

Virtualizando con Xen

Taller práctico: Compilación, instalación y configuración de Xen 3.4.3 y herramientas de control y gestión en GNU/Linux Debian

por @**canonigos**



Instalación del Sistema Operativo

- Empezaremos el taller con una instalación limpia (standard base) del sistema operativo GNU/Linux Debian '*Lenny*' 64bits a la que accederemos mediante ssh (OpenSSH(tcp_22))
- Necesitamos una partición con soporte LVM donde alojaremos nuestras máquinas virtuales (vserver)
- Ver presentación: InstalaciónDebianConSoporteLVM.pdf
- **Ojo!**: Si vas a usar una máquina con un sistema operativo existente, te aconsejo que hagas copias de seguridad de todos los datos que creas importantes.
- **Ojo!**: La instalación propuesta en la presentación 'InstalacionDebianConSoporteLVM.pdf' está pensada para una máquina de test. Para sistemas en producción sería conveniente utilizar otro esquema de particiones y tener distintas consideraciones de seguridad que no se tratan aquí.

Objetivo

- Compilaremos e instalaremos una versión actualizada (3.4.3) de Xen sobre GNU/Linux Debian ya que ésta trae como binario en sus repositorios la versión de Xen 3.2.1 además de las herramientas necesarias para la gestión y control.
- Utilizaremos el kernel 2.6.26-1-amd64-xen tanto para dom0 como para los domU's que viene como binario en la distribución.
- Utilizaremos un grupo de volúmenes LVM para almacenar las imágenes de las máquinas virtuales. (Se pueden usar ficheros de imagen, dispositivos de bloques o recursos en red de tipo nfs, iscsi o aoe).
- Configuraremos Xen-Tools e instalaremos una máquina virtual con dicha herramienta.
- Operaremos sobre la máquina virtual mediante la interfaz de consola xm y veremos distintas tareas.
- Si nos da tiempo veremos como virtualizar un sistema operativo mediante HVM.

Comprobar soporte VMX/SVM

```
Terminal — ssh — 80x24
virtual:~# egrep '(vmx|svm)' --color=always /proc/cpuinfo
flags          : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx lm constant
_tsc arch_perfmon pebs bts rep_good pni monitor ds_cpl vmx est tm2 ssse3 cx16 xt
pr lahf_lm ida
flags          : fpu vme de pse tsc msr pae mce cx8 apic sep mtrr pge mca cmov
pat pse36 clflush dts acpi mmx fxsr sse sse2 ss ht tm pbe syscall nx lm constant
_tsc arch_perfmon pebs bts rep_good pni monitor ds_cpl vmx est tm2 ssse3 cx16 xt
pr lahf_lm ida
virtual:~#
```

Prerequisitos para la Compilación

```
Terminal — ssh — 80x24
virtual:~# aptitude install bcc bin86 gawk bridge-utils iproute libcurl3 libcurl
4-openssl-dev bzip2 module-init-tools transfig tgif texinfo pciutils-dev mercuri
al build-essential zlib1g-dev python python-dev python-twisted libncurses5-dev l
ibvncserver-dev libsdl-dev libjpeg62-dev ntp debootstrap perl rinse rpm gcc-mult
ilib libconfig-inifiles-perl libtext-template-perl
```

Buscar Kernel

```
Terminal — ssh — 80x24
virtual:~# apt-cache search linux-image-2.6.26-*|grep xen
linux-headers-2.6.26-1-xen-amd64 - Header files for Linux 2.6.26-1-xen-amd64
linux-headers-2.6.26-2-xen-amd64 - Header files for Linux 2.6.26-2-xen-amd64
linux-image-2.6.26-1-xen-amd64 - Linux 2.6.26 image on AMD64, oldstyle Xen support
linux-image-2.6.26-2-xen-amd64 - Linux 2.6.26 image on AMD64, oldstyle Xen support
virtual:~#
```

Instalar Kernel 2.6.26-1-amd64-xen para dom0 y domU's

```
Terminal — ssh — 80x24
virtual:~# aptitude install linux-image-2.6.26-1-xen-amd64
Reading package lists... Done
Building dependency tree
Reading state information... Done
Reading extended state information
Initializing package states... Done
Reading task descriptions... Done
The following NEW packages will be installed:
  linux-image-2.6.26-1-xen-amd64 linux-modules-2.6.26-1-xen-amd64{a}
0 packages upgraded, 2 newly installed, 0 to remove and 0 not upgraded.
Need to get 21.1MB of archives. After unpacking 84.4MB will be used.
Do you want to continue? [Y/n/?] 
```

Descargar código fuente de Xen, Xen-Tools y Xen-Shell

```
Terminal — ssh — 87x24

virtual:/usr/src# wget http://bits.xensource.com/oss-xen/release/3.4.3/xen-3.4.3.tar.gz
--2010-11-10 01:06:28-- http://bits.xensource.com/oss-xen/release/3.4.3/xen-3.4.3.tar.gz
Resolving bits.xensource.com... 92.123.78.33, 92.123.78.72
Connecting to bits.xensource.com|92.123.78.33|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11203069 (11M) [application/x-gzip]
Saving to: `xen-3.4.3.tar.gz'

62% [=====>] 6,994,881 1.01M/s eta 5s
```

Descargar código fuente de Xen, Xen-Tools y Xen-Shell

```
Terminal — ssh — 87x24
virtual:/usr/src# wget http://xen-tools.org/software/xen-tools/xen-tools-4.2.tar.gz
--2010-11-10 01:07:07-- http://xen-tools.org/software/xen-tools/xen-tools-4.2.tar.gz
Resolving xen-tools.org... 85.10.207.172
Connecting to xen-tools.org|85.10.207.172|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 235191 (230K) [application/x-gzip]
Saving to: `xen-tools-4.2.tar.gz'

100%[----->] 235,191      368K/s   in 0.6s

2010-11-10 01:07:08 (368 KB/s) - `xen-tools-4.2.tar.gz' saved [235191/235191]

virtual:/usr/src#
```

Descargar código fuente de Xen, Xen-Tools y Xen-Shell

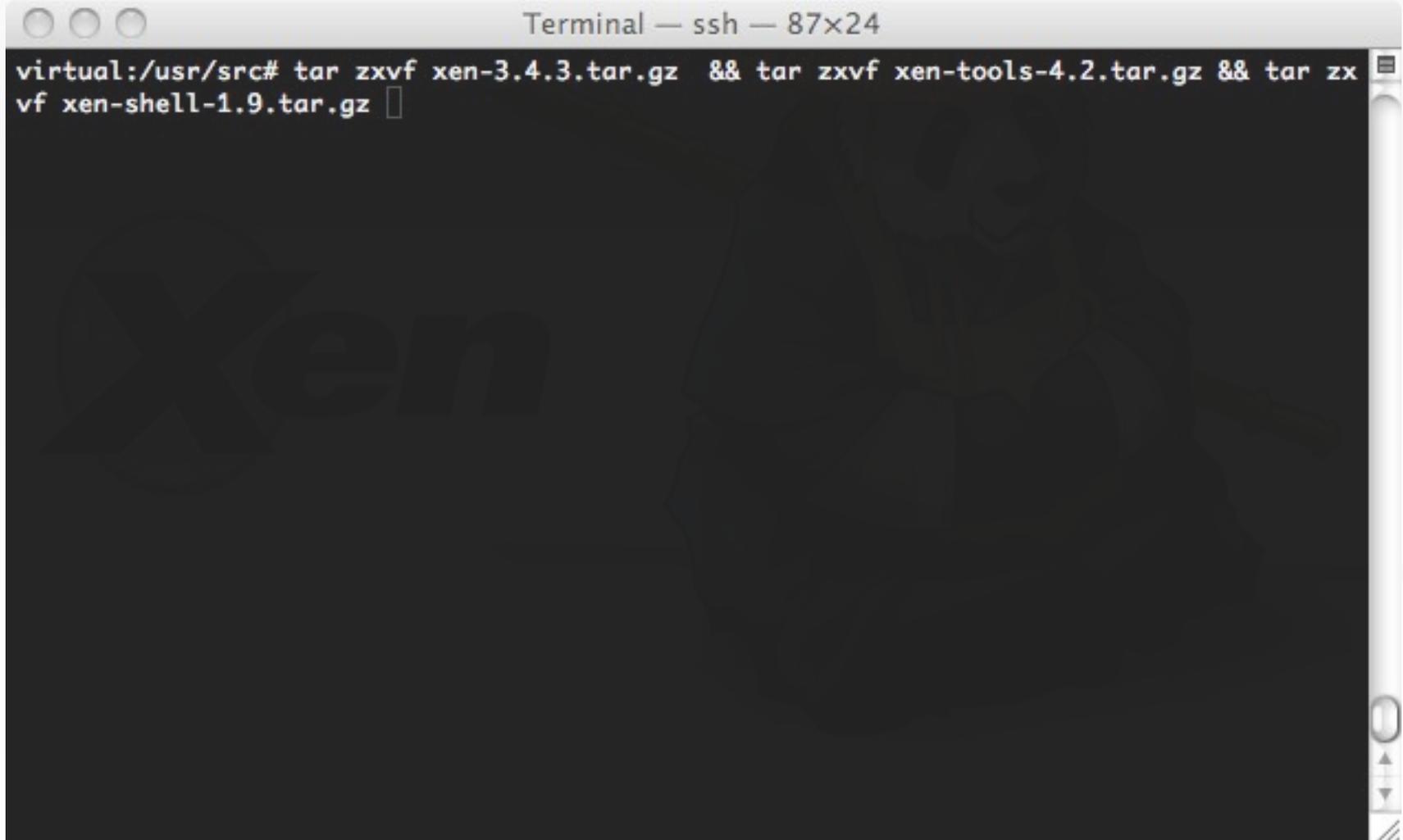
```
Terminal — ssh — 87x24
virtual:/usr/src# wget http://www.xen-tools.org/software/xen-shell/xen-shell-1.9.tar.gz
--2010-11-10 01:07:51-- http://www.xen-tools.org/software/xen-shell/xen-shell-1.9.tar.gz
Resolving www.xen-tools.org... 85.10.207.172
Connecting to www.xen-tools.org|85.10.207.172|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 207947 (203K) [application/x-gzip]
Saving to: `xen-shell-1.9.tar.gz'

100%[=====>] 207,947      349K/s  in 0.6s

2010-11-10 01:07:52 (349 KB/s) - `xen-shell-1.9.tar.gz' saved [207947/207947]

virtual:/usr/src#
```

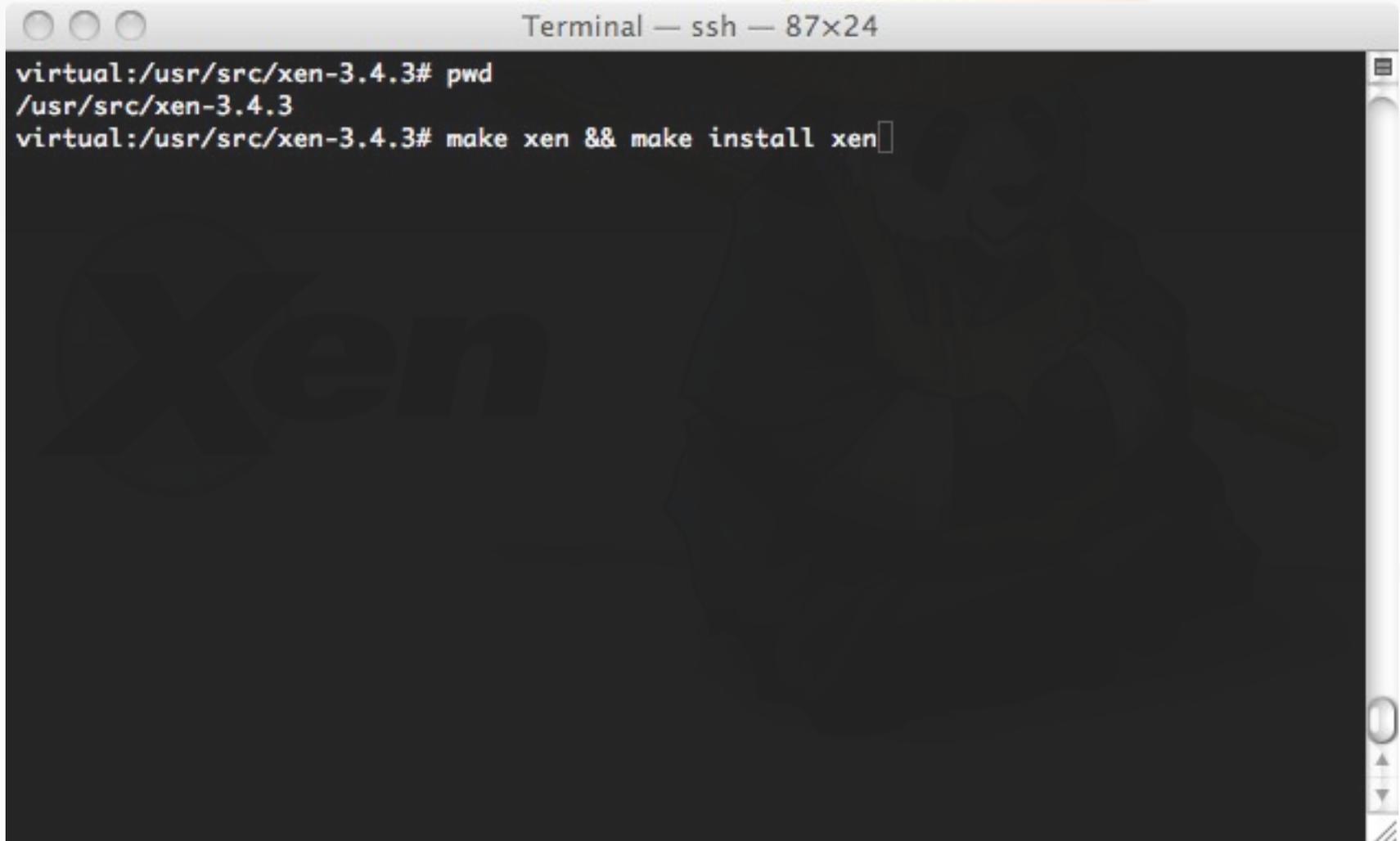
Descomprimir tarballs



A terminal window titled "Terminal — ssh — 87x24" is shown. The prompt is "virtual:/usr/src#". The command entered is "tar zxvf xen-3.4.3.tar.gz && tar zxvf xen-tools-4.2.tar.gz && tar zxvf xen-shell-1.9.tar.gz". The terminal is otherwise empty.

```
Terminal — ssh — 87x24
virtual:/usr/src# tar zxvf xen-3.4.3.tar.gz && tar zxvf xen-tools-4.2.tar.gz && tar zxvf xen-shell-1.9.tar.gz
```

Compilar e Instalar Xen



A terminal window titled "Terminal — ssh — 87x24" showing the following commands and output:

```
virtual:/usr/src/xen-3.4.3# pwd
/usr/src/xen-3.4.3
virtual:/usr/src/xen-3.4.3# make xen && make install xen
```

Compilación 2.6.18-xen-hg

```
Terminal — ssh — 87x24
Processor family
  1. AMD-Opteron/Athlon64 (MK8)
  2. Intel EM64T (MP5C)
> 3. Generic-x86-64 (GENERIC_CPU)
choice[1-3]: 3
Enable Xen compatible kernel (X86_64_XEN) [Y/n/?] y
/dev/cpu/microcode - Intel CPU microcode support (MICROCODE) [Y/n/m/?] y
/dev/cpu/*/msr - Model-specific register support (X86_MSR) [M/n/y/?] m
/dev/cpu/*/cpuid - CPU information support (X86_CPUID) [M/n/y/?] m
MTRR (Memory Type Range Register) support (MTRR) [Y/n/?] y
Symmetric multi-processing support (SMP) [Y/n/?] y
Preemption Model
  1. No Forced Preemption (Server) (PREEMPT_NONE)
> 2. Voluntary Kernel Preemption (Desktop) (PREEMPT_VOLUNTARY)
choice[1-2]: 2
Preempt The Big Kernel Lock (PREEMPT_BKL) [Y/n/?] y
Memory model
> 1. Flat Memory (FLATMEM_MANUAL)
choice[1]: 1
Cache clean pages in transcendent memory (PRECACHE) [N/y/?] (NEW)
Swap pages to transcendent memory (PRESWAP) [N/y/?] (NEW)
Maximum number of CPUs (2-256) (NR_CPUS) [32] 32
Support for hot-pluggable CPUs (EXPERIMENTAL) (HOTPLUG_CPU) [Y/n/?] y
Machine check support (X86_MCE) [Y/n/?] (NEW) 
```

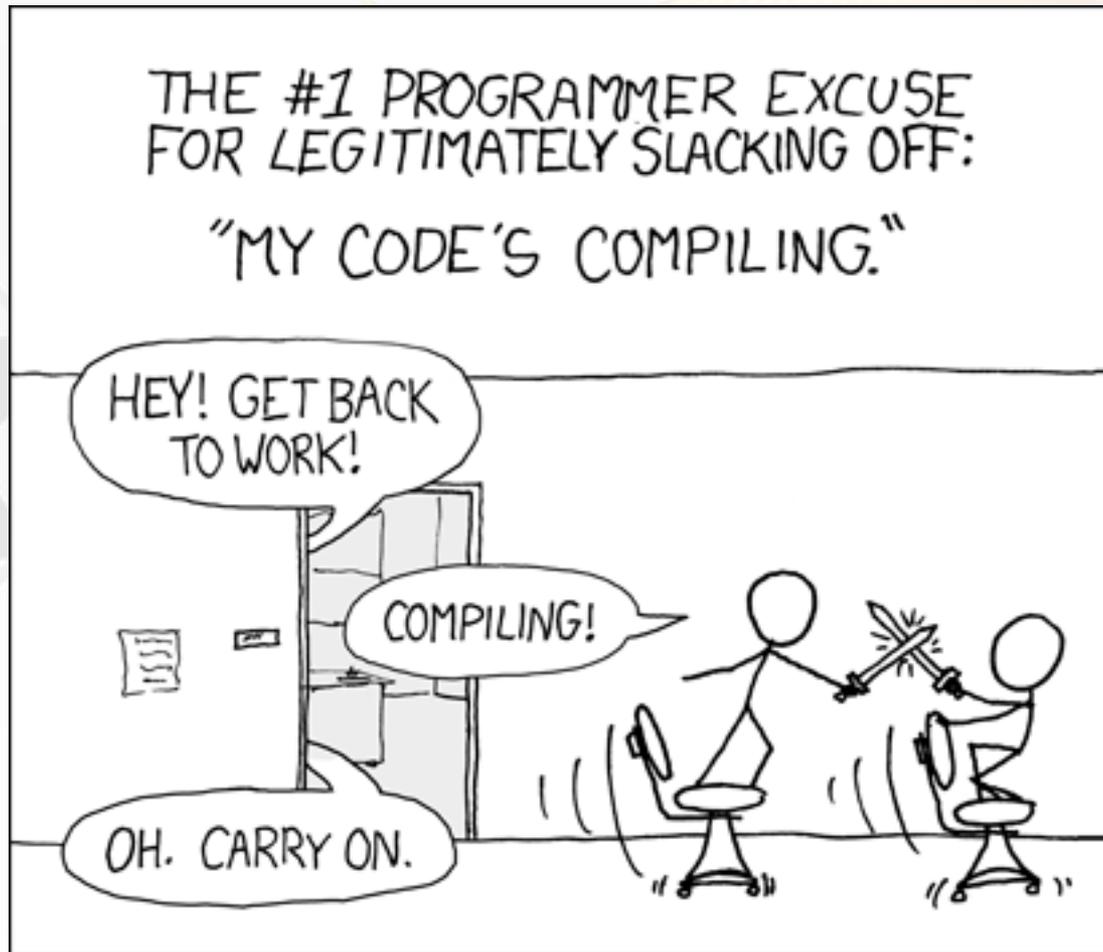
Cocinando Xen

THE #1 PROGRAMMER EXCUSE
FOR LEGITIMATELY SLACKING OFF:
"MY CODE'S COMPILING."

HEY! GET BACK
TO WORK!

COMPILING!

OH. CARRY ON.



htop del equipo durante compilación

```
Terminal — bash — 80x24

1  [|||||] 33.6% Tasks: 42 total, 2 running
2  [|||||] 70.0% Load average: 0.58 0.38 0.21
Mem [|||||] 205/3897MB Uptime: 00:39:18
Swp [|||||] 0/11421MB

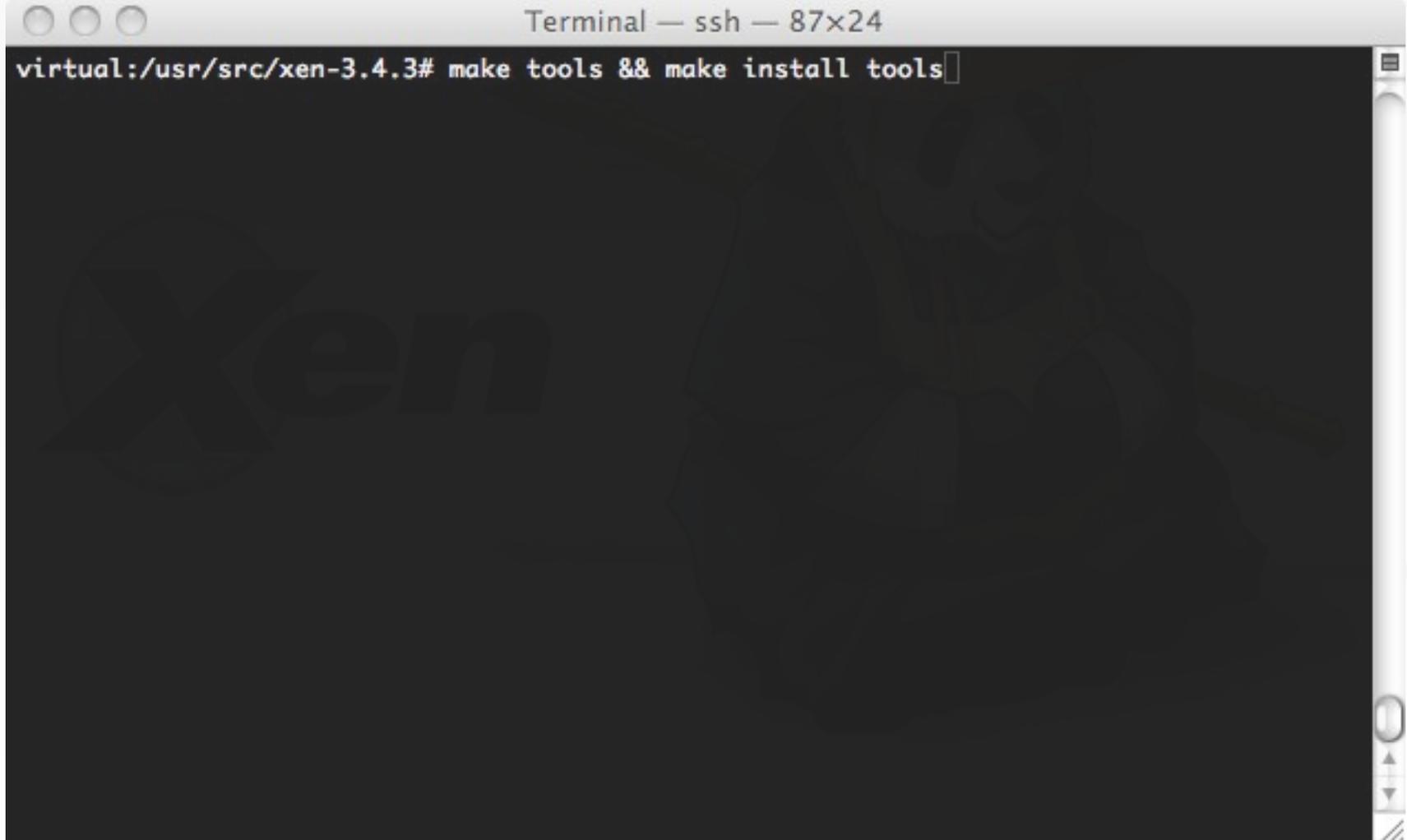
PID USER PRI NI VIRT RES SHR S CPU% MEM% TIME+ Command
2189 root 20 0 12688 4572 936 S 100.0 0.1 0:00.00 as -Qy --64 -o fs/
2188 root 20 0 31696 16368 2636 R 8.0 0.4 0:00.12 /usr/lib/gcc/x86_6
1778 root 20 0 19220 1276 992 R 0.0 0.0 0:00.02 htop
30161 root 20 0 19216 1288 996 S 0.0 0.0 0:00.66 htop
1 root 20 0 10316 752 624 S 0.0 0.0 0:00.76 init [2]
543 root 20 0 10128 1264 1068 S 0.0 0.0 0:00.00 /bin/sh -c for i i
544 root 20 0 9564 1076 776 S 0.0 0.0 0:00.00 make linux-2.6-xen
569 root 20 0 9548 1060 776 S 0.0 0.0 0:00.00 make -f buildconfi
961 root 20 0 10132 1280 1080 S 0.0 0.0 0:00.00 /bin/sh -c if grep
966 root 20 0 9432 1004 772 S 0.0 0.0 0:00.00 make -C build-linu
967 root 20 0 9428 996 752 S 0.0 0.0 0:00.00 make -C /usr/src/x
970 root 20 0 10768 2336 820 S 0.0 0.1 0:00.02 make -C /usr/src/x
1170 root 16 -4 16936 1168 492 S 0.0 0.0 0:00.18 udevd --daemon
1343 root 20 0 9824 1364 752 S 0.0 0.0 0:00.00 make -f /usr/src/x
1560 root 20 0 65932 3104 2476 S 0.0 0.1 0:00.00 sshd: root@pts/1
1648 root 20 0 18772 1836 1352 S 0.0 0.0 0:00.00 -bash

F1 Help F2 Setup F3 Search F4 Invert F5 Tree F6 SortBy F7 Nice - F8 Nice + F9 Kill F10 Quit
```

Compilación finalizada con éxito

```
Terminal — ssh — 87x24
om/mini-os-x86_32-grub/lib/xmalloc.o /usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/lib
/xs.o /usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/xenbus/xenbus.o /usr/src/xen-3.4.3
/stubdom/mini-os-x86_32-grub/console/console.o /usr/src/xen-3.4.3/stubdom/mini-os-x86_3
2-grub/console/xencons_ring.o -L/usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/arch/x86
-lx86_32 -lc -o /usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/mini-os.o
objcopy -w -G xenos_* -G _start /usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/mini-os.
o /usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/mini-os.o
ld -nostdlib -L/usr/src/xen-3.4.3/stubdom/cross-root-i686/i686-xen-elf/lib -m elf_i386
-T arch/x86/minios-x86_32.lds /usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/mini-os.o
-o /usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/mini-os
gzip -f -9 -c /usr/src/xen-3.4.3/stubdom/mini-os-x86_32-grub/mini-os >/usr/src/xen-3.4.
3/stubdom/mini-os-x86_32-grub/mini-os.gz
make[2]: Leaving directory `/usr/src/xen-3.4.3/extras/mini-os'
install -d -m0755 -p "/usr/lib/xen/boot"
install -m0644 -p mini-os-x86_32-grub/mini-os.gz "/usr/lib/xen/boot/pv-grub-x86_32.gz"
make[1]: Leaving directory `/usr/src/xen-3.4.3/stubdom'
sh ./docs/check_pkgs && make -C docs install || true
=====
=====
= WARNING: Package 'latex' is required
=         to build Xen documentation
=====
=====
virtual:/usr/src/xen-3.4.3#
```

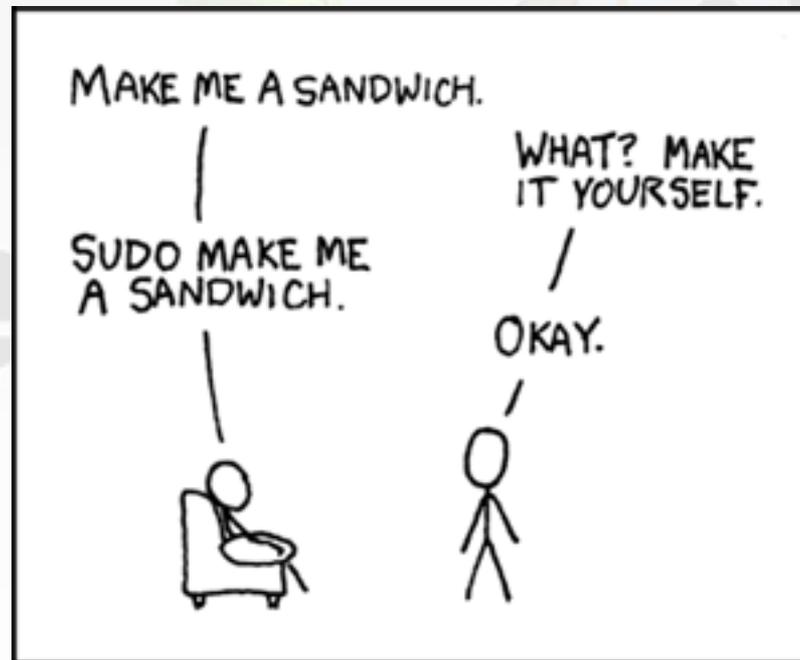
Compilar e instalar Herramientas



A terminal window titled "Terminal — ssh — 87x24" is shown. The prompt is "virtual:/usr/src/xen-3.4.3#". The command entered is "make tools && make install tools". The terminal is otherwise empty.

```
Terminal — ssh — 87x24
virtual:/usr/src/xen-3.4.3# make tools && make install tools
```

Cocinando Herramientas



<http://xkcd.com/149/>

Agregar xend y xendomains al arranque por defecto

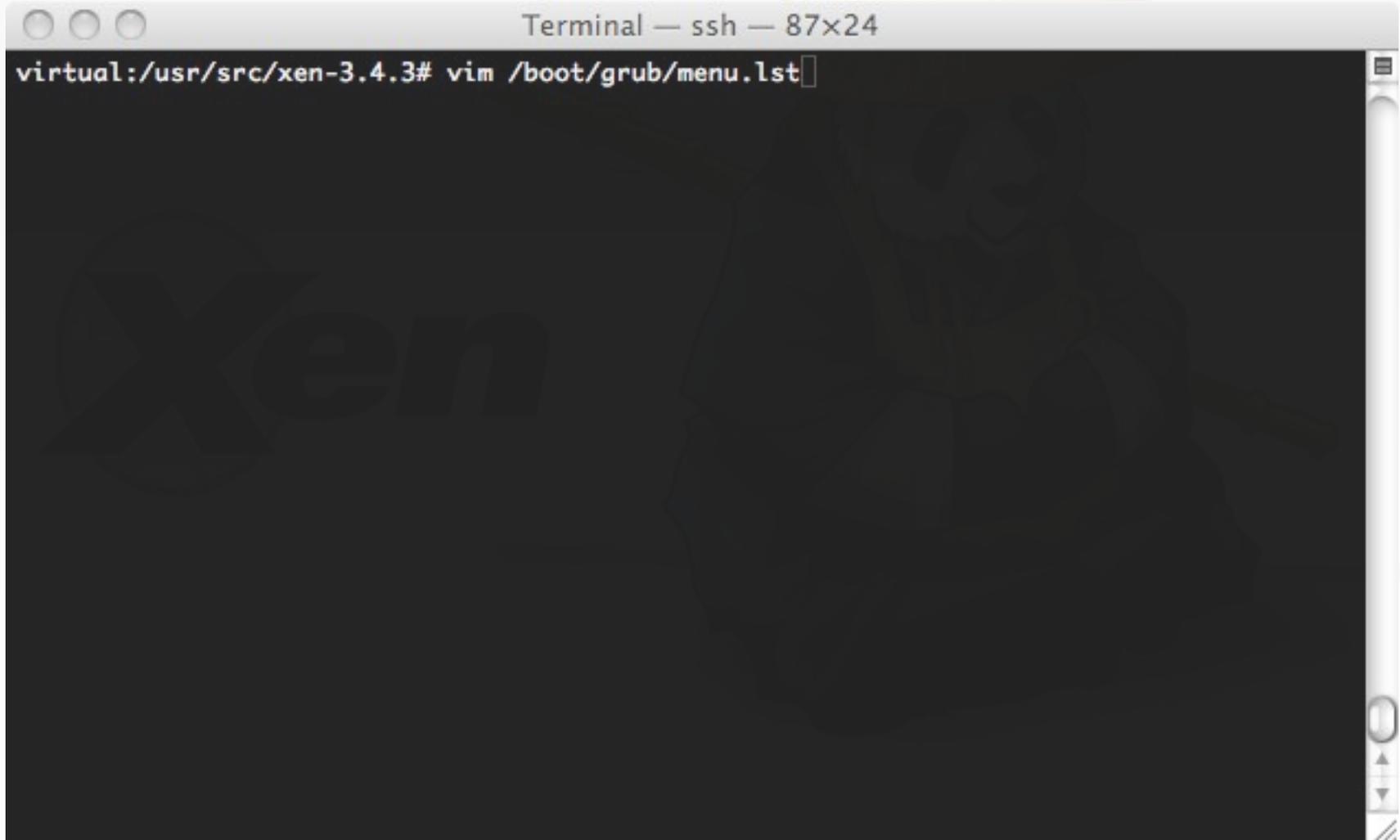
```
Terminal — ssh — 87x24
virtual:/usr/src/xen-3.4.3# update-rc.d xend defaults 20 21
Adding system startup for /etc/init.d/xend ...
/etc/rc0.d/K21xend -> ../init.d/xend
/etc/rc1.d/K21xend -> ../init.d/xend
/etc/rc6.d/K21xend -> ../init.d/xend
/etc/rc2.d/S20xend -> ../init.d/xend
/etc/rc3.d/S20xend -> ../init.d/xend
/etc/rc4.d/S20xend -> ../init.d/xend
/etc/rc5.d/S20xend -> ../init.d/xend
virtual:/usr/src/xen-3.4.3# update-rc.d xendomains defaults 21 20
Adding system startup for /etc/init.d/xendomains ...
/etc/rc0.d/K20xendomains -> ../init.d/xendomains
/etc/rc1.d/K20xendomains -> ../init.d/xendomains
/etc/rc6.d/K20xendomains -> ../init.d/xendomains
/etc/rc2.d/S21xendomains -> ../init.d/xendomains
/etc/rc3.d/S21xendomains -> ../init.d/xendomains
/etc/rc4.d/S21xendomains -> ../init.d/xendomains
/etc/rc5.d/S21xendomains -> ../init.d/xendomains
virtual:/usr/src/xen-3.4.3#
```

Actualizar gestor de arranque Grub

```
Terminal — ssh — 87x24
virtual:/usr/src/xen-3.4.3# update-grub
Searching for GRUB installation directory ... found: /boot/grub
Searching for default file ... found: /boot/grub/default
Testing for an existing GRUB menu.lst file ... found: /boot/grub/menu.lst
Searching for splash image ... none found, skipping ...
Found Xen hypervisor 3.4.3, kernel: /boot/vmlinuz-2.6.26-2-xen-amd64
Found Xen hypervisor 3.4.3, kernel: /boot/vmlinuz-2.6.18.8-xen
Found kernel: /boot/vmlinuz-2.6.26-2-xen-amd64
Found kernel: /boot/vmlinuz-2.6.26-2-amd64
Found kernel: /boot/vmlinuz-2.6.18.8-xen
Updating /boot/grub/menu.lst ... done

virtual:/usr/src/xen-3.4.3#
```

Editar configuración Grub



A terminal window titled "Terminal — ssh — 87x24" is shown. The prompt is "virtual:/usr/src/xen-3.4.3#". The command "vim /boot/grub/menu.lst" has been entered, and the cursor is at the end of the line. The terminal background is black, and the text is white. The window has a standard macOS-style title bar with three window control buttons (red, yellow, green) on the left. On the right side of the terminal, there are vertical scroll bars and a search icon.

```
Terminal — ssh — 87x24
virtual:/usr/src/xen-3.4.3# vim /boot/grub/menu.lst
```

Limitar memoria del dom0

```
Terminal — ssh — 80x24

## can be true or false
# updatedefaultentry=false

## should update-grub add savedefault to the default options
## can be true or false
# savedefault=false

## ## End Default Options ##

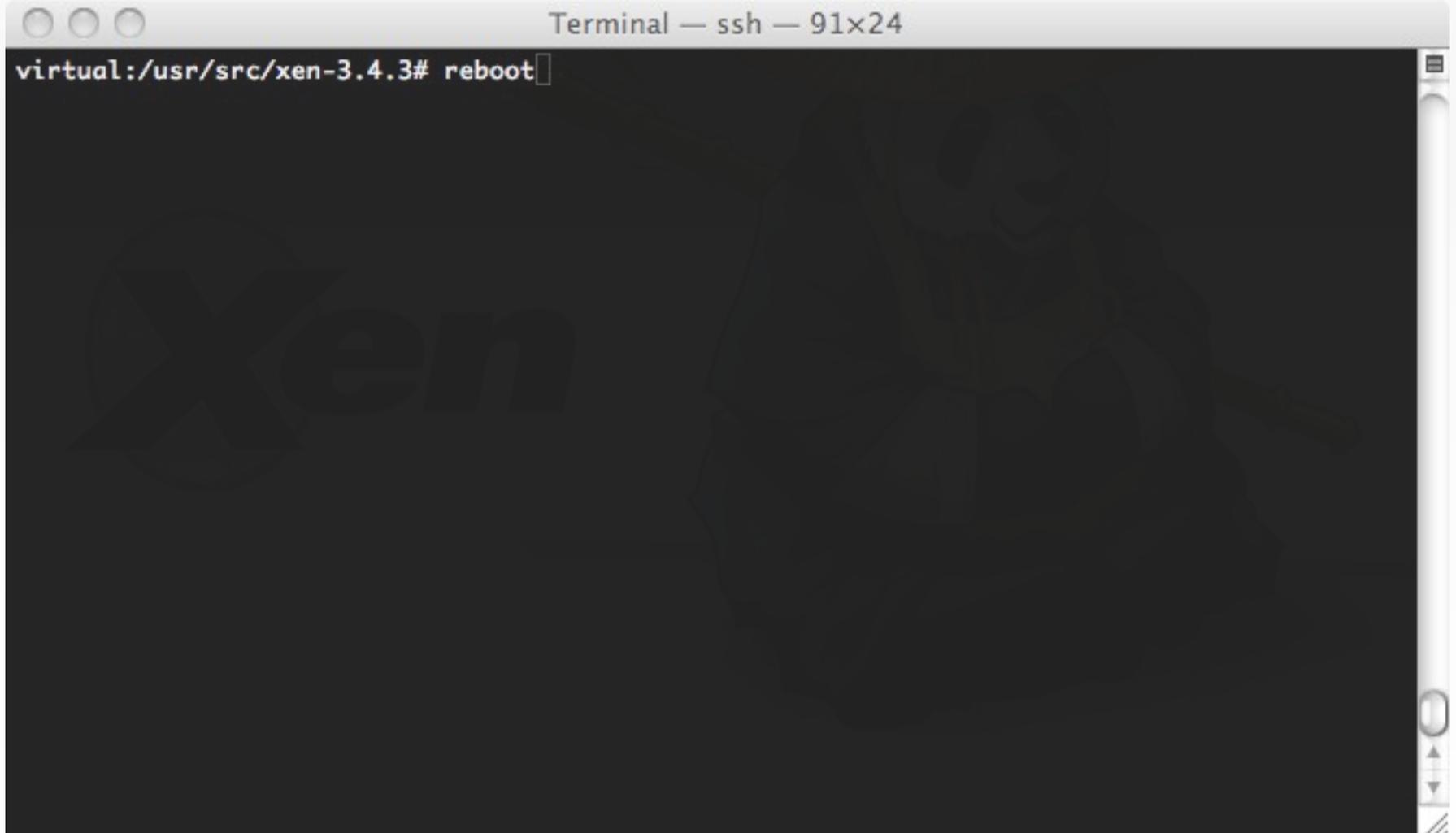
title                Xen 3.4.3 / Debian GNU/Linux, kernel 2.6.26-1-xen-amd64
root                 (hd0,0)
kernel              /boot/xen-3.4.3.gz dom0_mem=256M
module              /boot/vmlinuz-2.6.26-1-xen-amd64 root=/dev/sda1 ro console=tty0
pci=nomsimodule     /boot/initrd.img-2.6.26-1-xen-amd64

title                Xen 3.4.3 / Debian GNU/Linux, kernel 2.6.18.8-xen
root                 (hd0,0)
kernel              /boot/xen-3.4.3.gz
module              /boot/vmlinuz-2.6.18.8-xen root=/dev/sda1 ro console=tty0

title                Debian GNU/Linux, kernel 2.6.26-2-amd64
root                 (hd0,0)
```

124,28-36 80%

Reiniciar (la primera y última vez)

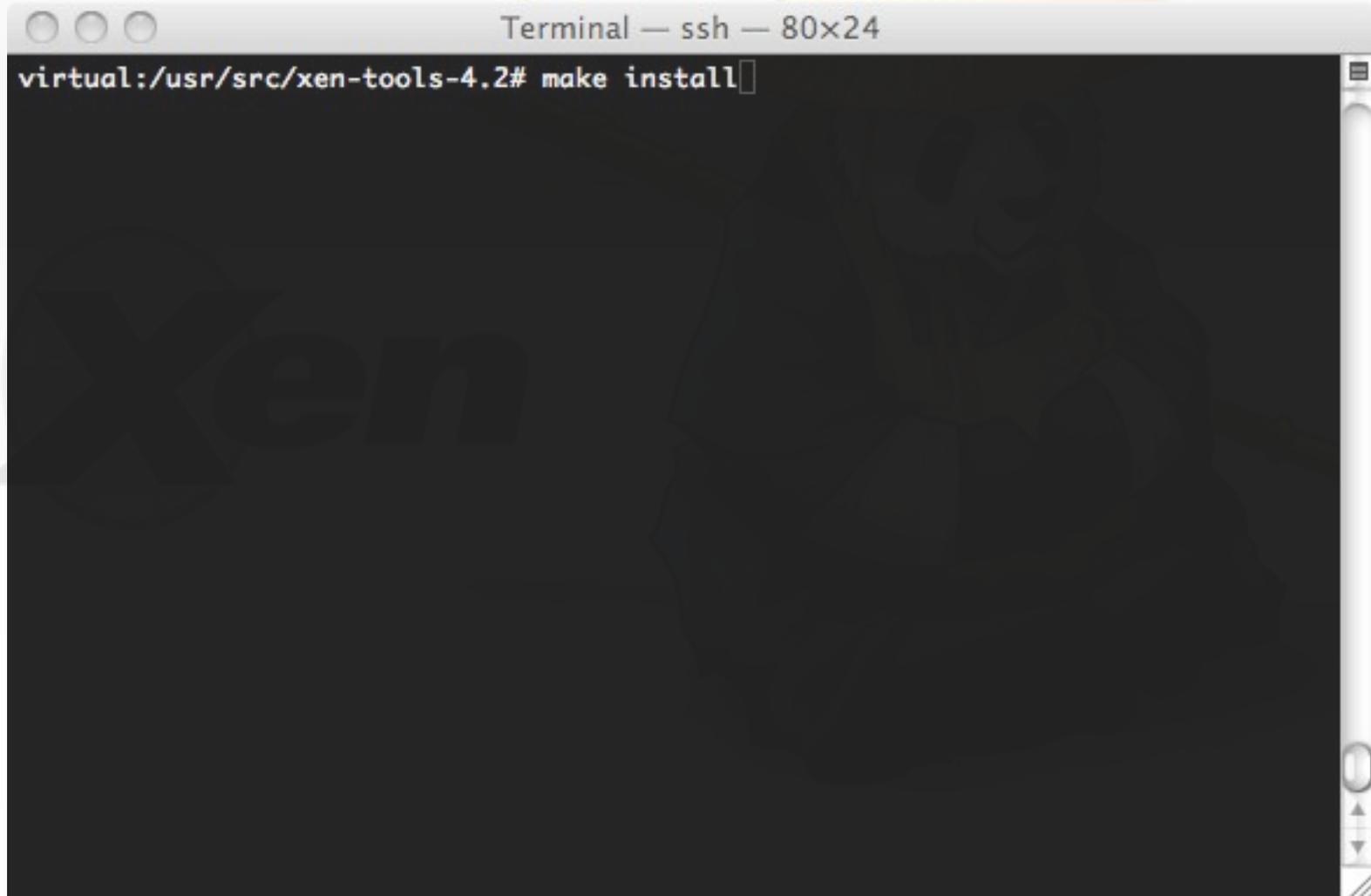
A terminal window titled "Terminal — ssh — 91x24" with a dark background. The prompt is "virtual:/usr/src/xen-3.4.3#". The command "reboot" has been entered, followed by a cursor. The terminal has standard window controls (red, yellow, green buttons) at the top left and a vertical toolbar on the right side.

```
virtual:/usr/src/xen-3.4.3# reboot
```

Comprobar *caps* del Hypervisor

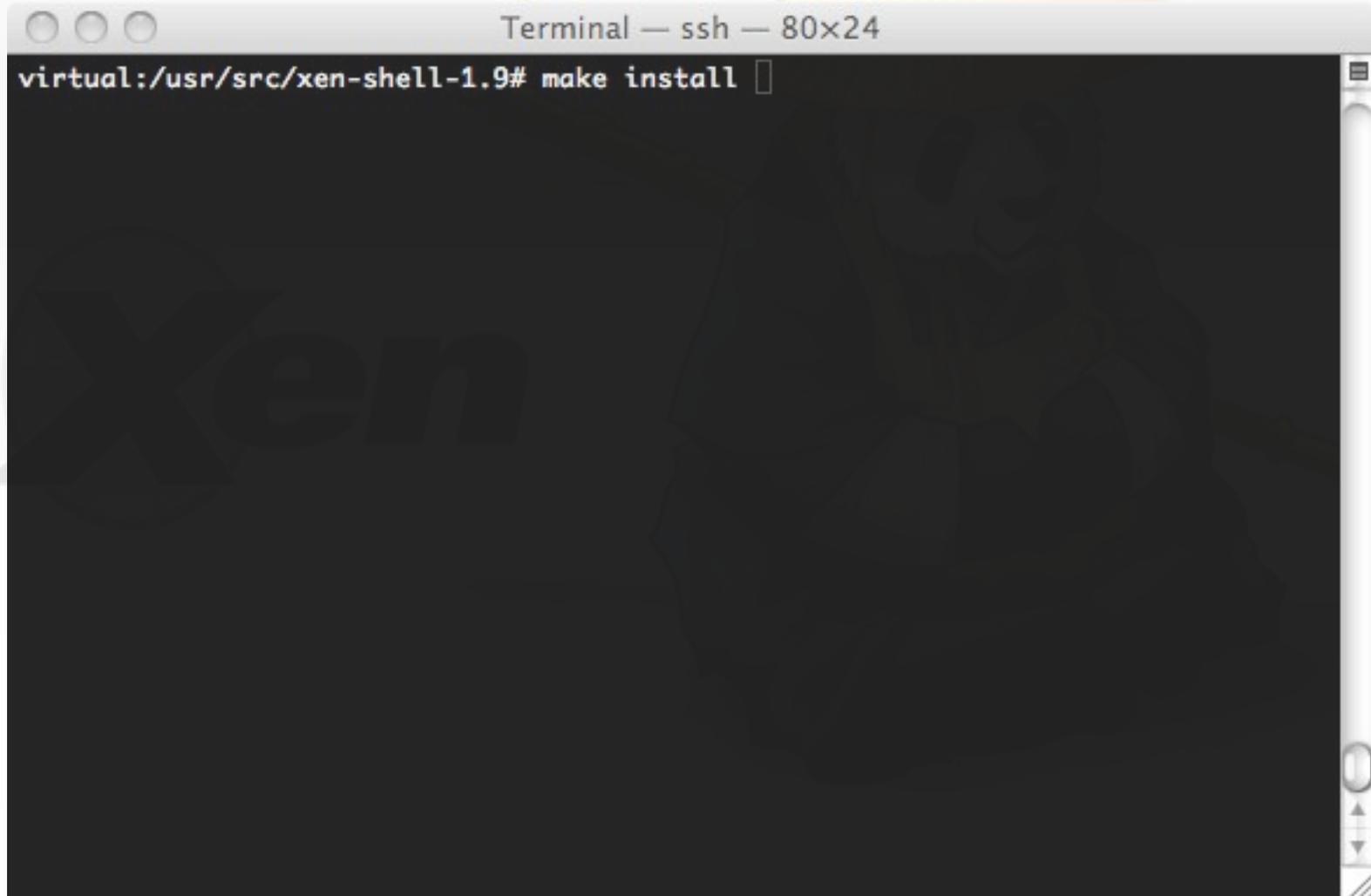
```
Terminal — ssh — 80x24
Linux virtual.canonigos.es 2.6.26-1-xen-amd64 #1 SMP Fri Mar 13 21:39:38 UTC 2009 x86_64 GNU/Linux
virtual:~# xm info
host                : virtual.canonigos.es
release             : 2.6.26-1-xen-amd64
version             : #1 SMP Fri Mar 13 21:39:38 UTC 2009
machine             : x86_64
nr_cpus             : 2
nr_nodes            : 1
cores_per_socket    : 2
threads_per_core    : 1
cpu_mhz             : 1995
hw_caps             : bfebfbff:20100800:00000000:00000140:0000e3bd:00000000:0
0000001:00000000
virt_caps           : hvm
total_memory        : 4022
free_memory         : 3708
node_to_cpu         : node0:0-1
node_to_memory      : node0:3708
xen_major           : 3
xen_minor           : 4
xen_extra           : .3
xen_caps            : xen-3.0-x86_64 xen-3.0-x86_32p hvm-3.0-x86_32 hvm-3.0-x
86_32p hvm-3.0-x86_64
```

Instalar Xen-Tools



```
Terminal — ssh — 80x24  
virtual:/usr/src/xen-tools-4.2# make install
```

Instalar Xen-Shell



```
Terminal — ssh — 80x24
virtual:/usr/src/xen-shell-1.9# make install
```

Editar configuración Xen-Tools (I)

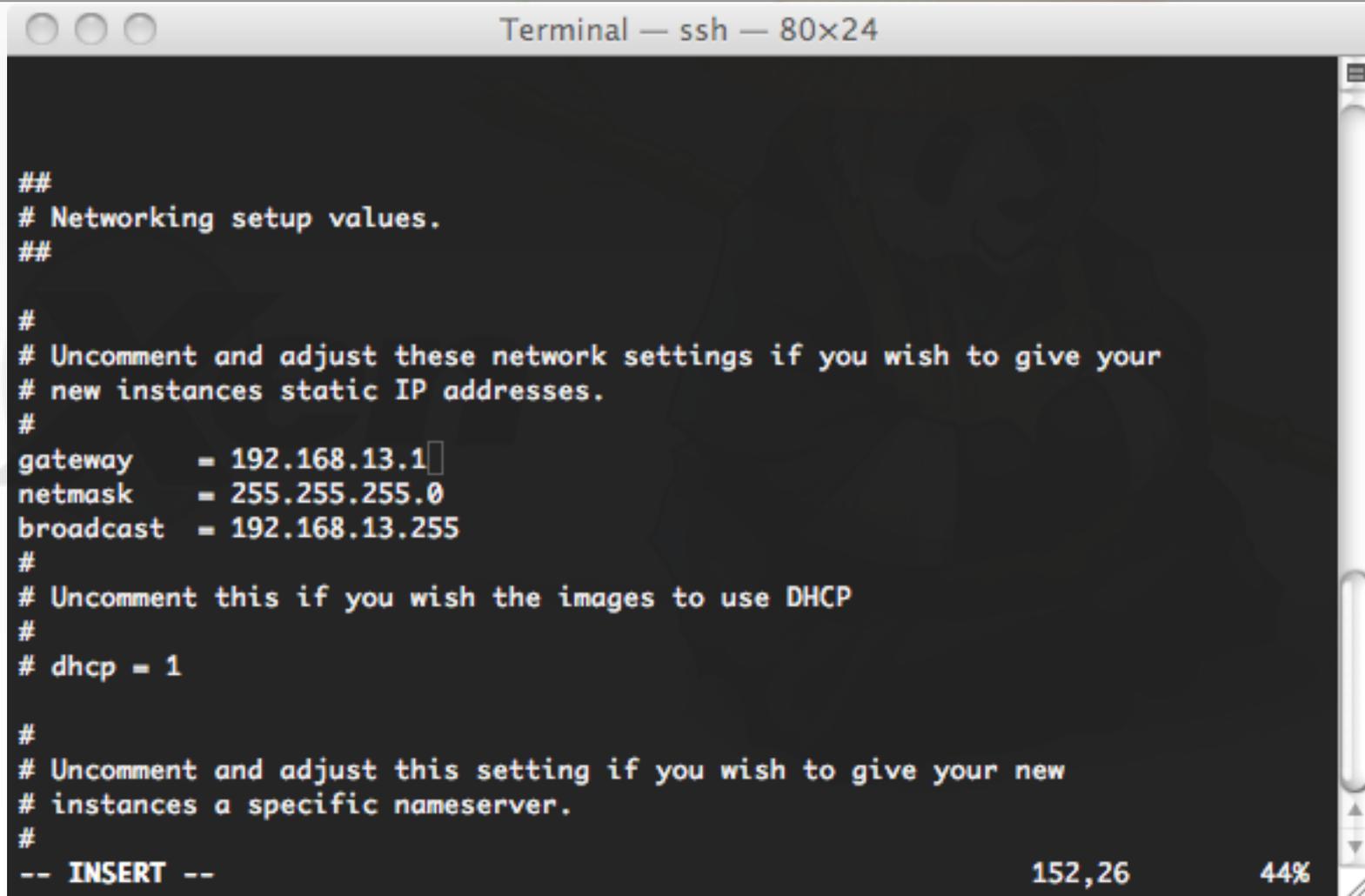
```
Terminal — ssh — 80x24
##
# Output directory for storing loopback images.
#
# If you choose to use loopback images, which are simple to manage but
# slower than LVM partitions, then specify a directory here and uncomment
# the line.
#
# New instances will be stored in subdirectories named after their
# hostnames.
#
##
# dir = /home/xen
#
#
##
# If you don't wish to use loopback images then you may specify an
# LVM volume group here instead
#
##
# lvm = vg0
lvm=vserver
-- INSERT --
```

56,12 10%

Editar configuración Xen-Tools (II)

```
Terminal — ssh — 80x24
# tar-cmd = /bin/tar --numeric-owner -xvf $src
#
#
#
##
# Disk and Sizing options.
##
#
size = 4Gb # Disk image size.
memory = 128Mb # Memory size
swap = 128Mb # Swap size
# noswap = 1 # Don't use swap at all for the new system.
fs = ext3 # use the EXT3 filesystem for the disk image.
dist = lenny # Default distribution to install.
image = sparse # Specify sparse vs. full disk images.
#
# See the README for currently supported and tested distributions. You can
# either find it in the root directory of the unpacked source or, on Debian
# and Ubuntu based systems, in /usr/share/doc/xen-tools/README.gz
-- INSERT -- 130,18 36%
```

Editar configuración Xen-Tools (III)



Terminal — ssh — 80x24

```
##  
# Networking setup values.  
##  
  
#  
# Uncomment and adjust these network settings if you wish to give your  
# new instances static IP addresses.  
#  
gateway    = 192.168.13.1  
netmask    = 255.255.255.0  
broadcast  = 192.168.13.255  
#  
# Uncomment this if you wish the images to use DHCP  
#  
# dhcp = 1  
  
#  
# Uncomment and adjust this setting if you wish to give your new  
# instances a specific nameserver.  
#  
-- INSERT --
```

152,26 44%

Editar configuración Xen-Tools (IV)

```
Terminal — ssh — 80x24
#
# You can yet change the hashing method to encrypt the generated
# password by changing the line below.
# Valid values : md5, sha256 and sha512.
#
# hash_method = sha256
#
#
# Uncomment the following line if you wish to interactively setup a
# new root password for images.
#
[passwd = 1
#
#
# If you'd like all accounts on your host system which are not present
# on the guest system to be copied over then uncomment the following line.
#
# accounts = 1
#
#
-- INSERT --
222,1 65%
```


Editar configuración Xen-Tools (VI)

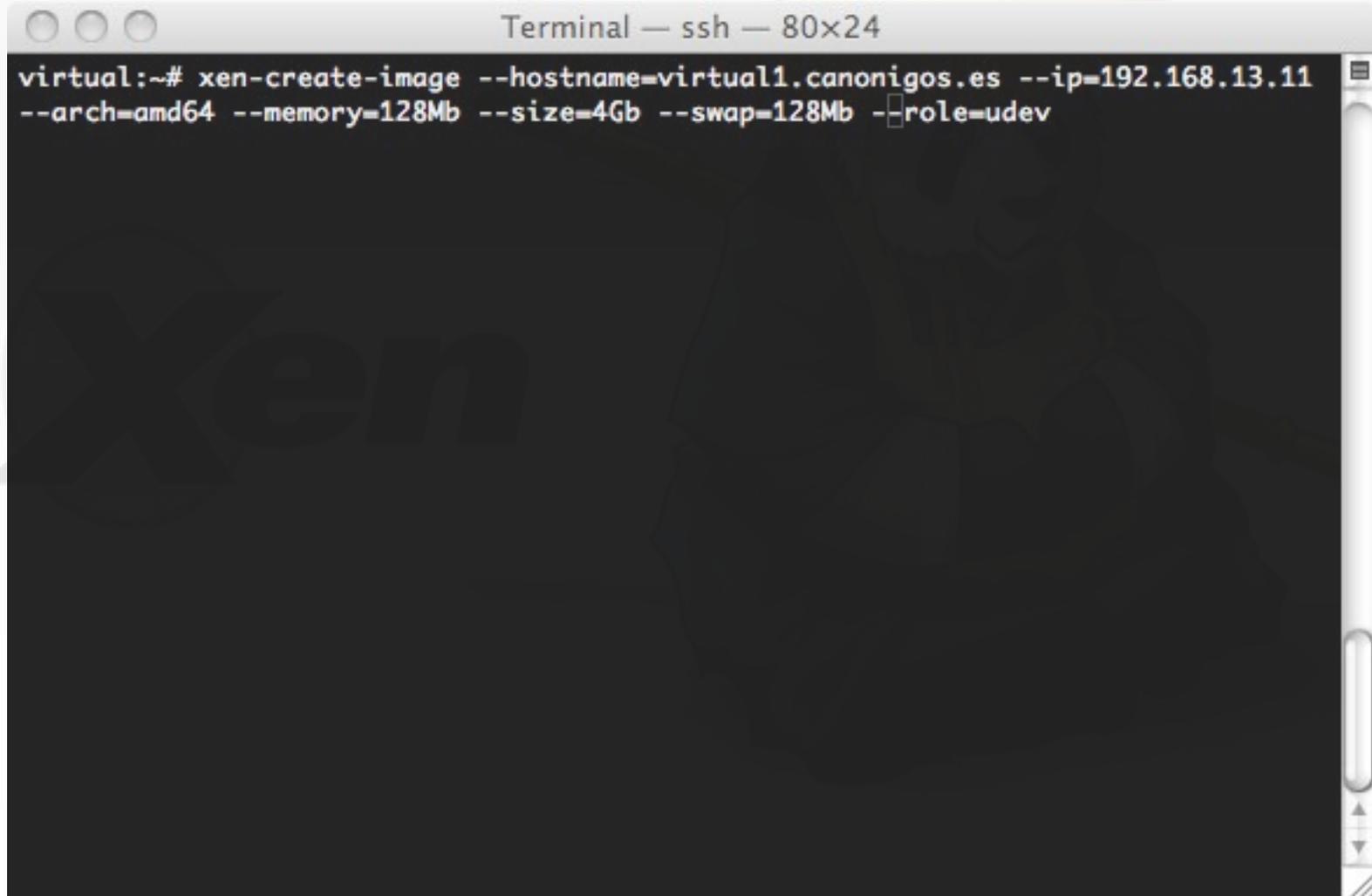
```
Terminal — ssh — 80x24

#
# If you're using the lenny or later version of the Xen guest kernel you will
# need to make sure that you use 'hvc0' for the guest serial device,
# and 'xvdX' instead of 'sdX' for serial devices.
#
# You may specify the things to use here:
#
serial_device = hvc0 #default
# serial_device = tty1
#
disk_device = xvda #default
# disk_device = sda
#

#
# Here we specify the output directory which the Xen configuration
# files will be written to, and the suffix to give them.
#
# Historically xen-tools have created configuration files in /etc/xen,
# and given each file the name $hostname.cfg. If you want to change
# that behaviour you may do so here.

304,1 93%
```

Crear máquina virtual



```
Terminal — ssh — 80x24
virtual:~# xen-create-image --hostname=virtual1.canonigos.es --ip=192.168.13.11
--arch=amd64 --memory=128Mb --size=4Gb --swap=128Mb --role=udev
```

Resumen de Xen-Tools y creación de discos sobre LVM

```
Terminal — ssh — 80x24
-----
Hostname      : virtual1.canonigos.es
Distribution   : lenny
Mirror        :
Partitions    : swap          128Mb (swap)
               /              4G    (ext3)
Image type    : full
Memory size   : 128Mb
Kernel path   : /boot/vmlinuz-2.6.26-1-xen-amd64
Initrd path   : /boot/initrd.img-2.6.26-1-xen-amd64

Networking Information
-----
IP Address 1  : 192.168.13.11 [MAC: 00:16:3E:9A:27:A3]
Netmask      : 255.255.255.0
Broadcast    : 192.168.13.255
Gateway      : 192.168.13.1

Creating swap on /dev/vserver/virtual1.canonigos.es-swap
Done

Creating ext3 filesystem on /dev/vserver/virtual1.canonigos.es-disk
█
```

htop del equipo durante creación

```
Terminal — ssh — 80x24
```

1 [|||||] 30.7% Tasks: 45 total, 1 running
2 [||||] 15.4% Load average: 1.05 0.35 0.12
Mem [|||||] 158/256MB Uptime: 00:17:47
Swp [] 0/11421MB

PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
12150	root	20	0	3820	508	412	D	100.	0.2	0:00.00	dpkg-split -Qao /v
11786	root	20	0	18336	4768	932	S	19.8	1.8	0:00.78	dpkg --status-fd 8
11784	root	20	0	9464	1312	456	S	2.6	0.5	0:00.08	/bin/sh -e /usr/sb
11781	root	20	0	9464	1208	352	S	0.0	0.5	0:01.82	/bin/sh -e /usr/sb
4540	root	20	0	19216	1276	992	R	0.0	0.5	0:00.38	htop
11782	root	20	0	9492	1232	348	S	0.0	0.5	0:00.00	/bin/sh -e /usr/sb
3505	root	20	0	3796	516	424	S	0.0	0.2	0:00.02	tee --append /var/
2969	root	20	0	224M	16220	1820	S	0.0	6.2	0:00.50	/usr/bin/python2.5
2963	root	20	0	224M	16220	1820	S	0.0	6.2	0:00.80	/usr/bin/python2.5
3504	root	20	0	9464	1896	1044	S	0.0	0.7	0:00.16	/bin/sh -e /usr/sb
3496	root	20	0	24844	8532	1840	S	0.0	3.3	0:02.10	/usr/bin/perl -w /
1	root	20	0	10312	756	624	S	0.0	0.3	0:00.28	init [2]
1216	root	16	-4	16776	1076	492	S	0.0	0.4	0:00.32	udevd --daemon
2304	daemon	20	0	8020	532	412	S	0.0	0.2	0:00.00	/sbin/portmap
2315	statd	20	0	10136	764	636	S	0.0	0.3	0:00.00	/sbin/rpc.statd
2527	root	20	0	118M	1864	988	S	0.0	0.7	0:00.00	/usr/sbin/rsyslogd

F1 Help F2 Setup F3 Search F4 Invert F5 Tree F6 SortBy F7 Nice - F8 Nice + F9 Kill F10 Quit

Terminando de crear máquina virtual, ejecutando *hooks*

```
Terminal — ssh — 80x24
/                               4G   (ext3)
Image type      : full
Memory size     : 128Mb
Kernel path     : /boot/vmlinuz-2.6.26-1-xen-amd64
Initrd path     : /boot/initrd.img-2.6.26-1-xen-amd64

Networking Information
-----
IP Address 1    : 192.168.13.11 [MAC: 00:16:3E:9A:27:A3]
Netmask        : 255.255.255.0
Broadcast      : 192.168.13.255
Gateway        : 192.168.13.1

Creating swap on /dev/vserver/virtual1.canonigos.es-swap
Done

Creating ext3 filesystem on /dev/vserver/virtual1.canonigos.es-disk
Done
Installation method: debootstrap
Done

Running hooks
█
```

Máquina virtual creada con éxito

```
Terminal — ssh — 80x24
Creating ext3 filesystem on /dev/vserver/virtual1.canonigos.es-disk
Done
Installation method: debootstrap
Done

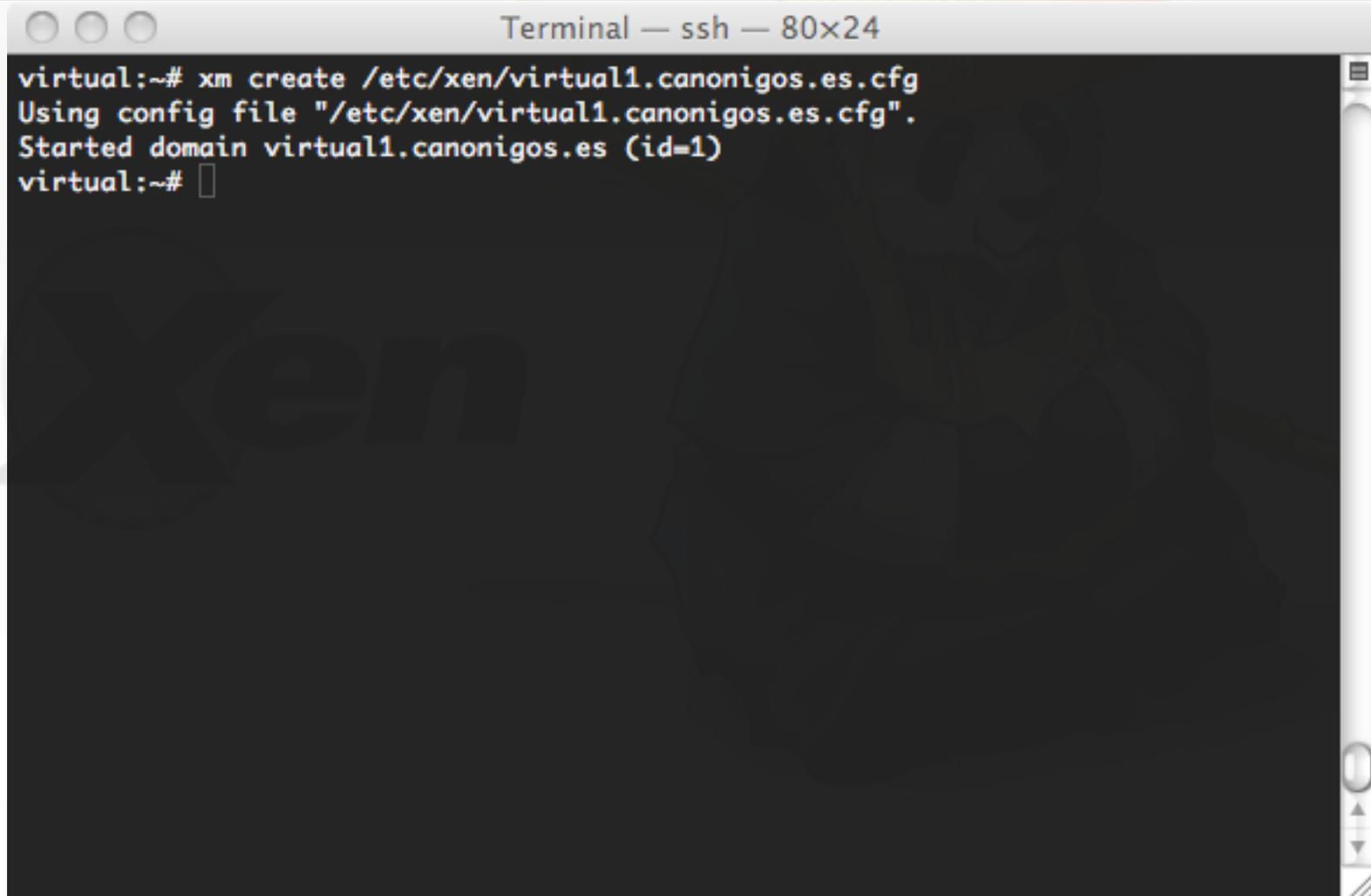
Running hooks
Done

Role: udev
    File: /etc/xen-tools/role.d/udev
Role script completed.

Creating Xen configuration file
Done
Setting up root password
Enter new UNIX password:
Retype new UNIX password:
passwd: password updated successfully
All done

Logfile produced at:
    /var/log/xen-tools/virtual1.canonigos.es.log
virtual:~#
```

Ejecución de máquina virtual



```
Terminal — ssh — 80x24
virtual:~# xm create /etc/xen/virtual1.canonigos.es.cfg
Using config file "/etc/xen/virtual1.canonigos.es.cfg".
Started domain virtual1.canonigos.es (id=1)
virtual:~#
```

Accediendo a la nueva máquina virtual

```
Terminal — ssh — 80x24
Last login: Wed Nov 10 02:22:14 on ttys000
trillian:~ esencia$ ssh root@192.168.13.11
The authenticity of host '192.168.13.11 (192.168.13.11)' can't be established.
RSA key fingerprint is 7c:ee:3c:74:de:8c:e5:5d:79:a2:d3:4d:d1:9b:5c:cc.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.13.11' (RSA) to the list of known hosts.
root@192.168.13.11's password:
Linux virtual1.canonigos.es 2.6.26-1-xen-amd64 #1 SMP Fri Mar 13 21:39:38 UTC 20
09 x86_64

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the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
virtual1:~# uname -a
Linux virtual1.canonigos.es 2.6.26-1-xen-amd64 #1 SMP Fri Mar 13 21:39:38 UTC 20
09 x86_64 GNU/Linux
virtual1:~# cat /proc/cpuinfo
processor       : 0
vendor_id     : GenuineIntel
cpu family    : 6
model         : 15
```

xm list

```
Terminal — ssh — 80x24
virtual:~# xm create /etc/xen/virtual1.canonigos.es.cfg
Using config file "/etc/xen/virtual1.canonigos.es.cfg".
Started domain virtual1.canonigos.es (id=1)
virtual:~# xm list
Name                               ID   Mem  VCPUs   State   Time(s)
Domain-0                            0   256    2    r----- 259.1
virtual1.canonigos.es                1   128    1    -b----  3.0
virtual:~#
```

xm top

```
Terminal — ssh — 80x24
xentop - 02:42:36 Xen 3.4.3
2 domains: 1 running, 1 blocked, 0 paused, 0 crashed, 0 dying, 0 shutdown
Mem: 4118836k total, 452684k used, 3666152k free CPUs: 2 @ 1995MHz
```

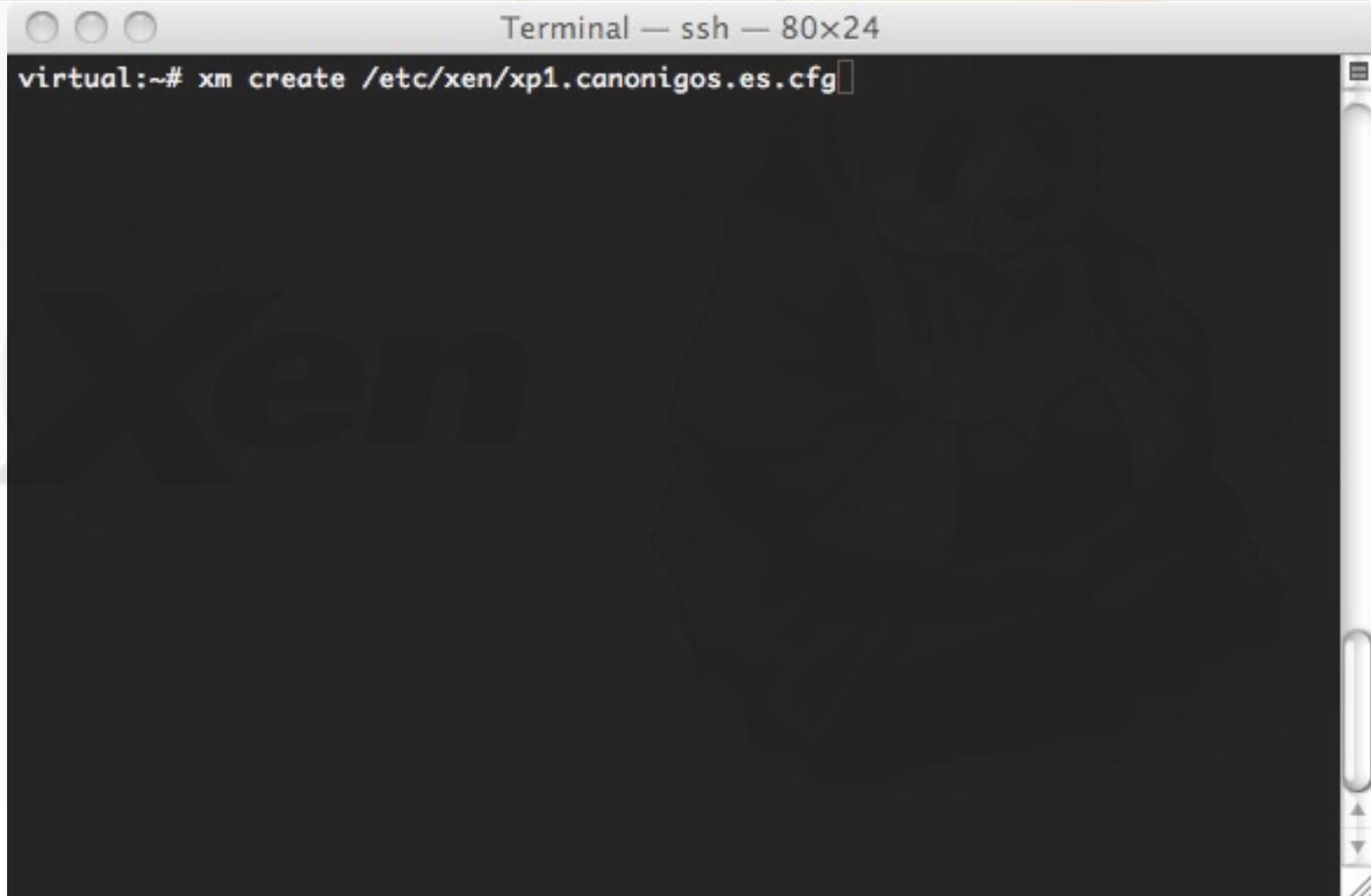
NAME	STATE	CPU(sec)	CPU(%)	MEM(k)	MEM(%)	MAXMEM(k)	MAXMEM(%)	VCPUS	
NETS	NETTX(k)	NETRX(k)	VBDS	VBD_00	VBD_RD	VBD_WR	SSID		
Domain-0	-----r		259	1.7	262144	6.4	no limit	n/a	2
0	0	0	0	0	0	0	0		
virtual1.c	--b---		2	0.0	131072	3.2	131072	3.2	1
1	11	20	2	0	853	61	0		

```
Delay Networks vBds VCPUs Repeat header Sort order Quit
```

Virtualizando HVM

```
xp1.canonigos.es.cfg (~/.Dropbox/TallerXen) - VIM1
1 import os, re
2 arch = os.uname()[4]
3
4 kernel = "/usr/lib/xen/boot/hvmloader"
5
6 builder='hvm'
7 vcpus = '2'
8 memory = 512
9 shadow_memory = 8
10 name = "xp1.canonigos.es"
11 vif = [ 'type=ioemu, bridge=eth0' ]
12 disk = [
13     'phy:/dev/mapper/vserver-lvol0,ioemu:hda,w',
14     'file:/root/xpsp3.iso,ioemu:hdb:cdrom,r'
15 ]
16
17
18 device_model = '/usr/lib/xen/bin/qemu-dm'
19 # boot on floppy (a), hard disk (c) or CD-ROM (d)
20 # default: hard disk, cd-rom, floppy
21 boot="c"
22
23 sdl=0
24 vnc=1
25 vnclisten="0.0.0.0"
26 vncconsole=1
27 vncpasswd='canonigos'
28 stdvga=0
29 serial='pty'
30 usbdevice='tablet'
31
32 on_poweroff = 'destroy'
33 on_reboot    = 'restart'
34 on_crash     = 'restart'
~
xp1.canonigos.es.cfg 1,1 All
```

Ejecución de máquina virtual



A terminal window titled "Terminal — ssh — 80x24" is shown. The prompt is "virtual:~#". The command entered is "xm create /etc/xen/xp1.canonigos.es.cfg". The terminal background is black, and the text is white. The window has a standard macOS-style title bar with three window control buttons (red, yellow, green) on the left. On the right side of the terminal, there are vertical scroll bars and a small menu icon.

```
virtual:~# xm create /etc/xen/xp1.canonigos.es.cfg
```

Preguntas

Xen



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Xen



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