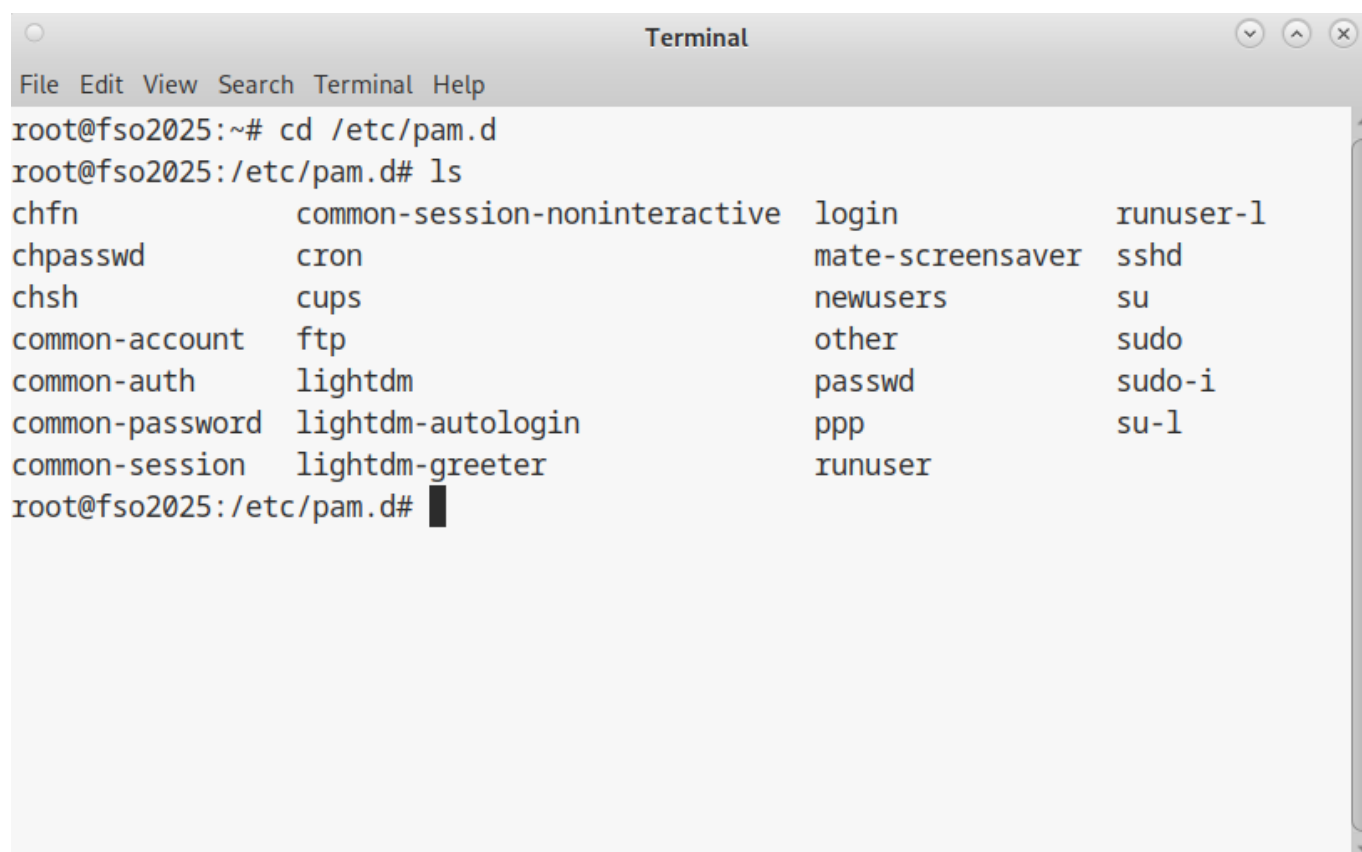


[FORT] Práctica 4: Securizando las cuentas de usuario

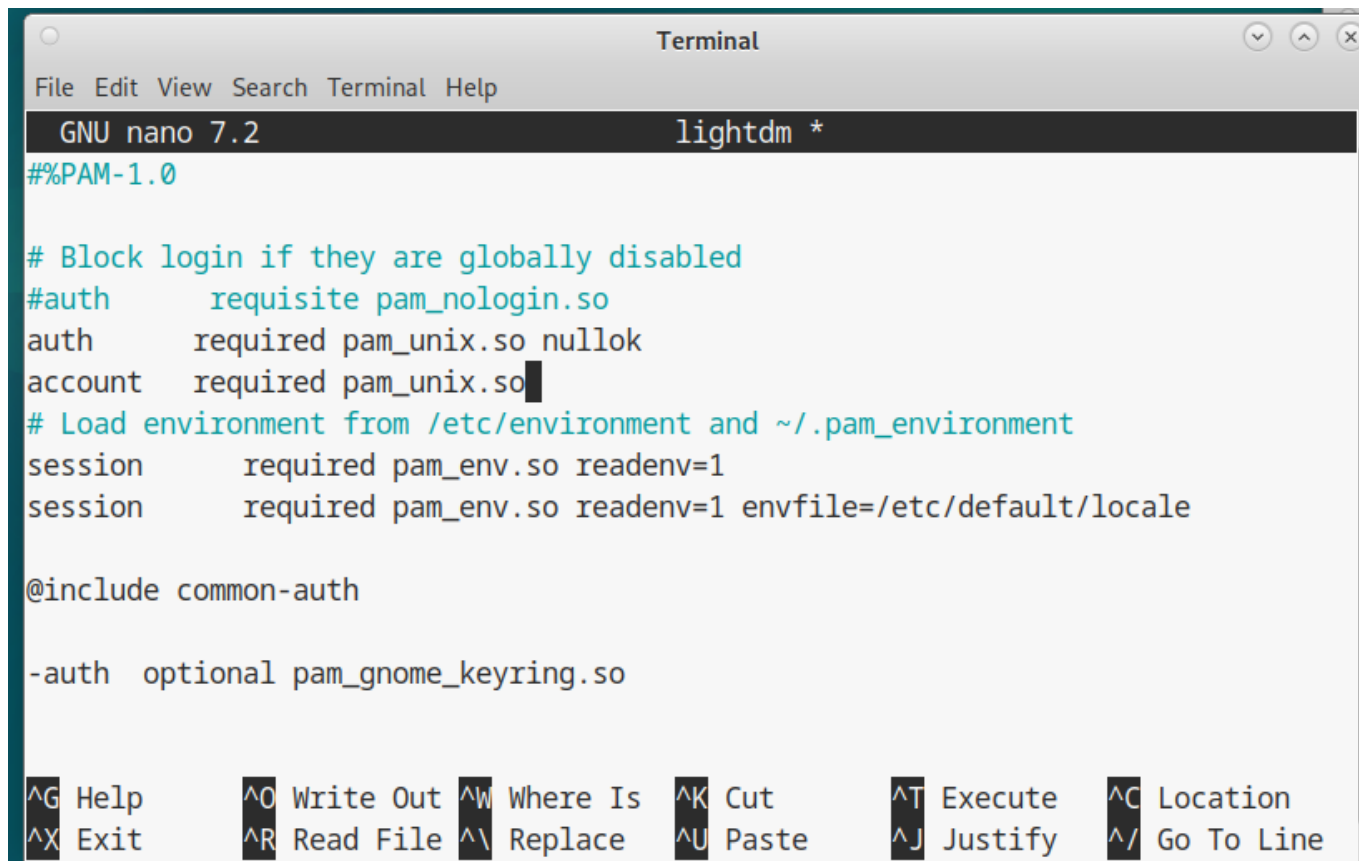
1. Deshabilita el login a root, tanto en el Display Manager como en las Terminales Virtuales excepto tty3

A terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows a root user at a machine named fso2025. The user navigates to /etc/pam.d and lists the files. The output is a list of 16 files arranged in four columns.

```
root@fso2025:~# cd /etc/pam.d
root@fso2025:/etc/pam.d# ls
chfn                common-session-noninteractive  login                      runuser-l
chpasswd            cron                           mate-screensaver          sshd
chsh                cups                            newusers                  su
common-account      ftp                            other                      sudo
common-auth          lightdm                        passwd                    sudo-i
common-password     lightdm-autologin             ppp                       su-l
common-session      lightdm-greeter               runuser
```

Para deshabilitar estos permisos vamos a modificar los archivos de PAM que se encuentran en /etc/pam.d. Para deshabilitar el acceso a root en la interfaz gráfica modificamos el archivo lightdm con las siguientes líneas:

```
auth required pam_unix.so nullok
account required pam_unix.so
```



```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 lightdm *
#%PAM-1.0

# Block login if they are globally disabled
#auth      requisite pam_nologin.so
auth       required pam_unix.so nullok
account    required pam_unix.so
# Load environment from /etc/environment and ~/.pam_environment
session    required pam_env.so readenv=1
session    required pam_env.so readenv=1 envfile=/etc/default/locale

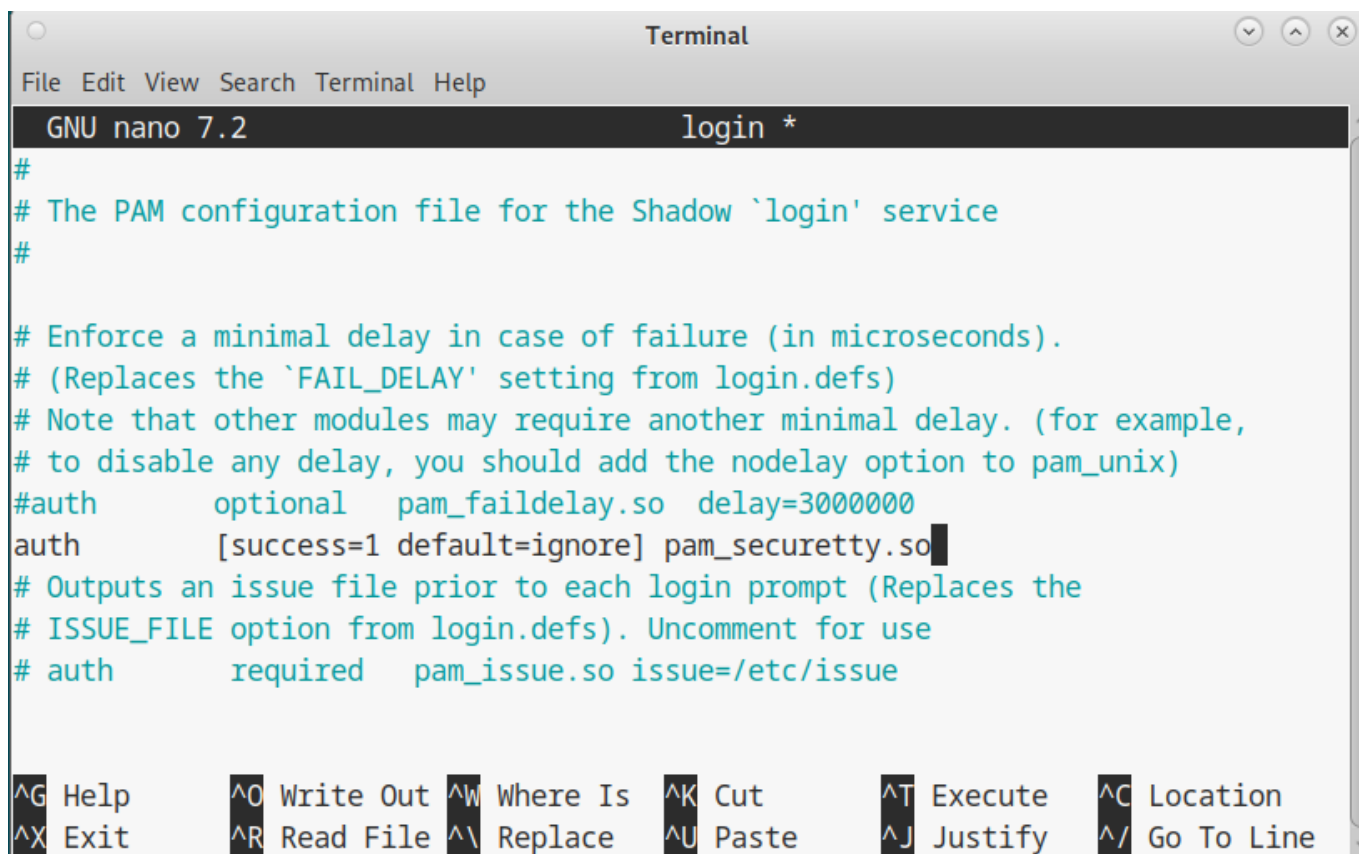
@include common-auth

-auth      optional pam_gnome_keyring.so

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace  ^U Paste     ^J Justify   ^_ Go To Line
```

Para deshabilitar los permisos en las terminales virtuales modificamos el archivo login con lo siguiente:

```
auth [success=1 default=ignore] pam_securetty.so
```



```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 login *
#
# The PAM configuration file for the Shadow `login' service
#
# Enforce a minimal delay in case of failure (in microseconds).
# (Replaces the `FAIL_DELAY' setting from login.defs)
# Note that other modules may require another minimal delay. (for example,
# to disable any delay, you should add the nodelay option to pam_unix)
#auth      optional pam_faildelay.so delay=3000000
auth      [success=1 default=ignore] pam_securetty.so
# Outputs an issue file prior to each login prompt (Replaces the
# ISSUE_FILE option from login.defs). Uncomment for use
# auth      required pam_issue.so issue=/etc/issue

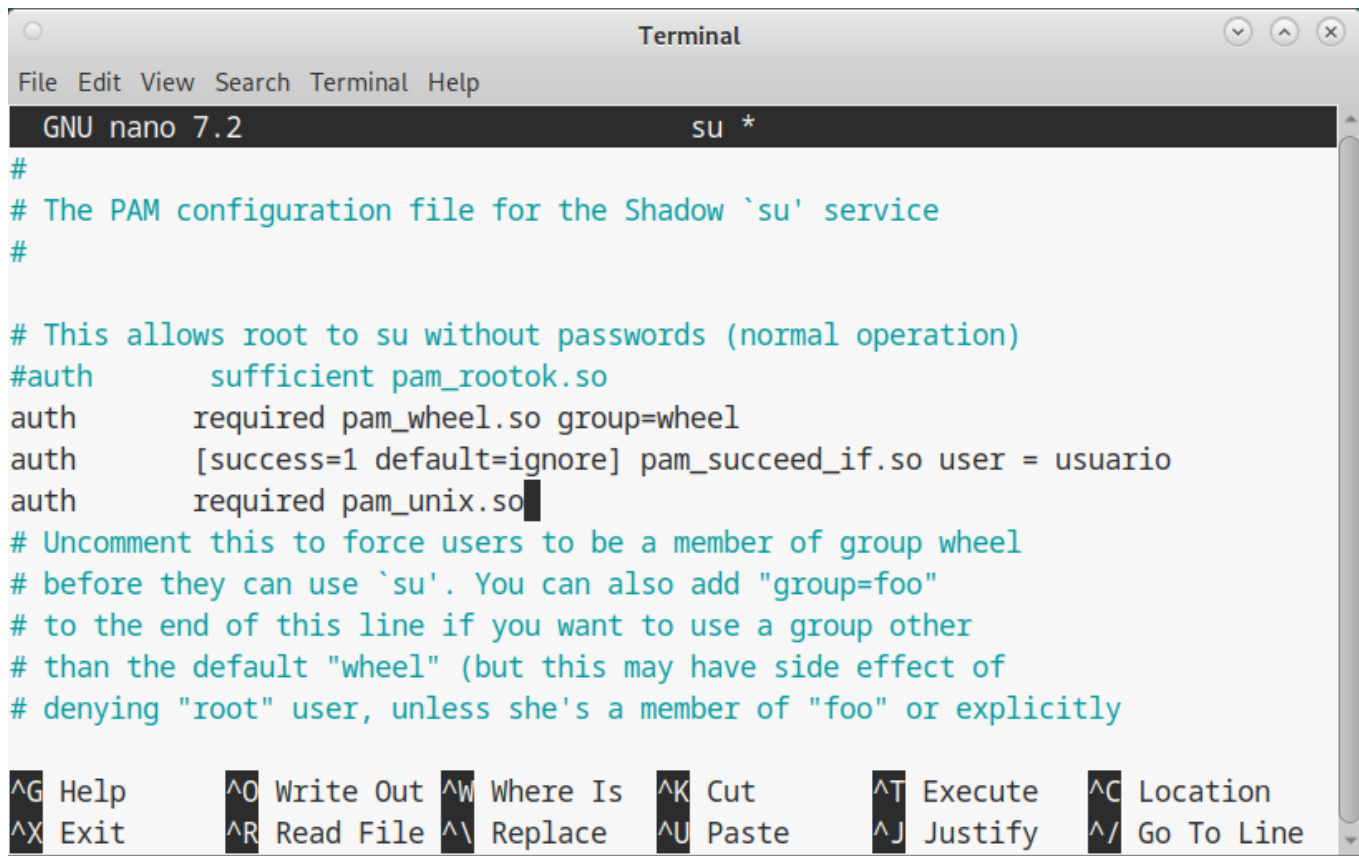
^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

2. Usando el módulo pam_wheel.so haz que solo usuario, user001, user002, user003 y user004 puedan volverse root con SU.

Usuario no necesita saber la contraseña, mientras que los usuarios del 001 al 004 la necesitan para convertirse en root. Al resto de usuarios no se les preguntará por la contraseña.

Para aplicar los ajustes debemos modificar el archivo /etc/pam.d/su con las siguientes líneas:

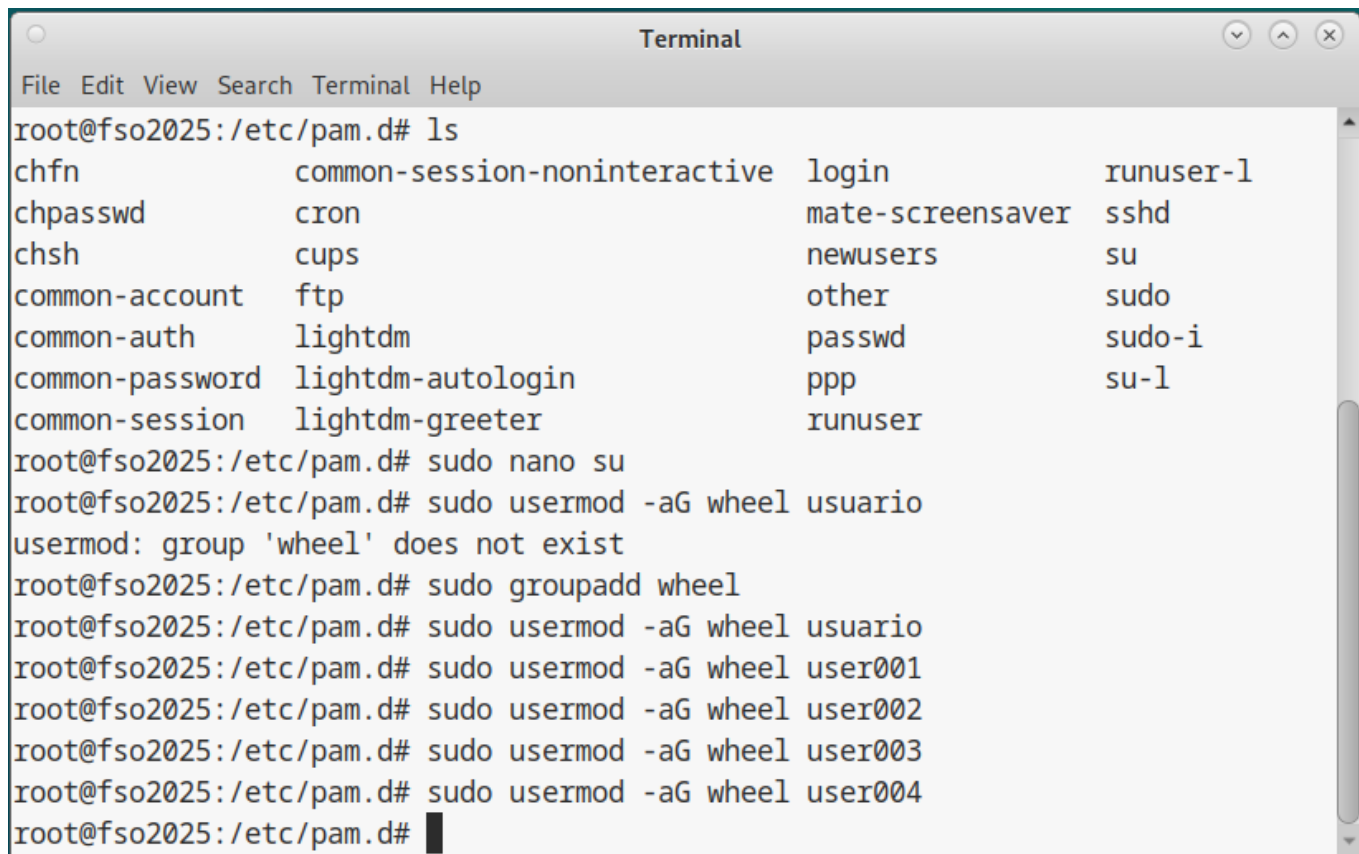
```
auth required pam_wheel.so group=wheel #Permite a los usuario del grupo
Wheel a usar su sin contraseña
auth [success=1 default=ignore] pam_succeed_if.so user = usuario #Permite al
usuario "usuario" usar su sin contraseña
auth required pam_unix.so #se configura para permitir que los usuarios
indicados tengan que poner la contraseña
```



```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 su *
#
# The PAM configuration file for the Shadow `su' service
#
# This allows root to su without passwords (normal operation)
#auth sufficient pam_rootok.so
auth required pam_wheel.so group=wheel
auth [success=1 default=ignore] pam_succeed_if.so user = usuario
auth required pam_unix.so
# Uncomment this to force users to be a member of group wheel
# before they can use `su'. You can also add "group=foo"
# to the end of this line if you want to use a group other
# than the default "wheel" (but this may have side effect of
# denying "root" user, unless she's a member of "foo" or explicitly
^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

También debemos añadir a los usuarios en cuestión al grupo wheel con el siguiente comando:

```
sudo usermod -aG wheel usuario
sudo usermod -aG wheel user001
sudo usermod -aG wheel user002
sudo usermod -aG wheel user003
sudo usermod -aG wheel user004
```



```
Terminal
File Edit View Search Terminal Help
root@fso2025:/etc/pam.d# ls
chfn          common-session-noninteractive  login          runuser-l
chpasswd      cron                          mate-screensaver  sshd
chsh          cups                          newusers        su
common-account  ftp                          other          sudo
common-auth     lightdm                     passwd         sudo-i
common-password lightdm-autologin          ppp           su-l
common-session  lightdm-greeter            runuser

root@fso2025:/etc/pam.d# sudo nano su
root@fso2025:/etc/pam.d# sudo usermod -aG wheel usuario
usermod: group 'wheel' does not exist
root@fso2025:/etc/pam.d# sudo groupadd wheel
root@fso2025:/etc/pam.d# sudo usermod -aG wheel usuario
root@fso2025:/etc/pam.d# sudo usermod -aG wheel user001
root@fso2025:/etc/pam.d# sudo usermod -aG wheel user002
root@fso2025:/etc/pam.d# sudo usermod -aG wheel user003
root@fso2025:/etc/pam.d# sudo usermod -aG wheel user004
root@fso2025:/etc/pam.d#
```

3. ¿Que método de cifrado se usa para las contraseñas? ¿Ha sido usado el mismo método para todas las contraseñas en el sistema?

Deberíamos usar SHA256 y cambiar las contraseñas de todos los usuarios a SHA256

¿Como deberíamos hacer? Echando un vistazo a /etc/shadow podemos ver las contraseñas cifradas por un lado para root:

```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 /etc/shadow *
root:$y$j9T$wu40xxdm9Ir3ymK4lJ47z1$f53H9ADkTixSlwhsfLdZBib1UwabqEGlQbgCZMBJps7:>
daemon*:20115:0:99999:7:::
bin*:20115:0:99999:7:::
sys*:20115:0:99999:7:::
sync*:20115:0:99999:7:::
games*:20115:0:99999:7:::
man*:20115:0:99999:7:::
lp*:20115:0:99999:7:::
mail*:20115:0:99999:7:::
news*:20115:0:99999:7:::
uucp*:20115:0:99999:7:::
proxy*:20115:0:99999:7:::
www-data*:20115:0:99999:7:::
backup*:20115:0:99999:7:::

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

y por otro lado para los demás usuarios:

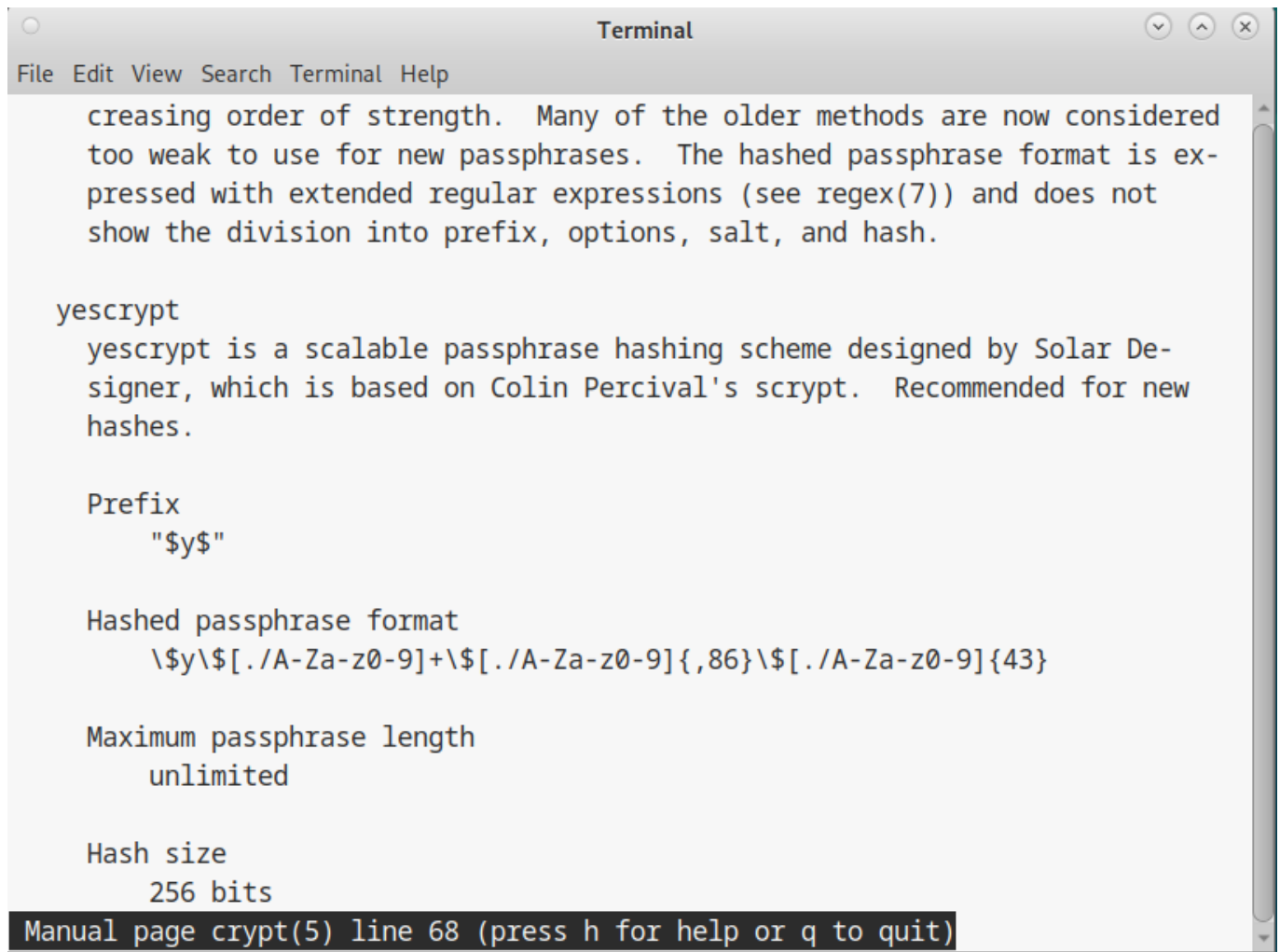
```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 /etc/shadow *
rtkit:!:20115:~::~:
colord:!:20115:~::~:
usuario:$y$j9T$dx2hZfuBiaZpB8x4cjyZm.$b2M0A9rJsqFb8kvQMwX2NRVyrEM9JqQGK0vzq01yW>
uuid:!:20115:~::~:
user001:$6$4QEkgEuOiUzWswK0$1hjftTeKiVJfjYxZwfxlUXZ7w.suJ8uiA40B6VzRjSS/2qDf1hC>
user002:$6$0M2lqX07ESE8DY9b$HvsE/QnieTSnsL5be24PlDIhvcGfNBCgI3oGydBF6yqz1K2VSnS>
user003:$6$Zw6r35Qf20xiCYr7$VJ//D08AIVuU1FeZ17RS6mUKjbbR36YvxiDmLYNNkfgBlsMSl4P>
user004:$6$CXltgKwCn7lzPVaE$LEZnsPsjcWztH69uPZ8ygFxiM49nEhNLpwvhMcpuA0yqN1L2UDt>
user005:$6$gkWfHVDpbjxEaMnS$hlvgf1UQ3QY0YDrt0L00vA67fSWSojeeqFeFSH5ghQvaCCNLpDc>
user006:$6$/u0MD2Xd93/cpQvy$LJIxCFRTNAJ8JL/mZvkwk6X.jD6DNZPcYq64q6k.2kENN7t.ssk>
user007:$6$avIuVZCVG1N4oQER$CuMBpN6m0FYhKt0zxAwoejBjZzTtQ0.FBpsCmZ3tsIezlVIF4KI>
user008:$6$sE3lylb2jY.dkdHT$3VC7w.IGXIPcP07KpXCSZ3jvzeLHM5rMBEkCLrHd2wvYPt3Fuow>
user009:$6$6pBgxkku.9VNCyW9$Prv0pWjRPudNWUY.hlevk4MonrR937N5i8rTx5dNujvoemDyhTS>
user010:$6$zul.ya6hES20TBWu$0e8/USvfja/zhJ8BPRRvUEk6Edwgoipk0iHrhC2tBcJt8UXTHqE>

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

Las contraseñas en general comienzan con una cadena `\$<caracter>\$`, estos primeros 3 caracteres señalan en que cifrado viene cada contraseña, por lo que sabemos que:

- Root y usuario comienzan con `\$y\$`, por lo que sabemos que usa yescrypt
- El resto de usuarios comienzan con `\$6\$`, por lo que sabemos que usan SHA-512

Esto lo sabemos gracias a las salidas del comando `man 5 crypt`, donde podemos ver que es cada cifrado, por ejemplo, el de root y usuario sería el siguiente:



```
creasing order of strength. Many of the older methods are now considered
too weak to use for new passphrases. The hashed passphrase format is ex-
pressed with extended regular expressions (see regex(7)) and does not
show the division into prefix, options, salt, and hash.

yescrypt
yescrypt is a scalable passphrase hashing scheme designed by Solar De-
signer, which is based on Colin Percival's script. Recommended for new
hashes.

Prefix
"$y$"

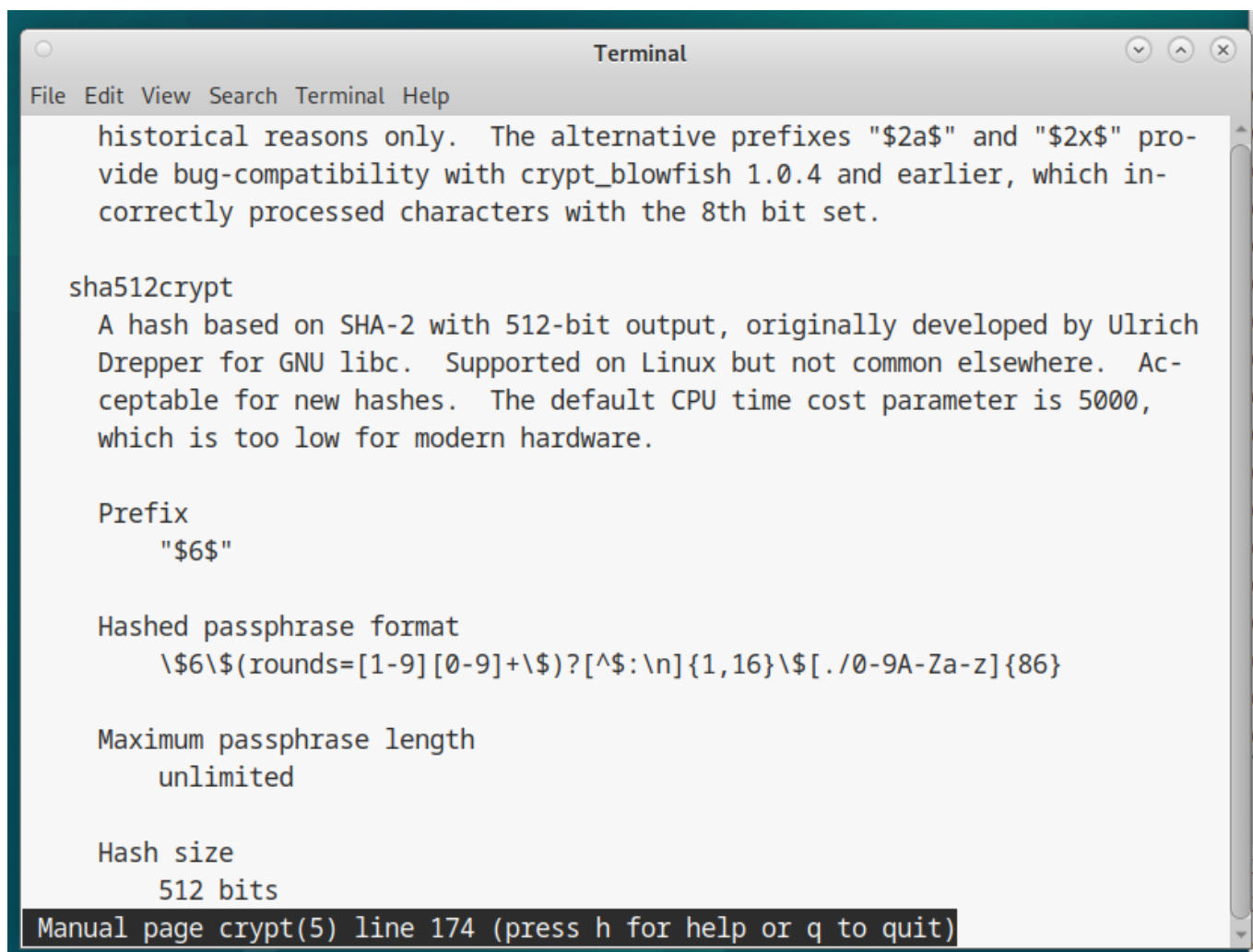
Hashed passphrase format
\$y\$[./A-Za-z0-9]+\$[./A-Za-z0-9]{,86}\$[./A-Za-z0-9]{43}

Maximum passphrase length
unlimited

Hash size
256 bits

Manual page crypt(5) line 68 (press h for help or q to quit)
```

Y el del resto de usuarios sería el siguiente:



```
Terminal
File Edit View Search Terminal Help

historical reasons only. The alternative prefixes "$2a$" and "$2x$" provide bug-compatibility with crypt_blowfish 1.0.4 and earlier, which incorrectly processed characters with the 8th bit set.

sha512crypt
A hash based on SHA-2 with 512-bit output, originally developed by Ulrich Drepper for GNU libc. Supported on Linux but not common elsewhere. Acceptable for new hashes. The default CPU time cost parameter is 5000, which is too low for modern hardware.

Prefix
"$6$"

Hashed passphrase format
\ $6\$(rounds=[1-9][0-9]+\$)?[^\$:\n]{1,16}\$[./0-9A-Za-z]{86}

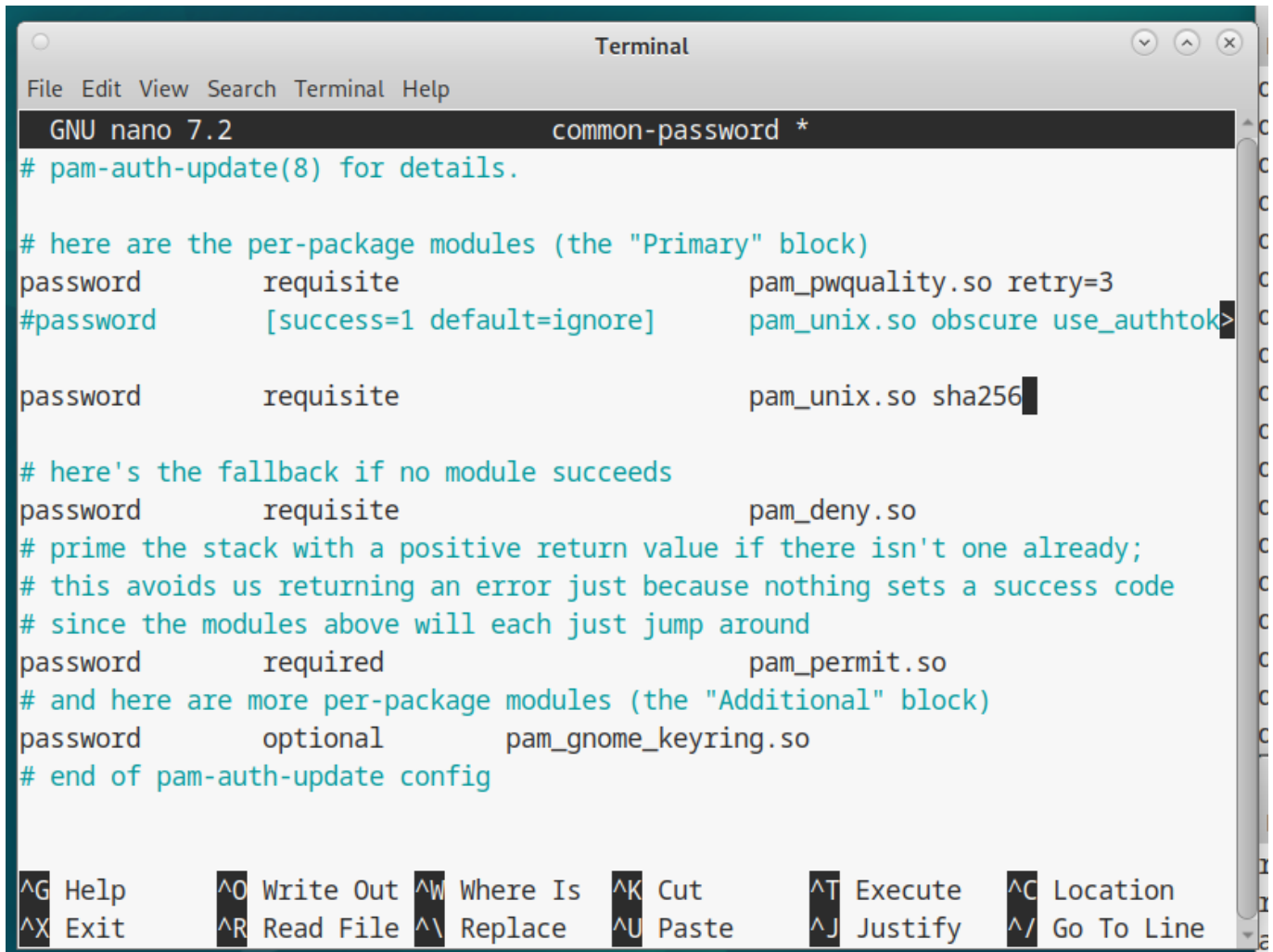
Maximum passphrase length
unlimited

Hash size
512 bits

Manual page crypt(5) line 174 (press h for help or q to quit)
```

Para cambiar el cifrado de todos los usuarios a SHA256 habría que primero cambiar cual es el cifrado predeterminado en `/etc/pam.d/common-password` con las siguientes líneas:

```
password requisite pam_unix.so sha256
```



```
Terminal
File Edit View Search Terminal Help
GNU nano 7.2 common-password *
# pam-auth-update(8) for details.

# here are the per-package modules (the "Primary" block)
password      requisite                    pam_pwquality.so retry=3
#password      [success=1 default=ignore]    pam_unix.so obscure use_authtok>

password      requisite                    pam_unix.so sha256

# here's the fallback if no module succeeds
password      requisite                    pam_deny.so
# prime the stack with a positive return value if there isn't one already;
# this avoids us returning an error just because nothing sets a success code
# since the modules above will each just jump around
password      required                     pam_permit.so
# and here are more per-package modules (the "Additional" block)
password      optional                     pam_gnome_keyring.so
# end of pam-auth-update config

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line
```

Y tras eso modificar todas las contraseñas con un script como este:

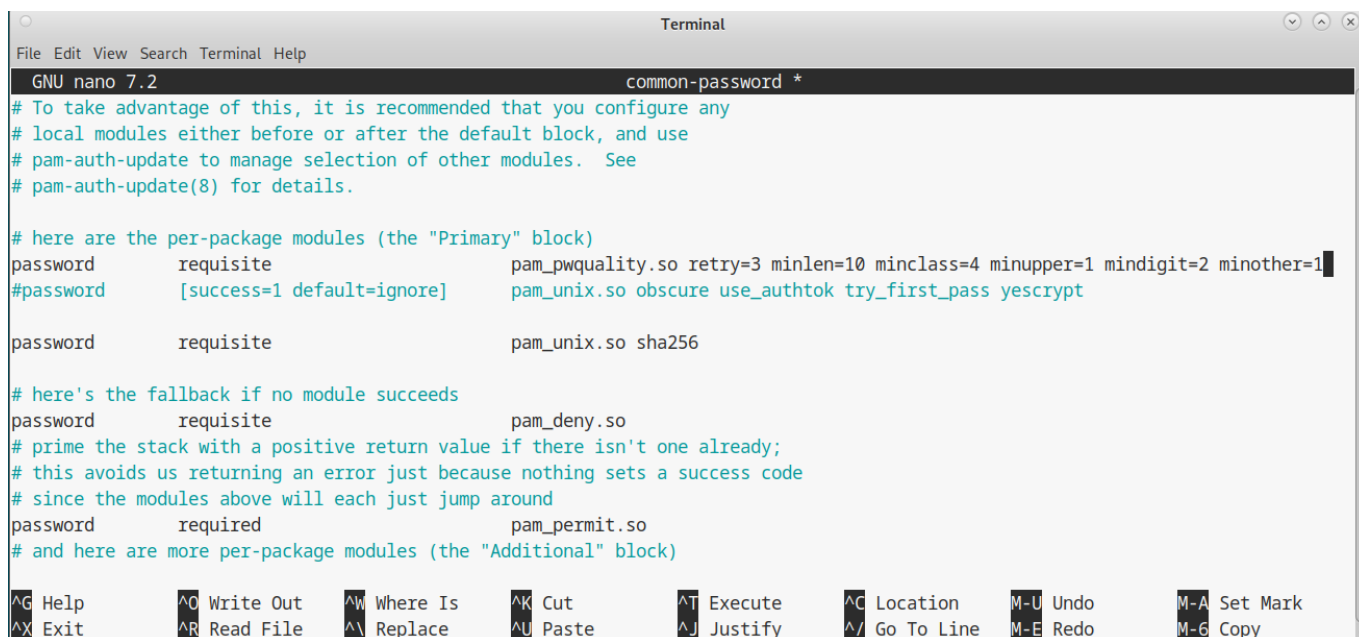
```
for user in $(cut -f1 -d: /etc/passwd); do
    sudo passwd --stdin $user
done
```

4. Fuerza los siguientes requisitos para los cambios de contraseña

- Al menos 10 caracteres
- Debe contener mayúsculas y minúsculas
- Debe contener al menos 2 dígitos
- Debe contener al menos un carácter no alfanumérico
- No puede ser una de las 3 contraseñas anteriores

Para aplicar dichas políticas de contraseña debemos modificar el módulo common-password de PAM añadiendo la siguiente línea:

```
password requisite pam_pwquality.so retry=3 minlen=10 minclass=4 minupper=1 mindigit=2 minother=1
```



```
GNU nano 7.2 common-password *
# To take advantage of this, it is recommended that you configure any
# local modules either before or after the default block, and use
# pam-auth-update to manage selection of other modules. See
# pam-auth-update(8) for details.

# here are the per-package modules (the "Primary" block)
password      requisite      pam_pwquality.so retry=3 minlen=10 minclass=4 minupper=1 mindigit=2 minother=1
#password      [success=1 default=ignore] pam_unix.so obscure use_authtok try_first_pass yescrypt

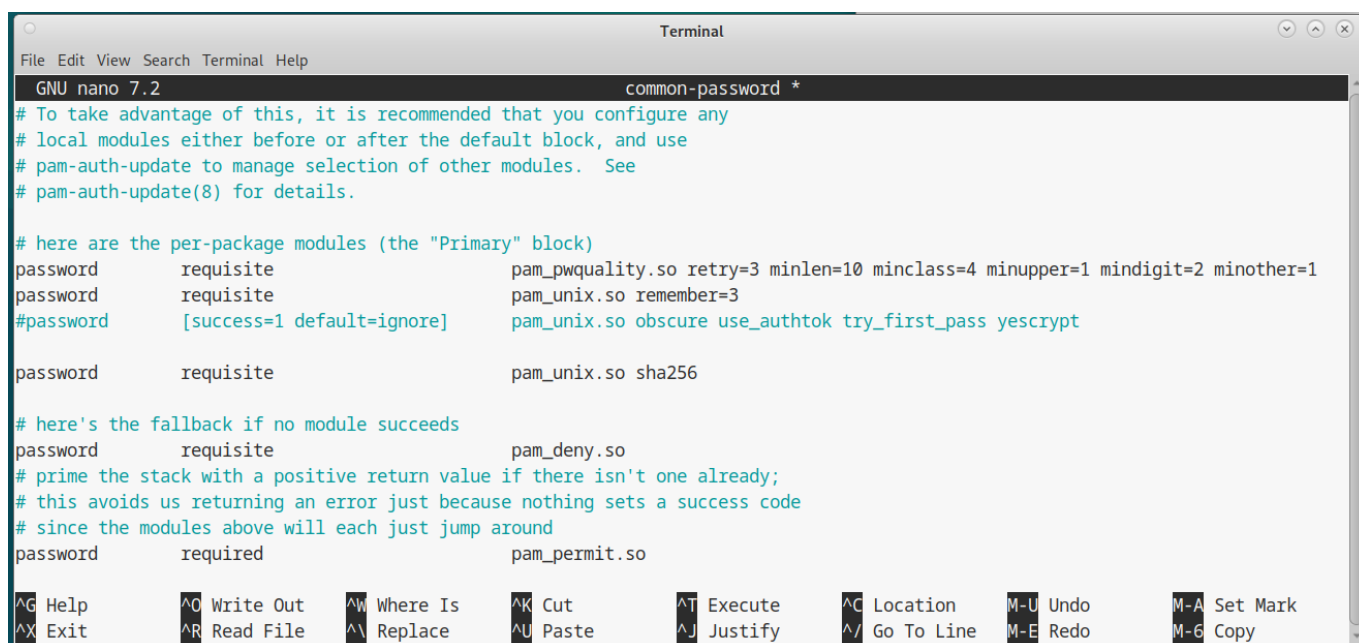
password      requisite      pam_unix.so sha256

# here's the fallback if no module succeeds
password      requisite      pam_deny.so
# prime the stack with a positive return value if there isn't one already;
# this avoids us returning an error just because nothing sets a success code
# since the modules above will each just jump around
password      required       pam_permit.so
# and here are more per-package modules (the "Additional" block)

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location  M-U Undo     M-A Set Mark
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line M-E Redo     M-G Copy
```

Tras esto faltaría por establecer que no se puedan usar las 3 contraseñas anteriores, para ello añadimos en el mismo fichero la siguiente línea:

```
password requisite pam_unix.so remember=3
```



```
GNU nano 7.2 common-password *
# To take advantage of this, it is recommended that you configure any
# local modules either before or after the default block, and use
# pam-auth-update to manage selection of other modules. See
# pam-auth-update(8) for details.

# here are the per-package modules (the "Primary" block)
password      requisite      pam_pwquality.so retry=3 minlen=10 minclass=4 minupper=1 mindigit=2 minother=1
password      requisite      pam_unix.so remember=3
#password      [success=1 default=ignore] pam_unix.so obscure use_authtok try_first_pass yescrypt

password      requisite      pam_unix.so sha256

# here's the fallback if no module succeeds
password      requisite      pam_deny.so
# prime the stack with a positive return value if there isn't one already;
# this avoids us returning an error just because nothing sets a success code
# since the modules above will each just jump around
password      required       pam_permit.so

^G Help      ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location  M-U Undo     M-A Set Mark
^X Exit      ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^_ Go To Line M-E Redo     M-G Copy
```

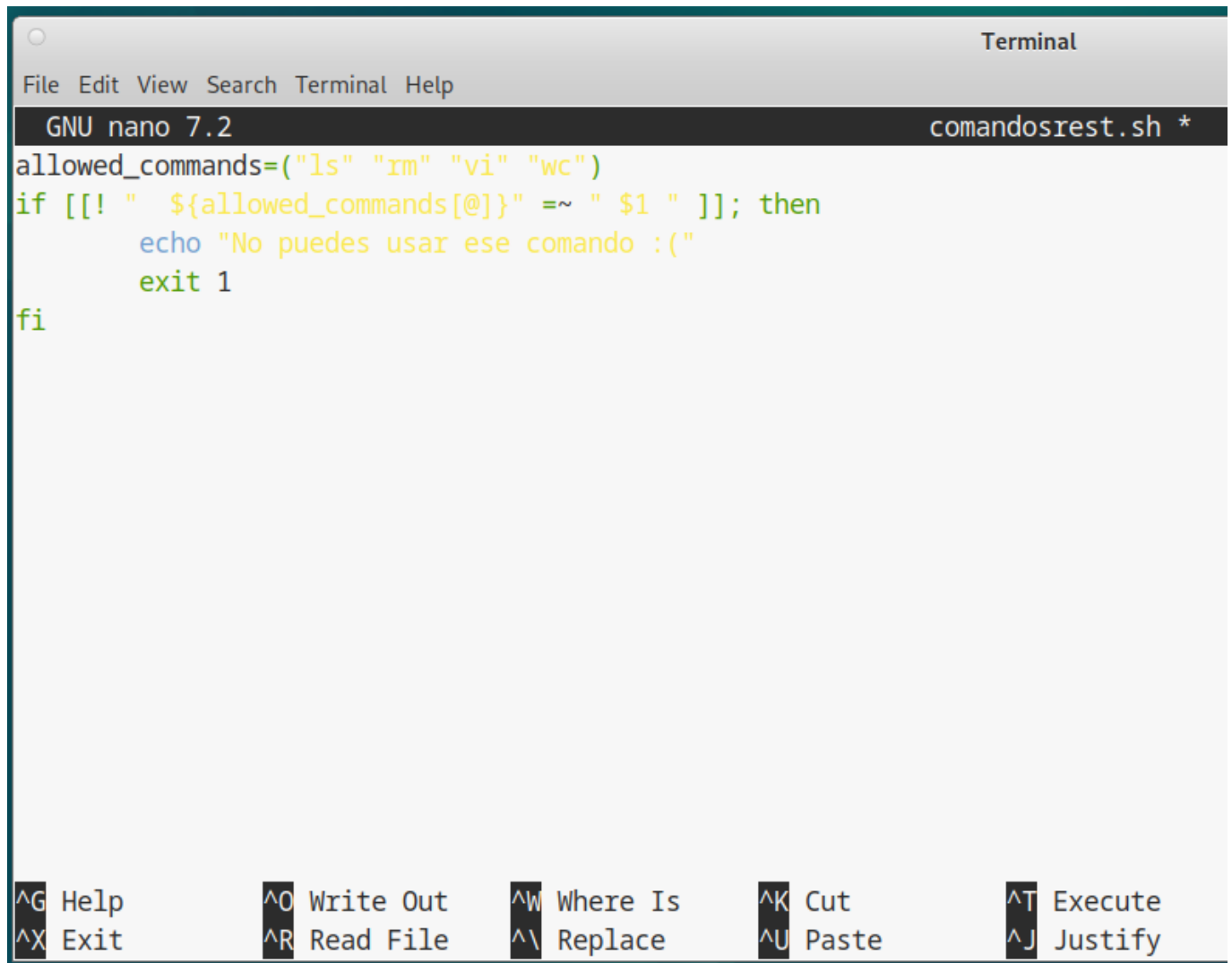
5. El usuario user010 SOLO puede ejecutar ls, rm, vi y wc

Para poder limitar el usuario de esta manera debemos comenzar por modificar el módulo login de PAM con la siguiente línea

```
auth required pam_shells.so
```

Tras eso creamos un archivo con los comandos restringidos llamado comandosrest.sh:

```
allowed_commands=("ls" "rm" "vi" "wc")
if [[ ! " ${allowed_commands[@]} " =~ " $1 " ]]; then
    echo "No puedes ejecutar ese comando :("
    exit 1
fi
```



The screenshot shows a terminal window titled "Terminal" with a menu bar (File, Edit, View, Search, Terminal, Help). The editor is GNU nano 7.2, editing a file named "comandosrest.sh". The code in the editor is:

```
allowed_commands=("ls" "rm" "vi" "wc")
if [[ ! " ${allowed_commands[@]} " =~ " $1 " ]]; then
    echo "No puedes usar ese comando :("
    exit 1
fi
```

At the bottom of the terminal, there is a status bar with keyboard shortcuts: ^G Help, ^O Write Out, ^W Where Is, ^K Cut, ^T Execute, ^X Exit, ^R Read File, ^\ Replace, ^U Paste, and ^J Justify.

Tras eso volvemos al archivo de login y añadimos la siguiente línea:

```
session required pam_exec.so /etc/pam.d/comandosrest.sh
```

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