Administración de Sistemas y Redes - Práctica 3

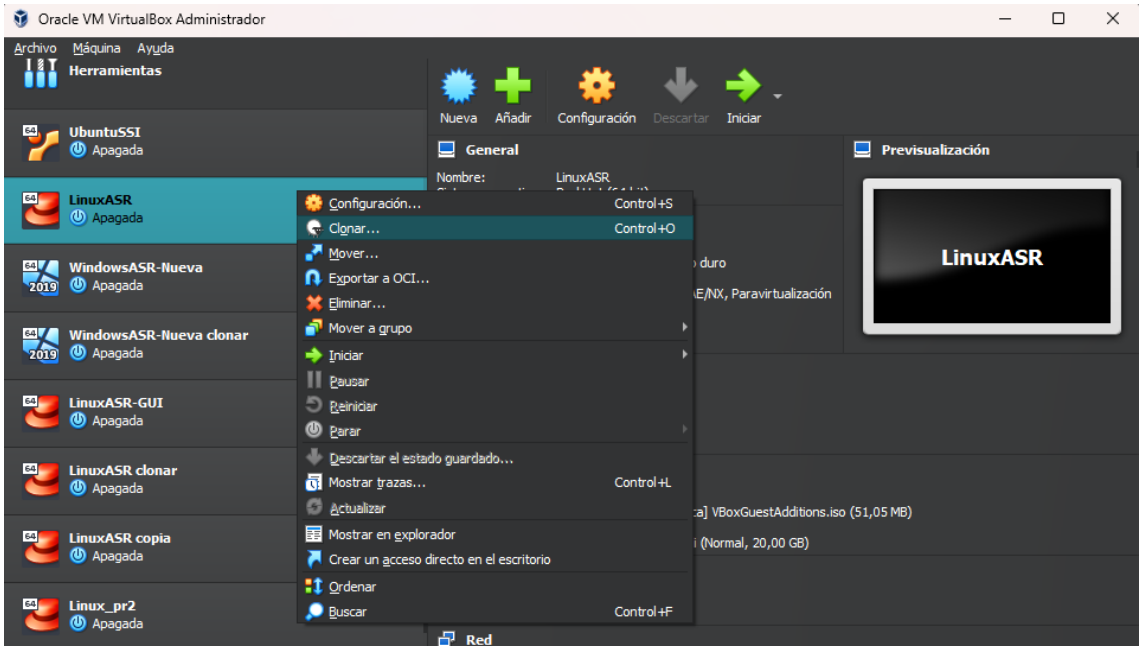
Miguel Fernández Huerta | UO287577

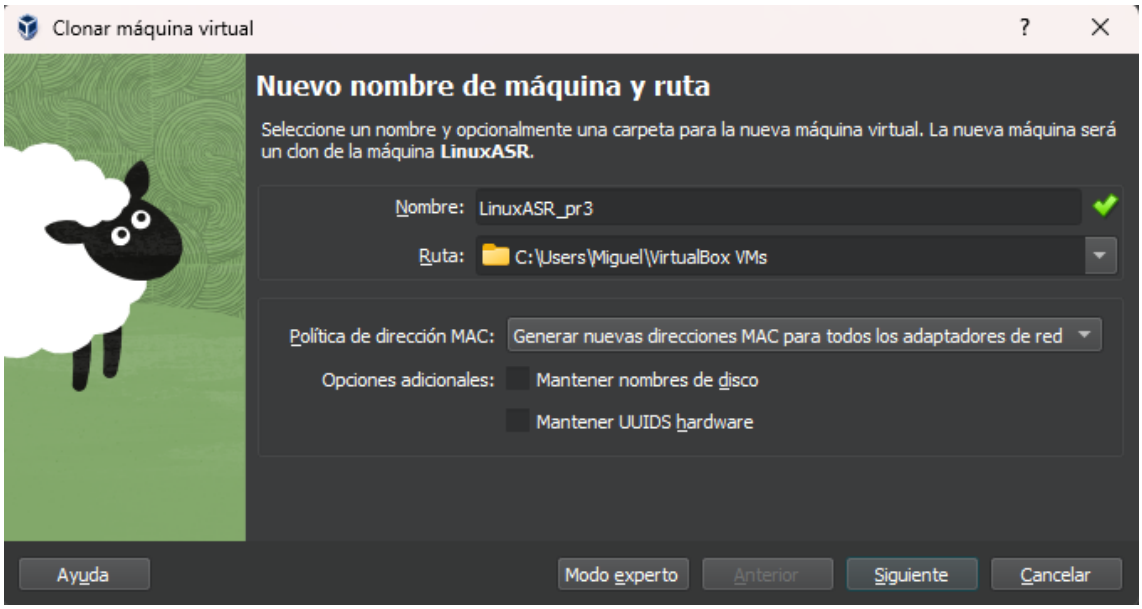
Índice

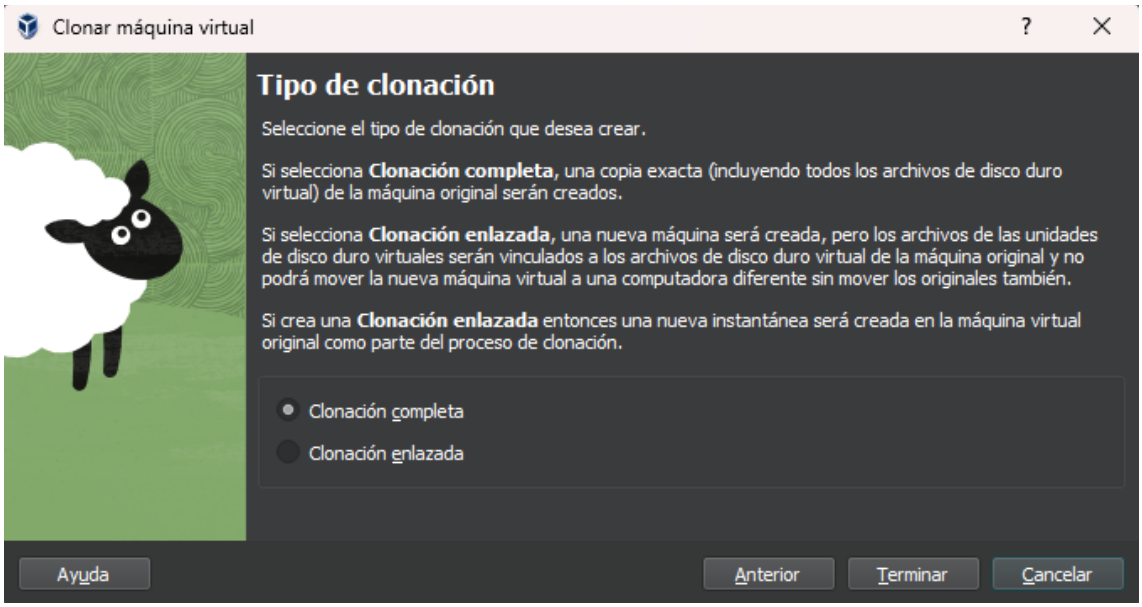
Recuperación básica del sistema y configuración avanzada de discos

El modo de mantenimiento o emergencia (modo de usuario único)

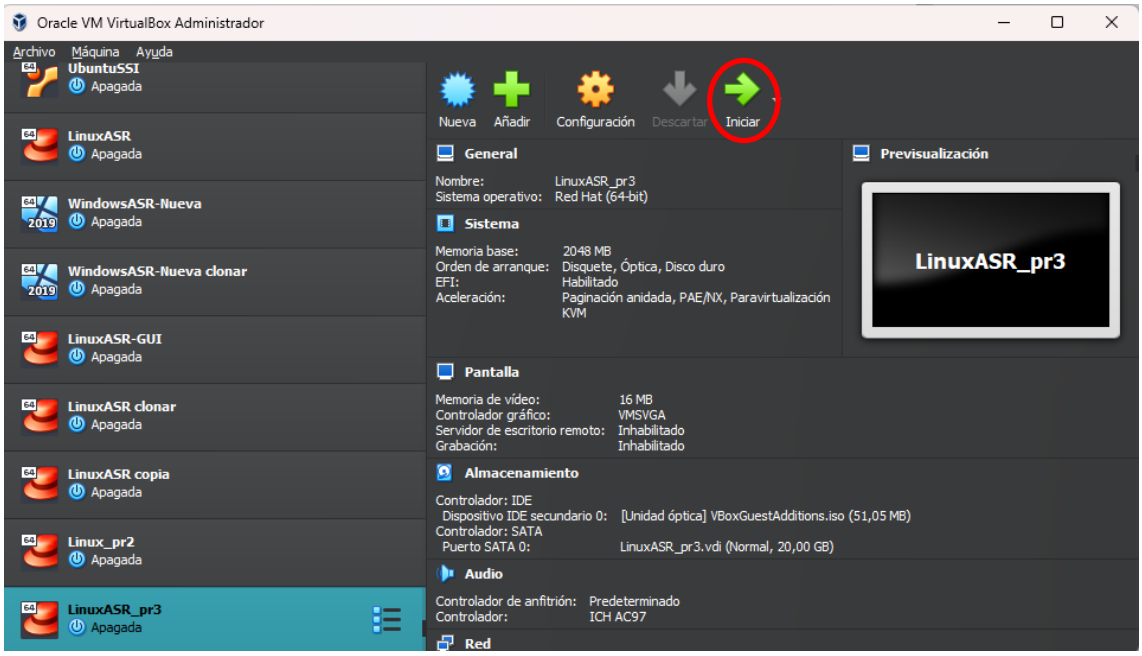
Clonamos la máquina virtual Linux original.



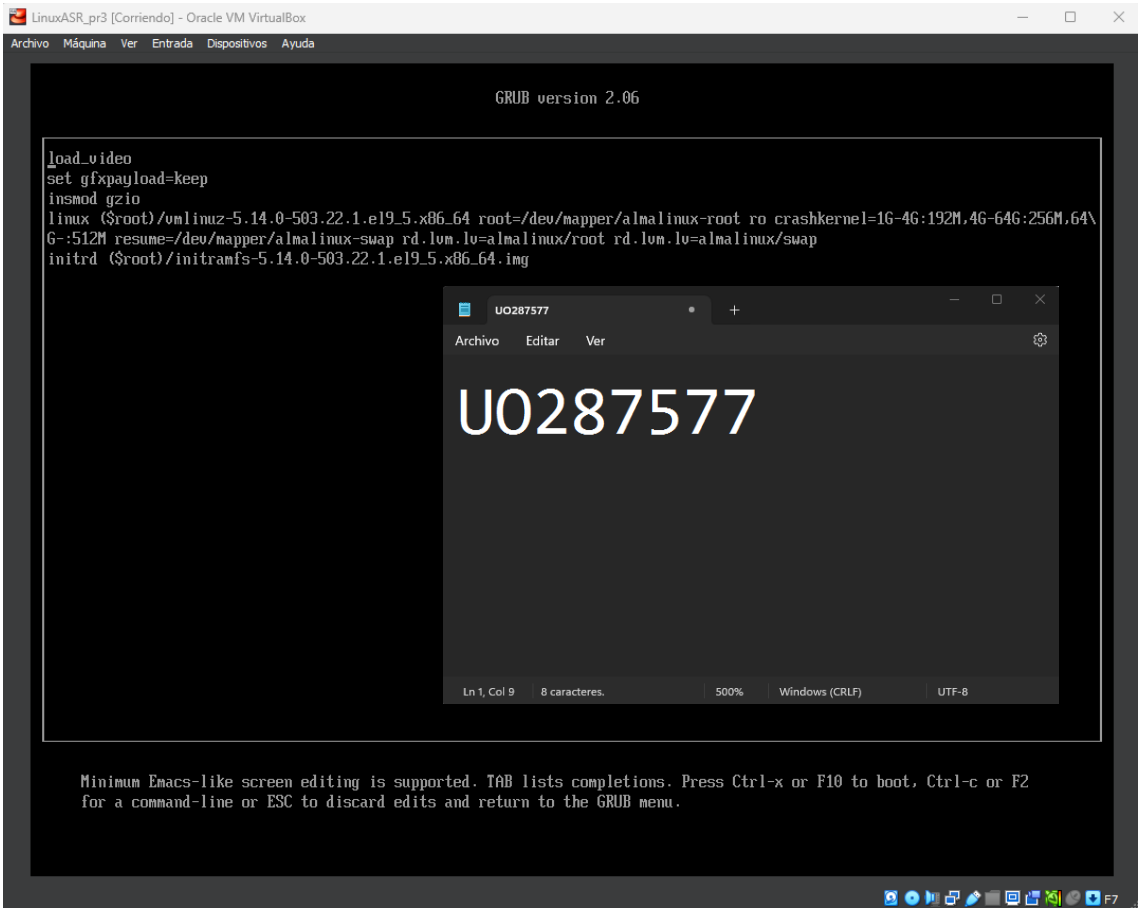




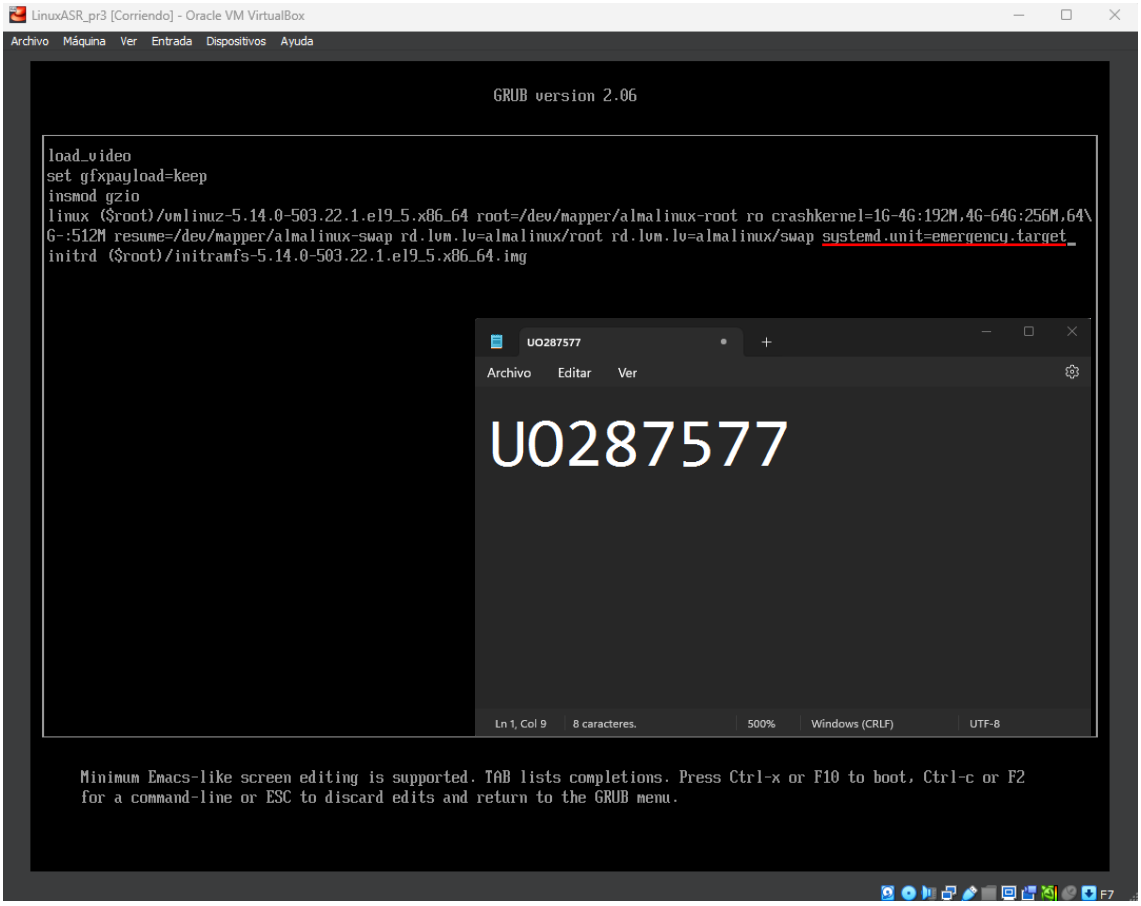
Iniciamos el sistema Linux.



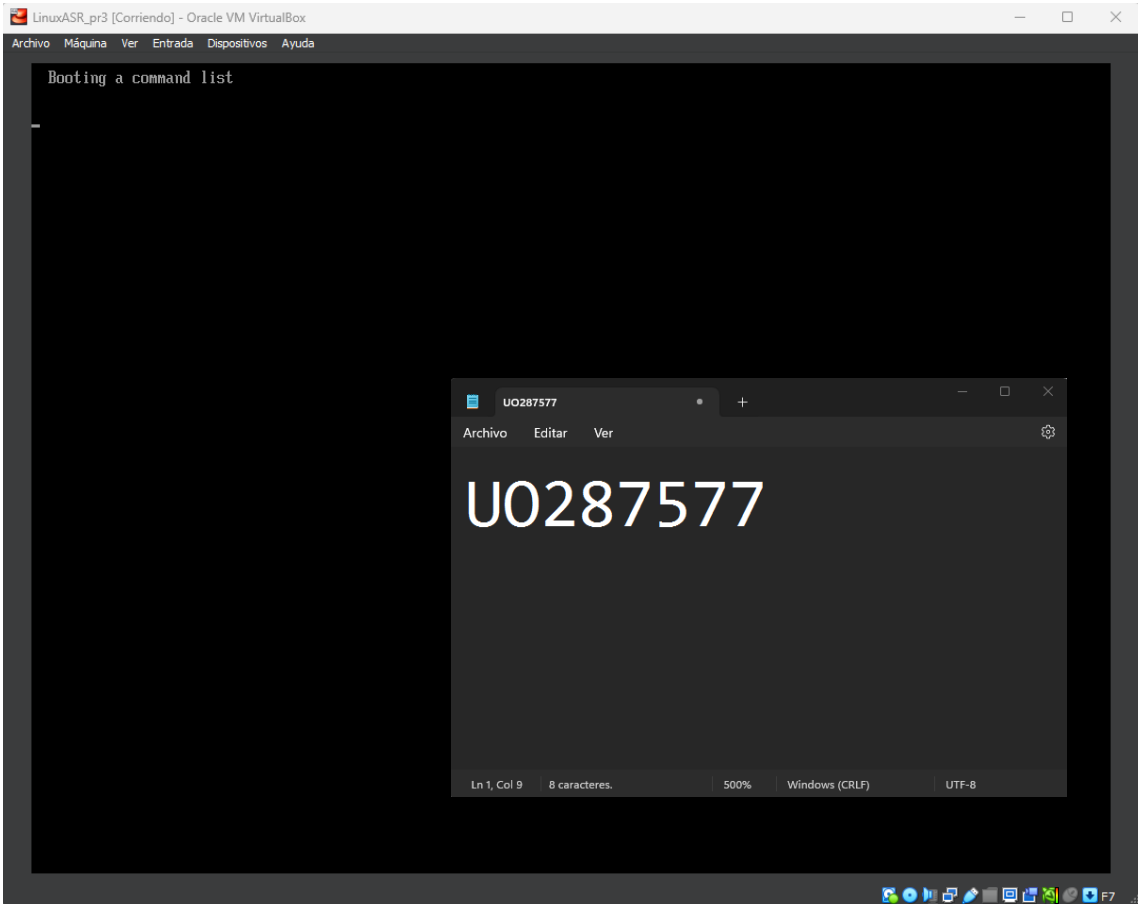
Al iniciar el sistema en el menú grub pulsamos la tecla "e" para editar las opciones de arranque.



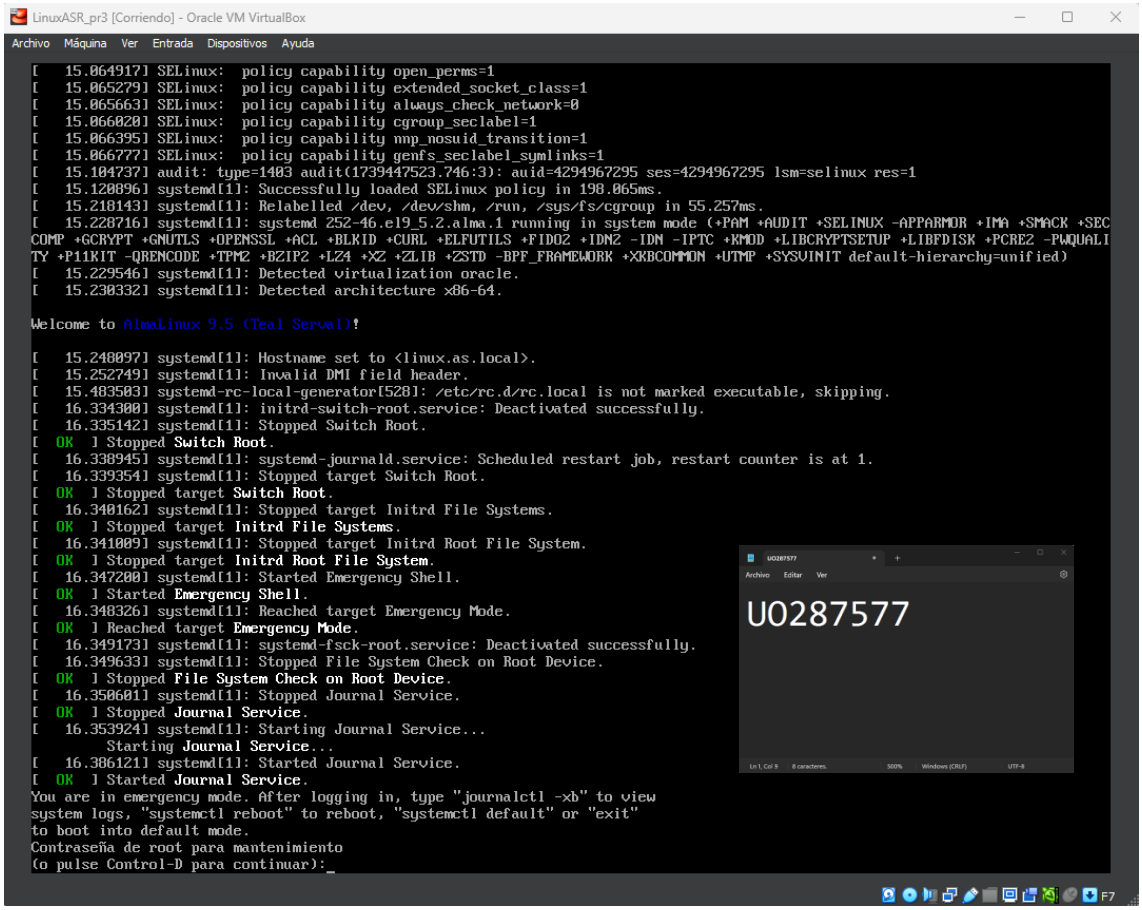
Buscamos la línea correspondiente al arranque del núcleo y agregamos un espacio y el texto systemd.unit=emergency.target al final de la misma.

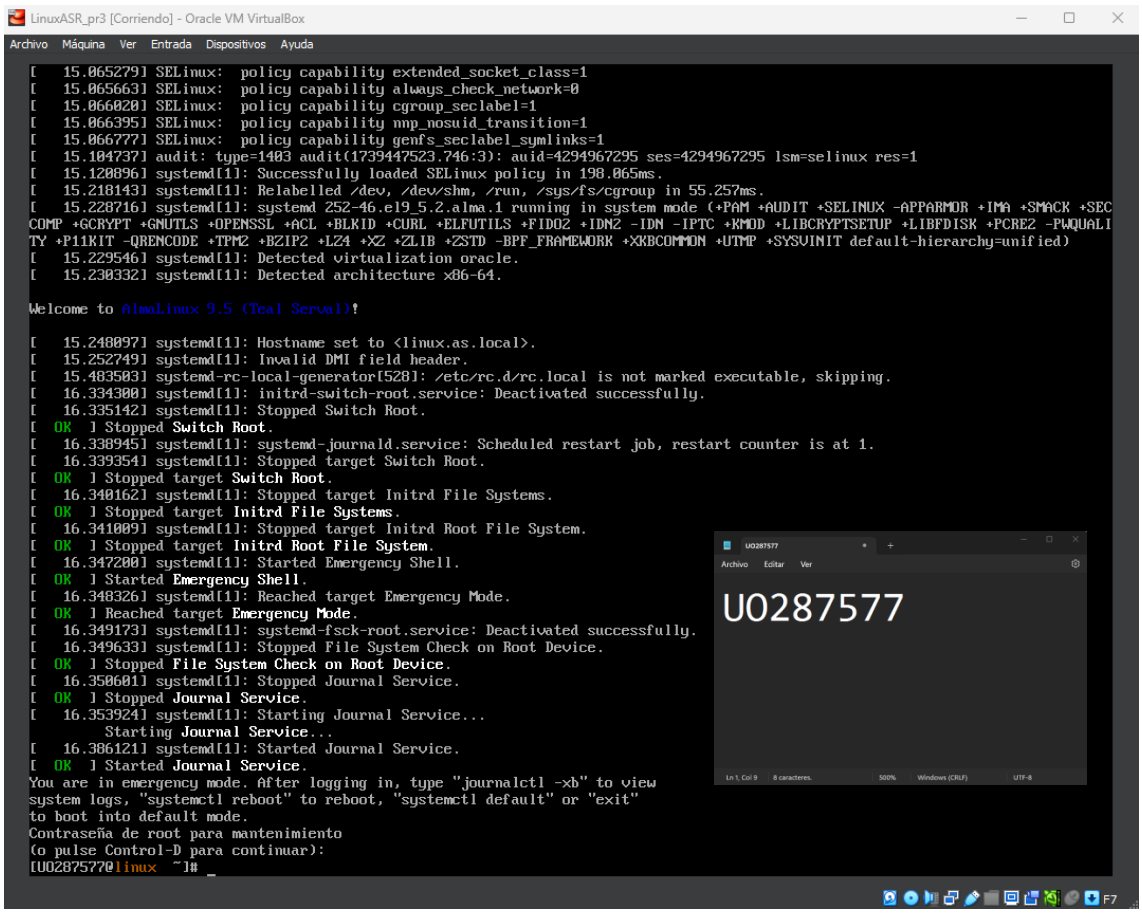


Pulsamos Ctrl-X.



Nos aparece un diálogo que requiere la contraseña de root.


LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
[15.064917] SELinux: policy capability open_perms=1
[15.065279] SELinux: policy capability extended_socket_class=1
[15.065663] SELinux: policy capability always_check_network=0
[15.066020] SELinux: policy capability cgroup_seclabel=1
[15.066395] SELinux: policy capability nnp_nosuid_transition=1
[15.066777] SELinux: policy capability genfs_seclabel_symlinks=1
[15.104737] audit: type=1403 audit(1739447523.746:3): auid=4294967295 ses=4294967295 lsm=selinux res=1
[15.120896] systemd[1]: Successfully loaded SELinux policy in 198.065ms.
[15.218143] systemd[1]: Relabelled /dev, /dev/shm, /run, /sys/fs/cgroup in 55.257ms.
[15.228716] systemd[1]: systemd 252-46.el9_5.2.alma.1 running in system mode (+PAM +AUDIT +SELINUX -APPARMOR +IMA +SMACK +SECCOMP +GCRYPT +GNUTLS +OPENSSL +ACL +BLKID +CURL +ELFUTILS +FIDO2 +IDN2 -IDN -IPTC +KMOD +LIBCRYPTSETUP +LIBFDISK +PCRE2 -PWQUALITY +P11KIT -QRENCODE +TPM2 +BZIP2 +LZ4 +XZ +ZLIB +ZSTD -BPF_FRAMEWORK +XKBCOMMON +UTMP +SYSVINIT default-hierarchy=unified)
[15.229546] systemd[1]: Detected virtualization oracle.
[15.230332] systemd[1]: Detected architecture x86-64.
Welcome to AlmaLinux 9.5 (Teal Serval)!
[15.248097] systemd[1]: Hostname set to <linux.as.local>.
[15.252749] systemd[1]: Invalid DMI field header.
[15.483503] systemd-rc-local-generator[528]: /etc/rc.d/rc.local is not marked executable, skipping.
[16.334300] systemd[1]: initrd-switch-root.service: Deactivated successfully.
[16.335142] systemd[1]: Stopped Switch Root.
[OK] Stopped Switch Root.
[16.338945] systemd[1]: systemd-journald.service: Scheduled restart job, restart counter is at 1.
[16.339354] systemd[1]: Stopped target Switch Root.
[OK] Stopped target Switch Root.
[16.340162] systemd[1]: Stopped target Initrd File Systems.
[OK] Stopped target Initrd File Systems.
[16.341009] systemd[1]: Stopped target Initrd Root File System.
[OK] Stopped target Initrd Root File System.
[16.347200] systemd[1]: Started Emergency Shell.
[OK] Started Emergency Shell.
[16.348326] systemd[1]: Reached target Emergency Mode.
[OK] Reached target Emergency Mode.
[16.349173] systemd[1]: systemd-fsck-root.service: Deactivated successfully.
[16.349633] systemd[1]: Stopped File System Check on Root Device.
[OK] Stopped File System Check on Root Device.
[16.350601] systemd[1]: Stopped Journal Service.
[OK] Stopped Journal Service.
[16.353924] systemd[1]: Starting Journal Service...
Starting Journal Service...
[16.386121] systemd[1]: Started Journal Service.
[OK] Started Journal Service.
You are in emergency mode. After logging in, type "journalctl -xb" to view
system logs, "systemctl reboot" to reboot, "systemctl default" or "exit"
to boot into default mode.
Contraseña de root para mantenimiento
(o pulse Control-D para continuar):
UO287577
Archivo Editar Ver
UO287577
F7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Archivo Máquina Ver Entrada Dispositivos Ayuda
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[15.066020] SELinux: policy capability cgroup_seclabel=1
[15.066395] SELinux: policy capability nnp_nosuid_transition=1
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[15.120896] systemd[1]: Successfully loaded SELinux policy in 198.065ms.
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[15.228716] systemd[1]: systemd 252-46.el9_5.2.alma.1 running in system mode (+PAM +AUDIT +SELINUX -APPARMOR +IMA +SMACK +SECCOMP +GCRYPT +GNUTLS +OPENSSL +ACL +BLKID +CURL +ELFUTILS +FIDO2 +IDN2 -IDN -IPTC +KMOD +LIBCRYPTSETUP +LIBFDISK +PCRE2 -PWQUALITY +P11KIT -QRENCODE +TPM2 +BZIP2 +LZ4 +XZ +ZLIB +ZSTD -BPF_FRAMEWORK +XKBCOMMON +UTMP +SYSVINIT default-hierarchy=unified)
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[OK] Stopped target Switch Root.
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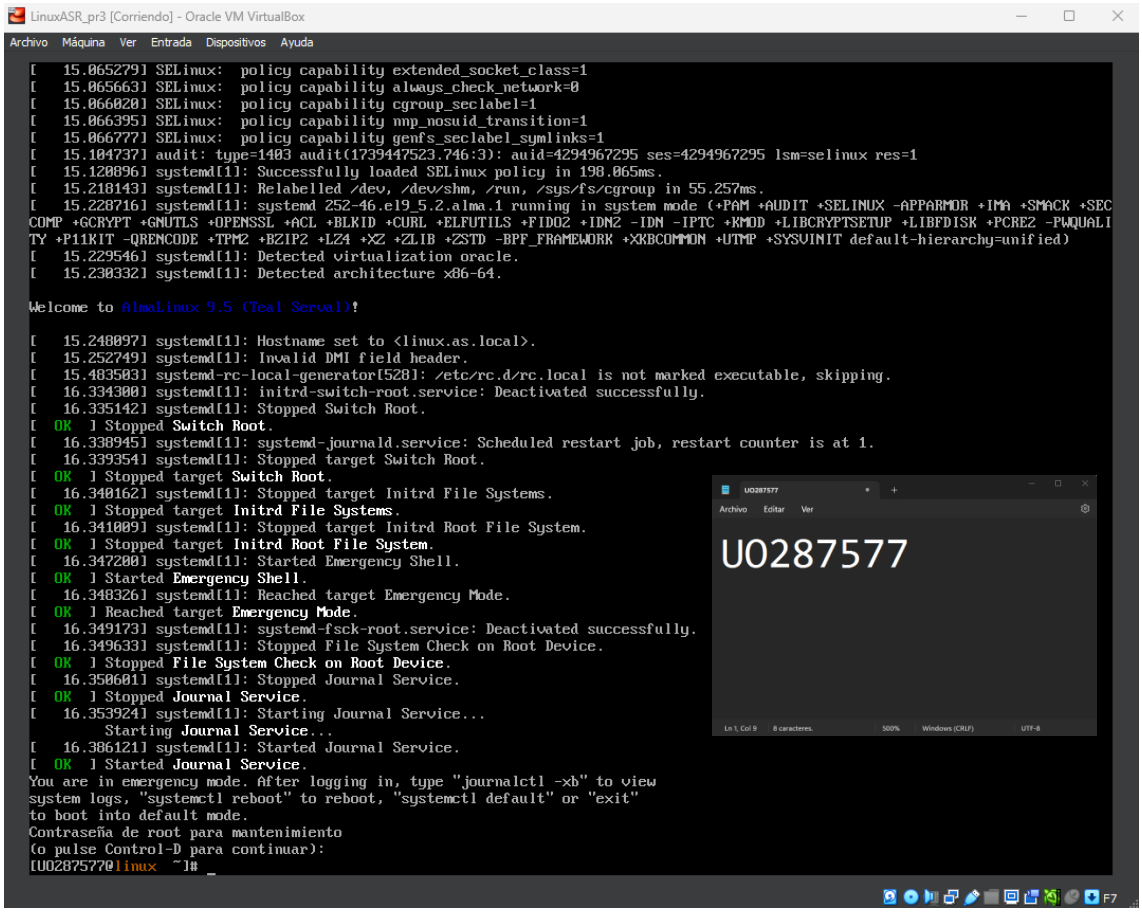
to boot into default mode.
Contraseña de root para mantenimiento
(o pulse Control-D para continuar):
[UO287577@linux ~]#
UO287577
Archivo Editar Ver
UO287577
F7

Comprobamos con Alt-F2 que no aparecen múltiples sesiones.



(En efecto, no aparecen múltiples sesiones)

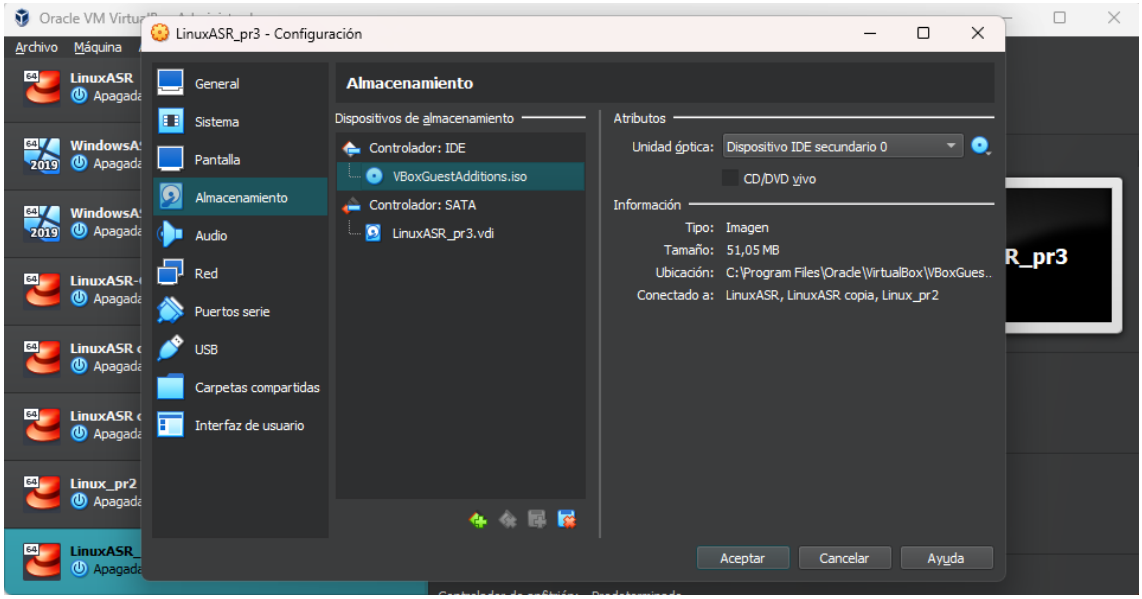
Comprobamos la red con nmcli e intentamos usar algunos comandos que requieren uso de la red como por ejemplo dnf para instalar algo.

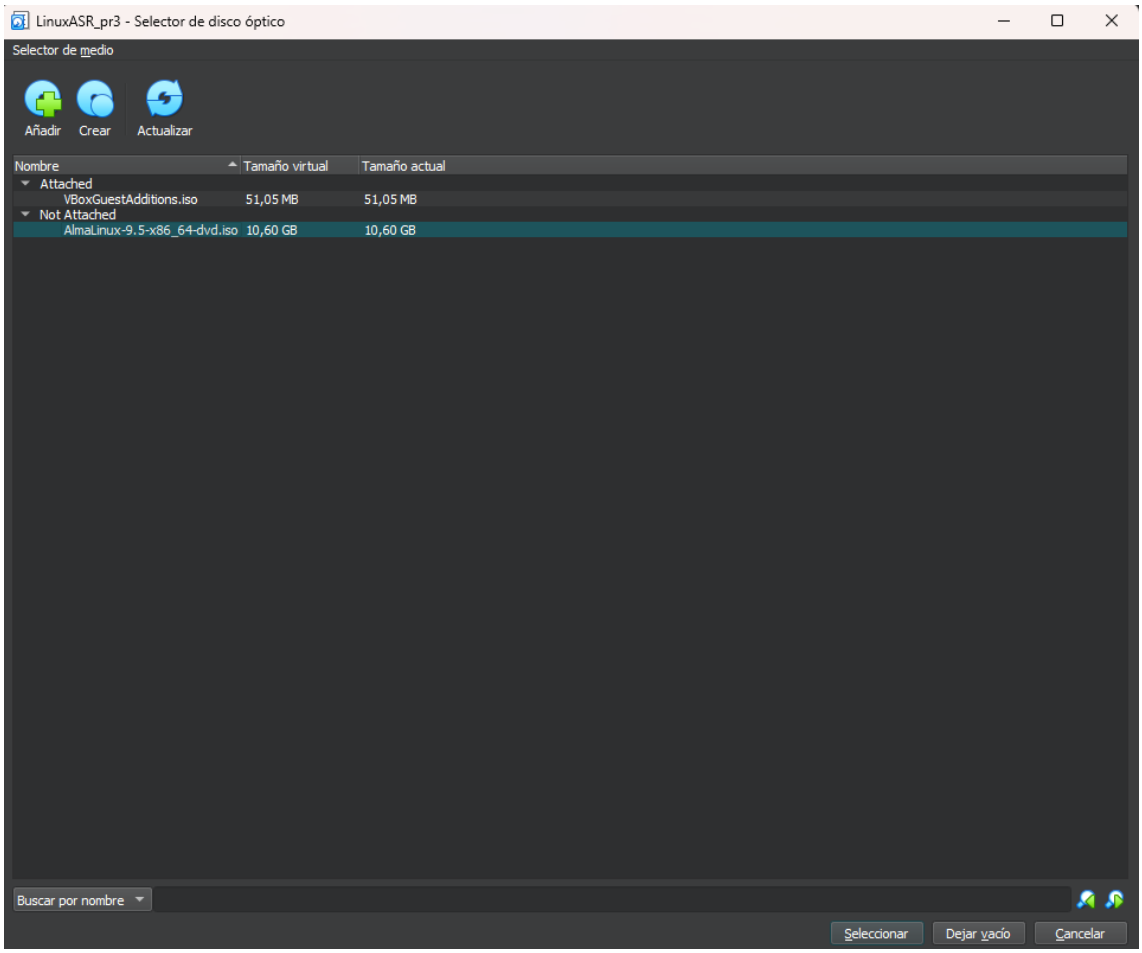
```
[UO287577@linux ~]# nmcli
Error: no se pudo crear el objeto NMClient: No se pudo conectar: No existe el fichero o el directorio.
[UO287577@linux ~]# _
```

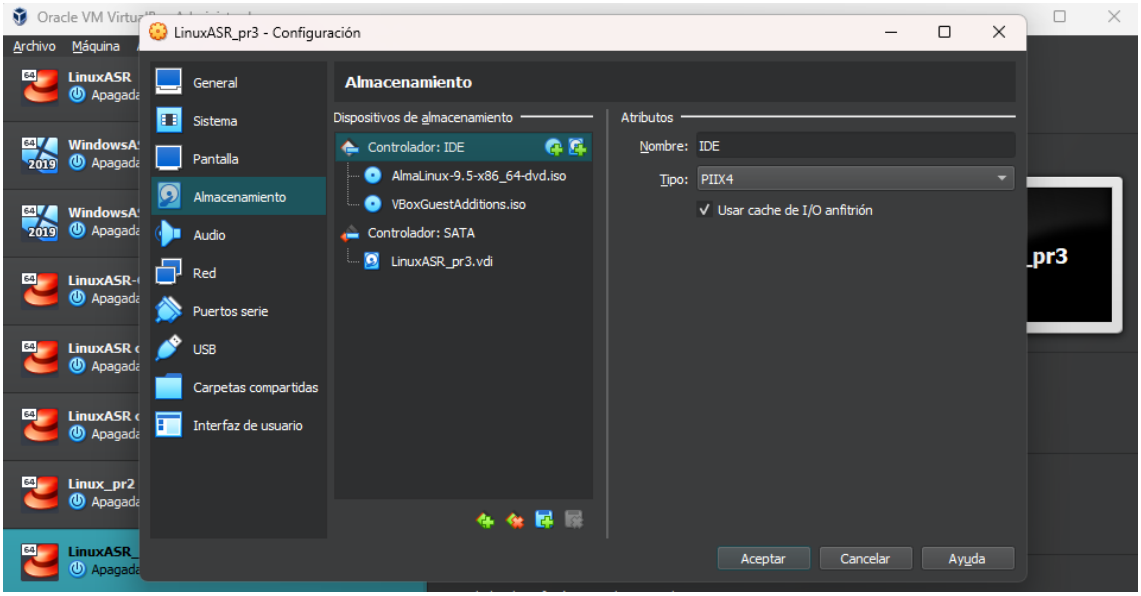
```
[UO287577@linux ~]# dnf update -y
Error de configuración: [Errno 30] Sistema de ficheros de sólo lectura: '/var/log/dnf.log': '/var/log/dnf.log'
[UO287577@linux ~]# _
```

Modo de rescate o recuperación

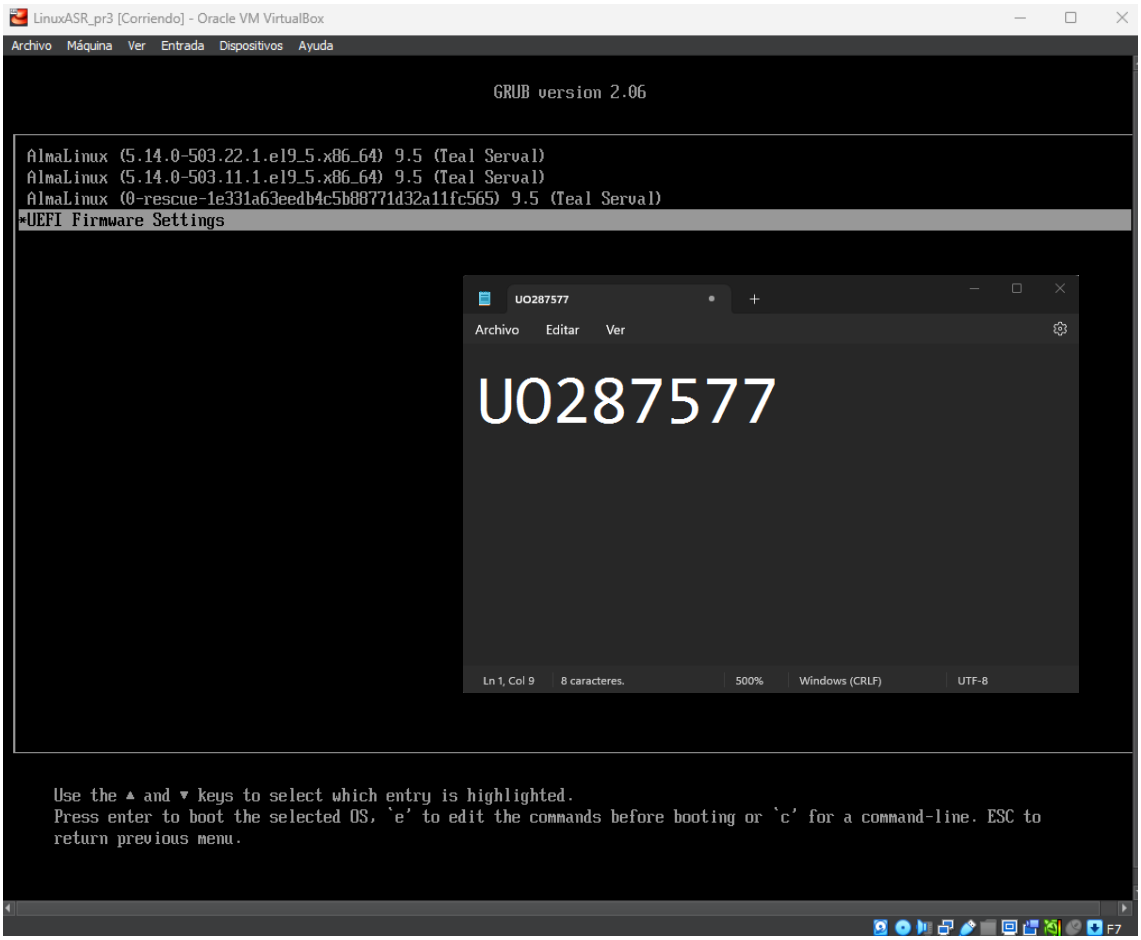
Comprobamos que el disco de instalación se encuentra insertado en la unidad óptica.

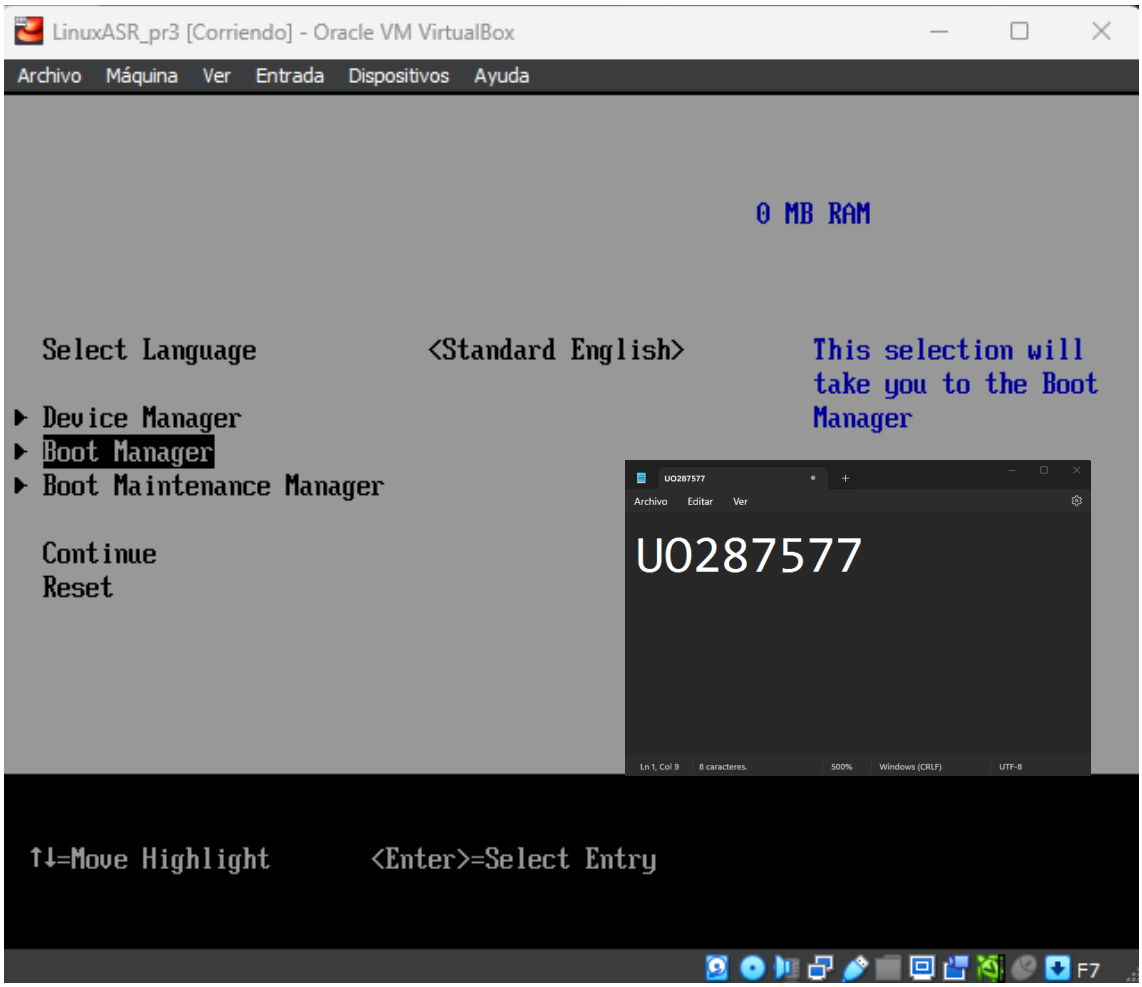

LinuxASR_pr3 - Configuración
General
Sistema
Pantalla
Almacenamiento
Audio
Red
Puertos serie
USB
Carpetas compartidas
Interfaz de usuario
Almacenamiento
Dispositivos de almacenamiento
Controlador: IDE
VBoxGuestAdditions.iso
Controlador: SATA
LinuxASR_pr3.vdi
Atributos
Unidad óptica:
Dispositivo IDE secundario 0
CD/DVD vivo
Información
Tipo: Imagen
Tamaño: 51,05 MB
Ubicación: C:\Program Files\Oracle\VirtualBox\VBoxGues..
Conectado a: LinuxASR, LinuxASR copia, Linux_pr2
Aceptar
Cancelar
Ayuda

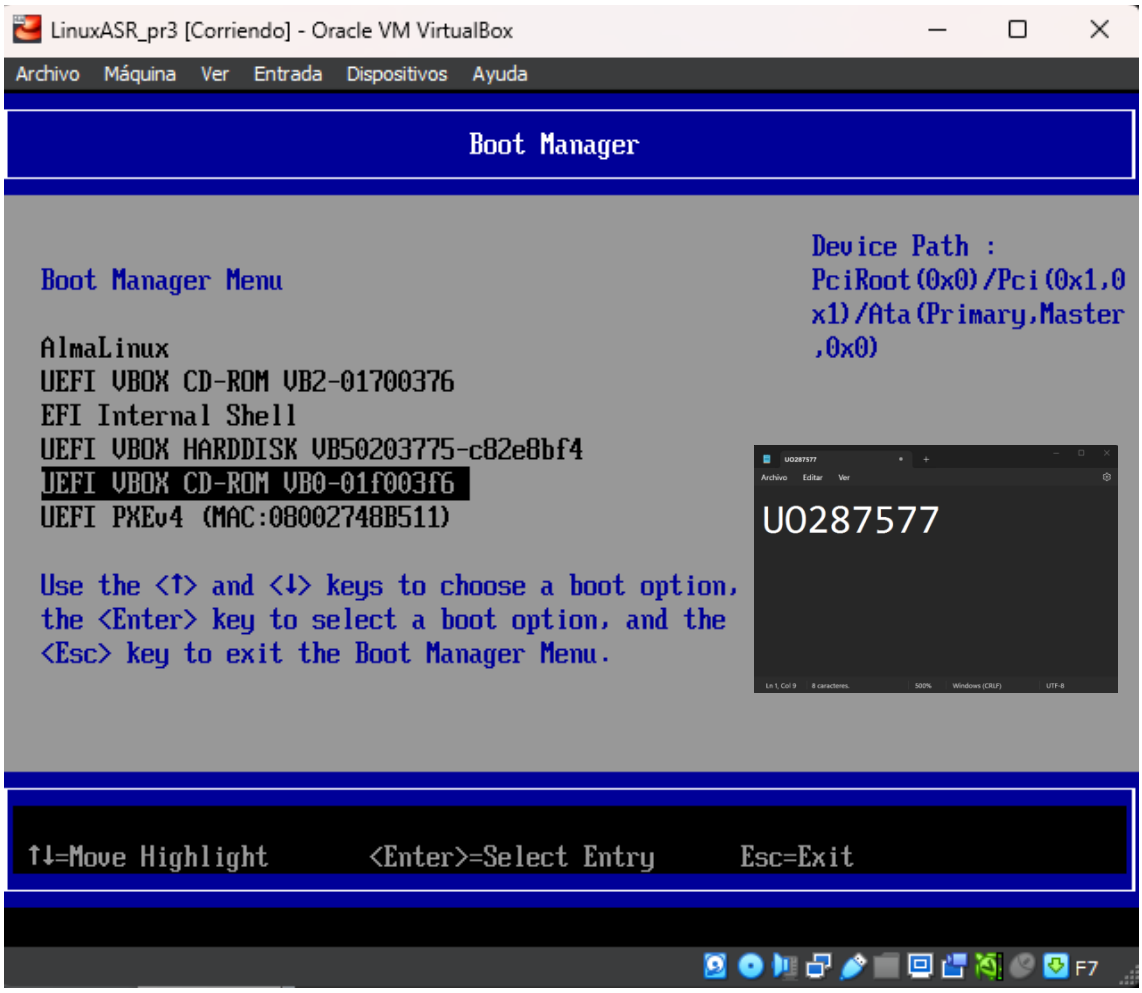

LinuxASR_pr3 - Selector de disco óptico
Selector de medio
Añadir
Crear
Actualizar
Nombre
Tamaño virtual
Tamaño actual
Attached
VBoxGuestAdditions.iso 51,05 MB 51,05 MB
Not Attached
AlmaLinux-9.5-x86_64-dvd.iso 10,60 GB 10,60 GB
Buscar por nombre
Seleccionar
Dejar vacío
Cancelar



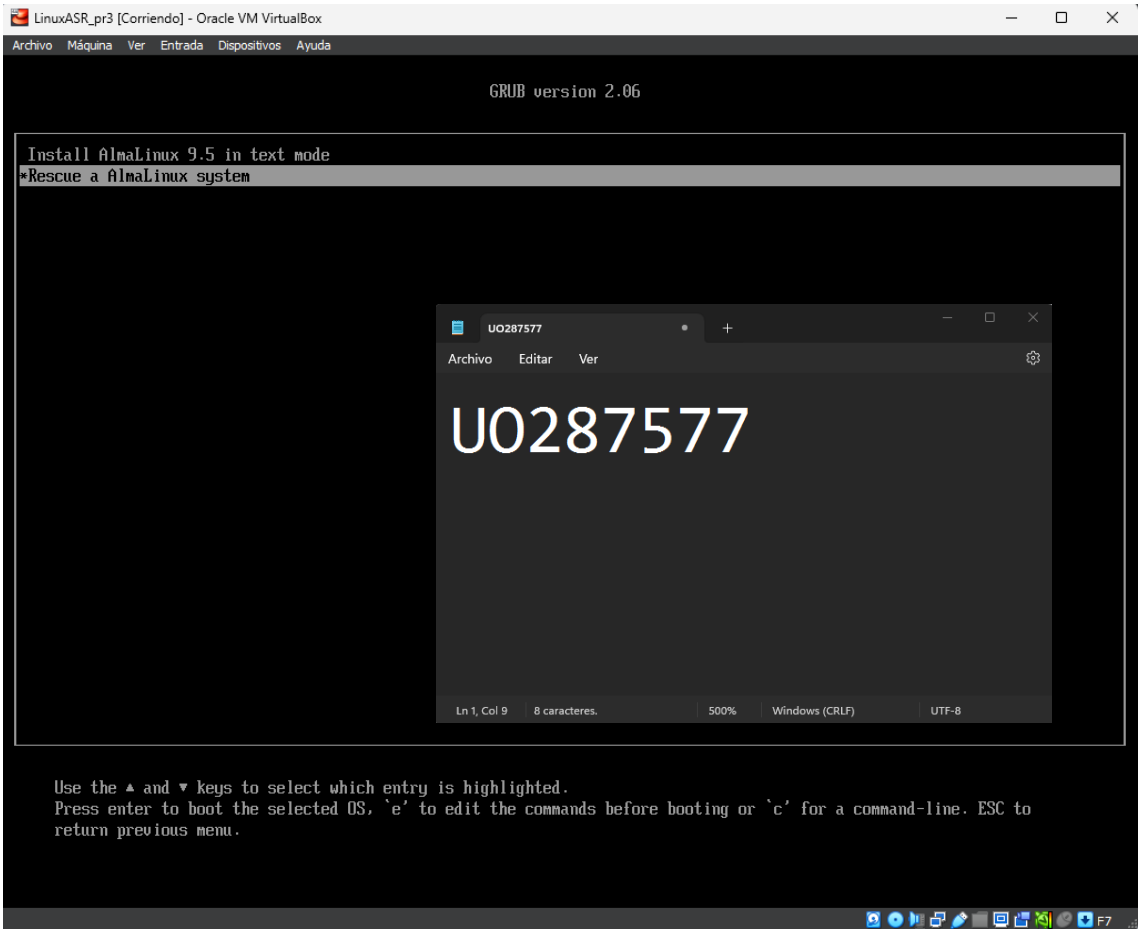
Iniciamos la máquina virtual de Linux y para arrancar desde el CD debemos seleccionar UEFI Firmware Settings → Boot Manager → UEFI VBOX CD-ROM.



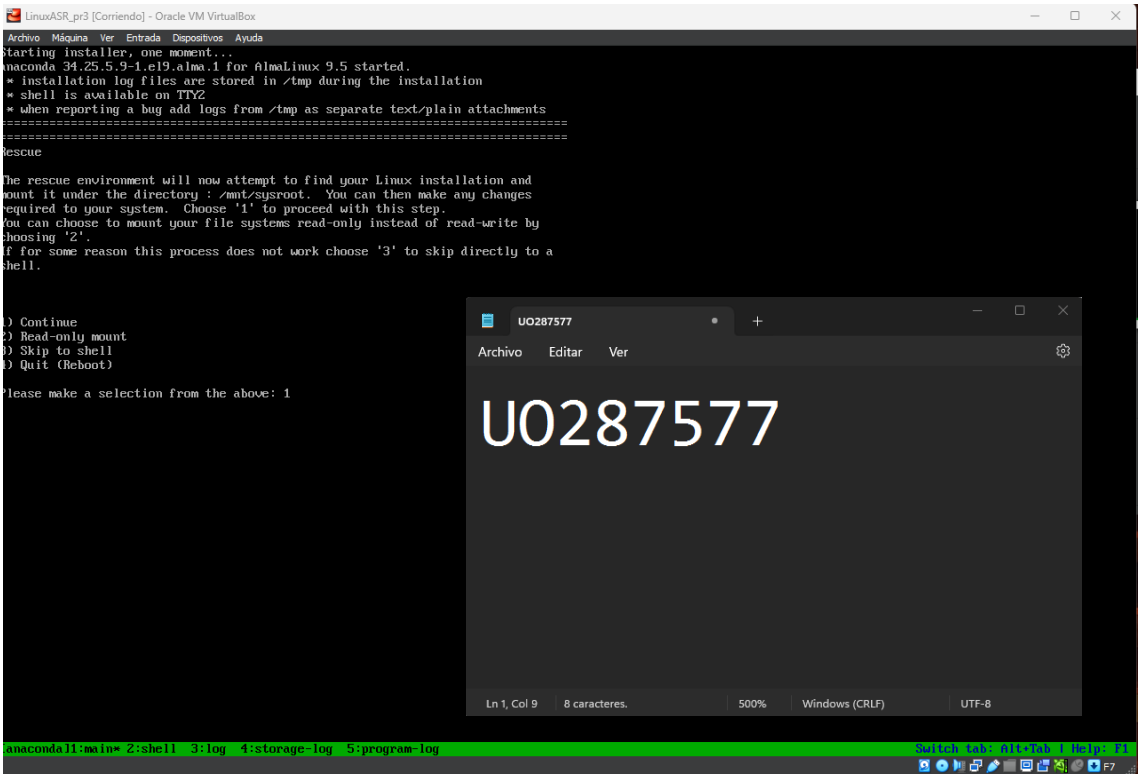

LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
0 MB RAM
Select Language <Standard English>
This selection will take you to the Boot Manager
Device Manager
Boot Manager
Boot Maintenance Manager
Continue
Reset
UO287577
Archivo Editar Ver
UO287577
Ln 1, Col 9 8 caracteres. 500% Windows (CRLF) UTF-8
↑↓=Move Highlight <Enter>=Select Entry
F7

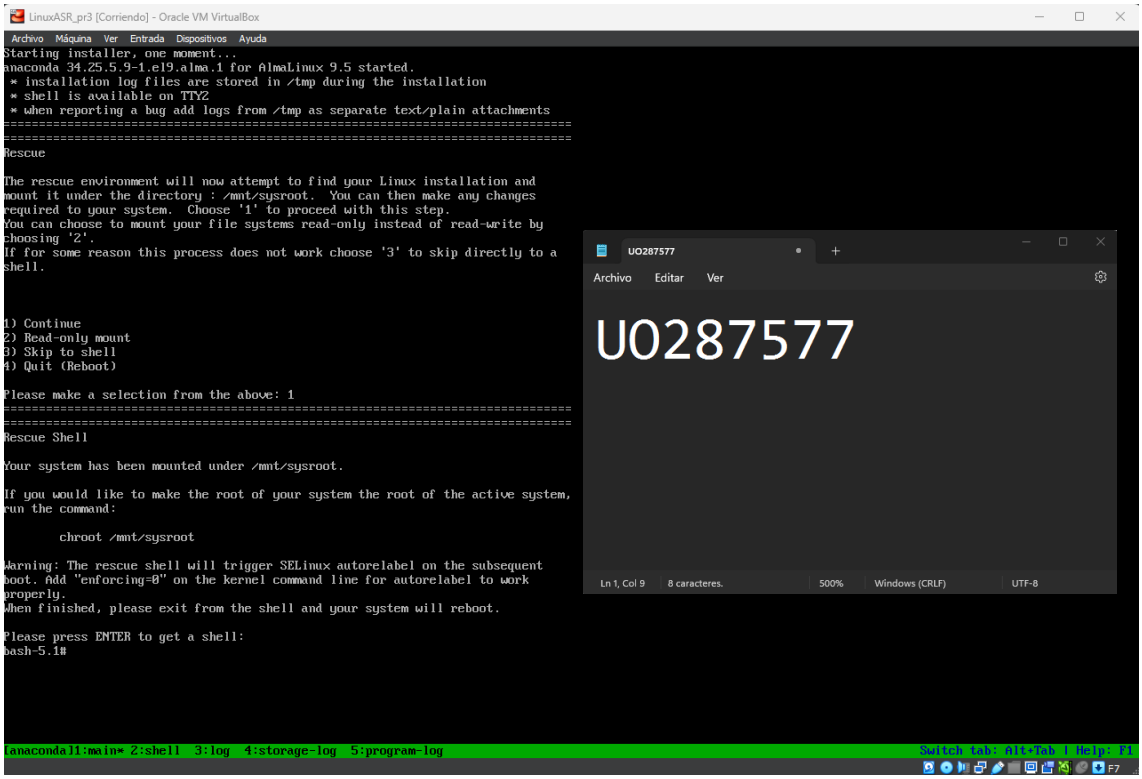


Arrancamos y ahora desde el menú de instalación seleccionamos "Troubleshooting" y "Rescue a AlmaLinux system".

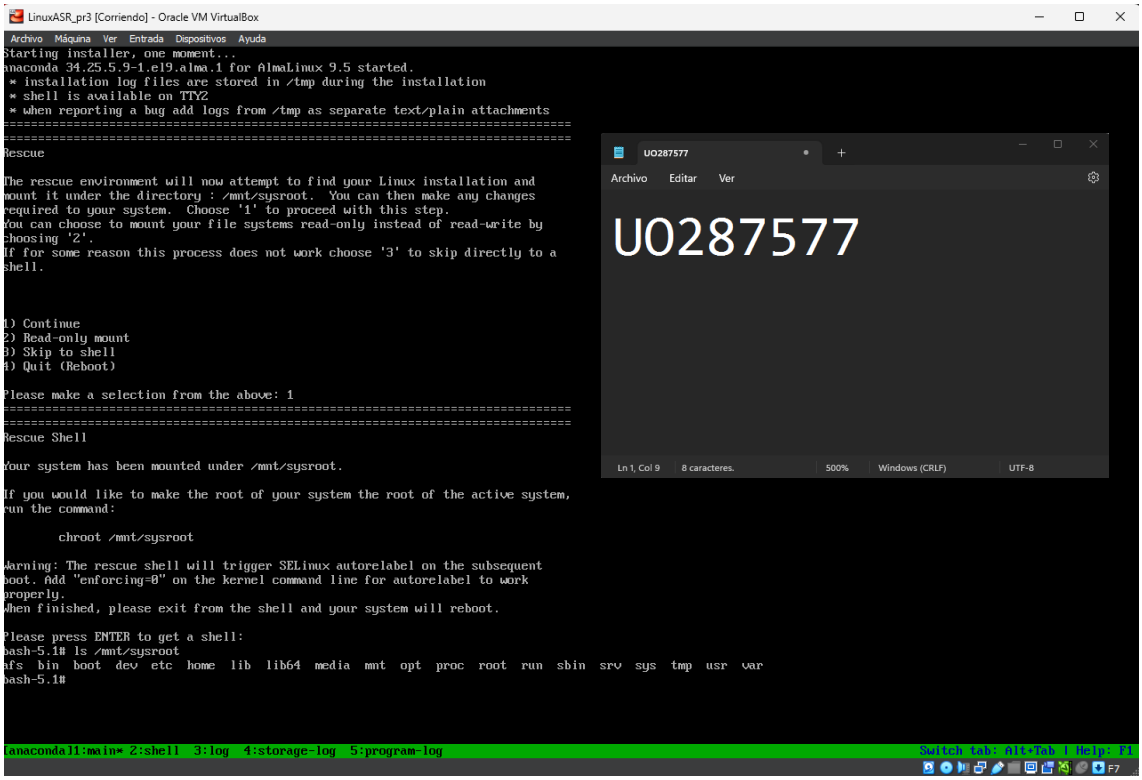


Seleccionamos la primera opción.

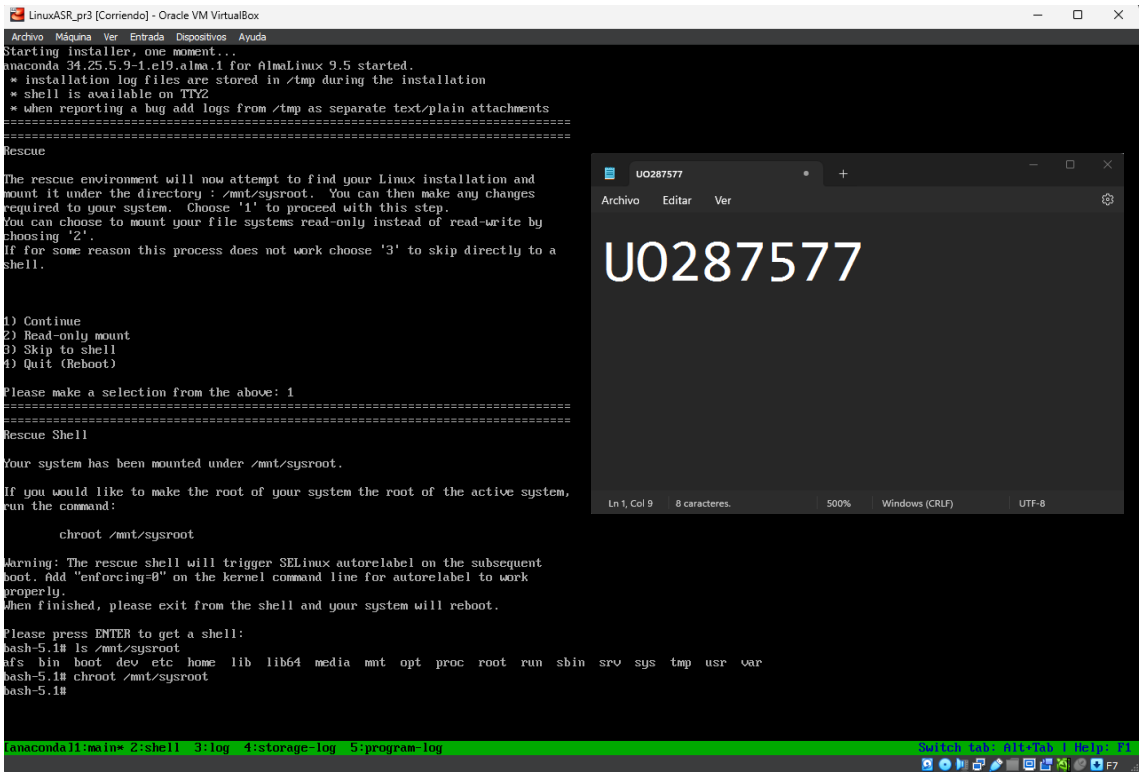




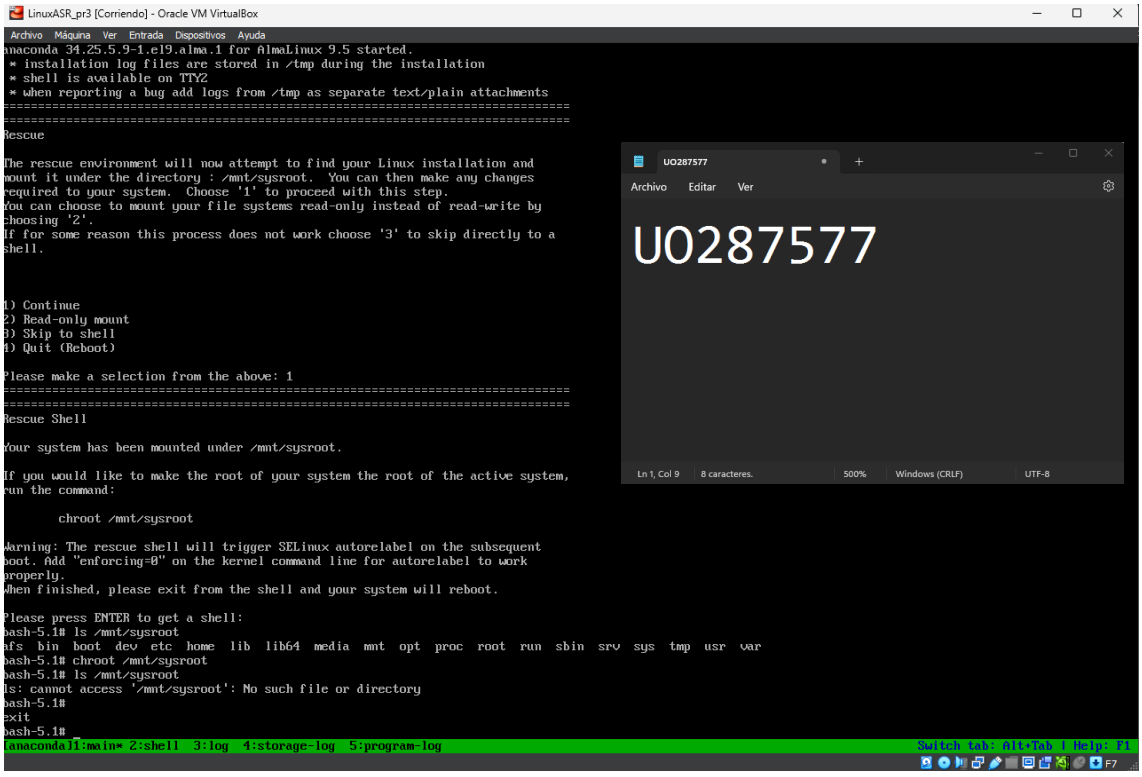
Listamos el contenido del servidor que se está reparando con la orden ls /mnt/sysroot.



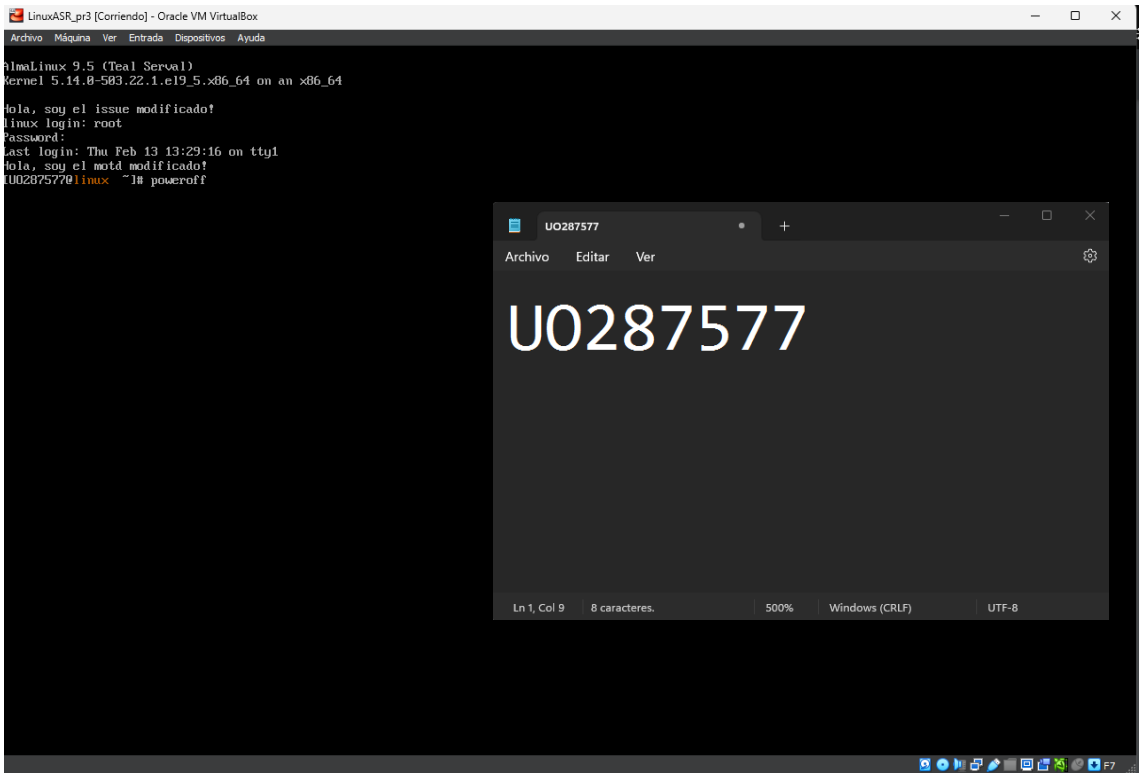
Lanzamos un shell con el comando chroot /mnt/sysroot de modo que el directorio raíz dentro del shell sea /mnt/sysroot.



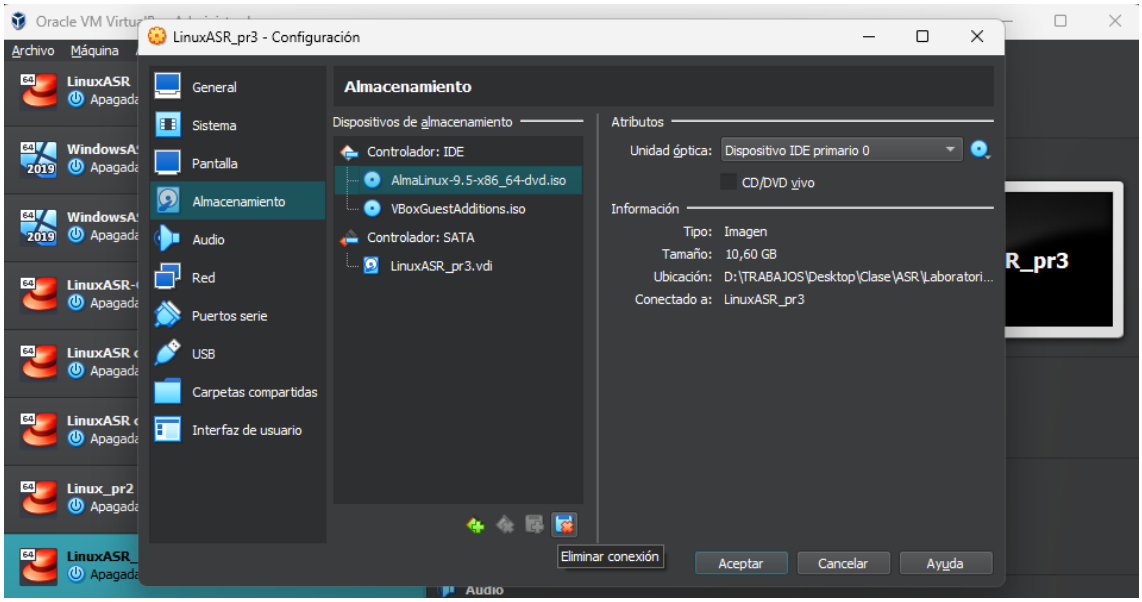
Cuando terminemos de reparar el sistema, salimos de sesión (Ctrl-D).

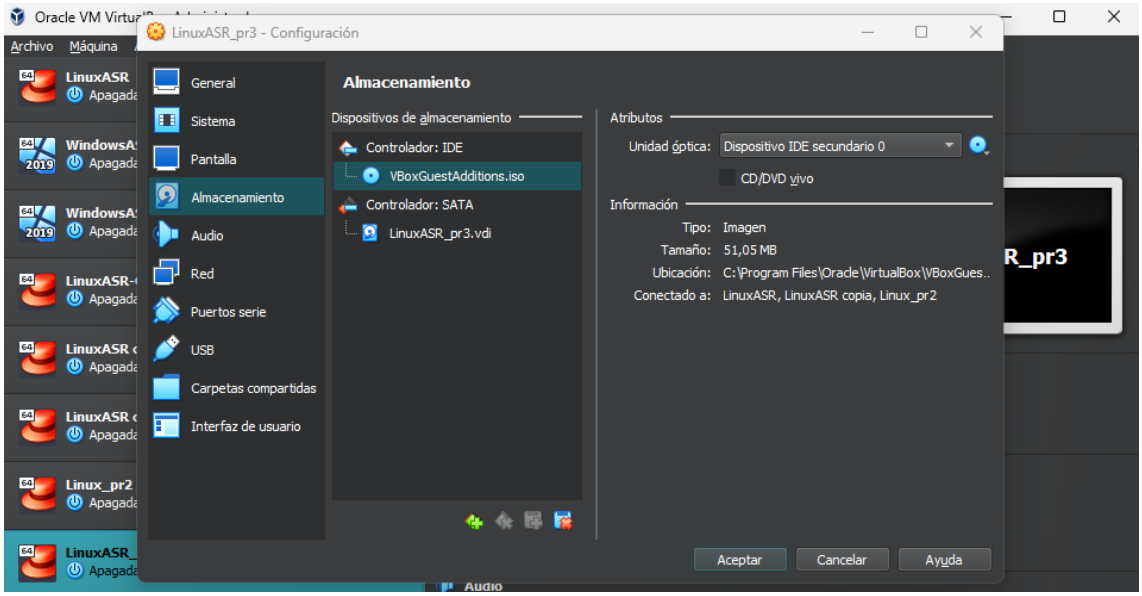


Apagamos el sistema.



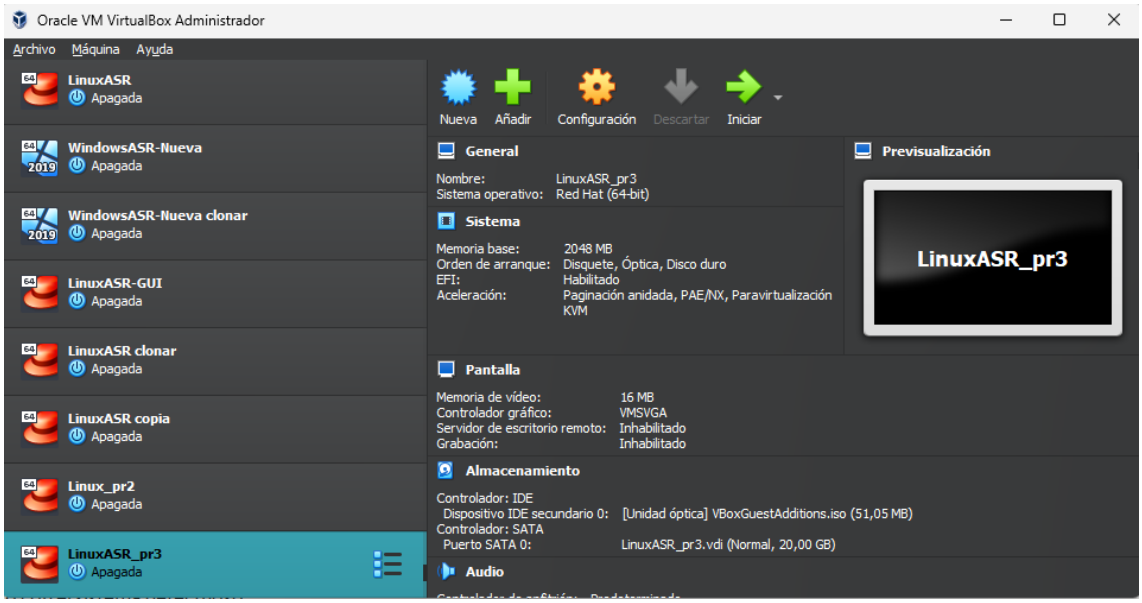
Y quitamos el disco de arranque.




LinuxASR_pr3 - Configuración
General
Sistema
Pantalla
Almacenamiento
Audio
Red
Puertos serie
USB
Carpetas compartidas
Interfaz de usuario
Almacenamiento
Dispositivos de almacenamiento
Controlador: IDE
VBoxGuestAdditions.iso
Controlador: SATA
LinuxASR_pr3.vdi
Atributos
Unidad óptica:
Dispositivo IDE secundario 0
CD/DVD vivo
Información
Tipo: Imagen
Tamaño: 51,05 MB
Ubicación: C:\Program Files\Oracle\VirtualBox\VBoxGues..
Conectado a: LinuxASR, LinuxASR copia, Linux_pr2
Aceptar
Cancelar
Ayuda

A. Recuperación básica de errores durante el inicio

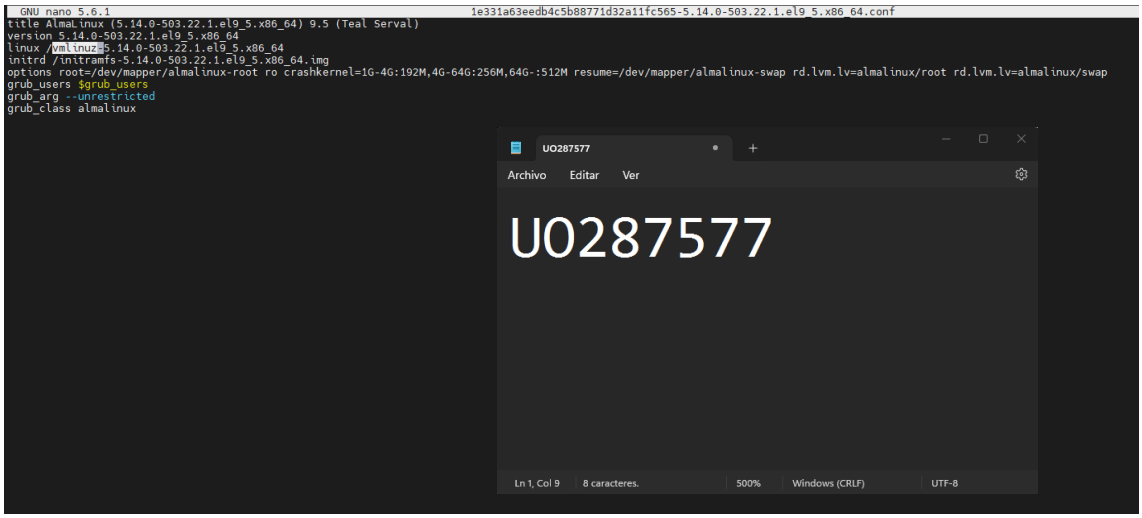
1.- Arrancamos Linux normalmente y examinamos el contenido de /boot/loader/entries.

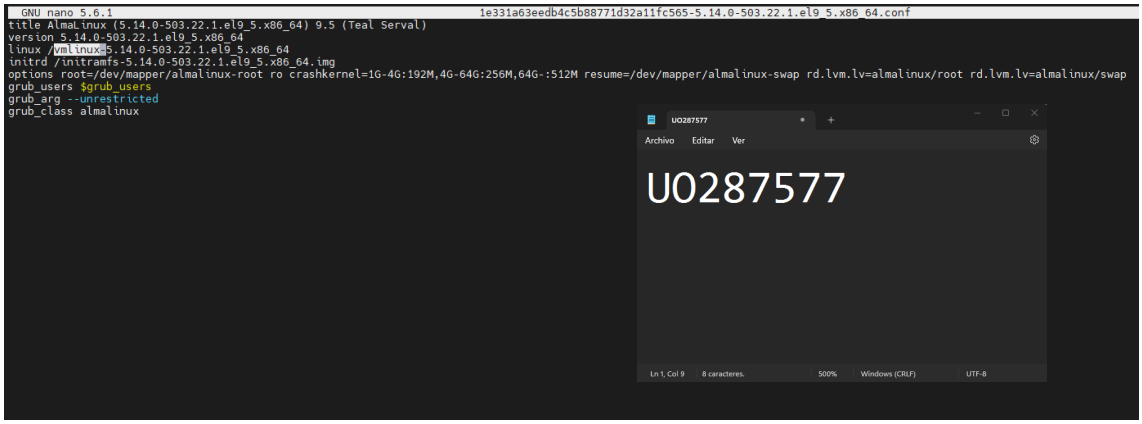



```
[U0287577@linux  ~]# cd /boot/loader/entries
[U0287577@linux  entries]# ls -l
total 12
-rw-r--r--. 1 root root 490 ene 30 15:27 1e331a63eedb4c5b88771d32a11fc565-0-rescue.conf
-rw-r--r--. 1 root root 438 ene 30 15:27 1e331a63eedb4c5b88771d32a11fc565-5.14.0-503.11.1.el9_5.x86_64.conf
-rw-r--r--. 1 root root 437 ene 30 16:00 1e331a63eedb4c5b88771d32a11fc565-5.14.0-503.22.1.el9_5.x86_64.conf
[U0287577@linux  entries]#
```

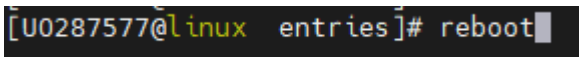
Editamos el fichero de configuración con el kernel más reciente de todos ellos, tendrá un nombre bastante largo y mostrará los números de versión más elevados. Buscamos la palabra vmlinuz y la cambiamos por vmlinux.

```
[U0287577@linux  entries]# nano 1e331a63eedb4c5b88771d32a11fc565-5.14.0-503.22.1.el9_5.x86_64.conf
```

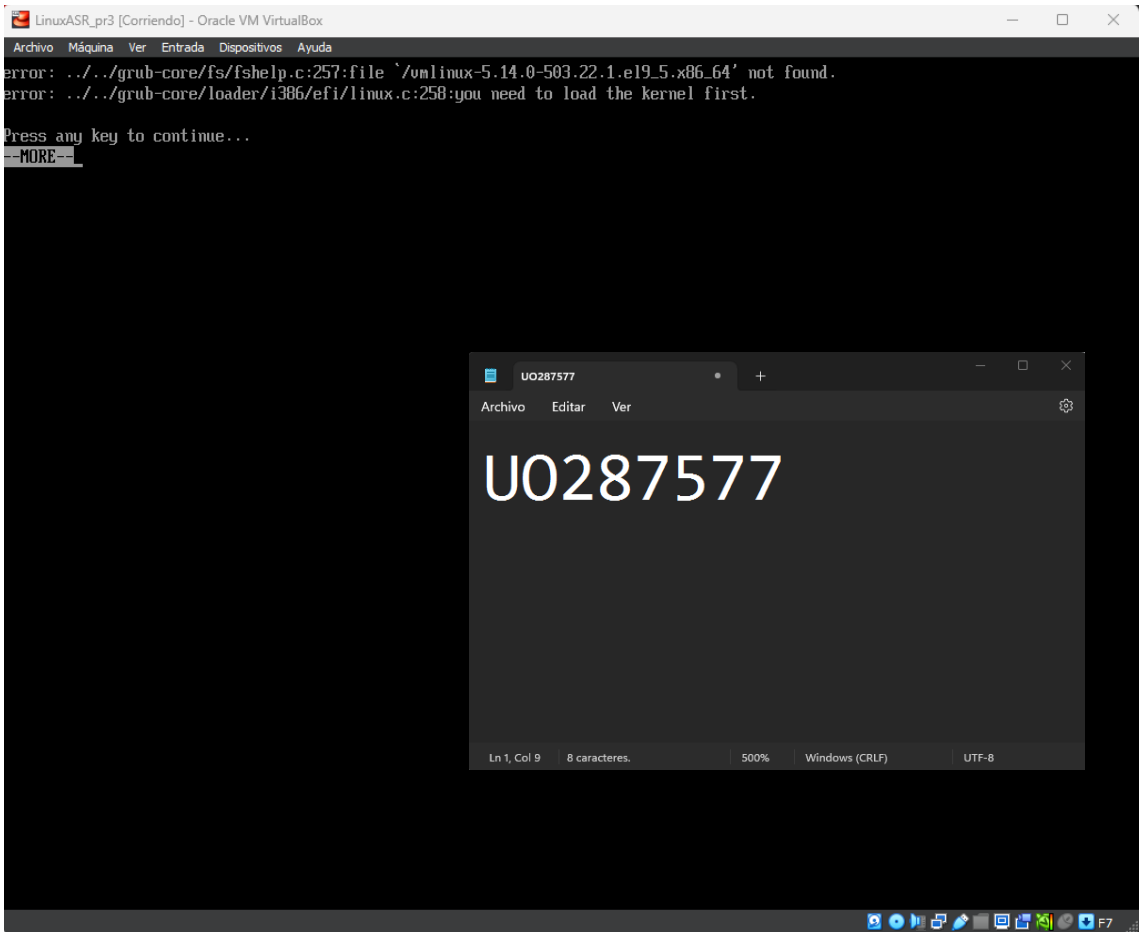




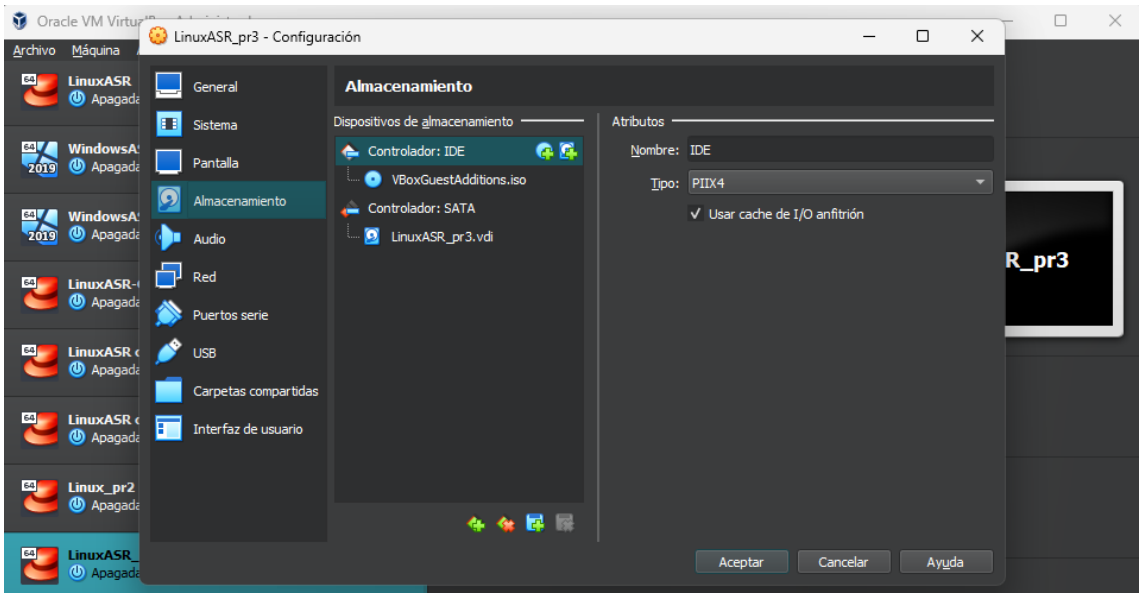
Reiniciamos la máquina virtual.

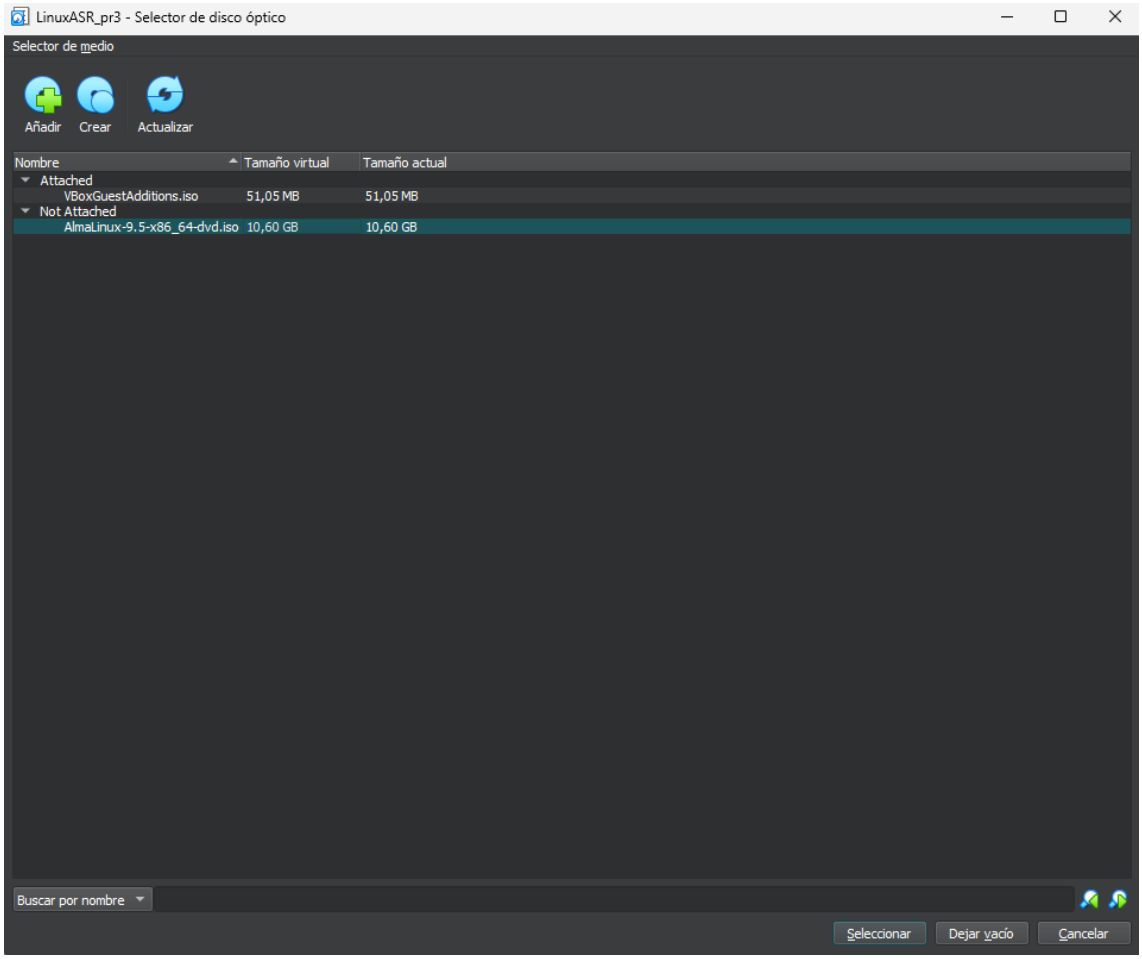


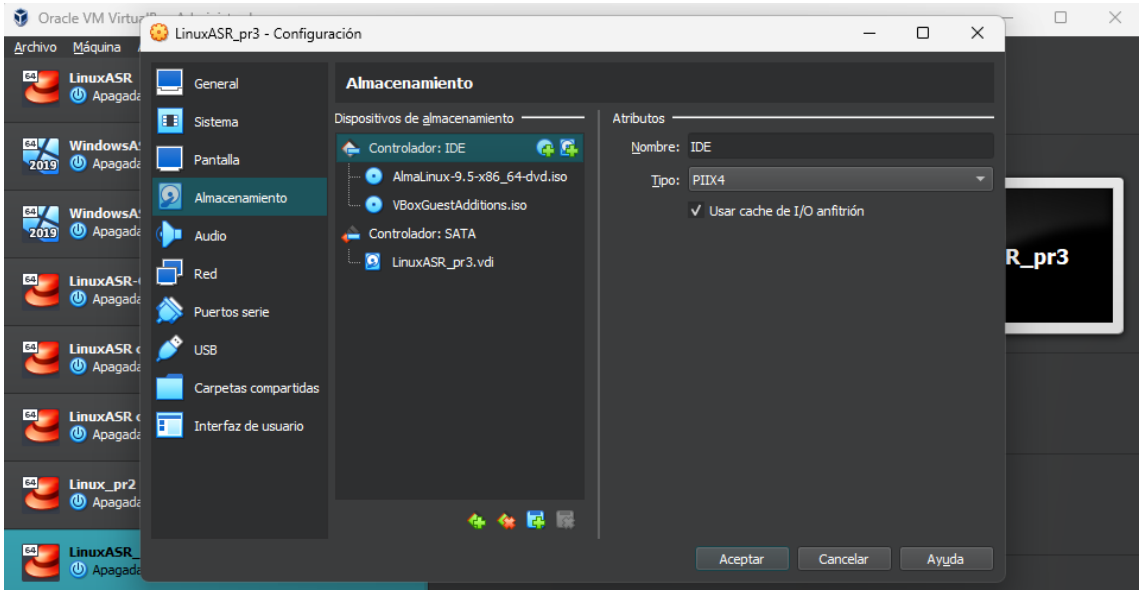
Y observamos que ahora ocurre un error.

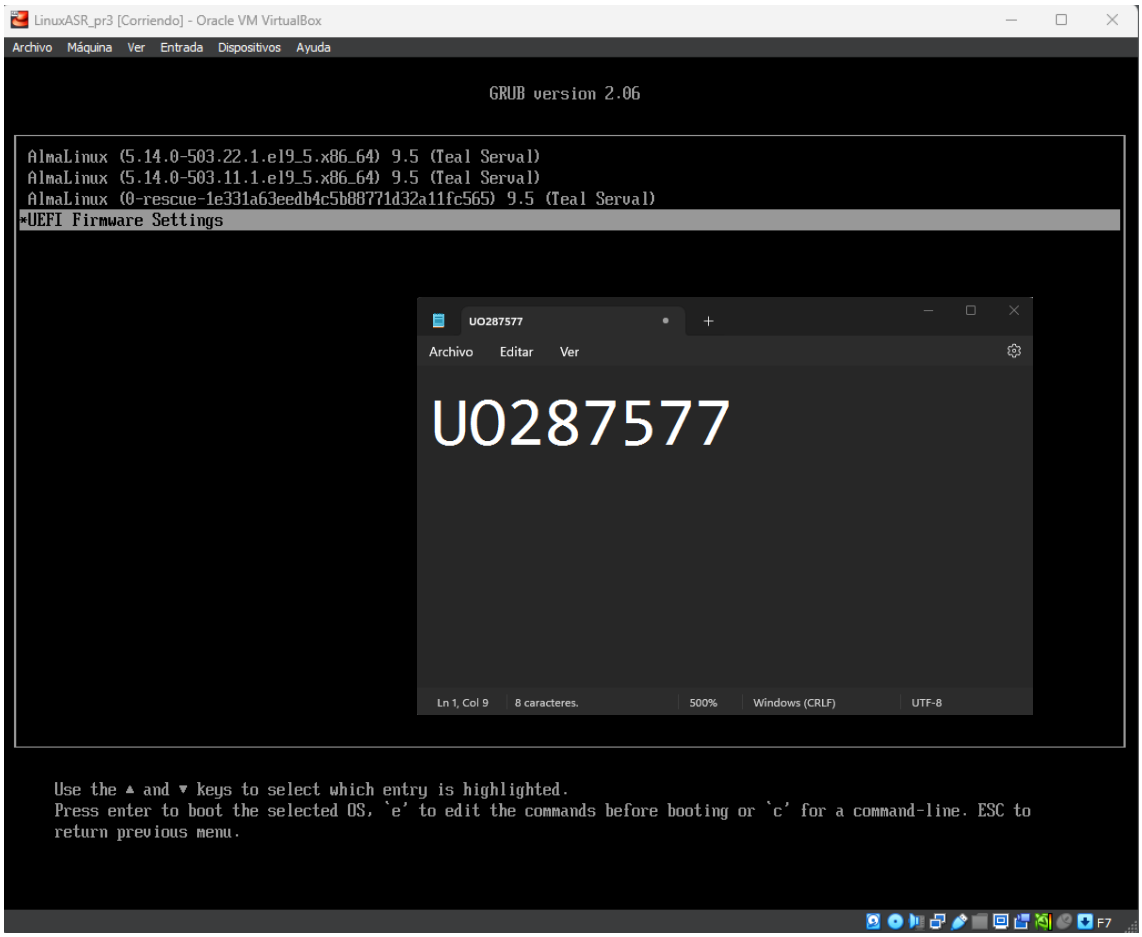


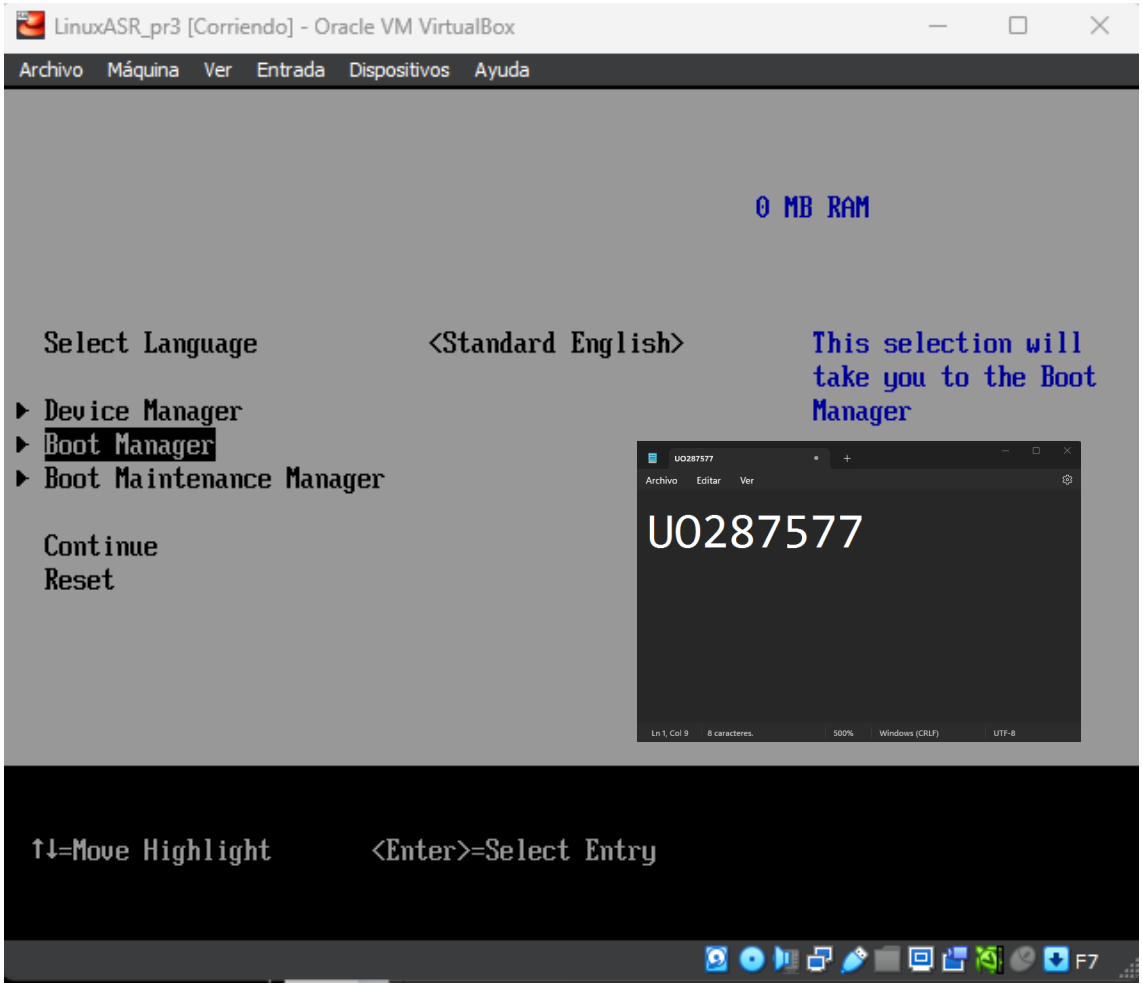
2.- Botamos en modo de recuperación y montamos el disco con el sistema defectuoso.

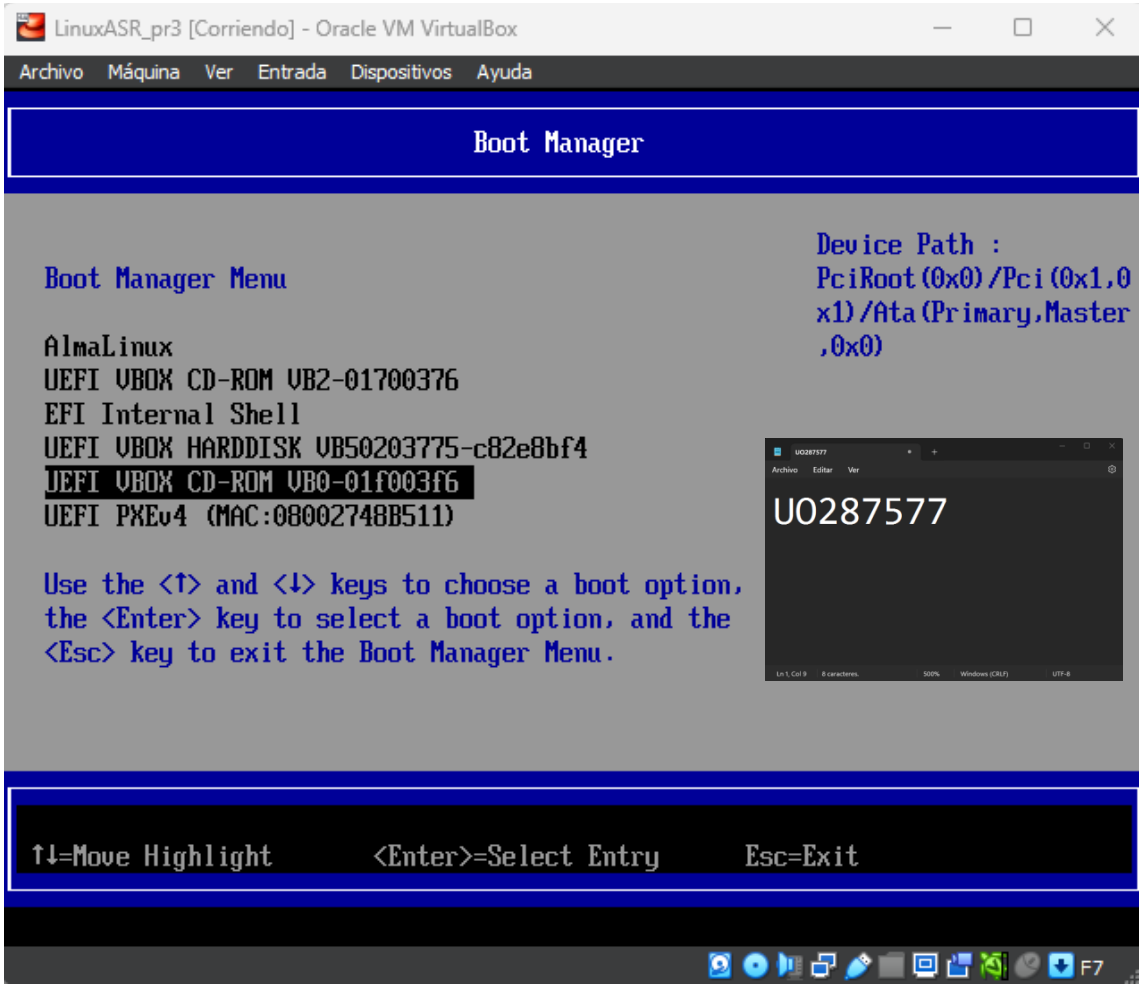


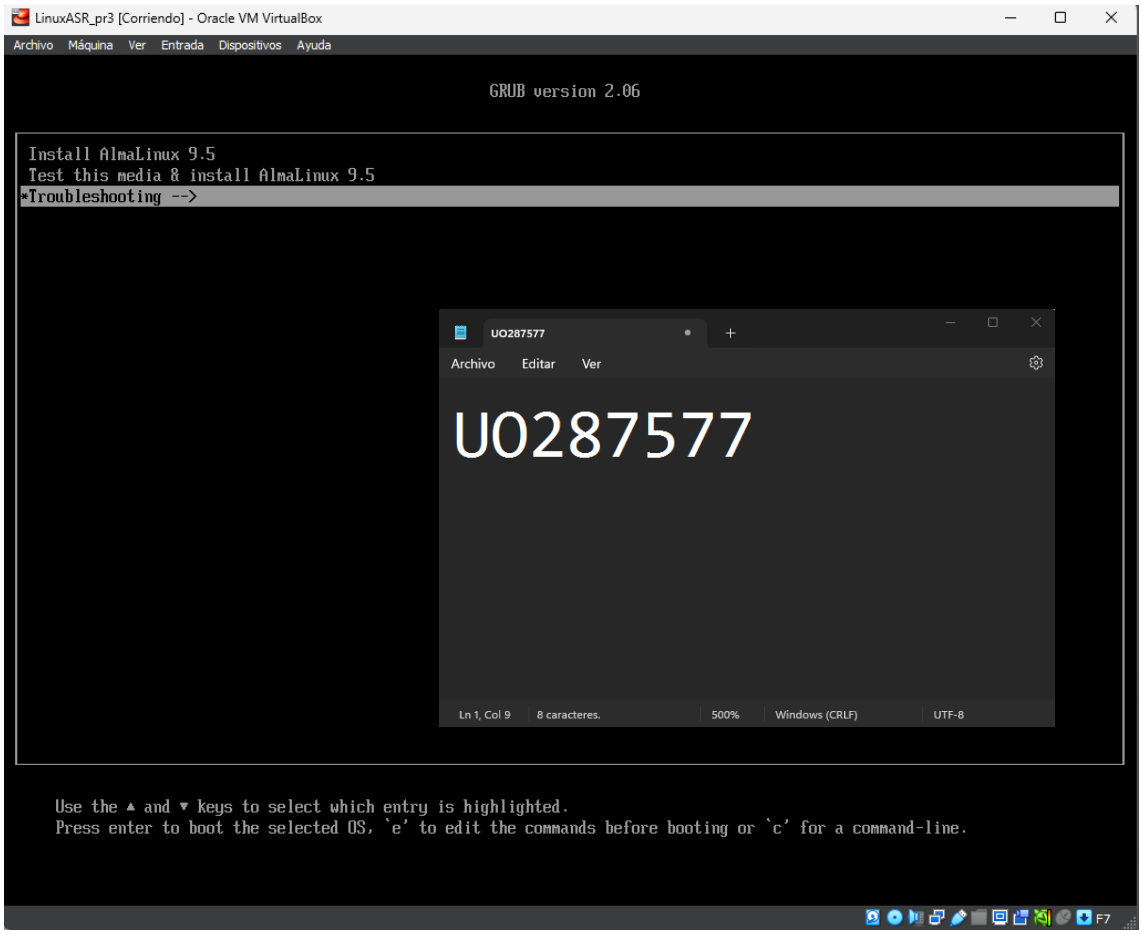

LinuxASR_pr3 - Selector de disco óptico
Selector de medio
Añadir
Crear
Actualizar
Nombre
Tamaño virtual
Tamaño actual
Attached
VBoxGuestAdditions.iso
51,05 MB
51,05 MB
Not Attached
AlmaLinux-9.5-x86_64-dvd.iso
10,60 GB
10,60 GB
Buscar por nombre
Seleccionar
Dejar vacío
Cancelar

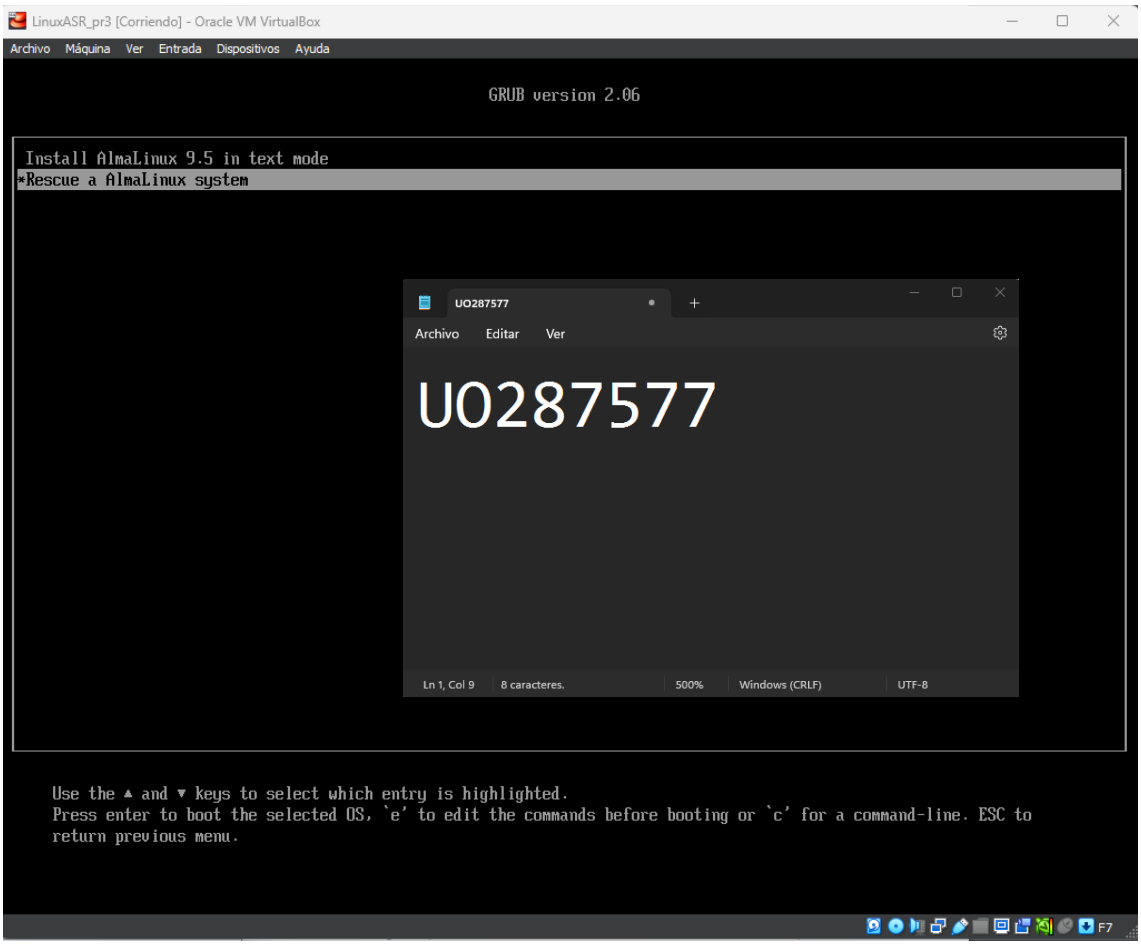

Archivo
Máquina
LinuxASR_pr3 - Configuración
General
Sistema
Pantalla
Almacenamiento
Audio
Red
Puertos serie
USB
Carpetas compartidas
Interfaz de usuario
Almacenamiento
Dispositivos de almacenamiento
Controlador: IDE
AlmaLinux-9.5-x86_64-dvd.iso
VBoxGuestAdditions.iso
Controlador: SATA
LinuxASR_pr3.vdi
Atributos
Nombre: IDE
Tipo: PIIX4
Usar cache de I/O anfitrión
Aceptar
Cancelar
Ayuda

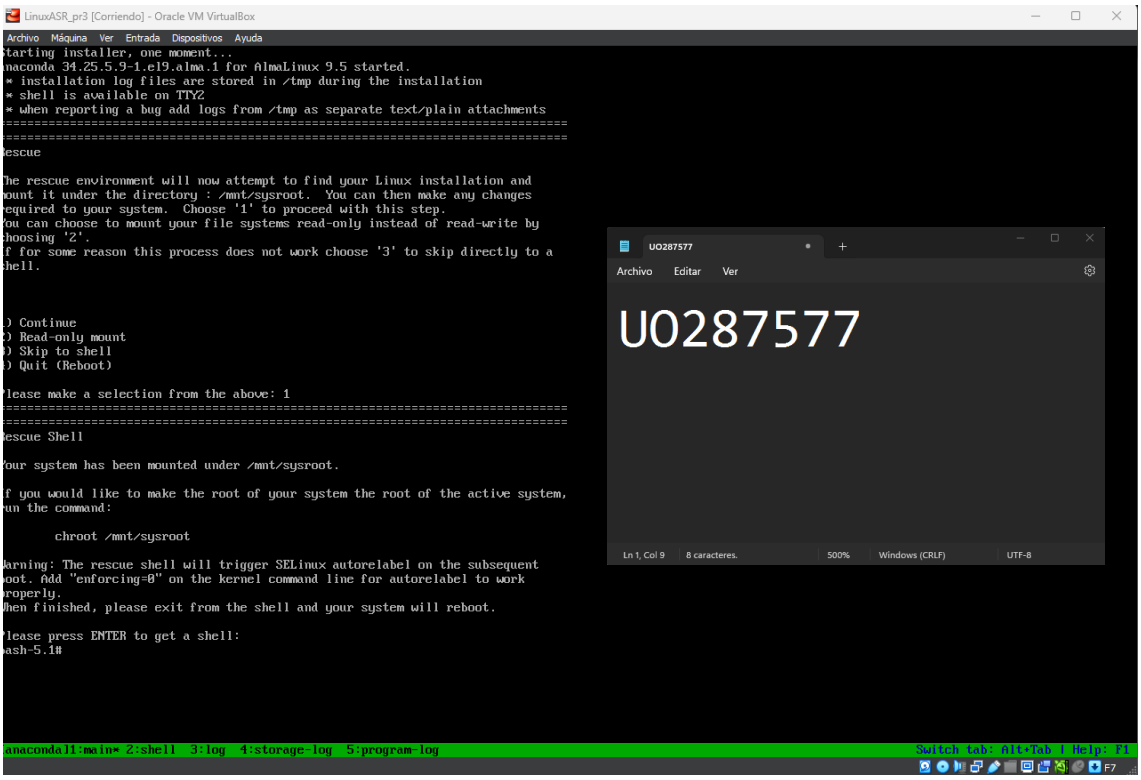

LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
GRUB version 2.06
AlmaLinux (5.14.0-503.22.1.el9_5.x86_64) 9.5 (Teal Serval)
AlmaLinux (5.14.0-503.11.1.el9_5.x86_64) 9.5 (Teal Serval)
AlmaLinux (0-rescue-1e331a63eedb4c5b88771d32a11fc565) 9.5 (Teal Serval)
*UEFI Firmware Settings
UO287577
Archivo Editar Ver
UO287577
Ln 1, Col 9 8 caracteres. 500% Windows (CRLF) UTF-8
Use the ▲ and ▼ keys to select which entry is highlighted.
Press enter to boot the selected OS, `e' to edit the commands before booting or `c' for a command-line. ESC to return previous menu.
F7


LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
0 MB RAM
Select Language <Standard English>
This selection will take you to the Boot Manager
Device Manager
Boot Manager
Boot Maintenance Manager
Continue
Reset
UO287577
Archivo Editar Ver
UO287577
↑↓=Move Highlight <Enter>=Select Entry
F7

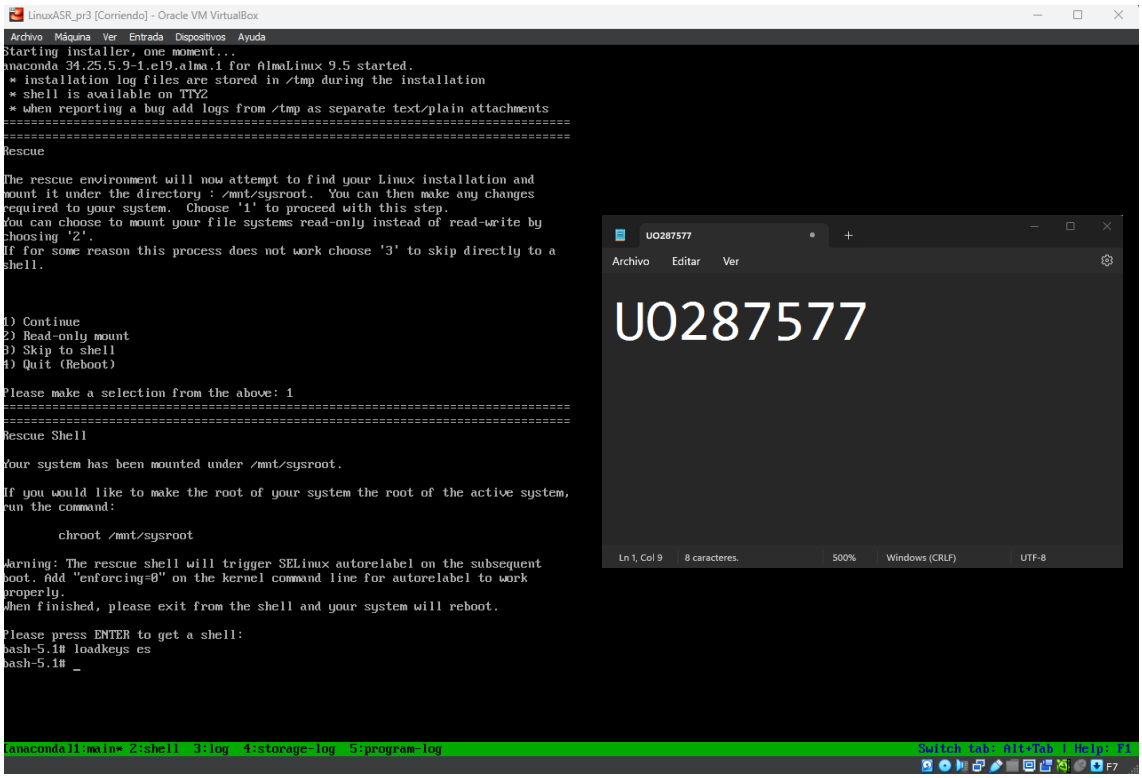

LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
Boot Manager
Boot Manager Menu
AlmaLinux
UEFI VBOX CD-ROM VB2-01700376
EFI Internal Shell
UEFI VBOX HARDDISK VB50203775-c82e8bf4
UEFI VBOX CD-ROM VB0-01f003f6
UEFI PXEv4 (MAC:08002748B511)
Device Path :
PciRoot(0x0)/Pci(0x1,0x1)/Ata(Primary,Master,0x0)
Use the <↑> and <↓> keys to choose a boot option, the <Enter> key to select a boot option, and the <Esc> key to exit the Boot Manager Menu.
UO287577
↑↓=Move Highlight
<Enter>=Select Entry
Esc=Exit
F7


LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
GRUB version 2.06
Install AlmaLinux 9.5
Test this media & install AlmaLinux 9.5
*Troubleshooting -->
UO287577
Archivo Editar Ver
UO287577
Ln 1, Col 9 8 caracteres. 500% Windows (CRLF) UTF-8
Use the ▲ and ▼ keys to select which entry is highlighted.
Press enter to boot the selected OS, `e' to edit the commands before booting or `c' for a command-line.

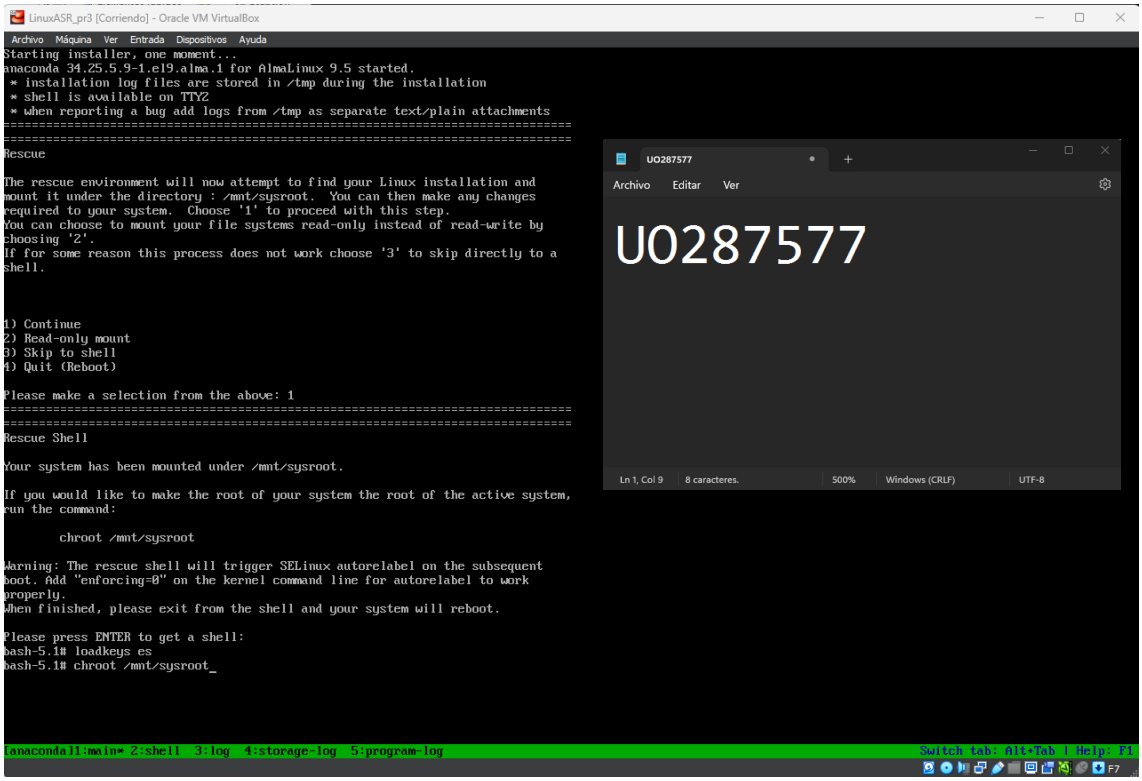


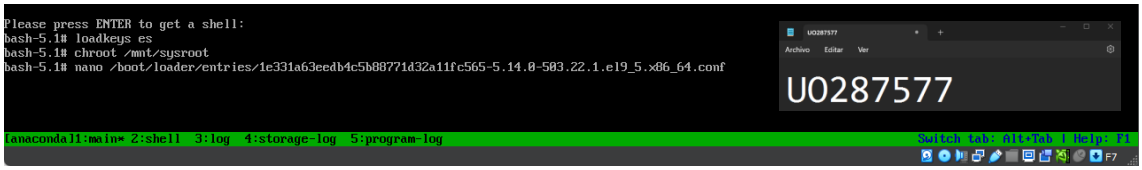


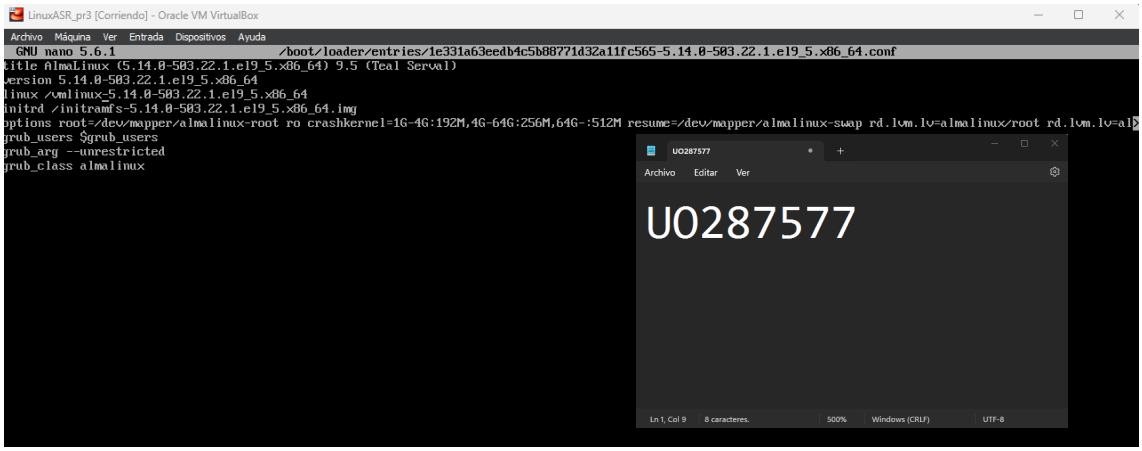
Cargamos el teclado español (loadkeys es).

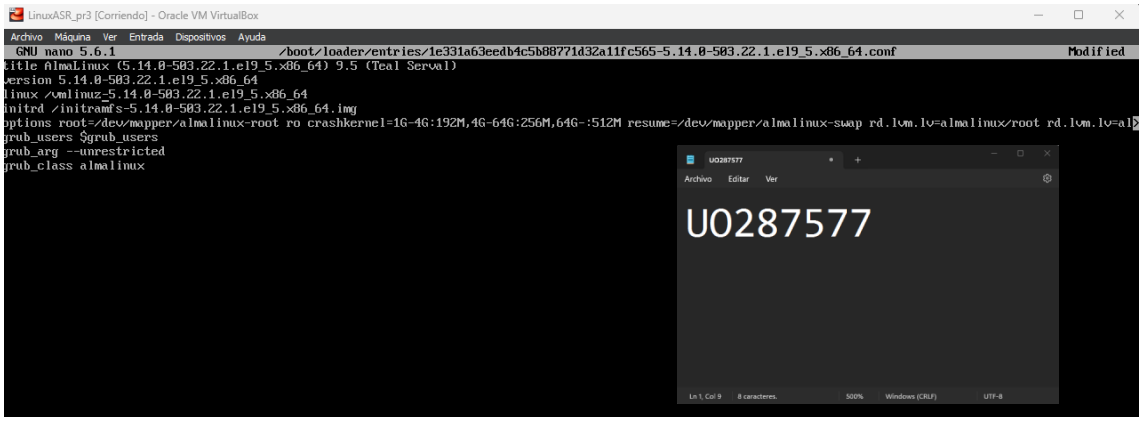


Hacemos chroot a /mnt/sysroot y editamos y corregimos el fichero del punto anterior.

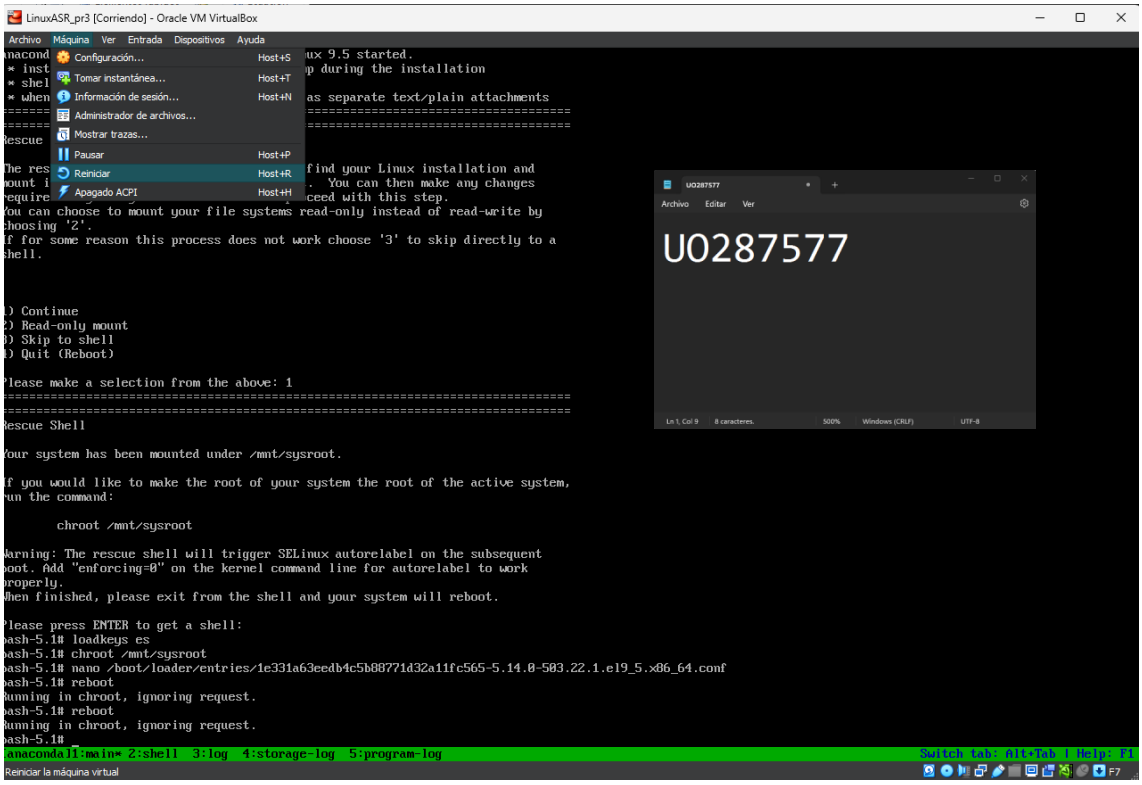


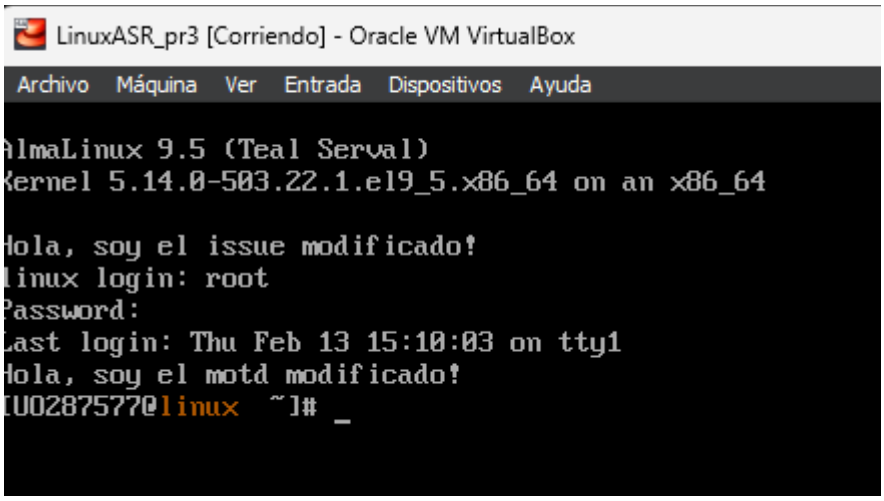






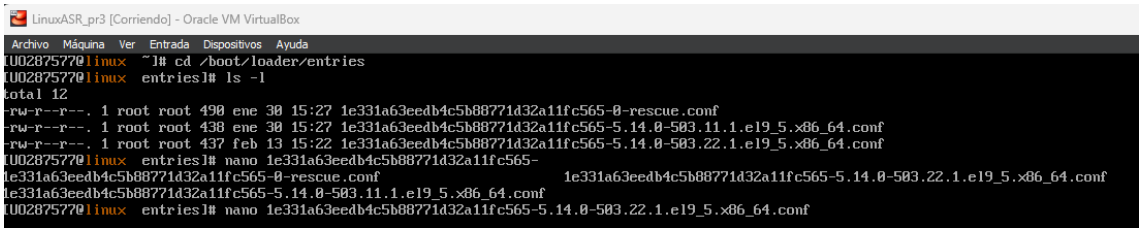
Rebotamos y comprobamos que el problema está solucionado. Ignoramos los mensajes de reetiquetado de SELinux.

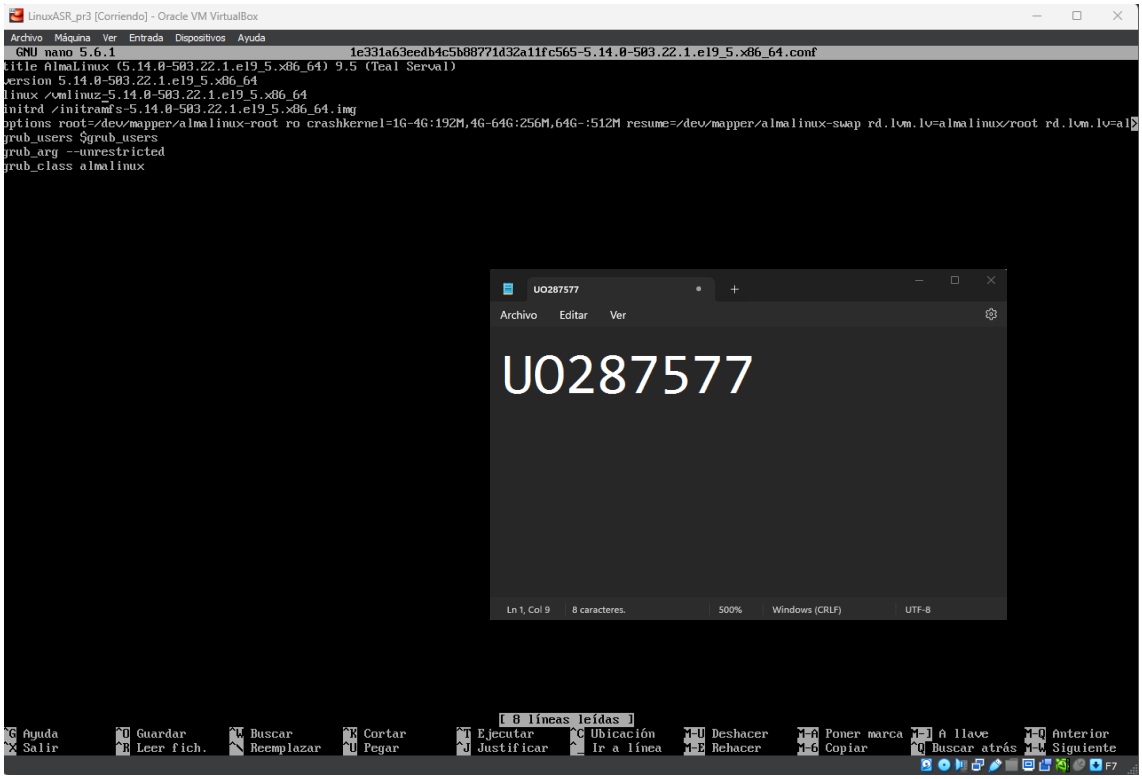


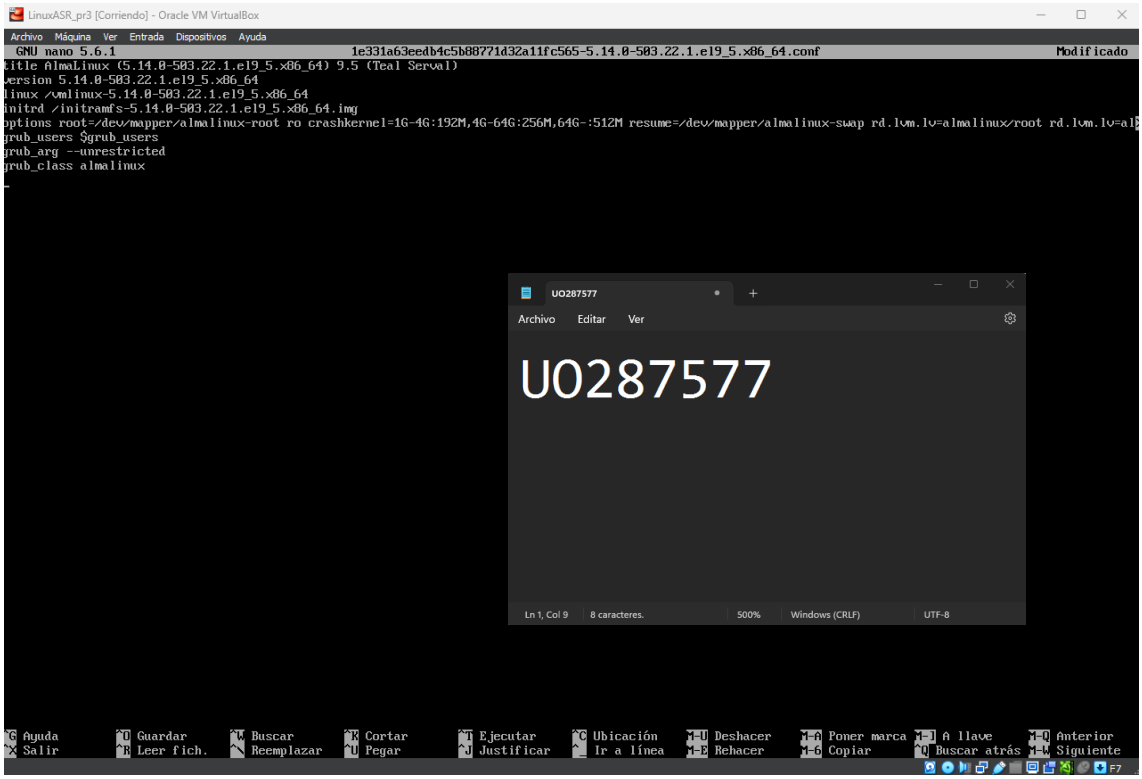


(El problema ha sido solucionado)

3.- Todavía tenemos una forma más de arreglar este problema. Volvemos a repetir lo del punto primero y cambiamos de nuevo vmlinuz por vmlinux.

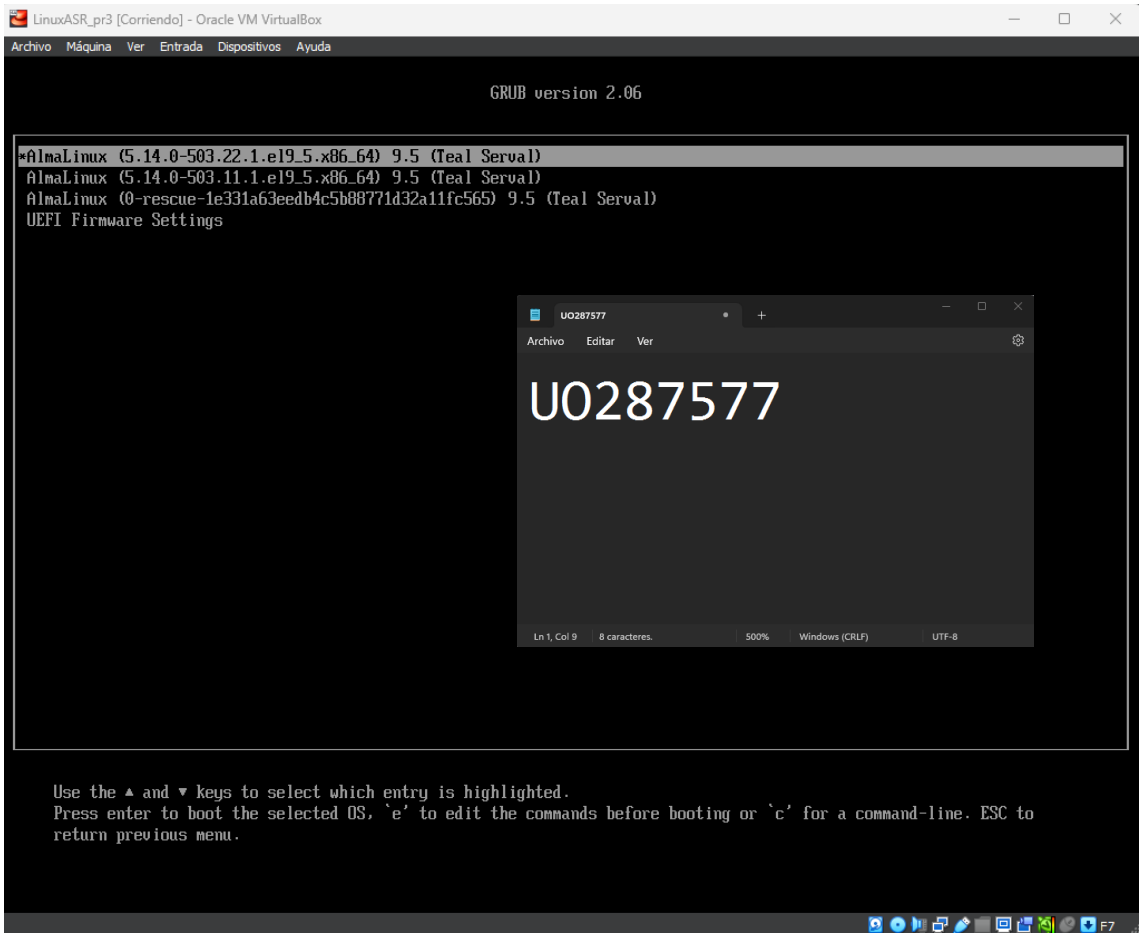


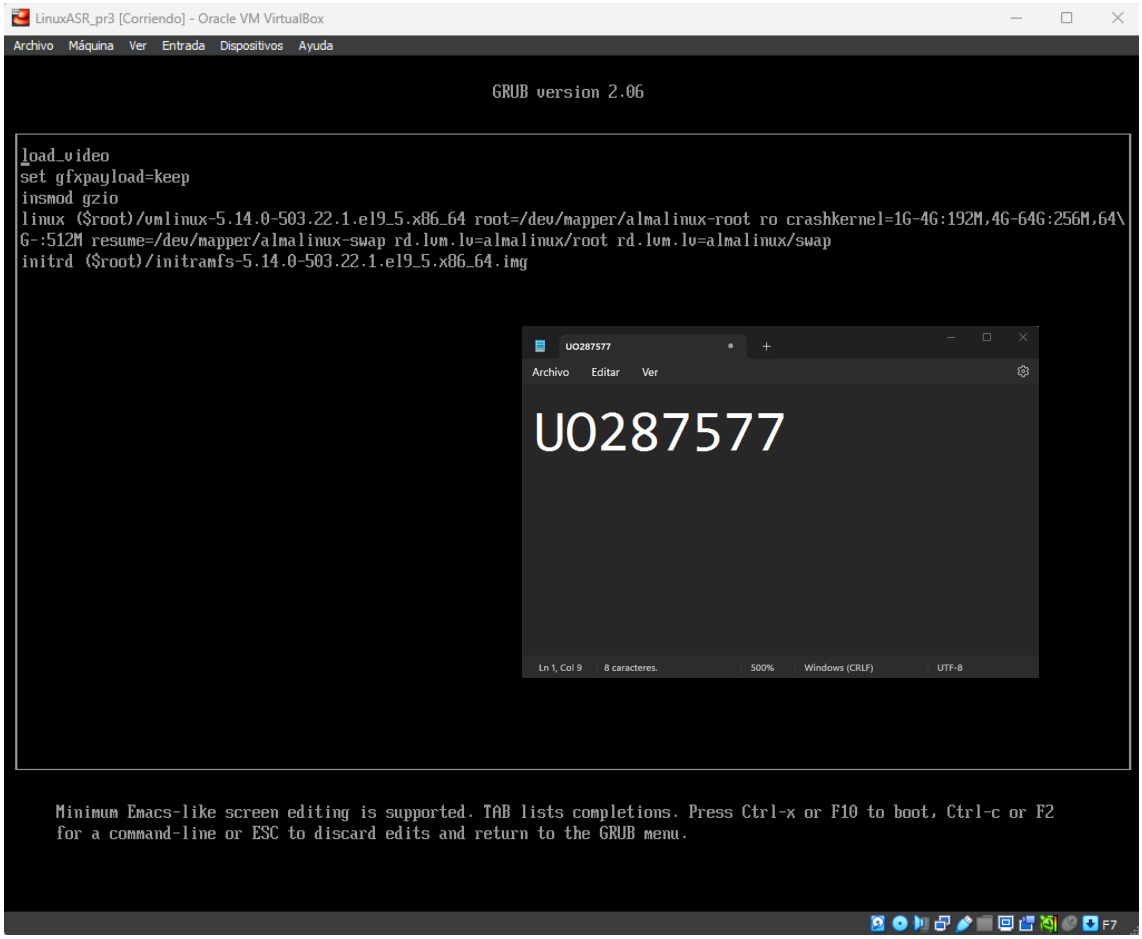


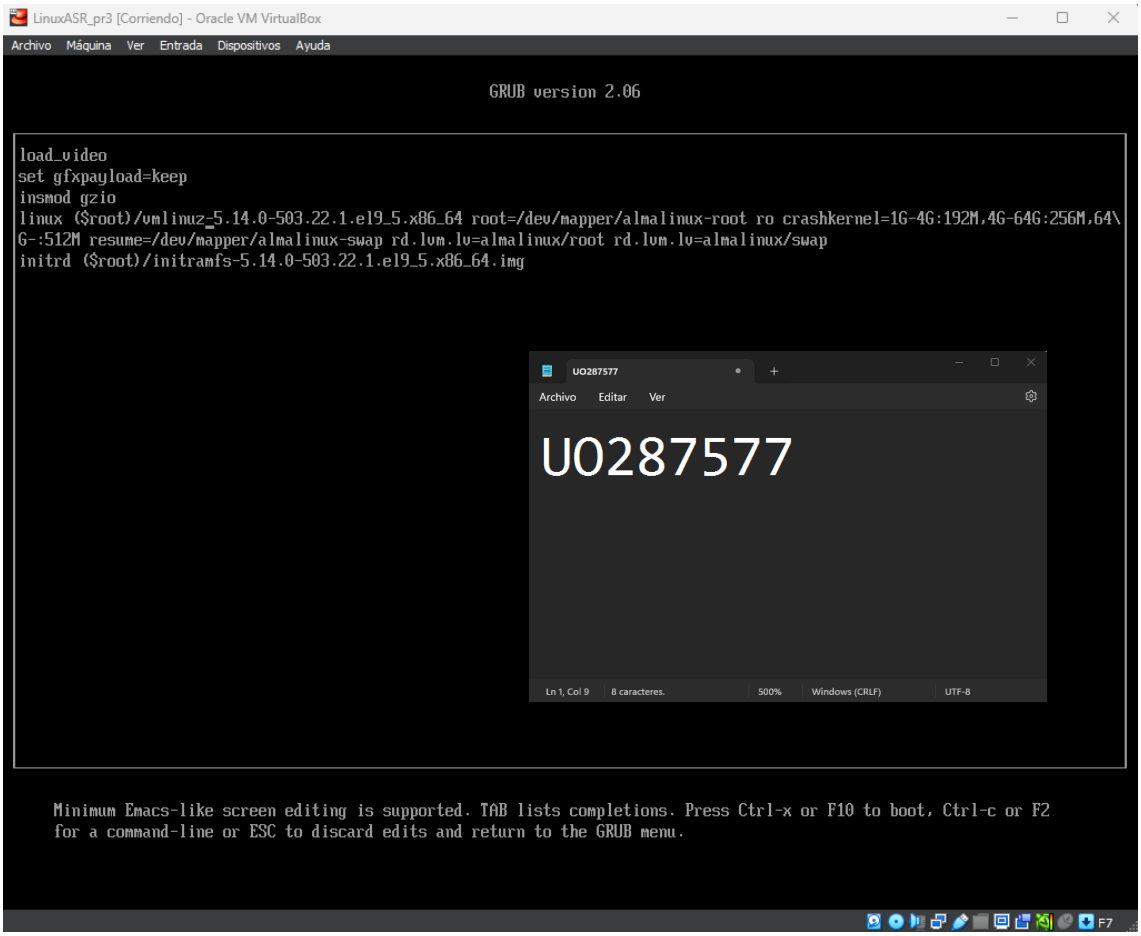


Reiniciamos y desde la pantalla de arranque modificamos el nombre del kernel (seleccionándolo en la entrada del menú y presionando la tecla "e" para editar el fichero) de forma que el servidor arranque correctamente.

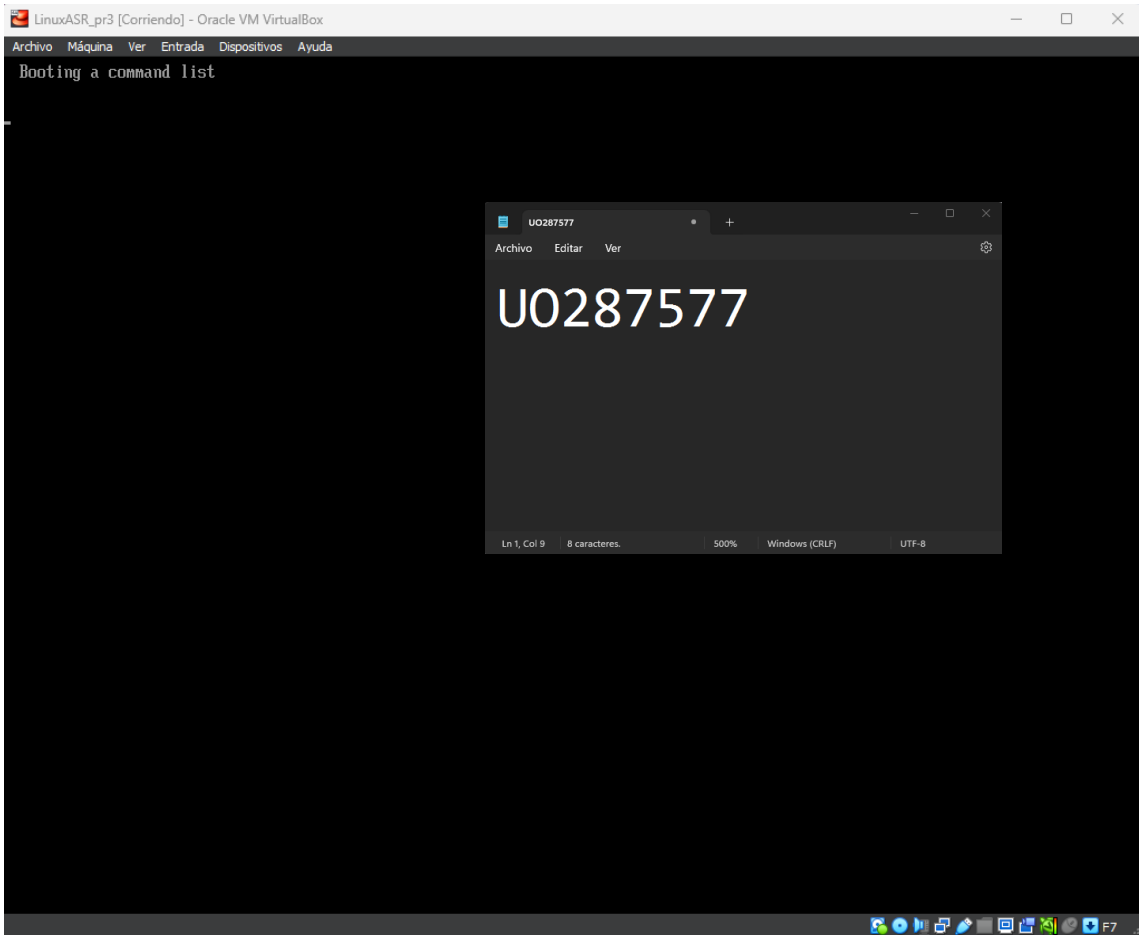
```
[UO287577@linux  entries]# reboot
```

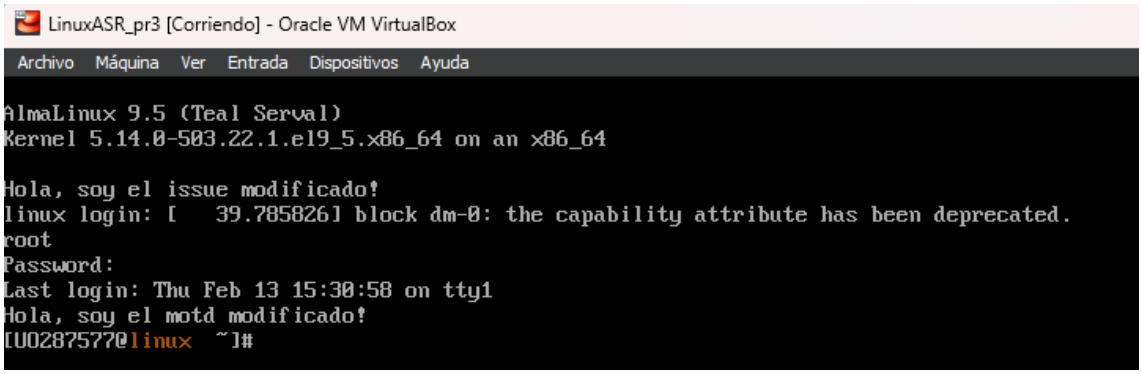

LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
GRUB version 2.06
*AlmaLinux (5.14.0-503.22.1.el9_5.x86_64) 9.5 (Teal Serval)
AlmaLinux (5.14.0-503.11.1.el9_5.x86_64) 9.5 (Teal Serval)
AlmaLinux (0-rescue-1e331a63eedb4c5b88771d32a11fc565) 9.5 (Teal Serval)
UEFI Firmware Settings
UO287577
Archivo Editar Ver
UO287577
Ln 1, Col 9 8 caracteres. 500% Windows (CRLF) UTF-8
Use the ▲ and ▼ keys to select which entry is highlighted.
Press enter to boot the selected OS, `e' to edit the commands before booting or `c' for a command-line. ESC to return previous menu.


LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
GRUB version 2.06
load_video
set gfxpayload=keep
insmod gzio
linux ($root)/vmlinux-5.14.0-503.22.1.el9_5.x86_64 root=/dev/mapper/almalinux-root ro crashkernel=1G-4G:192M,4G-64G:256M,64\
G-:512M resume=/dev/mapper/almalinux-swap rd.lvm.lv=almalinux/root rd.lvm.lv=almalinux/swap
initrd ($root)/initramfs-5.14.0-503.22.1.el9_5.x86_64.img
UO287577
Archivo Editar Ver
UO287577
Ln 1, Col 9 8 caracteres. 500% Windows (CRLF) UTF-8
Minimum Emacs-like screen editing is supported. TAB lists completions. Press Ctrl-x or F10 to boot, Ctrl-c or F2
for a command-line or ESC to discard edits and return to the GRUB menu.

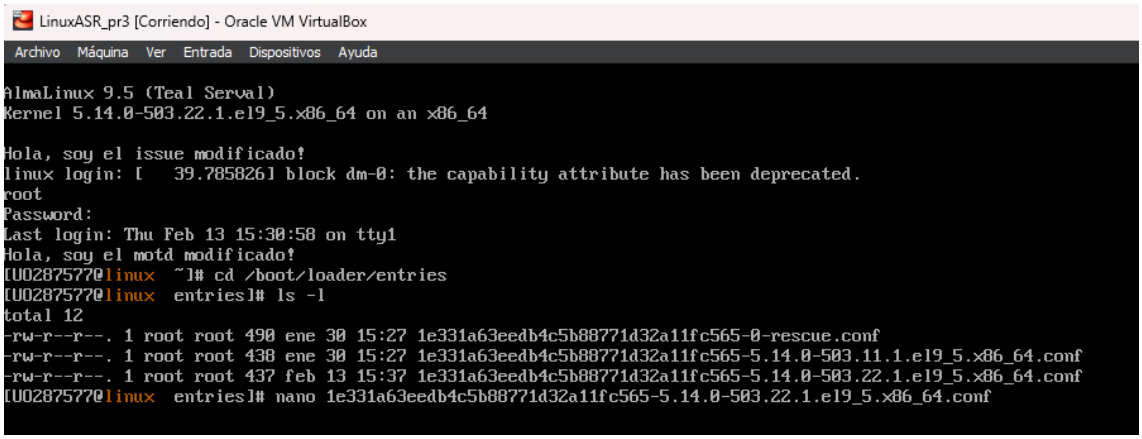


Presionamos Ctrl-X y vemos que la máquina ya arranca correctamente.

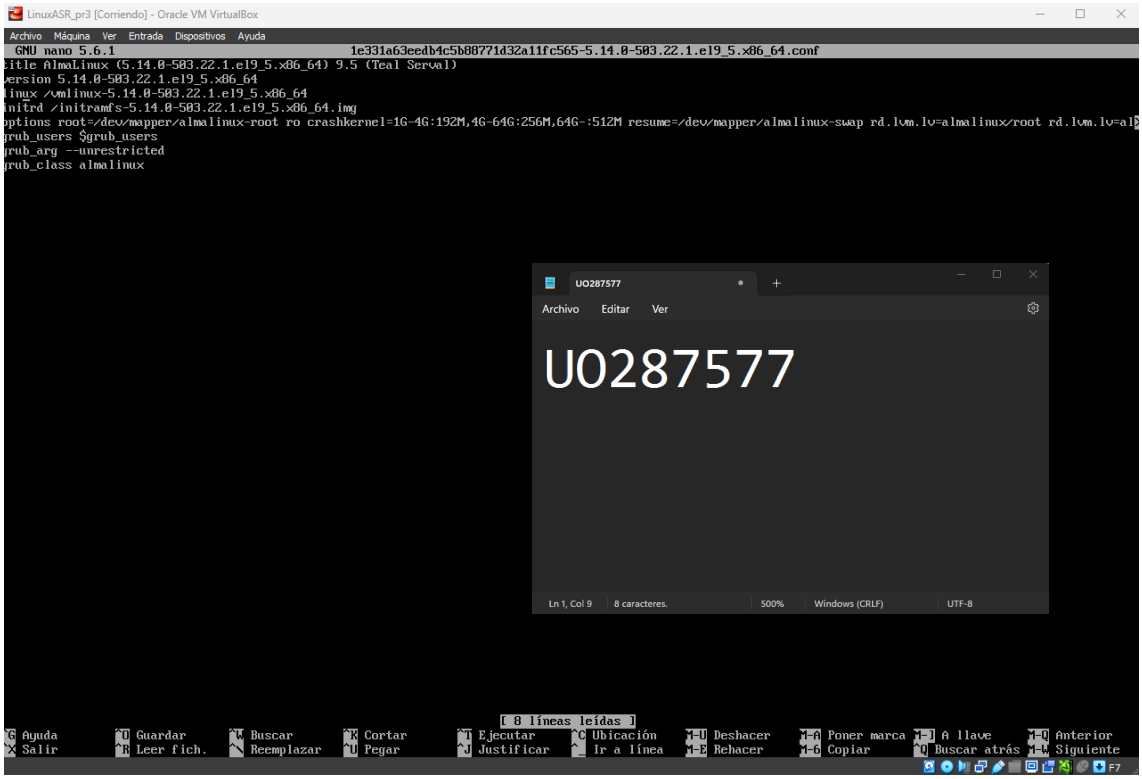




4.- Volvemos a examinar otra vez el fichero que modificamos.



¿Es correcto o sigue conteniendo la palabra "vmlinux"?



(Sigue conteniendo la palabra “vmlinux”)

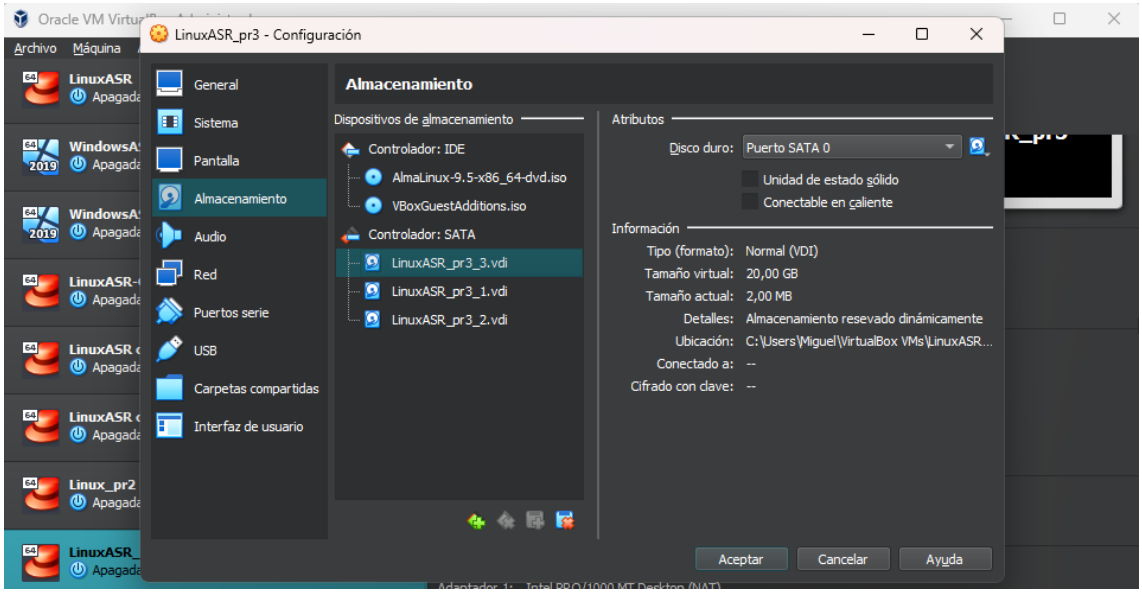
¿Por qué?

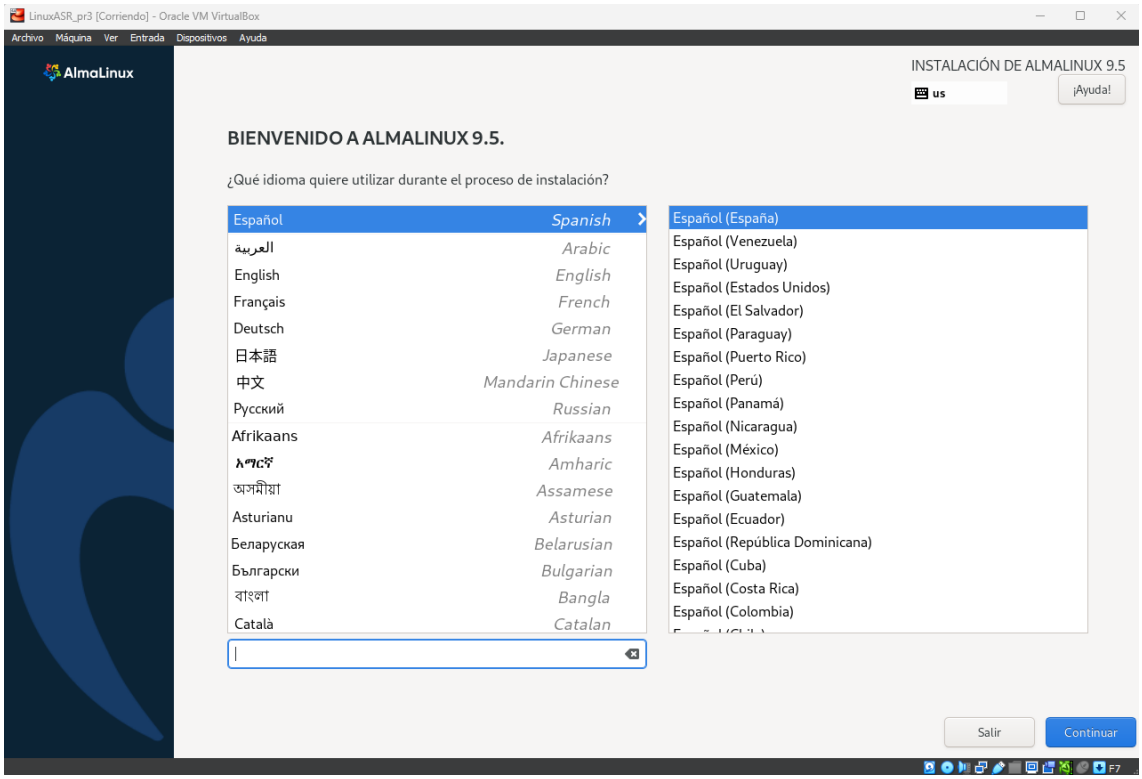
Aunque el sistema se enciende, el problema no se ha arreglado, puesto que el fichero de arranque es un fichero temporal.

B. Instalación de Linux con particionamiento dinámico

Parte 1:

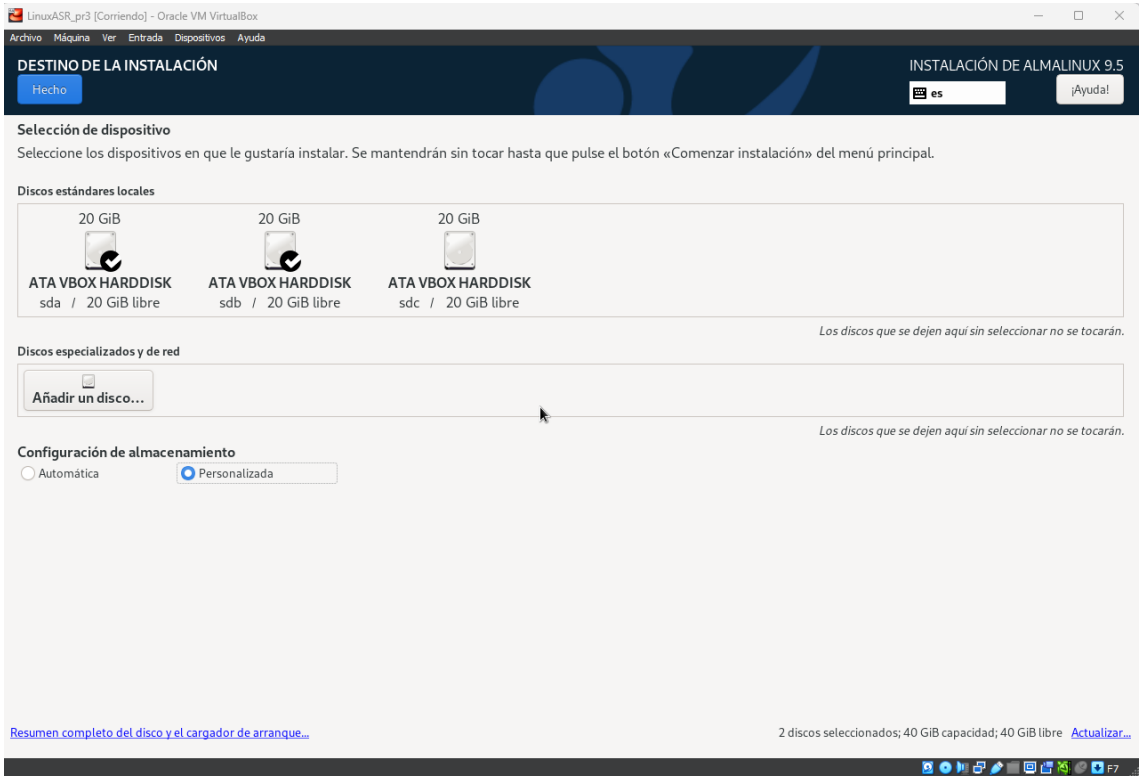
Reinstalamos un Linux sobre LVM en una nueva máquina con tres discos con el tamaño por defecto. Instalaremos el sistema en los dos primeros.



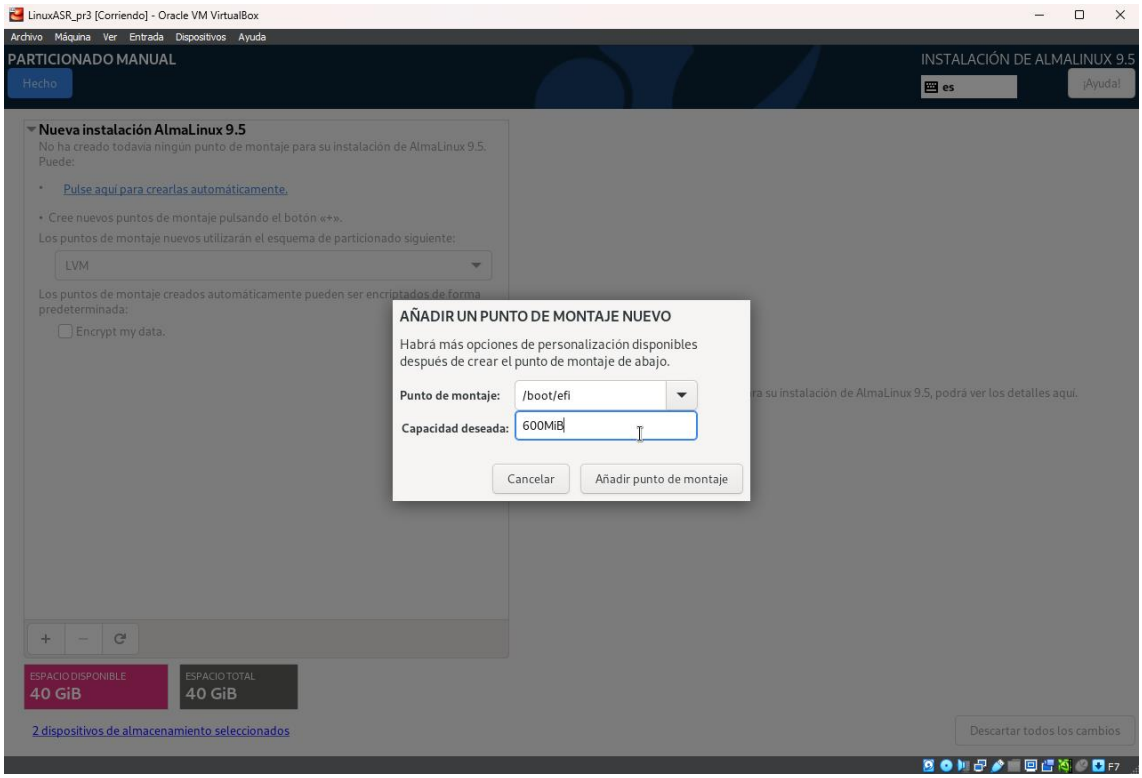


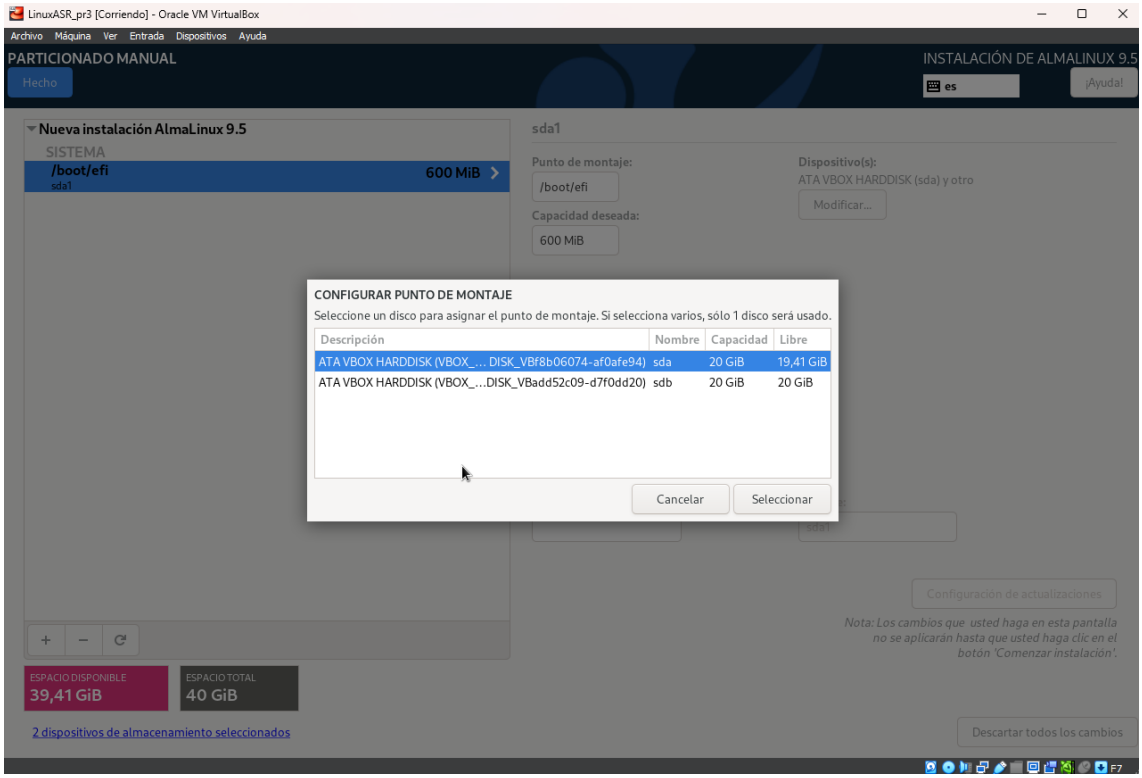
Hacemos que:

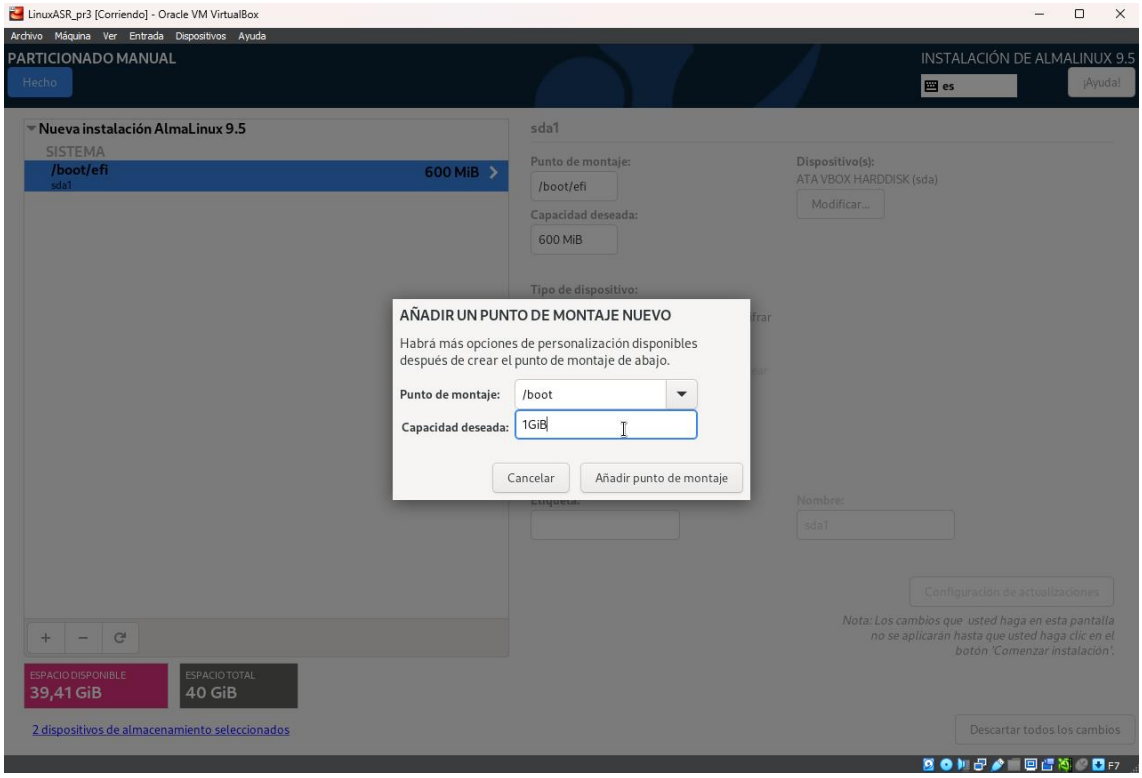
- El tercer disco duro no se modifique en la instalación

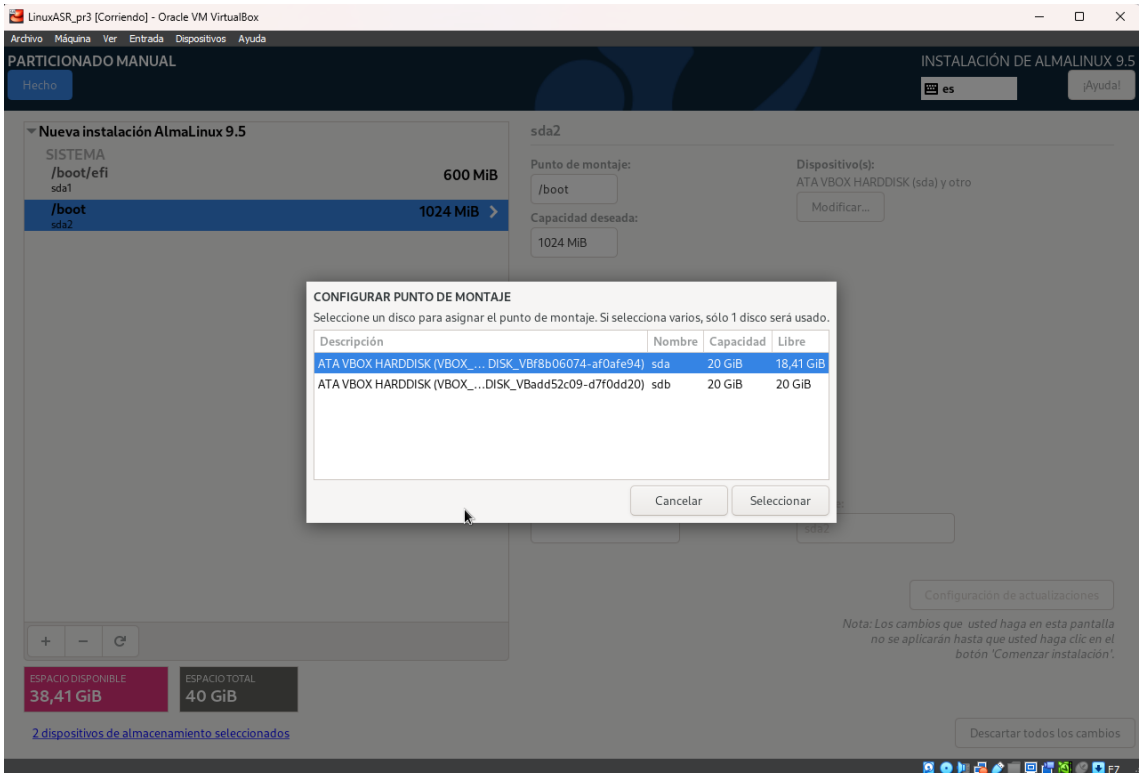


- Las particiones /boot/efi (600MiB) y /boot (1GiB) estén en el primer disco

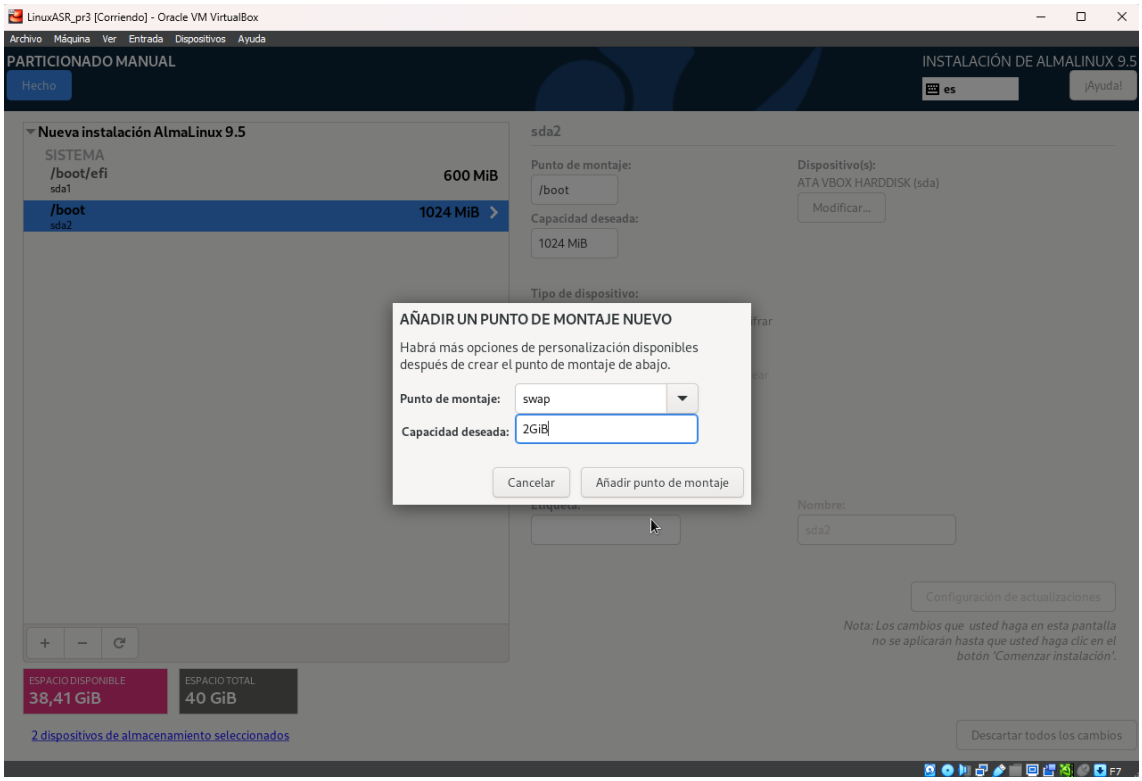


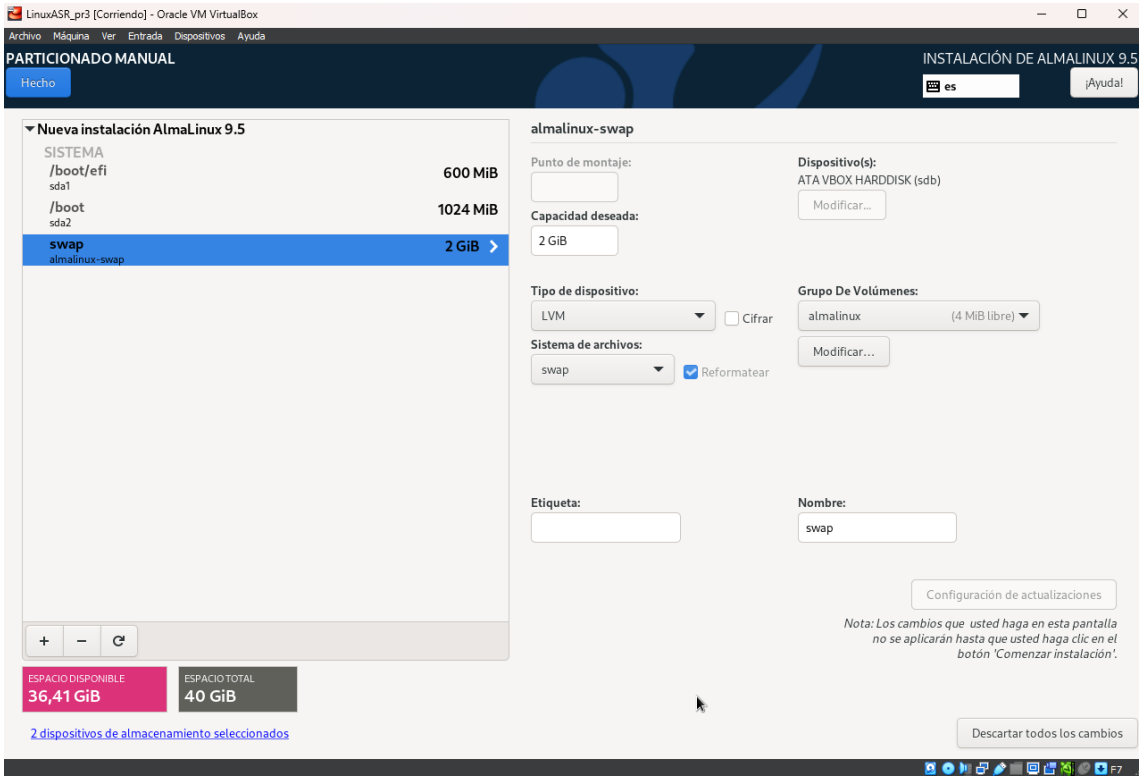

LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
PARTICIONADO MANUAL
Hecho
INSTALACIÓN DE ALMALINUX 9.5
es
¡Ayuda!
Nueva instalación AlmaLinux 9.5
SISTEMA
/boot/efi
sda1
600 MiB
sda1
Punto de montaje:
/boot/efi
Capacidad deseada:
600 MiB
Dispositivo(s):
ATA VBOX HARDDISK (sda) y otro
Modificar...
CONFIGURAR PUNTO DE MONTAJE
Seleccione un disco para asignar el punto de montaje. Si selecciona varios, sólo 1 disco será usado.
Descripción
Nombre
Capacidad
Libre
ATA VBOX HARDDISK (VBOX_... DISK_VBf8b06074-af0afe94)
sda
20 GiB
19,41 GiB
ATA VBOX HARDDISK (VBOX_...DISK_VBadd52c09-d7f0dd20)
sdb
20 GiB
20 GiB
Cancelar
Seleccionar
Configuración de actualizaciones
Nota: Los cambios que usted haga en esta pantalla no se aplicarán hasta que usted haga clic en el botón 'Comenzar instalación'.
ESPACIO DISPONIBLE
39,41 GiB
ESPACIO TOTAL
40 GiB
2 dispositivos de almacenamiento seleccionados
Descartar todos los cambios


LinuxASR_pr3 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
PARTICIONADO MANUAL
Hecho
INSTALACIÓN DE ALMALINUX 9.5
es
¡Ayuda!
Nueva instalación AlmaLinux 9.5
SISTEMA
/boot/efi
sda1
600 MiB
sda1
Punto de montaje:
/boot/efi
Capacidad deseada:
600 MiB
Dispositivo(s):
ATA VBOX HARDDISK (sda)
Modificar...
Tipo de dispositivo:
AÑADIR UN PUNTO DE MONTAJE NUEVO
Habrá más opciones de personalización disponibles después de crear el punto de montaje de abajo.
Punto de montaje:
/boot
Capacidad deseada:
1GiB
Cancelar
Añadir punto de montaje
Nombre:
sda1
Configuración de actualizaciones
Nota: Los cambios que usted haga en esta pantalla no se aplicarán hasta que usted haga clic en el botón 'Comenzar instalación'.
ESPACIO DISPONIBLE
39,41 GiB
ESPACIO TOTAL
40 GiB
2 dispositivos de almacenamiento seleccionados
Descartar todos los cambios

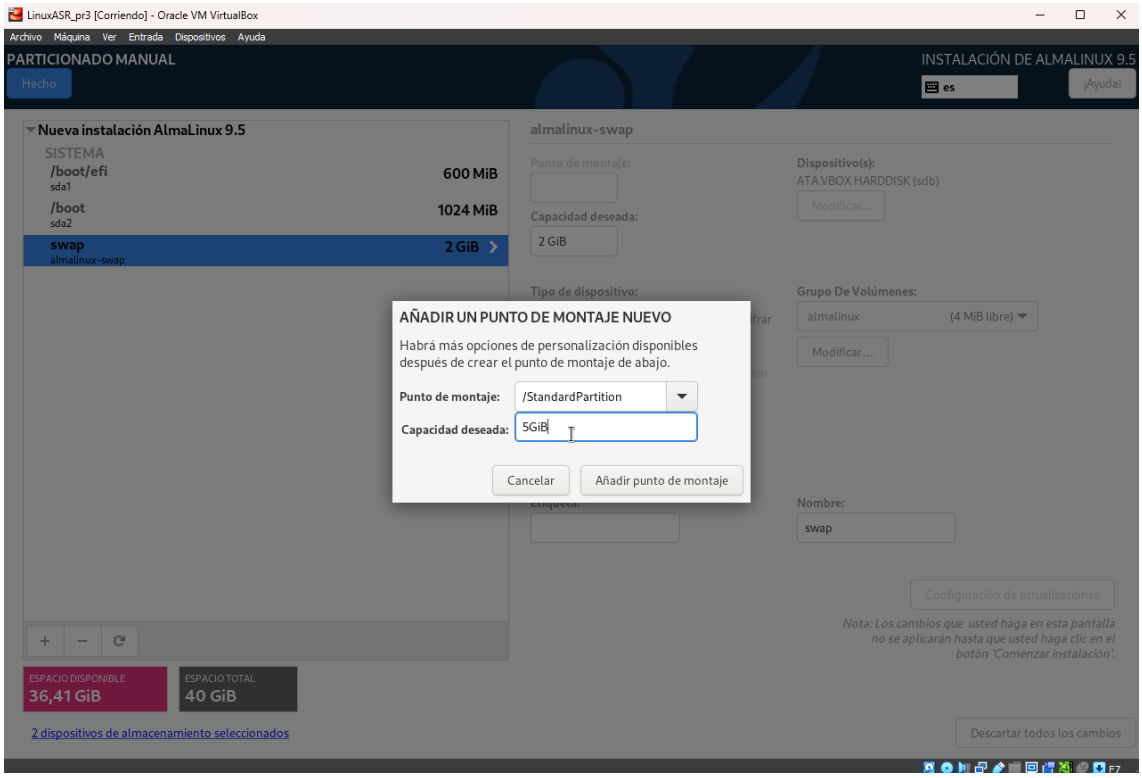


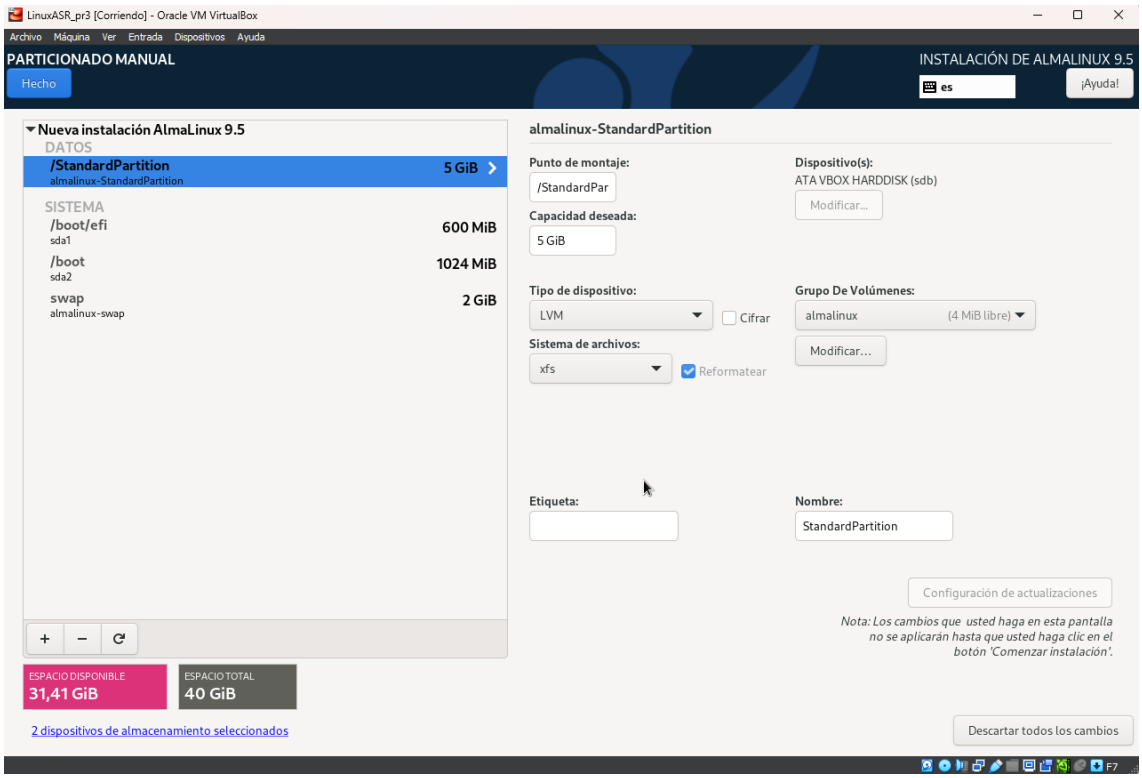
• La partición que contenga el espacio de swap tenga 2GiB y esté en el segundo disco



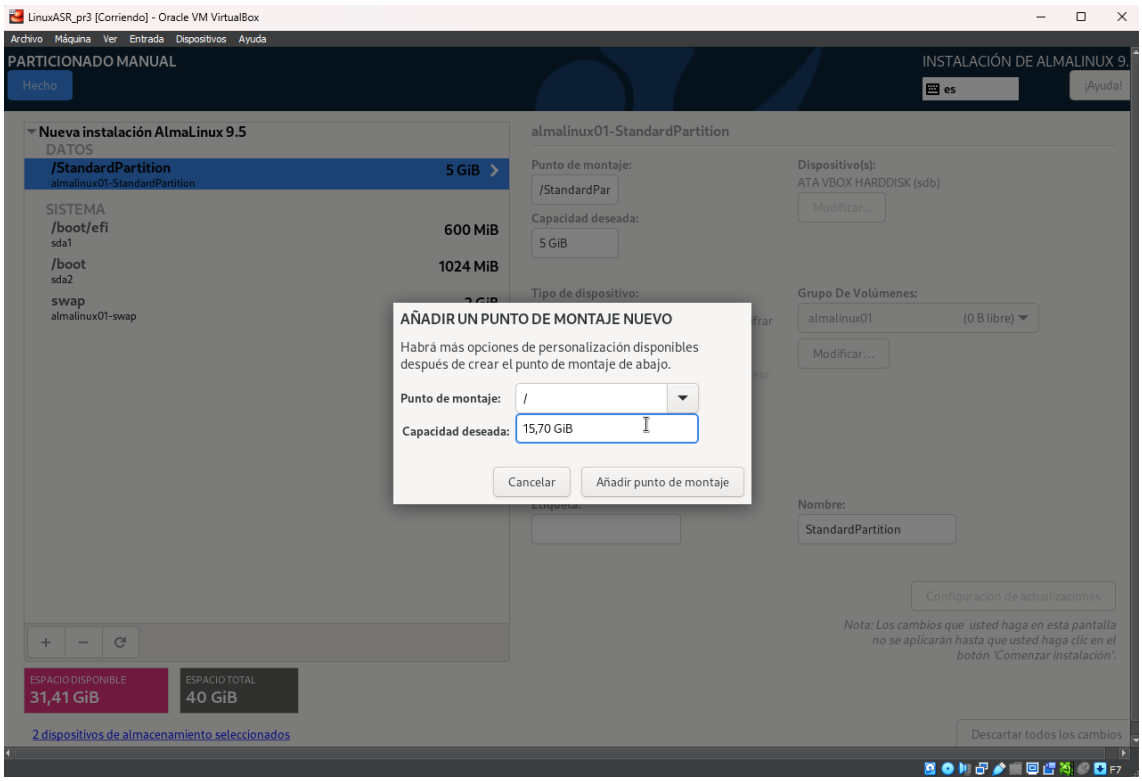


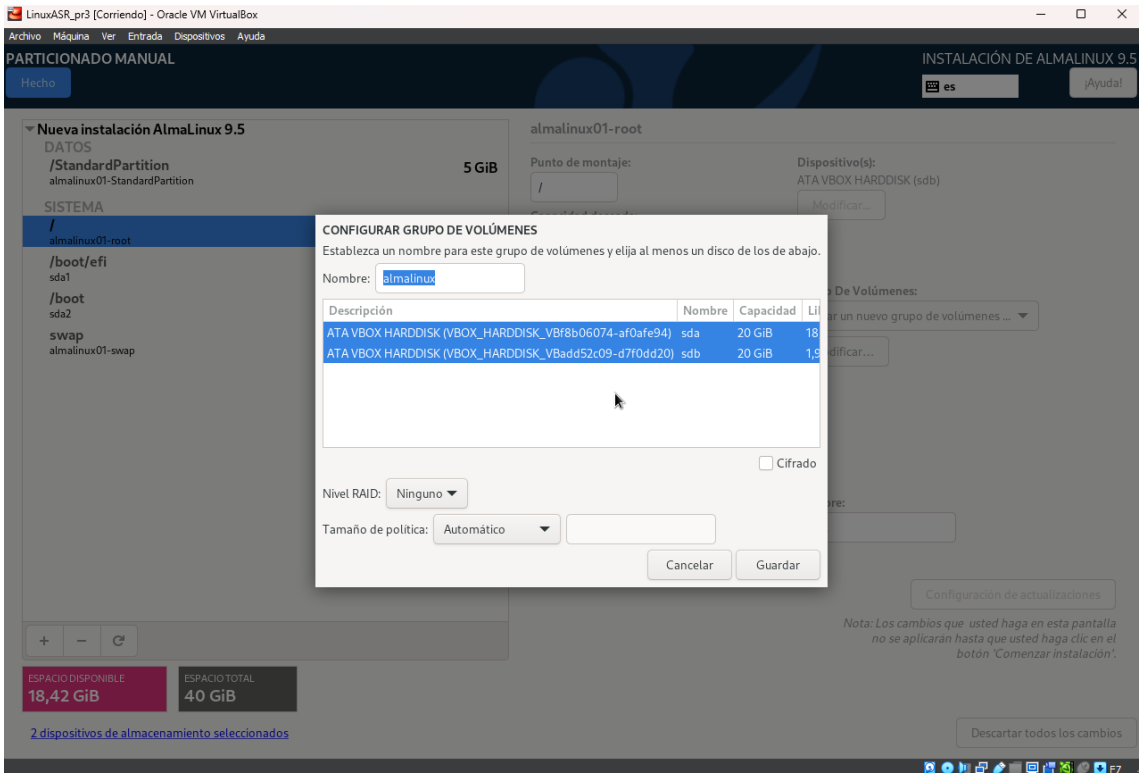
• Haya 5GiB de espacio sin asignar en el segundo disco. Para hacer esto, creamos primero un punto de montaje con un nombre arbitrario, de tipo "Standard Partition", y forzamos a que esté en el segundo disco.

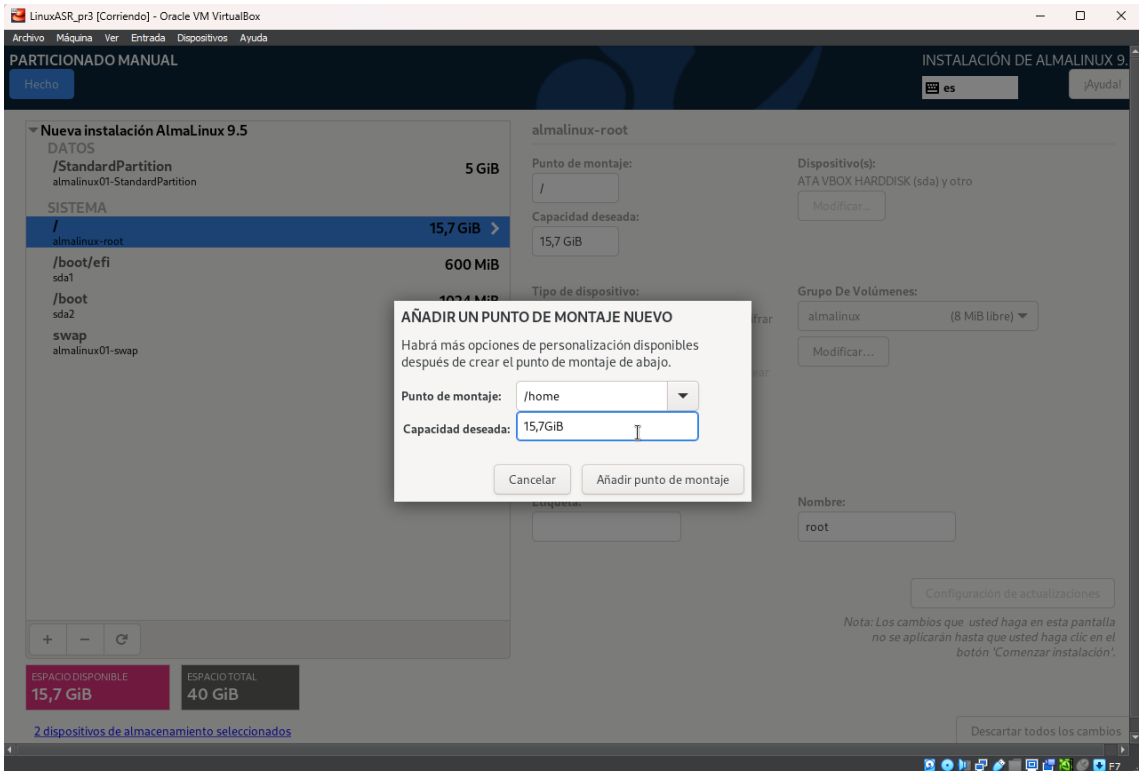




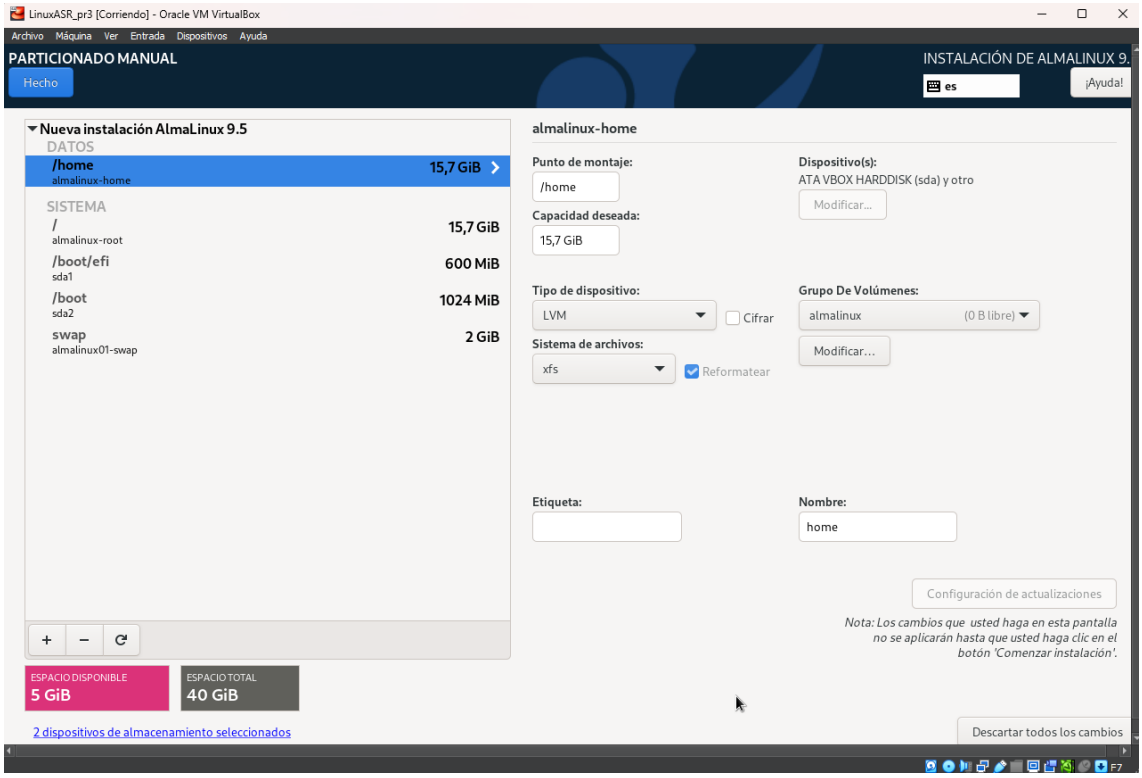
• Haya un grupo de volúmenes llamado "almalinux" dividido en dos volúmenes lógicos LVM, montados en / y en /home. Fuerza a que el volumen se instale enteramente en los dos discos. El volumen lógico que se montará en "/" debe usar la mitad del espacio disponible. El volumen lógico que se montará en /home usará el espacio restante.



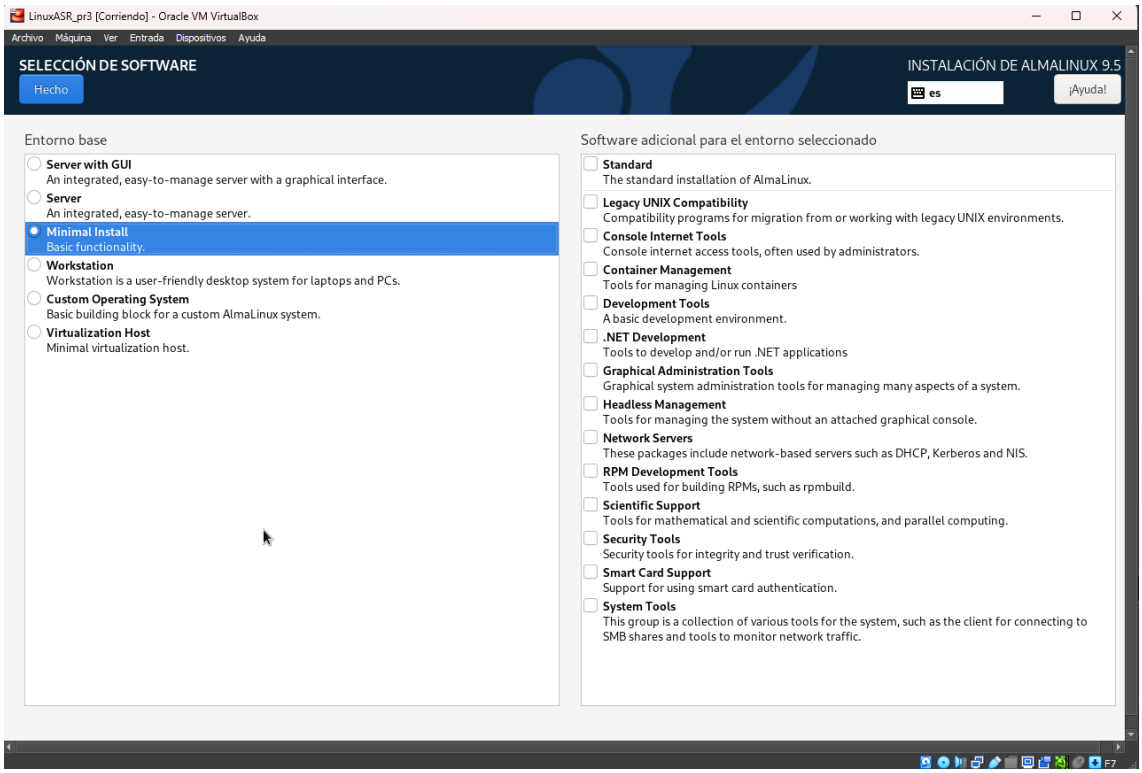


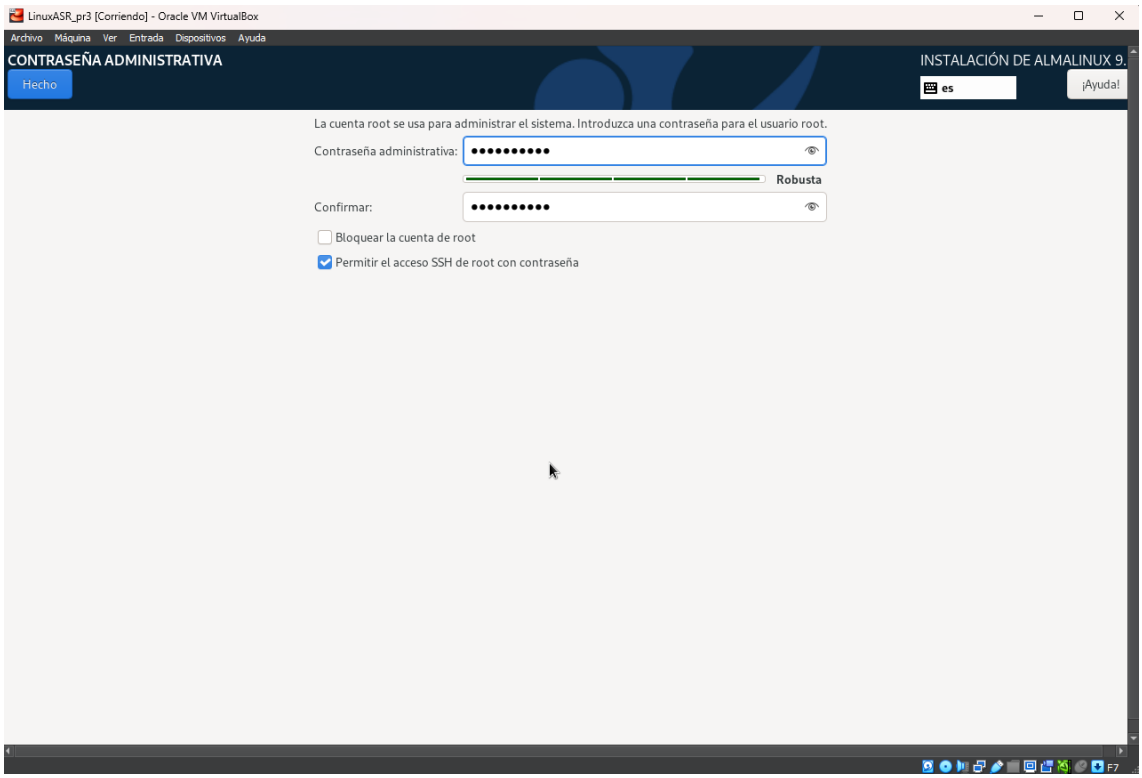


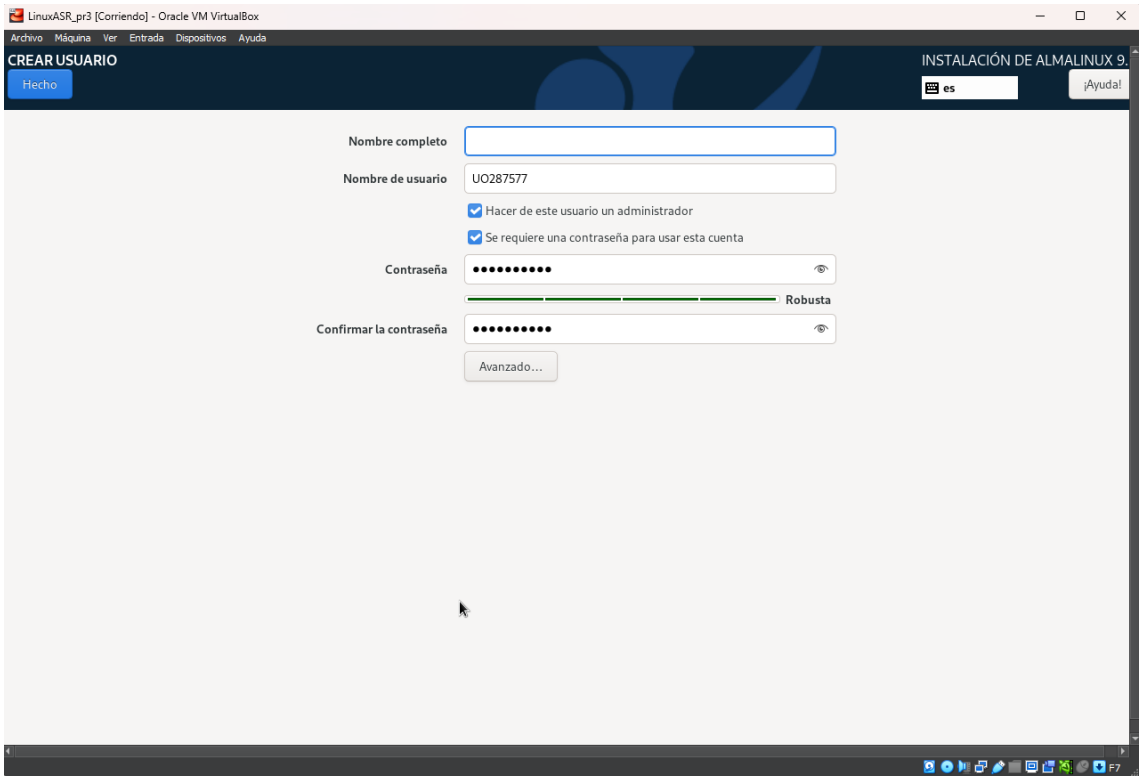
• Por último, elimina la partición standard que has creado en sdb.



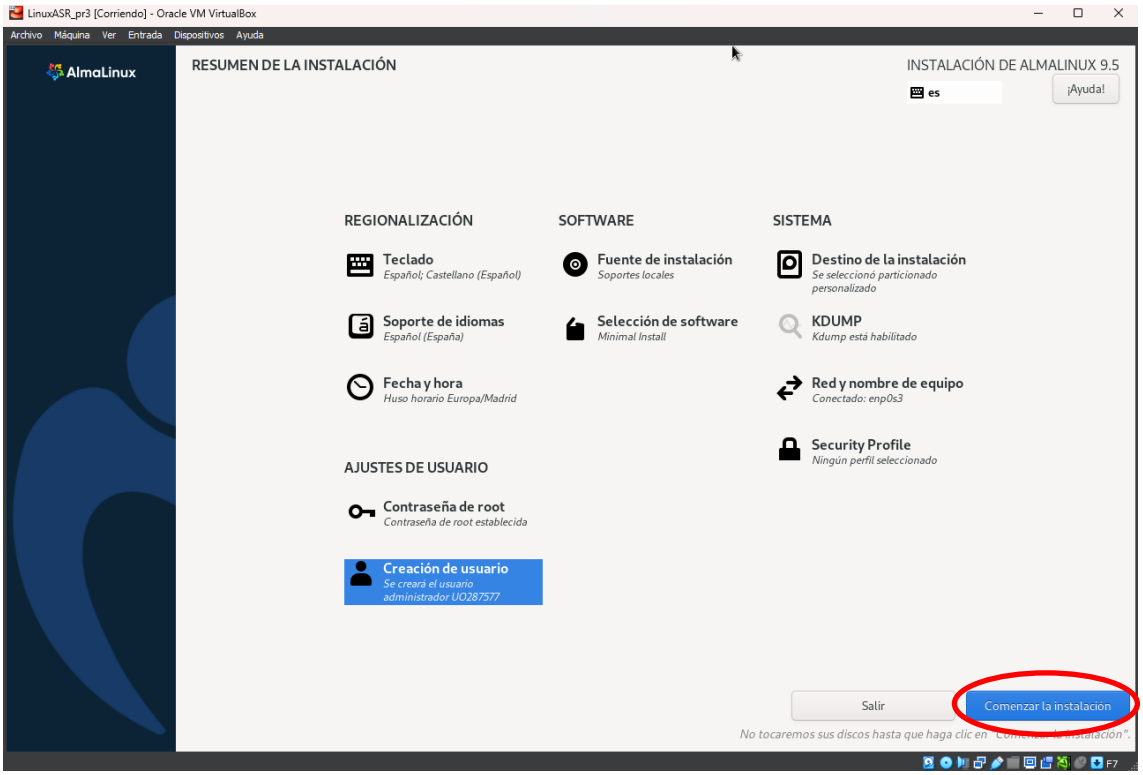
Completamos el resto de la instalación con la siguiente configuración.

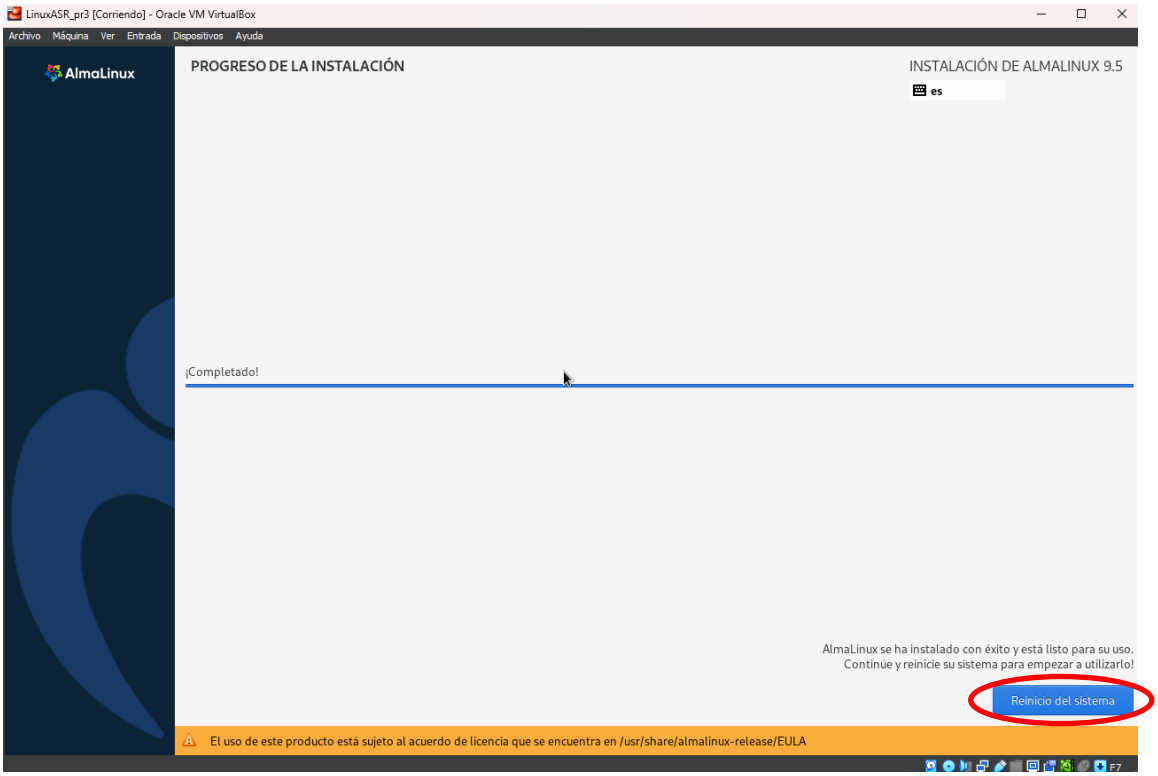




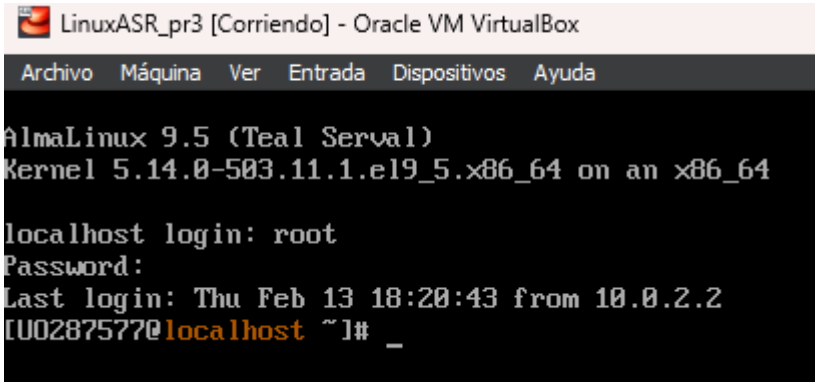


Instalamos el operativo.



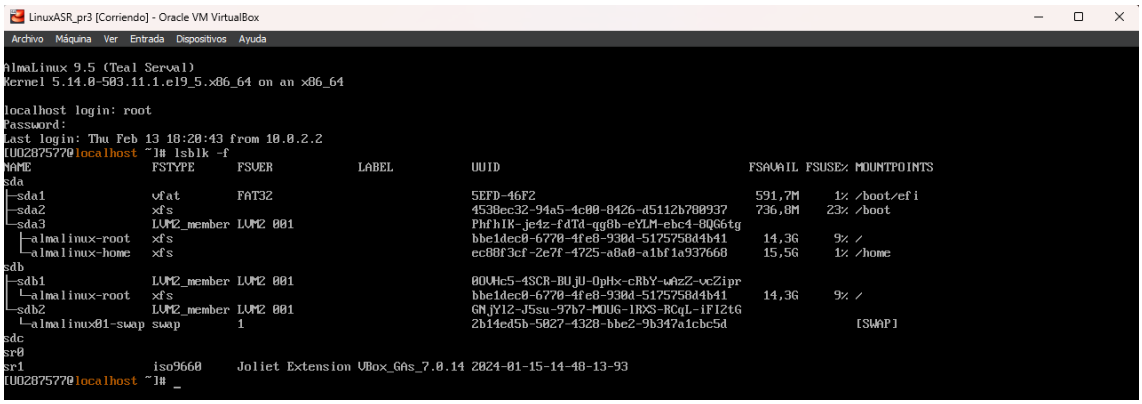


Iniciamos sesión para comprobar que todo es correcto.



(Todo es correcto)

Y hacemos lsblk –f, siendo el resultado el siguiente:

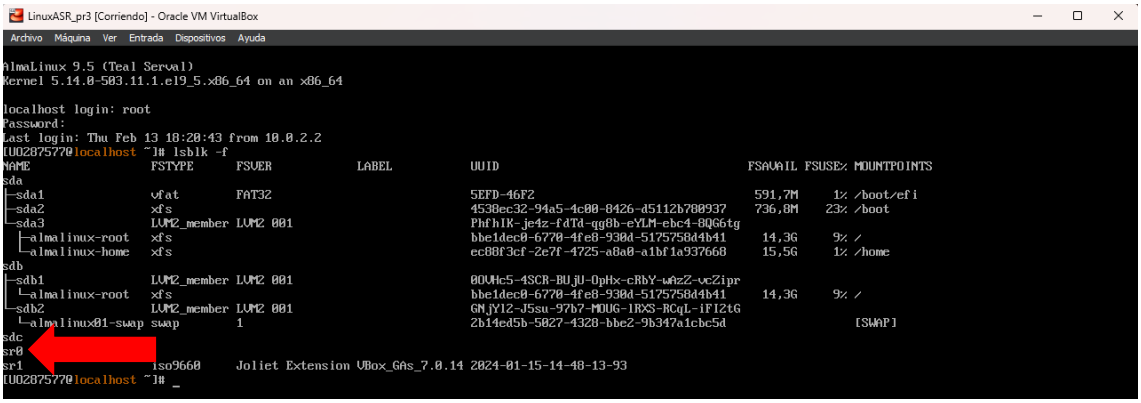


Parte 2:

Asignamos el espacio del tercer disco duro al volumen lógico que está montado en /home, sin reinstalar el sistema operativo y conservando el contenido del directorio /home.

Los pasos a realizar son:

1. Eliminamos con gdisk las particiones del tercer disco si las hubiere.



(En nuestro caso, el tercer disco no tiene particiones)

2. Creamos con gdisk una partición en el tercer disco, que ocupe todo su espacio, y le damos el tipo "Linux LVM".

```
[UO287577@localhost ~]# gdisk /dev/sdc
GPT fdisk (gdisk) version 1.0.7

[  427.710343]  sdc:
Partition table scan:
  MBR: protective
  BSD: not present
  APM: not present
  GPT: present

Found valid GPT with protective MBR; using GPT.

Command (? for help): n
Partition number (1-128, default 1): 1
First sector (34-41943006, default = 2048) or {+-}size{KMGTP}:
Last sector (2048-41943006, default = 41943006) or {+-}size{KMGTP}:
Current type is 8300 (Linux filesystem)
Hex code or GUID (L to show codes, Enter = 8300): L
Type search string, or <Enter> to show all codes: LVM
8e00 Linux LVM
Hex code or GUID (L to show codes, Enter = 8300): 8e00
Changed type of partition to 'Linux LVM'

Command (? for help): w_
```

```
Command (? for help): n
Partition number (1-128, default 1): 1
First sector (34-41943006, default = 2048) or {+-}size{KMGTP}:
Last sector (2048-41943006, default = 41943006) or {+-}size{KMGTP}:
Current type is 8300 (Linux filesystem)
Hex code or GUID (L to show codes, Enter = 8300): L
Type search string, or <Enter> to show all codes: LVM
8e00 Linux LVM
Hex code or GUID (L to show codes, Enter = 8300): 8e00
Changed type of partition to '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.
[  486.585015]  sdc: sdc1
[  487.595654]  sdc: sdc1
The operation has completed successfully.
[UO287577@localhost ~]# lsblk -f
NAME                FSTYPE      FSVER            LABEL           UUID                                   FSAVAIL FSUSE% MOUNTPOINTS
sda
├─sda1              vfat        FAT32                            5EFD-46F2                               591,7M     1% /boot/efi
├─sda2              xfs                                          4538ec32-94a5-4c00-8426-d5112b780937    736,8M    23% /boot
└─sda3              LVM2_member LVM2 001                         PhfhIK-je4z-fdTd-qg8b-eYLM-ebc4-8QG6tg
  ├─almalinux-root  xfs                                          bbe1dec0-6770-4fe8-930d-5175758d4b41     14,3G     9% /
  └─almalinux-home  xfs                                          ec88f3cf-2e7f-4725-a8a0-a1bf1a937668     15,5G     1% /home
sdb
├─sdb1              LVM2_member LVM2 001                         0OVHc5-4SCR-BUjU-OpHx-cRbY-wAzZ-vcZipr
│ └─almalinux-root  xfs                                          bbe1dec0-6770-4fe8-930d-5175758d4b41     14,3G     9% /
└─sdb2              LVM2_member LVM2 001                         GNjYl2-J5su-97b7-MOUG-lRXS-RCqL-iFI2tG
  └─almalinux01-swap swap       1                                2b14ed5b-5027-4328-bbe2-9b347a1cbc5d                [SWAP]
sdc
└─sdc1
sr0
sr1                 iso9660     Joliet Extension VBox_GAs_7.0.14 2024-01-15-14-48-13-93
[UO287577@localhost ~]#
```

3. Creamos un volumen físico en esa partición, usando la orden pvcreate.

```
[UO287577@localhost ~]# pvcreate /dev/sdc1
  Physical volume "/dev/sdc1" successfully created.
[UO287577@localhost ~]#
```

4. Añadimos con la orden vgextend el volumen físico al grupo de volúmenes lógicos (comprobamos con la orden vgscan que el nombre del grupo es "almalinux").

```
[UO287577@localhost ~]# vgextend almalinux /dev/sdc1
  Volume group "almalinux" successfully extended
[UO287577@localhost ~]#
```

5. Extendemos el volumen lógico que contiene a /home para que utilice otros 10GB del tercer disco (usaremos la mitad del nuevo disco que acabamos de incorporar).
    a. En primer lugar, debemos desmontar /home con la orden umount.

```
[UO287577@localhost ~]# umount /home
[  742.286953] XFS (dm-2): Unmounting Filesystem ec88f3cf-2e7f-4725-a8a0-a1bf1a937668
[UO287577@localhost ~]# _
```

    b. A continuación, usamos la orden lvextend -L+10G etc. para extender el volumen lógico.

```
[UO287577@localhost ~]# lvextend -L+10G /dev/mapper/almalinux-home
  Size of logical volume almalinux/home changed from 15,70 GiB (4020 extents) to 25,70 GiB (6580 extents).
  Logical volume almalinux/home successfully resized.
[UO287577@localhost ~]#
```

    c. Volvemos a montar /home.

```
[UO287577@localhost ~]# mount /dev/mapper/almalinux-home /home
[  882.670924] XFS (dm-2): Mounting V5 Filesystem ec88f3cf-2e7f-4725-a8a0-a1bf1a937668
[  882.760889] XFS (dm-2): Ending clean mount
[UO287577@localhost ~]# _
```

    d. Usamos el comando xfs_growfs para ajustar el tamaño del filesystem.

```
[UO287577@localhost ~]# xfs_growfs /home -D size
meta-data=/dev/mapper/almalinux-home isize=512    agcount=4, agsize=1029120 blks
         =                       sectsz=512   attr=2, projid32bit=1
         =                       crc=1        finobt=1, sparse=1, rmapbt=0
         =                       reflink=1    bigtime=1 inobtcount=1 nrext64=0
data     =                       bsize=4096   blocks=4116480, imaxpct=25
         =                       sunit=0      swidth=0 blks
naming   =version 2              bsize=4096   ascii-ci=0, ftype=1
log      =internal log           bsize=4096   blocks=16384, version=2
         =                       sectsz=512   sunit=0 blks, lazy-count=1
realtime =none                   extsz=4096   blocks=0, rtextents=0
data blocks changed from 4116480 to 6737920
[UO287577@localhost ~]#
```

Tras terminar el proceso, ejecutamos las siguientes órdenes:

```
[UO287577@localhost ~]# pvscan
  PV /dev/sdb2   VG almalinux01   lvm2 [2,00 GiB / 4,00 MiB free]
  PV /dev/sda3   VG almalinux     lvm2 [18,41 GiB / 0    free]
  PV /dev/sdb1   VG almalinux     lvm2 [12,99 GiB / 0    free]
  PV /dev/sdc1   VG almalinux     lvm2 [<20,00 GiB / <10,00 GiB free]
  Total: 4 [53,40 GiB] / in use: 4 [53,40 GiB] / in no VG: 0 [0   ]
[UO287577@localhost ~]#
```

```
[UO287577@localhost ~]# lvscan
  ACTIVE            '/dev/almalinux01/swap' [2,00 GiB] inherit
  ACTIVE            '/dev/almalinux/home' [25,70 GiB] inherit
  ACTIVE            '/dev/almalinux/root' [<15,70 GiB] inherit
[UO287577@localhost ~]#
```

```
[UO287577@localhost ~]# df /home
S.ficheros                bloques de 1K Usados Disponibles Uso% Montado en
/dev/mapper/almalinux-home     26886144 220708    26665436   1% /home
[UO287577@localhost ~]# _
```