Cloud Computing and Deployment

EFRAIN FERNANDEZ SANGRADOR

2. N02-Linux-Cluster

Instructions

Clone the virtual environment from the exercise of this environment N01 to a total of 10 instances

Then edit the network settings for each cloned instance so that it has its own local Internet Protocol (IP) address number and the communication to the OpenSSH server is enabled between these instances and to them.

Then show that you can connect to each hosted environment (computer 1)from the host computer (computer 0), and from this hosted environment to another hosted environment (computer 2), and then run the ` hostname-I ` command at the very latest (computer 2).

Show this for all combinations, and since there are 90 combinations of links, make this printout using a Bash script and command ` parallel-ssh ` (example for a few combinations: ssh comp1 parallel-ssh -i -H comp2 -H comp3 -H comp4 -H comp5 -H comp6 -H comp7 -H comp8 -H comp9 -H comp10 hostname -I).

Material for hints during the explanation of the task:

guest# apt-get update; apt-get install pssh

host$ for comp in comp{1..10}; do echo ssh $comp parallel-ssh

$(echo comp{1..10} | sed -e 's/'$comp'//g'); done

host$ vboxmanage clonevm Ubuntu

host$ vboxmanage controlvm Linux savestate

host$ vboxmanage startvm Linux -type headless

Submit a report about this exercise that demonstrates execution of the solution,

its implementation, and scripts/code.

FOR HALF POINTS: Without creating a script for all 90 combinations (only 1

complete combination)

First, we clone the existing VM with a new name:

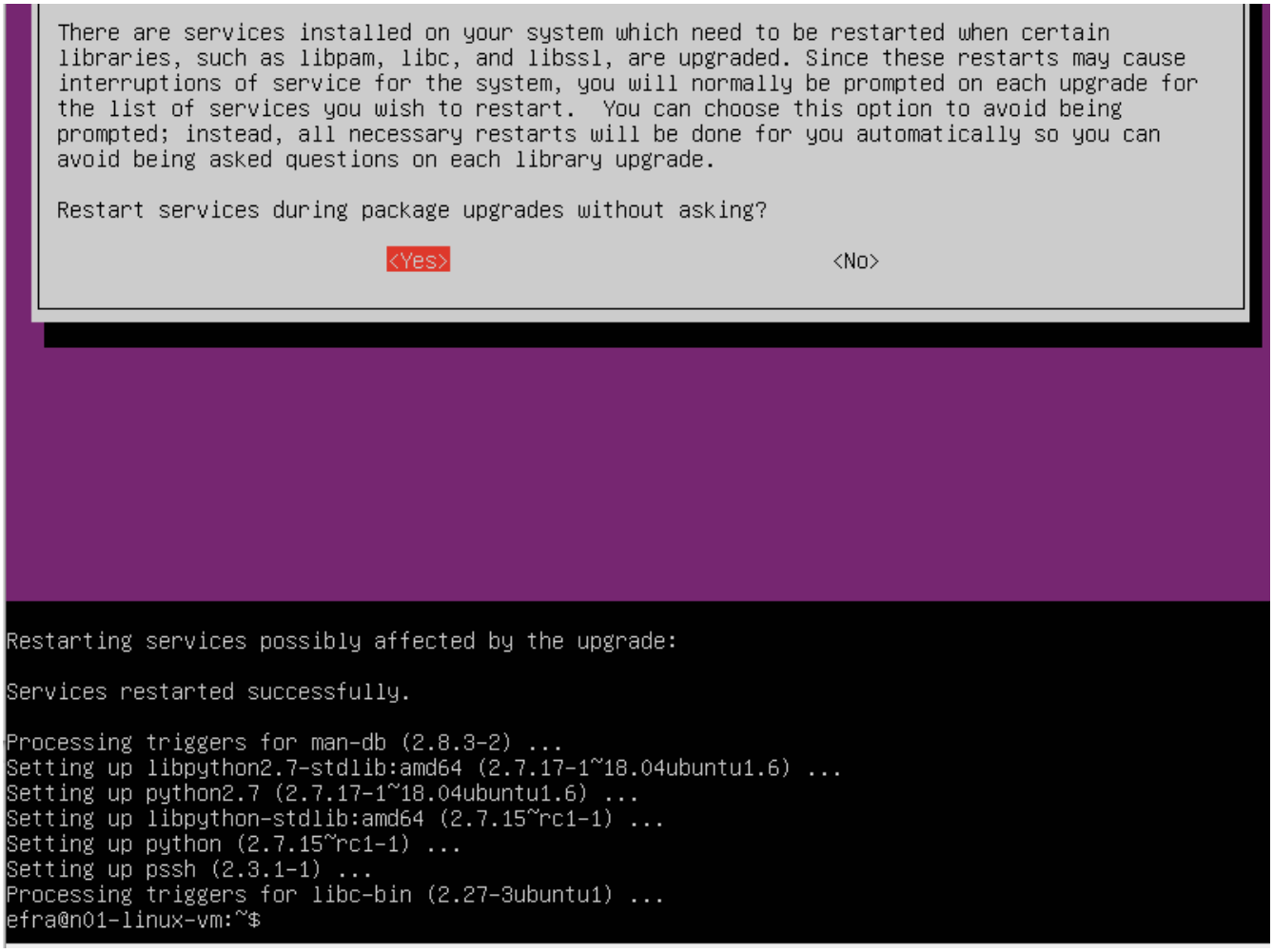
vboxmanage clonevm N01-Linux-VM --name=N02-Linux-Cluster-1 --register

```
✘ glifing@glifing-laptop ~/Escritorio/Cloud Computing vboxmanage clonevm N0
1-Linux-VM --name=N02-Linux-Cluster-1 --register
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-1"
```

We start the virtual machine and we:

update → sudo apt-get update

pssh (parallel-ssh) → sudo apt-get install pssh. I had installed ssh, so I only have to update



We shutdown the machine and prepare the environment to use multiple parallel instances.

We will connect this environments with IP automatically, so we create a new network interface that will be named vboxnet0 automatically (only for hosts):

vboxmanage hostonlyif create

Now we add DHCP (Dynamic Host Configuration Protocol) for assing automatically the Ips numbers:

vboxmanage dhcpserver add --ifname vboxnet1 \

--ip 192.168.57.2 --netmask 255.255.255.0 \

--lowerip 192.168.57.3 \

--upperip 192.168.57.254 \

--enable

Later, we configure network access via the host interface

vboxmanage modifyvm N02-Linux-Cluster-1 \

--nic1 hostonly

vboxmanage modifyvm N02-Linux-Cluster-1 \

--hostonlyadapter1 vboxnet1

We reduce the memory for later simultaneous execution of instances:

vboxmanage modifyvm N02-Linux-Cluster-1 \

--memory 1024

The VM is then started in screenless (headless) mode:

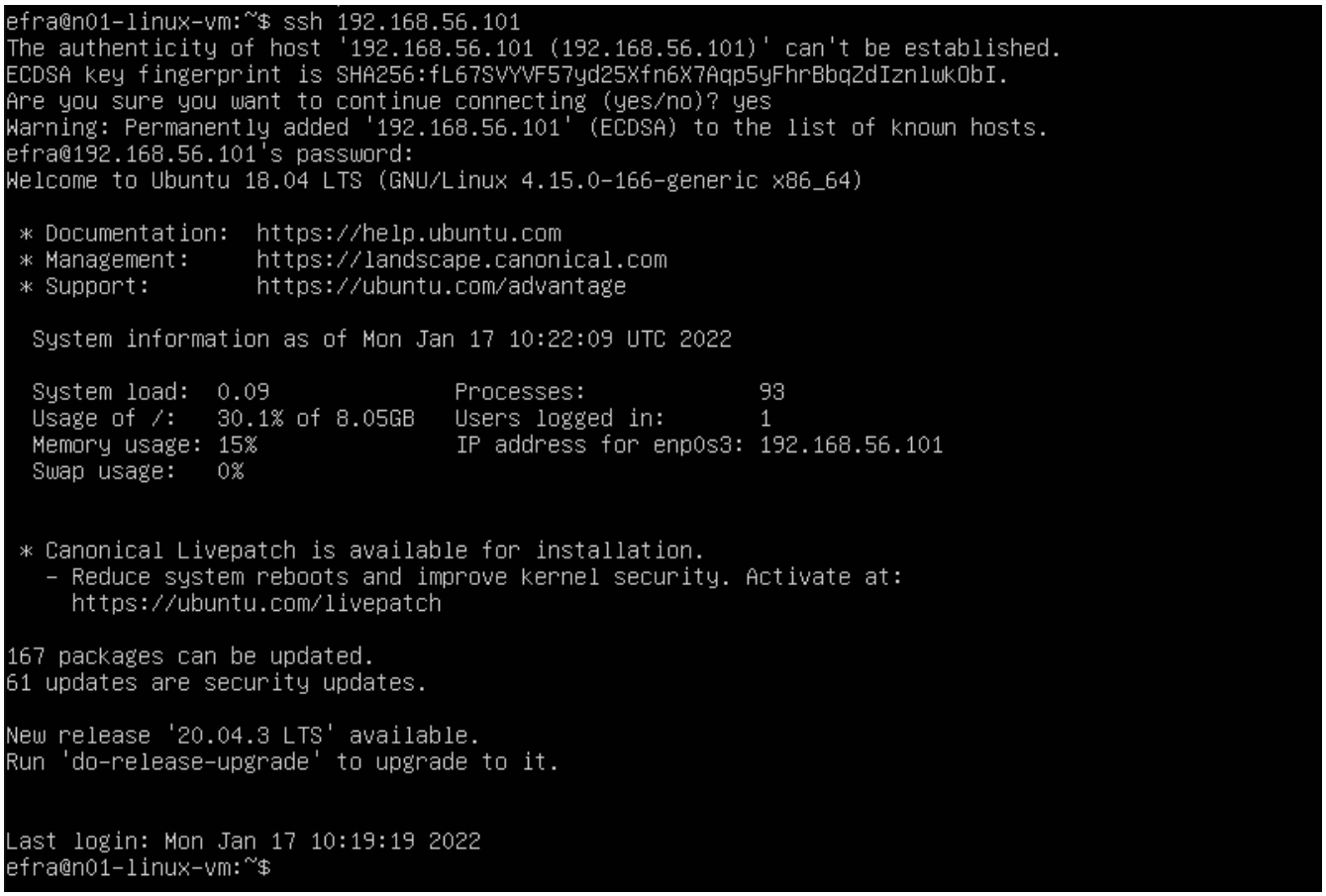
vboxmanage startvm N02-Linux-Cluster-1 \

--type headless;

```
glifing@glifing-laptop ~/Escritorio/Cloud Computing vboxmanage startvm N02-Linux-Cluster-1 \
--type headless;
Waiting for VM "N02-Linux-Cluster-1" to power on...
VM "N02-Linux-Cluster-1" has been successfully started.
```

We see the ip with the command: $ ip a → 192.168.56.101

We try to connect ssh



We save the RSA public key

cat ~/.ssh/id_rsa.pub | ssh 192.168.56.101 \

"cat >> ~/.ssh/authorized_keys"

Now, we clone the virtual environment N02-Linux-Cluster-1 nine times

for i in {2..10}; do

vboxmanage clonevm N02-Linux-Cluster-1 \

--name N02-Linux-Cluster-$i --register;

done

```
✘ glifing@glifing-laptop ~/Escritorio/Cloud Computing for i in {2..10}; do
vboxmanage clonevm N02-Linux-Cluster-1 \
--name N02-Linux-Cluster-$i --register;
done
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-2"
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-3"
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-4"
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-5"
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-6"
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-7"
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-8"
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-9"
0%...10%...20%...30%...40%...50%...60%...70%...80%...90%...100%
Machine has been successfully cloned as "N02-Linux-Cluster-10"
 glifing@glifing-laptop ~/Escritorio/Cloud Computing
```

Because of the space of my disk, I am forced to do only two virtual machines (a three machines clusters)

I’m going to use N01-Linux-VM like host.

for i in {2..3}; do

vboxmanage clonevm N02-Linux-Cluster-1 \

--name N02-Linux-Cluster-$i --register;

done

We can do the operations with scripts, but my computer can’t work it.

Also, we can do it with docker (and create a new network for this cluster):

for i in {1..10}; do

    docker run -it image_id

done