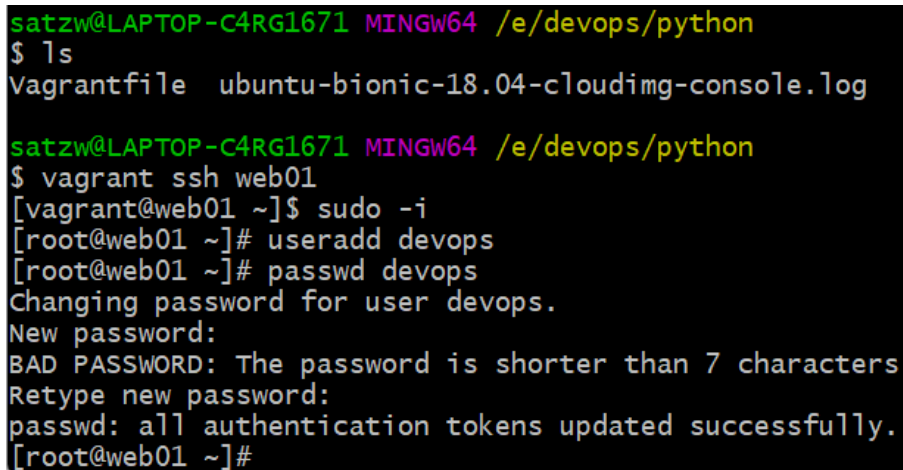
```
from fabric.api import *
def system_info():
    print "Disk Space"
    local("df -h")

    print "RAM size"
    local("free -m")

    print "System uptime"
    local("uptime")
```

## 8. Execute task on remote machine

- a. Login to remote machine web01 and create users first



```
satzw@LAPTOP-C4RG1671 MINGW64 /e/devops/python
$ ls
Vagrantfile  ubuntu-bionic-18.04-cloudimg-console.log

satzw@LAPTOP-C4RG1671 MINGW64 /e/devops/python
$ vagrant ssh web01
[vagrant@web01 ~]$ sudo -i
[root@web01 ~]# useradd devops
[root@web01 ~]# passwd devops
Changing password for user devops.
New password:
BAD PASSWORD: The password is shorter than 7 characters
Retype new password:
passwd: all authentication tokens updated successfully.
[root@web01 ~]#
```

- b. Edit sudoers file, and make sure user devops should have root privilege, add the below highlighted..

visudo

```
##      user      MACHINE=COMMANDS
##
## The COMMANDS section may have other options
##
## Allow root to run any commands anywhere
root    ALL=(ALL)          ALL
devops  ALL=(ALL)          NOPASSWD: ALL

## Allows members of the 'sys' group to run net
## service management apps and more.
# %sys ALL = NETWORKING, SOFTWARE, SERVICES, ST
```

vi /etc/ssh/sshd\_config and update the pwd auth to yes

```
# To disable tunneled clear text passwords, change to no here!
#PasswordAuthentication yes
#PermitEmptyPasswords no
PasswordAuthentication yes
```

c. Restart sshd service.

systemctl restart sshd

d. Repeat the same for web02

e. From scriptbox check whether we can ssh into web01 and web02.

```
devops@web02:~$ root@ubuntu-bionic:/opt/pyscripts/fabric# ssh devops@192.168.10.3
The authenticity of host '192.168.10.3 (192.168.10.3)' can't be established.
ECDSA key fingerprint is SHA256:qaAmZnirDNPTd20fhjucBEhD7urUj/GGj/3tYJWQJk8.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.10.3' (ECDSA) to the list of known hosts.
devops@192.168.10.3's password:
[devops@web01 ~]$ quit
-bash: quit: command not found
[devops@web01 ~]$ logout
Connection to 192.168.10.3 closed.
root@ubuntu-bionic:/opt/pyscripts/fabric# ssh devops@192.168.10.4
The authenticity of host '192.168.10.4 (192.168.10.4)' can't be established.
ECDSA key fingerprint is SHA256:bExIZuh7pEDvkLSGVwEWgCN5Dm/hkc8Kf0qemfMwFUQ.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.10.4' (ECDSA) to the list of known hosts.
devops@192.168.10.4's password:
[devops@web02 ~]$
```

9. Create a keygen and add it to web01 and for web02.

```
root@ubuntu-bionic: ~
root@ubuntu-bionic:/opt/pyscripts/fabric# cd ~
root@ubuntu-bionic:~# ssh-keygen
Generating public/private rsa key pair.
Enter file in which to save the key (/root/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /root/.ssh/id_rsa.
Your public key has been saved in /root/.ssh/id_rsa.pub.
The key fingerprint is:
SHA256:rVlKmGL14wvCniPNkvXcnFpTC3ImicMekBKOA0jB8vk root@ubuntu-bionic
The key's randomart image is:
+---[RSA 2048]-----+
|*o.
|*o.
|=oo.
|ooo o = .
|.B * S +
|+E+ B O .
|=+o.OB..
|+.+ooo+o
|oo....
+---[SHA256]-----+
root@ubuntu-bionic:~# ssh-copy-id devops@192.168.10.3
/usr/bin/ssh-copy-id: INFO: Source of key(s) to be installed: "/root/.ssh/id_rsa.pub"
/usr/bin/ssh-copy-id: INFO: attempting to log in with the new key(s), to filter out a
ny that are already installed
/usr/bin/ssh-copy-id: INFO: 1 key(s) remain to be installed -- if you are prompted no
w it is to install the new keys
devops@192.168.10.3's password:

Number of key(s) added: 1

Now try logging into the machine, with:  "ssh 'devops@192.168.10.3'"
and check to make sure that only the key(s) you wanted were added.

root@ubuntu-bionic:~# |
```

10. Now try to execute a command with fab by providing hostname, no key will be required.

root@ubuntu-bionic:/opt/pyscripts/fabric# fab -H 192.168.10.3 -u devops remote\_exec

```
root@ubuntu-bionic: /opt/pyscripts/fabric
root@ubuntu-bionic:/opt/pyscripts/fabric# fab -H 192.168.10.3 -u devops remote_exec
/usr/local/lib/python2.7/dist-packages/paramiko/transport.py:33: CryptographyDeprecat
ionWarning: Python 2 is no longer supported by the Python core team. Support for it i
s now deprecated in cryptography, and will be removed in the next release.
  from cryptography.hazmat.backends import default_backend
[192.168.10.3] Executing task 'remote_exec'
Get system Info
[192.168.10.3] run: hostname
[192.168.10.3] out: web01
[192.168.10.3] out:

[192.168.10.3] run: uptime
[192.168.10.3] out: 17:15:33 up 6:22, 2 users, load average: 0.00, 0.01, 0.03
[192.168.10.3] out:

Done.
Disconnecting from 192.168.10.3... done.
root@ubuntu-bionic:/opt/pyscripts/fabric# |
```

Added sudo command will execute with root privilege.

```
sudo("yum install mariadb-server -y")
sudo("systemctl start mariadb")
sudo("systemctl enable mariadb")
```

To download a website in scriptbox vm and push it to web01 vm.

```
def web_setup(WEBURL, DIRNAME):
    print "#####"
    local("apt install zip unzip -y")

    print "#####"
    print "Installing dependencies"
    print "#####"
    sudo("yum install httpd wget unzip -y")

    print "#####"
    print "Start & enable service."
    print "#####"
    sudo("systemctl start httpd")
    sudo("systemctl enable httpd")

    print "#####"
    print "Downloading and pushing website to webserver."
    print "#####"
    local(("wget -O website.zip %s" % WEBURL))
    local("unzip -o website.zip")

    print "#####"
    with lcd(DIRNAME):
        local("zip -r tooplate.zip * ")
        put("tooplate.zip", "/var/www/html/", use_sudo=True)

    with cd("/var/www/html/"):
        sudo("unzip -o tooplate.zip")

    sudo("systemctl restart httpd")

    print "Website setup is done."
```

Execute below in shell

```
fab -H 192.168.10.3 -u devops web_setup:https://www.tooplate.com/zip-
templates/2121_wave_cafe.zip,2121_wave_café
```

