



Administración de Sistemas y Redes

Sesión 3

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UO281847

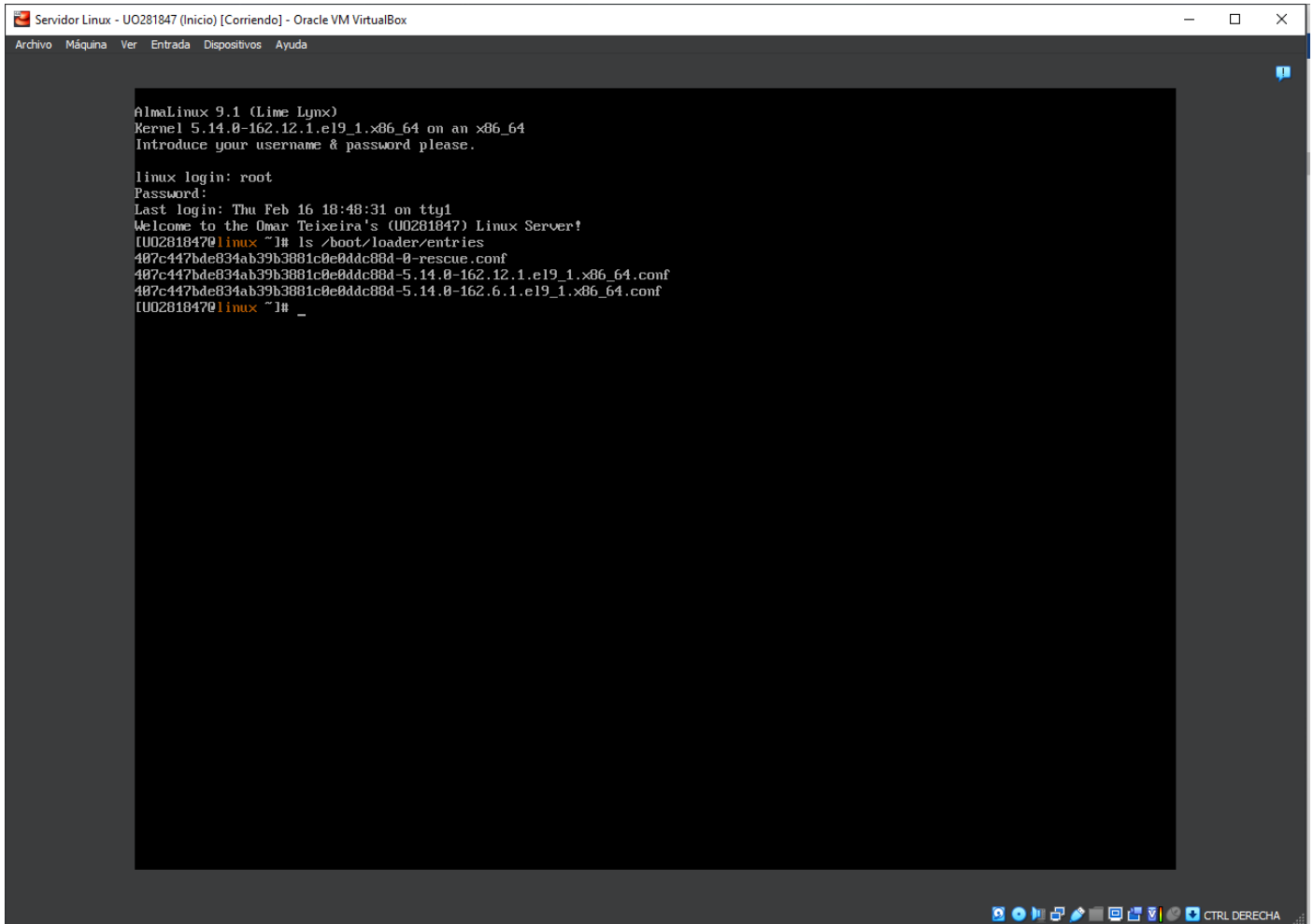
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Recuperación básica del sistema y configuración avanzada de discos

Recuperación básica de errores durante el inicio.

1. Tarea-1: Arranca Linux normalmente y examina el contenido de `/boot/loader/entries`. Cada fichero de ese directorio es una de las opciones de arranque que nos aparecen al inicio. Corresponden a varios *kernel* y al de rescate.

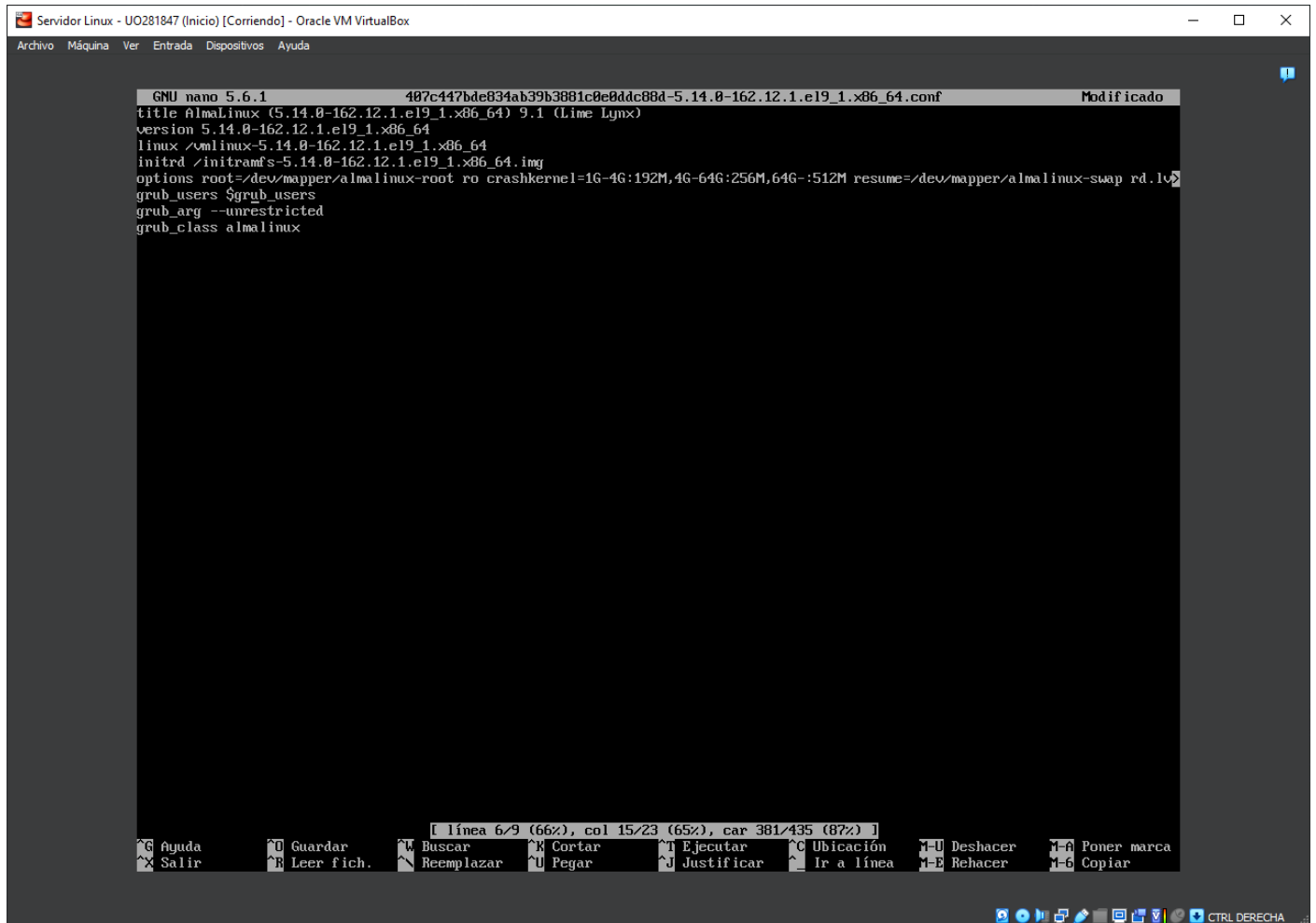


```
Servidor Linux - U0281847 [(Inicio) [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

AlmaLinux 9.1 (Lime Lynx)
Kernel 5.14.0-162.12.1.el9_1.x86_64 on an x86_64
Introduce your username & password please.

linux login: root
Password:
Last login: Thu Feb 16 18:48:31 on tty1
Welcome to the Omar Teixeira's (U0281847) Linux Server!
(U0281847@linux ~)ls /boot/loader/entries
407c447bde834ab39b3881c0e0ddc88d-0-rescue.conf
407c447bde834ab39b3881c0e0ddc88d-5.14.0-162.12.1.el9_1.x86_64.conf
407c447bde834ab39b3881c0e0ddc88d-5.14.0-162.6.1.el9_1.x86_64.conf
(U0281847@linux ~) _
```

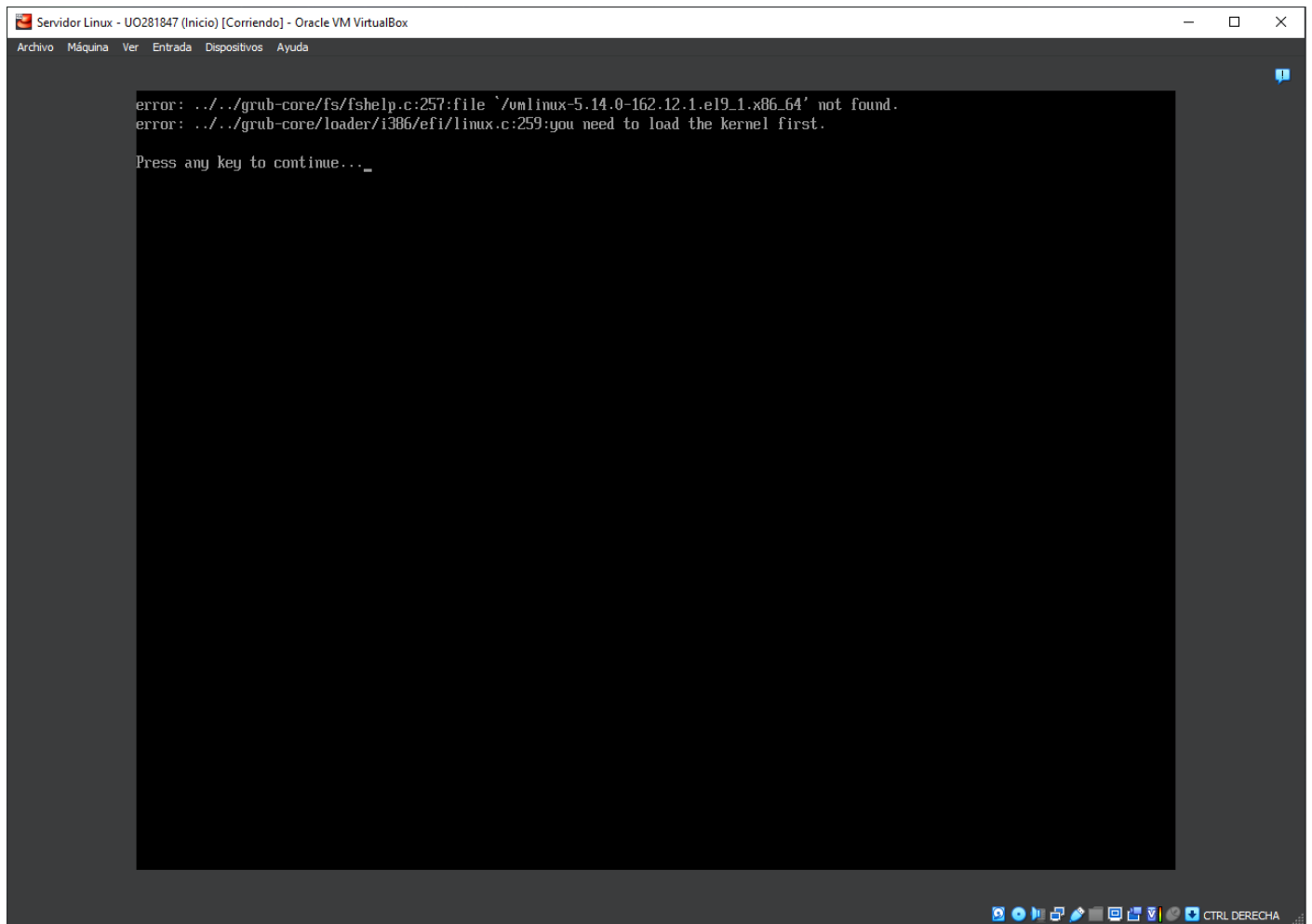
Edita el fichero de configuración con el *kernel* más reciente de todos ellos, tendrá un nombre bastante largo y mostrará los números de versión más elevados. Busca la palabra *vmlinuz* y cámbiala por *vmlinux*. Reinicia la máquina virtual ¿qué ocurre?



The screenshot shows a virtual machine window titled "Servidor Linux - UO281847 (Inicio) [Corriendo] - Oracle VM VirtualBox". Inside, the nano text editor is open, editing a file named "487c447bde834ab39b3881c0e0ddc88d-5.14.0-162.12.1.el9_1.x86_64.conf". The file content is as follows:

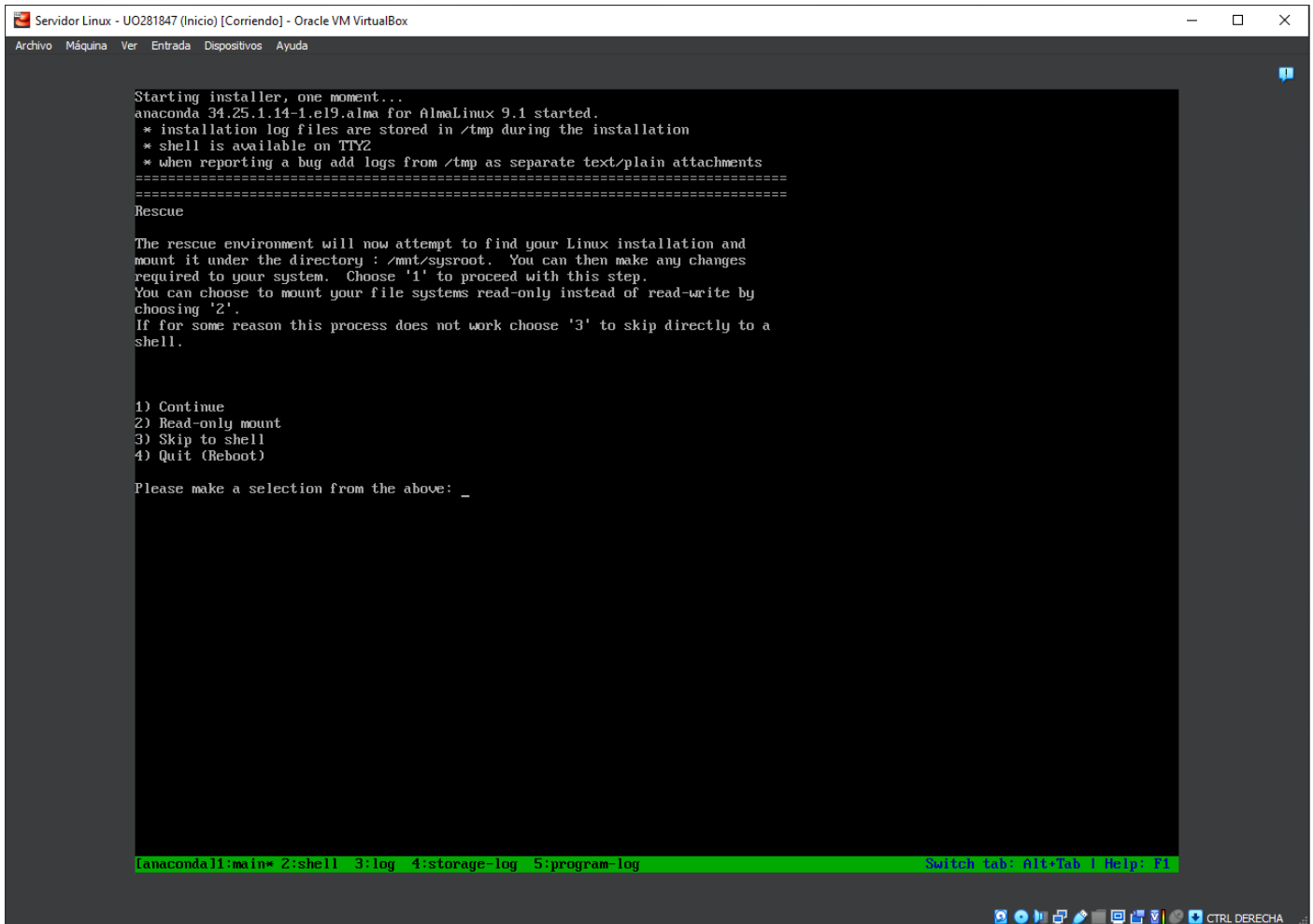
```
GNU nano 5.6.1 487c447bde834ab39b3881c0e0ddc88d-5.14.0-162.12.1.el9_1.x86_64.conf Modificado
title AlmaLinux (5.14.0-162.12.1.el9_1.x86_64) 9.1 (Lime Lynx)
version 5.14.0-162.12.1.el9_1.x86_64
linux /vmlinuz-5.14.0-162.12.1.el9_1.x86_64
initrd /initramfs-5.14.0-162.12.1.el9_1.x86_64.img
options root=/dev/mapper/almalinux-root ro crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M resume=/dev/mapper/almalinux-swap rd.lvm
grub_users $grub_users
grub_arg --unrestricted
grub_class almalinux
```

The status bar at the bottom of the nano editor indicates the cursor is at "línea 6/9 (66%), col 15/23 (65%), car 381/435 (87%)". A menu bar at the bottom lists various actions: Ayuda, Guardar, Buscar, Cortar, Ejecutar, Ubicación, Deshacer, Poner marca, Salir, Leer fich., Reemplazar, Pegar, Justificar, Ir a línea, Rehacer, and Copiar. The bottom of the window shows the Oracle VM VirtualBox taskbar with icons for the VM, a terminal, and other applications, along with the text "CTRL DERECHA".



Hay un error, hay que cargar el kernel primero.

2. Tarea-2: Bota en modo de recuperación y monta el disco con el sistema defectuoso, carga el teclado español (loadkeys es), haz *chroot* a */mnt/sysroot* y edita y corrige el fichero del punto anterior. Rebota y comprueba que el problema está solucionado. Ignora los mensajes de reetiquetado de *SELinux*.



The screenshot shows a terminal window titled "Servidor Linux - UO281847 (Inicio) [Corriendo] - Oracle VM VirtualBox". The terminal output is as follows:

```
Starting installer, one moment...
anaconda 34.25.1.14-1.el9.alma for AlmaLinux 9.1 started.
* installation log files are stored in /tmp during the installation
* shell is available on TTY2
* when reporting a bug add logs from /tmp as separate text/plain attachments
=====
Rescue

The rescue environment will now attempt to find your Linux installation and
mount it under the directory : /mnt/sysroot. You can then make any changes
required to your system. Choose '1' to proceed with this step.
You can choose to mount your file systems read-only instead of read-write by
choosing '2'.
If for some reason this process does not work choose '3' to skip directly to a
shell.

1) Continue
2) Read-only mount
3) Skip to shell
4) Quit (Reboot)

Please make a selection from the above: _
```

At the bottom of the terminal, a green status bar displays: `[anaconda]1:main* 2:shell 3:log 4:storage-log 5:program-log` and `Switch tab: Alt+Tab | Help: F1`. The VirtualBox window has a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda".

```
Servidor Linux - UO281847 (Inicio) [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

anaconda 34.25.1.14-1.el9.alma for AlmaLinux 9.1 started.
* installation log files are stored in /tmp during the installation
* shell is available on TTY2
* when reporting a bug add logs from /tmp as separate text/plain attachments
=====
Rescue

The rescue environment will now attempt to find your Linux installation and
mount it under the directory : /mnt/sysroot. You can then make any changes
required to your system. Choose '1' to proceed with this step.
You can choose to mount your file systems read-only instead of read-write by
choosing '2'.
If for some reason this process does not work choose '3' to skip directly to a
shell.

1) Continue
2) Read-only mount
3) Skip to shell
4) Quit (Reboot)

Please make a selection from the above: 1
=====
Rescue Shell

Your system has been mounted under /mnt/sysroot.

If you would like to make the root of your system the root of the active system,
run the command:

    chroot /mnt/sysroot

When finished, please exit from the shell and your system will reboot.

Please press ENTER to get a shell:
bash-5.1# loadkeys es
bash-5.1# chroot /mnt/sysroot
bash-5.1# ls
afs bin boot dev etc home lib lib64 media mnt opt proc root run sbin srv sys tmp usr var
bash-5.1# ls /boot/loader/entries
407c447bde834ab39b3881c0e0ddc88d-0-rescue.conf
407c447bde834ab39b3881c0e0ddc88d-5.14.0-162.12.1.el9_1.x86_64.conf
407c447bde834ab39b3881c0e0ddc88d-5.14.0-162.6.1.el9_1.x86_64.conf
bash-5.1#
[anaconda1]1:main* 2:shell 3:log 4:storage-log 5:program-log
```

```
Servidor Linux - UO281847 (Inicio) [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

GNU nano 5.6.1 407c447bde834ab39b3881c0e0ddc88d-5.14.0-162.12.1.el9_1.x86_64.conf Modified
title AlmaLinux (5.14.0-162.12.1.el9_1.x86_64) 9.1 (Lime Lynx)
version 5.14.0-162.12.1.el9_1.x86_64
linux /vmlinuz-5.14.0-162.12.1.el9_1.x86_64
initrd /initramfs-5.14.0-162.12.1.el9_1.x86_64.img
options root=/dev/mapper/almalinux-root ro crashkernel=16-4G:192M,4G-64G:256M,64G-:512M resume=/dev/mapper/almalinux-swap rd.lvm
grub_users $grub_users
grub_arg --unrestricted
grub_class almalinux

[ line 3/9 (33%), col 15/44 (34%), char 114/435 (26%) ]
^G Help      ^O Write Out  ^W Where Is   ^K Cut        ^I Execute   ^C Location
^X Exit      ^R Read File  ^M Replace    ^P Paste      ^J Justify   ^_ Go To Line
^U Undo      ^-B Redo      ^-A Set Mark  ^-6 Copy

[anaconda1]1:main* 2:shell 3:log 4:storage-log 5:program-log
```

Servidor Linux - U0281847 (Inicio) [Corriendo] - Oracle VM VirtualBox

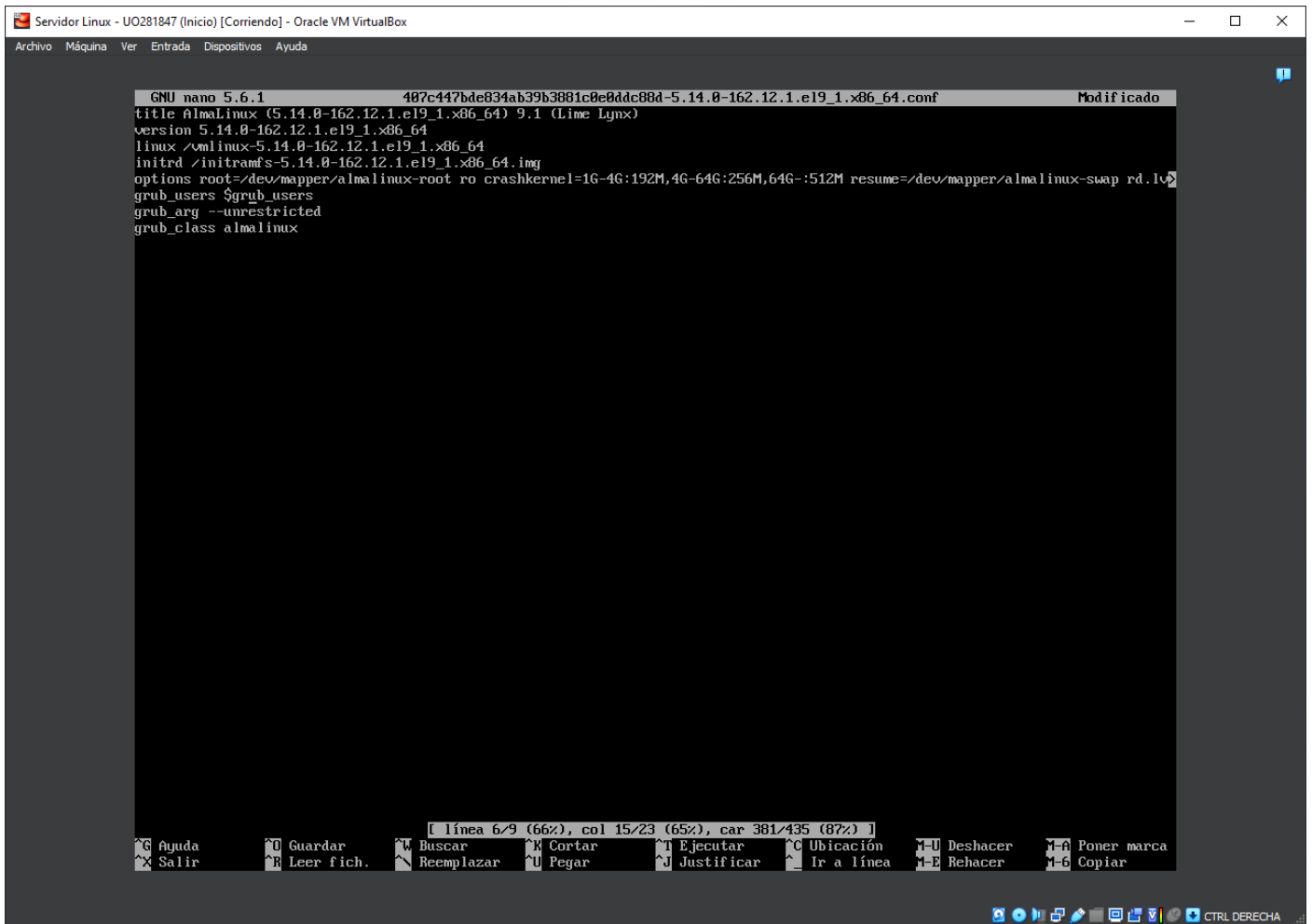
Archivo Máquina Ver Entrada Dispositivos Ayuda

```
AlmaLinux 9.1 (Lime Lynx)
Kernel 5.14.0-162.12.1.el9_1.x86_64 on an x86_64
Introduce your username & password please.

linux login: root
Password:
Last login: Thu Feb 16 19:31:26 on tty1
Welcome to the Omar Teixeira's (U0281847) Linux Server!
[U0281847@linux ~]# ^C
[U0281847@linux ~]# _
```

CTRL DERECHA

3. Tarea-3: Todavía tenemos una forma más de arreglar este problema. Vuelve a repetir lo del punto primero y cambia de nuevo *vmlinux* por *vmlinux*.

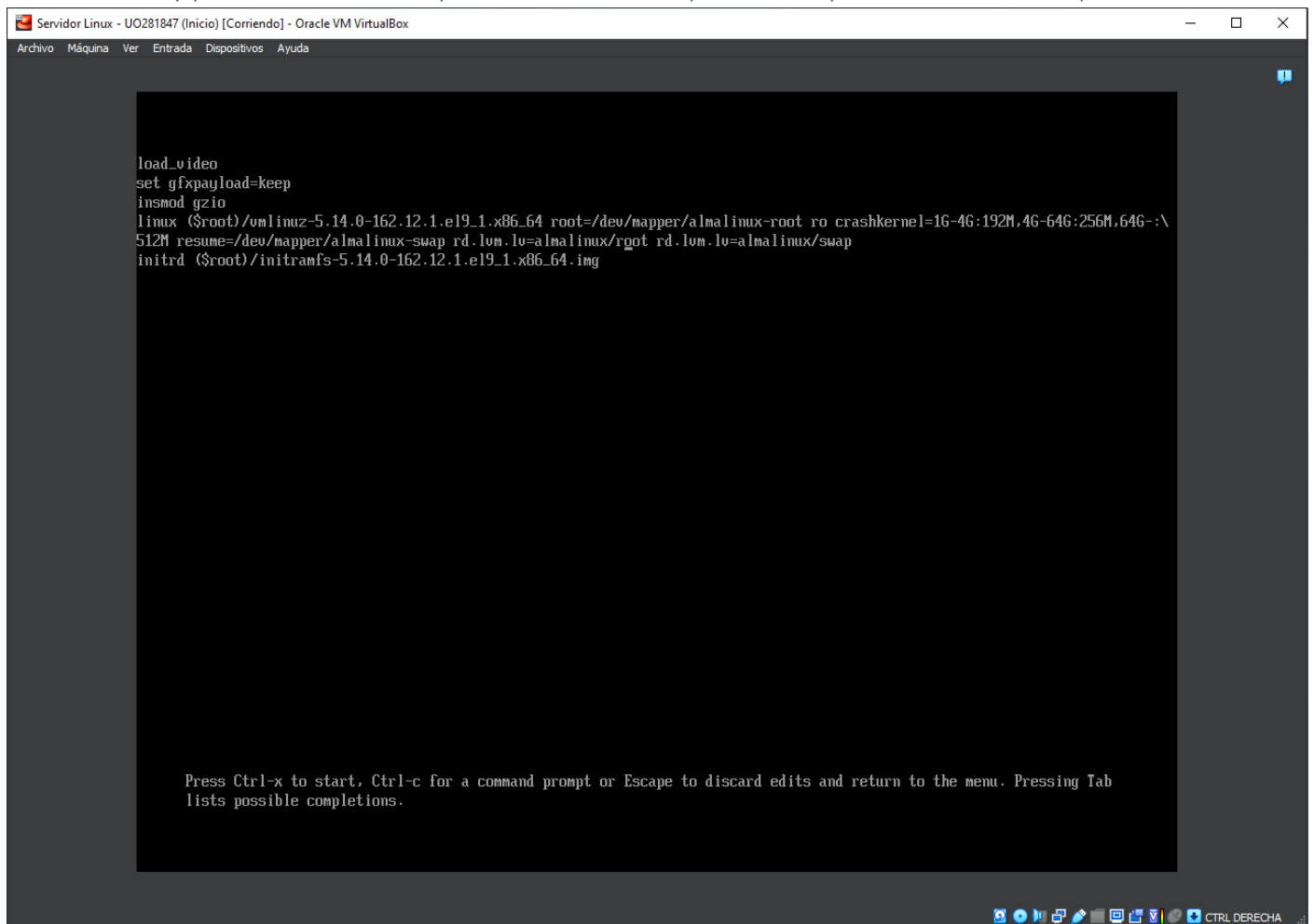


The screenshot shows a VirtualBox window titled "Servidor Linux - UO281847 (Inicio) [Corriendo] - Oracle VM VirtualBox". Inside the window is a terminal running GNU nano 5.6.1, editing a file named "407c447bde834ab39b3881c0e8ddc88d-5.14.0-162.12.1.el9_1.x86_64.conf". The file content is as follows:

```
title AlmaLinux (5.14.0-162.12.1.el9_1.x86_64) 9.1 (Lime Lynx)
version 5.14.0-162.12.1.el9_1.x86_64
linux /vmlinuz-5.14.0-162.12.1.el9_1.x86_64
initrd /initramfs-5.14.0-162.12.1.el9_1.x86_64.img
options root=/dev/mapper/almalinux-root ro crashkernel=1G-4G:192M,4G-64G:256M,64G-:512M resume=/dev/mapper/almalinux-swap rd.lvm
grub_users $grub users
grub_arg --unrestricted
grub_class almalinux
```

The nano editor interface includes a status bar at the bottom showing "línea 6/9 (66%), col 15/23 (65%), car 381/435 (87%)". A menu bar at the bottom lists various editing actions such as "Ayuda", "Guardar", "Buscar", "Cortar", "Ejecutar", "Ubicación", "Deshacer", "Poner marca", "Salir", "Leer fich.", "Reemplazar", "Pegar", "Justificar", "Ir a línea", "Rehacer", and "Copiar".

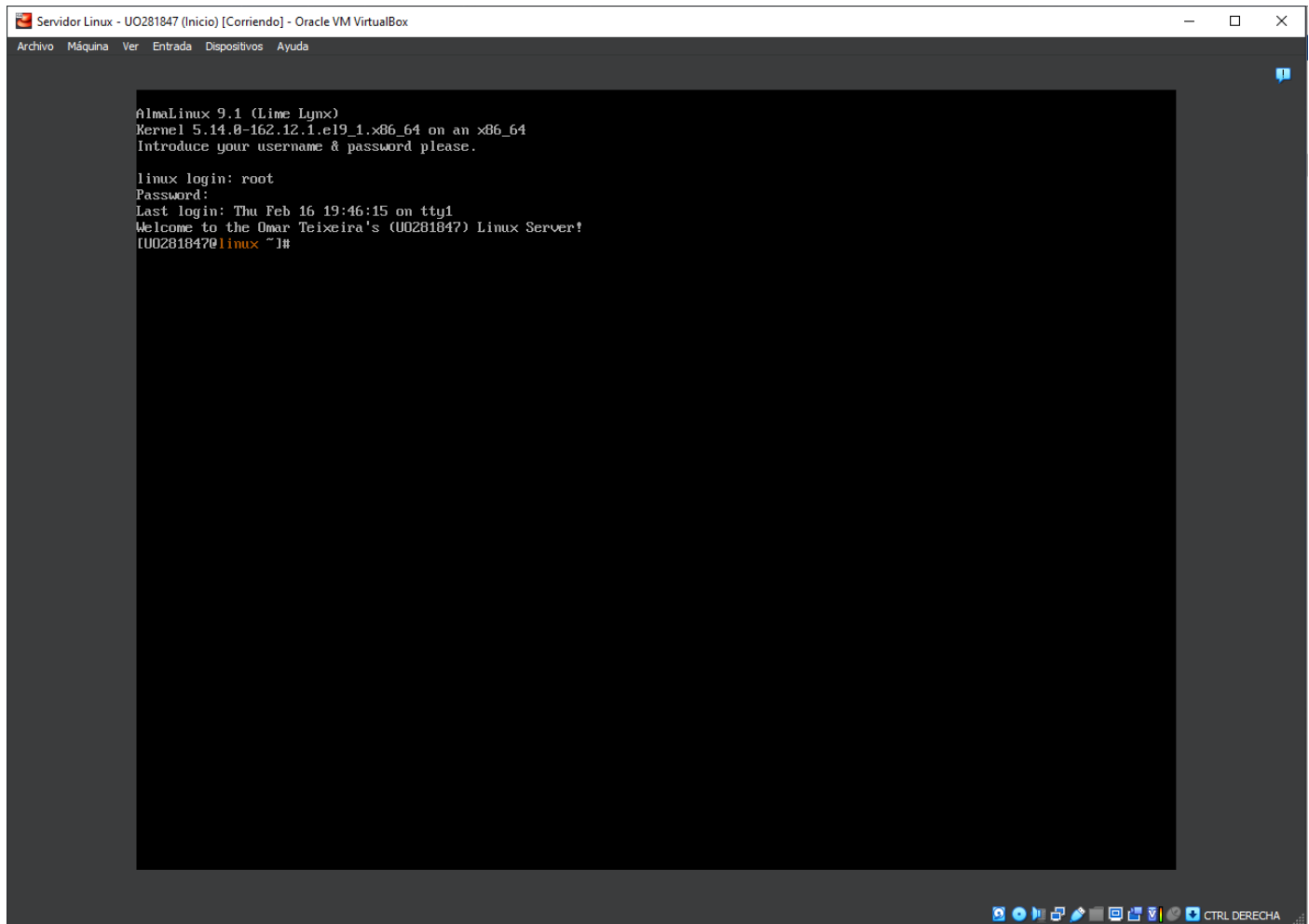
Reinicia y desde la pantalla de arranque modifica el nombre del *kernel* (selecciónalo en la entrada del menú y presiona la tecla "e" para editar el fichero) de forma que el servidor arranque correctamente.



```
load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinuz-5.14.0-162.12.1.el9_1.x86_64 root=/dev/mapper/almalinux-root ro crashkernel=16-4G:192M,4G-64G:256M,64G-:\
512M resume=/dev/mapper/almalinux-swap rd.lvm.lv=almalinux/root rd.lvm.lv=almalinux/swap
initrd ($root)/initramfs-5.14.0-162.12.1.el9_1.x86_64.img

Press Ctrl-x to start, Ctrl-c for a command prompt or Escape to discard edits and return to the menu. Pressing Tab
lists possible completions.
```

4. Tarea-4: Vuelve a examinar otra vez el fichero que modificaste. ¿Es correcto o sigue conteniendo la palabra "vmlinux"? ¿Por qué?

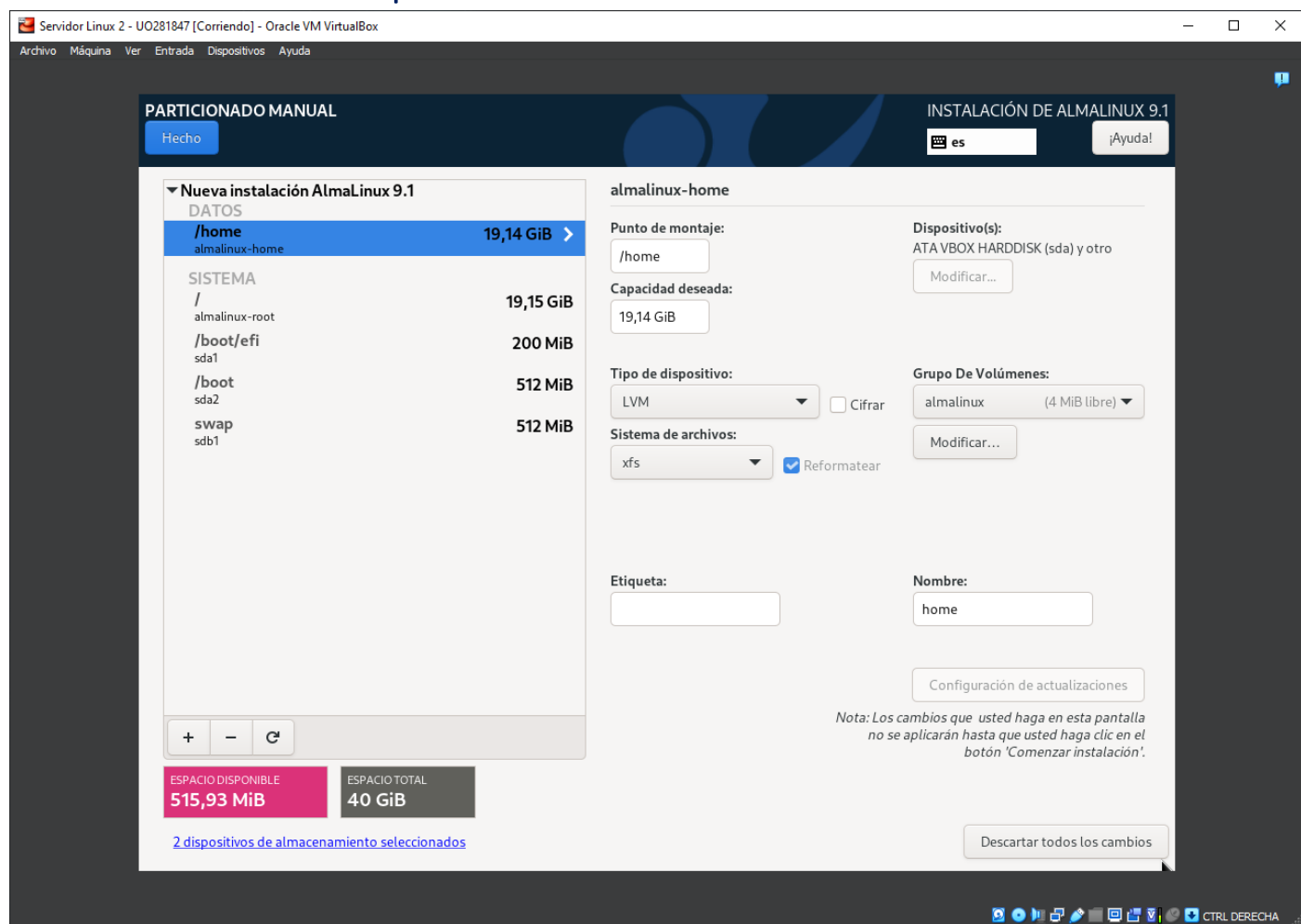


```
AlmaLinux 9.1 (Lime Lynx)
Kernel 5.14.0-162.12.1.el9_1.x86_64 on an x86_64
Introduce your username & password please.

linux login: root
Password:
Last login: Thu Feb 16 19:46:15 on tty1
Welcome to the Omar Teixeira's (U0281847) Linux Server!
U0281847@linox ~]#
```

Es correcto, porque hemos cambiado el nombre del kernel.

Instalación de Linux con particionamiento dinámico.



```
Servidor Linux 2 - UO281847 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

AlmaLinux 9.1 (Lime Lynx)
Kernel 5.14.0-162.6.1.el9_1.x86_64 on an x86_64

localhost login: root
Password:
[root@localhost ~]# lsblk -f
NAME                                FSTYPE     FSVER    LABEL UUID                                FSAVAIL FSUSE% MOUNTPOINTS
sda
├─sda1                                vfat        FAT16    FDE6-3041                                192,8M   3% /boot/efi
├─sda2                                xfs         306,5M   40% /boot
├─sda3                                LVM2_member LVM2 001  Pdrpdb-se9j-X1U1-kwke-e6Fv-LZS3-5CUF×U  a7a5dfad-5c2b-483d-8dfb-027e2f6fa26e  18G     6% /
└─┬─almalinux-root xfs
   └─almalinux-home xfs      d113d8e6-3ee7-4955-8abe-c06ce177a67c  19G     1% /home
sdb
├─sdb1                                swap        1        2b0cecb1-9470-44f5-9c45-fd3d2ebe3270                                [SWAP]
├─sdb2                                LVM2_member LVM2 001  mDykhP-HjGC-x7TY-5Yqg-u00B-9kjl-1S3Qcf  a7a5dfad-5c2b-483d-8dfb-027e2f6fa26e  18G     6% /
└─┬─almalinux-root xfs
   └─almalinux-home xfs
sdc
sr0
[root@localhost ~]# _
```

1. Tarea-1: Elimina con *gdisk* las particiones del tercer disco si las hubiere.

```
[root@localhost ~]# gdisk /dev/sdc
GPT fdisk (gdisk) version 1.0.7

Partition table scan:
  MBR: not present
  BSD: not present
  APM: not present
  GPT: not present

Creating new GPT entries in memory.

Command (? for help): d
No partitions
```

2. Tarea-2: Crea con *gdisk* una partición en el tercer disco, que ocupe todo su espacio, y dale el tipo "Linux LVM".

```

Servidor Linux 2 - UO281847 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda

n    add a new partition
o    create a new empty GUID partition table (GPT)
p    print the partition table
q    quit without saving changes
r    recovery and transformation options (experts only)
s    sort partitions
t    change a partition's type code
v    verify disk
w    write table to disk and exit
x    extra functionality (experts only)
?    print this menu

Command (? for help): i
Using 1
Partition GUID code: E6D6D379-F587-44C2-A23C-238F2A3DF928 (Linux LVM)
Partition unique GUID: 595286C5-388A-431D-B327-E3673D88C6EC
First sector: 2048 (at 1024.0 KiB)
Last sector: 41943806 (at 20.0 GiB)
Partition size: 41940959 sectors (20.0 GiB)
Attribute flags: 0000000000000000
Partition name: 'Linux LVM'

Command (? for help): w

Final checks complete. About to write GPT data. THIS WILL OVERWRITE EXISTING
PARTITIONS!!

Do you want to proceed? (Y/N): Y
OK: writing new GUID partition table (GPT) to /dev/sdc.
[ 438.799805] sdc: sdc1
[ 439.009061] sdc: sdc1
The operation has completed successfully.
[root@localhost ~]# lsblk -f

```

NAME	FSTYPE	FSVER	LABEL	UUID	FSAAvail	FSUSE%	MOUNTPOINTS
sda							
└─sda1	vfat	FAT16		FDE6-3841	192,8M	3%	/boot/efi
└─sda2	xfs			27c37671-a82c-4632-ac3a-99aae59cd631	306,5M	40%	/boot
└─sda3	LVM2_member	LVM2 001		Pdrpdb-se9j-X1U1-kwke-e6Fv-LZS3-5CUF×U			
└─almalinux-root	xfs			a7a5dfad-5c2b-483d-8dfb-027e2f6fa26e	18G	6%	/
└─almalinux-home	xfs			d113d8e6-3ee7-4955-8abe-c06ce177a67c	19G	1%	/home
sdb							
└─sdb1	swap	1		2b0cecb1-9478-44f5-9c45-fd3d2ebe3278			[SWAP]
└─sdb2	LVM2_member	LVM2 001		mbykdp-HjGC-x7TY-5Yqq-vu0B-9kjl-1S3Qcf			
└─almalinux-root	xfs			a7a5dfad-5c2b-483d-8dfb-027e2f6fa26e	18G	6%	/
sdc							
└─sdc1							
sr0							
[root@localhost ~]#							

3. Tarea-3: Crea un volumen físico en esa partición, usando la orden *pvccreate*.

```
Servidor Linux 2 - UO281847 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

NAME
    pvccreate - Initialize physical volume(s) for use by LVM

SYNOPSIS
    pvccreate position_args
             [ option_args ]

DESCRIPTION
    pvccreate initializes a Physical Volume (PV) on a device so the device is recognized as belonging to LVM. This allows the PV to be used in a Volume Group (VG). An LVM disk label is written to the device, and LVM metadata areas are initialized. A PV can be placed on a whole device or partition.

    Use vgcreate(8) to create a new VG on the PV, or vgextend(8) to add the PV to an existing VG. Use pvremove(8) to remove the LVM disk label from the device.

    The force option will create a PV without confirmation. Repeating the force option (-ff) will forcibly create a PV, overriding checks that normally prevent it, e.g. if the PV is already in a VG.

    Metadata location, size, and alignment

    The LVM disk label begins 512 bytes from the start of the device, and is 512 bytes in size.

    The LVM metadata area begins at an offset (from the start of the device) equal to the page size of the machine creating the PV (often 4 KiB.) The metadata area contains a 512 byte header and a multi-KiB circular buffer that holds text copies of the VG metadata.

    With default settings, the first physical extent (PE), which contains LV data, is 1 MiB from the start of the device. This location is controlled by default_data_alignment in lvm.conf, which is set to 1 (MiB) by default. The pe_start will be a multiple of this many MiB. This location can be checked with:
    pvs -o pe_start PV

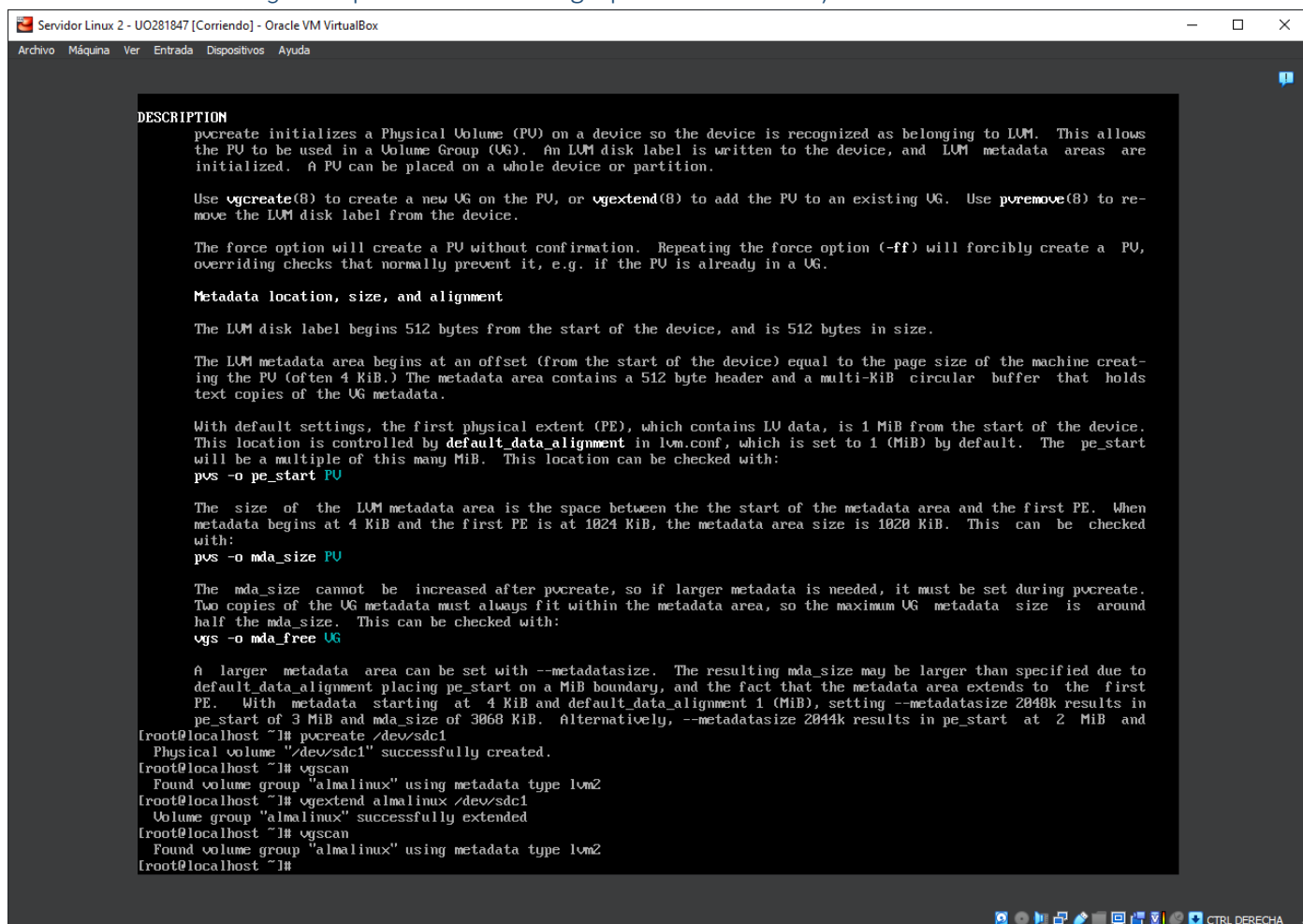
    The size of the LVM metadata area is the space between the the start of the metadata area and the first PE. When metadata begins at 4 KiB and the first PE is at 1024 KiB, the metadata area size is 1020 KiB. This can be checked with:
    pvs -o mda_size PV

    The mda_size cannot be increased after pvccreate, so if larger metadata is needed, it must be set during pvccreate. Two copies of the VG metadata must always fit within the metadata area, so the maximum VG metadata size is around half the mda_size. This can be checked with:
    vgs -o mda_free VG

    A larger metadata area can be set with --metadatasize. The resulting mda_size may be larger than specified due to default_data_alignment placing pe_start on a MiB boundary, and the fact that the metadata area extends to the first PE. With metadata starting at 4 KiB and default_data_alignment 1 (MiB), setting --metadatasize 2048k results in pe_start of 3 MiB and mda_size of 3068 KiB. Alternatively, --metadatasize 2044k results in pe_start at 2 MiB and mda_size of 3068 KiB.

    root@localhost ~]# pvccreate /dev/sdc1
    Physical volume "/dev/sdc1" successfully created.
    root@localhost ~]# _
```

4. Tarea-4: Añade con la orden *vgextend* el volumen físico al grupo de volúmenes lógicos (comprueba con la orden *vgscan* que el nombre del grupo es "almalinux").



The screenshot shows a terminal window titled "Servidor Linux 2 - UO281847 [Corriendo] - Oracle VM VirtualBox". The terminal displays the following content:

```
DESCRIPTION
pvcreate initializes a Physical Volume (PV) on a device so the device is recognized as belonging to LVM. This allows
the PV to be used in a Volume Group (VG). An LVM disk label is written to the device, and LVM metadata areas are
initialized. A PV can be placed on a whole device or partition.

Use vgcreate(8) to create a new VG on the PV, or vgextend(8) to add the PV to an existing VG. Use pvremove(8) to re-
move the LVM disk label from the device.

The force option will create a PV without confirmation. Repeating the force option (-ff) will forcibly create a PV,
overriding checks that normally prevent it, e.g. if the PV is already in a VG.

Metadata location, size, and alignment

The LVM disk label begins 512 bytes from the start of the device, and is 512 bytes in size.

The LVM metadata area begins at an offset (from the start of the device) equal to the page size of the machine creat-
ing the PV (often 4 KiB.) The metadata area contains a 512 byte header and a multi-KiB circular buffer that holds
text copies of the VG metadata.

With default settings, the first physical extent (PE), which contains LV data, is 1 MiB from the start of the device.
This location is controlled by default_data_alignment in lvm.conf, which is set to 1 (MiB) by default. The pe_start
will be a multiple of this many MiB. This location can be checked with:
pvs -o pe_start PV

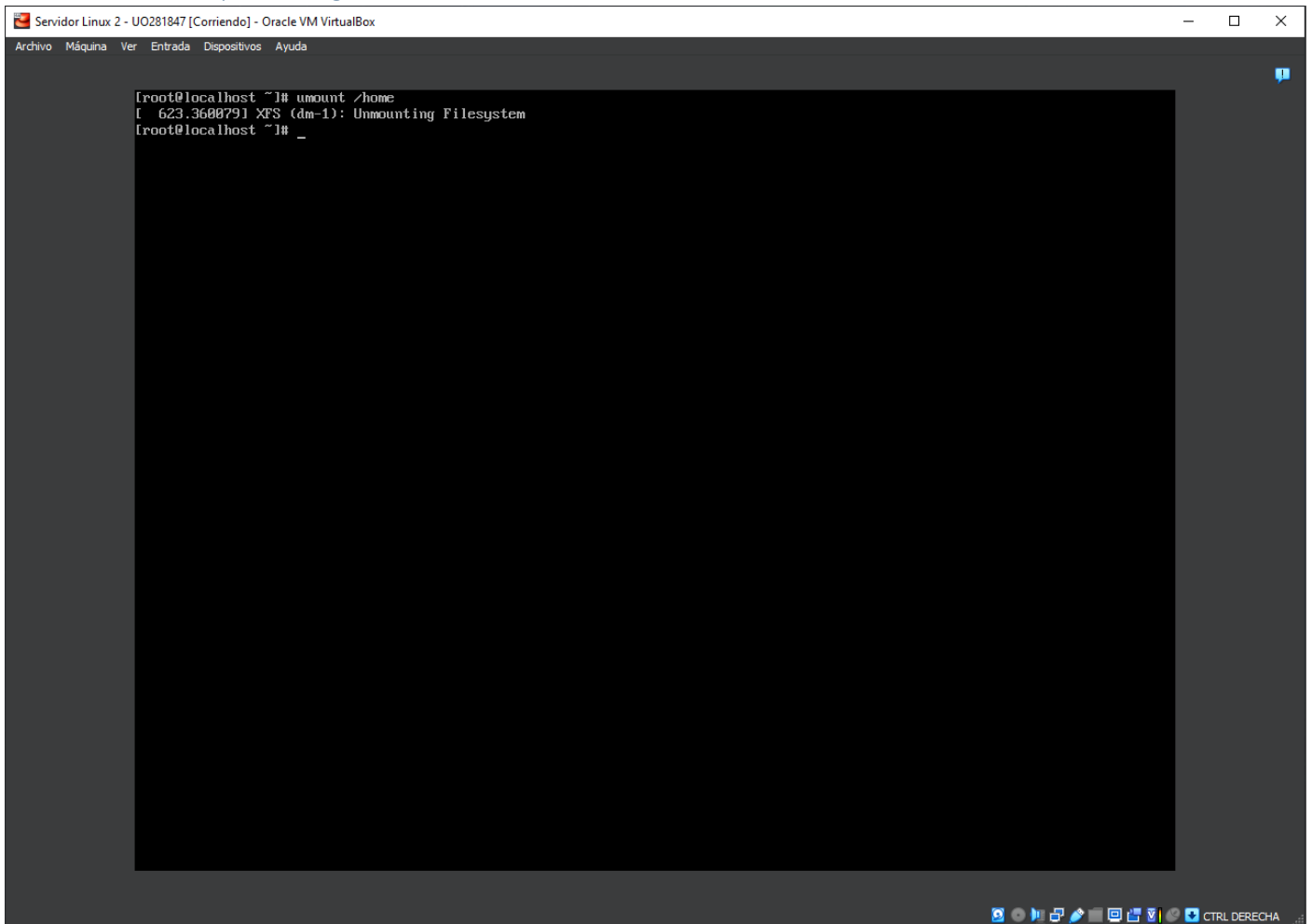
The size of the LVM metadata area is the space between the the start of the metadata area and the first PE. When
metadata begins at 4 KiB and the first PE is at 1024 KiB, the metadata area size is 1020 KiB. This can be checked
with:
pvs -o mda_size PV

The mda_size cannot be increased after pvcreate, so if larger metadata is needed, it must be set during pvcreate.
Two copies of the VG metadata must always fit within the metadata area, so the maximum VG metadata size is around
half the mda_size. This can be checked with:
vgs -o mda_free VG

A larger metadata area can be set with --metadatasize. The resulting mda_size may be larger than specified due to
default_data_alignment placing pe_start on a MiB boundary, and the fact that the metadata area extends to the first
PE. With metadata starting at 4 KiB and default_data_alignment 1 (MiB), setting --metadatasize 2048k results in
pe_start of 3 MiB and mda_size of 3068 KiB. Alternatively, --metadatasize 2044k results in pe_start at 2 MiB and

root@localhost ~# pvcreate /dev/sdc1
Physical volume "/dev/sdc1" successfully created.
root@localhost ~# vgscan
Found volume group "almalinux" using metadata type lvm2
root@localhost ~# vgextend almalinux /dev/sdc1
Volume group "almalinux" successfully extended
root@localhost ~# vgscan
Found volume group "almalinux" using metadata type lvm2
root@localhost ~#
```


5. Tarea-5: Extiende el volumen lógico que contiene a /home para que utilice otros 4GB del tercer disco (usaremos la mitad del nuevo disco que acabamos de incorporar).
- a. En primer lugar, debes desmontar /home con la orden *umount*.



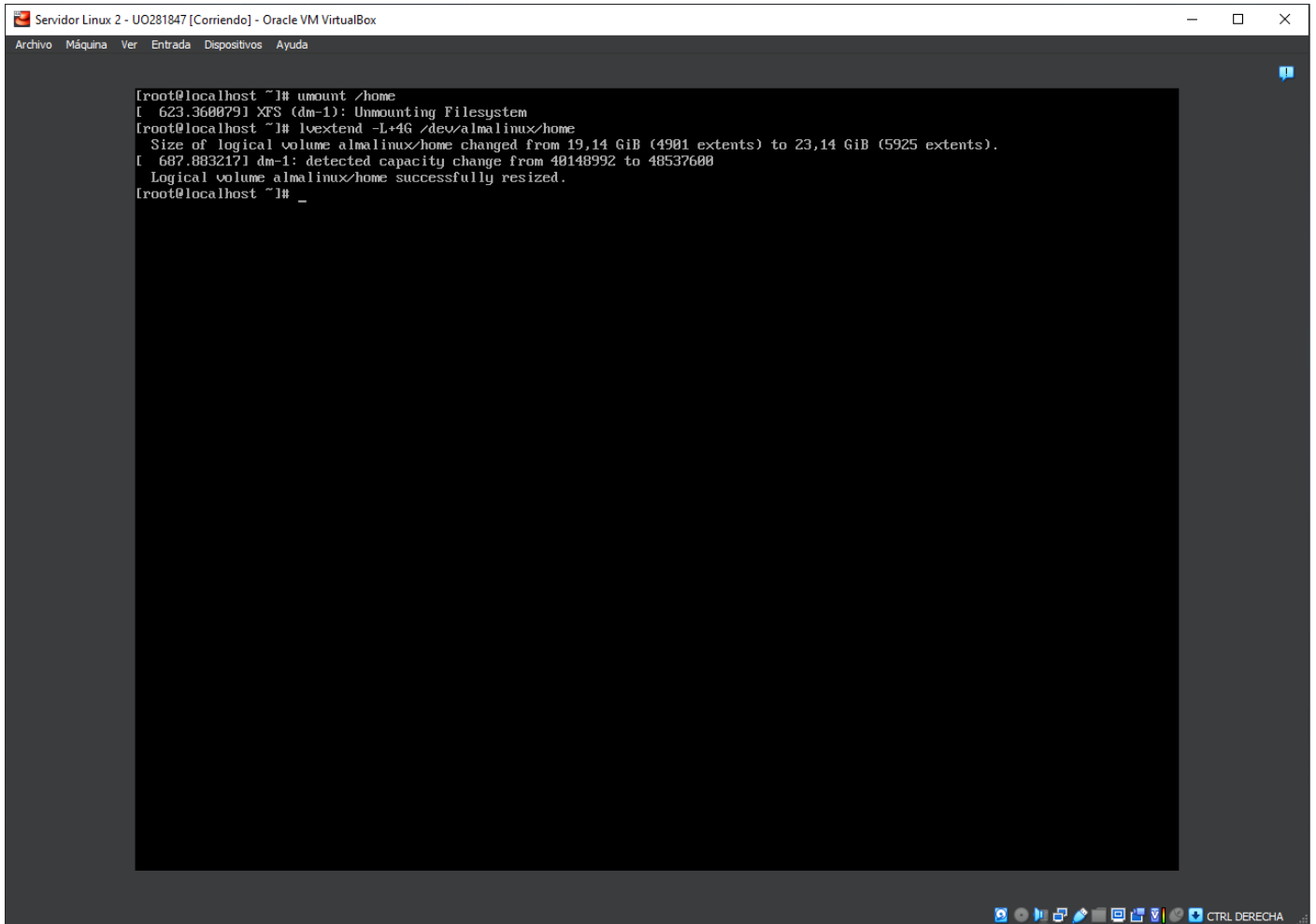
```

Servidor Linux 2 - UO281847 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

[root@localhost ~]# umount /home
[ 623.3688791 XFS (dm-1): Unmounting Filesystem
[root@localhost ~]# _

```

b. A continuación, usa la orden *lvextend -L+4G* etc. para extender el volumen lógico.



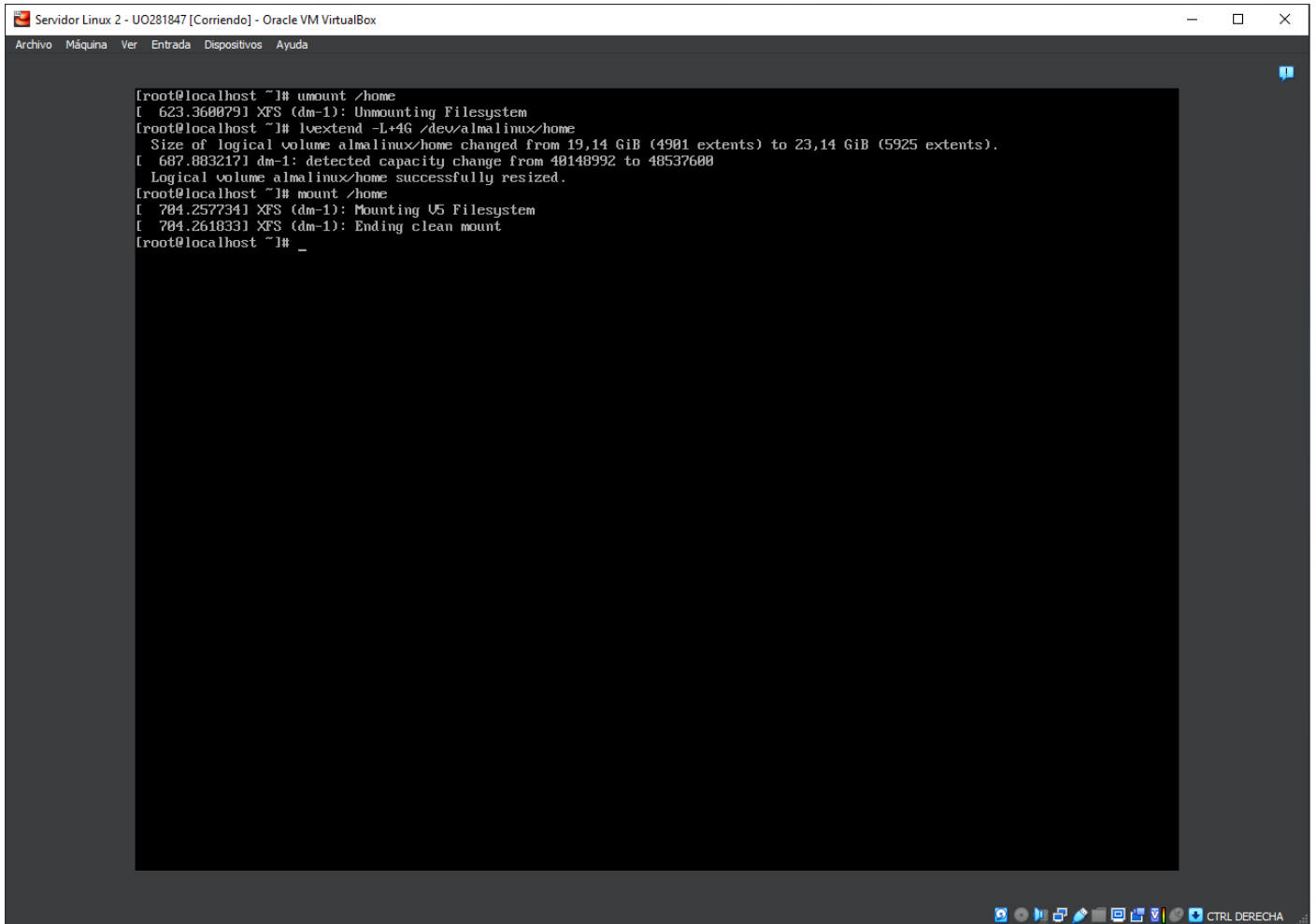
```

Servidor Linux 2 - UO281847 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

root@localhost ~]# mount /home
[ 623.360079] XFS (dm-1): Unmounting Filesystem
root@localhost ~]# lvextend -L+4G /dev/almalinux/home
Size of logical volume almalinux/home changed from 19,14 GiB (4901 extents) to 23,14 GiB (5925 extents).
[ 607.883217] dm-1: detected capacity change from 48148992 to 48537600
Logical volume almalinux/home successfully resized.
root@localhost ~]# _

```

c. Vuelve a montar /home.



```

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Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

root@localhost ~]# umount /home
[ 623.360079] XFS (dm-1): Unmounting Filesystem
root@localhost ~]# lvextend -L+4G /dev/almalinux/home
Size of logical volume almalinux/home changed from 19,14 GiB (4901 extents) to 23,14 GiB (5925 extents).
[ 687.883217] dm-1: detected capacity change from 48148992 to 48537600
Logical volume almalinux/home successfully resized.
root@localhost ~]# mount /home
[ 704.257734] XFS (dm-1): Mounting V5 Filesystem
[ 704.261833] XFS (dm-1): Ending clean mount
root@localhost ~]# _

```

d. Usa el comando `xfs_growfs` para ajustar el tamaño del *filesystem*.

```
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Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

[ root@localhost ~ ]# umount /home
[ 623.368879] XFS (dm-1): Unmounting Filesystem
[ root@localhost ~ ]# lvextend -L+4G /dev/almalinux/home
Size of logical volume almalinux/home changed from 19,14 GiB (4901 extents) to 23,14 GiB (5925 extents).
[ 687.883217] dm-1: detected capacity change from 48148992 to 48537600
Logical volume almalinux/home successfully resized.
[ root@localhost ~ ]# mount /home
[ 704.257734] XFS (dm-1): Mounting V5 Filesystem
[ 704.261833] XFS (dm-1): Ending clean mount
[ root@localhost ~ ]# xfs_growfs /home
meta-data=/dev/mapper/almalinux-home isize=512    agcount=4, agsize=1254656 blks
        =                               sectsz=512   attr=2, projid32bit=1
        =                               crc=1        finobt=1, sparse=1, rmapbt=0
        =                               reflink=1    bigtime=1 inobtcount=1
data      =                               bsize=4096   blocks=5818624, imaxpct=25
        =                               sunit=0      swidth=0 blks
naming    =version 2                     bsize=4096   ascii-ci=0, ftype=1
log        =internal log                 bsize=4096   blocks=2560, version=2
        =                               sectsz=512   sunit=0 blks, lazy-count=1
realtime  =none                          extsz=4096   blocks=0, rtextents=0
data blocks changed from 5818624 to 6067200
[ root@localhost ~ ]# _
```

6. Tarea-6: Anota en el documento las órdenes que has ejecutado y el resultado de ejecutar las órdenes *pvscan*, *lvscan* y *df /home* al terminar el proceso.

```

Servidor Linux 2 - UO281847 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

[root@localhost ~]# umount /home
[ 623.360079] XFS (dm-1): Unmounting Filesystem
[root@localhost ~]# lvextend -L+4G /dev/almalinux/home
Size of logical volume almalinux/home changed from 19,14 GiB (4901 extents) to 23,14 GiB (5925 extents).
[ 687.883217] dm-1: detected capacity change from 48148992 to 48537600
Logical volume almalinux/home successfully resized.
[root@localhost ~]# mount /home
[ 704.257734] XFS (dm-1): Mounting U5 Filesystem
[ 704.261833] XFS (dm-1): Ending clean mount
[root@localhost ~]# xfs_growfs /home
meta-data=/dev/mapper/almalinux-home isize=512    agcount=4, agsize=1254656 blks
         =                       sectsz=512    attr=2, projid32bit=1
         =                       crc=1        finobt=1, sparse=1, rmapbt=0
         =                       reflink=1     bigtime=1 inobtcount=1
data      =                       bsize=4096    blocks=5018624, imaxpct=25
         =                       sunit=0       swidth=0 blks
naming    =version 2              bsize=4096    ascii-ci=0, ftype=1
log       =internal log          bsize=4096    blocks=2560, version=2
         =                       sectsz=512    sunit=0 blks, lazy-count=1
realtime  =none                  extsz=4096    blocks=0, rtextents=0
data blocks changed from 5018624 to 6067200
[root@localhost ~]# pvscan
PV /dev/sda3   VG almalinux   lvm2 [19,30 GiB / 0   free]
PV /dev/sdb2   VG almalinux   lvm2 [19,00 GiB / 0   free]
PV /dev/sdc1   VG almalinux   lvm2 [20,00 GiB / 16,00 GiB free]
Total: 3 [58,29 GiB] / in use: 3 [58,29 GiB] / in no VG: 0 [0   ]
[root@localhost ~]# lvscan
ACTIVE       '/dev/almalinux/home' [23,14 GiB] inherit
ACTIVE       '/dev/almalinux/root' [19,15 GiB] inherit
[root@localhost ~]# df /home
S.ficheros          bloques de 1K Usados Disponibles Uso% Montado en
/dev/mapper/almalinux-home 24258560 202256    24056304    1% /home
[root@localhost ~]# _
```