Lab2 - Vagrant

Lab environment setup

1. Make sure all the required softwares are installed :

    ◦ *Git*

    ◦ *Vagrant*

2. Clone the git repository : *https://github.com/brahimhamdi/devops-lab*

```
brahim@Training:~$ git clone  https://github.com/brahimhamdi/devops-lab
Clonage dans 'devops-lab'...
remote: Enumerating objects: 134, done.
remote: Counting objects: 100% (134/134), done.
remote: Compressing objects: 100% (54/54), done.
remote: Total 134 (delta 15), reused 131 (delta 12), pack-reused 0
Réception d'objets: 100% (134/134), 24.00 Kio | 1.09 Mio/s, fait.
Résolution des deltas: 100% (15/15), fait.
brahim@Training:~$ cd devops-lab/
brahim@Training:~/devops-lab$ tre
La commande « tre » n'a pas été trouvée, mais peut être installée avec :
sudo apt install tre-command
brahim@Training:~/devops-lab$ tree
.
├── vagrant-centos7-single
│   ├── setup.sh
│   └── Vagrantfile
└── vagrant-ubuntu20-multiple
    └── Vagrantfile

2 directories, 3 files
brahim@Training:~/devops-lab$ 
```

Vagrant with one node

3. cd to : *devops-lab/vagrant-centos7-single*

    ◦ Describe the content of *Vagrantfile* file .

```
brahim@Training:~/devops-lab/vagrant-centos7-single$ ls
setup.sh  Vagrantfile
brahim@Training:~/devops-lab/vagrant-centos7-single$ cat Vagrantfile
Vagrant.require_version ">= 1.6.0"

boxes = [
    {
        :name => "centos-worker",
        :eth1 => "192.168.205.13",
        :mem => "1024",
        :cpu => "1"
    }
]

Vagrant.configure(2) do |config|

  config.vm.box = "centos/7"
  boxes.each do |opts|
    config.vm.define opts[:name] do |config|
      config.vm.hostname = opts[:name]
      config.vm.provider "vmware_fusion" do |v|
        v.vmx["memsize"] = opts[:mem]
        v.vmx["numvcpus"] = opts[:cpu]
      end
      config.vm.provider "virtualbox" do |v|
        v.customize ["modifyvm", :id, "--memory", opts[:mem]]
        v.customize ["modifyvm", :id, "--cpus", opts[:cpu]]
      end
      config.vm.network :private_network, ip: opts[:eth1]
    end
  end
  config.vm.provision "shell", privileged: true, path: "./setup.sh"
end
brahim@Training:~/devops-lab/vagrant-centos7-single$ ls
setup.sh  Vagrantfile
brahim@Training:~/devops-lab/vagrant-centos7-single$ □
```

4. Start and provision the vagrant environment with the command :

vagrant up

```
brahim@Training:~/devops-lab/vagrant-centos7-single$ vagrant up
Bringing machine 'centos-worker' up with 'virtualbox' provider...
==> centos-worker: Importing base box 'centos/7'...
==> centos-worker: Matching MAC address for NAT networking...
==> centos-worker: Checking if box 'centos/7' version '2004.01' is up to date...
==> centos-worker: Setting the name of the VM: vagrant-centos7-single_centos-worker_1686126612769_43543
==> centos-worker: Clearing any previously set network interfaces...
==> centos-worker: Preparing network interfaces based on configuration...
    centos-worker: Adapter 1: nat
    centos-worker: Adapter 2: hostonly
==> centos-worker: Forwarding ports...
    centos-worker: 22 (guest) => 2222 (host) (adapter 1)
==> centos-worker: Running 'pre-boot' VM customizations...
==> centos-worker: Booting VM...
==> centos-worker: Waiting for machine to boot. This may take a few minutes...
    centos-worker: SSH address: 127.0.0.1:2222
    centos-worker: SSH username: vagrant
    centos-worker: SSH auth method: private key
□
```

5. Output status of the vagrant machine with command :

vagrant status

```
brahim@Training:~/devops-lab/vagrant-centos7-single$ vagrant status
Current machine states:

centos-worker              running (virtualbox)

The VM is running. To stop this VM, you can run `vagrant halt` to
shut it down forcefully, or you can run `vagrant suspend` to simply
suspend the virtual machine. In either case, to restart it again,
simply run `vagrant up`.
```

◦   What is the VM hash ?

```
brahim@Training:~/devops-lab/vagrant-centos7-single$ vagrant global-status
id        name          provider   state    directory
-------------------------------------------------------------------------------------
eca171e   k8s-master    virtualbox poweroff /home/brahim/k8s-lab
c6f38e3   k8s-worker1   virtualbox poweroff /home/brahim/k8s-lab
f7ddb0a   k8s-worker2   virtualbox poweroff /home/brahim/k8s-lab
e178b7d   k8s-master2   virtualbox poweroff /home/brahim/k8s-lab
8f58c4e   k8s-worker21  virtualbox poweroff /home/brahim/k8s-lab
39097b4   centos-worker virtualbox running   /home/brahim/devops-lab/vagrant-centos7-single

The above shows information about all known Vagrant environments
on this machine. This data is cached and may not be completely
up-to-date (use "vagrant global-status --prune" to prune invalid
entries). To interact with any of the machines, you can go to that
directory and run Vagrant, or you can use the ID directly with
Vagrant commands from any directory. For example:
"vagrant destroy 1a2b3c4d"
brahim@Training:~/devops-lab/vagrant-centos7-single$ 
```

6. Connect to the VM with SSH

vagrant ssh   or   *vagrant ssh <hash>*

```
brahim@Training:~/devops-lab/vagrant-centos7-single$ vagrant ssh
Last login: Wed Jun  7 08:37:57 2023 from 10.0.2.2
[vagrant@localhost ~]$ cat /etc/os-release
NAME="CentOS Linux"
VERSION="7 (Core)"
ID="centos"
ID_LIKE="rhel fedora"
VERSION_ID="7"
PRETTY_NAME="CentOS Linux 7 (Core)"
ANSI_COLOR="0;31"
CPE_NAME="cpe:/o:centos:centos:7"
HOME_URL="https://www.centos.org/"
BUG_REPORT_URL="https://bugs.centos.org/"

CENTOS_MANTISBT_PROJECT="CentOS-7"
CENTOS_MANTISBT_PROJECT_VERSION="7"
REDHAT_SUPPORT_PRODUCT="centos"
REDHAT_SUPPORT_PRODUCT_VERSION="7"

[vagrant@localhost ~]$ logout
brahim@Training:~/devops-lab/vagrant-centos7-single$ vagrant ssh centos-worker
Last login: Wed Jun  7 08:38:15 2023 from 10.0.2.2
[vagrant@localhost ~]$ logout
brahim@Training:~/devops-lab/vagrant-centos7-single$ vagrant ssh 39
Last login: Wed Jun  7 08:38:31 2023 from 10.0.2.2
[vagrant@localhost ~]$ logout
brahim@Training:~/devops-lab/vagrant-centos7-single$ 
```

ahim HAMDI

- ○ What is the authentication method ? Keys pair : public + private

- ○ What is the name and path of private key ?

```
brahim@Training:~/devops-lab/vagrant-centos7-single$ ls -a
.  ..  setup.sh  .vagrant  Vagrantfile
brahim@Training:~/devops-lab/vagrant-centos7-single$ ls .vagrant/machines/centos-worker/virtualbox/private_key
.vagrant/machines/centos-worker/virtualbox/private_key
brahim@Training:~/devops-lab/vagrant-centos7-single$ cat .vagrant/machines/centos-worker/virtualbox/private_key
-----BEGIN RSA PRIVATE KEY-----
MIIEpAIBAAKCAQEA+C61MwXF9J7QgmVgzTLm4pvHcADzdP4wEoa1L/p7QxH3KEbj
```

7. Exit and stop the vagrant VM with the command:

vagrant halt   or   *vagrant halt <hash>*

```
brahim@Training:~/devops-lab/vagrant-centos7-single$ vagrant halt centos-worker
==> centos-worker: Attempting graceful shutdown of VM...
brahim@Training:~/devops-lab/vagrant-centos7-single$
brahim@Training:~/devops-lab/vagrant-centos7-single$ vagrant status
Current machine states:

centos-worker                 poweroff (virtualbox)

The VM is powered off. To restart the VM, simply run `vagrant up`
brahim@Training:~/devops-lab/vagrant-centos7-single$ []
```

Vagrant with multi-nodes

8. cd to ls *devops-lab/vagrant-ubuntu20-multiple/*

```
brahim@Training:~/devops-lab$ tree
.
├── vagrant-centos7-single
│   ├── setup.sh
│   └── Vagrantfile
└── vagrant-ubuntu20-multiple
    └── Vagrantfile

2 directories, 3 files
brahim@Training:~/devops-lab$ cd vagrant-ubuntu20-multiple/
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ ls
Vagrantfile
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ []
```

- ○ Describe the content of *Vagrantfile* file.

```
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ cat Vagrantfile
Vagrant.require_version ">= 2.0.0"

boxes = [
    {
        :name => "Manager",
        :eth1 => "192.168.205.10",
        :mem => "1024",
        :cpu => "1"
    },
    {
        :name => "worker1",
        :eth1 => "192.168.205.11",
        :mem => "1024",
        :cpu => "1"
    },
    {
        :name => "worker2",
        :eth1 => "192.168.205.12",
        :mem => "1024",
        :cpu => "1"
    }
]

Vagrant.configure(2) do |config|
  config.vm.box = "generic/ubuntu2004"

  boxes.each do |opts|
      config.vm.define opts[:name] do |config|
        config.vm.hostname = opts[:name]

        config.vm.provider "vmware_fusion" do |v|
          v.vmx["memsize"] = opts[:mem]
          v.vmx["numvcpus"] = opts[:cpu]
        end

        config.vm.provider "virtualbox" do |v|
          v.customize ["modifyvm", :id, "--memory", opts[:mem]]
          v.customize ["modifyvm", :id, "--cpus", opts[:cpu]]
        end
        config.vm.network :private_network, ip: opts[:eth1]
      end
  end

  config.vm.provision "shell", inline: <<-SHELL
    sudo apt install apt-transport-https ca-certificates curl software-properties-common
    curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
    sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu bionic stable"
    sudo apt update
    sudo apt install -y docker-ce
  SHELL
end
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ 
```

- What is the difference between this Vagrantfile and that described in question 4 ?

9. Start and provision the vagrant environment.

```
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ vagrant global-status
id        name        provider   state    directory
-----------------------------------------------------------------------------------
eca171e   k8s-master     virtualbox poweroff /home/brahim/k8s-lab
c6f38e3   k8s-worker1    virtualbox poweroff /home/brahim/k8s-lab
f7ddb0a   k8s-worker2    virtualbox poweroff /home/brahim/k8s-lab
e178b7d   k8s-master2    virtualbox poweroff /home/brahim/k8s-lab
8f58c4e   k8s-worker21   virtualbox poweroff /home/brahim/k8s-lab
39097b4   centos-worker virtualbox poweroff /home/brahim/devops-lab/vagrant-centos7-single

The above shows information about all known Vagrant environments
on this machine. This data is cached and may not be completely
up-to-date (use "vagrant global-status --prune" to prune invalid
entries). To interact with any of the machines, you can go to that
directory and run Vagrant, or you can use the ID directly with
Vagrant commands from any directory. For example:
"vagrant destroy 1a2b3c4d"
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ vagrant up
Bringing machine 'Manager' up with 'virtualbox' provider...
Bringing machine 'worker1' up with 'virtualbox' provider...
Bringing machine 'worker2' up with 'virtualbox' provider...
==> Manager: Importing base box 'generic/ubuntu2004'...
==> Manager: Matching MAC address for NAT networking...
==> Manager: Checking if box 'generic/ubuntu2004' version '4.2.14' is up to date...
==> Manager: A newer version of the box 'generic/ubuntu2004' for provider 'virtualbox' is
==> Manager: available! You currently have version '4.2.14'. The latest is version
==> Manager: '4.2.16'. Run `vagrant box update` to update.
==> Manager: Setting the name of the VM: vagrant-ubuntu20-multiple_Manager_1686128483666_46340
==> Manager: Clearing any previously set network interfaces...
==> Manager: Preparing network interfaces based on configuration...
    Manager: Adapter 1: nat
    Manager: Adapter 2: hostonly
==> Manager: Forwarding ports...
    Manager: 22 (guest) => 2222 (host) (adapter 1)
==> Manager: Running 'pre-boot' VM customizations...
==> Manager: Booting VM...
==> Manager: Waiting for machine to boot. This may take a few minutes...
    Manager: SSH address: 127.0.0.1:2222
    Manager: SSH username: vagrant
    Manager: SSH auth method: private key
```

```
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ vagrant global-status
id        name        provider   state    directory
-----------------------------------------------------------------------------------
eca171e   k8s-master     virtualbox poweroff /home/brahim/k8s-lab
c6f38e3   k8s-worker1    virtualbox poweroff /home/brahim/k8s-lab
f7ddb0a   k8s-worker2    virtualbox poweroff /home/brahim/k8s-lab
e178b7d   k8s-master2    virtualbox poweroff /home/brahim/k8s-lab
8f58c4e   k8s-worker21   virtualbox poweroff /home/brahim/k8s-lab
39097b4   centos-worker virtualbox poweroff /home/brahim/devops-lab/vagrant-centos7-single
f1b1b23   Manager        virtualbox running  /home/brahim/devops-lab/vagrant-ubuntu20-multiple
73354e3   worker1        virtualbox running  /home/brahim/devops-lab/vagrant-ubuntu20-multiple
ba83e8f   worker2        virtualbox running  /home/brahim/devops-lab/vagrant-ubuntu20-multiple

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on this machine. This data is cached and may not be completely
up-to-date (use "vagrant global-status --prune" to prune invalid
entries). To interact with any of the machines, you can go to that
directory and run Vagrant, or you can use the ID directly with
Vagrant commands from any directory. For example:
"vagrant destroy 1a2b3c4d"
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$
```

10. Connect to each vagrant VM via SSH.

```
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ cd
brahim@Training:~$ vagrant ssh f1
Last login: Wed Jun  7 09:14:08 2023 from 10.0.2.2
vagrant@Manager:~$ logout
brahim@Training:~$ vagrant ssh 73
vagrant@worker1:~$ logout
brahim@Training:~$ vagrant ssh ba
vagrant@worker2:~$ logout
brahim@Training:~$
```

11. Exit and stop the each vagrant VM.

```
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ vagrant global-status
id         name          provider    state     directory
-----------------------------------------------------------------------------------------------
eca171e    k8s-master    virtualbox  poweroff  /home/brahim/k8s-lab
c6f38e3    k8s-worker1   virtualbox  poweroff  /home/brahim/k8s-lab
f7ddb0a    k8s-worker2   virtualbox  poweroff  /home/brahim/k8s-lab
e178b7d    k8s-master2   virtualbox  poweroff  /home/brahim/k8s-lab
8f58c4e    k8s-worker21  virtualbox  poweroff  /home/brahim/k8s-lab
39097b4    centos-worker virtualbox  poweroff  /home/brahim/devops-lab/vagrant-centos7-single
f1b1b23    Manager       virtualbox  running   /home/brahim/devops-lab/vagrant-ubuntu20-multiple
73354e3    worker1       virtualbox  running   /home/brahim/devops-lab/vagrant-ubuntu20-multiple
ba83e8f    worker2       virtualbox  running   /home/brahim/devops-lab/vagrant-ubuntu20-multiple

The above shows information about all known Vagrant environments
on this machine. This data is cached and may not be completely
up-to-date (use "vagrant global-status --prune" to prune invalid
entries). To interact with any of the machines, you can go to that
directory and run Vagrant, or you can use the ID directly with
Vagrant commands from any directory. For example:
"vagrant destroy 1a2b3c4d"
brahim@Training:~/devops-lab/vagrant-ubuntu20-multiple$ cd
brahim@Training:~$ vagrant halt f1 73 ba
==> worker2: Attempting graceful shutdown of VM...
==> worker1: Attempting graceful shutdown of VM...
==> Manager: Attempting graceful shutdown of VM...
brahim@Training:~$
```

Other vagrant commands

12. Output global status Vagrant environments.

```
brahim@Training:~$ vagrant global-status
id         name          provider   state     directory
----------------------------------------------------------------------------------------
eca171e    k8s-master    virtualbox poweroff /home/brahim/k8s-lab
c6f38e3    k8s-worker1   virtualbox poweroff /home/brahim/k8s-lab
f7ddb0a    k8s-worker2   virtualbox poweroff /home/brahim/k8s-lab
e178b7d    k8s-master2   virtualbox poweroff /home/brahim/k8s-lab
8f58c4e    k8s-worker21  virtualbox poweroff /home/brahim/k8s-lab
39097b4    centos-worker virtualbox poweroff /home/brahim/devops-lab/vagrant-centos7-single
f1b1b23    Manager       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple
73354e3    worker1       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple
ba83e8f    worker2       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple

The above shows information about all known Vagrant environments
on this machine. This data is cached and may not be completely
up-to-date (use "vagrant global-status --prune" to prune invalid
entries). To interact with any of the machines, you can go to that
directory and run Vagrant, or you can use the ID directly with
Vagrant commands from any directory. For example:
"vagrant destroy 1a2b3c4d"
brahim@Training:~$ 
```

13. Stop and destroy all traces of the centos7 *single-node* vagrant machine.

```
8f58c4e   k8s-worker21  virtualbox poweroff /home/brahim/k8s-lab
39097b4   centos-worker virtualbox poweroff /home/brahim/devops-lab/vagrant-centos7-single
f1b1b23   Manager       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple
73354e3   worker1       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple
ba83e8f   worker2       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple

The above shows information about all known Vagrant environments
on this machine. This data is cached and may not be completely
up-to-date (use "vagrant global-status --prune" to prune invalid
entries). To interact with any of the machines, you can go to that
directory and run Vagrant, or you can use the ID directly with
Vagrant commands from any directory. For example:
"vagrant destroy 1a2b3c4d"
brahim@Training:~$ vagrant destroy 39097b4
    centos-worker: Are you sure you want to destroy the 'centos-worker' VM? [y/N] y
==> centos-worker: Destroying VM and associated drives...
brahim@Training:~$
brahim@Training:~$ vagrant global-status
id        name          provider    state    directory
-------------------------------------------------------------------------------
eca171e   k8s-master    virtualbox poweroff /home/brahim/k8s-lab
c6f38e3   k8s-worker1   virtualbox poweroff /home/brahim/k8s-lab
f7ddb0a   k8s-worker2   virtualbox poweroff /home/brahim/k8s-lab
e178b7d   k8s-master2   virtualbox poweroff /home/brahim/k8s-lab
8f58c4e   k8s-worker21  virtualbox poweroff /home/brahim/k8s-lab
f1b1b23   Manager       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple
73354e3   worker1       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple
ba83e8f   worker2       virtualbox poweroff /home/brahim/devops-lab/vagrant-ubuntu20-multiple

The above shows information about all known Vagrant environments
on this machine. This data is cached and may not be completely
up-to-date (use "vagrant global-status --prune" to prune invalid
entries). To interact with any of the machines, you can go to that
directory and run Vagrant, or you can use the ID directly with
Vagrant commands from any directory. For example:
"vagrant destroy 1a2b3c4d"
```

- Is centos7 box deleted too ? List the vagrant boxes.

```
brahim@Training:~$ vagrant box list
centos/7            (virtualbox, 2004.01)
generic/oracle8     (virtualbox, 4.2.6)
generic/rhel8       (virtualbox, 4.0.4)
generic/ubuntu2004  (virtualbox, 4.2.14)
generic/ubuntu2204  (virtualbox, 4.0.4)
brahim@Training:~$
```

Brahim HAMDI