

Laboratorio 5

The screenshot shows a terminal window titled "diggspapu@diggs-papu-laptop: ~". The window contains the following text output from a command-line session:

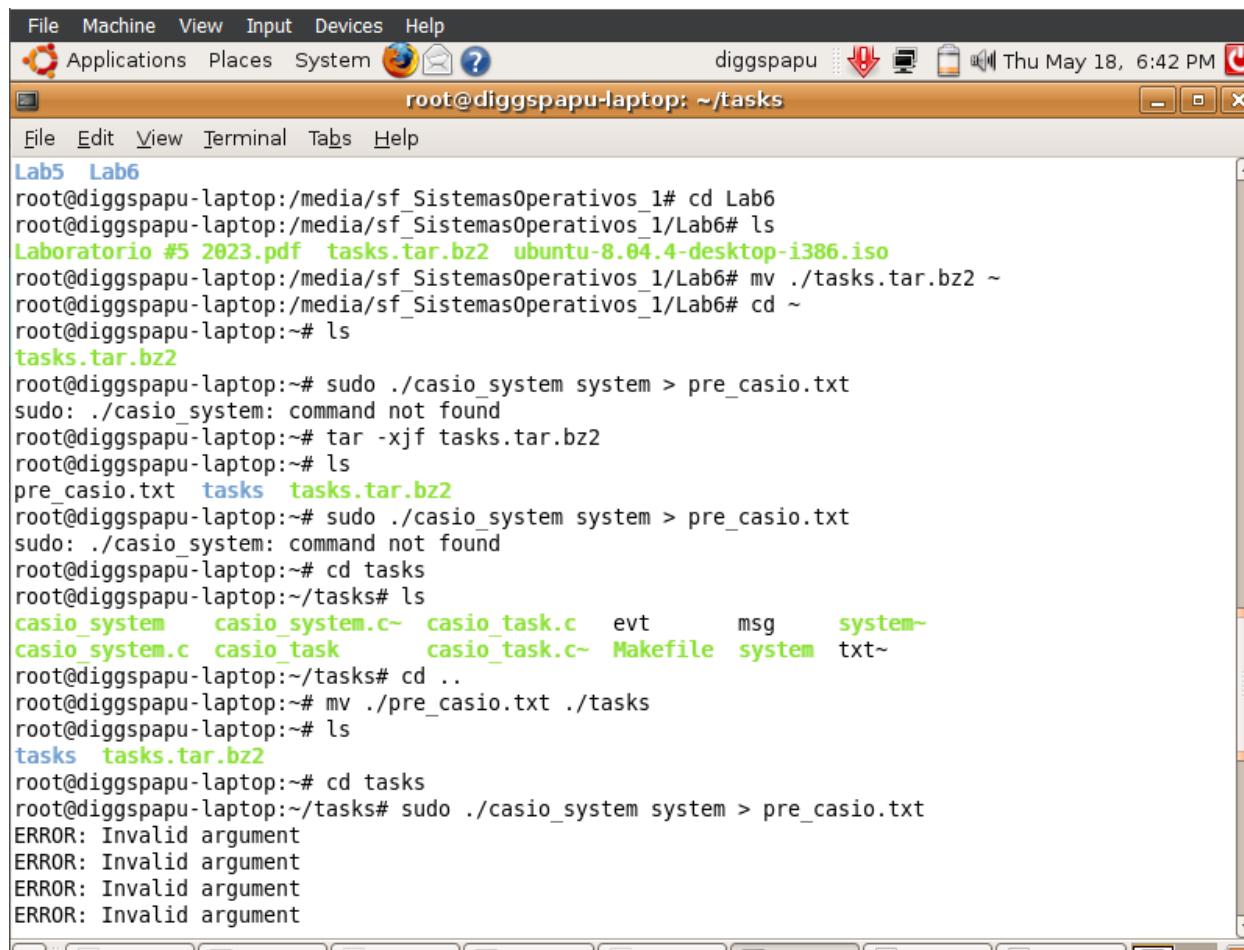
```
diggspapu@diggs-papu-laptop:~$ sudo /media/cdrom/VBoxLinuxAdditions.run
Verifying archive integrity... 100% MD5 checksums are OK. All good.
Uncompressing VirtualBox 7.0.8 Guest Additions for Linux 100%
VirtualBox Guest Additions installer
Removing installed version 7.0.8 of VirtualBox Guest Additions...
vboxadd-service.sh: Stopping VirtualBox Guest Addition service.
You may need to restart your guest system to finish removing guest drivers or
consider running 'rcvboxadd reload'.
Copying additional installer modules ...
Installing additional modules ...
Adding system startup for /etc/init.d/vboxadd ...
/etc/rc0.d/K90vboxadd -> ../init.d/vboxadd
/etc/rc1.d/K90vboxadd -> ../init.d/vboxadd
/etc/rc6.d/K90vboxadd -> ../init.d/vboxadd
/etc/rc2.d/S10vboxadd -> ../init.d/vboxadd
/etc/rc3.d/S10vboxadd -> ../init.d/vboxadd
/etc/rc4.d/S10vboxadd -> ../init.d/vboxadd
/etc/rc5.d/S10vboxadd -> ../init.d/vboxadd
Adding system startup for /etc/init.d/vboxadd-service ...
/etc/rc0.d/K65vboxadd-service -> ../init.d/vboxadd-service
/etc/rc1.d/K65vboxadd-service -> ../init.d/vboxadd-service
/etc/rc6.d/K65vboxadd-service -> ../init.d/vboxadd-service
/etc/rc2.d/S35vboxadd-service -> ../init.d/vboxadd-service
/etc/rc3.d/S35vboxadd-service -> ../init.d/vboxadd-service
/etc/rc4.d/S35vboxadd-service -> ../init.d/vboxadd-service
/etc/rc5.d/S35vboxadd-service -> ../init.d/vboxadd-service
VirtualBox Guest Additions: Starting.
VirtualBox Guest Additions: Setting up modules
VirtualBox Guest Additions: Building the VirtualBox Guest Additions kernel
```

The terminal window has a title bar "diggspapu@diggs-papu-laptop: ~". The bottom of the window shows a taskbar with several icons and a tooltip "Click to switch to 'Desk 2'".

The screenshot shows a terminal window titled "diggsapu@diggsapu-laptop: ~". The window contains the following text output from a terminal session:

```
File Edit View Terminal Tabs Help
diggsapu@diggsapu-laptop:~$ sudo /media/cdrom/VBoxLinuxAdditions.run
Verifying archive integrity... 100% MD5 checksums are OK. All good.
Uncompressing VirtualBox 7.0.8 Guest Additions for Linux 100%
VirtualBox Guest Additions installer
Removing installed version 7.0.8 of VirtualBox Guest Additions...
vboxadd-service.sh: Stopping VirtualBox Guest Addition service.
You may need to restart your guest system to finish removing guest drivers or
consider running 'rcvboxadd reload'.
Copying additional installer modules ...
Installing additional modules ...
Adding system startup for /etc/init.d/vboxadd ...
/etc/rc0.d/K90vboxadd -> ../init.d/vboxadd
/etc/rc1.d/K90vboxadd -> ../init.d/vboxadd
/etc/rc6.d/K90vboxadd -> ../init.d/vboxadd
/etc/rc2.d/S10vboxadd -> ../init.d/vboxadd
/etc/rc3.d/S10vboxadd -> ../init.d/vboxadd
/etc/rc4.d/S10vboxadd -> ../init.d/vboxadd
/etc/rc5.d/S10vboxadd -> ../init.d/vboxadd
Adding system startup for /etc/init.d/vboxadd-service ...
/etc/rc0.d/K65vboxadd-service -> ../init.d/vboxadd-service
/etc/rc1.d/K65vboxadd-service -> ../init.d/vboxadd-service
/etc/rc6.d/K65vboxadd-service -> ../init.d/vboxadd-service
/etc/rc2.d/S35vboxadd-service -> ../init.d/vboxadd-service
/etc/rc3.d/S35vboxadd-service -> ../init.d/vboxadd-service
/etc/rc4.d/S35vboxadd-service -> ../init.d/vboxadd-service
/etc/rc5.d/S35vboxadd-service -> ../init.d/vboxadd-service
VirtualBox Guest Additions: Starting.
VirtualBox Guest Additions: Setting up modules
VirtualBox Guest Additions: Building the VirtualBox Guest Additions kernel
```

The terminal window has a title bar "diggsapu@diggsapu-laptop: ~" and a menu bar with options: File, Edit, View, Terminal, Tabs, Help. The window is running on a desktop environment with a taskbar at the bottom. A tooltip "Click to switch to 'Desk 2'" is visible on the right side of the taskbar.



```
File Machine View Input Devices Help
Applications Places System diggspapu Thu May 18, 6:42 PM
root@diggspapu-laptop: ~/tasks
File Edit View Terminal Tabs Help
Lab5 Lab6
root@diggspapu-laptop:/media/sf_SistemasOperativos_1# cd Lab6
root@diggspapu-laptop:/media/sf_SistemasOperativos_1/Lab6# ls
Laboratorio #5 2023.pdf tasks.tar.bz2 ubuntu-8.04.4-desktop-i386.iso
root@diggspapu-laptop:/media/sf_SistemasOperativos_1/Lab6# mv ./tasks.tar.bz2 ~
root@diggspapu-laptop:/media/sf_SistemasOperativos_1/Lab6# cd ~
root@diggspapu-laptop:~# ls
tasks.tar.bz2
root@diggspapu-laptop:~# sudo ./casio_system system > pre_casio.txt
sudo: ./casio_system: command not found
root@diggspapu-laptop:~# tar -xjf tasks.tar.bz2
root@diggspapu-laptop:~# ls
pre_casio.txt tasks tasks.tar.bz2
root@diggspapu-laptop:~# sudo ./casio_system system > pre_casio.txt
sudo: ./casio_system: command not found
root@diggspapu-laptop:~# cd tasks
root@diggspapu-laptop:~/tasks# ls
casio_system casio_system.c~ casio_task.c evt msg system~
casio_system.c casio_task casio_task.c~ Makefile system txt~
root@diggspapu-laptop:~/tasks# cd ..
root@diggspapu-laptop:~/tasks# mv ./pre_casio.txt ./tasks
root@diggspapu-laptop:~/tasks# ls
tasks tasks.tar.bz2
root@diggspapu-laptop:~/tasks# cd tasks
root@diggspapu-laptop:~/tasks# sudo ./casio_system system > pre_casio.txt
ERROR: Invalid argument
ERROR: Invalid argument
ERROR: Invalid argument
ERROR: Invalid argument
```

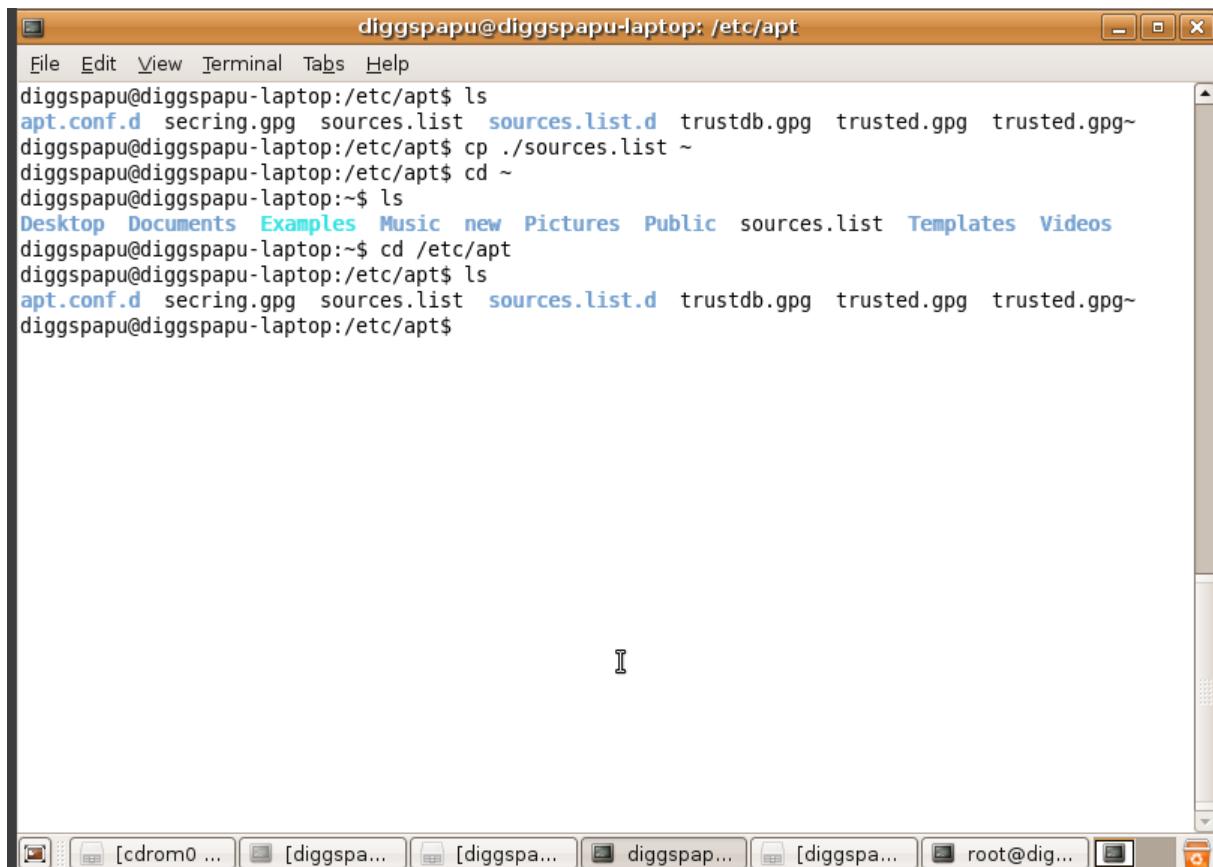
```
File Machine View Input Devices Help
Applications Places System diggspapu Thu May 18, 6:47 PM
root@diggspapu-laptop: ~/tasks
File Edit View Terminal Tabs Help
root@diggspapu-laptop:~/tasks# cd ..
root@diggspapu-laptop:~# ls
tasks tasks.tar.bz2
root@diggspapu-laptop:~# cd ..
root@diggspapu-laptop:/# cd ~/tasks
root@diggspapu-laptop:~/tasks# ls
casio_system casio_task evt pre_casio.txt txt~
casio_system.c casio_task.c Makefile system
casio_system.c~ casio_task.c~ msg system~
root@diggspapu-laptop:~/tasks# cat pre_casio.txt

pid[4]
deadline[150000000000]
Before sched_setscheduler:priority 0
After sched_setscheduler:priority 0

Task(4) has just started
Job(4,1) starts
Job(4,1) ends (0.730000)
Job(4,2) starts
Job(4,2) ends (1.530000)
Job(4,3) starts
Job(4,3) ends (1.550000)

Task(4) has finished
I will send a SIGUSR1 signal to start all tasks
I will send a SIGUSR2 signal to finish all tasks
All tasks have finished properly!!!
root@diggspapu-laptop:~/tasks#
```

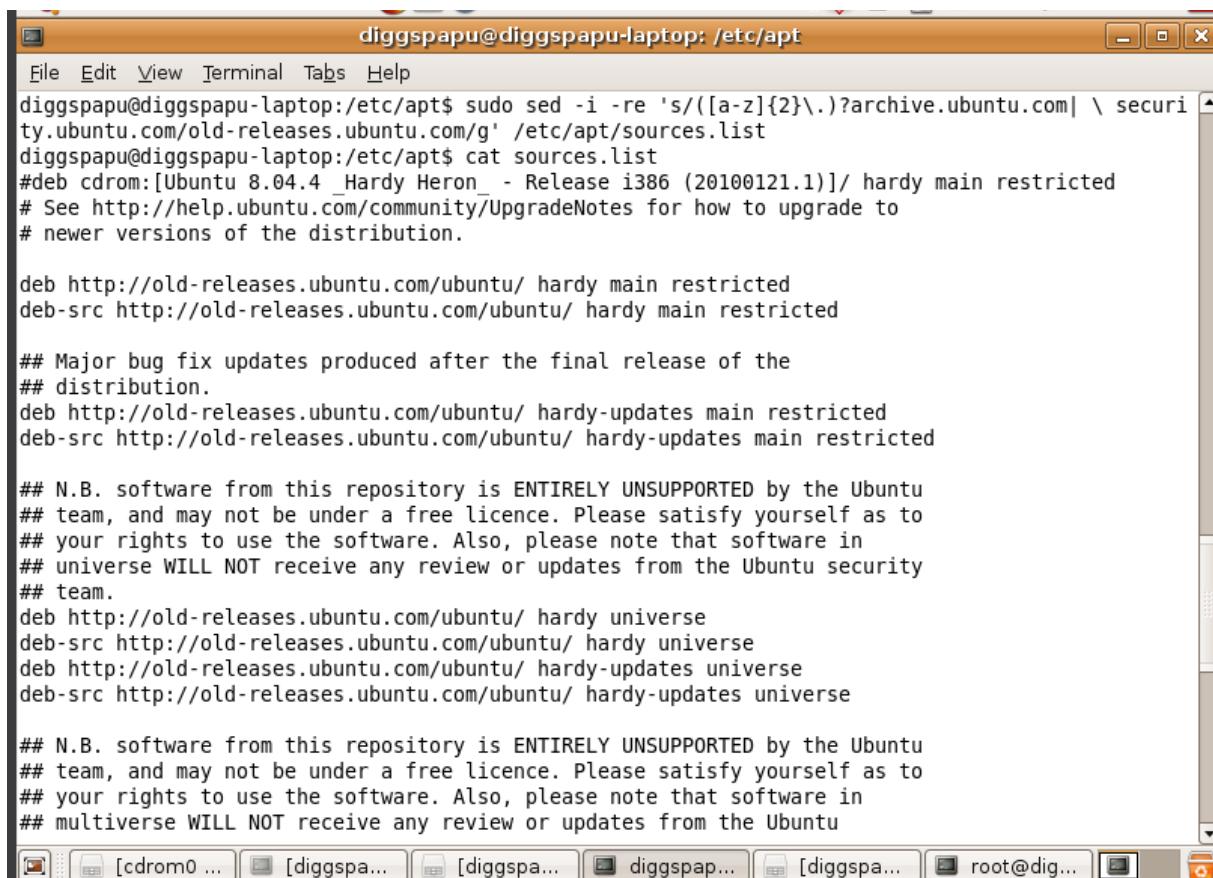
Creación de la copia de sources.list



```

diggspapu@diggspapu-laptop: /etc/apt
File Edit View Terminal Tabs Help
diggspapu@diggspapu-laptop:/etc/apt$ ls
apt.conf.d secring.gpg sources.list sources.list.d trustdb.gpg trusted.gpg trusted.gpg~
diggspapu@diggspapu-laptop:/etc/apt$ cp ./sources.list ~
diggspapu@diggspapu-laptop:/etc/apt$ cd ~
diggspapu@diggspapu-laptop:~$ ls
Desktop Documents Examples Music new Pictures Public sources.list Templates Videos
diggspapu@diggspapu-laptop:~$ cd /etc/apt
diggspapu@diggspapu-laptop:/etc/apt$ ls
apt.conf.d secring.gpg sources.list sources.list.d trustdb.gpg trusted.gpg trusted.gpg~
diggspapu@diggspapu-laptop:/etc/apt$
```

Cambiando el archivo sources.list



```

diggspapu@diggspapu-laptop: /etc/apt
File Edit View Terminal Tabs Help
diggspapu@diggspapu-laptop:/etc/apt$ sudo sed -i -re 's/([a-z]{2}\.)?archive.ubuntu.com| \ security.ubuntu.com/old-releases.ubuntu.com/g' /etc/apt/sources.list
diggspapu@diggspapu-laptop:/etc/apt$ cat sources.list
#deb cdrom:[Ubuntu 8.04.4 _Hardy Heron_ - Release i386 (20100121.1)]/ hardy main restricted
# See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to
# newer versions of the distribution.

deb http://old-releases.ubuntu.com/ubuntu/ hardy main restricted
deb-src http://old-releases.ubuntu.com/ubuntu/ hardy main restricted

## Major bug fix updates produced after the final release of the
## distribution.
deb http://old-releases.ubuntu.com/ubuntu/ hardy-updates main restricted
deb-src http://old-releases.ubuntu.com/ubuntu/ hardy-updates main restricted

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team, and may not be under a free licence. Please satisfy yourself as to
## your rights to use the software. Also, please note that software in
## universe WILL NOT receive any review or updates from the Ubuntu security
## team.
deb http://old-releases.ubuntu.com/ubuntu/ hardy universe
deb-src http://old-releases.ubuntu.com/ubuntu/ hardy universe
deb http://old-releases.ubuntu.com/ubuntu/ hardy-updates universe
deb-src http://old-releases.ubuntu.com/ubuntu/ hardy-updates universe

## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu
## team, and may not be under a free licence. Please satisfy yourself as to
## your rights to use the software. Also, please note that software in
## multiverse WILL NOT receive any review or updates from the Ubuntu
```

The screenshot shows a terminal window titled "diggspapu@diggs...:/etc/apt". The window is part of a desktop environment with a menu bar at the top. The terminal content displays the configuration of an apt repository, specifically for the "hardy" release. It includes URLs for deb and deb-src packages from old-releases.ubuntu.com, instructions for backports and Canonical's partner repository, and security repositories. The command "diggs...:/etc/apt\$" is visible at the end of the configuration.

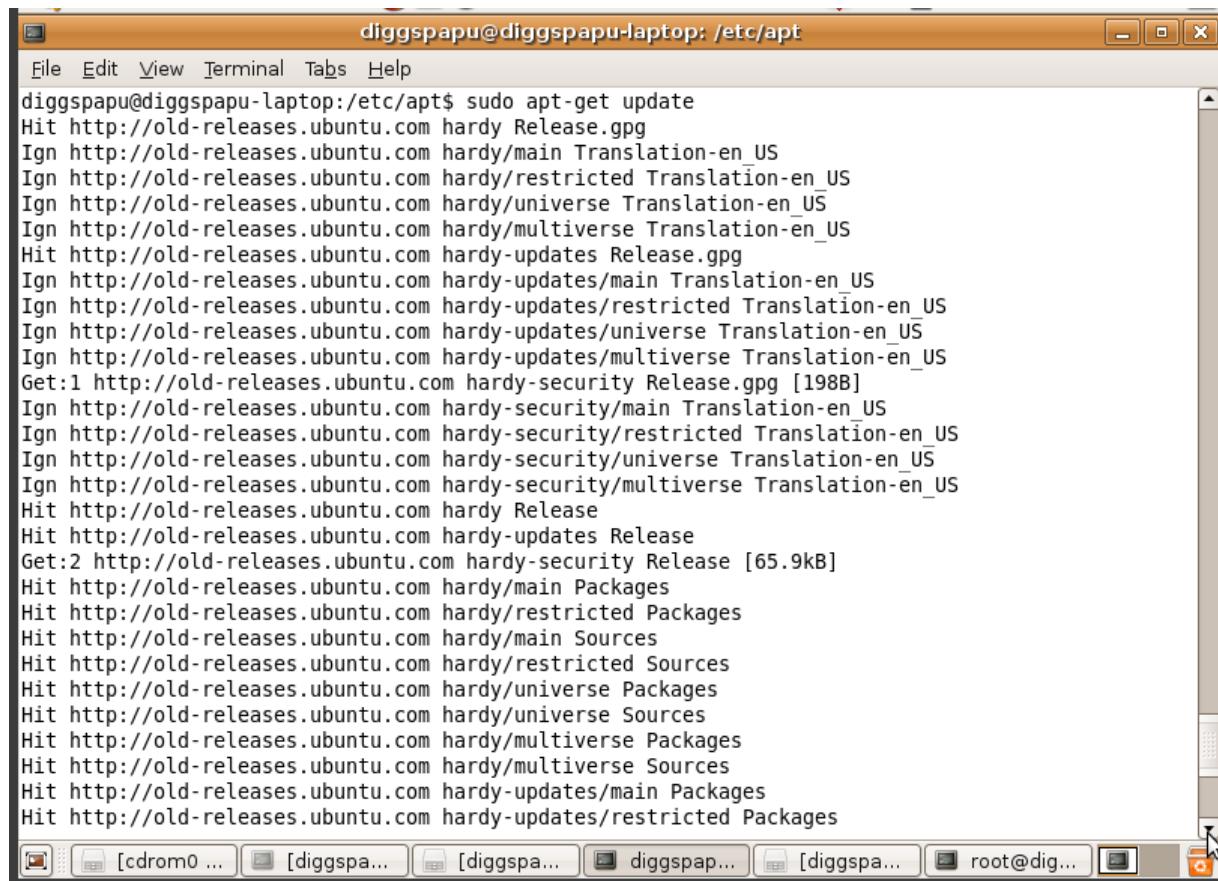
```
Applications Places System diggspapu Thu May 18, 7:24 PM
diggspapu@diggspapu-laptop: /etc/apt
File Edit View Terminal Tabs Help
deb-src http://old-releases.ubuntu.com/ubuntu/ hardy multiverse
deb http://old-releases.ubuntu.com/ubuntu/ hardy-updates multiverse
deb-src http://old-releases.ubuntu.com/ubuntu/ hardy-updates multiverse

## Uncomment the following two lines to add software from the 'backports'
## repository.
## N.B. software from this repository may not have been tested as
## extensively as that contained in the main release, although it includes
## newer versions of some applications which may provide useful features.
## Also, please note that software in backports WILL NOT receive any review
## or updates from the Ubuntu security team.
# deb http://old-releases.ubuntu.com/ubuntu/ hardy-backports main restricted universe multiverse
# deb-src http://old-releases.ubuntu.com/ubuntu/ hardy-backports main restricted universe multiverse

## Uncomment the following two lines to add software from Canonical's
## 'partner' repository. This software is not part of Ubuntu, but is
## offered by Canonical and the respective vendors as a service to Ubuntu
## users.
# deb http://archive.canonical.com/ubuntu hardy partner
# deb-src http://archive.canonical.com/ubuntu hardy partner

deb http://security.ubuntu.com/ubuntu hardy-security main restricted
deb-src http://security.ubuntu.com/ubuntu hardy-security main restricted
deb http://security.ubuntu.com/ubuntu hardy-security universe
deb-src http://security.ubuntu.com/ubuntu hardy-security universe
deb http://security.ubuntu.com/ubuntu hardy-security multiverse
deb-src http://security.ubuntu.com/ubuntu hardy-security multiverse
diggs...:/etc/apt$
```

Update



The screenshot shows a terminal window titled "diggspapu@diggspapu-laptop: /etc/apt". The window contains the output of the command "sudo apt-get update". The output lists various package sources and their contents being checked for updates. The window has a standard Linux-style title bar and a scroll bar on the right side. The terminal interface includes a menu bar with File, Edit, View, Terminal, Tabs, and Help. Below the menu is a toolbar with icons for cdrom0, diggspa..., diggspa..., diggspap..., diggspa..., root@dig..., and a trash can.

```
File Edit View Terminal Tabs Help
diggspapu@diggspapu-laptop:/etc/apt$ sudo apt-get update
Hit http://old-releases.ubuntu.com hardy Release.gpg
Ign http://old-releases.ubuntu.com hardy/main Translation-en_US
Ign http://old-releases.ubuntu.com hardy/restricted Translation-en_US
Ign http://old-releases.ubuntu.com hardy/universe Translation-en_US
Ign http://old-releases.ubuntu.com hardy/multiverse Translation-en_US
Hit http://old-releases.ubuntu.com hardy-updates Release.gpg
Ign http://old-releases.ubuntu.com hardy-updates/main Translation-en_US
Ign http://old-releases.ubuntu.com hardy-updates/restricted Translation-en_US
Ign http://old-releases.ubuntu.com hardy-updates/universe Translation-en_US
Ign http://old-releases.ubuntu.com hardy-updates/multiverse Translation-en_US
Get:1 http://old-releases.ubuntu.com hardy-security Release.gpg [198B]
Ign http://old-releases.ubuntu.com hardy-security/main Translation-en_US
Ign http://old-releases.ubuntu.com hardy-security/restricted Translation-en_US
Ign http://old-releases.ubuntu.com hardy-security/universe Translation-en_US
Ign http://old-releases.ubuntu.com hardy-security/multiverse Translation-en_US
Hit http://old-releases.ubuntu.com hardy Release
Hit http://old-releases.ubuntu.com hardy-updates Release
Get:2 http://old-releases.ubuntu.com hardy-security Release [65.9kB]
Hit http://old-releases.ubuntu.com hardy/main Packages
Hit http://old-releases.ubuntu.com hardy/restricted Packages
Hit http://old-releases.ubuntu.com hardy/main Sources
Hit http://old-releases.ubuntu.com hardy/restricted Sources
Hit http://old-releases.ubuntu.com hardy/universe Packages
Hit http://old-releases.ubuntu.com hardy/universe Sources
Hit http://old-releases.ubuntu.com hardy/multiverse Packages
Hit http://old-releases.ubuntu.com hardy/multiverse Sources
Hit http://old-releases.ubuntu.com hardy-updates/main Packages
Hit http://old-releases.ubuntu.com hardy-updates/restricted Packages
```

Build-essential

```
diggspapu@diggs...: /etc/apt
File Edit View Terminal Tabs Help
diggspapu@diggs...: /etc/apt$ sudo apt-get install build-essential
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  dpkg-dev g++ g++-4.2 libc6 libc6-dev libc6-i686 libstdc++6-4.2-dev libtimedate-perl
  linux-libc-dev patch
Suggested packages:
  debian-keyring g++-multilib g++-4.2-multilib gcc-4.2-doc libstdc++6-4.2-dbg glibc-doc
  manpages-dev libstdc++6-4.2-doc diff-doc
The following NEW packages will be installed:
  build-essential dpkg-dev g++ g++-4.2 libc6-dev libstdc++6-4.2-dev libtimedate-perl
  linux-libc-dev patch
The following packages will be upgraded:
  libc6 libc6-i686
2 upgraded, 9 newly installed, 0 to remove and 164 not upgraded.
Need to get 14.4MB of archives.
After this operation, 34.2MB of additional disk space will be used.
Do you want to continue [Y/n]? y
Get:1 http://old-releases.ubuntu.com hardy-updates/main libc6 2.7-10ubuntu8.3 [4428kB]
Get:2 http://old-releases.ubuntu.com hardy-updates/main libc6-i686 2.7-10ubuntu8.3 [1252kB]
Get:3 http://old-releases.ubuntu.com hardy-updates/main linux-libc-dev 2.6.24-32.107 [733kB]
Get:4 http://old-releases.ubuntu.com hardy-updates/main libc6-dev 2.7-10ubuntu8.3 [3373kB]
Get:5 http://old-releases.ubuntu.com hardy-updates/main libstdc++6-4.2-dev 4.2.4-1ubuntu4 [1187kB]
]
Get:6 http://old-releases.ubuntu.com hardy-updates/main g++-4.2 4.2.4-1ubuntu4 [2784kB]
Get:7 http://old-releases.ubuntu.com hardy-updates/main g++ 4:4.2.3-1ubuntu6 [1440B]
Get:8 http://old-releases.ubuntu.com hardy/main libtimedate-perl 1.1600-9 [30.1kB]
Get:9 http://old-releases.ubuntu.com hardy/main patch 2.5.9-4 [95.6kB]
```

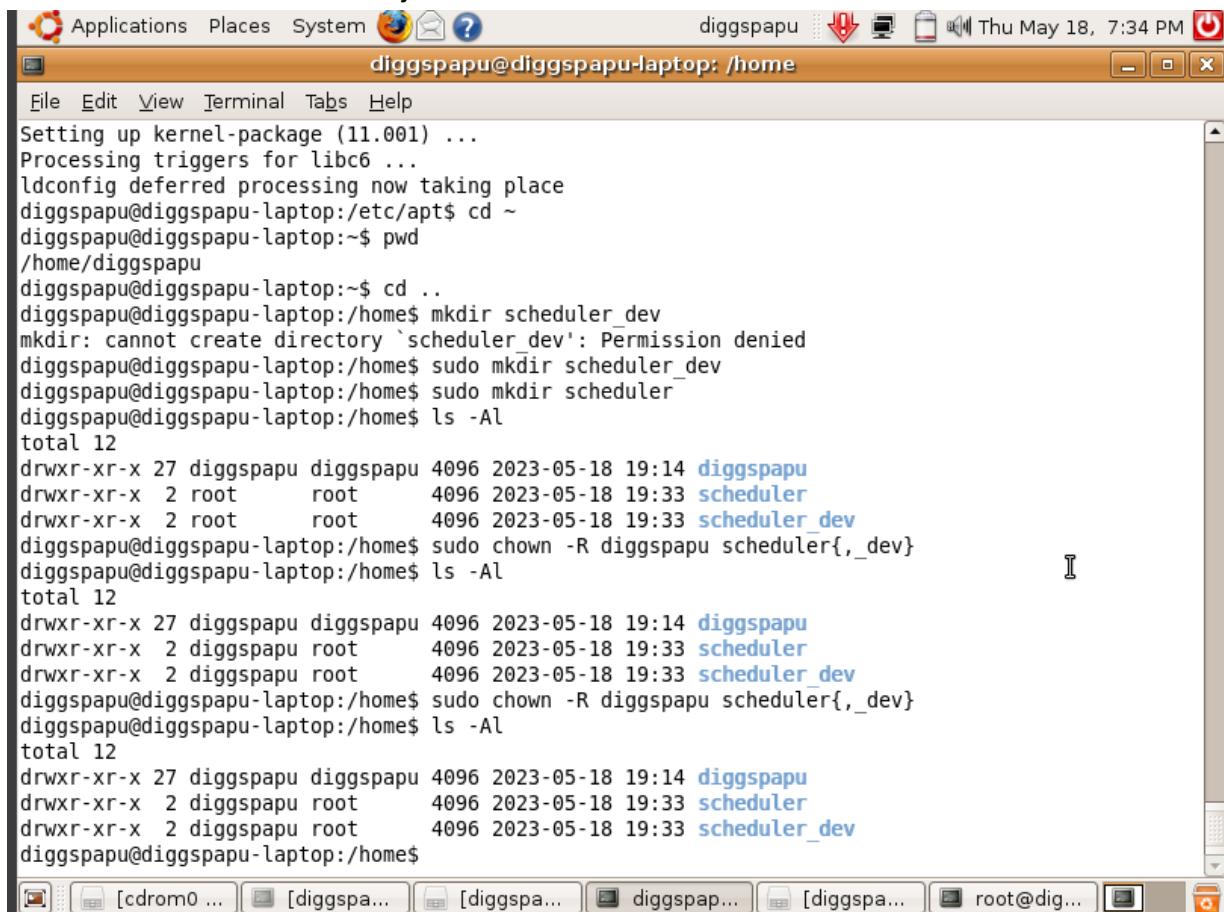
The terminal window shows the command `sudo apt-get install build-essential` being run. It lists the packages to be installed, suggests some, and shows the download progress for nine packages from the `http://old-releases.ubuntu.com` repository. The user responds with 'y' to the confirmation prompt.

Kernel package and libncurses5-dev

```
diggspapu@diggs...: /etc/apt
File Edit View Terminal Tabs Help
diggspapu@diggs...: /etc/apt$ sudo apt-get install libncurses5-dev
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  libncurses5-dev
0 upgraded, 1 newly installed, 0 to remove and 164 not upgraded.
Need to get 1483kB of archives.
After this operation, 6480kB of additional disk space will be used.
Get:1 http://old-releases.ubuntu.com hardy/main libncurses5-dev 5.6+20071124-1ubuntu2 [1483kB]
Fetched 1483kB in 1s (748kB/s)
Selecting previously deselected package libncurses5-dev.
(Reading database ... 97936 files and directories currently installed.)
Unpacking libncurses5-dev (from .../libncurses5-dev_5.6+20071124-1ubuntu2_i386.deb) ...
Setting up libncurses5-dev (5.6+20071124-1ubuntu2) ...
diggspapu@diggs...: /etc/apt$ sudo apt-get install kernel-package
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following extra packages will be installed:
  gettext intltool-debian po-debconf
Suggested packages:
  cvs gettext-doc linux-source kernel-source libdb3-dev docbook-utils
Recommended packages:
  libmail-sendmail-perl libcompress-zlib-perl libmail-box-perl
The following NEW packages will be installed:
  gettext intltool-debian kernel-package po-debconf
0 upgraded, 4 newly installed, 0 to remove and 164 not upgraded.
Need to get 2751kB of archives.
```

The terminal window shows the command `sudo apt-get install libncurses5-dev` being run. It lists the package to be installed, shows the download progress for one package from the `http://old-releases.ubuntu.com` repository, and then lists several recommended and suggested packages.

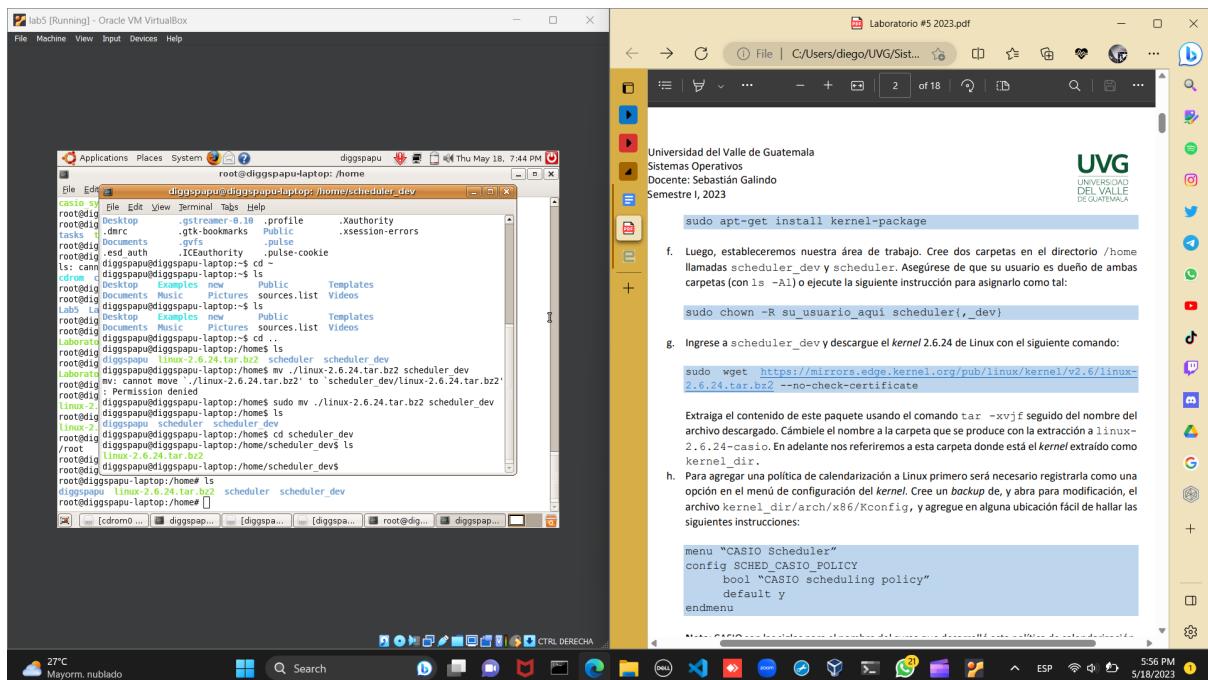
Haciendo el ambiente de trabajo



```

Applications Places System diggspapu Thu May 18, 7:34 PM
diggspapu@diggspapu-laptop: /home
File Edit View Terminal Tabs Help
Setting up kernel-package (11.001) ...
Processing triggers for libc6 ...
ldconfig deferred processing now taking place
diggspapu@diggspapu-laptop:/etc/apt$ cd ~
diggspapu@diggspapu-laptop:~$ pwd
/home/diggspapu
diggspapu@diggspapu-laptop:~$ cd ..
diggspapu@diggspapu-laptop:/home$ mkdir scheduler_dev
mkdir: cannot create directory `scheduler_dev': Permission denied
diggspapu@diggspapu-laptop:/home$ sudo mkdir scheduler_dev
diggspapu@diggspapu-laptop:/home$ sudo mkdir scheduler
diggspapu@diggspapu-laptop:/home$ ls -Al
total 12
drwxr-xr-x 27 diggspapu diggspapu 4096 2023-05-18 19:14 diggspapu
drwxr-xr-x 2 root      root     4096 2023-05-18 19:33 scheduler
drwxr-xr-x 2 root      root     4096 2023-05-18 19:33 scheduler_dev
diggspapu@diggspapu-laptop:/home$ sudo chown -R diggspapu scheduler{,_dev}
diggspapu@diggspapu-laptop:/home$ ls -Al
total 12
drwxr-xr-x 27 diggspapu diggspapu 4096 2023-05-18 19:14 diggspapu
drwxr-xr-x 2 diggspapu root      4096 2023-05-18 19:33 scheduler
drwxr-xr-x 2 diggspapu root      4096 2023-05-18 19:33 scheduler_dev
diggspapu@diggspapu-laptop:/home$ sudo chown -R diggspapu scheduler{,_dev}
diggspapu@diggspapu-laptop:/home$ ls -Al
total 12
drwxr-xr-x 27 diggspapu diggspapu 4096 2023-05-18 19:14 diggspapu
drwxr-xr-x 2 diggspapu root      4096 2023-05-18 19:33 scheduler
drwxr-xr-x 2 diggspapu root      4096 2023-05-18 19:33 scheduler_dev
diggspapu@diggspapu-laptop:/home$
```

Install linux kernel



Lab5 [Running] - Oracle VM VirtualBox

Laboratorio #5 2023.pdf

Universidad del Valle de Guatemala
Sistemas Operativos
Docente: Sebastián Galindo
Semestre I, 2023

f. Luego, estableceremos nuestra área de trabajo. Cree dos carpetas en el directorio /home llamadas scheduler_dev y scheduler. Asegúrese de que su usuario es dueño de ambas carpetas (con ls -Al) o ejecute la siguiente instrucción para asignarlo como tal:

```
sudo chown -R su_usuario_aquí scheduler{,_dev}
```

g. Ingrese a scheduler_dev y descargue el kernel 2.6.24 de Linux con el siguiente comando:

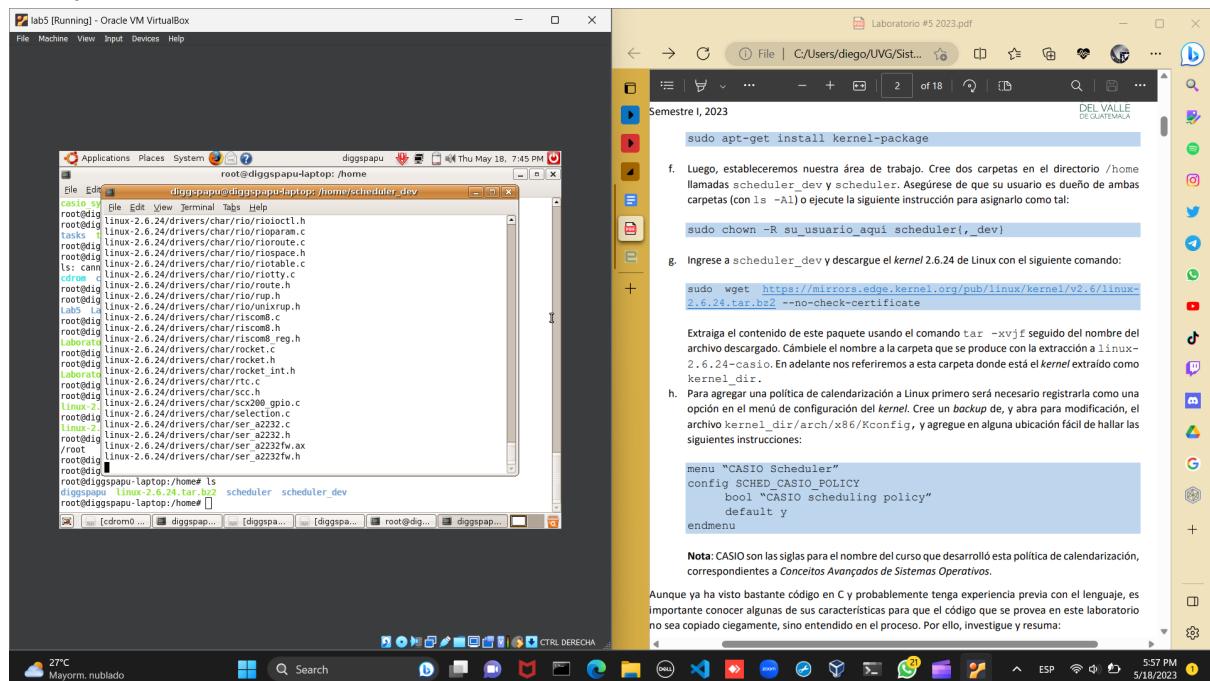
```
sudo wget https://mirrors.edge.kernel.org/pub/linux/kernel/v2.6/linux-2.6.24.tar.bz2 --no-check-certificate
```

Extraje el contenido de este paquete usando el comando tar -xvf seguido del nombre del archivo descargado. Cambie el nombre a la carpeta que se produce con la extracción a linux-2.6.24-casio. En adelante nos referiremos a esta carpeta donde está el kernel extraído como kernel_dir.

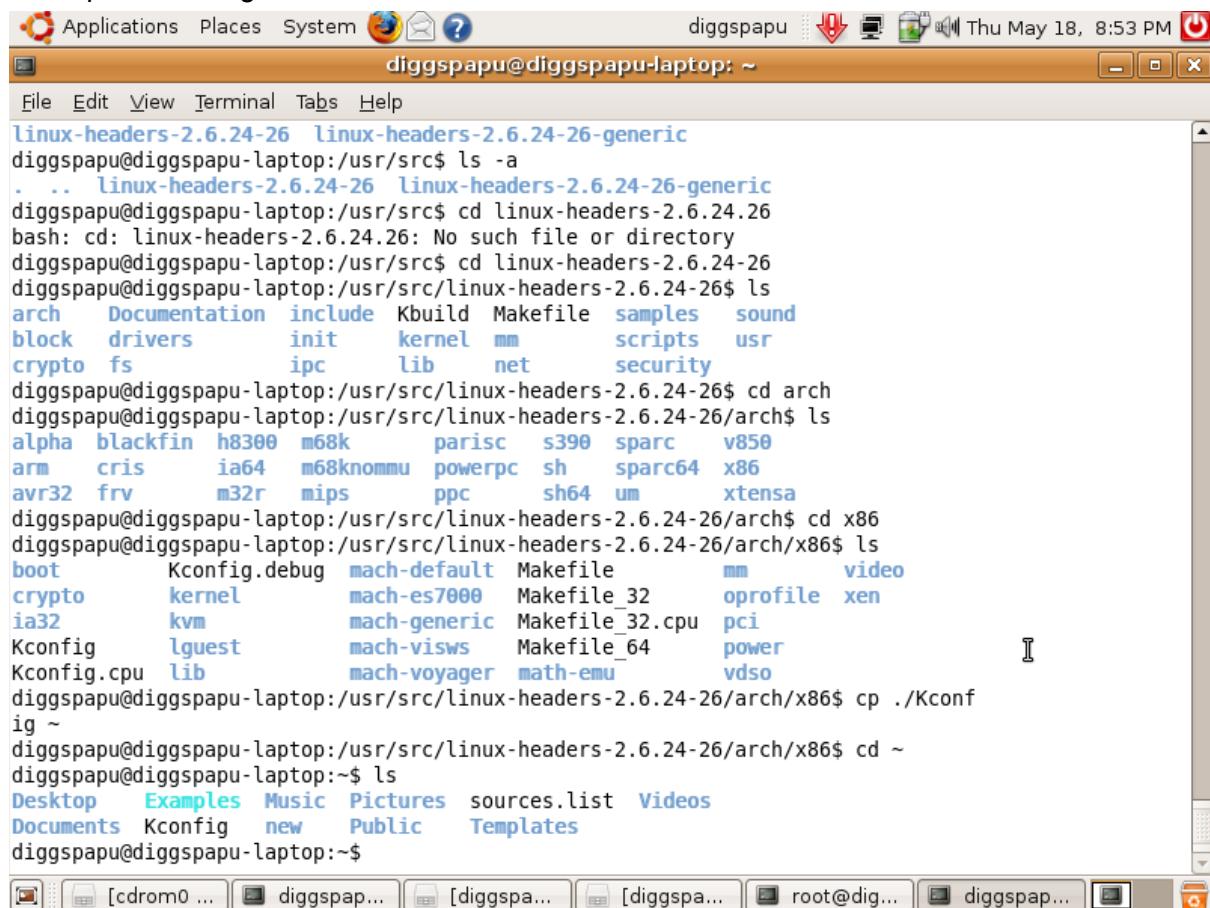
h. Para agregar una política de calendarización a Linux primero será necesario registrarla como una opción en el menú de configuración del kernel. Cree un backup de, y abra para modificación, el archivo kernel_dir/arch/x86/Kconfig, y agregue en alguna ubicación fácil de hallar las siguientes instrucciones:

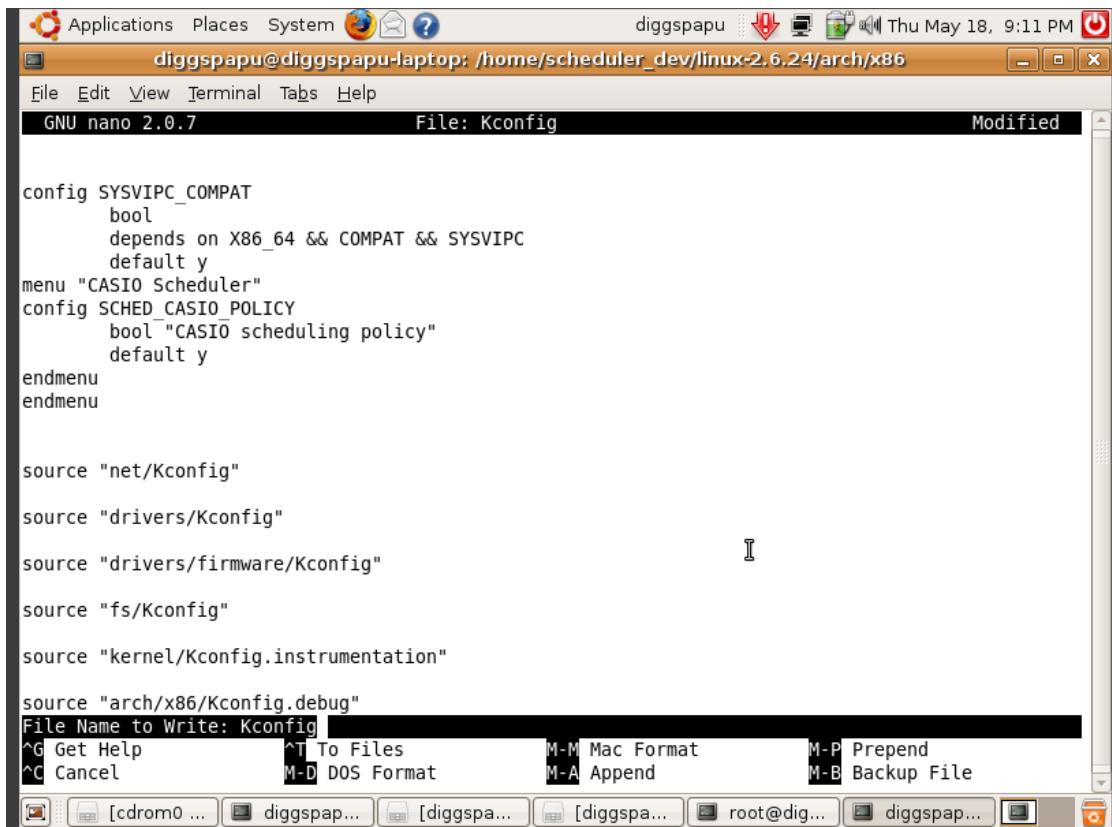
```
menu "CASIO Scheduler"
config SCHED_CASIO_POLICY
    bool "CASIO scheduling policy"
    default y
endmenu
```

Extrayendo la data



Backup del Kconfig





```

config SYSVIPC_COMPAT
    bool
    depends on X86_64 && COMPAT && SYSVIPC
    default y
menu "CASIO Scheduler"
config SCHED_CASIO_POLICY
    bool "CASIO scheduling policy"
    default y
endmenu
endmenu

source "net/Kconfig"
source "drivers/Kconfig"
source "drivers/firmware/Kconfig"
source "fs/Kconfig"
source "kernel/Kconfig.instrumentation"
source "arch/x86/Kconfig.debug"

```

File Name to Write: Kconfig

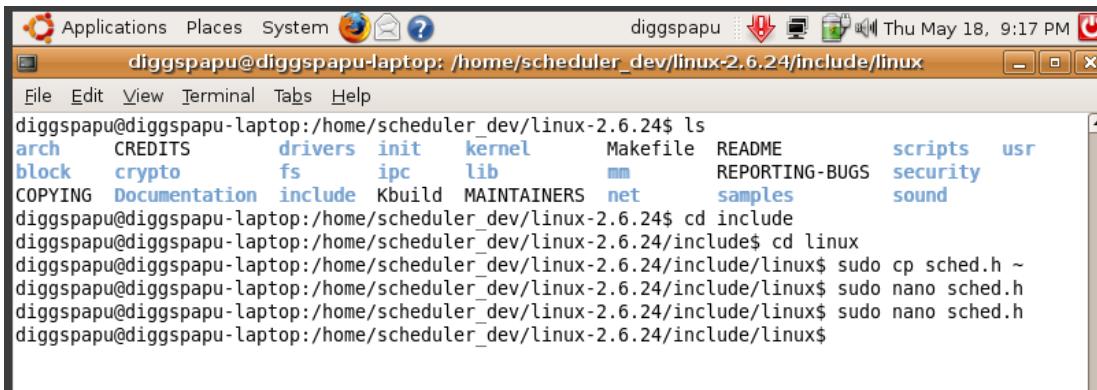
File Name to Write: Kconfig

^G Get Help ^T To Files M-M Mac Format M-P Prepend
 ^C Cancel M-D DOS Format M-A Append M-B Backup File

Investigación:

- Funcionamiento y sintaxis de uso de structs:
- Propósito y directivas del preprocesador:
- Diferencia entre * y & en el manejo de referencias a memoria (punteros):
- Propósito y modo de uso de APT y dpkg:

Backup y modificación



```

diggspapu@diggs...:~/scheduler...$ ls
arch CREDITS drivers init kernel Makefile README scripts usr
block crypto fs ipc lib mm REPORTING-BUGS security
COPYING Documentation include Kbuild MAINTAINERS net samples sound
diggspapu@diggs...:~/scheduler...$ cd include
diggspapu@diggs...:~/scheduler...$ cd linux
diggspapu@diggs...:~/scheduler...$ sudo cp sched.h ~
diggspapu@diggs...:~/scheduler...$ sudo nano sched.h
diggspapu@diggs...:~/scheduler...$ sudo nano sched.h
diggspapu@diggs...:~/scheduler...$ sudo nano sched.h
diggspapu@diggs...:~/scheduler...$ ls

```

```

#define CLONE_NEWUTS      0x04000000 /* New utsname group? */
#define CLONE_NEWIPC     0x08000000 /* New ipcs */
#define CLONE_NEWUSER    0x10000000 /* New user namespace */
#define CLONE_NEWPID     0x20000000 /* New pid namespace */
#define CLONE_NEWWNET   0x40000000 /* New network namespace */

/*
 * Scheduling policies
 */
#define SCHED_NORMAL      0
#define SCHED_FIFO       1
#define SCHED_RR        2
#define SCHED_BATCH     3
/* SCHED_ISO: reserved but not implemented yet */
#define SCHED_IDLE      5

#ifndef CONFIG_SCHED_CASIO_POLICY
#define SCHED_CASIO     6
#endif

#ifndef __KERNEL__
struct sched_param {
    int sched_priority;

```

Key bindings shown at the bottom:

- ^G Get Help
- ^O WriteOut
- ^R Read File
- ^Y Prev Page
- ^K Cut Text
- ^C Cur Pos
- ^X Exit
- ^J Justify
- ^W Where Is
- ^V Next Page
- ^U UnCut Text
- ^T To Spell

Modificación de bits/sched.h

```

#error "Never include <bits/sched.h> directly; use <sched.h> instead."
#endif

/* Scheduling algorithms. */
#define SCHED_OTHER      0
#define SCHED_FIFO       1
#define SCHED_RR        2
#ifndef __USE_GNU
#define SCHED_BATCH     3
#endif

#define SCHED_CASIO     6

#ifndef __USE_MISC
/* Cloning flags. */
#define CSIGNAL          0x000000ff /* Signal mask to be sent at exit. */
#define CLONE_VM         0x0000100 /* Set if VM shared between processes. */
#define CLONE_FS         0x0000200 /* Set if fs info shared between processes. */
#define CLONE_FILES      0x0000400 /* Set if open files shared between processes. */
#define CLONE_SIGHAND    0x0000800 /* Set if signal handlers shared. */
#define CLONE_PTRACE     0x0002000 /* Set if tracing continues on the child. */
#define CLONE_VFORK      0x0004000 /* Set if the parent wants the child to
                                wake it up on mm_release. */

```

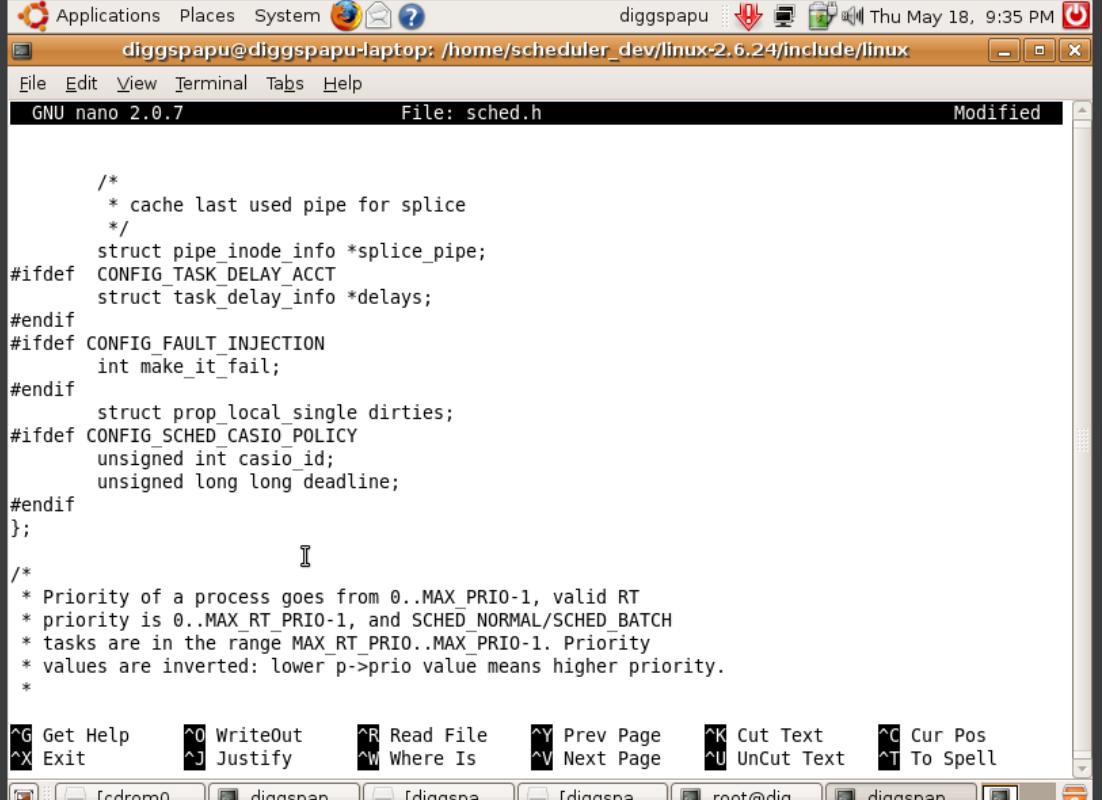
Key bindings shown at the bottom:

- ^G Get Help
- ^O WriteOut
- ^R Read File
- ^Y Prev Page
- ^K Cut Text
- ^C Cur Pos
- ^X Exit
- ^J Justify
- ^W Where Is
- ^V Next Page
- ^U UnCut Text
- ^T To Spell

- La razón por la cuál se modifican los archivos sched es para definir una política de planificación de procesos personalizada en el kernel de Linux. De manera que en el caso del primer programa se definen constantes que representan las políticas de

planificación de procesos disponibles en el kernel. De manera que dichas constantes son utilizadas por el planificador del kernel para determinar qué proceso debería de ejecutarse según su prioridad.

struct change in sched.h



```

/*
 * cache last used pipe for splice
 */
struct pipe_inode_info *splice_pipe;
#endif CONFIG_TASK_DELAY_ACCT
struct task_delay_info *delays;
#endif
#ifndef CONFIG_FAULT_INJECTION
int make_it_fail;
#endif
struct prop_local_single dirties;
#ifndef CONFIG_SCHED_CASIO_POLICY
unsigned int casio_id;
unsigned long long deadline;
#endif
};

/*
 * Priority of a process goes from 0..MAX_PRIO-1, valid RT
 * priority is 0..MAX_RT_PRIO-1, and SCHED_NORMAL/SCHED_BATCH
 * tasks are in the range MAX_RT_PRIO..MAX_PRIO-1. Priority
 * values are inverted: lower p->prio value means higher priority.
 *

```

The terminal window shows the command `diggspapu@diggs... /home/scheduler_dev/linux-2.6.24/include/linux` and the file `File: sched.h`. The status bar indicates it is a modified file. The bottom of the window shows a menu bar with File, Edit, View, Terminal, Tabs, Help, and a toolbar with icons for cut, copy, paste, etc. The bottom right corner shows a vertical scroll bar. The bottom of the window displays a series of icons representing open files or windows.

Una task en linux es la unidad básica de planificación, de manera que representa un proceso o un thread, a su vez, cada proceso es alojado dinámicamente en una estructura task_struct, así mismo, su propósito es contener toda la información relevante sobre un proceso o thread, y el equivalente en windows es el ETHREAD.

Cambio de sched_param

The screenshot shows a dual-monitor setup. The left monitor displays a terminal window titled 'File: sched.h' containing C code for scheduling parameters. The right monitor displays another terminal window with a similar title, also containing the same C code. Both terminals are running the 'nano' text editor version 2.0.7. The desktop environment is Gnome, with a taskbar at the bottom showing various application icons and open windows.

```
/* Get index of currently used CPU. */
extern int sched_getcpu (void) __THROW;
#endif

__END_DECLS

#endif /* need schedparam */

#if !defined __defined_schedparam \
    && (defined __need_schedparam || defined _SCHED_H)
#define __defined_schedparam 1
/* Data structure to describe a process' schedulability. */
struct __sched_param
{
    int __sched_priority;
    unsigned int casio_id;
    unsigned long long deadline;
};

#undef __need_schedparam
#endif

#if defined _SCHED_H && !defined __cpu_set_t_defined
#define __cpu_set_t_defined
^G Get Help      ^O WriteOut      ^R Read File      ^Y Prev Page      ^K Cut Text      ^C Cur Pos
^X Exit          ^J Justify       ^W Where Is       ^V Next Page      ^U UnCut Text     ^T To Spell
[cdrom0 ...] [digspap...]
[digspap...] [digspap...]
[root@dig...]
[digspap...]
Applications Places System diggspapu Fri May 19, 12:24 AM
File Edit View Terminal Tabs Help
File: sched.h
GNU nano 2.0.7
before MM copy. */
#define CLONE_CHILD_CLEARTID 0x00200000 /* Register exit futex and memory
                                         location to clear. */
#define CLONE_DETACHED 0x00400000 /* Create clone detached. */
#define CLONE_UNTRACED 0x00800000 /* Set if the tracing process can't
                                         force CLONE_PTRACE on this clone. */
#define CLONE_CHILD_SETTID 0x01000000 /* Store TID in userlevel buffer in
                                         the child. */
#define CLONE_STOPPED 0x02000000 /* Start in stopped state. */
#endif

/* The official definition. */
struct sched_param
{
    int __sched_priority;
    unsigned int casio_id;
    unsigned long long deadline;
};

__BEGIN_DECLS

#endif /* USE_MISC
/* Clone current process. */
^G Get Help      ^O WriteOut      ^R Read File      ^Y Prev Page      ^K Cut Text      ^C Cur Pos
^X Exit          ^J Justify       ^W Where Is       ^V Next Page      ^U UnCut Text     ^T To Spell
[cdrom0 ...] [digspap...]
[digspap...] [digspap...]
[root@dig...]
[digspap...]
```

Sched param contiene:

1. `sched_priority` que es un entero que representa la prioridad de la tarea.
 2. `casio_id` representa el id de la tarea.
 3. `deadline` representa el límite de tiempo o la fecha límite de la tarea.

Cambio en sched.c

```

/*
 * Each time a sched group cpu_power is changed,
 * we must compute its reciprocal value
 */
static inline void sg_inc_cpu_power(struct sched_group *sg, u32 val)
{
    sg->_cpu_power += val;
    sg->reciprocal_cpu_power = reciprocal_value(sg->_cpu_power);
}
#endif

static inline int rt_policy(int policy)
{
    if (unlikely(policy == SCHED_FIFO) || unlikely(policy == SCHED_RR))
#endif CONFIG_SCHED_CASIO_POLICY
    || unlikely(policy == SCHED_CASIO)
#endif
    ){
        return 1;
    }
    return 0;
}

^G Get Help      ^O WriteOut      ^R Read File      ^Y Prev Page      ^K Cut Text      ^C Cur Pos
^X Exit          ^J Justify       ^W Where Is       ^V Next Page      ^U UnCut Text     ^T To Spell

```

La función `rt_policy` sirve para determinar si una política de planificación dada pertenece a la clase de tiempo real o no. Así mismo, la función que revisa la política es `SCHED_FIFO` o `SCHED_RR`. Así mismo, el `unlikely` es para indicar que la condición dentro del paréntesis es poco probable que sea verdadera. Esto permite optimizar el código de manera que se compile de manera más eficiente.

El tipo de tareas que calendariza el EDF es según su fecha límite, así mismo, calendariza tareas que sean compatibles con dicho EDF, sobre todo sí tienen una política de First In First Out, Round Robin, o Casio.

```

# include "sched_debug.c"
#endif

#ifndef CONFIG_SCHED_CASIO_POLICY
#include "sched_casio.c"
#endif

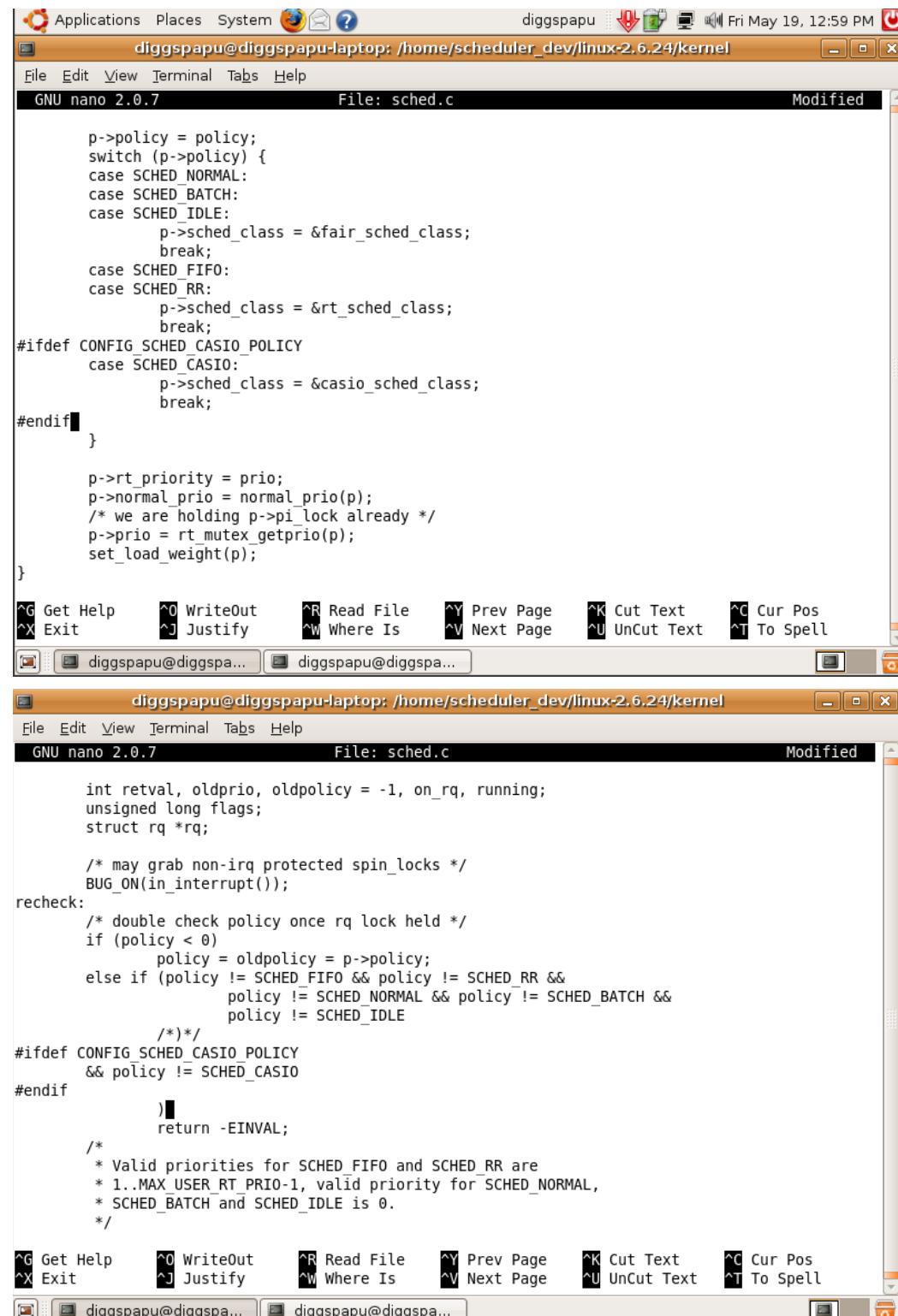
#ifndef CONFIG_SCHED_CASIO_POLICY
#define sched_class_highest (&casio_sched_class)
#else
#define sched_class_highest (&rt_sched_class)
#endif

/*
 * Update delta_exec, delta_fair fields for rq.
 *
 * delta_fair clock advances at a rate inversely proportional to
 * total load (rq->load.weight) on the runqueue, while
 * delta_exec advances at the same rate as wall-clock (provided
 * cpu is not idle).
 *
 * delta_exec / delta_fair is a measure of the (smoothened) load on this
 * runqueue over any given interval. This (smoothened) load is used
 * during load balance.

```

La precedencia de prioridades es dada porque de primero estarían las EDF, luego las RT y por último las CFS dado que este laboratorio se empleo las EDF, y de cierta forma las CFS son la antítesis de la misma tiene sentido que tenga la menor prioridad.

SetScheduler modificación



```

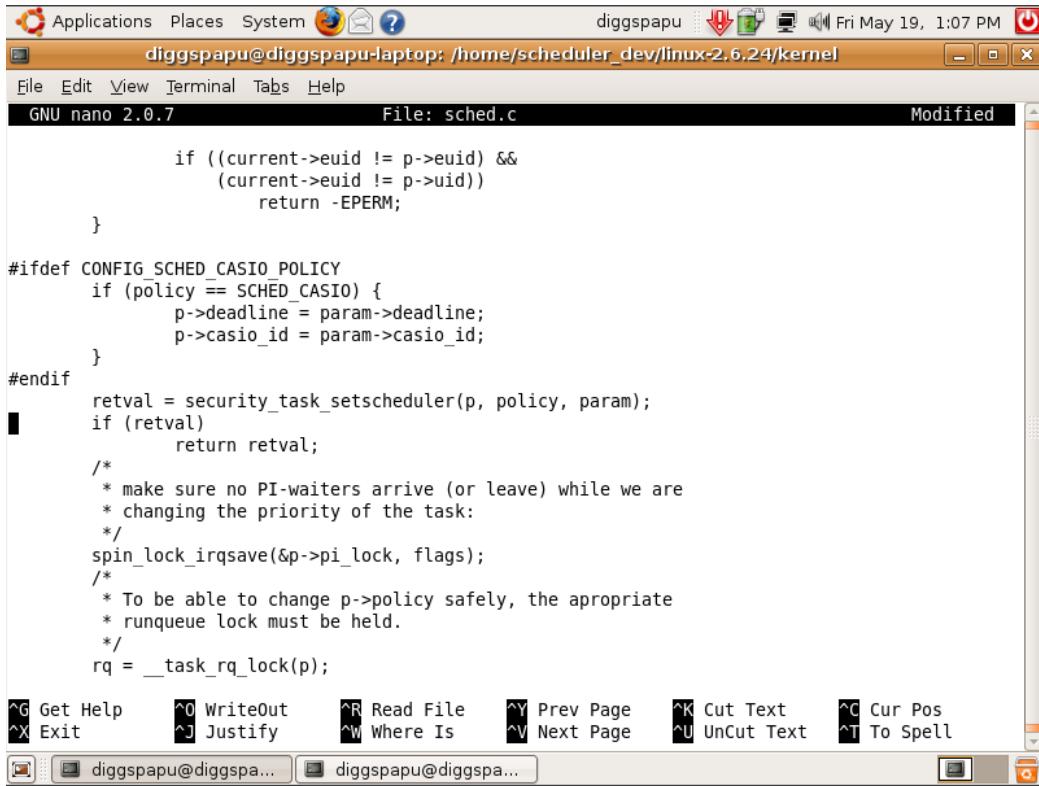
Applications Places System diggspapu Fri May 19, 12:59 PM
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help
GNU nano 2.0.7 File: sched.c Modified
p->policy = policy;
switch (p->policy) {
    case SCHED_NORMAL:
    case SCHED_BATCH:
    case SCHED_IDLE:
        p->sched_class = &fair_sched_class;
        break;
    case SCHED_FIFO:
    case SCHED_RR:
        p->sched_class = &rt_sched_class;
        break;
#endif CONFIG_SCHED_CASIO_POLICY
    case SCHED_CASIO:
        p->sched_class = &casio_sched_class;
        break;
#endif
}
p->rt_priority = prio;
p->normal_prio = normal_prio(p);
/* we are holding p->pi_lock already */
p->prio = rt_mutex_getprio(p);
set_load_weight(p);
}

^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help
GNU nano 2.0.7 File: sched.c Modified
int retval, oldprio, oldpolicy = -1, on_rq, running;
unsigned long flags;
struct rq *rq;

/* may grab non-irq protected spin_locks */
BUG_ON(in_interrupt());
recheck:
    /* double check policy once rq lock held */
    if (policy < 0)
        policy = oldpolicy = p->policy;
    else if (policy != SCHED_FIFO && policy != SCHED_RR &&
            policy != SCHED_NORMAL && policy != SCHED_BATCH &&
            policy != SCHED_IDLE)
        /* */
#endif CONFIG_SCHED_CASIO_POLICY
    && policy != SCHED_CASIO
#endif
)
return -EINVAL;
/*
 * Valid priorities for SCHED_FIFO and SCHED_RR are
 * 1..MAX_USER_RT_PRIO-1, valid priority for SCHED_NORMAL,
 * SCHED_BATCH and SCHED_IDLE is 0.
*/
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell

```

La estructura de casio_task contiene casio_rb_node que es usado para operaciones del árbol red-black, el absolute deadline es un entero sin signo que representa cuánto se tardará el task, la casio_list_node sirve para hacer operaciones en la linked list, finalmente el puntero task es un puntero que asocia el árbol con la task.



```

Applications Places System diggspapu Fri May 19, 1:07 PM
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help
GNU nano 2.0.7 File: sched.c Modified

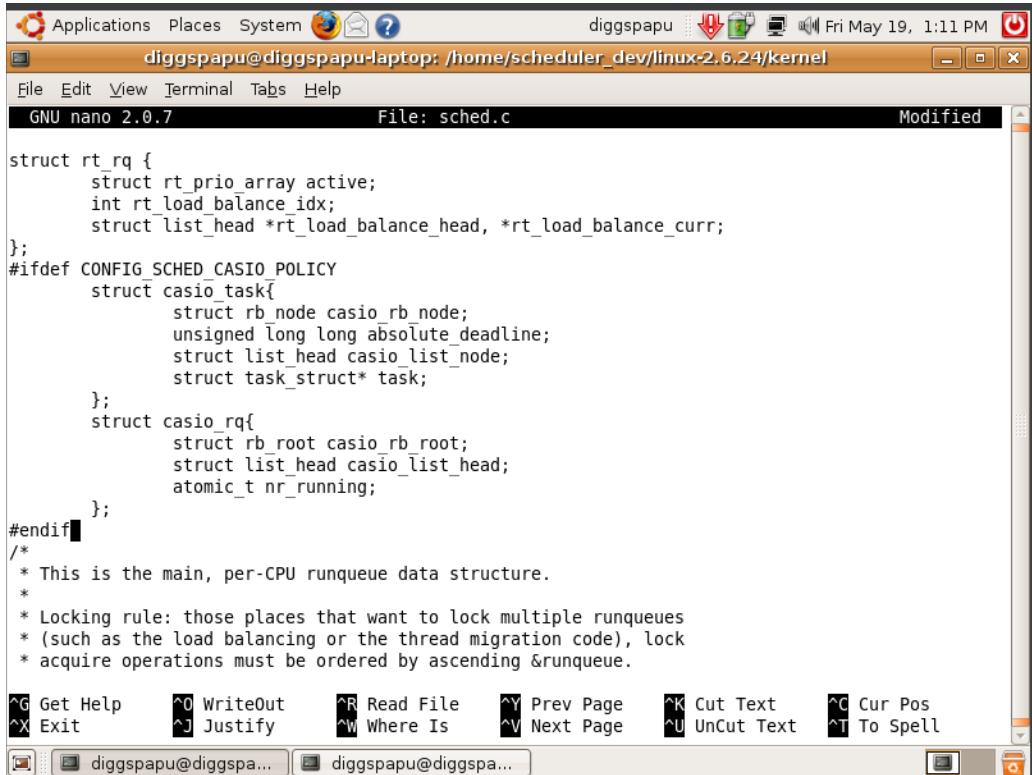
if ((current->euid != p->euid) &&
    (current->euid != p->uid))
    return -EPERM;
}

#ifndef CONFIG_SCHED_CASIO_POLICY
if (policy == SCHED_CASIO) {
    p->deadline = param->deadline;
    p->casio_id = param->casio_id;
}
#endif
retval = security_task_setscheduler(p, policy, param);
if (retval)
    return retval;
/*
 * make sure no PI-waiters arrive (or leave) while we are
 * changing the priority of the task:
 */
spin_lock_irqsave(&p->pi_lock, flags);
/*
 * To be able to change p->policy safely, the appropriate
 * runqueue lock must be held.
 */
rq = __task_rq_lock(p);

^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell

```

Tasks calendarizables



```

Applications Places System diggspapu Fri May 19, 1:11 PM
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help
GNU nano 2.0.7 File: sched.c Modified

struct rt_rq {
    struct rt_prio_array active;
    int rt_load_balance_idx;
    struct list_head *rt_load_balance_head, *rt_load_balance_curr;
};

#ifndef CONFIG_SCHED_CASIO_POLICY
struct casio_task{
    struct rb_node casio_rb_node;
    unsigned long long absolute_deadline;
    struct list_head casio_list_node;
    struct task_struct* task;
};
struct casio_rq{
    struct rb_root casio_rb_root;
    struct list_head casio_list_head;
    atomic_t nr_running;
};
#endif
/*
 * This is the main, per-CPU runqueue data structure.
 *
 * Locking rule: those places that want to lock multiple runqueues
 * (such as the load balancing or the thread migration code), lock
 * acquire operations must be ordered by ascending &runqueue.
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell

```

Referencia a tareas calendarizadas:

```

Applications Places System diggspapu Fri May 19, 1:19 PM
diggspapu@diggs...: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help File: sched.c Modified
GNU nano 2.0.7

unsigned char in_nohz_recently;
#endif
/* capture load from *all* tasks on this cpu: */
struct load_weight load;
unsigned long nr_load_updates;
u64 nr_switches;

struct cfs_rq cfs;
#ifndef CONFIG_FAIR_GROUP_SCHED
/* list of leaf cfs_rq on this cpu: */
struct list_head leaf_cfs_rq_list;
#endif
struct rt_rq rt;
#ifndef CONFIG_SCHED_CASIO_POLICY
struct casio_rq casio_rq;
#endif
/*
 * This is part of a global counter where only the total sum
 * over all CPUs matters. A task can increase this counter on
 * one CPU and if it got migrated afterwards it may decrease
 * it on another CPU. Always updated under the runqueue lock:
 */
unsigned long nr_uninterruptible;

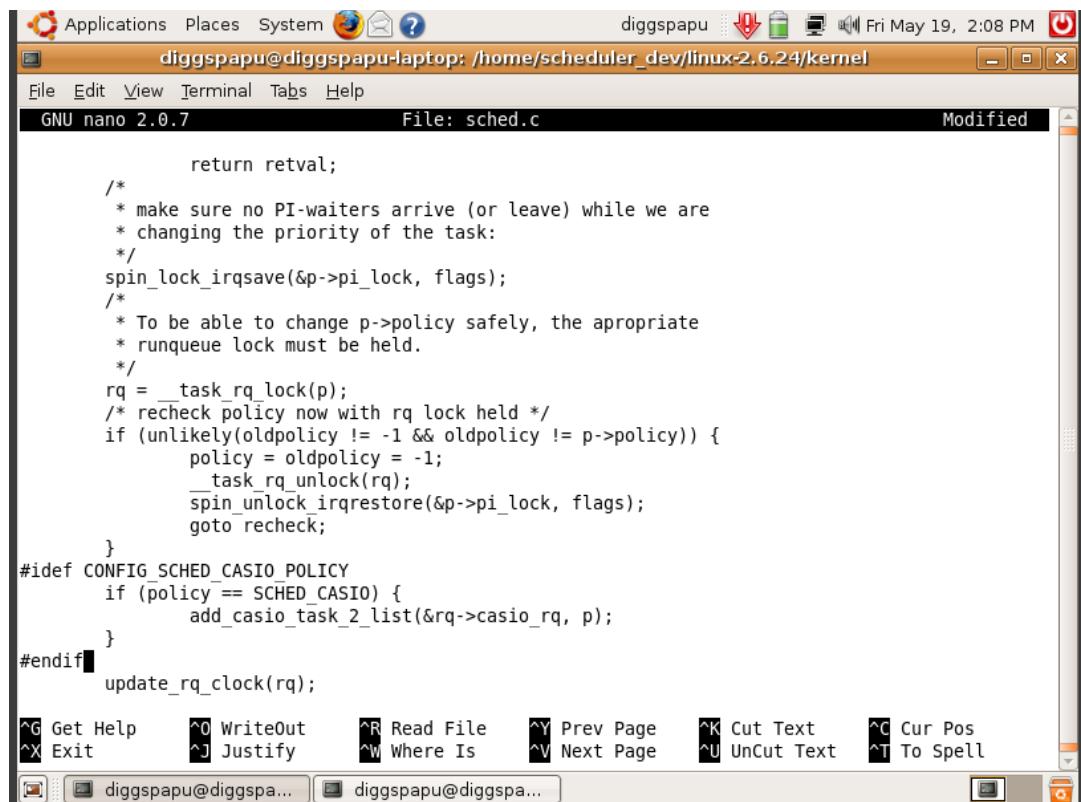
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U Uncut Text ^T To Spell
diggspapu@diggs...

```

La struct `casio_rq` es usado para la política de calendarización de CASIO, su propósito es mantener una pista de las tasks que han sido calendarizado utilizando dicha política, así mismo, contiene varios miembros: `casio_rq_list` que es una lista con los tasks que han sido calendarizado usando esta política, así mismo `casio_rq_nr_running` que es el número de tasks que están siendo corridos en el CPU.

El tipo `atomic_t` provee operaciones atómicas en variables enteras, de manera que su propósito es proveer una forma de realizar dichas operaciones en estructuras de datos compartidas en un ambiente multithreading sin la necesidad de que se utilicen bloqueos o métodos de sincronización. A su vez las operaciones RMW es una clase de operaciones atómicas que leen el valor actual de una variable y la modifican de alguna forma, para después escribir un nuevo valor en memoria. Las MMIO se refiere a una técnica para acceder dispositivos hardware de manera que los registros de dichos dispositivos se mapean en el espacio de direcciones del CPU como si fuera locaciones de memoria, esto permite al CPU leer y escribir a los registros utilizando protocolos estándares como con memoria regular.

Función setscheduler

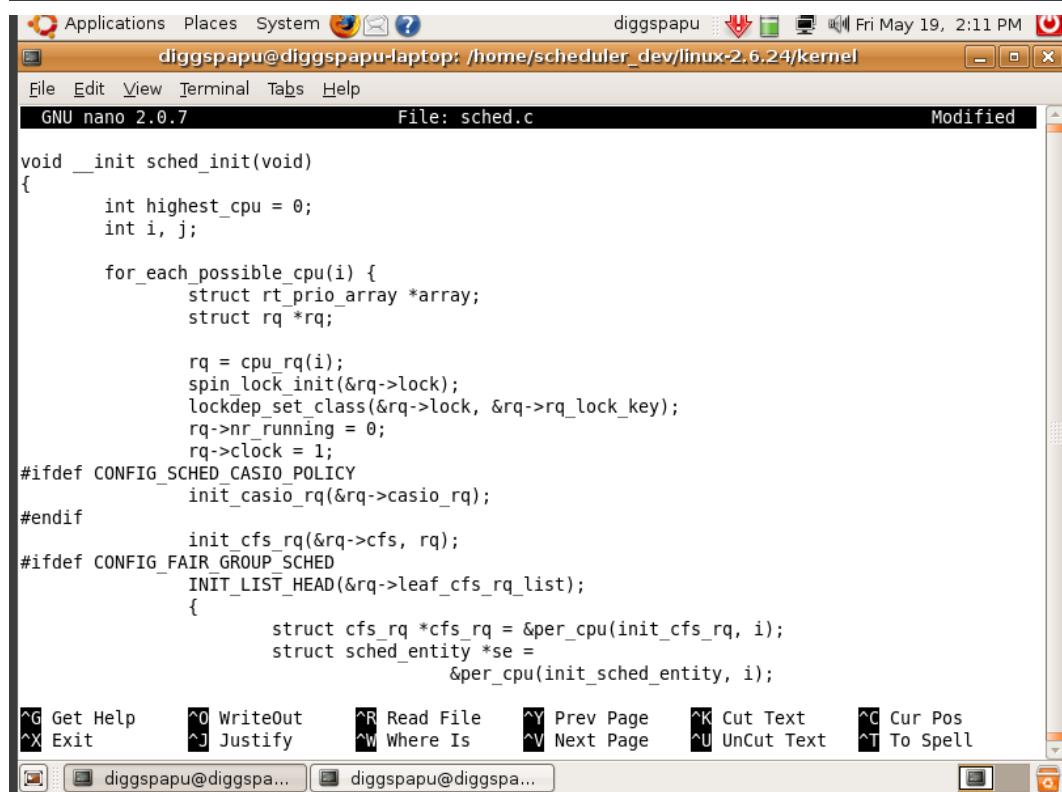


```

return retval;
/*
 * make sure no PI-waiters arrive (or leave) while we are
 * changing the priority of the task:
 */
spin_lock_irqsave(&p->pi_lock, flags);
/*
 * To be able to change p->policy safely, the appropriate
 * runqueue lock must be held.
 */
rq = __task_rq_lock(p);
/* recheck policy now with rq lock held */
if (unlikely(oldpolicy != -1 && oldpolicy != p->policy)) {
    policy = oldpolicy = -1;
    __task_rq_unlock(rq);
    spin_unlock_irqrestore(&p->pi_lock, flags);
    goto recheck;
}
#endif CONFIG_SCHED_CASIO_POLICY
    if (policy == SCHED_CASIO) {
        add_casio_task_2_list(&rq->casio_rq, p);
    }
#endif
update_rq_clock(rq);

```

^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U Uncut Text ^T To Spell



```

void __init sched_init(void)
{
    int highest_cpu = 0;
    int i, j;

    for_each_possible_cpu(i) {
        struct rt_prio_array *array;
        struct rq *rq;

        rq = cpu_rq(i);
        spin_lock_init(&rq->lock);
        lockdep_set_class(&rq->lock, &rq->rq_lock_key);
        rq->nr_running = 0;
        rq->clock = 1;
#ifdef CONFIG_SCHED_CASIO_POLICY
        init_casio_rq(&rq->casio_rq);
#endif
        init_cfs_rq(&rq->cfs, rq);
#ifdef CONFIG_FAIR_GROUP_SCHED
        INIT_LIST_HEAD(&rq->leaf_cfs_rq_list);
        {
            struct cfs_rq *cfs_rq = &per_cpu(init_cfs_rq, i);
            struct sched_entity *se =
                &per_cpu(init_sched_entity, i);

```

^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where Is ^V Next Page ^U Uncut Text ^T To Spell

Programando sched_casio.c

```
Applications Places System diggspapu Fri May 19, 2:37 PM
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel$ cat sched_casio.c
void init_casio_rq(struct casio_rq* casio_rq) {
    casio_rq->casio_rb_root = RB_ROOT;
    INIT_LIST_HEAD(&casio_rq->casio_list_head);
    atomic_set(&casio_rq->n_rn_running, 0);
}
void add_casio_task_2_list(struct casio_rq* rq, struct task_struct* p) {
    struct list_head* ptr = NULL;
    struct casio_task* new = NULL;
    struct casio_task* casio_task = NULL;
    // char msg
    if (rq && p) {
        new = (struct casio_task*)kzalloc(sizeof(struct casio_task), GFP_KERNEL);
        if (new) {
            casio_task = NULL;
            new->task = p;
            new->absolute_deadline = 0;
            list_for_each(ptr, &rq->casio_list_head) {
                casio_task = list_entry(ptr, struct casio_task, casio_list_node);
                if (casio_task) {
                    if (new->task->casio_id < casio_task->task->casio_id) {
                        list_add(&new->casio_list_node, ptr);
                        return;
                    }
                }
            }
            list_add(&new->casio_list_node, &rq->casio_list_head);
            //logs
        } else {
            printk(KERN_ALERT "add_casio_task_2_list: kzalloc\n");
        }
    } else {
        printk(KERN_ALERT "add_casio_task_2_list: null pointers\n"
    }
}

diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File diggspapu - File Br... home - File Browser Mozilla Firefox
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File diggspapu - File Br... home - File Browser Mozilla Firefox
```

```

Applications Places System diggspapu ? Fri May 19, 2:38 PM
diggspapu@diggspapu-laptop: /home/scheduler_dev/linux-2.6.24/kernel
File Edit View Terminal Tabs Help
}

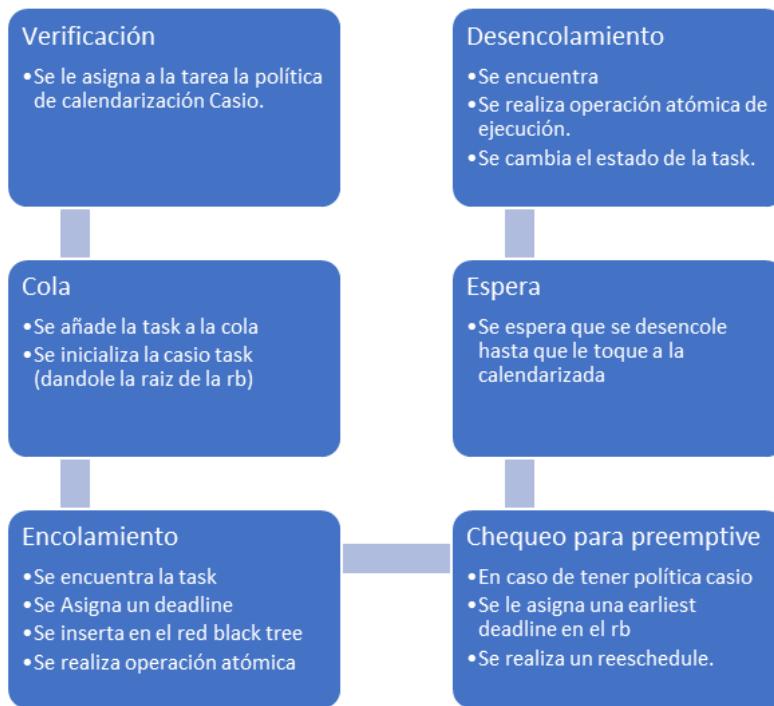
void rem_casio_task(struct casio_rq* rq, struct task_struct* p) {
    struct list_head* ptr = NULL;
    struct list_head* next = NULL;
    struct casio_task* casio_task = NULL;
    //char msg
    if (rq && p) {
        list_for_each_safe(ptr, next, &rq->casio_list_head) {
            casio_task = list_entry(ptr, struct casio_task, casio_list_node);
            if (casio_task) {
                if(casio_task->task->casio_id == p->casio_id) {
                    list_del(ptr);
                    kfree(casio_task);
                    return;
                }
            }
        }
    }
}

struct casio_task* find_casio_task_list(struct casio_rq* rq, struct task_struct* p) {
    struct list_head* ptr = NULL;
    struct casio_task* casio_task = NULL;
    if (rq && p) {
        list_for_each(ptr, &rq->casio_list_head) {
            casio_task = list_entry(ptr, struct casio_task, casio_list_node);
            if (casio_task) {
                if (casio_task->task->casio_id == p->casio_id) {
                    return casio_task;
                }
            }
        }
    }
    return NULL;
}

diggspapu@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24/kernel$
```

¿Qué indica el campo .next de esta estructura? Es un puntero a la clase que define a la estructura de calendarización para las tareas en tiempo real (rt) de amena que esta función usa un apuntador para poder usar las tareas en tiempo real y poder calendarizar en que momento serán ejecutadas.

Tomando en cuenta las funciones para manejo de lista y red-black tree de casio_tasks, explique el ciclo de vida de una casio_task desde el momento en el que se le asigna esta clase de calendarización mediante sched_setscheduler. El objetivo es que indique el orden y los escenarios en los que se ejecutan estas funciones, así como las estructuras de datos por las que pasa. ¿Por qué se guardan las casio_tasks en un red-black tree y en una lista encadenada?



Se guarda en una lista encadenada debido a que utiliza colas para poder ejecutarse y así calendarizar los procesos en colas, así mismo, es un red black tree precisamente para hacer las búsquedas más eficientes de las tasks calendarizadas.

¿Cuándo preempesta una casio_task a la task actualmente en ejecución? Se preempesta cuando cuando el deadline de la casio task sea mayor que el del current.

Tomando un snapshot

```

root@diggspapu-laptop: /home/scheduler
File Edit View Terminal Tabs Help
block Documentation init lib net scripts
COPYING drivers ipc MAINTAINERS README security
CREDITS fs Kbuild Makefile REPORTING-BUGS sound
root@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24-casio# sudo nano Makefile
root@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24-casio# cd /boot
root@diggspapu-laptop:/boot# cd /home/scheduler_dev/linux-2.6.24-casio/
root@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24-casio# sudo cp /boot/config-2.6.24-26-generic .config
root@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24-casio# cp /home/scheduler_dev /home/scheduler
cp: omitting directory `/home/scheduler_dev'
root@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24-casio# cp -r /home/scheduler_dev /home/scheduler
root@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24-casio# cd /home/scheduler
bash: cd: /home/schedule: No such file or directory
root@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24-casio# cd /home/scheduler
root@diggspapu-laptop:/home/scheduler# ls
scheduler_dev
root@diggspapu-laptop:/home/scheduler#
root@diggspapu-laptop:/home/scheduler# rm -r scheduler_dev
root@diggspapu-laptop:/home/scheduler# cp -a /home/scheduler_dev /home/scheduler
root@diggspapu-laptop:/home/scheduler# ls
scheduler_dev
root@diggspapu-laptop:/home/scheduler#
root@diggspapu-laptop:/home/scheduler_dev/linux-2.6.24-casio/fs/proc# 
  
```

Sudo make oldconfig

```

Support for PCI Hotplug (EXPERIMENTAL) (HOTPLUG_PCI) [M/n/y/?] m
Fake PCI Hotplug driver (HOTPLUG_PCI_FAKE) [M/n/?] m
Compaq PCI Hotplug driver (HOTPLUG_PCI_COMPAQ) [M/n/?] m
Save configuration into NVRAM on Compaq servers (HOTPLUG_PCI_COMPAQ_NVRAM) [Y/n/?] y
IBM PCI Hotplug driver (HOTPLUG_PCI_IBM) [M/n/?] m
ACPI PCI Hotplug driver (HOTPLUG_PCI_ACPI) [M/n/?] m
ACPI PCI Hotplug driver IBM extensions (HOTPLUG_PCI_ACPI_IBM) [M/n/?] m
CompactPCI Hotplug driver (HOTPLUG_PCI_CPCI) [Y/n/?] y
Ziatech ZT5550 CompactPCI Hotplug driver (HOTPLUG_PCI_CPCI_ZT5550) [M/n/?] m
Generic port I/O CompactPCI Hotplug driver (HOTPLUG_PCI_CPCI_GENERIC) [M/n/?] m
SHPC PCI Hotplug driver (HOTPLUG_PCI_SHPC) [M/n/?] m
*
* Executable file formats / Emulations
*
Kernel support for ELF binaries (BINfmt_ELF) [Y/n/?] y
Kernel support for a.out and ECOff binaries (BINfmt_AOUT) [M/n/y/?] m
Kernel support for MISC binaries (BINfmt_MISC) [M/n/y/?] m
*
* CASIO Scheduler
*
CASIO Scheduling policy (SCHED_CASIO_POLICY) [Y/n] (NEW) y

```

siguiente comando:

```

sudo cp /boot/config-2.6.24-26-generic .config

```

Note el espacio antes de .config. Ahora copie todo el contenido de scheduler_dev/2.6.24-casio a scheduler (use la opción -a del comando cp). Se recomienda crear una sr (al menos) en este punto. Diríjase a scheduler/linux-2.6.24-casio y ejecute lo siguiente:

```

sudo make oldconfig

```

Este proceso de compilación toma un archivo de configuración existente y crea uno nuevo, pidiendo al usuario sobre las características nuevas o desconocidas que tenga el kernel a compilarse. Puede preguntar que se le realice habrá un valor entre corchetes y, en caso de ser una pregunta con respuesta "si" o "no", se señalará con una letra mayúscula la opción por defecto. Asegúrese de que Scheduler sea configurada con 'y' y todas las demás opciones con su valor por defecto. Al terminar el proceso, ejecute el siguiente comando:

```

sudo make-kpkg --initrd kernel_image 2>../errors

```

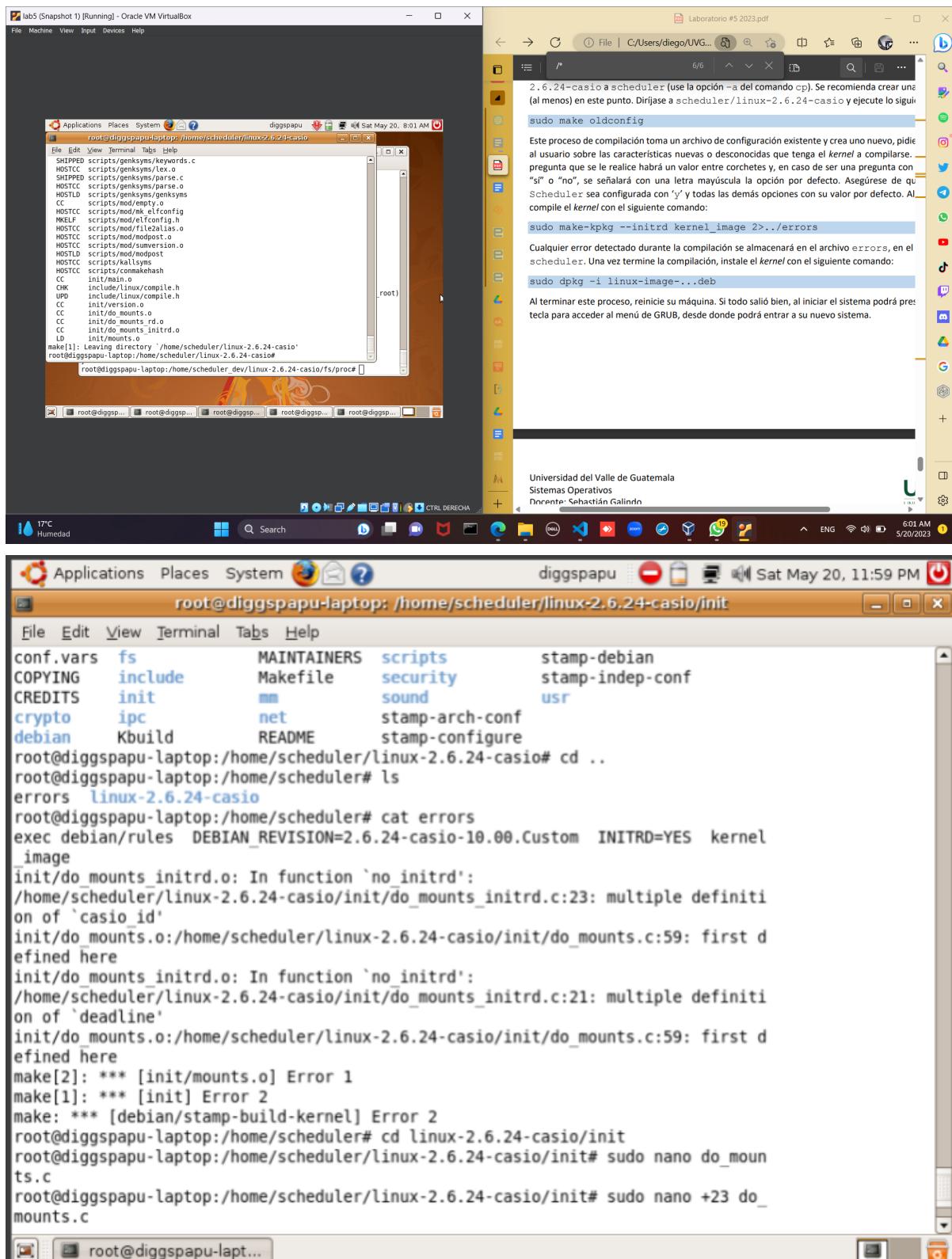
Cualquier error detectado durante la compilación se almacenará en el archivo errors, en el directorio scheduler. Una vez termine la compilación, instale el kernel con el siguiente comando:

```

sudo dpkg -i linux-image-...

```

Al terminar este proceso, reinicie su máquina. Si todo salió bien, al iniciar el sistema podrá presionar la tecla para acceder al menú de GRUB, desde donde podrá entrar a su nuevo sistema.



¿Qué información contiene el archivo system que se especifica como argumento en la ejecución de casio_system? Dado el error de arriba no pude contestar esta pregunta.

Investigue el concepto de aislamiento temporal en relación a procesos. Explique cómo el calendarizador SCHED_DEADLINE, introducido en la versión 3.14 del kernel de Linux, añade al algoritmo EDF para lograr aislamiento temporal

El aislamiento temporal es la capacidad de garantizar que un proceso de tiempo real pueda cumplir con sus requisitos de tiempo y que se cumpla dentro de los límites de tiempo especificados, sin ser afectado por otros procesos en el sistema. Así mismo, sistema operativo debe proporcionar un mecanismo de planificación que separe y aisle los procesos de tiempo real. Así mismo, el SCHED_DEADLINE implementa esto mediante EDF, primero usa las prioridades basadas límite de ejecución, aislamiento mediante subdominios que son conjuntos de procesos que comparten características y políticas de planificación similares, la planificación de EDF en cada dominio de manera que se aplica el algoritmo de planificación EDF para ordenar los procesos según el plazo más cercano. Finalmente utiliza el control de recursos de manera que controla los recursos para hacerlo lo más justo posible.