

# Practicas 1-4

ADMINISTRACION DE SISTEMAS Y REDES

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# Practica 1

## 1.2.- Systemd

**Entregar:** Anota el PID del proceso systemd. Anota el runlevel en el que está el sistema, antes y después de hacer `systemctl isolate` (comando `who -a`). ¿Qué diferencias hay en el arranque cuando el runlevel por defecto es 1? ¿Qué ocurre al hacer `systemctl isolate runlevel6? target?`

Ejecutamos el comando `ps ax` y mostramos la lista de procesos. El PID del proceso "systemd" se asocia al 1.

```
U02644760~ $ >ps ax
PID TTY          STAT       TIME COMMAND
  1 ?            Ss         0:01 /usr/lib/systemd/systemd --switched-root --system --deserialize 17
  2 ?            S           0:00 [kthreadd]
  3 ?            I<          0:00 [rcu_gp]
  4 ?            I<          0:00 [rcu_par_gp]
  5 ?            I           0:00 [kworker/0:0-ata_sff]
  6 ?            I<          0:00 [kworker/0:0H-kblockd]
  8 ?            I<          0:00 [mm_percpu_wq]
  9 ?            S           0:00 [ksoftirqd/0]
 10 ?            R           0:00 [rcu_sched]
 11 ?            S           0:00 [migration/0]
 12 ?            S           0:00 [watchdog/0]
 13 ?            S           0:00 [cpuhp/0]
 15 ?            S           0:00 [kdevtmpfs]
 16 ?            I<          0:00 [netns]
 17 ?            S           0:00 [kauditd]
 18 ?            S           0:00 [khungtaskd]
 19 ?            S           0:00 [oom_reaper]
 20 ?            I<          0:00 [writeback]
 21 ?            S           0:00 [kcompactd0]
 22 ?            SN          0:00 [ksmd]
 23 ?            SN          0:00 [khugepaged]
 24 ?            I<          0:00 [crypto]
 25 ?            I<          0:00 [kintegrityd]
 26 ?            I<          0:00 [kblockd]
 27 ?            I<          0:00 [tpm_dev_wq]
 28 ?            I<          0:00 [md]
 29 ?            I<          0:00 [edac-poller]
 30 ?            S           0:00 [watchdogd]
 39 ?            S           0:00 [kswapd0]
 58 ?            I           0:00 [kworker/u2:1-events_unbound]
 90 ?            I<          0:00 [kthrotld]
 91 ?            I<          0:00 [acpi_thermal_pm]
 92 ?            I<          0:00 [kmpath_rdacd]
 93 ?            I<          0:00 [kaluad]
 94 ?            I<          0:00 [ip6_addrconf]
```

Posteriormente ejecutamos la orden `systemctl get-default` para comprobar que el sistema esta en modo multi usuario.

```
1583 ?            I           0:00 [kworker/0:1-ata_sff]
U02644760~ $ >systemctl get-default
multi-user.target
U02644760~ $ >
```

Y aplicamos el comando `who -a` para obtener el run-level actual del sistema 3.

```
U02644760~ $ >who -a
          system boot    2020-02-11 18:08
          run-level 3    2020-02-11 18:08
root      + tty1         2020-02-11 18:09      .      895
U02644760~ $ >
```

Aplicamos el comando `systemctl isolate runlevel1.target` para cambiar a modo single-user, y aplicamos el comando `who -a` para ver que efectivamente el runlevel es 1.

```
U02644760~ $ >who -a
          system boot    2020-02-11 18:08
          run-level 1    2020-02-11 18:11
          tty1           1970-01-01 01:00
          last=3
          895 id=tty1   term=1 exit=0
U02644760~ $ >_
```

### ¿Qué ocurre al hacer `systemctl isolate runlevel6? target?`

La máquina se reinicia

## 1.4.-Syslog

Ejecutamos el comando `"last"` para ver los inicios recientes de sesión y las caídas del sistema (reboot)

```
Feb  5 15:46:24 localhost systemd[1]: Started Getty on tty2.
Feb  5 15:46:42 localhost systemd[1]: Started Session 5 of user root.
Feb  5 15:46:42 localhost systemd-logind[1756]: New session 5 of user root.
U02644760~ $ >_
```

**Entregar:** ¿Cuál es el motivo de la última caída del sistema, de acuerdo con la orden `last`?

Ahora como indica la practica apagamos la maquina de forma anómala desde VirtualBox y posterior a su inicio ejecutamos el comando `"last"` nuevamente.

```

02644760~ $ >last
root      tty1                Tue Feb 11 18:17   still logged in
reboot    system boot      4.18.0-147.el8.x Tue Feb 11 18:17   still running
root      tty3                Tue Feb 11 18:16 - crash (00:01)
root      tty3                Tue Feb 11 18:15 - 18:15 (00:00)
root      tty1                Tue Feb 11 18:14 - crash (00:02)
reboot    system boot      4.18.0-147.el8.x Tue Feb 11 18:12   still running
root      tty1                Tue Feb 11 18:09 - 18:11 (00:02)
reboot    system boot      4.18.0-147.el8.x Tue Feb 11 18:08 - 18:12 (00:03)
root      tty2                Wed Feb  5 15:56 - crash (6+02:11)
root      tty1                Wed Feb  5 15:53 - crash (6+02:15)
reboot    system boot      4.18.0-147.el8.x Wed Feb  5 15:51 - 18:12 (6+02:21)
root      tty2                Wed Feb  5 15:46 - 15:50 (00:03)
root      tty1                Wed Feb  5 15:45 - 15:50 (00:04)
root      tty1                Wed Feb  5 15:44 - 15:45 (00:00)
reboot    system boot      4.18.0-147.el8.x Wed Feb  5 15:44 - 15:50 (00:05)
root      tty1                Wed Feb  5 15:42 - 15:44 (00:02)
root      tty1                Wed Feb  5 15:31 - 15:41 (00:10)
reboot    system boot      4.18.0-147.el8.x Wed Feb  5 15:31 - 15:44 (00:13)
root      tty1                Wed Jan 29 18:05 - 18:28 (00:23)
reboot    system boot      4.18.0-147.el8.x Wed Jan 29 18:05 - 15:44 (6+21:39)

```

Al ejecutar el comando "last" vemos que la causa del apagado es un "CRASH".

## 1.5.-Ejecucion periódica de comandos

**Entregar:** En el directorio /etc/cron.daily hay un script encargado de borrar los ficheros con los logs más antiguos y de rotar cada día los ficheros de log. ¿Cuál es el nombre de este script?

Accedemos al repositorio /etc/ y mostramos todas las posibles opciones de cron con /etc/cron\*

```

02644760~ $ >ls -ld /etc/cron*
cron.d/      cron.daily/  cron.deny    cron.hourly/ cron.monthly/ crontab      cron.weekly/

```

Posteriormente accedemos al cron. daily y vemos que contiene un fichero LOGROTATE, este fichero como podemos comprobar con el cat posterior es el encargado de borrar los ficheros con los logs más antiguos y de rotar cada día los ficheros de log

```
0264476@ ~ $ >ls -d /etc/cron.daily/logrotate
etc/cron.daily/logrotate
0264476@ ~ $ >ls -d /etc/cron*
etc/cron.d      /etc/cron.deny      /etc/cron.monthly  /etc/cron.weekly
etc/cron.daily  /etc/cron.hourly    /etc/crontab
0264476@ ~ $ >cd /etc/cr
ron.d/
ron.daily/      cron.deny      cron.monthly/    cron.weekly/    crypttab
ron.daily/      cron.hourly/   crontab          crypto-policies/
0264476@ ~ $ >cd /etc/cron
ron.d/          cron.daily/    cron.deny      cron.hourly/    cron.monthly/    crontab      cron.weekly/
0264476@ ~ $ >cd /etc/cron.daily/
0264476@cron.daily $ >ls -la
total 16
-rwxr-xr-x. 2 root root 23 Jan 29 18:00 .
-rwxr-xr-x. 78 root root 8192 Feb  5 15:51 ..
-rwxr-xr-x. 1 root root 189 Jan  4 2018 logrotate
0264476@cron.daily $ >cat logrotate
#!/bin/sh

/usr/sbin/logrotate /etc/logrotate.conf
EXITVALUE=$?
if [ $EXITVALUE != 0 ]; then
    /usr/bin/logger -t logrotate "ALERT exited abnormally with [$EXITVALUE]"
fi
exit $EXITVALUE
0264476@cron.daily $ >_
```

## 1.6.- Login desde red

**Entregar:** Haz ssh localhost desde la terminal a la que has accedido con ALT-F2. Haz *ps ax* y busca los procesos *sshd*. ¿En qué terminal figura el segundo proceso *sshd*?

Hacemos el ssh localhost para conectarnos con ssh y hacer una nueva sesión

```
0264476@ ~ $ >ssh localhost
The authenticity of host 'localhost (::1)' can't be established.
ECDSA key fingerprint is SHA256:m0gCAxka1Dndw3WQRBwJ9nzRW119DTgw4qD8eZUEek.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'localhost' (ECDSA) to the list of known hosts.
root@localhost's password:
Last login: Tue Feb 11 18:17:49 2020
```

Hacemos "ps ax" en una nueva terminal para ver que existe el proceso sshd.

```

545 ?      I<      0:00 [xfs-recv/dm-]
546 ?      I<      0:00 [xfs-log/dm-0]
547 ?      I<      0:00 [xfs-eofblocks/d]
548 ?      S       0:00 [xfsaild/dm-0]
642 ?      Ss      0:00 /usr/lib/systemd/systemd-journald
673 ?      Ss      0:00 /usr/lib/systemd/systemd-udev
784 ?      I       0:00 [kworker/0:5-memcg_kmem_cache]
790 ?      S       0:00 [jbd2/sda1-8]
791 ?      I<      0:00 [ext4-rsv-conver]
814 ?      S<sl    0:00 /sbin/auditd
837 ?      Ssl     0:00 /usr/lib/polkit-1/polkitd --no-debug
838 ?      Ssl     0:00 /usr/bin/dbus-daemon --system --address=systemd: --nofork --nopidfile
839 ?      Ss      0:00 /usr/sbin/sss -i --logger=files
840 ?      Ssl     0:01 /sbin/rngd -f
851 ?      Ssl     0:01 /usr/libexec/platform-python -s /usr/sbin/firewalld --nofork --nopid
852 ?      S       0:00 /usr/libexec/sss/sss_be --domain implicit_files --uid 0 --gid 0 --log
853 ?      S       0:00 /usr/libexec/sss/sss_nss --uid 0 --gid 0 --logger=files
854 ?      Ss      0:00 /usr/lib/systemd/systemd-logind
864 ?      Ssl     0:00 /usr/sbin/NetworkManager --no-daemon
872 ?      Ssl     0:00 /usr/libexec/platform-python -Es /usr/sbin/tuned -l -P
873 ?      Ss      0:00 /usr/sbin/sshd -D -oCiphers=aes256-gcm@openssh.com,chacha20-poly1305@op
889 ?      Ss      0:00 /usr/sbin/crond -n
896 ?      Ss      0:00 login -- root
898 ?      I       0:00 [kworker/0:6-events]
1268 ?     Ssl     0:00 /usr/sbin/rsyslogd -n
1553 ?     Ss      0:00 /usr/lib/systemd/systemd --user
1558 ?     S       0:00 (sd-pam)
1564 tty1   Ss      0:00 -bash
1591 tty1   S+      0:00 ssh localhost
1592 ?     Ss      0:00 sshd: root [priv]
1595 ?     Ss      0:00 /usr/libexec/sss/sss_kcm uid 0 gid 0 logger=files
1599 ?     S       0:00 sshd: root@pts/0
1600 pts/0  Ss+      0:00 -bash
1621 ?     Ss      0:00 login -- root
1626 tty2   Ss      0:00 -bash
1648 tty2   R+      0:00 ps ax
j0264476@ ~ $ >_

```

El segundo proceso ssh localhost se ha creado en el mismo terminal en el que se ha ejecutado el proceso, en el terminal 2.

## 1.7.- Sistemas de ficheros en red

Instalamos samba

```

j0264476@ ~ $ >yum install samba
CentOS-8 - AppStream          11 kB/s | 4.3 kB      00:00
CentOS-8 - AppStream          3.7 MB/s | 6.4 MB     00:01

```

Mostramos el man de samba

```

SAMBА(?)                               Miscellanea                               SAMBА(?)
NAME
    samba - A Windows AD and SMB/CIFS fileserver for UNIX
SYNOPSIS
    samba
DESCRIPTION
    The Samba software suite is a collection of programs that implements the Server Message
    Block (commonly abbreviated as SMB) protocol for UNIX systems and provides Active
    Directory services. The first version of the SMB protocol is sometimes also referred to as
    the Common Internet File System (CIFS). For a more thorough description, see
    http://www.ubiqx.org/cifs/. Samba also implements the NetBIOS protocol in nmbd.

    samba(8)
        The samba daemon provides the Active Directory services and file and print services to
        SMB clients. The configuration file for this daemon is described in smb.conf(5).

    smbd(8)
        The smbd daemon provides the file and print services to SMB clients. The configuration
        file for this daemon is described in smb.conf(5).

    nmbd(8)
        The nmbd daemon provides NetBIOS nameservice and browsing support. The configuration
        file for this daemon is described in smb.conf(5).

    winbindd(8)
        winbindd is a daemon that is used for integrating authentication and the user database
        into unix.

    smbclient(1)
        The smbclient program implements a simple ftp-like client. This is useful for
        accessing SMB shares on other compatible SMB servers, and can also be used to allow a
        UNIX box to print to a printer attached to any SMB server.

Manual page samba(?) line 1 (press h for help or q to quit)

```

## 1.8.- Correo electrónico

**Entregar:** Consulta la ayuda de mail. ¿Cuál es el comando para salir de la orden mail?



Para salir de la orden mail hay que ejecutar el comando q.

```
MAILX(1)                                User Commands                                MAILX(1)

NAME
    mailx - send and receive Internet mail

SYNOPSIS
    mailx [-BDdEFinto~] [-s subject] [-a attachment] [-c cc-addr] [-b bcc-addr] [-r from-addr] [-h hops] [-A account] [-S variable[=value]] to-addr . . .
    mailx [-BDdEHiInNRv~] [-T name] [-A account] [-S variable[=value]] -f [name]
    mailx [-BDdEiInNRv~] [-A account] [-S variable[=value]] [-u user]

DESCRIPTION
    Mailx is an intelligent mail processing system, which has a command syntax reminiscent of ed(1) with lines replaced by messages. It is based on Berkeley Mail 8.1, is intended to provide the functionality of the POSIX mailx command, and offers extensions for MIME, IMAP, POP3, SMTP, and S/MIME. Mailx provides enhanced features for interactive use, such as caching and disconnected operation for IMAP, message threading, scoring, and filtering. It is also usable as a mail batch language, both for sending and receiving mail.

    The following options are accepted:

    -A name
        Executes an account command (see below) for name after the startup files have been read.

    -a file
        Attach the given file to the message.

    -B
        Make standard input and standard output line-buffered.

    -b address
        Send blind carbon copies to list. List should be a comma-separated list of names.

    -c address
        Send carbon copies to list of users.

Manual page mail(1) line 1 (press h for help or q to quit)
```

## 1.9.- servicios de impresión

Busca CUPS en Wikipedia.

### Common Unix Printing System

**Common Unix Printing System** (Sistema de impresión común de Unix, abreviado **CUPS**) es un sistema de impresión modular para sistemas operativos de tipo Unix que permite que un computador actúe como **servidor de impresión**. Un computador que ejecuta CUPS actúa como un **servidor** que puede aceptar tareas de impresión desde otros computadores **clientes**, los procesa y los envía a la impresora apropiada.

CUPS está compuesto por una **cola de impresión** con su **planificador**, un sistema de filtros que convierte datos para imprimir hacia formatos que la impresora conozca, y un sistema de soporte que envía los datos al dispositivo de impresión. CUPS utiliza el protocolo IPP (Internet Printing Protocol) como base para el manejo de tareas de impresión y de **colas de impresión**. También provee los comandos tradicionales de línea de comandos de impresión de los sistemas Unix, junto a un soporte limitado de operaciones bajo el protocolo **server message block** (SMB). Los **controladores de dispositivos de impresión** que CUPS provee pueden ser configurados utilizando archivos de texto con formato **PostScript Printer Description** (PPD) de Adobe Systems. Existen varias interfaces de usuario para diferentes plataformas para configurar CUPS; cuenta también con una interfaz como aplicación Web. CUPS es **software libre** y se distribuye bajo licencia GNU General Public License y GNU Lesser General Public License, versión 2.

Índice [ocultar]
1 Historia
2 Visión general
2.1 Planificador
2.2 Sistema de filtrado
2.2.1 Base de datos MIME
2.2.2 Procesos de filtrados
2.3 Backends
3 Compatibilidad
4 Herramientas de Interfaz de Usuario
4.1 Interfaz web para administrar CUPS
4.2 GNOME
4.3 KDE
5 Véase también
6 Referencias

Common Unix Printing System	
<span>www.cups.org</span>	
	
[[Archivo:CUPS 1.4.6 admin rus.png 245px CUPS Logo]]	
<b>Tipo de programa</b>	Servidor de impresión software libre
<b>Desarrollador</b>	Michael Sweet Apple
<b>Autor</b>	Michael Sweet ( <b>Easy Software Products</b> )
<b>Lanzamiento</b>	9 de junio de 1999
<b>Última versión estable</b>	2.3.1 ( <span>info</span> ) 13 de diciembre de 2019 (1 mes y 29 días)
<b>Género</b>	Servidor de impresión
<b>Programado en</b>	C C++
<b>Sistema operativo</b>	tipo-Unix
<b>Licencia</b>	GNU GPL GNU LGPL

Entra en [www.cups.org](http://www.cups.org) para obtener más información.

CUPS.org Blog Bugs Help Lists Software Search

## CUPS

CUPS is the standards-based, open source printing system developed by [Apple Inc.](#) for macOS® and other UNIX®-like operating systems. CUPS uses the Internet Printing Protocol (IPP) to support printing to local and network printers.

[Download CUPS](#)
[Github Repository](#)
[License](#)
[Reporting Bugs](#)
[Frequently Asked Questions](#)

### CUPS 2.3.1

13 Dec 20

CUPS 2.3.1 is a general bug fix release, including a fix for CVE-2019-2228. A detailed list of changes can be found in the change log included in the download.

Enjoy!

[Download CUPS 2.3.1](#)

### CUPS 2.2.13

13 Dec 20

CUPS 2.2.13 is the last general bug fix release in the 2.2.x series and includes a fix for CVE-2019-2228. A detailed list of changes can be found in the change log included in the download.

Enjoy!

[Download CUPS 2.2.13](#)

# Opcionales Practica 1

## 2) Documentación y ayuda:

### 1.1) Ejecuta el comando *mandb*

Instalamos el man-pages

```
root@N 00264476 ~]# yum install man-pages
Last metadata expiration check: 0:00:37 ago on Sun 23 Feb 2020 01:07:30 PM EST.
Dependencies resolved.
=====
Package                        Architecture      Version           Repository        Size
=====
Installing:
man-pages                      x86_64            4.15-6.el8        BaseOS            5.9 M
Installing weak dependencies:
man-pages-overrides           noarch            8.1.0-2.el8        AppStream         17 k
=====
Transaction Summary
=====
Install 2 Packages

Total download size: 6.0 M
Installed size: 5.5 M
Is this ok [y/N]: y
Downloading Packages:
(1/2): man-pages-overrides-8.1.0-2.el8.noarch.rpm    77 kB/s | 17 kB    00:00
(2/2): man-pages-4.15-6.el8.x86_64.rpm             2.9 MB/s | 5.9 MB  00:02
-----
Total                                           2.0 MB/s | 6.0 MB  00:02
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                : man-pages-overrides-8.1.0-2.el8.noarch            1/1
  Installing               : man-pages-overrides-8.1.0-2.el8.noarch            1/2
  Installing               : man-pages-4.15-6.el8.x86_64.rpm                  1/2
```

Ejecutamos el comando mandb

```

root@U0264476~1$ mandb
Purging old database entries in /usr/share/man/overrides...
Processing manual pages under /usr/share/man/overrides...
Purging old database entries in /usr/share/man...
Processing manual pages under /usr/share/man...
Purging old database entries in /usr/share/man/ru...
Processing manual pages under /usr/share/man/ru...
Purging old database entries in /usr/share/man/fr...
Processing manual pages under /usr/share/man/fr...
Purging old database entries in /usr/share/man/ja...
Processing manual pages under /usr/share/man/ja...
Purging old database entries in /usr/share/man/ko...
Processing manual pages under /usr/share/man/ko...
Purging old database entries in /usr/share/man/pl...
Processing manual pages under /usr/share/man/pl...
Purging old database entries in /usr/share/man/sk...
Processing manual pages under /usr/share/man/sk...
Purging old database entries in /usr/share/man/cs...
Processing manual pages under /usr/share/man/cs...
Purging old database entries in /usr/share/man/da...
Processing manual pages under /usr/share/man/da...
Purging old database entries in /usr/share/man/de...
Processing manual pages under /usr/share/man/de...
Purging old database entries in /usr/share/man/hu...
Processing manual pages under /usr/share/man/hu...
Purging old database entries in /usr/share/man/id...
Processing manual pages under /usr/share/man/id...
Purging old database entries in /usr/share/man/it...
Processing manual pages under /usr/share/man/it...
Purging old database entries in /usr/share/man/pt_BR...
Processing manual pages under /usr/share/man/pt_BR...

```

## 1.2) Usa las órdenes *man* e *info* para conocer el significado de los términos *whatis* y *apropos* y haz una lista de las órdenes del sistema que hacen referencia al término *reboot*. Escribe el comando que necesitas para mostrar cada una de las páginas de manual que aparece en esa lista.

Primero ejecutamos el comando `man whatis` y sale la siguiente pantalla. Obtenemos que `What` imprime descripciones de páginas de manual.

```

what(1)                                manual page utils                                what(1)

NAME
    whatis - display one-line manual page descriptions

SYNOPSIS
    whatis [-dlv?U] [-r|-w] [-s list] [-m system,...] [-M path] [-L locale] [-C file] name ...

DESCRIPTION
    Each manual page has a short description available within it. what searches the manual page names and displays the manual page descriptions of any name matched.

    name may contain wildcards (-w) or be a regular expression (-r). Using these options, it may be necessary to quote the name or escape (\) the special characters to stop the shell from interpreting them.

    index databases are used during the search, and are updated by the mandb program. Depending on your installation, this may be run by a periodic cron job, or may need to be run manually after new manual pages have been installed. To produce an old style text what database from the relative index database, issue the command:

    what -M manpath -w '*' | sort > manpath/what

    where manpath is a manual page hierarchy such as /usr/man.

OPTIONS
    -d, --debug
        Print debugging information.

    -v, --verbose
        Print verbose warning messages.

    -r, --regex
        Interpret each name as a regular expression. If a name matches any part of a page name, a match will be made. This option causes what to be somewhat slower due to the nature of database searches.

    -w, --wildcard
        Interpret each name as a pattern containing shell style wildcards. For a match to be made, an expanded name must match the entire page name. This option causes what to be somewhat slower due to the nature of database searches.

    -l, --long
        Do not trim output to the terminal width. Normally, output will be truncated to the terminal width to avoid ugly results from poorly-written NAME sections.

    -s list, --sections list, --section list
        Search only the given manual sections. list is a colon- or comma-separated list of sections. If an entry in list is a simple section, for example "3", then the displayed list of descriptions will include pages in sections "3", "3perl", "3k", and so on; while if an entry in list has an extension, for example "3perl", then the

Manual page what(1) line 1 (press h for help or q to quit)

```

Ahora ejecutamos el comando `man apropos`. Descubrimos que `Apropos` busca entre las páginas del manual y las descripciones.

```

Manual page apropos(1)
NAME
    apropos - search the manual page names and descriptions
SYNOPSIS
    apropos [-d] [-e] [-w] [-r] [-s list] [-m system[,...]] [-M path] [-L locale] [-C file] keyword ...
DESCRIPTION
    Each manual page has a short description available within it. apropos searches the descriptions for instances of keyword.
    keyword is usually a regular expression, as if (-r) was used, or may contain wildcards (-w), or match the exact keyword (-e). Using these options, it may be necessary to quote the keyword or escape (\) the special characters to stop the shell from interpreting them.
    The standard matching rules allow matches to be made against the page name and word boundaries in the description.
    The database searched by apropos is updated by the mandb program. Depending on your installation, this may be run by a periodic cron job, or may need to be run manually after new manual pages have been installed.
OPTIONS
    -d, --debug
        Print debugging information.
    -v, --verbose
        Print verbose warning messages.
    -r, --regex
        Interpret each keyword as a regular expression. This is the default behaviour. Each keyword will be matched against the page names and the descriptions independently. It can match any part of either. The match is not limited to word boundaries.
    -w, --wildcard
        Interpret each keyword as a pattern containing shell style wildcards. Each keyword will be matched against the page names and the descriptions independently. If --exact is also used, a match will only be found if an expanded keyword matches an entire description or page name. Otherwise the keyword is also allowed to match on word boundaries in the description.
    -e, --exact
        Each keyword will be exactly matched against the page names and the descriptions.
    -a, --and
        Only display items that match all the supplied keywords. The default is to display items that match any keyword.
    -l, --long
        Manual page apropos(1) line 4 (press h for help or q to quit)

```

Ahora ejecutamos el comando `info whatis` y obtenemos prácticamente el mismo resultado

```

WHATIS(1)                                Manual pager utils                                WHATIS(1)

NAME
  whatis - display one-line manual page descriptions

SYNOPSIS
  whatis [-dlv?UI] [-rl-w] [-s list] [-m system[,...]] [-M path] [-L locale] [-C file] name ...

DESCRIPTION
  Each manual page has a short description available within it.  whatis searches the manual page names and displays the
  manual page descriptions of any name matched.

  name may contain wildcards (-w) or be a regular expression (-r).  Using these options, it may be necessary to quote
  the name or escape (\) the special characters to stop the shell from interpreting them.

  index databases are used during the search, and are updated by the mandb program.  Depending on your installation,
  this may be run by a periodic cron job, or may need to be run manually after new manual pages have been installed.
  To produce an old style text whatis database from the relative index database, issue the command:

  whatis -M manpath -w '*' | sort > manpath/whatis

  where manpath is a manual page hierarchy such as /usr/man.

OPTIONS
  -d, --debug
      Print debugging information.

  -v, --verbose
      Print verbose warning messages.

  -r, --regex
      Interpret each name as a regular expression.  If a name matches any part of a page name, a match will be made.
      This option causes whatis to be somewhat slower due to the nature of database searches.

  -w, --wildcard
      Interpret each name as a pattern containing shell style wildcards.  For a match to be made, an expanded name
      must match the entire page name.  This option causes whatis to be somewhat slower due to the nature of data-
      base searches.

  -l, --long
      Do not trim output to the terminal width.  Normally, output will be truncated to the terminal width to avoid
      ugly results from poorly-written NAME sections.

  -s list, --sections list, --section list
      Search only the given manual sections.  list is a colon- or comma-separated list of sections.  If an entry in
      list is a simple section, for example "3", then the displayed list of descriptions will include pages in sec-
-----Info: (*manpages*)whatis, 120 lines --Top-----
No menu item 'whatis' in node '(dir)Top'

```

Realizamos lo mismo con `info apropos`

```

APROPUS(1)                               Manual pager utils                               APROPOS(1)

NAME
  apropos - search the manual page names and descriptions

SYNOPSIS
  apropos [-dalv?UI] [-el-wl-r] [-s list] [-m system[,...]] [-M path] [-L locale] [-C file] keyword ...

DESCRIPTION
  Each manual page has a short description available within it.  apropos searches the descriptions for instances of
  keyword.

  keyword is usually a regular expression, as if (-r) was used, or may contain wildcards (-w), or match the exact key-
  word (-e).  Using these options, it may be necessary to quote the keyword or escape (\) the special characters to
  stop the shell from interpreting them.

  The standard matching rules allow matches to be made against the page name and word boundaries in the description.

  The database searched by apropos is updated by the mandb program.  Depending on your installation, this may be run by
  a periodic cron job, or may need to be run manually after new manual pages have been installed.

OPTIONS
  -d, --debug
      Print debugging information.

  -v, --verbose
      Print verbose warning messages.

  -r, --regex
      Interpret each keyword as a regular expression.  This is the default behaviour.  Each keyword will be matched
      against the page names and the descriptions independently.  It can match any part of either.  The match is not
      limited to word boundaries.

  -w, --wildcard
      Interpret each keyword as a pattern containing shell style wildcards.  Each keyword will be matched against
      the page names and the descriptions independently.  If --exact is also used, a match will only be found if an
      expanded keyword matches an entire description or page name.  Otherwise the keyword is also allowed to match
      on word boundaries in the description.

  -e, --exact
      Each keyword will be exactly matched against the page names and the descriptions.

  -a, --and
      Only display items that match all the supplied keywords.  The default is to display items that match any key-
      word.

-----Info: (*manpages*)apropos, 131 lines --Top-----
No menu item 'apropos' in node '(dir)Top'

```

### 1.3) Explica qué hace el comando `cd /usr/bin; ls | xargs whatis | less`

La primera parte de este comando está formada por “`cd /usr/bin`” y nos lleva al directorio bin, que se encuentra dentro del directorio usr. La segunda parte, muestra todas las ordenes que pueden ser ejecutadas por el sistema y una breve explicación sobre cada una. A su vez, la orden `less` nos permite hacer un pequeño scroll por la información ofrecida.

```

[root@00264476 ~]# cd /usr/bin; ls | xargs whatis | less
brotli: nothing appropriate.
catchsegv: nothing appropriate.
centrino-decode: nothing appropriate.
csslint-0.6: nothing appropriate.
dnf-3: nothing appropriate.
g13: nothing appropriate.
gettext.sh: nothing appropriate.
gio-querymodules-64: nothing appropriate.
gpg-error: nothing appropriate.
gpgsplit: nothing appropriate.
gpg-zip: nothing appropriate.
gpio-event-mon: nothing appropriate.
gpio-hammer: nothing appropriate.
lddiag-socket-details: nothing appropriate.
libio_event_monitor: nothing appropriate.
libio_generic_buffer: nothing appropriate.
kbautil: nothing appropriate.
lesspipe.sh: nothing appropriate.
linux-boot-prober: nothing appropriate.
lowmfs-3g: nothing appropriate.
lsgpio: nothing appropriate.
lsio: nothing appropriate.
makedb: nothing appropriate.
make-dummy-cert: nothing appropriate.
modulemd-validator-v1: nothing appropriate.
[ (1) - bash built-in commands, see bash(1)
alias (1) - bash built-in commands, see bash(1)
alias (1p) - define or display aliases
apropos (1) - search the manual page names and descriptions
arch (1) - print machine hardware name (same as uname -m)
aulast (8) - a program similar to last
aulastlog (8) - a program similar to lastlog
ausyscall (8) - a program that allows mapping syscall names and numbers
authselect (8) - select system identity and authentication sources.
auvirt (8) - a program that shows data related to virtual machines
awk (1) - pattern scanning and processing language
awk (1p) - pattern scanning and processing language
b2sum (1) - compute and check BLAKE2 message digest
base32 (1) - base32 encode/decode data and print to standard output

```

## 3) Conceptos básicos de administración de paquetes

### 2.1) Haz una lista de todos los paquetes del sistema, cuenta cuántos hay con `wc`

Ejecutando el comando `rpm -qa --last` obtenemos la lista solicitada de paquetes del sistema

```

libmnl-1.0.4-6.el8.x86_64 Mon 27 Jan 2020 04:01:04 PM EST
libcap-ng-0.7.9-4.el8.x86_64 Mon 27 Jan 2020 04:01:04 PM EST
grub2-common-2.02-78.el8.noarch Mon 27 Jan 2020 04:01:04 PM EST
gmp-6.1.2-18.el8.x86_64 Mon 27 Jan 2020 04:01:04 PM EST
audit-libs-3.0-8.10.20180831git0047a6c.el8.x86_64 Mon 27 Jan 2020 04:01:04 PM EST
sqlite-libs-3.26.0-3.el8.x86_64 Mon 27 Jan 2020 04:01:03 PM EST
libstdc++-8.3.1-4.5.el8.x86_64 Mon 27 Jan 2020 04:01:03 PM EST
libgcrypt-1.8.3-4.el8.x86_64 Mon 27 Jan 2020 04:01:03 PM EST
libffi-3.1-21.el8.x86_64 Mon 27 Jan 2020 04:01:03 PM EST
expat-2.2.5-3.el8.x86_64 Mon 27 Jan 2020 04:01:03 PM EST
elfutils-libelf-0.176-5.el8.x86_64 Mon 27 Jan 2020 04:01:03 PM EST
chkconfig-1.11-1.el8.x86_64 Mon 27 Jan 2020 04:01:03 PM EST
readline-7.0-10.el8.x86_64 Mon 27 Jan 2020 04:01:02 PM EST
libxml2-2.9.7-5.el8.x86_64 Mon 27 Jan 2020 04:01:02 PM EST
libxcrypt-4.1.1-4.el8.x86_64 Mon 27 Jan 2020 04:01:02 PM EST
libuuid-2.32.1-17.el8.x86_64 Mon 27 Jan 2020 04:01:02 PM EST
libgpg-error-1.31-1.el8.x86_64 Mon 27 Jan 2020 04:01:02 PM EST
libcap-2.26-1.el8.x86_64 Mon 27 Jan 2020 04:01:02 PM EST
info-6.5-4.el8.x86_64 Mon 27 Jan 2020 04:01:02 PM EST
zlib-1.2.11-10.el8.x86_64 Mon 27 Jan 2020 04:01:01 PM EST
xz-libs-5.2.4-3.el8.x86_64 Mon 27 Jan 2020 04:01:01 PM EST
port-1.16-14.el8.x86_64 Mon 27 Jan 2020 04:01:01 PM EST
libsepol-2.9-1.el8.x86_64 Mon 27 Jan 2020 04:01:01 PM EST
libcom_err-1.44.6-3.el8.x86_64 Mon 27 Jan 2020 04:01:01 PM EST
bzip2-libs-1.0.6-26.el8.x86_64 Mon 27 Jan 2020 04:01:01 PM EST
bash-4.4.19-10.el8.x86_64 Mon 27 Jan 2020 04:01:01 PM EST
glibc-2.28-72.el8.x86_64 Mon 27 Jan 2020 04:01:00 PM EST
glibc-langpack-en-2.28-72.el8.x86_64 Mon 27 Jan 2020 04:00:59 PM EST
glibc-common-2.28-72.el8.x86_64 Mon 27 Jan 2020 04:00:59 PM EST
xkeyboard-config-2.24-3.el8.noarch Mon 27 Jan 2020 04:00:58 PM EST
publicsuffix-list-dafsa-20180723-1.el8.noarch Mon 27 Jan 2020 04:00:58 PM EST
pcrc2-10.32-1.el8.x86_64 Mon 27 Jan 2020 04:00:58 PM EST
ncurses-libs-6.1-7.20180224.el8.x86_64 Mon 27 Jan 2020 04:00:58 PM EST
ncurses-base-6.1-7.20180224.el8.noarch Mon 27 Jan 2020 04:00:58 PM EST
libselinux-2.9-2.1.el8.x86_64 Mon 27 Jan 2020 04:00:58 PM EST
filesystem-3.8-2.el8.x86_64 Mon 27 Jan 2020 04:00:57 PM EST
efi-filesystem-3-2.el8.noarch Mon 27 Jan 2020 04:00:57 PM EST
basesystem-11-5.el8.noarch Mon 27 Jan 2020 04:00:57 PM EST
centos-repos-8.1-1.1911.0.8.el8.x86_64 Mon 27 Jan 2020 04:00:56 PM EST
centos-release-8.1-1.1911.0.8.el8.x86_64 Mon 27 Jan 2020 04:00:56 PM EST
tzdata-2019c-1.el8.noarch Mon 27 Jan 2020 04:00:55 PM EST
python3-setuptools-wheel-39.2.0-5.el8.noarch Mon 27 Jan 2020 04:00:55 PM EST
python3-pip-wheel-9.0.3-15.el8.noarch Mon 27 Jan 2020 04:00:55 PM EST
centos-gpg-keys-8.1-1.1911.0.8.el8.noarch Mon 27 Jan 2020 04:00:55 PM EST
geolite2-city-20180605-1.el8.noarch Mon 27 Jan 2020 04:00:53 PM EST
libgcc-8.3.1-4.5.el8.x86_64 Mon 27 Jan 2020 04:00:49 PM EST
geolite2-country-20180605-1.el8.noarch Mon 27 Jan 2020 04:00:49 PM EST
[root@U0264476bin]#

```

Añadimos `|wc -l` para obtener el número de paquetes.

```

[root@U0264476bin]# rpm -qa -last |wc -l
420
[root@U0264476bin]#

```

## 2.2) Comprueba qué paquetes están sin actualizar (no los actualices)

```

root@U0264476bin1$ yum check-update
Last metadata expiration check: 0:06:06 ago on Sun 23 Feb 2020 01:07:30 PM EST.

epel-release.noarch                8-8.el8                                epe1
libc.x86_64                        2.28-72.el8_1.1                       BaseOS
libc-common.x86_64                 2.28-72.el8_1.1                       BaseOS
libc-langpack-en.x86_64            2.28-72.el8_1.1                       BaseOS
rub2-common.noarch                 1:2.02-78.el8_1.1                     BaseOS
rub2-efi-x86_64.x86_64             1:2.02-78.el8_1.1                     BaseOS
rub2-pc.x86_64                     1:2.02-78.el8_1.1                     BaseOS
rub2-pc-modules.noarch             1:2.02-78.el8_1.1                     BaseOS
rub2-tools.x86_64                  1:2.02-78.el8_1.1                     BaseOS
rub2-tools-extra.x86_64            1:2.02-78.el8_1.1                     BaseOS
rub2-tools-minimal.x86_64          1:2.02-78.el8_1.1                     BaseOS
kernel.x86_64                      4.18.0-147.5.1.el8_1                  BaseOS
kernel-core.x86_64                 4.18.0-147.5.1.el8_1                  BaseOS
kernel-modules.x86_64              4.18.0-147.5.1.el8_1                  BaseOS
kernel-tools.x86_64                4.18.0-147.5.1.el8_1                  BaseOS
kernel-tools-libs.x86_64           4.18.0-147.5.1.el8_1                  BaseOS
libarchive.x86_64                  3.3.2-8.el8_1                         BaseOS
openldap.x86_64                    2.4.46-11.el8_1                       BaseOS
openssh.x86_64                     8.0p1-4.el8_1                         BaseOS
openssh-clients.x86_64             8.0p1-4.el8_1                         BaseOS
openssh-server.x86_64              8.0p1-4.el8_1                         BaseOS
policycoreutils.x86_64             2.9-3.el8_1.1                         BaseOS
python3-perf.x86_64                4.18.0-147.5.1.el8_1                  BaseOS
q-lite-libs.x86_64                 3.26-0-4.el8_1                        BaseOS
systemd.x86_64                     239-18.el8_1.2                        BaseOS
systemd-libs.x86_64                239-18.el8_1.2                        BaseOS
systemd-pam.x86_64                 239-18.el8_1.2                        BaseOS
systemd-udev.x86_64                239-18.el8_1.2                        BaseOS
unred.noarch                        2.12.0-3.el8_1.1                      BaseOS
Obsoleting Packages
rub2-tools.x86_64                  1:2.02-78.el8_1.1                     BaseOS
  grub2-tools.x86_64               1:2.02-78.el8                         @anaconda
rub2-tools-efi.x86_64              1:2.02-78.el8_1.1                     BaseOS
  grub2-tools.x86_64               1:2.02-78.el8                         @anaconda
rub2-tools-extra.x86_64            1:2.02-78.el8_1.1                     BaseOS
  grub2-tools.x86_64               1:2.02-78.el8                         @anaconda
rub2-tools-minimal.x86_64          1:2.02-78.el8_1.1                     BaseOS
  grub2-tools.x86_64               1:2.02-78.el8                         @anaconda
root@U0264476bin1$

```

## 2.3) Instala el paquete emacs

```

jasper-libs-2.0.14-4.el8.x86_64      jbigkit-libs-2.1-14.el8.x86_64
lcms2-2.9-2.el8.x86_64               libICE-1.0.9-15.el8.x86_64
libSM-1.2.3-1.el8.x86_64             libX11-1.6.7-1.el8.x86_64
libX11-common-1.6.7-1.el8.noarch     libX11-xcb-1.6.7-1.el8.x86_64
libXau-1.0.8-13.el8.x86_64           libXaw-1.0.13-10.el8.x86_64
libXcomposite-0.4.4-14.el8.x86_64   libXcursor-1.1.15-3.el8.x86_64
libXdamage-1.1.4-14.el8.x86_64      libXext-1.3.3-9.el8.x86_64
libXfixes-5.0.3-7.el8.x86_64        libXft-2.3.2-10.el8.x86_64
libXi-1.7.9-7.el8.x86_64             libXinerama-1.1.4-1.el8.x86_64
libXmu-1.1.2-12.el8.x86_64          libXpm-3.5.12-7.el8.x86_64
libXrandr-1.5.1-7.el8.x86_64        libXrender-0.9.10-7.el8.x86_64
libXt-1.1.5-12.el8.x86_64           libXtst-1.2.3-7.el8.x86_64
libXv-1.0.11-7.el8.x86_64           libXxf86vm-1.1.4-9.el8.x86_64
libdatrie-0.2.9-7.el8.x86_64        libdrm-2.4.98-2.el8.x86_64
libepoxy-1.5.2-1.el8.x86_64         libglvnd-1.10.1-0.9.git5baa1e5.el8.x86_64
libglvnd-egl-1.1.0.1-0.9.git5baa1e5.el8.x86_64
libglvnd-glx-1.1.0.1-0.9.git5baa1e5.el8.x86_64
liblockfile-1.14-1.el8.x86_64       libjpeg-turbo-1.5.3-10.el8.x86_64
libogg-2.1.3-2-10.el8.x86_64        libnotify-0.7.7-5.el8.x86_64
librsync-2.4.2-7-3.el8.x86_64       libotf-0.9.13-11.el8.x86_64
libtheora-1.1.1-21.el8.x86_64       libthai-0.1.27-2.el8.x86_64
libvisual-1.0.4-0-24.el8.x86_64     libtiff-4.0.9-15.el8.x86_64
libwayland-client-1.15.0-1.el8.x86_64
libwayland-egl-1.15.0-1.el8.x86_64
libwebp-1.0.0-1.el8.x86_64          m17n-db-1.8.0-3.el8.noarch
libxshmfence-1.3-2.el8.x86_64       mesa-libEGL-19.1.4-3.el8_1.x86_64
m17n-lib-1.8.0-2.el8.x86_64         mesa-libgbm-19.1.4-3.el8_1.x86_64
mesa-libGL-19.1.4-3.el8_1.x86_64   mesa-libglapi-19.1.4-3.el8_1.x86_64
openjpeg2-2.3.1-2.el8_1.x86_64     orc-0.4.28-2.el8.x86_64
opus-1.3.0-4.beta.el8.x86_64        pixman-0.36.0-1.el8.x86_64
pango-1.42.4-6.el8.x86_64          webkit2gtk3-2.24.4-2.el8_1.x86_64
rest-0.8.1-2.el8.x86_64             woff2-1.0.2-4.el8.x86_64
webkit2gtk3-jsc-2.24.4-2.el8_1.x86_64
ModemManager-glib-1.10.4-1.el8.x86_64
bubblewrap-0.3.0-1.el8.x86_64      avahi-glib-0.7-19.el8.x86_64
dejavu-sans-mono-fonts-2.35-6.el8.noarch
fontconfig-2.13.1-3.el8.x86_64     dejavu-fonts-common-2.35-6.el8.noarch
gdk-pixbuf2-2.36.12-5.el8.x86_64   emacsfilesystem-1.26.1-5.el8.noarch
gsettings-desktop-schemas-3.32.0-3.el8.x86_64
fontpackages-filesystem-1.44-22.el8.noarch
libgusb-0.3.0-1.el8.x86_64          glib-networking-2.56.1-1.1.el8.x86_64
libpciaccess-0.14-1.el8.x86_64     json-glib-1.4.4-1.el8.x86_64
libproxy-0.4.15-5.2.el8.x86_64     libmodman-2.0.1-17.el8.x86_64
libxslt-1.1.32-3.el8.x86_64        libpkgconf-1.4.2-1.el8.x86_64
pkgconf-m4-1.4.2-1.el8.noarch       libsoup-2.62.3-1.el8.x86_64
xml-common-0.6.3-50.el8.noarch      pkgconf-1.4.2-1.el8.x86_64
pkgconf-pkg-config-1.4.2-1.el8.x86_64
complete!
root@U0264476bin1$ yum install emacs

```



### 3) Opciones del kernel. Mostrar la versión del kernel

#### 3.1) Encuentra una orden para mostrar en pantalla la versión de kernel.

Usamos el comando `uname -a` para saber toda la información sobre el kernel.

```
[root@localhost ~]# uname -a
Linux localhost.localdomain 3.10.0-957.5.1.el7.x86_64 #1 SMP Fri Feb 1 14:54:57
UTC 2019 x86_64 x86_64 x86_64 GNU/Linux
[root@localhost ~]# _
```

### 4) Mensaje de presentación /etc/motd, /etc/issue

#### 4.1) Descubre la función de los ficheros /etc/motd y /etc/issue

Los ficheros `/etc/motd` y `/etc/issue` contienen los mensajes de bienvenida al arrancar la máquina Linux. Si los modificamos, se cambia el saludo.

```
[root@U0264476bin]# cat /etc/motd
HOLA MUNDO
[root@U0264476bin]# cat /etc/issue
\S
Kernel \r on an \m
[root@U0264476bin]#
```

## Practica 2

Empezamos creando un disco duro de 8GB en la máquina.

Ahora con el comando `parted /dev/sda unit MB print free` y con `lsblk -f` comprobamos las particiones actuales del disco principal.

```
U02644760~ $ >parted /dev/sda unit MB print free
Model: ATA VBOX HARDDISK (scsi)
Disk /dev/sda: 42950MB
Sector size (logical/physical): 512B/512B
Partition Table: msdos
Disk Flags:

Number   Start    End      Size    Type    File system  Flags
  1       0.00MB   1.05MB   1.05MB   primary ext4          boot
  2      1.05MB  42950MB  41875MB   primary                lvm

U02644760~ $ >
```

```
U02644760~ $ >lsblk -f
NAME            FSTYPE      LABEL UUID                                MOUNTPOINT
sda
├─sda1           ext4         65d08fe1-1415-4c54-b3b9-0d3a32d63b77 /boot
├─sda2           LVM2_member giZrXY-7FnP-ngSb-EKKy-AzUy-Pcdc-mAKATw
├─┌-cl-root      xfs         adfd9fd1-d5a4-4f86-b8ff-2e47628e0124 /
└─┌-cl-swap      swap        411f9f03-3782-44d8-9809-082a8db5883e [SWAP]
sdb
sr0
U02644760~ $ >
```

**Dispositivos de almacenamiento: ¿Cuál es el nombre del fichero de dispositivo del nuevo disco?**

El nombre del nuevo disco creado anteriormente es `sdb`.

## A. Particionamiento: Uso de gdisk:

### Instala gdisk con dnf

```
U02644760~ $ >dnf install gdisk
Last metadata expiration check: 1 day, 22:53:13 ago on Tue 11 Feb 2020 06:27:36 PM GMT.
Dependencies resolved.
=====
Package                Architecture          Version               Repository            Size
=====
Installing:
gdisk                  x86_64                1.0.3-6.el8           BaseOS                 240 k
=====
Transaction Summary
=====
Install 1 Package

Total download size: 240 k
Installed size: 873 k
Is this ok [y/N]: y
Downloading Packages:
gdisk-1.0.3-6.el8.x86_64.rpm                129 kB/s | 240 kB      00:01
-----
Total                                         99 kB/s | 240 kB      00:02
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing      :                                1/1
  Installing     : gdisk-1.0.3-6.el8.x86_64      1/1
  Running scriptlet: gdisk-1.0.3-6.el8.x86_64    1/1
  Verifying      : gdisk-1.0.3-6.el8.x86_64      1/1

Installed:
  gdisk-1.0.3-6.el8.x86_64

Complete!
```

**Haz gdisk /dev/XXX (/dev/XXX es el nombre del segundo dispositivo).**

```
U02644760~ $ >gdisk /dev/sdb
GPT fdisk (gdisk) version 1.0.3

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

Creating new GPT entries.

Command (? for help): _
```

**Usa el comando 'p' para ver la tabla de particiones**

Usamos el comando p para consultar la tabla de particiones.

```

Command (? for help): p
Disk /dev/sdb: 16777216 sectors, 8.0 GiB
Model: UBOX HARDDISK
Sector size (logical/physical): 512/512 bytes
Disk identifier (GUID): 5833430C-7012-48FC-AEF7-0A01D337D4FD
Partition table holds up to 128 entries
Main partition table begins at sector 2 and ends at sector 33
First usable sector is 34, last usable sector is 16777182
Partitions will be aligned on 2048-sector boundaries
Total free space is 16777149 sectors (8.0 GiB)

Number  Start (sector)    End (sector)  Size      Code  Name
Command (? for help): _

```

### Usa el comando 'n' para crear una partición de 512MiB de tipo Linux filesystem

Creamos la partición de 512 MiB con el numero 1 y de tipo Linux filesystem

```

Command (? for help): n
Partition number (1-128, default 1): 1
First sector (34-16777182, default = 2048) or {+-}size{KMGTP}:
Last sector (2048-16777182, default = 16777182) or {+-}size{KMGTP}: +512MiB
Current type is 'Linux filesystem'
Hex code or GUID (L to show codes, Enter = 8300):
Changed type of partition to 'Linux filesystem'

Command (? for help): _

```

### Crea una nueva partición de 3GiB

Creamos la partición de 3GiB con el numero 2 y de tipo Linux filesystem

```

Command (? for help): n
Partition number (2-128, default 2):
First sector (34-16777182, default = 1050624) or {+-}size{KMGTP}:
Last sector (1050624-16777182, default = 16777182) or {+-}size{KMGTP}: +3GiB
Current type is 'Linux filesystem'
Hex code or GUID (L to show codes, Enter = 8300):
Changed type of partition to 'Linux filesystem'

Command (? for help): _

```

### Y una tercera con el resto del espacio disponible de tipo Microsoft Basic data

```

Command (? for help): n
Partition number (3-128, default 3):
First sector (34-16777182, default = 7342080) or {+}size{KMGTP}:
Last sector (7342080-16777182, default = 16777182) or {+}size{KMGTP}:
Current type is 'Linux filesystem'
Hex code or GUID (L to show codes, Enter = 8300): _

```

Buscamos el código de Microsoft Basic Data, con el comando L en gdisk, en este caso 0700.

```

Hex code or GUID (L to show codes, Enter = 8300): L
0700 Microsoft basic data  0c01 Microsoft reserved  2700 Windows RE
0800 ONIE boot             3001 ONIE config      3900 Plan 9
1100 PowerPC PReP boot     4200 Windows LDM data 4201 Windows LDM metadata
1202 Windows Storage Spac 7501 IBM GPFS         7f00 ChromeOS kernel
7f01 ChromeOS root        7f02 ChromeOS reserved 8200 Linux swap
8300 Linux filesystem      8301 Linux reserved    8302 Linux /home
8303 Linux x86 root (/)    8304 Linux x86-64 root (/) 8305 Linux ARM64 root (/)
8306 Linux /srv           8307 Linux ARM32 root (/) 8400 Intel Rapid Start
8e00 Linux LVM            a000 Android bootloader a001 Android bootloader 2
a002 Android boot        a003 Android recovery  a004 Android misc
a005 Android metadata    a006 Android system    a007 Android cache
a008 Android data         a009 Android persistent a00a Android factory
a00b Android fastboot/ter a00c Android OEM       a500 FreeBSD disklabel
a501 FreeBSD boot        a502 FreeBSD swap      a503 FreeBSD UFS
a504 FreeBSD ZFS         a505 FreeBSD Vinum/RAID a580 Midnight BSD data

```

```

fb01 VMware reserved      fc00 VMware kcore crash p fd00 Linux
Hex code or GUID (L to show codes, Enter = 8300): 0700
Changed type of partition to 'Microsoft basic data'

Command (? for help): _

```

### Graba las particiones a disco con el comando 'w'.

Usamos el comando w para grabar las particiones

```

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/sdb.
The operation has completed successfully.
U02644760~ $ >_

```

### Usa el comando parted /dev/XXX unit MB print y anota el resultado

Después de usar el comando observamos como salen las particiones hechas con gdisk en el disco nuevo.

```

U02644760~ $ >parted /dev/sdb unit MB print
Model: ATA UBOX HARDISK (scsi)
Disk /dev/sdb: 8590MB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number   Start    End      Size    File system  Name            Flags
  1       1.05MB   538MB    537MB    Linux filesystem
  2       538MB   3759MB   3221MB    Linux filesystem
  3       3759MB   8590MB   4831MB    Microsoft basic data  msftdata
U02644760~ $ >

```

**Haz `mkfs /dev/XXX1` (/dev/XXX es el nombre del dispositivo, 1 es el número de la primera partición) para crear un sistema de archivos de tipo ext2 en la partición de 512Mb del disco.**

```

U02644760~ $ >mkfs.ext2 /dev/sdb1
mke2fs 1.44.6 (5-Mar-2019)
Creating filesystem with 131072 4k blocks and 32768 inodes
Filesystem UUID: dfb193d0-3d9b-4203-b72c-93cc1590b901
Superblock backups stored on blocks:
    32768, 98304

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done
U02644760~ $ >_

```

**Haz `e2label /dev/XXX1 disco2a` para darle una etiqueta al disco**

```

U02644760~ $ >e2label /dev/sdb1 disco2a

```

**Haz `tune2fs -j /dev/XXX1` para crear el archivo de journal y hacer que el filesystem sea de tipo ext3**

```

U02644760~ $ >tune2fs -j /dev/sdb1
tune2fs 1.44.6 (5-Mar-2019)
Creating journal inode: done
U02644760~ $ >

```

**Crea un sistema de archivos xfs en la segunda partición. Ponle como etiqueta disco2b con el comando xfs\_admin**

```
U02644760~ $ >mkfs.xfs /dev/sdb2
meta-data=/dev/sdb2             isize=512    agcount=4, agsize=196608 blks
      =                       sectsz=512    attr=2, projid32bit=1
      =                       crc=1        finobt=1, sparse=1, rmapbt=0
      =                       reflink=1
data      =                       bsize=4096    blocks=786432, 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
U02644760~ $ >
```

```
U02644760~ $ >xfs_admin -L disco2b /dev/sdb2
writing all SBs
new label = "disco2b"
U02644760~ $ >
```

**Crea un sistema de archivos fat32 en la tercera partición del disco. Usa fatlabel para etiquetar la partición con DISCO2C**  
Repetimos el mismo proceso que en los anteriores y finalmente tenemos estas particiones

```
[root@U02644760 ~]# parted /dev/sdb unit MB print
Model: ATA VBOX HARDISK (scsi)
Disk /dev/sdb: 8590MB
Sector size (logical/physical): 512B/512B
Partition Table: gpt
Disk Flags:

Number  Start   End     Size    File system  Name                  Flags
  1      1.05MB  538MB   537MB   ext3         Linux filesystem
  2      538MB  3759MB  3221MB  xfs          Linux filesystem
  3      3759MB  8590MB  4831MB  fat32        Microsoft basic data msftdata

[root@U02644760 ~]#
```

**Haz mkdir /mnt/prueba para crear un punto de montaje**

```
U02644760~ $ >mkdir /mnt/prueba
U02644760~ $ >
```

**Haz mount /dev/XXX1 /mnt/prueba para montar el nuevo filesystem en el árbol de directorios**

```

U0264476@~ $ >mkdir /mnt/prueba
U0264476@~ $ >mount /dev/sdb1 /mnt/prueba
U0264476@~ $ >cd /mnt/prueba
U0264476@prueba $ >mkdir dir1
U0264476@prueba $ >ls -la
total 24
drwxr-xr-x. 4 root root 4096 Feb 13 17:30 .
drwxr-xr-x. 3 root root 20 Feb 13 17:29 ..
drwxr-xr-x. 2 root root 4096 Feb 13 17:30 dir1
drwx----- 2 root root 16384 Feb 13 17:25 lost+found
U0264476@prueba $ >_

```

**Crea algún archivo en el directorio /mnt/prueba**

```

U0264476@prueba $ >mount /dev/sdb2 /mnt/prueba
U0264476@prueba $ >cd /mnt/prueba
U0264476@prueba $ >mkdir dir2
U0264476@prueba $ >

```

**Repite el proceso con los restantes filesystems usando otros puntos de montaje. Cuando hayas terminado, ejecuta lsblk -f y anota el resultado.**

```

root@U0264476~# lsblk -f

```

NAME	FSTYPE	LABEL	UUID	MOUNTPOINT
sda				
└─sda1	vfat		F64E-CE13	/boot/efi
└─sda2	ext4		e3fc24a7-7dda-4a46-b504-f5f8bff351bc	/boot
└─sda3	LVM2_member		dzWDb7-AT8N-1e7L-EE62-qFx5-NNXn-0MhS8t	
└─cl-root	xfs		b0d65fd0-9e74-4ab8-8db6-37de1cff28df	/
└─cl-swap	swap		155084c4-3e7b-495f-adc1-1924d02ae34b	[SWAP]
sdb				
└─sdb1	ext3	disco2a	3af0b81f-da8e-49b7-a5dd-df99476b4643	
└─sdb2	xfs	disco2b	3b84c80f-b433-454b-9c2d-7a83ab56bc4b	
└─sdb3	vfat	DISCO2C	91FB-4203	
sdc				
sdd				
sr0				

```

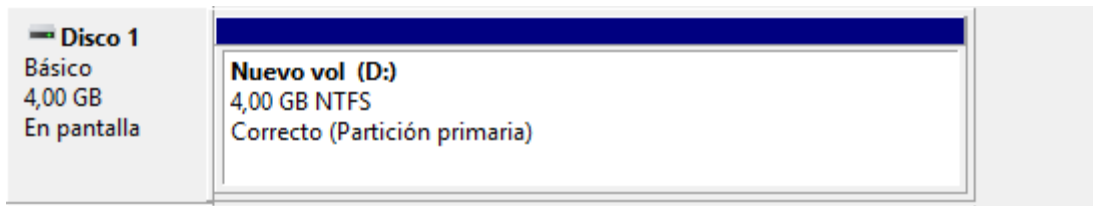
root@U0264476~#

```

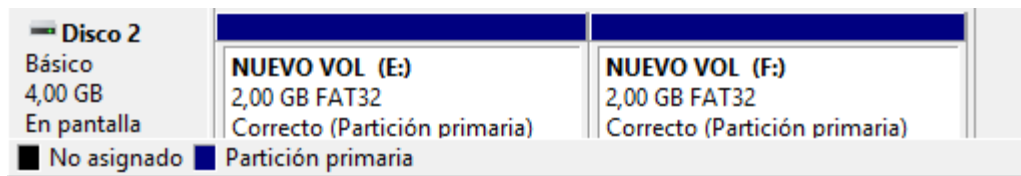
**Adición de nuevos discos a un sistema Windows ya instalado**

**Con el primer disco, haz un único volumen simple y formatealo como NTFS**





**Con el segundo disco, haz dos particiones de igual tamaño. Formatea ambas como FAT32. Captura la pantalla.**

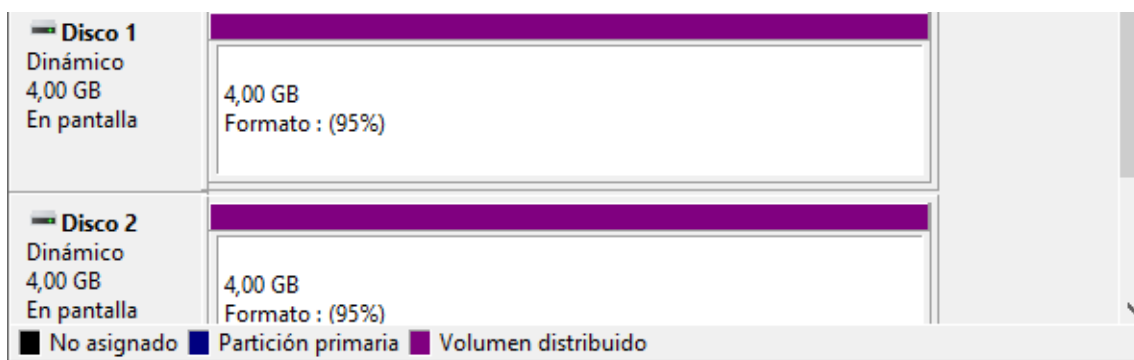


**Elimina la partición del disco 1 y las dos particiones del disco 2, dejando todo el espacio como no asignado**

Eliminamos ambos discos



**Une ambos discos con volúmenes NTFS distribuidos, de forma que exista una única unidad E. ¿Qué tamaño tiene la nueva unidad?**



**Elimina el volumen distribuido y une de nuevo ambos discos con volúmenes distribuidos NTFS en un volumen reflejado (RAID1). ¿Qué tamaño tiene la nueva unidad?**



**Para que ésta reconozca la partición NTFS debemos instalar el driver ntfs-3g que se encuentra en el repositorio epel.**

```

root@U0264476 ~]# dnf install -y epel-release
CentOS-8 - AppStream                               18 kB/s | 4.3 kB   00:00
CentOS-8 - AppStream                               2.5 MB/s | 3.6 MB  00:01

Failed to download metadata for repo 'AppStream'
Error: Failed to download metadata for repo 'AppStream'
root@U0264476 ~]# dnf install -y epel-release
CentOS-8 - AppStream                               8.7 kB/s | 4.3 kB   00:00
CentOS-8 - AppStream                               3.3 MB/s | 6.5 MB   00:01
CentOS-8 - Base                                    15 kB/s | 3.8 kB   00:00
CentOS-8 - Base                                    3.9 MB/s | 5.0 MB   00:01
CentOS-8 - Extras                                  5.3 kB/s | 1.5 kB   00:00
Extra Packages for Enterprise Linux 8 - x86_64     43 kB/s | 34 kB    00:00
Extra Packages for Enterprise Linux 8 - x86_64     3.5 MB/s | 5.9 MB   00:01
Package epel-release-8-5.el8.noarch is already installed.
Dependencies resolved.

=====
Package                        Architecture      Version           Repository        Size
=====
Upgrading:
epel-release                   noarch            8-8.el8            epel               22 k
Transaction Summary
=====
Upgrade 1 Package

Total download size: 22 k
Downloading Packages:
epel-release-8-8.el8.noarch.rpm                                61 kB/s | 22 kB   00:00
Total
Running transaction check
19 kB/s | 22 kB   00:01

root@U0264476 ~]# dnf install -y ntfs-3g
Extra Packages for Enterprise Linux Modular 8 - x86_64
Package ntfs-3g-2:2017.3.23-11.el8.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!
root@U0264476 ~]#

```

# Practica 3

## A. Recuperación básica de errores durante el inicio

Arranca CentOS normalmente (con EFI activado y sin el disco de instalación) 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.

```
root@U0264476entries:~# ls -la
total 28
drwx----- 2 root root 4096 Feb 20 09:42 .
drwxr-xr-x 3 root root 4096 Jan 27 16:02 ..
-rw-r--r-- 1 root root 395 Jan 27 16:06 ebaf50fe4f1441b0803054b5dabfcc3e-0-rescue.conf
-rw-r--r-- 1 root root 353 Feb 20 09:42 ebaf50fe4f1441b0803054b5dabfcc3e-4.18.0-147.3.1.el8_1.x86_64.conf
-rw-r--r-- 1 root root 323 Jan 27 16:06 ebaf50fe4f1441b0803054b5dabfcc3e-4.18.0-147.el8.x86_64.conf
root@U0264476entries:~#
```

Editamos el fichero de en medio, el más reciente

```
title CentOS Linux (4.18.0-147.3.1.el8_1.x86_64) 0 (Core)
version 4.18.0-147.3.1.el8_1.x86_64
linux /vmlinuz-4.18.0-147.3.1.el8_1.x86_64
initrd /initramfs-4.18.0-147.3.1.el8_1.x86_64.img $tuned_initrd
options $kernelopts $tuned_params
id centos-20200104000231-4.18.0-147.3.1.el8_1.x86_64
grub_users $grub_users
grub_arg --unrestricted
grub_class kernel

-- INSERT --
```

Modificamos la x en vmlinuz por vmlinuz y arrancamos la máquina de nuevo, y vemos como no reconoce el kernel.

```
error: file '/vmlinuz-3.10.0-957.5.1.el7.x86_64' not found.
error: you need to load the kernel first.

Press any key to continue...
```

**Bota en modo de recuperación y monta el disco con el sistema defectuoso, haz chroot a /mnt/sysimage, carga el teclado español (loadkeys es) y edita y corrige el fichero del punto anterior. Quita el disco de arranque, activa EFI, rebota y comprueba que el problema está solucionado. Ignora los mensajes de reetiquetado de SELinux.**

Ejecutamos el Troubleshooting -> Rescue a CentOS system en el menú de instalación.

```
* If the graphical installation interface fails to start, try again with the
  inst.text bootoption to start text installation
* 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/sysimage. 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
[anaconda] 1:main* 2:shell 3:log 4:storage-ls> Switch tab: Alt+Tab | Help: F1
```

Accedemos al fichero /mnt/sysimage/boot/grub.cfg y volvemos a hacer el cambio.

```

insmod xfs
set root='hd0,msdos1'
if [ x${feature_platform_search_hint} = xy ]; then
    search --no-floppy --fs-uuid --set=root --hint-bios=hd0,msdos1 --hint-efi=hd0,msdos1 --hint-baremetal=ahci0,msdos1 --hint='hd0,msdos1' b99afb7c-da88-44b2-a834-f0e7fcdece5b
else
    search --no-floppy --fs-uuid --set=root b99afb7c-da88-44b2-a834-f0e7fcdece5b
fi
linux16 vmlinuz-3.10.0-957.5.1.el7.x86_64 root=/dev/mapper/centos-root
no crashkernel=auto rd.lvm.lv=centos/root rd.lvm.lv=centos/swap rhgb quiet
initrd16 /initramfs-3.10.0-957.5.1.el7.x86_64.img
}
menuentry 'CentOS Linux (3.10.0-957.1.3.el7.x86_64) 7 (Core)' --class centos --class gnu-linux --class gnu --class os --unrestricted $menuentry_id_option 'gnulinux-3.10.0-957.1.3.el7.x86_64-advanced-0efb9c52-1789-4165-b061-1476f82de163' {
    load_video
    set gfxpayload=keep
    insmod gzio
    insmod part_msdos
    insmod xfs
    set root='hd0,msdos1'
}

```

anaconda1 1:main\* 2:shell 3:log 4:storage-lo> Switch tab: Alt+Tab | Help: F1

Y la maquina funciona de igual manera.

**Vuelve a repetir lo del punto primero y cambia de nuevo vmlinuz por vmlinux. Reinicia y desde la pantalla de arranque (sin usar el disco de instalación) modifica el nombre del kernel en la entrada del menú de forma que el servidor arranque**

Deshacemos el cambio anterior y hacemos el mismo cambio en el fichero de arranque y la maquina continúa funcionando correctamente.

```

insmod part_msdos
insmod xfs
set root='hd0,msdos1'
if [ x${feature_platform_search_hint} = xy ]; then
    search --no-floppy --fs-uuid --set=root --hint-bios=hd0,msdos1 --hint-efi=hd0,msdos1 --hint-baremetal=ahci0,msdos1 --hint='hd0,msdos1' b99afb7c-da88-44b2-a834-f0e7fcdece5b
else
    search --no-floppy --fs-uuid --set=root b99afb7c-da88-44b2-a834-f0e7fcdece5b
fi
linux16 vmlinux-3.10.0-957.5.1.el7.x86_64 root=/dev/mapper/centos-root
no crashkernel=auto rd.lvm.lv=centos/root rd.lvm.lv=centos/swap rhgb quiet
initrd16 /initramfs-3.10.0-957.5.1.el7.x86_64.img
}
menuentry 'CentOS Linux (3.10.0-957.1.3.el7.x86_64) 7 (Core)' --class centos --class gnu-linux --class gnu --class os --unrestricted $menuentry_id_option 'gnulinux-3.10.0-957.1.3.el7.x86_64-advanced-0efb9c52-1789-4165-b061-1476f82de163' {
    load_video
    set gfxpayload=keep
    insmod gzio
    insmod part_msdos
    insmod xfs
    set root='hd0,msdos1'
}

```

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

El fichero de arranque es un fichero temporal, si examinamos el grub.cfg vemos que no se ha modificado el kernel del sistema, para que este cambio sea permanente debería hacerse en el grub.cfg del kernel no en el fichero de arranque.

## B. Instalación de Linux con particionamiento dinámico

Creamos el sistema con los parámetros de la practica

**PARTICIONADO MANUAL** INSTALACIÓN DE CENTOS LINUX

Hecho es Ayud

▼ Nueva instalación de CentOS Linux 8

**DATOS**

<b>/home</b>	<b>19,3 GiB</b>
cl-home	

**SISTEMA**

<b>/</b>	<b>20 GiB</b>
cl-root	
<b>/boot</b>	<b>512 MiB</b>
sda1	
<b>/boot/efi</b>	<b>200 MiB</b>
sda2	

+ - ↺

**cl-home**

Punto de montaje: /home

Dispositivo(s): ATA VBOX HARDDISK (sda)

Capacidad deseada: 19,3 GiB

Tipo de dispositivo: LVM ☐ Cifrar

Sistema de archivos: xfs ☒ Reformatear

Etiqueta:

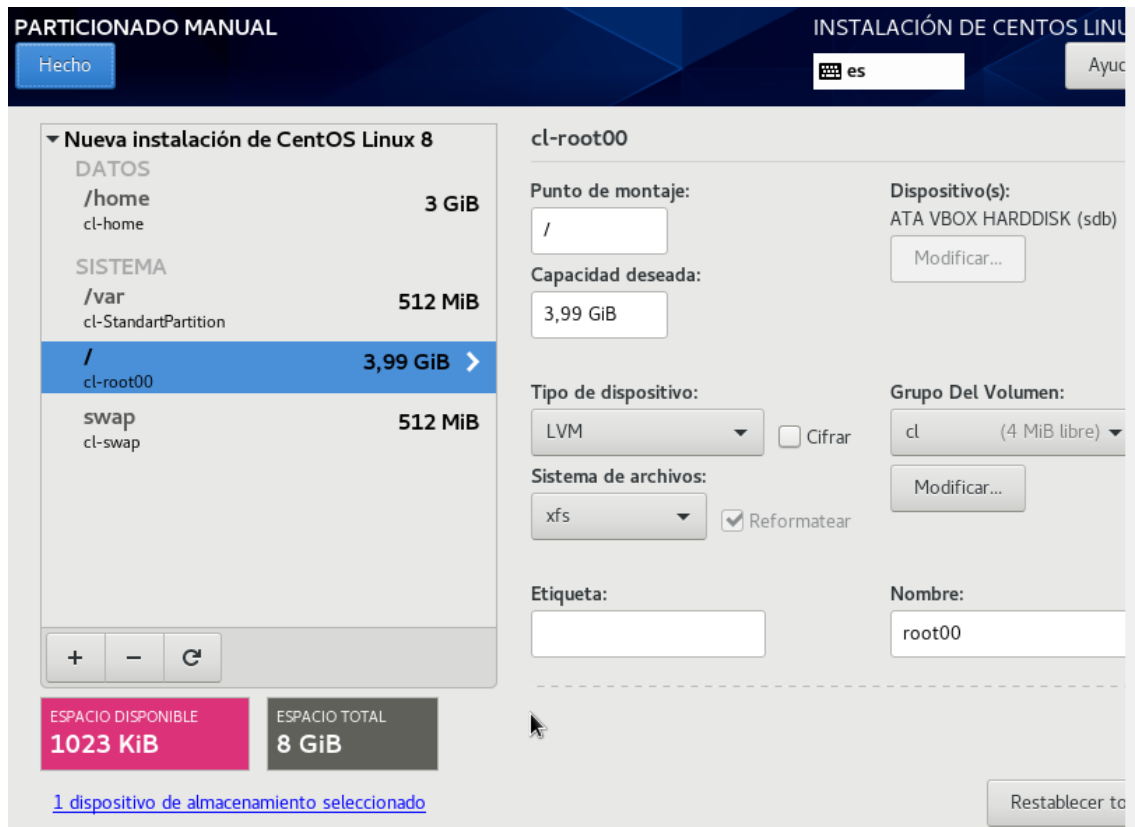
Grupo Del Volumen: cl (0 B libre)

Nombre: home

Restablecer to

ESPACIO DISPONIBLE **1023 KiB** ESPACIO TOTAL **40 GiB**

[1 dispositivo de almacenamiento seleccionado](#)



**Anota en el documento el resultado final, o haz una copia de la pantalla de programa de instalación. A continuación, instala el operativo e inicia sesión, para comprobar que todo es correcto. Haz df y copia la pantalla.**

```
[U02644760~]df
S.ficheros      bloques de 1K  Usados  Disponibles  Uso%  Montado en
devtmpfs        919172         0      919172      0%  /dev
tmpfs           936776         0      936776      0%  /dev/shm
tmpfs           936776      8636      928140      1%  /run
tmpfs           936776         0      936776      0%  /sys/fs/cgroup
/dev/mapper/cl-root 20961280 1434220 19527060      7%  /
/dev/mapper/cl-home 20228096 174144 20053952      1%  /home
/dev/sda1        499656     136552     326408     30%  /boot
/dev/sda2        204580         8     204572      1%  /boot/efi
tmpfs           187352         0     187352      0%  /run/user/0
[U02644760~]
```

**Elimina con gdisk las particiones del tercer disco si las hubiere**

Ejecutamos el comando p en gdisk y vemos que no hay particiones.

```

1002041700 1gdisks /dev/sdc
GPT fdisk (gdisk) version 1.0.3

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

Creating new GPT entries.

Command (? for help): p
Disk /dev/sdc: 16777216 sectors, 8.0 GiB
Model: VBOX HARDDISK
Sector size (logical/physical): 512/512 bytes
Disk identifier (GUID): ADD38987-66B0-4A0E-83AC-B3B99AE99BCB
Partition table holds up to 128 entries
Main partition table begins at sector 2 and ends at sector 33
First usable sector is 34, last usable sector is 16777182
Partitions will be aligned on 2048-sector boundaries
Total free space is 16777149 sectors (8.0 GiB)

Number  Start (sector)    End (sector)  Size      Code  Name
Command (? for help): _

```

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

```

a000 Apple DFS
a903 NetBSD LFS
a906 NetBSD RAID
af01 Apple RAID
Press the <Enter> key to see more codes:
af04 AppleTV recovery
af06 Apple SoftRAID Scratch
b300 QNX6 Power-Safe
bf00 Solaris root
bf03 Solaris backup
bf06 Solaris alternate se
bf09 Solaris Reserved 3
c001 HP-UX data
e101 ONIE config
ed00 Sony system partition
ef01 MBR partition scheme
f801 Ceph dm-crypt OSD
f804 Ceph disk in creatio
fb01 VMware reserved
Hex code or GUID (L to show codes, Enter = 8300): 8e00
Changed type of partition to 'Linux LVM'

Command (? for help): p
Disk /dev/sdc: 16777216 sectors, 8.0 GiB
Model: VBOX HARDDISK
Sector size (logical/physical): 512/512 bytes
Disk identifier (GUID): ADD38987-66B0-4A0E-83AC-B3B99AE99BCB
Partition table holds up to 128 entries
Main partition table begins at sector 2 and ends at sector 33
First usable sector is 34, last usable sector is 16777182
Partitions will be aligned on 2048-sector boundaries
Total free space is 2014 sectors (1007.0 KiB)

Number  Start (sector)    End (sector)  Size      Code  Name
1         2048             16777182     8.0 GiB   8E00   Linux LVM

Command (? for help):

```



**Crea un volumen físico en esa partición, usando la orden pvcreate**

```
[U02644760~]pvcreate /dev/sdc1
Physical volume "/dev/sdc1" successfully created.
[U02644760~]
```

**Añade con la orden vgextend el volumen físico al grupo de volúmenes lógicos**

```
[U02644760~]vgextend cl /dev/sdc1
Volume group "cl" successfully extended
[U02644760~]_
```

**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).**

```
[U02644760~]mount /home
[U02644760~]xfs_growfs
Usage: xfs_growfs [options] mountpoint

Options:
  -d          grow data/metadata section
  -l          grow log section
  -r          grow realtime section
  -n          don't change anything, just show geometry
  -i          convert log from external to internal format
  -t          alternate location for mount table (/etc/mtab)
  -x          convert log from internal to external format
  -D size     grow data/metadata section to size blks
  -L size     grow/shrink log section to size blks
  -R size     grow realtime section to size blks
  -e size     set realtime extent size to size blks
  -m imaxpct  set inode max percent to imaxpct
  -V         print version information

[U02644760~]xfs_growfs /home
meta-data=/dev/mapper/cl-home    isize=512    agcount=4, agsize=1264896 blks
=                               sectsz=512    attr=2, projid32bit=1
=                               crc=1        finobt=1, sparse=1, rmapbt=0
=                               reflink=1
data      =                       bsize=4096   blocks=5059584, 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
[U02644760~]
```

**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.**

```
[U02644760~]df /home
$ .ficheros    bloques de 1K Usados Disponibles Uso% Montado en
/dev/mapper/cl-home 20228096 174144    20053952    1% /home
[U02644760~]
```

# Practica 4

**Instala el gdisk si no está ya instalado y crea dos particiones primarias en el segundo disco: la primera de 6GB de tamaño de tipo Linux y la segunda con el espacio restante (2GB) de tipo Linux LVM. Crea un filesystem en la primera partición**

```
Current type is 'Linux filesystem'
Hex code or GUID (L to show codes, Enter = 8300):
Changed type of partition to 'Linux filesystem'

Command (? for help): n
Partition number (2-128, default 2):
First sector (34-16777182, default = 12584960) or {+}-size{KMGTp}:
Last sector (12584960-16777182, default = 16777182) or {+}-size{KMGTp}: +2GiB
Last sector (12584960-16777182, default = 16777182) or {+}-size{KMGTp}:
Current type is 'Linux filesystem'
Hex code or GUID (L to show codes, Enter = 8300):
Changed type of partition to 'Linux filesystem'

Command (? for help): p
Disk /dev/sdb: 16777216 sectors, 8.0 GiB
Model: VBOX HARDDISK
Sector size (logical/physical): 512/512 bytes
Disk identifier (GUID): A4583DD1-EB3F-405D-BAAC-10E492ED7939
Partition table holds up to 128 entries
Main partition table begins at sector 2 and ends at sector 33
First usable sector is 34, last usable sector is 16777182
Partitions will be aligned on 2048-sector boundaries
Total free space is 2014 sectors (1007.0 KiB)

Number  Start (sector)    End (sector)  Size      Code  Name
   1            2048         12584959   6.0 GiB   8300   Linux filesystem
   2        12584960         16777182   2.0 GiB   8300   Linux filesystem

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/sdb.
The operation has completed successfully.
[002644760 ~]_
```

**Crea el punto de montaje /mnt/backup y monta la partición a la que acabas de dar formato en /mnt/backup**

```

[root@U0264476 ~]# mkfs /dev/sdb1
mke2fs 1.44.6 (5-Mar-2019)
/dev/sdb1 contains a ext3 file system labelled 'disco2a'
    last mounted on Mon Feb  3 10:13:02 2020
Proceed anyway? (y,N) y
Creating filesystem with 1572864 4k blocks and 393216 inodes
Filesystem UUID: 2ae6b8e8-6d8a-4a8b-9a8c-ad88af07d624
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done

[root@U0264476 ~]# mount /dev/sdb2 /mnt/backup
mount: /mnt/backup: wrong fs type, bad option, bad superblock on /dev/sdb2, missing codepage or helper program, or other error.
[root@U0264476 ~]# mount /mnt/backup /dev/sdb2
mount: /dev/sdb2: /mnt/backup is not a block device.
[root@U0264476 ~]# mount /mnt/backup /dev/sdb1
mount: /dev/sdb1: /mnt/backup is not a block device.
[root@U0264476 ~]# mount /dev/sdb1 /mnt/backup
[root@U0264476 ~]#

```

**Antes de modificar la estructura del grupo de volúmenes CentOS, guarda el archivo de configuración de LVM (.vg) para restaurarlo después en el nuevo servidor.**

**Crea un volumen físico en la segunda partición del disco:**

```

[root@U0264476 ~]# cp /etc/lvm/archive/* /mnt/backup
[root@U0264476 ~]# cp /etc/lvm/archive/* /mnt/backup
[root@U0264476 ~]# pvcreate /dev/sdb2
Physical volume "/dev/sdb2" successfully created.
[root@U0264476 ~]# vgextend cl /dev/sdb2
Volume group "cl" successfully extended
[root@U0264476 ~]# lvcreate -L1000M -s -n backupAS /dev/cl/root
Logical volume "backupAS" created.
[root@U0264476 ~]# lvs
  LV      VG Attr      LSize   Pool Origin Data%  Meta%   Move Log Cpy%Sync Convert
 backupAS cl  swi-a-s--- 1000.00m             root    0.01
  root    cl  owi-aos---   16.41g
  swap    cl  -wi-ao----    2.00g
[root@U0264476 ~]# mkdir /mnt/snapshot
[root@U0264476 ~]# mount /dev/cl/backupAS /mnt/snapshot/
mount: /mnt/snapshot: wrong fs type, bad option, bad superblock on /dev/mapper/cl-backupAS, missing codepage or helper program, or other error.
[root@U0264476 ~]# mount /dev/cl/backupAS /mnt/snapshot
mount: /mnt/snapshot: wrong fs type, bad option, bad superblock on /dev/mapper/cl-backupAS, missing codepage or helper program, or other error.
[root@U0264476 ~]# mkfs /dev/cl/backupAS
mke2fs 1.44.6 (5-Mar-2019)
/dev/cl/backupAS contains a xfs file system
Proceed anyway? (y,N) y
Creating filesystem with 4301824 4k blocks and 1077120 inodes
Filesystem UUID: 676529e8-dc32-45d6-8972-c369624ddd40
Superblock backups stored on blocks:
    32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
    4096000

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done

[root@U0264476 ~]# mount /dev/cl/backupAS /mnt/snapshot
[root@U0264476 ~]# mount -o nouuid /dev/cl/backupAS /mnt/snapshot/

```

## Instala el tar

```

root@U0264476:~$ dnf install tar
Last metadata expiration check: 0:02:58 ago on Wed 19 Feb 2020 04:38:43 AM EST.
Dependencies resolved.
=====
Package                Architecture      Version           Repository        Size
=====
Installing:
tar                    x86_64            2:1.30-4.el8      BaseOS            838
=====
Transaction Summary
=====
Install 1 Package

Total download size: 838 k
Installed size: 2.8 M
Is this ok [y/N]: y
Downloading Packages:
tar-1.30-4.el8.x86_64.rpm                                3.4 MB/s | 838 kB | 00:00
Total
1.3 MB/s | 838 kB | 00:00
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                :
  Installing                : tar-2:1.30-4.el8.x86_64
  Running scriptlet        : tar-2:1.30-4.el8.x86_64
  Verifying                 : tar-2:1.30-4.el8.x86_64
Installed:
tar-2:1.30-4.el8.x86_64

```

## Captura las salidas de los comandos lsblk -f y df -Th.

```

root@U0264476:~$ lsblk -f
NAME        FSTYPE     LABEL UUID                                MOUNTPOINT
sda
├─sda1      vfat       F64E-CE13                               /boot/efi
├─sda2      ext4       e3fc24a7-7dda-4a46-b504-f5f8bfff351bc  /boot
├─sda3      LVM2_member dzWDb7-AT8M-1e7L-EE62-qF5-NNXn-0MhS8t
│   └─cl-swap swap       155084c4-3e7b-495f-adc1-1924d02ae34b  [SWAP]
│   └─cl-root-real
│       └─cl-root xfs       b0d65fd0-9e74-4ab8-8db6-37de1cff28df  /
│           └─cl-backupAS ext2      676529e8-dc32-45d6-8972-c369624ddd40  /mnt/snapshot
sdb
├─sdb1      ext2       2ae6b8e8-6d8a-4a8b-9a0c-ad08af07d624  /mnt/backup
├─sdb2      LVM2_member jXtIP6-bqI9-1aUd-G0Ux-rAjt-7F4N-A6kp33
│   └─cl-backupAS-cow ext2      676529e8-dc32-45d6-8972-c369624ddd40  /mnt/snapshot
│   └─cl-backupAS ext2      676529e8-dc32-45d6-8972-c369624ddd40  /mnt/snapshot
sdc
├─sdc1
└─sdc2      ntfs       vol1 30E2D932E2D8FD52
sr0

root@U0264476:~$ df -Th
Filesystem            Type      Size  Used Avail Use% Mounted on
devtmpfs              devtmpfs  899M   0  899M   0% /dev
tmpfs                 tmpfs     915M   0   915M   0% /dev/shm
tmpfs                 tmpfs     915M  8.5M   906M   1% /run
tmpfs                 tmpfs     915M   0   915M   0% /sys/fs/cgroup
/dev/mapper/cl-root    xfs       17G   1.6G   15G  10% /
/dev/sda2              ext4      976M  182M   727M  21% /boot
/dev/sda1              vfat      599M   6.8M   593M   2% /boot/efi
tmpfs                 tmpfs     183M   0   183M   0% /run/user/0
/dev/sdb1              ext2      6.0G   12M   5.6G   1% /mnt/backup
/dev/mapper/cl-backupAS ext2      17G    44M   16G   1% /mnt/snapshot

```

**Haz un backup de la partición /boot (porque sólo hemos guardado copia del filesystem raíz)**

```

root@U0264476~1$ tar -cpzf /mnt/backup/boot.tgz /boot/
tar: Removing leading '/' from member names
boot/
boot/initramfs-4.18.0-147.el8.x86_64.img
boot/initramfs-4.18.0-147.el8.x86_64kdump.img
boot/initramfs-4.18.0-147.3.1.el8_1.x86_64kdump.img
boot/.vmlinuz-4.18.0-147.el8.x86_64.hmac
boot/initramfs-0-rescue-ebaf50fe4f1441b0803054b5dabfcc3e.img
boot/loader/
boot/loader/entries/
boot/loader/entries/ebaf50fe4f1441b0803054b5dabfcc3e-4.18.0-147.el8.x86_64.conf
boot/loader/entries/ebaf50fe4f1441b0803054b5dabfcc3e-0-rescue.conf
boot/loader/entries/ebaf50fe4f1441b0803054b5dabfcc3e-4.18.0-147.3.1.el8_1.x86_64.conf
boot/.vmlinuz-4.18.0-147.3.1.el8_1.x86_64.hmac
boot/System.map-4.18.0-147.3.1.el8_1.x86_64
boot/config-4.18.0-147.el8.x86_64
boot/lost+found/
boot/vmlinuz-4.18.0-147.3.1.el8_1.x86_64
boot/efi/
boot/efi/EFI/
boot/efi/EFI/BOOT/
boot/efi/EFI/BOOT/BOOTX64.EFI
boot/efi/EFI/BOOT/fbx64.efi
boot/efi/EFI/centos/
boot/efi/EFI/centos/shimx64-centos.efi
boot/efi/EFI/centos/BOOTX64.CSU
boot/efi/EFI/centos/mmx64.efi
boot/efi/EFI/centos/fonts/
boot/efi/EFI/centos/grubx64.efi
boot/efi/EFI/centos/grubenv
boot/efi/EFI/centos/shimx64.efi
boot/efi/EFI/centos/grub.cfg
boot/vmlinuz-0-rescue-ebaf50fe4f1441b0803054b5dabfcc3e
boot/System.map-4.18.0-147.el8.x86_64
boot/grub2/
boot/grub2/grubenv
boot/initramfs-4.18.0-147.3.1.el8_1.x86_64.img
boot/config-4.18.0-147.3.1.el8_1.x86_64
boot/vmlinuz-4.18.0-147.el8.x86_64
root@U0264476~1$

```

**Finalmente, para guardar el backup, se desmonta el disco sdb2 y después se elimina el snapshot de grupo de volúmenes.**

```

[root@U0264476~1$ umount /mnt/snapshot
[root@U0264476~1$ lvremove /dev/cl/backupAS
Do you really want to remove active logical volume cl/backupAS? [y/n]: y
Logical volume "backupAS" successfully removed
[root@U0264476~1$ vgreduce cl /dev/sdb2
Removed "/dev/sdb2" from volume group "cl"
[root@U0264476~1$ umount /mnt/backup
[root@U0264476~1$

```