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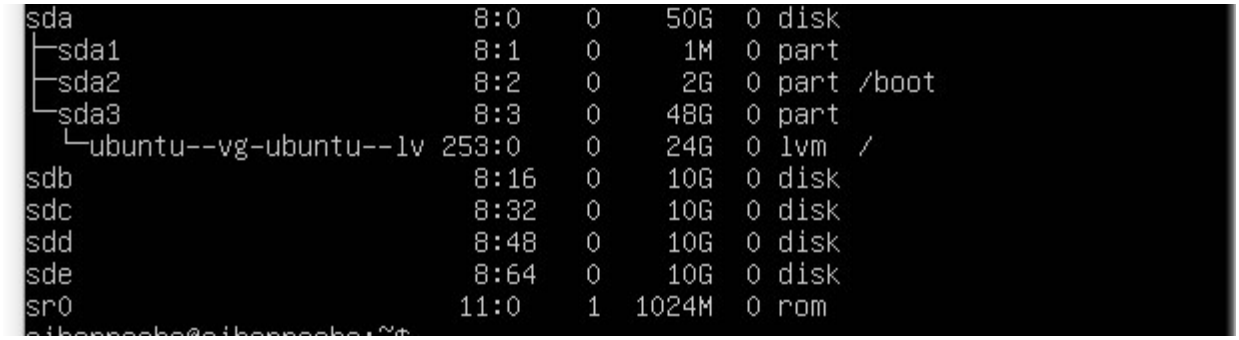
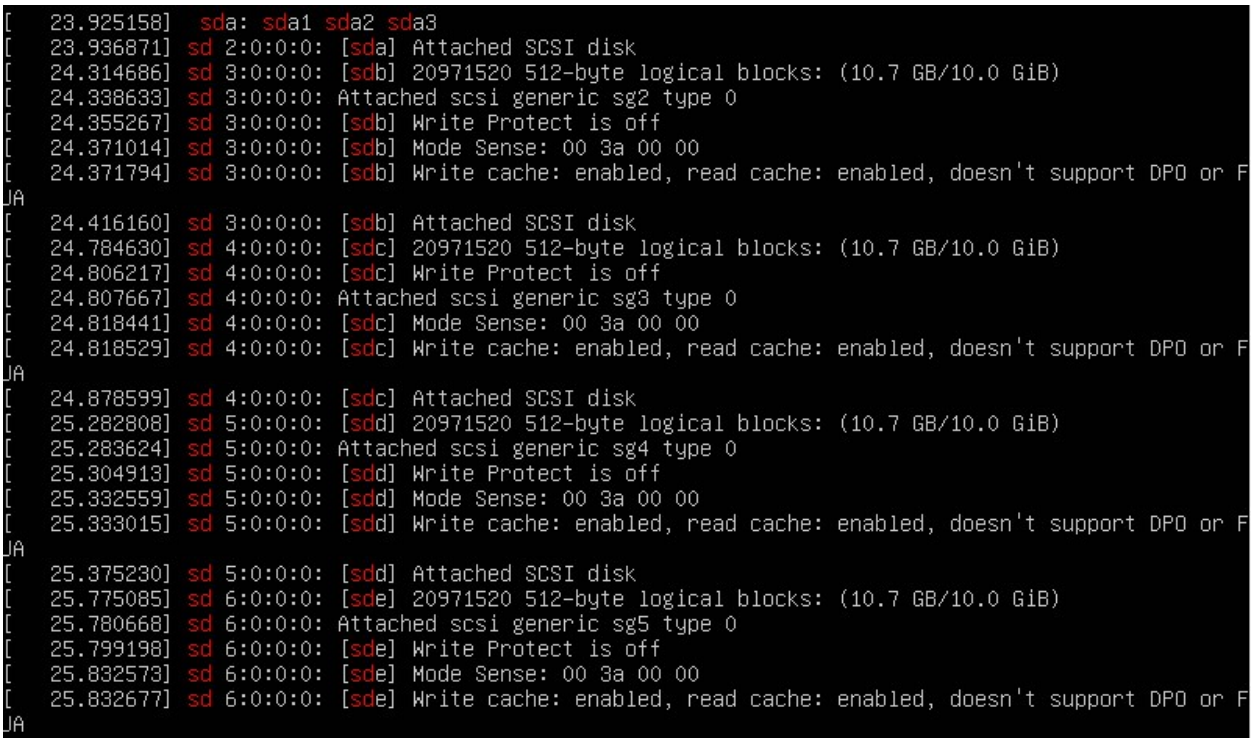
Ciclo Formativo:	ASIR
Módulo:	FH
Curso:	1

lsblk



dmesg | grep -i "sd"



sudo fdisk -l

```
Disk /dev/sdb: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/sdc: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/sdd: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes


Disk /dev/sde: 10 GiB, 10737418240 bytes, 20971520 sectors
Disk model: VBOX HARDDISK
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
```

Primer, hacemos particiones de cada unidad con el comando fdisk /dev/sd?

```
NAME                      MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0                       7:0    0  63,9M  1 loop /snap/core20/2182
loop1                       7:1    0  63,9M  1 loop /snap/core20/2264
loop2                       7:2    0 111,9M  1 loop /snap/lxd/24322
loop3                       7:3    0  53,3M  1 loop /snap/snapd/19457
sda                         8:0    0    50G  0 disk
├─sda1                      8:1    0     1M  0 part
├─sda2                      8:2    0     2G  0 part /boot
└─sda3                      8:3    0    48G  0 part
  └─ubuntu--vg-ubuntu--lv 253:0    0    24G  0 lvm  /
sdb                         8:16   0    10G  0 disk
sdc                         8:32   0    10G  0 disk
sdd                         8:48   0    10G  0 disk
sde                         8:64   0    10G  0 disk
sr0                        11:0    1  1024M  0 rom
cibernacho@cibernacho:~$ sudo fdisk /dev/sdb
[sudo] password for cibernacho:

Welcome to fdisk (util-linux 2.37.2).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Device does not contain a recognized partition table.
Created a new DOS disklabel with disk identifier 0x4b1f09d3.
```

```
Command (m for help): g

Created a new GPT disklabel (GUID: F3D9B85E-D13A-5742-9972-73CC94020CE7).
```

```
Command (m for help): n
Partition number (1-128, default 1):
First sector (2048-20971486, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-20971486, default 20971486):

Created a new partition 1 of type 'Linux filesystem' and of size 10 GiB.

Command (m for help): w
The partition table has been altered.
Syncing disks.
```

```
sda                         8:0    0    50G  0 disk
├─sda1                      8:1    0     1M  0 part
├─sda2                      8:2    0     2G  0 part /boot
└─sda3                      8:3    0    48G  0 part
  └─ubuntu--vg-ubuntu--lv 253:0    0    24G  0 lvm  /
sdb                         8:16   0    10G  0 disk
└─sdb1                      8:17   0    10G  0 part
sdc                         8:32   0    10G  0 disk
sdd                         8:48   0    10G  0 disk
sde                         8:64   0    10G  0 disk
sr0                        11:0    1  1024M  0 rom
cibernacho@cibernacho:~$
```

```
cibernacho@cibernacho:~$ lsblk
NAME                      MAJ:MIN RM   SIZE RO TYPE MOUNTPOINTS
loop0                       7:0    0  63,9M  1 loop /snap/core20/2182
loop1                       7:1    0  63,9M  1 loop /snap/core20/2264
loop2                       7:2    0 111,9M  1 loop /snap/lxd/24322
loop3                       7:3    0  53,3M  1 loop /snap/snapd/19457
sda                         8:0    0    50G  0 disk
├─sda1                      8:1    0     1M  0 part
├─sda2                      8:2    0     2G  0 part /boot
└─sda3                      8:3    0    48G  0 part
  └─ubuntu--vg-ubuntu--lv 253:0    0    24G  0 lvm  /
sdb                         8:16   0    10G  0 disk
└─sdb1                      8:17   0    10G  0 part
sdc                         8:32   0    10G  0 disk
└─sdc1                      8:33   0    10G  0 part
sdd                         8:48   0    10G  0 disk
└─sdd1                      8:49   0    10G  0 part
sde                         8:64   0    10G  0 disk
sr0                        11:0    1  1024M  0 rom
cibernacho@cibernacho:~$
```

mdadm –help

```
cibernacho@cibernacho:~$ mdadm --help
mdadm is used for building, managing, and monitoring
Linux md devices (aka RAID arrays)
Usage: mdadm --create device options...
             Create a new array from unused devices.
       mdadm --assemble device options...
             Assemble a previously created array.
       mdadm --build device options...
             Create or assemble an array without metadata.
       mdadm --manage device options...
             make changes to an existing array.
       mdadm --misc options... devices
             report on or modify various md related devices.
       mdadm --grow options device
             resize/reshape an active array
       mdadm --incremental device
             add/remove a device to/from an array as appropriate
       mdadm --monitor options...
             Monitor one or more array for significant changes.
       mdadm device options...
             Shorthand for --manage.
Any parameter that does not start with '-' is treated as a device name
or, for --examine-bitmap, a file name.
The first such name is often the name of an md device.  Subsequent
names are often names of component devices.

 For detailed help on the above major modes use --help after the mode
 e.g.
         mdadm --assemble --help
 For general help on options use
         mdadm --help-options
```

cat /proc/mdstat

```
cibernacho@cibernacho:~$ cat /proc/mdstat
Personalities : [linear] [multipath] [raid0] [raid1] [raid6] [raid5] [raid4] [raid10]
unused devices: <none>
cibernacho@cibernacho:~$ _
```

Sudo mdadm –-create /dev/md0 –-level=5 –-raid-devices=3 /dev/sdb1 /dev/sdc1 /dev/sdd1

```
cibernacho@cibernacho:~$ sudo mdadm --create /dev/md0 --level=5 --raid-devices=3 /dev/sdb1 /dev/sdc1 /dev/sdd1
[sudo] password for cibernacho:
mdadm: Defaulting to version 1.2 metadata
mdadm: array /dev/md0 started.
```

cat /proc/mdstat

```
cibernacho@cibernacho:~$ cat /proc/mdstat
Personalities : [linear] [multipath] [raid0] [raid1] [raid6] [raid5] [raid4] [raid10]
md0 : active raid5 sdd1[3] sdc1[1] sdb1[0]
      20950016 blocks super 1.2 level 5, 512k chunk, algorithm 2 [3/2] [UU_]
      [========>............]  recovery = 44.0% (4612332/10475008) finish=3.0min speed=31932K/sec

unused devices: <none>
```

Sudo mkfs.ext4 /dev/md0

```
cibernacho@cibernacho:~$ sudo mkfs.ext4 /dev/md0
mke2fs 1.46.5 (30-Dec-2021)
Creating filesystem with 5237504 4k blocks and 1310720 inodes
Filesystem UUID: 35c5480b-300c-4b14-8e57-1da443083369
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done
```

Sudo mkdir /RAID5

Sudo blkid /dev/md0

```
cibernacho@cibernacho:~$ sudo mkdir /RAID5
cibernacho@cibernacho:~$ sudo blkid /dev/md0
/dev/md0: UUID="35c5480b-300c-4b14-8e57-1da443083369" BLOCK_SIZE="4096" TYPE="ext4
```

Sudo vim /etc/fstab

```
cibernacho@cibernacho:~$ sudo vim /etc/fstab
```

```
#
# <file system> <mount point>   <type>  <options>       <dump>  <pass>
# / was on /dev/ubuntu-vg/ubuntu-lv during curtin installation
/dev/disk/by-id/dm-uuid-LVM-yuaueYHaJyYEd39pesKJ4NADaEiVw32AUPehmubovpEbuDY6QYBeQ9CKRYQ6wuo
 1
# /boot was on /dev/sda2 during curtin installation
/dev/disk/by-uuid/65ed2c5f-1e32-4476-b414-7f83e22152d5 /boot ext4 defaults 0 1
/swap.img       none    swap    sw      0       0
UUID=35c5480b-300c-4b14-8e57-1da443083369 /RAID5 ext4 defaults 0 2
~
~
```

```
cibernacho@cibernacho:~$ sudo mount -a
cibernacho@cibernacho:~$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              423M  1,2M  422M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv   24G  7,8G   15G  35% /
tmpfs                              2,1G     0  2,1G   0% /dev/shm
tmpfs                              5,0M     0  5,0M   0% /run/lock
/dev/sda2                          2,0G  251M  1,6G  14% /boot
tmpfs                              423M  4,0K  423M   1% /run/user/1000
/dev/md0                            20G   24K   19G   1% /RAID5
cibernacho@cibernacho:~$
```

Una vez hecho el reboot, compruebo que el RAID queda montado al incidió del sistema y puede acceder a los archivos sin problemas

```
cibernacho@cibernacho:~$ reboot
```

Pongo a prueba el sistema simulando fallos en los dispositivos que lo componen:

sudo mdadm /dev/md127 - -fail /dev/sdc1

```
cibernacho@cibernacho:~$ sudo mdadm /dev/md127 --fail /dev/sdc1
mdadm: set /dev/sdc1 faulty in /dev/md127
```

Compruebo el estado del RAID consultando el archivo:

cat /proc/mdstat

```
cibernacho@cibernacho:~$ cat /proc/mdstat
Personalities : [raid6] [raid5] [raid4] [linear] [multipath] [raid0] [raid1] [raid10]
md127 : active raid5 sdd1[3] sdb1[0] sdc1[1]
      20950016 blocks super 1.2 level 5, 512k chunk, algorithm 2 [3/3] [UUU]

unused devices: <none>
```

También con el comando df –h puedo verificar los sistemas de archivos montados en el sistema y sus respecticos puntos de montaje.

df -h

```
cibernacho@cibernacho:~$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              423M  2,6M  421M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv   24G  8,1G   15G  37% /
tmpfs                              2,1G     0  2,1G   0% /dev/shm
tmpfs                              5,0M     0  5,0M   0% /run/lock
/dev/sda2                          2,0G  251M  1,6G  14% /boot
/dev/md127                          20G   24K   19G   1% /RAID5
tmpfs                              423M  4,0K  423M   1% /run/user/1000
```

Ahora añado el cuarto disco para comprobar cómo el RAID5 se reconstruye automáticamente:

Sudo mdadm /dev/md127 - - add /dev/sde1

```
cibernacho@cibernacho:~$ sudo mdadm /dev/md127 --add /dev/sde1
mdadm: added /dev/sde1
```

```
sdb                       8:16   0    10G  0 disk
└─sdb1                    8:17   0    10G  0 part
  └─md127                 9:127  0    20G  0 raid5 /RAID5
sdc                       8:32   0    10G  0 disk
└─sdc1                    8:33   0    10G  0 part
  └─md127                 9:127  0    20G  0 raid5 /RAID5
sdd                       8:48   0    10G  0 disk
└─sdd1                    8:49   0    10G  0 part
  └─md127                 9:127  0    20G  0 raid5 /RAID5
sde                       8:64   0    10G  0 disk
└─sde1                    8:65   0    10G  0 part
  └─md127                 9:127  0    20G  0 raid5 /RAID5
sr0                      11:0    1  1024M  0 rom
```

En la siguiente parte, crearemos un directorio compartido con el programa samba:

```
cibernacho@cibernacho:~$ sudo service smbd status
● smbd.service - Samba SMB Daemon
     Loaded: loaded (/lib/systemd/system/smbd.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2024-04-11 12:46:14 UTC; 49min ago
       Docs: man:smbd(8)
             man:samba(7)
             man:smb.conf(5)
    Process: 927 ExecStartPre=/usr/share/samba/update-apparmor-samba-profile (code=exited, status=0/SUCCESS)
   Main PID: 939 (smbd)
     Status: "smbd: ready to serve connections..."
      Tasks: 4 (limit: 4935)
     Memory: 18.1M
        CPU: 1.545s
     CGroup: /system.slice/smbd.service
             ├─939 /usr/sbin/smbd --foreground --no-process-group
             ├─975 /usr/sbin/smbd --foreground --no-process-group
             ├─976 /usr/sbin/smbd --foreground --no-process-group
             └─985 /usr/lib/x86_64-linux-gnu/samba/samba-bgqd --ready-signal-fd=45 --parent-watch-fd=11 --debug>

abr 11 12:46:12 cibernacho systemd[1]: Starting Samba SMB Daemon...
abr 11 12:46:14 cibernacho systemd[1]: Started Samba SMB Daemon.
lines 1-20/20 (END)
```

Seguidamente hago una copia de seguridad del archivo de configuración creado con samba:

```
cibernacho@cibernacho:~$ sudo cp /etc/samba/smb.conf /etc/samba/smb_bk.conf
cibernacho@cibernacho:~$
```

Edito el archivo de configuración para compartir los archivos a través de nano:

```
cibernacho@cibernacho:~$ sudo nano /etc/samba/smb.conf
```

```
[raid_samba]

   comment = Samba en Ubuntu-server
   path = /RAID5
   read only = no
   browseable = yes
```

Una vez modificado el archivo de configuración, creo un nuevo usuario en mi Ubuntu-server para acceder al recurso compartido

```
cibernacho@cibernacho:/home$ ls
cibernacho  nacho
```

Sin embargo, samba no acepta la contraseña de la cuenta de usuario ya integrada en el sistema, por tanto configuro otra para el servicio y añadir al usuario:

```
cibernacho@cibernacho:~$ sudo smbpasswd -a nacho
New SMB password:
Retype new SMB password:
```

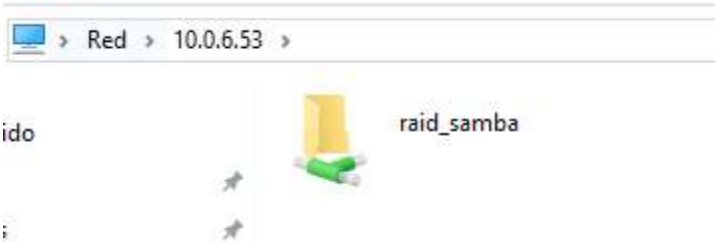
```
Added user nacho.
```

Reinicio el programa Samba

```
cibernacho@cibernacho:~$ sudo service smbd restart
```

Me conecto a través del explorador de archivos de Windows y con la ip de la máquina virtual de Ubuntu-server donde cree la carpeta compartida:

```
inet 10.0.6.53/24
```



Le cambio los permisos para poder modificar:

```
cibernacho@cibernacho:~$ sudo chmod -R 777 /RAID5/
```

Finalmente, se puede observar que he creado una carpeta dentro de la carpeta compartida.