Xen VGA Passthrough with AMD Display Cards

Version 1.4

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Software Configuration:

Host operating system dom0: Ubuntu 14.04 LTS
Linux kernel: self-compiled 3.16.1
Xen hypervisor: self-compiled 4.4.1
Guest operating system domU: Windows 7 Ultimate HVM domU
Sapphire AMD Radeon HD 6450 Driver DVD: INSTALLED

Hardware Configuration:

Processor: Intel Core i5-4430 CPU @ 3.00GHz (Quad Core)
Motherboard: Asrock B85M Pro4 LGA 1150 Motherboard
Memory: 32 GB DDR3-1600
PCI-E x16 Display Card: Sapphire AMD Radeon HD 6450 1 GB DDR3
VT-x: Enabled in UEFI BIOS
VT-d: Enabled in UEFI BIOS

Download Xen 4.4.1 from the following URL:

http://www.xenproject.org/downloads/xen-archives/xen-44-series/xen-441.html

```
tar xfvz xen-4.4.1.tar.gz
cd xen-4.4.1/
sudo -s
sudo apt-get install libaio1
sudo apt-get install libaio-dev
sudo apt-get install libpixman-1-dev
nano README
./configure
make world
make install
```


The following command does not work anymore with Xen 4.4.1:

```
sudo update-rc.d xend defaults
```

Execute the following commands to automatically start Xen services.

```
sudo update-rc.d xencommons defaults
sudo update-rc.d xendomains defaults
sudo update-rc.d xen-watchdog defaults
```

```
sudo nano /etc/default/grub
```

```
GRUB_DEFAULT=0
#GRUB_HIDDEN_TIMEOUT=0
GRUB_TIMEOUT=100
```

```
sudo update-grub
```

```
sudo nano /etc/ld.so.conf
```

```
/usr/lib64
```

```
sudo ldconfig -v
```

List PCI ID of various computer hardware.

```
lspci -v | less
```

Sapphire AMD Radeon HD 6450 1 GB DDR3 VGA PCI ID: 01:00.0

Audio Controller PCI ID:
01:00.1 (AMD)
00:1b.0 (Intel)

USB 3.0 Controllers PCI ID: 00:14.0 00:1a.0 00:1d.0


```
sudo nano /etc/grub.d/40_custom
```

```
menuentry 'Ubuntu 14.04 LTS with Xen 4.4.1 and 3.16.1-xen-teo.en.ming-sgp' --class gnu-linux
--class gnu --class os {
recordfail
insmod part_msdos
insmod ext2
set root='hd0,msdos1'
search --no-floppy --fs-uuid --set=root 8d86148d-b6d4-414f-b515-37d97452772f
multiboot /boot/xen.gz placeholder dom0_mem=1024M iommu=1 loglvl=all guest_loglvl=all
unrestricted_guest=1 msi=1
module /boot/vmlinuz-3.16.1-xen-teo.en.ming-sgp placeholder root=UUID=8d86148d-b6d4-414f-
b515-37d97452772f ro quiet xen-pciback.hide=(01:00.0)(01:00.1)(00:1b.0)(00:14.0)(00:1a.0)
(00:1d.0) xen-pciback.permissive
module /boot/initrd.img-3.16.1-xen-teo.en.ming-sgp
}
```

```
sudo update-grub
```

Prevents radeon and snd_hda_intel kernel modules from loading at bootup.

```
sudo nano /etc/modprobe.d/blacklist.conf
```

```
# blacklist radeon kernel module
blacklist radeon
# blacklist snd_hda_intel kernel module
blacklist snd_hda_intel
```

Uninstall the lightdm display manager. Previous versions of Ubuntu uses gdm.

```
sudo apt-get remove lightdm
```

Create Windows 7 Ultimate ISO file from Microsoft original DVD-ROM.

```
cd /home/teo-en-ming
dd if=/dev/sr0 of=win7.iso
```

Create a 20 GB raw disk image to contain Windows 7 Ultimate HVM domU.

```
cd /etc/xen
sudo dd if=/dev/zero of=win7.img bs=1024k seek=20000 count=0
```


Create a Windows 7 Ultimate HVM domU configuration file.

```
sudo nano /etc/xen/win7.cfg
```

```
builder='hvm'
memory = 8192
name = 'win7'
vcpus=4
pae=1
acpi=1
apic=1
on_xend_stop='shutdown'
vif = [ 'mac=00:16:3e:68:e1:01,bridge=virbr0' ]
#vif=[ 'bridge=virbr0,type=ioemu,model=e1000' ]
#disk = [ '/etc/xen/win7.img,raw,hda,rw' , '/home/teo-en-ming/win7.iso,raw,hdc,devtype=cdrom' ]
disk = [ '/etc/xen/win7.img,raw,hda,rw' , '/home/teo-en-ming/6450.iso,raw,hdc,devtype=cdrom' ]
device_model_version = 'qemu-xen-traditional'
boot='dc'
sdl=0
vnc=1
vncpasswd=''
vnclisten="192.168.1.39"
stdvga=0
serial='pty'
tsc_mode='default'
viridian=1
usb=1
usbdevice='tablet'
gfx_passthru=0
pci=[ '01:00.0', '01:00.1', '00:1b.0', '00:14.0', '00:1a.0', '00:1d.0' ]
localtime=1
pci_power_mgmt=1
```

Install the sshd daemon in Ubuntu 14.04 LTS dom0.

```
sudo apt-get install ssh
```

You must install Windows 7 Ultimate HVM domU first from a vnc viewer window.

On another computer running Linux, execute the following commands:

```
ping 192.168.1.39
ssh -l teo-en-ming 192.168.1.39
```


192.168.1.39 is the IP address of dom0.

Once you have ssh into dom0 from another computer running Linux, execute the following command to start Windows 7 HVM domU.

```
sudo xl create /etc/xen/win7.cfg
```

Still on the other computer running Linux, execute the following commands to open a vnc viewer into Windows 7 HVM domU.

```
sudo apt-get install xtightvncviewer
xtightvncviewer 192.168.1.39
```

If you want to return to using the GUI on Ubuntu 14.04 LTS dom0, execute the following commands:

```
sudo reboot
sudo apt-get install lightdm
sudo service lightdm start
```

Install the Virtual Machine Manager so that libvirtd daemon will create a network bridge called virbr0 in dom0.

Click on Ubuntu Software Center.
Search for Virtual Machine Manager.
Click on the Install button for Virtual Machine Manager.

Install the USB 3.0 controller driver in Windows 7 Ultimate HVM domU so that the USB mouse and USB keyboard work in the domU.

Install USB 3.0 driver from http://www.asrock.com website in Windows 7 Ultimate HVM domU.

Please refer to the following download links:

http://www.asrock.com/mb/Intel/B85M%20Pro4/?cat=Download&os=Win764

ftp://download.asrock.com/drivers/Intel/usb/USB3(v2.5.0.19).zip

Windows 8 HVM domU Configuration File

You must also install Windows 8 HVM domU first by opening a vnc viewer to it from another computer running Linux.

```
sudo nano /etc/xen/win8.cfg
```

```
builder='hvm'
memory = 8192
name = 'win8'
vcpus=4
pae=1
acpi=1
apic=1
on_xend_stop='shutdown'
vif = [ 'mac=00:16:3e:68:e1:01,bridge=virbr0' ]
#vif=[ 'bridge=virbr0,type=ioemu,model=e1000' ]
#disk = [ '/etc/xen/win7.img,raw,hda,rw' , '/home/teo-en-ming/win7.iso,raw,hdc,devtype=cdrom' ]
disk = [ '/etc/xen/win8.img,raw,hda,rw' , '/home/teo-en-ming/win8.iso,raw,hdc,devtype=cdrom' ]
device_model_version = 'qemu-xen-traditional'
boot='dc'
sdl=0
vnc=1
vncpasswd=''
vnclisten="192.168.1.39"
stdvga=0
serial='pty'
tsc_mode='default'
viridian=1
usb=1
usbdevice='tablet'
gfx_passthru=0
pci=[ '01:00.0', '01:00.1', '00:1b.0', '00:14.0', '00:1a.0', '00:1d.0' ]
localtime=1
pci_power_mgmt=1
```

