Assignment-5

Virtual Machine Live Migration using XenCenter

Due: May 02, 2019

Introduction

In this assignment, you are going to install the XenServer, create VMs and perform Virtual Machine (VM) live migration using XenCenter. XenServer is the leading open source virtualization platform, powered by the Xen Project hypervisor. The XenCenter and XenServer are used in various cloud settings (commercial or otherwise).

To perform VM migration from one host to another, you need to have 2 Physical Machines (PM). For this assignment, we will "emulate" two PMs using VirtualBox to create two machines and use those VirtualBox VMs as PMs. VirtualBox is a free and open-source hypervisor for x86 computers.

For this assignment, you are required to have a Desktop/Laptop with Windows OS installed. If you do not have a Desktop/Laptop with Windows then you can request a Loner Laptop from CS department. Send you requests to cshelpdesk@virginia.edu.

You will need the following:

1. Download VirtualBox from https://www.virtualbox.org/wiki/Downloads.

2. Download XenServer ISO online to your PC, https://www.citrix.com/products/citrix-hypervisor/get-started.html. Make sure to download **version 7.2 or older**, if not you may run into licensing issues. **Let's name it as XenServer.iso** (you may be asked to create an account with Citrix, go ahead and create an account).

3. Download Debian Wheezy 7.0 ISO online to your PC, http://cdimage.debian.org/cdimage/archive/7.11.0/amd64/iso-dvd/debian-7.11.0-amd64-DVD-1.iso. **Let's name it as Debian.iso.**

4. Download XenCenter to your PC https://www.citrix.com/downloads/. Enter "XenCenter" in the search option and download **version 7.2 or older**. XenCenter only works for Windows. **XenCenter.msi**

Installation:

1. Install VirtualBox on Windows.

2. Open VirtualBox, create two new VMs, we will use the two VMs to emulate two PMs.

3. When you create VMs on VirtualBox, you will need to specify the name of your VM. Let's call them PM1 and PM2, respectively.

Ignore the type and version of OS -> Specify the memory size. **Recommendation: 1.5GB** -> Create a virtual hard disk now -> VDI format -> Specify the storage type: fixed size -> size of storage **(atleast 80GB for each VM to perform migration)** -> create

4. After PM1 and PM2 are created, right click and choose settings. In the “Storage” tab, you can see an empty drive. Load the **XenServer.iso** into the drive. Then, in the “Network” tab, select the “Bridge Adapter”. Next start PM1 and PM2. This will take you through to the XenServer installation steps.

5. Follow the instructions on the screen to install XenServer. For the network, choose “Automatic configuration (DHCP)”.

Specify the host names as “your UVa Computing ID + 1” and “your UVa Computing ID + 2” for grading purpose.

For network time protocol (NTP), select manually time entry. Generally, in practice, it is important to specify the server, as maintaining a single time of the whole cluster is important. However, in this assignment, we do not need to setup NTP server.

6. After the installation, you will enter the XenServer interface. You will be able to see IP address on the “Status Display”.

7. Install XenCenter on your PC.

ATTENTION: please do not install XenCenter on PM1 or PM2. Install it on your PC with Windows OS.

8. Open XenCenter, connect to PM1 and PM2 using their IP addresses (as shows in “Status Display”) using “Add New Server” tab.

9. Create a VM for both PMs. To create, simply select “New VM”.

(1) Select “Debian Wheezy 7.0 (64-bit)” as the template.

(2) You will need to specify the Debian OS ISO. To do so, go to the screens of PM1 and PM2, select the “Device -> Optical drive” tab and load the **Debian.iso.** Go back to the screen of XenCenter, select DVD drive 0 on XXX (should be the default option).

(3) Specify the number of vCPU cores -- 1 is sufficient.

Specify the memory size (recommendation: 256-512MB), based on the memory size of the PM1 and PM2. You should not use more than half of the memory size of the PM1 and PM2, as we need to leave sufficient memory space for migration.

(4) Specify the storage space – default is sufficient.

10. After you create the VMs on PM1 and PM2, you can click on the VMs and go to “Console”. Follow the steps to install Debian 7.0.

11. To verify that the VMs are created correctly, please create some simple files and run word count command (i.e., wc) on the VMs through the XenCenter console.

In VirtualBox, for each machine (PM1 and PM2), select Devices->Optical Drives-> Host Device. Then click on force unmount.

Take screenshots on the XenCenter for the VMs to show that they can run commands successfully.

12. To perform VM migration, you will need to first put both PM1 and PM2 in one pool. Just create a pool and put them inside the pool. You will need to turn off the VMs to put in one pool. After putting the PMs in one pool, remember to turn on the VMs again.

Once the VMs are up, select a VM that you plan to migrate and in the "console" (e.g., PM2), run a simple loop that prints date in forever loop

for ((; ;)); do echo `date`; sleep 1; done

13. Now we can migrate the VM. Select one VM from one PM (e.g., PM2) and right click and migrate it to PM1. The process will take several minutes. You will see that the VM is still running during migration.

Take screenshots on the XenCenter during migration. You will need to take screenshots of the performance of both PM1 and PM2.

Take another screenshot on the XenCenter after the completion of VM migration, which shows that the two VMs are on one PM.

After the migration, click Window->Log Window. Take a screenshot of the list of events.

Submission:

Submit all the screenshots in one PDF file for grading. Please remember that the screenshots should clearly show your UVa computing ID (host names of PM1 and PM2).

Sample screenshots:

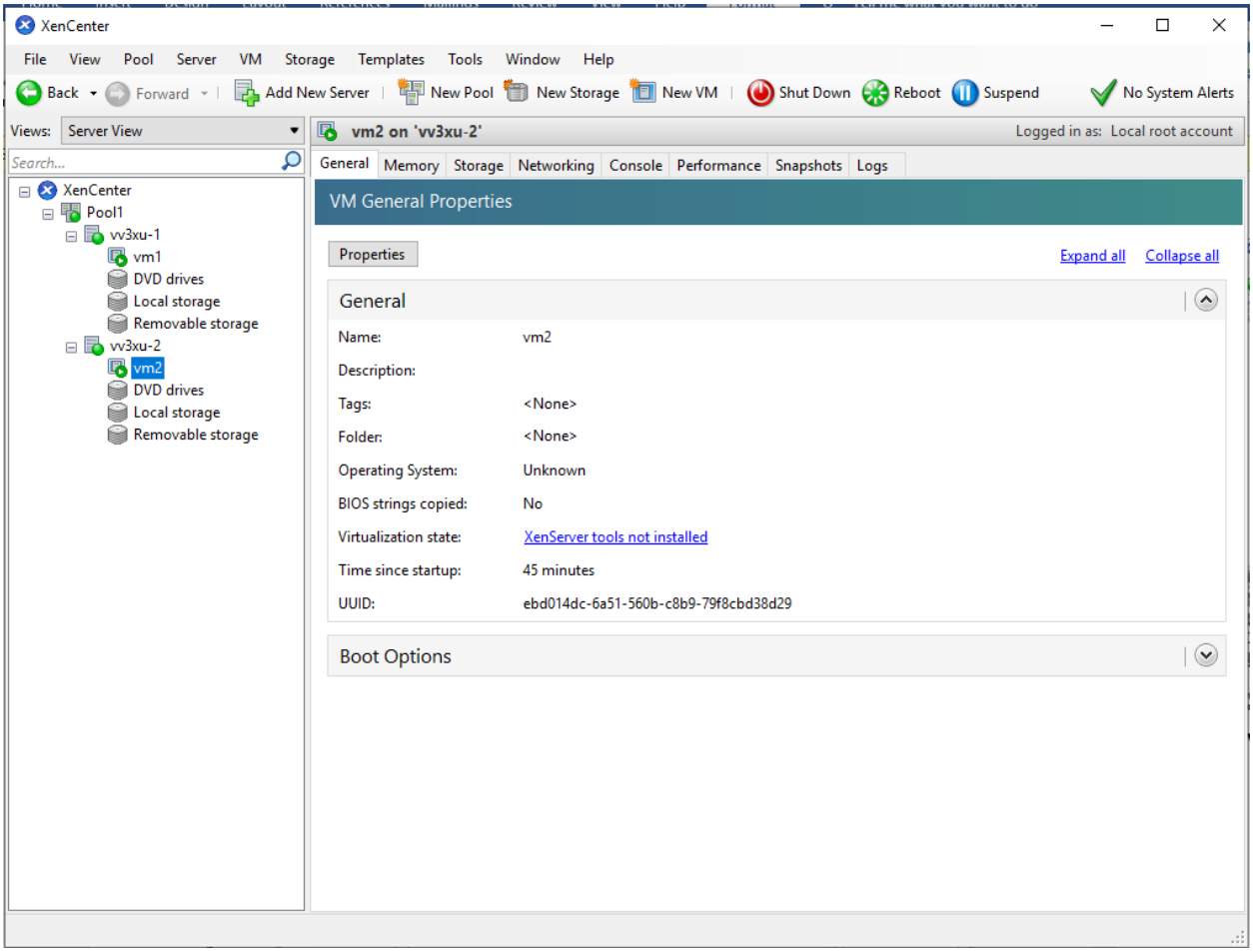

Figure1. vm1 running on vv3xu-1 (PM1) and vm2 running on vv3xu-2 (PM2)

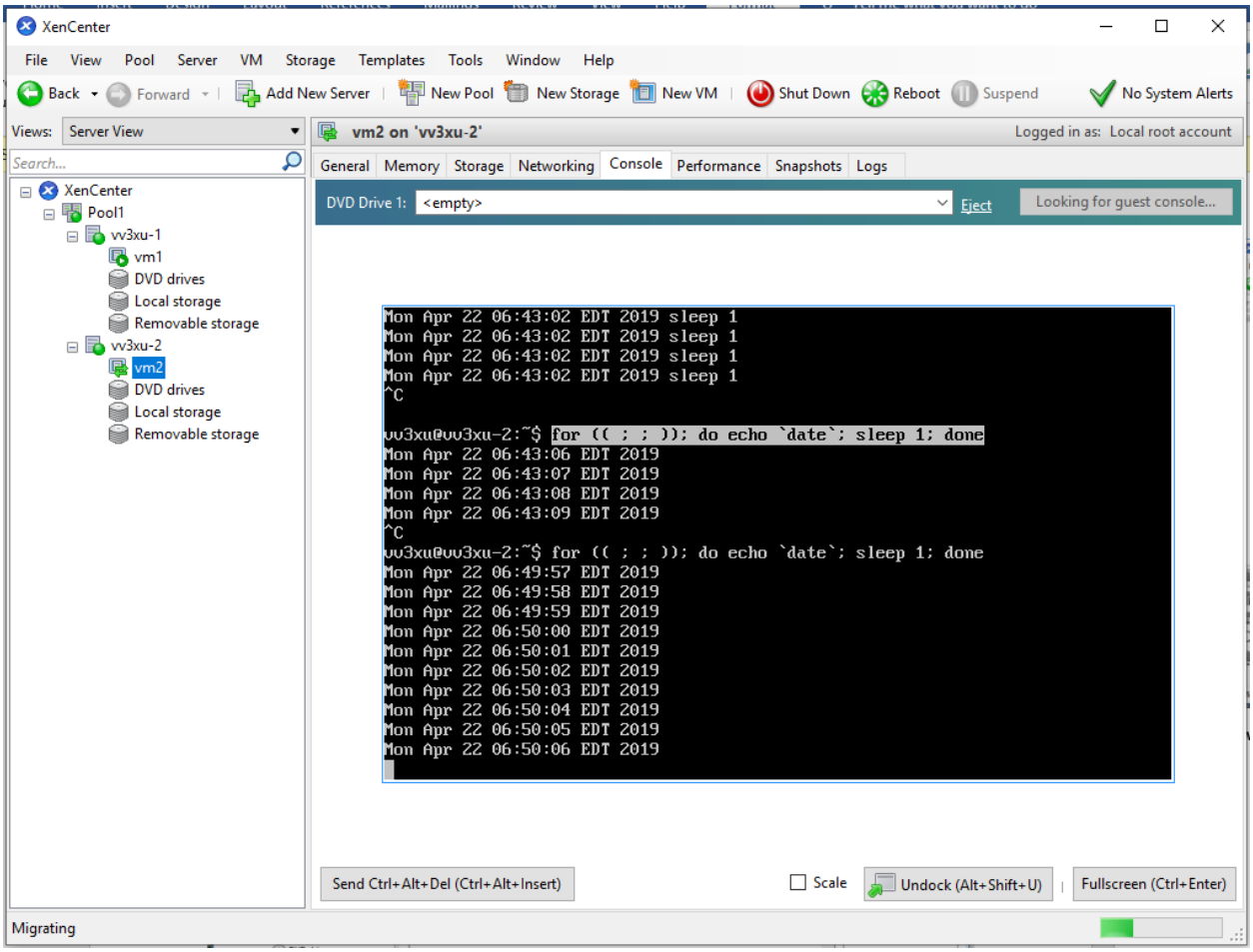

Figure2. vm2 running for loop (printing date) during migration

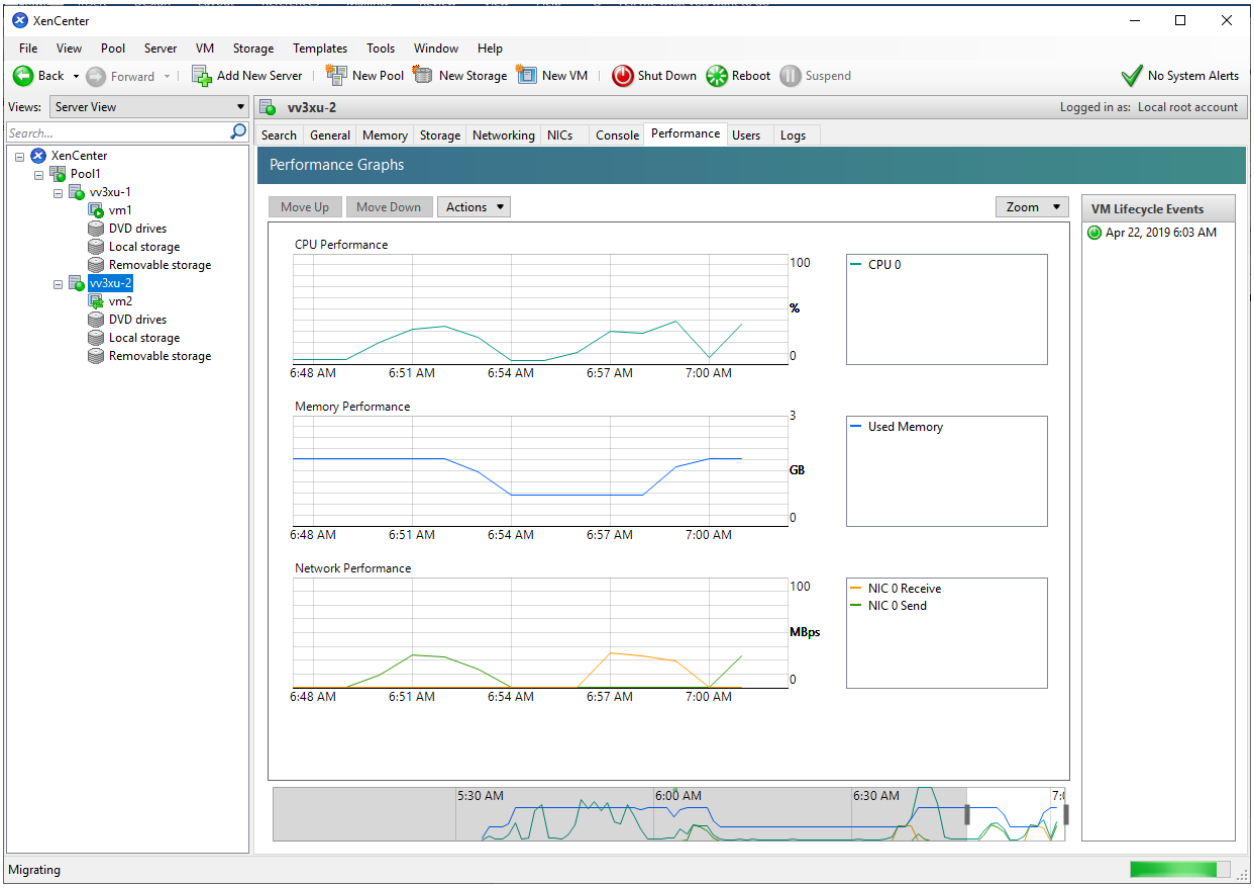

Figure3. Network performance during migration (Starting at 7.00 AM)

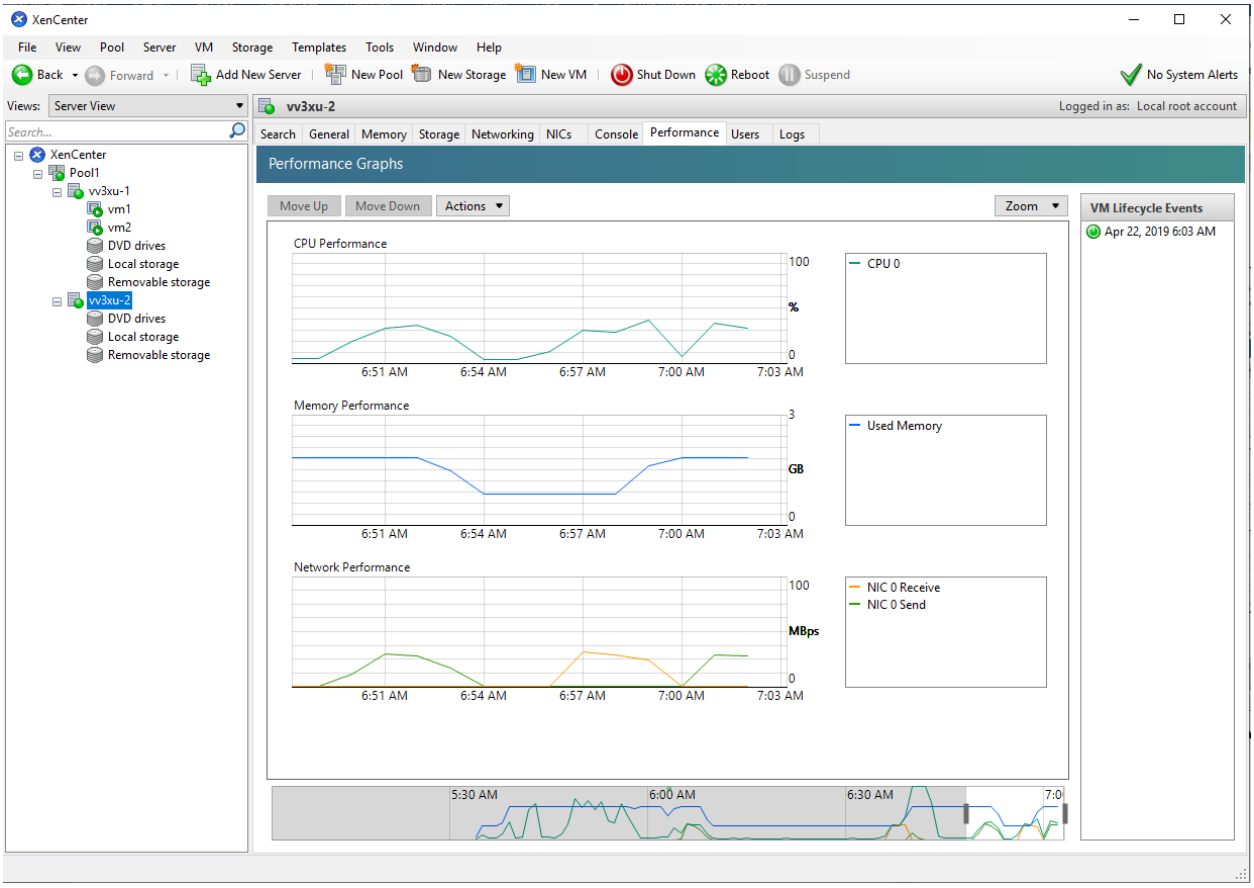

Figure4. After successful migration, vm2 migrated from vv3xu-2 (PM2) to vv3xu-1 (PM1)

Figure5. Event list