

Lab 1

Xen Guest Installation

Goal: To install RHEL 3, 4 and 5 beta 2, and Windows XP Xen guests.
Setup at Start: A workstation installed with Red Hat Enterprise Linux 5 beta 2/
Virtualization Platform.

In this lab, we will configure and install RHEL 3, 4 and 5 beta 2, and Win XP Xen guests using various virtualization tools.

Sequence 1: Checking for PAE support

In this sequence, we will determine if your system has PAE support. Any x86_64 or ia64 CPU is supported for running para-virtualized guests. To run i386 guests requires a CPU with PAE extension. Many older laptops (particularly those based on Pentium Mobile or Centrino) do not have PAE support.

1. To determine if your CPU has PAE support, run the following command:

```
grep pae /proc/cpuinfo
```

2. The following output shows a CPU that has PAE support. If the command returns nothing, then the CPU does not have PAE support. All the lab exercises require a i386 CPU with PAE extension or x86_64 or ia64 in order to proceed.

```
flags           : fpu vme de pse tsc msr pae mce cx8 apic mtrr pge mca cmov pat  
clflush dts acpi mmx fxsr sse sse2 ss tm pbe nx up est tm2
```

Sequence 2: Installing RHEL5 beta 2 Xen para-virtualized guest using virt-install

In this sequence, we will install a Red Hat Enterprise Linux 5 beta 2 Xen guest using **virt-install**.

1. Use the **virt-install** command to start install your Red Hat Enterprise Linux 5 beta 2 Xen guest.

```
virt-install
```

2. When prompted to install a fully virtualized guest, enter '**no**'.
3. Enter **rhel5b2-pv1** for your virtual machine name.
4. Enter **500** for your RAM to be allocated.

5. Enter `/xen/rhel5b2-pv1.img` for your disk (guest image).
6. Enter `6` for the size of your disk (guest image).
7. Enter `yes` to enable graphics support.
8. Enter `nfs:server:/path/to/rhel5b2` for your install location.
9. The installation will then commence. Proceed as normal with the installation.
10. After installation, edit `/etc/xen/rhel5b2-pv1`, and make the following changes:

```
#vnc=1
#vncunused=1
sdl=1
```

11. Also, edit `/etc/inittab`, add in the following changes, and type `init 5`.

```
#id:3:initdefault:
id:5:initdefault:
```

Sequence 3: Installing RHEL5 beta 2 Xen para-virtualized guest using virt-manager

In this sequence, we will install a Red Hat Enterprise Linux 5 beta 2 Xen guest using `virt-manager`.

1. Use the `virt-manager` command to start install your Red Hat Enterprise Linux 5 beta 2 Xen guest.

`virt-manager`
2. On the 'Open connection' screen, select `Local Xen host`, and click on `Connect`.
3. On the 'Virtual Machine Manager' screen, click on `New`.
4. Click on `Forward`.
5. Enter `rhel5b2-pv2` for your system name, and click on `Forward`.
6. Select `Paravirtualized`, and click `Forward`.
7. Enter `nfs:server:/path/to/rhel5b2` for your install media URL, and click `Forward`.
8. Select `Simple File`, enter `/xen/rhel5b2-pv2.img` for your file location. Choose `6000 MB`, and click `Forward`.
9. Choose `500` for your VM Max and Startup Memory, and click `Forward`.

10. Click **Finish**.
12. The 'Virtual Machine Console' window will pop up. Proceed as normal with the installation.

Sequence 4: Checking for Intel-VT or AMD-V support

In this sequence, we will determine if your system has enabled Intel-VT or AMD-V support. Your system has to be using a Intel-VT or AMD-V enabled CPU in order to install fully virtualized guest operating systems. Xen uses a generic 'HVM' layer to support both CPU vendor.

1. To determine if your CPU has Intel-VT or AMD-V support, run the following command:

```
egrep -e 'vmx|svm' /proc/cpuinfo
```

2. The following output shows a CPU that has Intel-VT support. If the command returns nothing, then the CPU does not have Intel-VT or AMD-V support.

```
flags           : fpu tsc msr pae mce cx8 apic mtrr mca cmov pat clflush dts  
acpi mmx fxsr sse sse2 ss ht tm pbe constant_tsc pni monitor vmx est tm2 xtpr
```

3. To determine if your system has enabled Intel-VT or AMD-V support, run the following command:

```
cat /sys/hypervisor/properties/capabilities
```

4. The following output shows that Intel-VT support has been enabled in the BIOS. If the command returns nothing, then go into the BIOS Setup Utility and look for a setting related to 'Virtualization', i.e. 'Intel(R) Virtualization Technology' under 'CPU' section on a IBM T60p. Enable and save the setting and do a power off to take effect.

```
xen-3.0-x86_32p hvm-3.0-x86_32 hvm-3.0-x86_32p
```

Sequence 5: Installing RHEL5 beta 2 Xen fully virtualized guest using virt-install

In this sequence, we will install a Red Hat Enterprise Linux 5 beta 2 Xen guest using **virt-install**.

1. Use the **virt-install** command to start install your Red Hat Enterprise Linux 5 beta 2 Xen guest.

```
virt-install
```

2. When prompted to install a fully virtualized guest, enter '**yes**'.
3. Enter **rhel5b2-fv1** for your virtual machine name.
4. Enter **500** for your RAM to be allocated.
5. Enter **/xen/rhel5b2-fv1.img** for your disk (guest image).
6. Enter **6** for the size of your disk (guest image).

7. Enter **yes** to enable graphics support.
8. Enter **/dev/cdrom** for the virtual CD image.
9. VNC viewer will pop up with the installation window. If there is an error messages that says "**main: Unable to connect to host: Connection refused (111)**", then type the following command to proceed:

```
vncviewer localhost:59001
```
13. The installation will then commence. Proceed as normal with the installation.

Sequence 6: Installing RHEL5 beta 2 Xen fully virtualized guest using virt-manager

In this sequence, we will install a Red Hat Enterprise Linux 5 beta 2 Xen guest using **virt-manager**.

1. Use the **virt-manager** command to start install your Red Hat Enterprise Linux 5 beta 2 Xen guest.

```
virt-manager
```
2. On the 'Open connection' screen, select **Local Xen host**, and click on **Connect**.
3. On the 'Virtual Machine Manager' screen, click on **New**.
4. Click on **Forward**.
5. Enter **rhel5b2-fv2** for your system name, and click on **Forward**.
6. Select **Fully virtualized**, and click **Forward**.
7. Select **CD-ROM or DVD** and the **Path to install media** if you have the CD-ROM or DVD. Select **ISO Image location** if you choose to install from ISO image. Click **Forward**.
8. Select **Simple File**, enter **/xen/rhel5b2-fv2.img** for your file location. Choose **6000 MB**, and click **Forward**.
9. Choose **500** for your VM Max and Startup Memory, and click **Forward**.
10. Click **Finish**.
11. The 'Virtual Machine Console' window will pop up. Proceed as normal with the installation.

Sequence 7: Installing RHEL3 Xen fully virtualized guest using virt-manager

¹ VNC port 5900 refers to the first Xen guest that is running on vnc. If it doesn't work, you might need to use 5901, etc.

In this sequence, we will install a Red Hat Enterprise Linux 3 Xen guest using **virt-manager**.

1. The same instructions for Sequence 6 applies here.

Sequence 8: Installing RHEL4 Xen fully virtualized guest using virt-manager

In this sequence, we will install a Red Hat Enterprise Linux 4 Xen guest using **virt-manager**.

2. The same instructions for Sequence 6 applies here.

Sequence 9: Installing Windows XP Xen fully virtualized guest using virt-manager

In this sequence, we will install a Windows XP Xen fully virtualized guest using **virt-manager**.

1. Use the **virt-manager** command to start install your Windows XP Xen guest.

virt-manager

2. On the 'Open connection' screen, select **Local Xen host**, and click on **Connect**.
3. On the 'Virtual Machine Manager' screen, click on **New**.
4. Click on **Forward**.
5. Enter **winxp** for your system name, and click on **Forward**.
6. Select **Fully virtualized**, and click **Forward**.
7. Select **CD-ROM or DVD** and the **Path to install media** if you have the CD-ROM or DVD. Select **ISO Image location** if you choose to install from ISO image. Click **Forward**.
8. Select **Simple File**, enter **/xen/winxp.img** for your file location. Choose **6000 MB**, and click **Forward**.
9. Choose **1024** for your VM Max and Startup Memory, and **2** for VCPUs. Click **Forward**.
10. Click **Finish**.
11. The 'Virtual Machine Console' window will pop up. Proceed as normal with the installation.
12. Choose to format the **C:** partition in **FAT file system** format. Red Hat Enterprise Linux 5 does not come with NTFS kernel modules. Mounting or writing files to the Xen guest image may not be as straight-forward if you were to format the partition in **NTFS file system** format.
13. After the first reboot, fix the **winxp** guest image:

```
losetup /dev/loop0 /xen/winxp.img  
kpartx -av /dev/loop0  
mount /dev/mapper/loop0p1 /mnt  
cp -prv $WINDOWS/i386 /mnt/1  
umount /mnt
```

14. Restart the Xen guest manually:

```
xm create -c winxp
```

15. Select **winxp** Xen guest from 'Virtual Machine Manager' and click **Open**.
16. The 'Virtual Machine Console' window will pop up. Proceed as normal with the installation.
17. Whenever a 'Files Needed' dialog box appears, change the path **GLOBALROOT\DEVICE\CDROM0\I386** to **C:\I386**. Depending on your installation, you may or may not see this problem. You may be prompted for missing files numerous times. Changing the path to **C:\I386** will fix this problem.
18. If the Xen guest console freezes, click **shutdown**, make the following changes in `/etc/xen/winxp`:

```
#vnc=1  
#vncunused=1  
sdl=1  
#vcpus=2
```

19. Repeat step 14 and proceed as normal with the installation.

¹ This is to fix a problem that you may face in the later part of the Windows installation.