

Building and Installing Xen 4.x and Linux Kernel 3.x on Ubuntu and Debian Linux

Version 1.3

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1 Linux Kernel 3.x with Xen Virtualization Support (Dom0 and DomU)

In this installation document, we will build/compile Xen 4.1.3-rc1-pre and Linux kernel 3.3.0-rc7 from sources.

```
sudo apt-get install aria2
```

```
aria2c -x 5 http://www.kernel.org/pub/linux/kernel/v3.0/testing/linux-3.3-rc7.tar.bz2  
tar xfvj linux-3.3-rc7.tar.bz2  
cd linux-3.3-rc7
```

2 Configuring the Linux kernel

```
cp /boot/config-3.0.0-12-generic .config  
make oldconfig
```

Accept the defaults for new kernel configuration options by pressing enter.

```
nano .config
```

3 Configuring the kernel for dom0 support

NOTE: Xen dom0 support depends on ACPI support. Make sure you enable ACPI support or you won't see Dom0 options at all.

In addition to the config options above you also need to enable:

```
CONFIG_X86_IO_APIC=y  
CONFIG_ACPI=y  
CONFIG_ACPI_PROCFS=y (optional)  
CONFIG_XEN_DOM0=y
```

```
CONFIG_PCI_XEN=y
CONFIG_XEN_DEV_EVTCHN=y
CONFIG_XENFS=y
CONFIG_XEN_COMPAT_XENFS=y
CONFIG_XEN_SYS_HYPERVISOR=y
CONFIG_XEN_GNTDEV=y
CONFIG_XEN_BACKEND=y
CONFIG_XEN_NETDEV_BACKEND=m
CONFIG_XEN_BLKDEV_BACKEND=m
CONFIG_XEN_PCIDEV_BACKEND=y
CONFIG_XEN_PRIVILEGED_GUEST=y
CONFIG_XEN_BALLOON=y
CONFIG_XEN_SCRUB_PAGES=y
CONFIG_XEN_DEV_EVTCHN=y
CONFIG_XEN_GNTDEV=y
```

4 Configuring the kernel for domU support

1. If building 32 bit kernel make sure you have CONFIG_X86_PAE enabled (which is set by selecting CONFIG_HIGHMEM64G) non-PAE mode doesn't work in 2.6.25, and has been dropped altogether from 2.6.26 and newer kernel versions.

2. Enable these core options (Processor type and features| Paravirtualized guest support]

```
CONFIG_PARAVIRT=y
CONFIG_XEN=y
CONFIG_PARAVIRT_GUEST=y
CONFIG_PARAVIRT_SPINLOCKS=y
```

3. And Xen pv console device support (Device Drivers|Character devices

```
CONFIG_HVC_DRIVER=y
CONFIG_HVC_XEN=y
```

4. And Xen disk and network support (Device Drivers|Block devices and Device Drivers|Network device support)

```
CONFIG_XEN_FBDEV_FRONTEND=y
CONFIG_XEN_BLKDEV_FRONTEND=y
CONFIG_XEN_NETDEV_FRONTEND=y
```

5. And the rest (Device Drivers|Xen driver support)

```
CONFIG_XEN_PCIDEV_FRONTEND=y
CONFIG_INPUT_XEN_KBDDEV_FRONTEND=y
CONFIG_XEN_FBDEV_FRONTEND=y
CONFIG_XEN_XENBUS_FRONTEND=y
CONFIG_XEN_SAVE_RESTORE=y
CONFIG_XEN_GRANT_DEV_ALLOC=m
```

6. And for tmem support:

```
CONFIG_XEN_TMEM=y
CONFIG_CLEANCACHE=y
CONFIG_FRONTSWAP=y
CONFIG_XEN_SELFBALLOONING=y
```

5 Building the Linux Kernel

```
sudo apt-get install git-core kernel-package fakeroot build-essential libncurses5-dev
```

```
sed -rie 's/echo "\+"/#echo "\+"/' scripts/setlocalversion
```

```
make-kpkg clean
CONCURRENCY_LEVEL=3 fakeroot make-kpkg --initrd \
--append-to-version=-xen-teo.en.ming-sgp --revision=17.mar.2012 kernel_image kernel_headers
cd ..
sudo dpkg -i linux-image-3.3.0-rc7-xen-teo.en.ming-sgp_14.mar.2012_amd64.deb
sudo dpkg -i linux-headers-3.3.0-rc7-xen-teo.en.ming-sgp_14.mar.2012_amd64.deb
```

```
cd /lib/modules
ls
sudo update-initramfs -ck 3.3.0-rc7-xen-teo.en.ming-sgp
sudo update-grub
```

```
sudo nano /etc/modules
```

```
# /etc/modules: kernel modules to load at boot time.
#
# This file contains the names of kernel modules that should be loaded
# at boot time, one per line. Lines beginning with "#" are ignored.
lp
rtc
# Added these lines
xen-evtchn
xen-gntdev
xen-netback
xen-blkback
xenfs
blktap
```

6 Building Xen 4.1.3-rc1-pre

```
sudo apt-get install ocaml-findlib
```

```
sudo apt-get install bcc bin86 gawk bridge-utils iproute libcurl3 libcurl4-openssl-dev bzip2
module-init-tools transfig tgif texinfo texlive-latex-base texlive-latex-recommended
texlive-fonts-extra texlive-fonts-recommended pciutils-dev mercurial build-essential make
gcc libc6-dev zlib1g-dev python python-dev python-twisted libncurses5-dev patch
libvncserver-dev libsdl-dev libjpeg62-dev iasl libbz2-dev e2fslibs-dev git-core uuid-dev
ocaml libx11-dev bison flex
```

```
sudo apt-get install gcc-multilib
```

```
sudo apt-get install xz-utils
```

```
cd  
hg clone http://xenbits.xen.org/xen-4.1-testing.hg  
cd xen-4.1-testing.hg  
make xen  
make tools  
make stubdom  
sudo make install-xen  
sudo make install-tools PYTHON_PREFIX_ARG=  
sudo make install-stubdom
```

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

7 Building Xen-4.2-unstable (currently changeset 25070)

If you wish to build and install from xen-unstable.hg instead,

```
cd  
git clone git://github.com/lloyd/yajl  
cd yajl  
sudo apt-get install ruby cmake  
./configure  
make  
sudo make install
```

```
cd  
hg clone http://xenbits.xensource.com/xen-unstable.hg  
cd xen-unstable.hg  
./configure  
make world  
sudo make install
```

8 GRUB2

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

```
#!/bin/sh
exec tail -n +3 $0
# This file provides an easy way to add custom menu entries.  Simply type the
# menu entries you want to add after this comment.  Be careful not to change
# the 'exec tail' line above.
menuentry 'Ubuntu 11.10 Release with Xen 4.1.3-rc1-pre and Kernel 3.3.0-rc7-xen-teo.en.ming-sgp' --class gnu-linux --class gnu --class os {
    recordfail
    insmod part_msdos
    insmod ext2
    search --no-floppy --fs-uuid --set=root fd1ee157-7822-4a08-8549-56f4ae96f0dc
    set root='(/dev/sda,msdos1)'
    search --no-floppy --fs-uuid --set=root fd1ee157-7822-4a08-8549-56f4ae96f0dc
    multiboot /boot/xen.gz
    module /boot/vmlinuz-3.3.0-rc7-xen-teo.en.ming-sgp placeholder root=UUID=fd1ee157-7822-4a08-8549-56f4ae96f0dc dom0_mem=1024 console=tty quiet splash vt.handoff=7
    module /boot/initrd.img-3.3.0-rc7-xen-teo.en.ming-sgp
}
menuentry 'Ubuntu 11.10 Release with Xen 4.1.3-rc1-pre and Kernel 3.2.11-xen-teo.en.ming-sgp' --class gnu-linux --class gnu --class os {
    recordfail
    insmod part_msdos
    insmod ext2
    search --no-floppy --fs-uuid --set=root fd1ee157-7822-4a08-8549-56f4ae96f0dc
    set root='(/dev/sda,msdos1)'
    search --no-floppy --fs-uuid --set=root fd1ee157-7822-4a08-8549-56f4ae96f0dc
    multiboot /boot/xen.gz
    module /boot/vmlinuz-3.2.11-xen-teo.en.ming-sgp placeholder root=UUID=fd1ee157-7822-4a08-8549-56f4ae96f0dc dom0_mem=1024 console=tty quiet splash vt.handoff=7
    module /boot/initrd.img-3.2.11-xen-teo.en.ming-sgp
}
menuentry 'Ubuntu 11.10 Release with Xen 4.1.3-rc1-pre and Kernel 3.3.0-xen-teo.en.ming-sgp' --class gnu-linux --class gnu --class os {
    recordfail
    insmod part_msdos
    insmod ext2
    search --no-floppy --fs-uuid --set=root fd1ee157-7822-4a08-8549-56f4ae96f0dc
    set root='(/dev/sda,msdos1)'
    search --no-floppy --fs-uuid --set=root fd1ee157-7822-4a08-8549-56f4ae96f0dc
    multiboot /boot/xen.gz
    module /boot/vmlinuz-3.3.0-xen-teo.en.ming-sgp placeholder root=UUID=fd1ee157-7822-4a08-8549-56f4ae96f0dc dom0_mem=1024 console=tty quiet splash vt.handoff=7
    module /boot/initrd.img-3.3.0-xen-teo.en.ming-sgp
}
menuentry 'Ubuntu 11.10 Release with Xen 4.1.3-rc1-pre and Kernel 3.2.12-xen-teo.en.ming-sgp'
```

```
--class gnu-linux --class gnu --class os {
  recordfail
  insmod part_msdos
  insmod ext2
  search --no-floppy --fs-uuid --set=root fd1ee157-7822-4a08-8549-56f4ae96f0dc
  set root='(/dev/sda,msdos1)'
  search --no-floppy --fs-uuid --set=root fd1ee157-7822-4a08-8549-56f4ae96f0dc
  multiboot /boot/xen.gz
  module /boot/vmlinuz-3.2.12-xen-teo.en.ming-sgp placeholder root=UUID=fd1ee157-7822-4a08-8549-56f4ae96f0dc dom0_mem=1024 console=tty quiet splash vt.handoff=7
  module /boot/initrd.img-3.2.12-xen-teo.en.ming-sgp
}
```

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

```
#GRUB_HIDDEN_TIMEOUT=0
```

```
sudo update-grub
```

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

```
/usr/lib64
```

```
sudo ldconfig -v
```

```
sudo nano /etc/xen/xend-config.sxp
```

```
(xend-http-server yes)
```

```
sudo service xend restart
```

9 Installing Virtual Machine Manager

On the taskbar on the extreme left of the screen, click on “Ubuntu Software Center”. In the search bar, type “Virtual Machine Manager”. Click Install.

10 Shorewall Firewall Configuration Files

10.1 /etc/shorewall/zones

```
#
# Shorewall version 4.0 - Sample Zones File for two-interface configuration.
# Copyright (C) 2006 by the Shorewall Team
#
# This library is free software; you can redistribute it and/or
# modify it under the terms of the GNU Lesser General Public
# License as published by the Free Software Foundation; either
# version 2.1 of the License, or (at your option) any later version.
#
# See the file README.txt for further details.
#-----
# For information about entries in this file, type "man shorewall-zones"
#####
#####
#ZONE  TYPE  OPTIONS          IN          OUT
#              OPTIONS          OPTIONS
fw     firewall
net    ipv4
loc    ipv4
```

10.2 /etc/shorewall/interfaces

```
#
# Shorewall version 4.0 - Sample Interfaces File for two-interface configuration.
# Copyright (C) 2006 by the Shorewall Team
#
# This library is free software; you can redistribute it and/or
# modify it under the terms of the GNU Lesser General Public
# License as published by the Free Software Foundation; either
# version 2.1 of the License, or (at your option) any later version.
#
# See the file README.txt for further details.
#-----
# For information about entries in this file, type "man shorewall-interfaces"
#####
#####
#ZONE INTERFACE  BROADCAST  OPTIONS
net  eth0      detect     dhcp,tcpflags,nosmurfs,routefilter,logmartians
loc  virbr0    detect     tcpflags,nosmurfs,routefilter,logmartians,routeback
```

10.3 /etc/shorewall/policy

```
#
# Shorewall version 4.0 - Sample Policy File for two-interface configuration.
# Copyright (C) 2006 by the Shorewall Team
#
# This library is free software; you can redistribute it and/or
# modify it under the terms of the GNU Lesser General Public
# License as published by the Free Software Foundation; either
# version 2.1 of the License, or (at your option) any later version.
#
# See the file README.txt for further details.
#-----
# For information about entries in this file, type "man shorewall-policy"
#####
#SOURCE      DEST      POLICY      LOG LEVEL      LIMIT:BURST

net          all          DROP         info
loc          net          ACCEPT
$FW          net          ACCEPT
# THE FOLLOWING POLICY MUST BE LAST
all          all          REJECT       info
```

10.4 /etc/shorewall/rules

```
#
# Shorewall version 4.0 - Sample Rules File for two-interface configuration.
# Copyright (C) 2006,2007 by the Shorewall Team
#
# This library is free software; you can redistribute it and/or
# modify it under the terms of the GNU Lesser General Public
# License as published by the Free Software Foundation; either
# version 2.1 of the License, or (at your option) any later version.
#
# See the file README.txt for further details.
#-----
# For information about entries in this file, type "man shorewall-rules"
#####
#####
#ACTION      SOURCE      DEST      PROTO  DEST  SOURCE      ORIGINAL
RATE        USER/  MARK
#           PORT  PORT(S)  DEST    LIMIT    GROUP
# Allow DHCP requests from the local network to the firewall
ACCEPT:info  loc      $FW      udp    67
ACCEPT:info  $FW      loc      udp    68
# Allow DNS lookups from the local network to the firewall
DNS(ACCEPT)  loc      $FW
```


10.5 /etc/shorewall/masq

```
#
# Shorewall version 4.0 - Sample Masq file for two-interface configuration.
# Copyright (C) 2006 by the Shorewall Team
#
# This library is free software; you can redistribute it and/or
# modify it under the terms of the GNU Lesser General Public
# License as published by the Free Software Foundation; either
# version 2.1 of the License, or (at your option) any later version.
#
# See the file README.txt for further details.
#-----
# For information about entries in this file, type "man shorewall-masq"
#####
#INTERFACE      SOURCE      ADDRESS      PROTO PORT(S) IPSEC MARK
eth0            virbr0
```

10.6 /etc/shorewall/shorewall.conf

```
STARTUP_ENABLED=Yes
```

10.7 /etc/default/shorewall

```
startup=1
```

11 XL Domain Configuration File for Windows 8 Consumer Preview 64-bit English HVM domU

The following commands create a 20 GB disk image file named *windows8consumerpreview64-bitenglish.img*.

```
cd /etc/xen
sudo mkdir images
cd images
sudo dd if=/dev/zero of=windows8consumerpreview64-bitenglish.img bs=1024k seek=20000 \
count=0
```

```
cd /etc/xen
sudo nano Windows8ConsumerPreview64bitEnglish

# XL domain configuration file for Windows 8 Consumer Preview 64-bit English HVM domU
# Please refer to "man xl.cfg" for further explanations.
# See also docs/misc/xl-network-configuration.markdown and
# docs/misc/xl-disk-configuration.txt

# Written by Teo En Ming (Zhang Enming)
# Email: teo.en.ming@gmail.com
```

```
# Mobile Phone: +65-8369-2618
# Country: Singapore
# Date: 18 Mar 2012 Sun

name="Windows8ConsumerPreview64bitEnglish"
# Product Key: DNJXJ-7XBW8-2378T-X22TX-BKG7J

builder="hvm"

vcpus=2

memory=1024

on_poweroff="destroy"
on_reboot="restart"
on_crash="destroy"

disk=[ 'format=raw, vdev=hda, access=rw, target=/etc/xen/images/windows8consumerpreview64-
bitenglish.img', 'format=raw, vdev=hdc, access=ro, devtype=cdrom, target=/home/teo-en-
ming/Downloads/Windows8-ConsumerPreview-64bit-English.iso' ]

vif=[ 'bridge=virbr0,type=ioemu,model=e1000' ]

#boot=[c|d|n]
#       Selects the emulated virtual device to boot from. Options are hard disk (c), cd-rom (d) or
network/PXE (n).
#       Multiple options can be given and will be attempted in the order they are given. e.g. to
boot from cd-rom
#       but fallback to the hard disk you can give dc. The default is cd.

boot="dc"

acpi=1

xen_platform_pci=1

viridian=1

stdvga=1

vnc=1
vnclisten="localhost"
vncdisplay=0
vncunused=1
vncpasswd=""
sdl=0

usb=1
usbdevice="tablet"
```

```
gfx_passthru=0
```

```
sudo xl create -c Windows8ConsumerPreview64bitEnglish
```

```
sudo apt-get install xtightvncviewer  
xtightvncviewer localhost
```

12 XL Domain Configuration File for Windows XP Home Edition SP3 HVM domU

```
# XL domain configuration file for Windows XP Home Edition SP3 HVM domU  
# Please refer to "man xl.cfg" for further explanations.  
# See also docs/misc/xl-network-configuration.markdown and  
# docs/misc/xl-disk-configuration.txt  
  
# Written by Teo En Ming (Zhang Enming)  
# Email: teo.en.ming@gmail.com  
# Mobile Phone: +65-8369-2618  
# Country: Singapore  
# Date: 18 Mar 2012 Sun  
  
name="WindowsXPHomeEditionSP3"  
  
builder="hvm"  
  
vcpus=2  
  
memory=1024  
  
on_poweroff="destroy"  
on_reboot="restart"  
on_crash="destroy"  
  
disk=[ 'format=raw, vdev=hda, access=rw, target=/var/lib/libvirt/images/Windows-XP-Home-  
Edition.img' ]  
  
vif=[ 'bridge=virbr0,type=ioemu,model=rtl8139' ]  
  
#boot=[c|d|n]  
#     Selects the emulated virtual device to boot from. Options are hard disk (c), cd-rom (d) or  
network/PXE (n).  
#     Multiple options can be given and will be attempted in the order they are given. e.g. to  
boot from cd-rom  
#     but fallback to the hard disk you can give dc. The default is cd.  
  
boot="dc"  
  
acpi=1
```

```
xen_platform_pci=1

viridian=1

stdvga=1

vnc=1
vnclisten="localhost"
vncdisplay=1
vncunused=1
vncpasswd=""
sdl=0

usb=1
usbdevice="tablet"

gfx_passthru=0
```

13 XL Domain Configuration File for Fedora 16 x86_64 PV domU

NOTE: Paravirtualized (PV) guests will only work with Xen 4.1.3-rc1-pre and NOT Xen 4.2-unstable changeset 25070.

NOT REQUIRED: You will need to install apache2 and create a local http mirror.

```
NOT REQUIRED:
sudo apt-get install apache2
sudo service apache2 start
cd /var/www
sudo ln -s /media/fedora/ .
```

NOT REQUIRED: HTTP Installation URL: <http://192.168.122.1/fedora/>

```
cd /media
sudo mkdir fedora
cd ~/Downloads
sudo mount -o loop Fedora-16-x86\_64-DVD.iso /media/fedora
cd
mkdir -p vms/f16
cd /media/fedora/images/pxeboot
cp vmlinuz initrd.img ~/vms/f16/
```

```
sudo nano /etc/xen/Fedora16x86_64
```

```
# Kernel image to boot
kernel = "/home/teo-en-ming/vms/f16/vmlinuz"

# Ramdisk (optional)
ramdisk = "/home/teo-en-ming/vms/f16/initrd.img"

#bootloader="pygrub"
```

```
cd /etc/xen/images/
sudo dd if=/dev/zero of=fedora16x86_64.img bs=1024k seek=10000 count=0
```

To install Fedora 16 x86_64 as a paravirtualized guest domain,

```
sudo xl create -c Fedora16x86_64
```

After installing Fedora 16 x86_64 PV domU,

```
sudo nano /etc/xen/Fedora16x86_64
```

```
# Kernel image to boot
#kernel = "/home/teo-en-ming/vms/f16/vmlinuz"

# Ramdisk (optional)
#ramdisk = "/home/teo-en-ming/vms/f16/initrd.img"

bootloader="pygrub"
```

```
# NOTE: Paravirtualized guests will only work with Xen 4.1.3-rc1-pre
# and NOT Xen 4.2-unstable changeset 25070.
#
# XL domain configuration file for Fedora 16 x86_64 PV domU
# Please refer to "man xl.cfg" for further explanations.
# See also docs/misc/xl-network-configuration.markdown and
# docs/misc/xl-disk-configuration.txt

# Written by Teo En Ming (Zhang Enming)
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# Mobile Phone: +65-8369-2618
# Country: Singapore
# Date: 19 Mar 2012 Mon

name="Fedora16x86_64"

builder="generic"

vcpus=2
```

```
# Minimum memory of 768 MB is required to install Fedora 16 x86_64
#memory=768
memory=512

on_poweroff="destroy"
on_reboot="restart"
on_crash="destroy"

# Format compatible with Xen 4.2-unstable
#disk=[ 'format=raw, vdev=hda, access=rw, target=/etc/xen/images/fedora16x86_64.img' ]
# Format compatible with Xen 4.1.3-rc1-pre
disk=[ 'file:/etc/xen/images/fedora16x86_64.img,hda,w' ]

# Keywords type and model are reserved for HVM guests and NOT valid for PV guests
vif=[ 'bridge=virbr0' ]

# Virtual frame buffer parameter is for paravirtualized guests only.
vfb=[ 'vnc=1,vnclisten=localhost,vncdisplay=2,vncunused=1,vncpasswd=,sdl=0' ]

gfx_passthru=0

# Step 1
# To install Fedora 16 x86_64 PV domU, configure the kernel, ramdisk, and extra keys below and
comment out bootloader.

# Kernel image to boot
#kernel = "/home/teo-en-ming/vms/f16/vmlinuz"

# Ramdisk (optional)
#ramdisk = "/home/teo-en-ming/vms/f16/initrd.img"

# Kernel command line options
#extra = "root=/dev/xvda1"

# Step 2
# To boot the already installed Fedora 16 x86_64 PV domU, comment out the parameters in Step 1
and uncomment bootloader below.

bootloader="pygrub"
```

After you login to Fedora 16 x86_64 PV domU in the text console, execute “startx” to start GNOME. Please note that GNOME3 cannot start due to poor graphics performance. Then

```
xtightvncviewer localhost:2
```

14 XL Domain Configuration File for Ubuntu 12.04 Precise Pangolin Beta 1 amd64 HVM domU

NOTE: Ubuntu 12.04 Beta 1 amd 64 HVM domU installation hanged while copying files.

```
# This configuration file will only work with Xen 4.1.3-rc1-pre and NOT
# Xen 4.2-unstable due to the disk parameter.
#
# XL domain configuration file for Ubuntu 12.04 Precise Pangolin Beta 1 amd64 HVM domU
# Please refer to "man xl.cfg" for further explanations.
# See also docs/misc/xl-network-configuration.markdown and
# docs/misc/xl-disk-configuration.txt

# Written by Teo En Ming (Zhang Enming)
# Email #1: teo.en.ming@gmail.com
# Email #2: teo-en-ming@teo-en-ming.com
# Mobile Phone: +65-8369-2618
# Country: Singapore
# Date: 20 Mar 2012 Tue

name="Ubuntu12.04Beta1amd64"

builder="hvm"

vcpus=2

memory=768

on_poweroff="destroy"
on_reboot="restart"
on_crash="destroy"

# Format compatible with Xen 4.2-unstable changeset 25070 only.
#disk=[ 'format=raw, vdev=hda, access=rw, target=/var/lib/libvirt/images/Ubuntu-12.04-beta1-
amd64.img', 'format=raw, vdev=hdc, access=ro, devtype=cdrom, target=/home/teo-en-
ming/Downloads/ubuntu-12.04-beta1-dvd-amd64.iso' ]
# Format compatible with Xen 4.1.3-rc1-pre only.
disk=[ 'file:/var/lib/libvirt/images/Ubuntu-12.04-beta1-amd64.img,hda,w', 'file:/home/teo-en-
ming/Downloads/ubuntu-12.04-beta1-dvd-amd64.iso,hdc:cdrom,r' ]

vif=[ 'bridge=virbr0,type=ioemu,model=e1000' ]

#boot=[c|d|n]
#       Selects the emulated virtual device to boot from. Options are hard disk (c), cd-rom (d) or
network/PXE (n).
#       Multiple options can be given and will be attempted in the order they are given. e.g. to
boot from cd-rom
#       but fallback to the hard disk you can give dc. The default is cd.

boot="dc"
```

```
#boot="c"

acpi=0

#xen_platform_pci=1

#viridian=1

stdvga=0

vnc=1
vnclisten="localhost"
vncdisplay=3
vncunused=1
vncpasswd=""
sdl=0

usb=1
#usbdevice="tablet"

gfx_passthru=0
```

15 Xen VGA Passthrough to HVM Guest Operating Systems

Please refer to David Techer's blog for his excellent How To/tutorial/documentation on patching Xen 4.2-unstable to support Xen VGA passthrough to HVM domU/virtual machines.

Hardware Requirements

NVIDIA PCI-Express x16 graphics card

Article: Xen 4.2.unstable: Patches/Notes for VGA Pass Through and NVIDIA

URL: <http://www.davidgis.fr/blog/index.php?2011/12/07/860-xen-42unstable-patches-for-vga-pass-through>