

Pràctica: Gestió Avançada de Particions

Abel Romero Martínez

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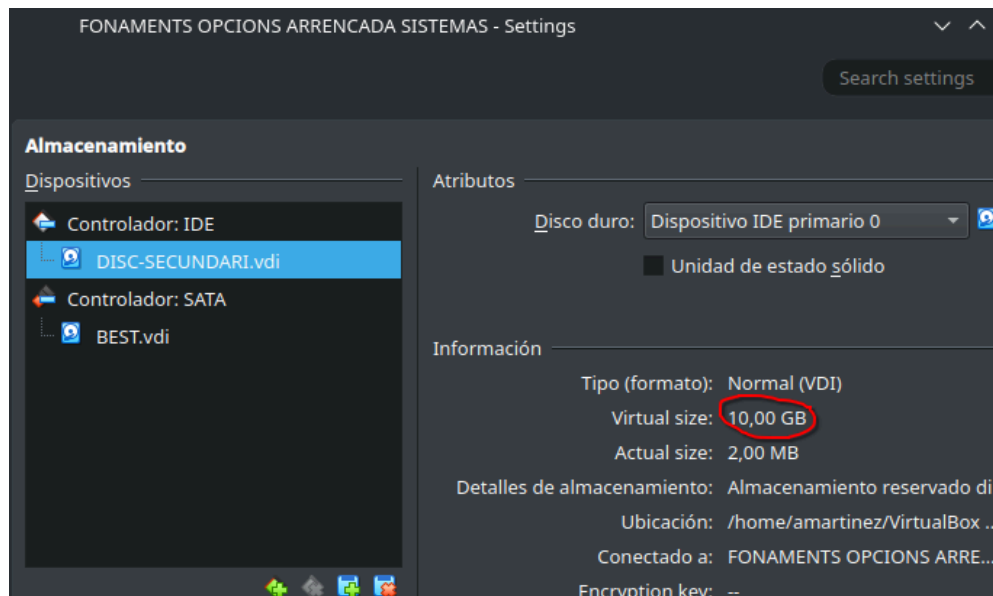
Introducció a la pràctica

En aquesta pràctica, sobre la gestió avançada de particions, la faré amb una màquina virtual Ubuntu 22.04. L'objectiu de la pràctica és aprendre a crear, configurar i muntar particions manualment. D'aquesta manera aprendré aplicar sistemes de fitxers i configurar l'automuntatge.

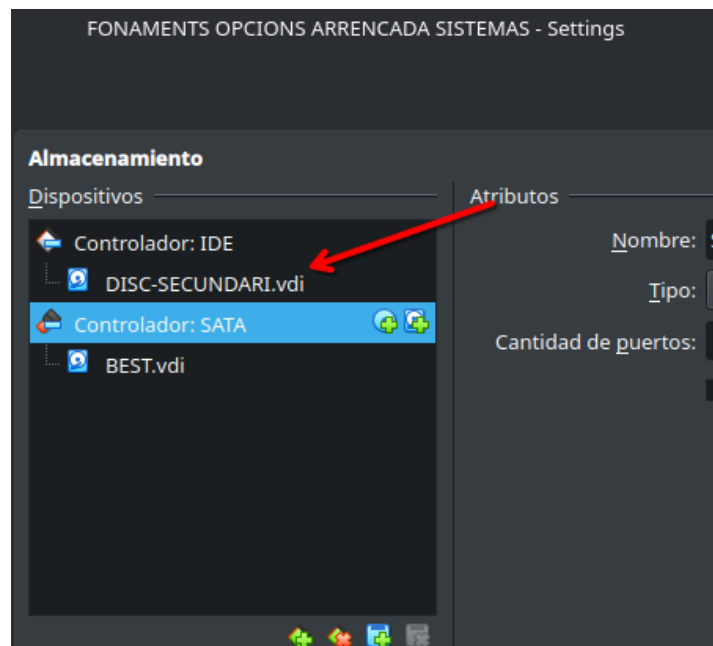
Finalment, faré proves de rendiment de l'eficiència del sistema en les particions.

1. Configuració del disc virtual

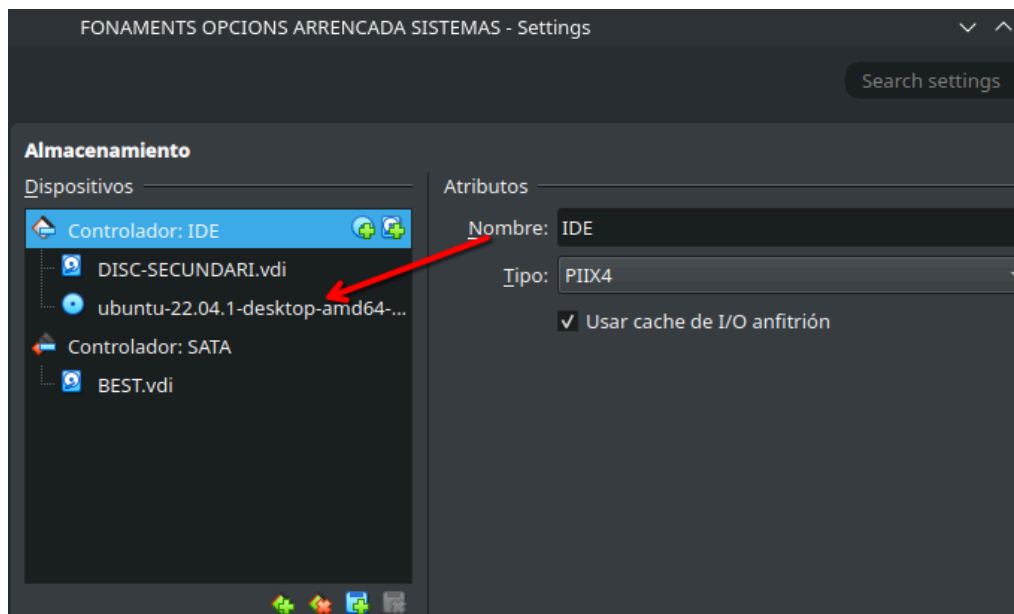
- Crear el disc virtual (disc-secundari.vdi) de mida 10 GB.



- Aquí ja tenim el nostre nou disc creat en la nostra màquina virtual d'Ubuntu.



- He afegit l'Ubuntu 22.04.1 com a disc a la màquina virtual.



- Comprovació que el disc sdb.

```

abel@abel-VirtualBox:~$ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINTS
loop0       7:0      0   4K  1 loop /snap/bare/5
loop1       7:1      0  62M  1 loop /snap/core20/1587
loop2       7:2      0 163,3M  1 loop /snap/firefox/1635
loop3       7:3      0  91,7M  1 loop /snap/gtk-common-themes/1535
loop4       7:4      0 400,8M  1 loop /snap/gnome-3-38-2004/112
loop5       7:5      0  45,9M  1 loop /snap/snap-store/582
loop6       7:6      0   47M  1 loop /snap/snapd/16292
loop7       7:7      0  284K  1 loop /snap/snapd-desktop-integration/14
sda         8:0      0   50G  0 disk
├─sda1      8:1      0    1M  0 part
├─sda2      8:2      0  513M  0 part /boot/efi
├─sda3      8:3      0   30G  0 part
└─sda4      8:4      0  19,5G  0 part /
sdb         8:16     0   10G  0 disk
sr0        11:0     1 1024M  0 rom
sr1        11:1     1 1024M  0 rom

```

2. Creació de particions

- Creem una nova taula de particions al disc

```
abel@abel-VirtualBox:~$ sudo fdisk /dev/sdb
```

- Posem g per crear una nova etiqueta, és a dir, una carpeta dins del disc.
Després creem les particions seguin la guia següent:
Partició 1: 4G
Partició 2: 4G
Partició 3: 2G

```
Orden (m para obtener ayuda): g
Se ha creado una nueva etiqueta de disco GPT (GUID: 99D9C94F-74E9-DE47-B15D-DD3D4D1A6C0A).

Orden (m para obtener ayuda): n
Número de partición (1-128, valor predeterminado 1): 1
Primer sector (2048-20971486, valor predeterminado 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-20971486, valor predeterminado 20971486): +4G

Crea una nueva partición 1 de tipo 'Linux filesystem' y de tamaño 4 GiB.

Orden (m para obtener ayuda): n
Número de partición (2-128, valor predeterminado 2): 2
Primer sector (8390656-20971486, valor predeterminado 8390656):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (8390656-20971486, valor predeterminado 20971486): +4G

Orden (m para obtener ayuda): n
Número de partición (3-128, valor predeterminado 3): 3
Primer sector (16779264-20971486, valor predeterminado 16779264):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (16779264-20971486, valor predeterminado 20971486):
):

Crea una nueva partición 3 de tipo 'Linux filesystem' y de tamaño 2 GiB.

Orden (m para obtener ayuda): w
Se ha modificado la tabla de particiones.
Llamando a ioctl() para volver a leer la tabla de particiones.
Se están sincronizando los discos.
```

- Posem lsblk per veure quines particions ha creat dins del nostre disc.

```
abel@abel-VirtualBox:~$ lsblk
```

NAME	MAJ:MIN	RM	SIZE	RO	TYPE	MOUNTPOINTS
loop0	7:0	0	4K	1	loop	/snap/bare/5
loop1	7:1	0	62M	1	loop	/snap/core20/1587
loop2	7:2	0	163,3M	1	loop	/snap/firefox/1635
loop3	7:3	0	91,7M	1	loop	/snap/gtk-common-themes/1535
loop4	7:4	0	400,8M	1	loop	/snap/gnome-3-38-2004/112
loop5	7:5	0	45,9M	1	loop	/snap/snap-store/582
loop6	7:6	0	47M	1	loop	/snap/snapd/16292
loop7	7:7	0	284K	1	loop	/snap/snapd-desktop-integration/14
sda	8:0	0	50G	0	disk	
├─sda1	8:1	0	1M	0	part	
├─sda2	8:2	0	513M	0	part	/boot/efi
├─sda3	8:3	0	30G	0	part	
├─sda4	8:4	0	19,5G	0	part	/
sdb	8:16	0	10G	0	disk	
├─sdb1	8:17	0	4G	0	part	
├─sdb2	8:18	0	4G	0	part	
└─sdb3	8:19	0	2G	0	part	
sr0	11:0	1	1024M	0	rom	
sr1	11:1	1	1024M	0	rom	

3. Preparació i formatació

- Partició 1 fitxer ext4

```
abel@abel-VirtualBox:~$ sudo mkfs.ext4 /dev/sdb1
mke2fs 1.46.5 (30-Dec-2021)
Se está creando un sistema de ficheros con 1048576 bloques de 4k y 262144 nodos-i
UUID del sistema de ficheros: 3fef7cd5-fa64-47c7-9099-abea0d0b0ee2
Respalos del superbloque guardados en los bloques:
    32768, 98304, 163840, 229376, 294912, 819200, 884736

Reservando las tablas de grupo: hecho
Escribiendo las tablas de nodos-i: hecho
Creando el fichero de transacciones (16384 bloques): hecho
Escribiendo superbloques y la información contable del sistema de archivos: hecho
```

- Partició 2 fitxer NTFS

```
abel@abel-VirtualBox:~$ sudo mkfs.ntfs /dev/sdb2
[sudo] contraseña para abel:
Cluster size has been automatically set to 4096 bytes.
Initializing device with zeroes: 100% - Done.
Creating NTFS volume structures.
mkntfs completed successfully. Have a nice day.
```

- Partició 3

```
abel@abel-VirtualBox:~$ sudo mkswap /dev/sdb3
Configurando espacio de intercambio versión 1, tamaño = 2 GiB (2146410496 bytes)
sin etiqueta, UUID=b04439c7-6fea-4823-aeb6-8ded82354ff1
```

- Confirmació de què estan llestes per utilitzar-les (les particions).

```
abel@abel-VirtualBox:~$ df -h
S.ficheros      Tamaño Usados  Disp Uso% Montado en
tmpfs           392M   1,5M   391M   1% /run
/dev/sda4       20G    11G    7,7G  58% /
tmpfs           2,0G     0    2,0G   0% /dev/shm
tmpfs           5,0M    4,0K   5,0M   1% /run/lock
/dev/sda2       512M    6,1M   506M   2% /boot/efi
tmpfs           392M   108K   392M   1% /run/user/1000
abel@abel-VirtualBox:~$ swapon --show
NAME      TYPE      SIZE USED  PRIO
/swapfile file       2G 268K   -2
/dev/sdb3 partition 2G   0B    -3
```

```
sdb      8:16    0    10G    0 disk
├─sdb1   8:17    0     4G    0 part
├─sdb2   8:18    0     4G    0 part
└─sdb3   8:19    0     2G    0 part [SWAP]
```

```
abel@abel-VirtualBox:~$ sudo blkid
/dev/sda4: UUID="e5b95d60-3eb7-4e03-96ab-01a3ba1680cc" BLOCK_SIZE="4096" TYPE="ext4" PARTUUID="6a72b6e3-051a-42de-b125-4463e2eefde1"
/dev/loop1: TYPE="squashfs"
/dev/sdb2: BLOCK_SIZE="512" UUID="0A8777572631D271" TYPE="ntfs" PARTUUID="c2da0024-f0fd-674e-9816-1d739096a04a"
/dev/sdb3: UUID="b04439c7-6fea-4823-aeb6-8ded82354ff1" TYPE="swap" PARTUUID="dfb09b63-a6af-e646-bfc6-8c770c7a8627"
/dev/sdb1: UUID="3fef7cd5-fa64-47c7-9099-abea0d0b0ee2" BLOCK_SIZE="4096" TYPE="ext4" PARTUUID="ab19f511-08d0-4b4e-a3ed-6f25dbd899f0"
/dev/loop6: TYPE="squashfs"
/dev/loop4: TYPE="squashfs"
/dev/loop2: TYPE="squashfs"
/dev/loop0: TYPE="squashfs"
/dev/loop7: TYPE="squashfs"
/dev/sda2: UUID="3E8C-4E3E" BLOCK_SIZE="512" TYPE="vfat" PARTLABEL="EFI System Partition" PARTUUID="4ef623af-2bdb-4b69-ba37-4ebddb339bd9"
/dev/sda3: UUID="22734393-da2b-46af-8ccd-ac4d5fe1f217" BLOCK_SIZE="4096" TYPE="ext4" PARTUUID="69eb6e14-42c1-4845-97db-09c888ffd143"
/dev/sda1: PARTUUID="f1544188-b1d5-486c-bf78-04411b6170af"
/dev/loop5: TYPE="squashfs"
/dev/loop3: TYPE="squashfs"
```


4. Muntatge i desmuntatge

- Creació punts de muntatge.

```
abel@abel-VirtualBox:~$ sudo mkdir -p /mnt/particio1  
[sudo] contraseña para abel:  
abel@abel-VirtualBox:~$ sudo mkdir -p /mnt/particio2
```

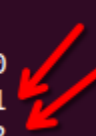
```
abel@abel-VirtualBox:~$ sudo mount /dev/sdb1 /mnt/particio1
```

```
abel@abel-VirtualBox:~$ sudo mount /dev/sdb2 /mnt/particio2
```

- Comprovació muntatges amb df -h.

```
abel@abel-VirtualBox:~$ df -h
```

S.ficheros	Tamaño	Usados	Disp	Uso%	Montado en
tmpfs	392M	1,5M	391M	1%	/run
/dev/sda4	20G	11G	7,7G	58%	/
tmpfs	2,0G	0	2,0G	0%	/dev/shm
tmpfs	5,0M	4,0K	5,0M	1%	/run/lock
/dev/sda2	512M	6,1M	506M	2%	/boot/efi
tmpfs	392M	108K	392M	1%	/run/user/1000
/dev/sdb1	3,9G	24K	3,7G	1%	/mnt/particio1
/dev/sdb2	4,0G	22M	4,0G	1%	/mnt/particio2



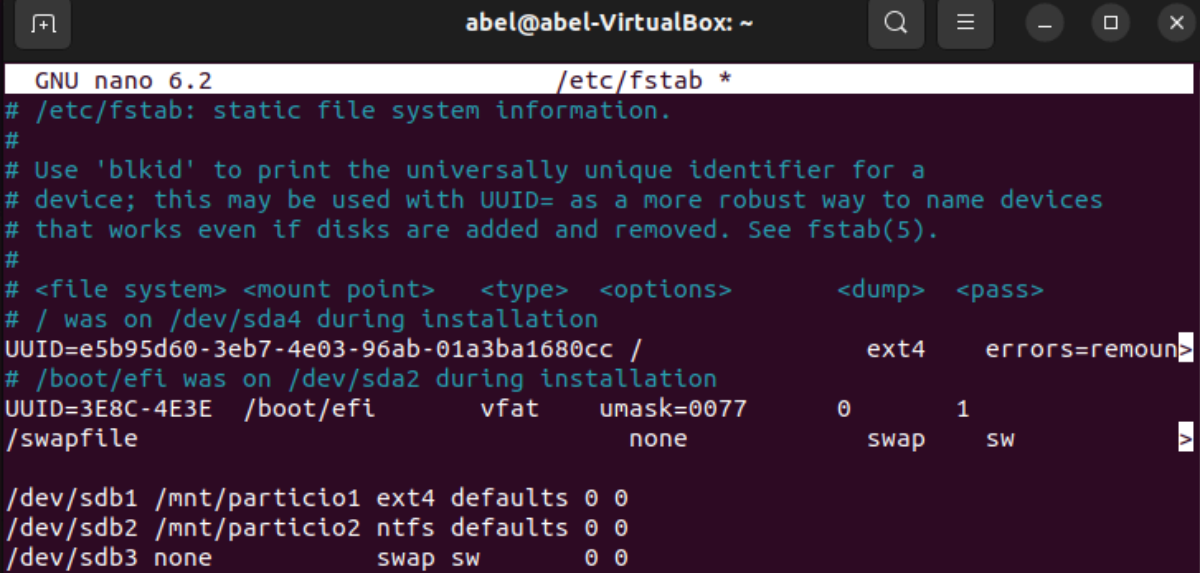
- Desmuntar particions.

```
abel@abel-VirtualBox:~$ sudo umount /mnt/particio1  
abel@abel-VirtualBox:~$ sudo umount /mnt/particio2
```

5. Automuntatge al sistema

- Automuntem les particions

```
abel@abel-VirtualBox:~$ sudo nano /etc/fstab
```



```
GNU nano 6.2 /etc/fstab *
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point> <type> <options> <dump> <pass>
# / was on /dev/sda4 during installation
UUID=e5b95d60-3eb7-4e03-96ab-01a3ba1680cc / ext4 errors=remoun
# /boot/efi was on /dev/sda2 during installation
UUID=3E8C-4E3E /boot/efi vfat umask=0077 0 1
/swapfile none swap sw 0 0

/dev/sdb1 /mnt/particio1 ext4 defaults 0 0
/dev/sdb2 /mnt/particio2 ntfs defaults 0 0
/dev/sdb3 none swap sw 0 0
```

- Comprovació de les particions muntades (1,2,3).

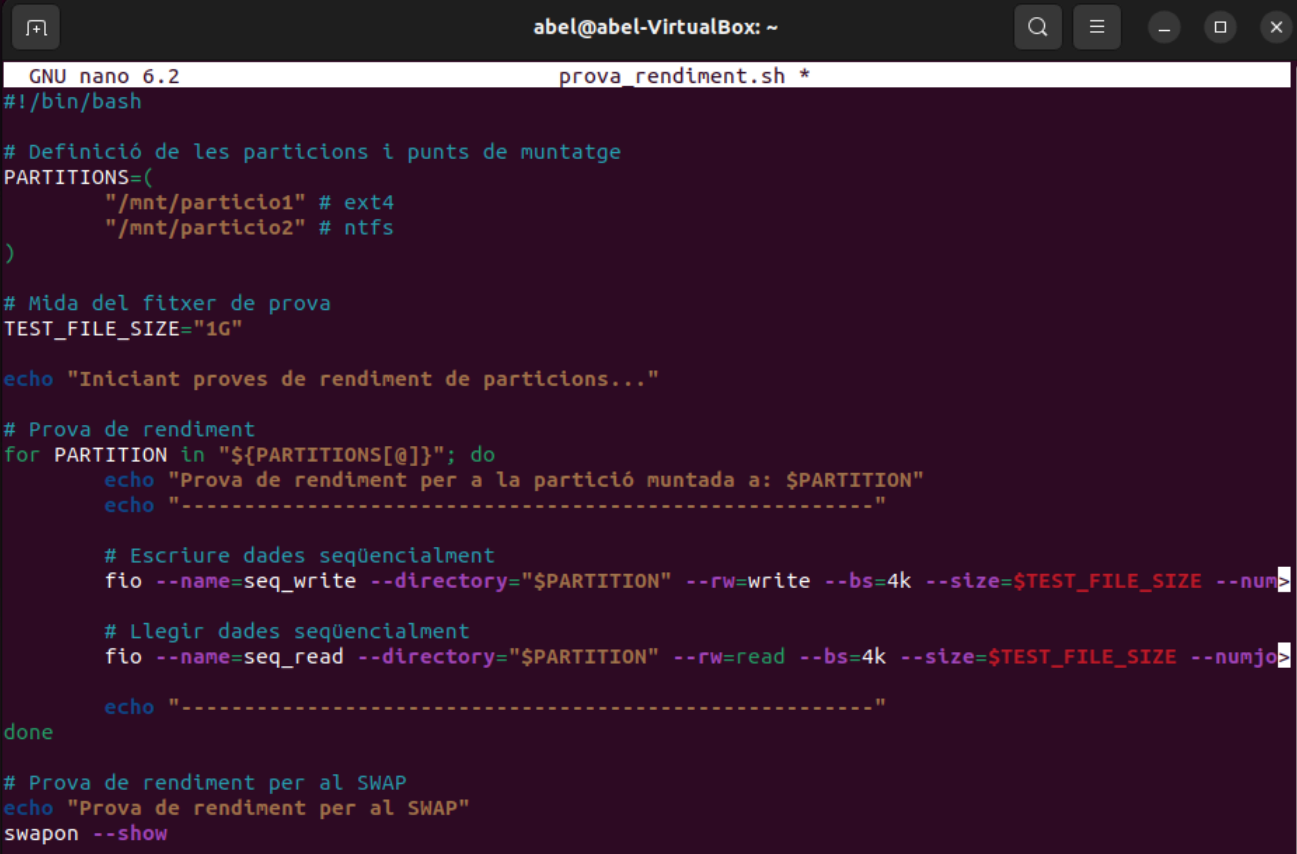
```
abel@abel-VirtualBox:~$ df -h
```

S.ficheros	Tamaño	Usados	Disp	Uso%	Montado en
tmpfs	392M	1,5M	391M	1%	/run
/dev/sda4	20G	11G	7,6G	58%	/
tmpfs	2,0G	0	2,0G	0%	/dev/shm
tmpfs	5,0M	4,0K	5,0M	1%	/run/lock
/dev/sda2	512M	6,1M	506M	2%	/boot/efi
/dev/sdb1	3,9G	24K	3,7G	1%	/mnt/particio1
/dev/sdb2	4,0G	22M	4,0G	1%	/mnt/particio2
tmpfs	392M	2,4M	390M	1%	/run/user/1000

6. Anàlisi de rendiment

- Amb aquesta nova creació de fitxer li posarem les particions amb el nano i tota la informació que tenim de les particions 1 i 2. D'aquesta manera podré comprovar finalment el rendiment de les dues particions creades anteriorment.

```
abel@abel-VirtualBox:~$ nano prova_rendiment.sh
```



```
GNU nano 6.2                                prova_rendiment.sh *
#!/bin/bash

# Definició de les particions i punts de muntatge
PARTITIONS=(
    "/mnt/particio1" # ext4
    "/mnt/particio2" # ntfs
)

# Mida del fitxer de prova
TEST_FILE_SIZE="1G"

echo "Iniciant proves de rendiment de particions..."

# Prova de rendiment
for PARTITION in "${PARTITIONS[@]"; do
    echo "Prova de rendiment per a la partició muntada a: $PARTITION"
    echo "-----"

    # Escriure dades seqüencialment
    fio --name=seq_write --directory="$PARTITION" --rw=write --bs=4k --size=$TEST_FILE_SIZE --numj>
    # Llegir dades seqüencialment
    fio --name=seq_read --directory="$PARTITION" --rw=read --bs=4k --size=$TEST_FILE_SIZE --numjo>
    echo "-----"
done

# Prova de rendiment per al SWAP
echo "Prova de rendiment per al SWAP"
swapon --show
```

- Canvio els permisos perquè sigui executable.

```
abel@abel-VirtualBox:~$ chmod +x prova_rendiment.sh
```

- Executo l'escript per poder-lo veure i comparar el rendiment de les particions.

```
abel@abel-VirtualBox:~$ sudo ./prova_rendiment.sh
Iniciant proves de rendiment de particions...
Prova de rendiment per a la partició muntada a: /mnt/particio1
-----
seq_write: (g=0): rw=write, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B, ioengine=psync, iode
pth=1
fio-3.28
Starting 1 process
seq_write: Laying out IO file (1 file / 1024MiB)
Jobs: 1 (f=1): [W(1)][13.3%][w=40.8MiB/s][w=10.4k IOPS][eta 00m:26s]
```

```

abel@abel-VirtualBox:~$ sudo ./prova_rendiment.sh
Iniciant proves de rendiment de particions...
Prova de rendiment per a la partició muntada a: /mnt/particio1
-----
seq_write: (g=0): rw=write, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B, ioengine=psync, iodepth=1
fio-3.28
Starting 1 process
seq_write: Laying out IO file (1 file / 1024MiB)
Jobs: 1 (f=1): [W(1)][100.0%][eta 00m:00s]
seq_write: (groupid=0, jobs=1): err= 0: pid=6747: Tue Jan 28 20:08:34 2025
  write: IOPS=4867, BW=19.0MiB/s (19.9MB/s)(571MiB/30008msec); 0 zone resets
    clat (nsec): min=1824, max=1584.5M, avg=204912.89, stdev=8634985.01
    lat (nsec): min=1852, max=1584.5M, avg=204984.79, stdev=8634989.74
    clat percentiles (nsec):
      | 1.00th=[ 1928], 5.00th=[ 1944], 10.00th=[ 1976],
      | 20.00th=[ 2024], 30.00th=[ 2040], 40.00th=[ 2096],
      | 50.00th=[ 2128], 60.00th=[ 2288], 70.00th=[ 2992],
      | 80.00th=[ 11456], 90.00th=[ 11968], 95.00th=[ 14144],
      | 99.00th=[ 64768], 99.50th=[ 13041664], 99.90th=[ 28180480],
      | 99.95th=[ 36438016], 99.99th=[206569472]
    bw ( KiB/s): min= 24, max=656568, per=100.00%, avg=22726.82, stdev=91142.21, samples=51
    iops       : min= 6, max=164142, avg=5681.63, stdev=22785.56, samples=51
    lat (usec) : 2=15.18%, 4=57.91%, 10=4.83%, 20=19.67%, 50=1.17%
    lat (usec) : 100=0.41%, 250=0.13%, 500=0.02%, 750=0.01%, 1000=0.01%
    lat (msec) : 2=0.01%, 4=0.01%, 10=0.01%, 20=0.45%, 50=0.18%
    lat (msec) : 100=0.01%, 250=0.02%, 1000=0.01%, 2000=0.01%
    cpu        : usr=0.65%, sys=2.35%, ctx=1013, majf=0, minf=16
    IO depths  : 1=100.0%, 2=0.0%, 4=0.0%, 8=0.0%, 16=0.0%, 32=0.0%, >=64=0.0%
    submit     : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
    complete   : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
    issued rwts: total=0,146078,0,0 short=0,0,0,0 dropped=0,0,0,0
    latency    : target=0, window=0, percentile=100.00%, depth=1

Run status group 0 (all jobs):
  WRITE: bw=19.0MiB/s (19.9MB/s), 19.0MiB/s-19.0MiB/s (19.9MB/s-19.9MB/s), io=571MiB (598MB), run=30008-30008msec

Disk stats (read/write):
  sdb: ios=0/364, merge=0/34, ticks=0/533240, in_queue=541503, util=98.45%
seq_read: (g=0): rw=read, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B, ioengine=psync, iodepth=1

```

```

Run status group 0 (all jobs):
  READ: bw=1865MiB/s (1956MB/s), 1865MiB/s-1865MiB/s (1956MB/s-1956MB/s), io=54.6GiB (58.7GB), run=30001-30001mse


Disk stats (read/write):
  sdb: ios=526/0, merge=0/0, ticks=9785/0, in_queue=9786, util=18.87%
-----
Prova de rendiment per al SWAP
NAME      TYPE      SIZE USED PRIO
/swapfile file      2G 524K  -2
/dev/sdb3 partition 2G  0B   -3

```

```

Prova de rendiment per al SWAP
NAME      TYPE      SIZE USED PRIO
/swapfile file      2G 524K  -2
/dev/sdb3 partition 2G  0B   -3

```



Partició1 /mnt/particio1:

- Escriptura: 19.0 MiB/s (4,867 IOPS)
- Lectura: 28.2 MiB/s (7,224 IOPS)

Partició2 /mnt/particio2:

- Escriptura: 20.8 MiB/s (5,322 IOPS)
- Lectura: 1,865 MiB/s (476,154 IOPS)

Com a resum del rendiment que he fet, podem veure amb claredat que la partició 2 ha mostrat un rendiment molt superior en lectura, amb velocitats molt altes de 1,865 MiB/s. En escriptura, totes dues tenen un rendiment similar, encara que la partició 1 té una latència una mica més variable.

6. Conclusió de la pràctica

En conclusió, en aquesta pràctica he après a mesurar el rendiment del disc, a crear configurar i muntar particions de sistemes de fitxers i configurar l'automuntatge. També ser realitzar codis per configurar les particions fins a comprovar el seu rendiment.

Finalment, els resultats obtinguts en terminal mostren diferents nivells de rendiment en les particions. Ja que amb la partició 1 destaca en la lectura, mentre que la partició 2 mostra una latència controlada, amb valors més baixos de lectura, però d'escriptura una mica més alta.

En definitiva, aquesta m'ajuda a millorar amb la creació de particions i amb el muntatge i configuracions finalitzant amb una comparació dels rendiments entre les particions creades.

7. Bibliografies web

<https://github.com/HectorPascuallesCarlesVallbona/ASX01-fonaments-maquinari/blob/main/01-RAs/RA03/02-practica/04-practica03-particions.md>

<https://linux.die.net/man/8/fdisk>

<https://archive.kernel.org/oldwiki/ext4.wiki.kernel.org/>

8. Annexa

Codi del rendiment

```
(abel@abel-VirtualBox:~$ sudo ./prova_rendiment.sh
```

```
Iniciant proves de rendiment de particions...
```

```
Prova de rendiment per a la partició muntada a: /mnt/particio1
```

```
-----  
seq_write: (g=0): rw=write, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B,  
ioengine=psync, iodepth=1
```

```
fio-3.28
```

```
Starting 1 process
```

```
seq_write: Laying out IO file (1 file / 1024MiB)
```

```
Jobs: 1 (f=1): [W(1)][100.0%][eta 00m:00s]
```

```
seq_write: (groupid=0, jobs=1): err= 0: pid=6747: Tue Jan 28 20:08:34 2025
```

```
write: IOPS=4867, BW=19.0MiB/s (19.9MB/s)(571MiB/30008msec); 0 zone resets
```

```
clat (nsec): min=1824, max=1584.5M, avg=204912.89, stdev=8634985.01
```

```
lat (nsec): min=1852, max=1584.5M, avg=204984.79, stdev=8634989.74
```

```
clat percentiles (nsec):
```

```
| 1.00th=[ 1928], 5.00th=[ 1944], 10.00th=[ 1976],
```

```
| 20.00th=[ 2024], 30.00th=[ 2040], 40.00th=[ 2096],
```

```
| 50.00th=[ 2128], 60.00th=[ 2288], 70.00th=[ 2992],
```

```
| 80.00th=[ 11456], 90.00th=[ 11968], 95.00th=[ 14144],
```

```
| 99.00th=[ 64768], 99.50th=[ 13041664], 99.90th=[ 28180480],
```

```
| 99.95th=[ 36438016], 99.99th=[206569472]
```

```
bw ( KiB/s): min= 24, max=656568, per=100.00%, avg=22726.82, stdev=91142.21, samples=51
```

```
iops : min= 6, max=164142, avg=5681.63, stdev=22785.56, samples=51
```

```
lat (usec) : 2=15.18%, 4=57.91%, 10=4.83%, 20=19.67%, 50=1.17%
```

```
lat (usec) : 100=0.41%, 250=0.13%, 500=0.02%, 750=0.01%, 1000=0.01%
```

```
lat (msec) : 2=0.01%, 4=0.01%, 10=0.01%, 20=0.45%, 50=0.18%
```

```
lat (msec) : 100=0.01%, 250=0.02%, 1000=0.01%, 2000=0.01%
```

```
cpu : usr=0.65%, sys=2.35%, ctx=1013, majf=0, minf=16
```

```
IO depths : 1=100.0%, 2=0.0%, 4=0.0%, 8=0.0%, 16=0.0%, 32=0.0%, >=64=0.0%
```

```
submit : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
```

```
complete : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
```

```
issued rwts: total=0,146078,0,0 short=0,0,0,0 dropped=0,0,0,0
```

```
latency : target=0, window=0, percentile=100.00%, depth=1
```

```
Run status group 0 (all jobs):
```

```
WRITE: bw=19.0MiB/s (19.9MB/s), 19.0MiB/s-19.0MiB/s (19.9MB/s-19.9MB/s), io=571MiB (598MB),  
run=30008-30008msec
```

```
Disk stats (read/write):
```

```
sdb: ios=0/364, merge=0/34, ticks=0/533240, in_queue=541503, util=98.45%
```

```
seq_read: (g=0): rw=read, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B,
```

```
ioengine=psync, iodepth=1
```

```
fio-3.28
```

```
Starting 1 process
```

```
seq_read: Laying out IO file (1 file / 1024MiB)
```

```
Jobs: 1 (f=1): [R(1)][100.0%][r=30.5MiB/s][r=7808 IOPS][eta 00m:00s]
```

```
seq_read: (groupid=0, jobs=1): err= 0: pid=7059: Tue Jan 28 20:11:57 2025
```

```
read: IOPS=7224, BW=28.2MiB/s (29.6MB/s)(847MiB/30003msec)
      clat (nsec): min=528, max=102863k, avg=137664.33, stdev=1542967.19
      lat (nsec): min=546, max=102863k, avg=137751.53, stdev=1542968.44
      clat percentiles (nsec):
        | 1.00th=[ 572], 5.00th=[ 596], 10.00th=[ 612],
        | 20.00th=[ 652], 30.00th=[ 692], 40.00th=[ 812],
        | 50.00th=[ 3024], 60.00th=[ 3504], 70.00th=[ 3632],
        | 80.00th=[ 3728], 90.00th=[ 3920], 95.00th=[ 4512],
        | 99.00th=[ 6389760], 99.50th=[ 7110656], 99.90th=[15400960],
        | 99.95th=[40632320], 99.99th=[45875200]
      bw ( KiB/s): min=11776, max=35328, per=100.00%, avg=28930.97, stdev=3574.81, samples=59
      iops       : min= 2944, max= 8832, avg=7232.64, stdev=893.71, samples=59
      lat (nsec) : 750=36.62%, 1000=7.07%
      lat (usec) : 2=3.86%, 4=44.72%, 10=5.22%, 20=0.41%, 50=0.30%
      lat (msec) : 100=0.15%, 250=0.08%, 500=0.02%, 750=0.01%, 1000=0.01%
      lat (msec) : 2=0.01%, 4=0.25%, 10=1.09%, 20=0.11%, 50=0.08%
      lat (msec) : 100=0.01%, 250=0.01%
      cpu        : usr=1.32%, sys=3.74%, ctx=3389, majf=0, minf=16
      IO depths  : 1=100.0%, 2=0.0%, 4=0.0%, 8=0.0%, 16=0.0%, 32=0.0%, >=64=0.0%
                  submit : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
                  complete : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
                  issued rwts: total=216765,0,0,0 short=0,0,0,0 dropped=0,0,0,0
                  latency  : target=0, window=0, percentile=100.00%, depth=1
```

Run status group 0 (all jobs):

READ: bw=28.2MiB/s (29.6MB/s), 28.2MiB/s-28.2MiB/s (29.6MB/s-29.6MB/s), io=847MiB (888MB), run=30003-30003msec

Disk stats (read/write):

sdb: ios=3372/4, merge=0/1, ticks=58242/64, in_queue=58369, util=95.45%

Prova de rendiment per a la partició muntada a: /mnt/particio2

seq_write: (g=0): rw=write, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B,
ioengine=psync, iodepth=1

fio-3.28

Starting 1 process

seq_write: Laying out IO file (1 file / 1024MiB)

Jobs: 1 (f=1): [W(1)][100.0%][w=136KiB/s][w=34 IOPS][eta 00m:00s]

seq_write: (groupid=0, jobs=1): err= 0: pid=7064: Tue Jan 28 20:12:28 2025

write: IOPS=5322, BW=20.8MiB/s (21.8MB/s)(627MiB/30157msec); 0 zone resets

clat (usec): min=18, max=209009, avg=187.27, stdev=4474.12

lat (usec): min=18, max=209009, avg=187.34, stdev=4474.13

clat percentiles (usec):

| 1.00th=[19], 5.00th=[20], 10.00th=[21], 20.00th=[35],

| 30.00th=[38], 40.00th=[39], 50.00th=[39], 60.00th=[40],

| 70.00th=[41], 80.00th=[45], 90.00th=[57], 95.00th=[77],

| 99.00th=[1909], 99.50th=[2008], 99.90th=[11994], 99.95th=[14877],

| 99.99th=[208667]

bw (KiB/s): min= 23, max=132508, per=100.00%, avg=21383.78, stdev=40580.10, samples=60

iops : min= 5, max=33127, avg=5345.87, stdev=10145.06, samples=60

lat (usec) : 20=10.18%, 50=75.73%, 100=9.94%, 250=1.39%, 500=0.49%

lat (usec) : 750=0.14%, 1000=0.05%
lat (msec) : 2=1.57%, 4=0.34%, 10=0.01%, 20=0.11%, 50=0.01%
lat (msec) : 250=0.05%
cpu : usr=0.98%, sys=5.60%, ctx=321307, majf=0, minf=17
IO depths : 1=100.0%, 2=0.0%, 4=0.0%, 8=0.0%, 16=0.0%, 32=0.0%, >=64=0.0%
submit : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
complete : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%
issued rwts: total=0,160512,0,0 short=0,0,0,0 dropped=0,0,0,0
latency : target=0, window=0, percentile=100.00%, depth=1

Run status group 0 (all jobs):

WRITE: bw=20.8MiB/s (21.8MB/s), 20.8MiB/s-20.8MiB/s (21.8MB/s-21.8MB/s), io=627MiB (657MB),
run=30157-30157msec

Disk stats (read/write):

sdb: ios=5/176, merge=0/30640, ticks=774/401500, in_queue=402274, util=83.45%
seq_read: (g=0): rw=read, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B,
ioengine=psync, iodepth=1
fio-3.28

Starting 1 process

seq_read: Laying out IO file (1 file / 1024MiB)

Jobs: 1 (f=1): [R(1)][100.0%][r=2372MiB/s][r=607k IOPS][eta 00m:00s]

seq_read: (groupid=0, jobs=1): err= 0: pid=7070: Tue Jan 28 20:15:39 2025

read: IOPS=478k, BW=1865MiB/s (1956MB/s)(54.6GiB/30001msec)

clat (nsec): min=508, max=325149k, avg=1739.62, stdev=213051.99

lat (nsec): min=527, max=325149k, avg=1759.86, stdev=213052.21

clat percentiles (nsec):

| 1.00th=[540], 5.00th=[548], 10.00th=[556], 20.00th=[564],
| 30.00th=[572], 40.00th=[580], 50.00th=[580], 60.00th=[596],
| 70.00th=[620], 80.00th=[660], 90.00th=[708], 95.00th=[812],
| 99.00th=[33536], 99.50th=[37120], 99.90th=[77312], 99.95th=[112128],
| 99.99th=[234496]

bw (MiB/s): min= 0, max= 2472, per=99.72%, avg=1859.98, stdev=853.78, samples=59

iops : min= 192, max=632920, avg=476154.75, stdev=218567.82, samples=59

lat (nsec) : 750=93.56%, 1000=3.51%

lat (usec) : 2=0.88%, 4=0.19%, 10=0.11%, 20=0.13%, 50=1.36%

lat (usec) : 100=0.19%, 250=0.05%, 500=0.01%, 750=0.01%, 1000=0.01%

lat (msec) : 2=0.01%, 4=0.01%, 10=0.01%, 20=0.01%, 50=0.01%

lat (msec) : 100=0.01%, 250=0.01%, 500=0.01%

cpu : usr=16.59%, sys=59.89%, ctx=23552, majf=0, minf=20

IO depths : 1=100.0%, 2=0.0%, 4=0.0%, 8=0.0%, 16=0.0%, 32=0.0%, >=64=0.0%

submit : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%

complete : 0=0.0%, 4=100.0%, 8=0.0%, 16=0.0%, 32=0.0%, 64=0.0%, >=64=0.0%

issued rwts: total=14325495,0,0,0 short=0,0,0,0 dropped=0,0,0,0

latency : target=0, window=0, percentile=100.00%, depth=1

Run status group 0 (all jobs):

READ: bw=1865MiB/s (1956MB/s), 1865MiB/s-1865MiB/s (1956MB/s-1956MB/s), io=54.6GiB
(58.7GB), run=30001-30001msec

Disk stats (read/write):

sdb: ios=526/0, merge=0/0, ticks=9785/0, in_queue=9786, util=18.87%


```
-----  
Prova de rendiment per al SWAP  
NAME TYPE SIZE USED PRIO  
/swapfile file 2G 524K -2  
/dev/sdb3 partition 2G 0B -3
```

Partició 1 (/mnt/particio1)

Prova d'escriptura:

Prova de rendiment per a la partició muntada a: /mnt/particio1

```
-----  
seq_write: (g=0): rw=write, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B,  
ioengine=psync, iodepth=1  
fio-3.28  
Starting 1 process  
seq_write: Laying out IO file (1 file / 1024MiB)  
Jobs: 1 (f=1): [W(1)][100.0%][eta 00m:00s]  
...  
write: IOPS=4867, BW=19.0MiB/s (19.9MB/s)(571MiB/30008msec);  
lat (nsec): min=1824, max=1584.5M, avg=204912.89, stdev=8634985.01  
lat (usec): 2=15.18%, 4=57.91%, 10=4.83%, 20=19.67%, 50=1.17%
```

Prova de lectura:

```
seq_read: (g=0): rw=read, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B,  
ioengine=psync, iodepth=1  
fio-3.28  
Starting 1 process  
seq_read: Laying out IO file (1 file / 1024MiB)  
Jobs: 1 (f=1): [R(1)][100.0%][r=30.5MiB/s][r=7808 IOPS][eta 00m:00s]  
...  
read: IOPS=7224, BW=28.2MiB/s (29.6MB/s)(847MiB/30003msec)  
lat (nsec): min=528, max=102863k, avg=137664.33, stdev=1542967.19  
lat (usec): 2=3.86%, 4=44.72%, 10=5.22%, 20=0.41%, 50=0.30%
```

Partició 2 (/mnt/particio2)

Aquest és l'output de les proves realitzades sobre la segona partició.

Prova d'escriptura:

Prova de rendiment per a la partició muntada a: /mnt/particio2

```
-----  
seq_write: (g=0): rw=write, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B,  
ioengine=psync, iodepth=1  
fio-3.28  
Starting 1 process  
seq_write: Laying out IO file (1 file / 1024MiB)
```

Jobs: 1 (f=1): [W(1)][100.0%][w=136KiB/s][w=34 IOPS][eta 00m:00s]

...

write: IOPS=5322, BW=20.8MiB/s (21.8MB/s)(627MiB/30157msec);

lat (usec): min=18, max=209009, avg=187.27, stdev=4474.12

lat (usec): 20=10.18%, 50=75.73%, 100=9.94%, 250=1.39%, 500=0.49%

Prova de lectura:

seq_read: (g=0): rw=read, bs=(R) 4096B-4096B, (W) 4096B-4096B, (T) 4096B-4096B,

ioengine=psync, iodepth=1

fio-3.28

Starting 1 process

seq_read: Laying out IO file (1 file / 1024MiB)

Jobs: 1 (f=1): [R(1)][100.0%][r=2372MiB/s][r=607k IOPS][eta 00m:00s]

...

read: IOPS=478k, BW=1865MiB/s (1956MB/s)(54.6GiB/30001msec)

lat (nsec): min=508, max=325149k, avg=1739.62, stdev=213051.99

lat (usec): 2=0.88%, 4=0.19%, 10=0.11%, 20=0.13%, 50=1.36%