



Universidade Federal de Uberlândia FEELT
Faculdade de Engenharia Elétrica
Engenharia de Controle e Automação



Sistemas Embarcados II

Comandos Básicos - Terminal Linux

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Introdução

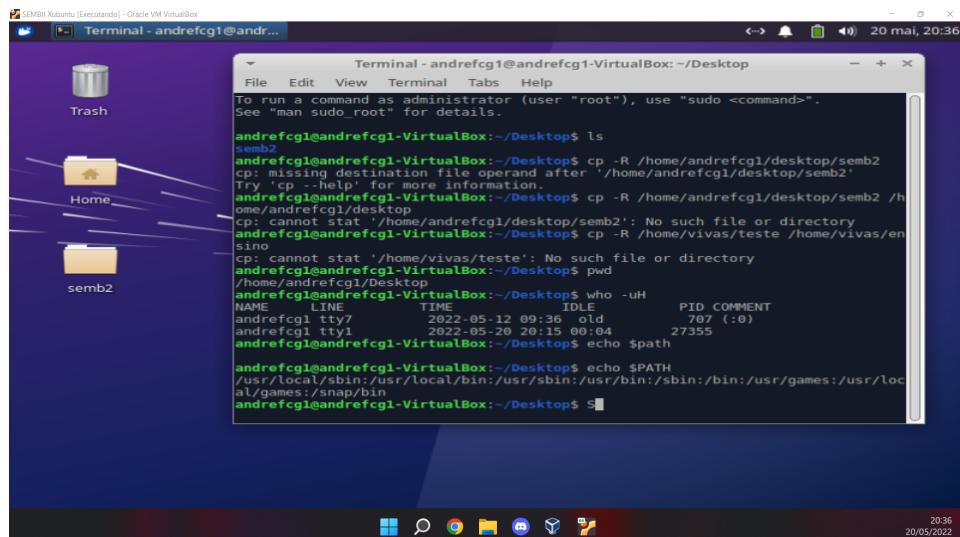
Ao longo da disciplina utilizaremos uma vertente do sistema operacional Linux, sendo o mesmo um termo popularmente empregado para se referir a sistemas operativos ou sistemas operacionais que utilizam o Kernel Linux.

Sendo necessário compreender melhor e familiarizar-se com o sistema operacional, neste primeiro momento, teremos este arquivo que parte da ideia de criar afinidade com o terminal (ou shell) do Xubuntu (distribuição Linux derivada do Ubuntu que utiliza o ambiente Xfce).

Desenvolvimento

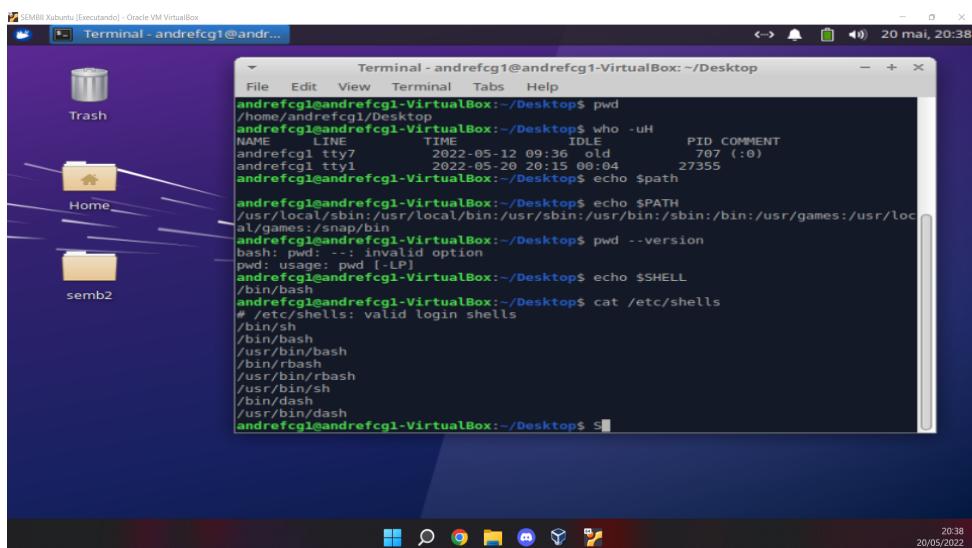
O arquivo a seguir descreve de forma breve o que envolve as telas (prints) e, quando se faz necessário, uma análise mais detalhada do tópico.

Comandos básicos no terminal



```
Terminal - andre@andre-VirtualBox:~/Desktop$ ls
sem2
andre@andre-VirtualBox:~/Desktop$ cp -R /home/andre/andre/Desktop/sem2
cp: missing destination file operand after '/home/andre/andre/Desktop/sem2'
Try 'cp --help' for more information.
andre@andre-VirtualBox:~/Desktop$ cp -R /home/andre/andre/Desktop/sem2 /home/vivas/teste
cp: cannot stat '/home/andre/andre/Desktop/sem2': No such file or directory
andre@andre-VirtualBox:~/Desktop$ cp -R /home/vivas/teste /home/vivas/en
sino
cp: cannot stat '/home/vivas/teste': No such file or directory
andre@andre-VirtualBox:~/Desktop$ pwd
/home/andre/andre/Desktop
andre@andre-VirtualBox:~/Desktop$ who -uH
NAME        LINE       TIME      IDLE      PID COMMENT
andre@tty7  2022-05-12 09:36 old      707 (:0)
andre@tty1  2022-05-20 20:15 00:04 27355
andre@andre-VirtualBox:~/Desktop$ echo $path
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/usr/games:/usr/local/games:/snap/bin
andre@andre-VirtualBox:~/Desktop$
```

Descobrindo shells



```
Terminal - andre@andre-VirtualBox:~/Desktop$ pwd
/home/andre/andre/Desktop
andre@andre-VirtualBox:~/Desktop$ who -uH
NAME        LINE       TIME      IDLE      PID COMMENT
andre@tty7  2022-05-12 09:36 old      707 (:0)
andre@tty1  2022-05-20 20:15 00:04 27355
andre@andre-VirtualBox:~/Desktop$ echo $path
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/usr/games:/usr/local/games:/snap/bin
andre@andre-VirtualBox:~/Desktop$ pwd --version
pwd: usage: pwd [-LP]
andre@andre-VirtualBox:~/Desktop$ echo $SHELL
/bin/bash
andre@andre-VirtualBox:~/Desktop$ cat /etc/shells
# /etc/shells: valid login shells
/bin/sh
/bin/bash
/usr/bin/bash
/bin/rbash
/usr/bin/rbash
/bin/dash
/usr/bin/dash
andre@andre-VirtualBox:~/Desktop$
```

Interpretação de caracteres especiais

```
Terminal - andrefcg1@andrefcg1-VirtualBox:~/Desktop
File Edit View Terminal Tabs Help
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ echo teste
teste
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ echo 'teste'
teste
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ echo -e "string1\tstring2\nstring3"
string1 string2
string3
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ echo -e "string1\tstring2\n\nstring3"
string1 string2
\nstring3
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ echo -e "string1\tstring2\tstring3"
string1
string2
string3
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ echo -e "string1\nstring2\nstring3"
string1
string2
string3
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ S
```

Histórico

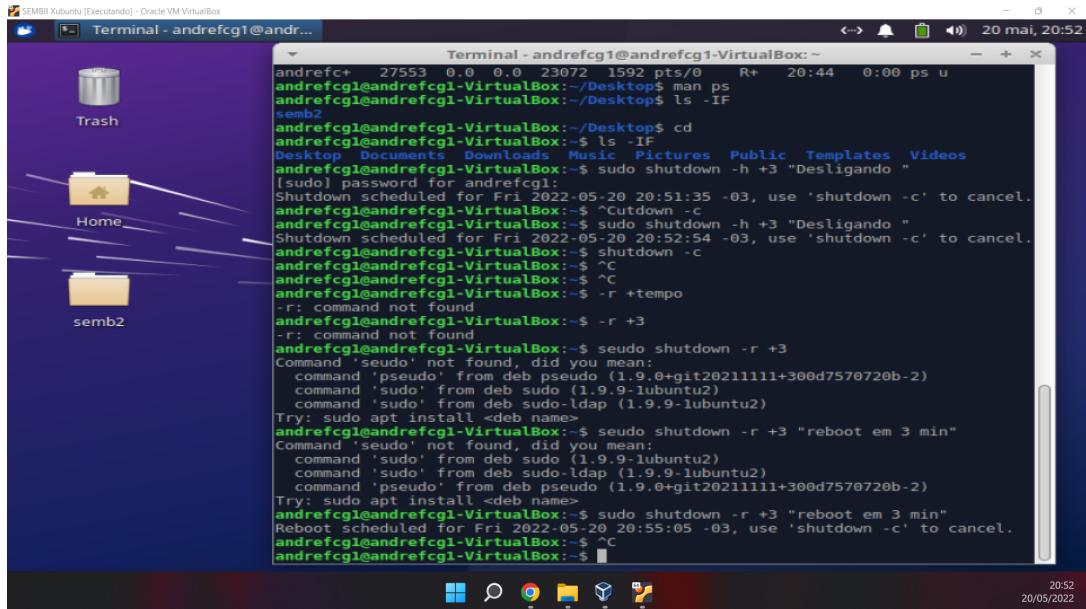
```
Terminal - andrefcg1@andrefcg1-VirtualBox:~/Desktop
File Edit View Terminal Tabs Help
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ echo -e "string1\nstring2\nstring3"
string1
string2
string3
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ history
1 ls
2 cp -R /home/andrefcg1/desktop/semb2
3 cp -R /home/andrefcg1/Desktop/semb2 /home/andrefcg1/Desktop
4 cp -R /home/vivas/teste /home/vivas/ensino
5 pwd
6 who -uH
7 echo $path
8 echo ${PATH}
9 pwd --version
10 echo $$SHELL
11 cat /etc/shells
12 /bin/ls
13 clear
14 echo teste
15 echo 'teste'
16 echo "teste"
17 echo -e "string1\tstring2\nstring3"
18 echo -e "string1\tstring2\n\nstring3"
19 echo -e "string1\tstring2\tstring3"
20 echo -e "string1\nstring2\nstring3"
21 history
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ S
```

Comandos ps

```
Terminal - andrefcg1@andrefcg1-VirtualBox:~/Desktop
File Edit View Terminal Tabs Help
21 history
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ !4
cp -R /home/vivas/teste /home/vivas/ensino
cp: cannot stat '/home/vivas/teste': No such file or directory
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ !5
pwd
/home/andrefcg1/Desktop
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ date
sex 20 mai 2022 20:44:27 -03
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ ps
  PID TTY          TIME COMMAND
 27503 pts/0    00:00:00 bash
 27551 pts/0    00:00:00 ps
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ ps -au
USER      PID %CPU %MEM   VSZ RSS TTY      STAT START   TIME COMMAND
root     613  0.2  2.8 293248 58088 ttys0  R+ 20:03  0:05 /usr/lib/xorg
root    27271  0.0  0.2  7584  5172 ttys0  Ss 20:14  0:00 /bin/login -p
andrefcg1 27503  0.0  0.2  21548  5268 pts/0  S+ 20:15  0:00 -bash
andrefcg1 27552  0.0  0.0  23072  1568 pts/0  R+ 20:32  0:00 bash
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ ps u
USER      PID %CPU %MEM   VSZ RSS TTY      STAT START   TIME COMMAND
andrefcg1 27355  0.0  0.2  21492  5316 ttys0  S+ 20:15  0:00 -bash
andrefcg1 27503  0.0  0.2  21548  5268 pts/0  Ss 20:32  0:00 bash
andrefcg1 27553  0.0  0.0  23072  1592 pts/0  R+ 20:44  0:00 ps u
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ man ps
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ S
```

Foram vistos também: os comandos de navegação de página (page up e down), utilização de comandos do histórico, clear, log out, exit, shutdown, entre outros que não possibilitaram printar.

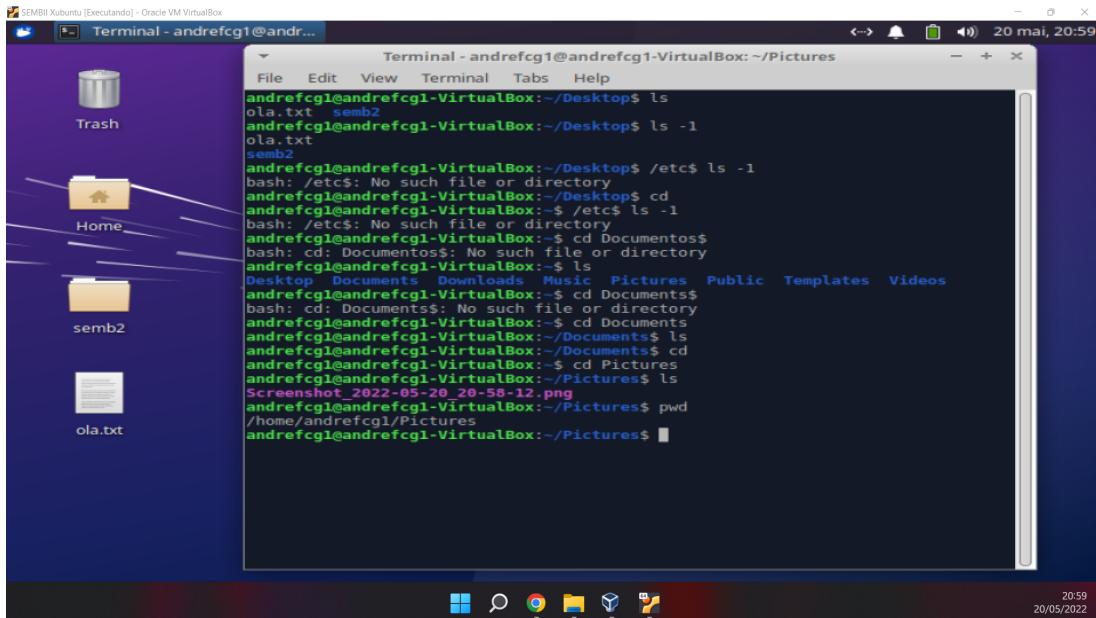
Agendamento de desligar e reiniciar a máquina



```
Terminal - andrefcg1@andrefcg1-VirtualBox:~
```

```
andrefcg1@andrefcg1-VirtualBox:~$ man ps
andrefcg1@andrefcg1-VirtualBox:~$ ls -lF
Desktop Documents Downloads Music Pictures Public Templates Videos
andrefcg1@andrefcg1-VirtualBox:~$ sudo shutdown -h +3 "Desligando"
[sudo] password for andrefcg1:
Shutdown scheduled for Fri 2022-05-20 20:51:35 -03, use 'shutdown -c' to cancel.
andrefcg1@andrefcg1-VirtualBox:~$ ^C
andrefcg1@andrefcg1-VirtualBox:~$ sudo shutdown -h +3 "Desligando"
Shutdown scheduled for Fri 2022-05-20 20:52:54 -03, use 'shutdown -c' to cancel.
andrefcg1@andrefcg1-VirtualBox:~$ shutdown -c
andrefcg1@andrefcg1-VirtualBox:~$ ^C
andrefcg1@andrefcg1-VirtualBox:~$ -r +tempo
-r: command not found
andrefcg1@andrefcg1-VirtualBox:~$ -r +3
-r: command not found
andrefcg1@andrefcg1-VirtualBox:~$ seudo shutdown -r +3
Command 'seudo' not found, did you mean:
  command 'pseudo' from deb pseudo (1.9.0+git20211111+300d7570720b-2)
  command 'sudo' from deb sudo (1.9.9-1ubuntu2)
  command 'sudo' from deb sudo-ldap (1.9.9-1ubuntu2)
Try: sudo apt install <deb name>
andrefcg1@andrefcg1-VirtualBox:~$ seudo shutdown -r +3 "reboot em 3 min"
Command 'seudo' not found, did you mean:
  command 'sudo' from deb sudo (1.9.9-1ubuntu2)
  command 'sudo' from deb sudo-ldap (1.9.9-1ubuntu2)
  command 'pseudo' from deb pseudo (1.9.0+git20211111+300d7570720b-2)
Try: sudo apt install <deb name>
andrefcg1@andrefcg1-VirtualBox:~$ sudo shutdown -r +3 "reboot em 3 min"
Reboot scheduled for Fri 2022-05-20 20:55:05 -03, use 'shutdown -c' to cancel.
andrefcg1@andrefcg1-VirtualBox:~$ ^C
andrefcg1@andrefcg1-VirtualBox:~$
```

Comandos de navegação



```
Terminal - andrefcg1@andrefcg1-VirtualBox:~/Pictures
```

```
File Edit View Terminal Tabs Help
```

```
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ ls
ola.txt semb2
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ ls -l
ola.txt
semb2
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ /etc$ ls -l
bash: /etc$: No such file or directory
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ cd
andrefcg1@andrefcg1-VirtualBox:~/$ /etc$ ls -l
bash: /etc$: No such file or directory
andrefcg1@andrefcg1-VirtualBox:~/$ cd Documentos$
bash: cd: Documentos$: No such file or directory
andrefcg1@andrefcg1-VirtualBox:~/$ ls
Desktop Documents Downloads Music Pictures Public Templates Videos
andrefcg1@andrefcg1-VirtualBox:~/$ cd Documentos$
bash: cd: Documentos$: No such file or directory
andrefcg1@andrefcg1-VirtualBox:~/$ cd Documents
andrefcg1@andrefcg1-VirtualBox:~/Documents$ ls
andrefcg1@andrefcg1-VirtualBox:~/Documents$ cd Pictures
andrefcg1@andrefcg1-VirtualBox:~/Pictures$ ls
Screenshot_2022-05-20_20-58-12.png
andrefcg1@andrefcg1-VirtualBox:~/Pictures$ pwd
/home/andrefcg1/Pictures
andrefcg1@andrefcg1-VirtualBox:~/Pictures$
```

Editando e movendo arquivo entre os diretórios

```
SEMBI Xubuntu [Executando] - Oracle VM VirtualBox
Terminal - andrefcg1@andrefcg1-VirtualBox: ~/Desktop/semb2
File Edit View Terminal Tabs Help
total 0
0 'ola (copy 1).txt' 0 ola.txt
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ ls -alF
total 0
drwxrwxr-x 2 andrefcg1 andrefcg1 4096 mai 20 21:02 .
drwxr-xr-x 3 andrefcg1 andrefcg1 4096 mai 20 20:55 /
-rw-rw-r-- 1 andrefcg1 andrefcg1 0 mai 20 20:55 'ola (copy 1).txt'
-rw-rw-r-- 1 andrefcg1 andrefcg1 0 mai 20 20:55 ola.txt
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ cd
andrefcg1@andrefcg1-VirtualBox:~$ echo -e/home/vivas
/home/vivas
andrefcg1@andrefcg1-VirtualBox:~$ cd Desktop
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ cd semb2
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ pwd
/home/andrefcg1/Desktop/semb2
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ ls
'ola (copy 1).txt'  ola.txt
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ ls ola.txt
ola.txt
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ cp ola.txt /home/andrefcg1/desk
op/semb2 /home/Documents
cp: target '/home/Documents' is not a directory
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ cp ola.txt /home/andrefcg1/desk
op/semb2 /home/andrefcg1/Documents
cp: cannot stat '/home/andrefcg1/Desktop/semb2': No such file or directory
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ cp ola.txt
cp: missing destination file operand after 'ola.txt'
Try 'cp --help' for more information.
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ cp ola.txt /home/andrefcg1/Docum
ents
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ rename ola.txt bye.txt
Command 'rename' not found, but can be installed with:
sudo apt install rename
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ sudo apt install rename
21:12
20/05/2022
```

Adicionando e removendo diretório

```
SEMBI Xubuntu [Executando] - Oracle VM VirtualBox
Terminal - andrefcg1@andrefcg1-VirtualBox: ~/Desktop/semb2
File Edit View Terminal Tabs Help
Rename full path: including any directory component. DEFAULT
-d, --filename, --nopath, --nofullpath
Do not rename directory: only rename filename component of path.
-h, --help
Help: print SYNOPSIS and OPTIONS.
-m, --man
Manual: print manual page.
-V, --version
Version: show version number.
-u, --unicode [encoding]
Treat filenames as perl (unicode) strings when running the
user-supplied code.
Decode/encode filenames using encoding, if present.
encoding is optional: if omitted, the next argument should be an
option starting with '--', for instance '-e'.
-e
Expression: code to act on files name.
May be repeated to build up code (like "perl -e"). If no -e, the
first argument is used as code.
-E
Statement: code to act on files name, as -e but terminated by
';'.
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ rm ola.txt
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ mkdir teste
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ 
21:14
20/05/2022
```

```
SEMBI Xubuntu [Executando] - Oracle VM VirtualBox
Terminal - andrefcg1@andrefcg1-VirtualBox: ~/Desktop/semb2
File Edit View Terminal Tabs Help
Rename full path: including any directory component. DEFAULT
-d, --filename, --nopath, --nofullpath
Do not rename directory: only rename filename component of path.
-h, --help
Help: print SYNOPSIS and OPTIONS.
-m, --man
Manual: print manual page.
-V, --version
Version: show version number.
-u, --unicode [encoding]
Treat filenames as perl (unicode) strings when running the
user-supplied code.
Decode/encode filenames using encoding, if present.
encoding is optional: if omitted, the next argument should be an
option starting with '--', for instance '-e'.
-e
Expression: code to act on files name.
May be repeated to build up code (like "perl -e"). If no -e, the
first argument is used as code.
-E
Statement: code to act on files name, as -e but terminated by
';'.
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ rm ola.txt
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ mkdir teste
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ rmdir teste
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ 
21:14
20/05/2022
```

Alguns comandos de manipulação de caracteres e palavras do capítulo 4

Comandos de informação de arquivos

The screenshot shows a desktop environment with a file manager window open on the left and a terminal window open on the right.

File Manager (Left):

- Icon: Trash
- Path: /home/andrefcg1/Desktop/semb2
- File List:
 - 4300-0.txt
 - ola.txt
 - ola (copy 1).txt

Terminal (Right):

```
Try 'wget --help' for more options.
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ cd
andrefcg1@andrefcg1-VirtualBox:~$ cd semb2
andrefcg1@andrefcg1-VirtualBox:~/semb2$ sudo file ola
andrefcg1@andrefcg1-VirtualBox:~/semb2$ cd desktop
bash: cd: desktop: No such file or directory
andrefcg1@andrefcg1-VirtualBox:~/semb2$ cd Desktop
andrefcg1@andrefcg1-VirtualBox:~/Desktop$ cd semb2
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ wget -q http://www.gutenberg.org/files/4300/4300-0.txt
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ file 4300-0.txt
4300-0.txt: HTML document, ASCII text, with very long lines (938), with no line terminators
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ file CENTENFOLHA
CENTENFOLHA: cannot open CENTENFOLHA (No such file or directory)
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ file CENTERFOLHA
CENTERFOLHA: cannot open CENTERFOLHA (No such file or directory)
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ l 4300-0.txt
<!DOCTYPE html PUBLIC "-//W3C//DTD XHTML 1.0 Transitional//EN" "http://www.w3.org/TR/xhtml1/DTD/xhtml1-transitional.dtd"><html><head><meta http-equiv="refresh" content="0;url=http://lander.rnbarfruit.com/main?%20ParticipantID=loz9eqzenc0fc4ufawcz9aubx2zgfrw7z&FailedURI=http%3A%2F%2Fwww.gutenberg.org/files%2F4300%2F4300-0.txt&FailureMode=1&Implementation=&AddInType=4&Version=pwry1_0&ClientLocation=br&S=1"></head><script>url="http://lander.rnbarfruit.com/main?%20ParticipantID=loz9eqzenc0fc4ufawcz9aubx2zgfrw7z&FailedURI=http%3A%2F%2Fwww.gutenberg.org/files%2F4300%2F4300-0.txt&FailureMode=1&Implementation=&AddInType=4&Version=pwry1_0&ClientLocation=br&S=1";if((top.location!=location)){var w=w.innerWidth,d=document.documentElement,b=d.body,y=w.innerHeight||e.clientWidth||b.clientWidth||b.clientHeight||y.innerHTML||e.clientHeight||b.clientWidth||url+="&w="+(y||b.clientWidth||b.clientHeight);if(url){document.location.replace(url)}}</script></head><body></body></html>
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$ wc 4300-0.txt
   12 938 4300-0.txt
andrefcg1@andrefcg1-VirtualBox:~/Desktop/semb2$
```

"4300-0.txt": 938 bytes, 12 lines

Alguns dos comandos de informações do sistema do capítulo 5

The screenshot shows a terminal window titled "Terminal - andrefcfg1@andrefcfg1-VirtualBox: ~". The terminal output is as follows:

```
colorfd:x:120:129:colorfd colour management daemon,,,:/var/lib/colorfd:/usr/sbin/no
login
pulse:x:121:130:PulseAudio daemon,,,:/run/pulse:/usr/sbin/nologin
hplip:x:122:HPLIP system user,,,:/run/hplip:/bin/false
andrefcfg1:x:1000:1000:Andrefcfg1,,,:/home/andrefcfg1:/bin/bash
andrefcfg1@andrefcfg1-VirtualBox:~$ /Desktop/semb$ cd
andrefcfg1@andrefcfg1-VirtualBox:~$ passwd
Changing password for andrefcfg1.
Current password:
New password:
Retype new password:
No password has been supplied.
New password:
Retype new password:
You must choose a longer password.
New password:
Retype new password:
The password has not been changed.
passwd: Authentication token manipulation error
password unchanged
andrefcfg1@andrefcfg1-VirtualBox:~$ users
andrefcfg1
andrefcfg1@andrefcfg1-VirtualBox:~$ uname -s
Linux
andrefcfg1@andrefcfg1-VirtualBox:~$ uname -r
5.15.0-27-generic
andrefcfg1@andrefcfg1-VirtualBox:~$ uname -n
andrefcfg1@VirtualBox
andrefcfg1@andrefcfg1-VirtualBox:~$ uname -m
x86_64
andrefcfg1@andrefcfg1-VirtualBox:~$ uname -a
Linux andrefcfg1-VirtualBox 5.15.0-27-generic #28-Ubuntu SMP Thu Apr 14 04:55:28
UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
andrefcfg1@andrefcfg1-VirtualBox:~$
```

```

SEMBII Xubuntu [Executando] - Oracle VM VirtualBox
/home/andrefcg1/Desktop... /home/andrefcg1/Desktop... Terminal - andrefcg1@andrefcg1-VirtualBox: ~
File Edit View Terminal Tabs Help
andrefcg1@andrefcg1-VirtualBox:~$ users
andrefcg1
andrefcg1@andrefcg1-VirtualBox:~$ uname -s
Linux
andrefcg1@andrefcg1-VirtualBox:~$ uname -r
5.15.0-27-generic
andrefcg1@andrefcg1-VirtualBox:~$ uname -n
andrefcg1-VirtualBox
andrefcg1@andrefcg1-VirtualBox:~$ uname -m
x86_64
andrefcg1@andrefcg1-VirtualBox:~$ uname -a
Linux andrefcg1-VirtualBox 5.15.0-27-generic #28-Ubuntu SMP Thu Apr 14 04:55:28
UTC 2022 x86_64 x86_64 x86_64 GNU/Linux
andrefcg1@andrefcg1-VirtualBox:~$ echo $PATH
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/bin:/usr/games:/usr/local/games:/snap/bin
andrefcg1@andrefcg1-VirtualBox:~$ timeout 2ping www.ufu.com.br
timeout: invalid time interval '2ping'
Try 'timeout --help' for more information.
andrefcg1@andrefcg1-VirtualBox:~$ timeout 2 ping www.ufu.com.br
PING www.ufu.com.br (92.242.140.6) 56(84) bytes of data.
64 bytes from 92.242.140.6: icmp_seq=1 ttl=52 time=212 ms
64 bytes from 92.242.140.6: icmp_seq=2 ttl=52 time=212 ms
andrefcg1@andrefcg1-VirtualBox:~$ w
21:36:52 up 41 min, 1 user, load average: 0,00, 0,00, 0,00
USER TTY FROM LOGIN@ IDLE JCPU PCPU WHAT
andrefcg1 tty7 :0 20:55 41:39 22.03s 0.32s xfce4-session
andrefcg1@andrefcg1-VirtualBox:~$ whereis gcc
gcc: /usr/lib/gcc /usr/share/gcc
andrefcg1@andrefcg1-VirtualBox:~$ hostname;date;ls
sex 20 mai 2022 21:37:38 -03
Desktop Documents Downloads Music Pictures Public Templates Videos
andrefcg1@andrefcg1-VirtualBox:~$ 

```

Capítulo 7 - No que se diz respeito às permissões e “donos” de arquivos, foi lido todo material do capítulo, porém não utilizarei prints nesta etapa devido a simplicidade, apesar de no caso de realmente ser necessário aplicá-la, é uma etapa que se torna mais complexa.

Manipulações de usuários e grupos

```

SEMBII Xubuntu [Executando] - Oracle VM VirtualBox
Terminal - andrefcg1@andrefcg1-VirtualBox: ~
File Edit View Terminal Tabs Help
or 'ps --help <s|l|o|t|m|a>' for additional help text.
For more details see ps(1).
andrefcg1@andrefcg1-VirtualBox:~$ jobs
andrefcg1@andrefcg1-VirtualBox:~$ jobs -l
bash: jobs: -l: invalid option
jobs: usage: jobs [-lnprsl] [jobspec ...] or jobs -x command [args]
andrefcg1@andrefcg1-VirtualBox:~$ d: command not found
andrefcg1@andrefcg1-VirtualBox:~$ sudo adduser aluno
[sudo] password for andrefcg1:
Adding user 'aluno'...
Adding new group 'aluno' (1001)...
Adding new user 'aluno' (1001) with group 'aluno'...
Creating home directory '/home/aluno'...
Copying files from `/etc/skel'...
New password:
Retype new password:
password updated successfully
Changing the user information for aluno
Enter the new value, or press ENTER for the default
    Full Name []:
    Room Number []:
    Work Phone []:
    Home Phone []:
    Other []:
Is the information correct? (Y/n) y
andrefcg1@andrefcg1-VirtualBox:~$ -u
-u: command not found
andrefcg1@andrefcg1-VirtualBox:~$ sudo userdel aluno
andrefcg1@andrefcg1-VirtualBox:~$ userdel -r aluno
userdel: user 'aluno' does not exist
andrefcg1@andrefcg1-VirtualBox:~$ sudo userdel aluno

```

Instalação net-tools e tabela arp

```
Terminal - andrefcfg1@andrefcfg1-VirtualBox:~  
File Edit View Terminal Tabs Help  
andrefcfg1@andrefcfg1-VirtualBox:~$ cat /etc/hosts  
127.0.0.1 localhost  
127.0.1.1 andrefcfg1-VirtualBox  
  
# The following lines are desirable for IPv6 capable hosts  
::1 ip6-localhost ip6-loopback  
fe00::0 ip6-allnodes  
ff00::0 ip6-allrouters  
ff02::2 ip6-allrouters  
ff02::2:2 ip6-loopback  
  
andrefcfg1@andrefcfg1-VirtualBox:~$ arp -a  
Command 'arp' not found, but can be installed with:  
sudo apt install net-tools  
Reading package lists... Done  
Building dependency tree... Done  
Reading state information... Done  
The following NEW packages will be installed:  
    net-tools  
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.  
Need to get 204 kB of archives.  
After this operation, 819 kB of additional disk space will be used.  
Get:1 http://br.archive.ubuntu.com/ubuntu jammy/main amd64 net-tools amd64 1.60+git20181103.0eebce-1 [204 kB]  
Fetched 204 kB in 0s (857 kB/s)  
Selecting previously unselected package net-tools.  
(Reading database, 195017 files and directories currently installed.)  
Preparing to unpack .../net-tools_1.60+git20181103.0eebce-1ubuntu5_amd64.deb ...  
Unpacking net-tools (1.60+git20181103.0eebce-1ubuntu5) ...  
Setting up net-tools (1.60+git20181103.0eebce-1ubuntu5) ...  
Processing triggers for man-db (2.10.2-1) ...  
andrefcfg1@andrefcfg1-VirtualBox:~$ arp -a  
gateway (10.0.2.2) at 52:54:00:12:35:02 [ether] on enp0s3  
andrefcfg1@andrefcfg1-VirtualBox:~$
```

ifconfig commands

```
Terminal - andrefcfg1@andrefcfg1-VirtualBox:~  
File Edit View Terminal Tabs Help  
andrefcfg1@andrefcfg1-VirtualBox:~$ ifconfig eno1  
eno1: error fetching interface information: Device not found  
andrefcfg1@andrefcfg1-VirtualBox:~$ ifconfig eno1  
eno1: error fetching interface information: Device not found  
andrefcfg1@andrefcfg1-VirtualBox:~$ ping 10.1.212.1  
PING 10.1.212.1 (10.1.212.1) 56(84) bytes of data.  
^C  
-- 10.1.212.1 ping statistics --  
11 packets transmitted, 0 received, 100% packet loss, time 10236ms  
andrefcfg1@andrefcfg1-VirtualBox:~$ ping 192.168.137.82  
PING 192.168.137.82 (192.168.137.82) 56(84) bytes of data.  
64 bytes from 192.168.137.82: icmp_seq=1 ttl=63 time=125 ms  
64 bytes from 192.168.137.82: icmp_seq=2 ttl=63 time=45.8 ms  
64 bytes from 192.168.137.82: icmp_seq=3 ttl=63 time=66.0 ms  
64 bytes from 192.168.137.82: icmp_seq=4 ttl=63 time=41.7 ms  
64 bytes from 192.168.137.82: icmp_seq=5 ttl=63 time=112 ms  
64 bytes from 192.168.137.82: icmp_seq=6 ttl=63 time=29.5 ms  
64 bytes from 192.168.137.82: icmp_seq=7 ttl=63 time=53.3 ms  
64 bytes from 192.168.137.82: icmp_seq=8 ttl=63 time=178 ms  
64 bytes from 192.168.137.82: icmp_seq=9 ttl=63 time=98.8 ms  
64 bytes from 192.168.137.82: icmp_seq=10 ttl=63 time=126 ms  
64 bytes from 192.168.137.82: icmp_seq=11 ttl=63 time=83 ms  
64 bytes from 192.168.137.82: icmp_seq=12 ttl=63 time=62.5 ms  
64 bytes from 192.168.137.82: icmp_seq=13 ttl=63 time=348 ms  
64 bytes from 192.168.137.82: icmp_seq=14 ttl=63 time=118 ms  
64 bytes from 192.168.137.82: icmp_seq=15 ttl=63 time=26.1 ms  
^C  
-- 192.168.137.82 ping statistics --  
15 packets transmitted, 15 received, 0% packet loss, time 14025ms  
rtt min/avg/max/mdev = 5.825/99.229/347.926/80.216 ms  
andrefcfg1@andrefcfg1-VirtualBox:~$
```

Comandos, para intervalo, número de pacotes, host, dig, nslookup, traceroute, tracepath, etc

```
Terminal - andrefcfg1@andrefcfg1-VirtualBox:~  
File Edit View Terminal Tabs Help  
andrefcfg1@andrefcfg1-VirtualBox:~$ ping 192.168.137.82  
PING 192.168.137.82 (192.168.137.82) 56(84) bytes of data.  
64 bytes from 192.168.137.82: icmp_seq=1 ttl=63 time=125 ms  
64 bytes from 192.168.137.82: icmp_seq=2 ttl=63 time=45.8 ms  
64 bytes from 192.168.137.82: icmp_seq=3 ttl=63 time=66.0 ms  
64 bytes from 192.168.137.82: icmp_seq=4 ttl=63 time=41.7 ms  
64 bytes from 192.168.137.82: icmp_seq=5 ttl=63 time=112 ms  
64 bytes from 192.168.137.82: icmp_seq=6 ttl=63 time=29.5 ms  
64 bytes from 192.168.137.82: icmp_seq=7 ttl=63 time=53.3 ms  
64 bytes from 192.168.137.82: icmp_seq=8 ttl=63 time=178 ms  
64 bytes from 192.168.137.82: icmp_seq=9 ttl=63 time=98.8 ms  
64 bytes from 192.168.137.82: icmp_seq=10 ttl=63 time=126 ms  
64 bytes from 192.168.137.82: icmp_seq=11 ttl=63 time=83 ms  
64 bytes from 192.168.137.82: icmp_seq=12 ttl=63 time=62.5 ms  
64 bytes from 192.168.137.82: icmp_seq=13 ttl=63 time=348 ms  
64 bytes from 192.168.137.82: icmp_seq=14 ttl=63 time=118 ms  
64 bytes from 192.168.137.82: icmp_seq=15 ttl=63 time=26.1 ms  
^C  
-- 192.168.137.82 ping statistics --  
15 packets transmitted, 15 received, 0% packet loss, time 14025ms  
rtt min/avg/max/mdev = 5.825/99.229/347.926/80.216 ms  
andrefcfg1@andrefcfg1-VirtualBox:~$ ping -c 2 www.ufu.br  
PING www.ufu.br (200.19.145.55) 56(84) bytes of data.  

```

```

Terminal - andrefcg1@andrefcg1-VirtualBox:~ 
Unpacking dnsutils (1:9.18.1-1ubuntu1) ...
Setting up dnsutils (1:9.18.1-1ubuntu1) ...
andrefcg1@andrefcg1-VirtualBox:~$ dig www.google.com
; <>> DIG 9.18.1-1ubuntu1-Ubuntu <>> www.google.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<- opcode: QUERY, status: NOERROR, id: 17092
;; flags: qr rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1
;; OPT PSEUDOSECTION:
;; EDNS: version: 0, flags: udp: 65494
;; QUESTION SECTION:
;www.google.com.           IN      A
;; ANSWER SECTION:
www.google.com.        127    IN      A      142.251.129.100
;; Query time: 0 msec
;; SERVER: 127.0.0.53#53(127.0.0.53) (UDP)
;; WHEN: Fri May 20 22:08:00 -03 2022
;; MSG SIZE rcvd: 59
andrefcg1@andrefcg1-VirtualBox:~$ nslookup www.google.com
Server: 127.0.0.53
Address: 127.0.0.53#53

Non-authoritative answer:
Name: www.google.com
Address: 142.251.129.100
Name: www.google.com
Address: 2800:3f0:4001:82e::2004
andrefcg1@andrefcg1-VirtualBox:~$ 

```

Demais comandos de rede do Capítulo 9

```

Terminal - andrefcg1@andrefcg1-VirtualBox:~ 
Selecting previously unselected package nmap-common.
Preparing to unpack .../nmap-common_7.91+dfsg1+really7.80+dfsg1-2build1_all.deb ...
Unpacking nmap-common (7.91+dfsg1+really7.80+dfsg1-2build1) ...
Selecting previously unselected package nmap.
Preparing to unpack .../nmap_7.91+dfsg1+really7.80+dfsg1-2build1_amd64.deb ...
Unpacking nmap (7.91+dfsg1+really7.80+dfsg1-2build1) ...
Setting up liblinear4:amd64 (2.3.0+dfsg-5) ...
Setting up nmap-common (7.91+dfsg1+really7.80+dfsg1-2build1) ...
Setting up nmap (7.91+dfsg1+really7.80+dfsg1-2build1) ...
Processing triggers for man-db (2.18.2-1) ...
Processing triggers for libc-bin (2.35-0ubuntu3) ...
andrefcg1@andrefcg1-VirtualBox:~$ nmap www.ufu.br
Starting Nmap 7.80 ( https://nmap.org ) at 2022-05-20 22:10 -03
Nmap scan report for www.ufu.br (200.19.145.55)
Host is up (0.022s latency).
rDNS record for 200.19.145.55: bulma.dr.ufu.br
Not shown: 988 filtered ports
PORT      STATE SERVICE
25/tcp    open  smtp
80/tcp    open  http
110/tcp   open  pop3
119/tcp   open  nntp
143/tcp   open  imap
443/tcp   open  https
465/tcp   open  smtps
563/tcp   open  snews
587/tcp   open  submission
993/tcp   open  imaps
995/tcp   open  pop3s
8008/tcp  open  http
Nmap done: 1 IP address (1 host up) scanned in 4.91 seconds
andrefcg1@andrefcg1-VirtualBox:~$ 

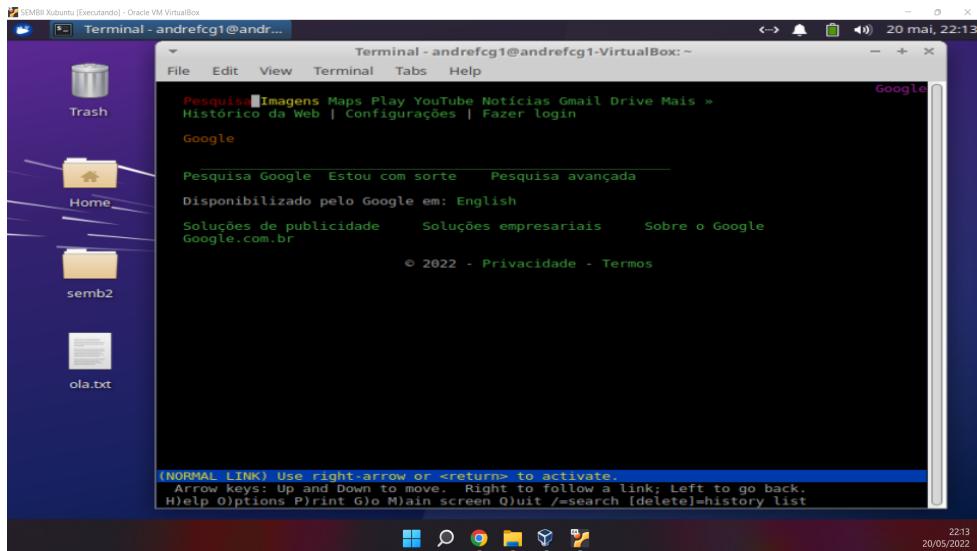
```

```

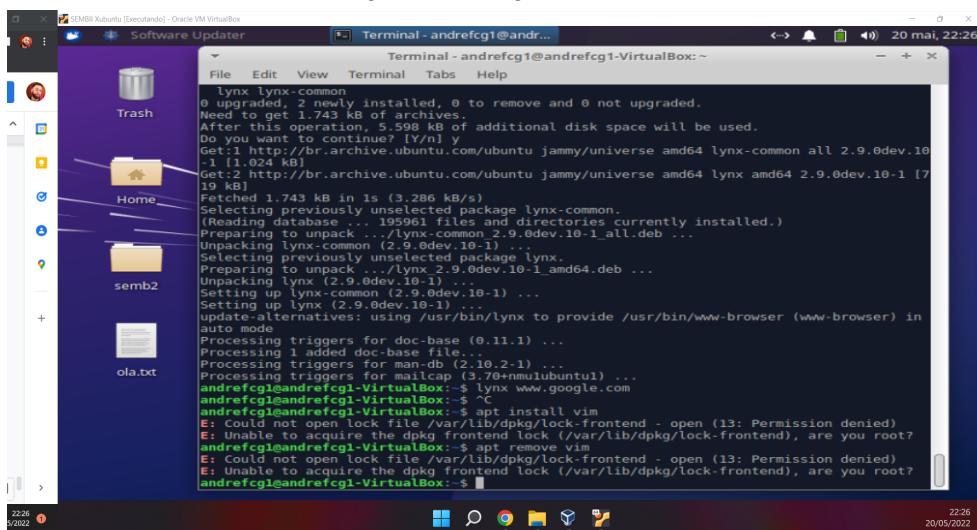
Terminal - andrefcg1@andrefcg1-VirtualBox:~ 
andrefcg1@andrefcg1-VirtualBox:~$ nmap -v localhost
Starting Nmap 7.80 ( https://nmap.org ) at 2022-05-20 22:11 -03
Initiating Ping Scan at 22:11
Scanning 1 total host (127.0.0.1) [2 ports]
Completed Ping Scan at 22:11, 0.005s elapsed (1 total hosts)
Initiating Connect Scan at 22:11
Scanning localhost (127.0.0.1) [1000 ports]
Discovered open port 631/tcp on 127.0.0.1
Completed Connect Scan at 22:11, 0.01s elapsed (1000 total ports)
Nmap scan report for localhost (127.0.0.1)
Host is up (0.000048s latency).
Not shown: 999 closed ports
PORT      STATE SERVICE
631/tcp  open  ipp
Read data files from: /usr/bin/../share/nmap
Nmap done: 1 IP address (1 host up) scanned in 0.05 seconds
andrefcg1@andrefcg1-VirtualBox:~$ sudo apt install tcpdump
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
tcpdump is already the newest version (4.99.1-3build2).
tcpdump set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
andrefcg1@andrefcg1-VirtualBox:~$ tcpdump -D
1.enp0s3 [Up, Running, Connected]
2.any (Pseudo-device that captures on all interfaces) [Up, Running]
3.lo [Up, Running, Loopback]
4.bluetooth-monitor (Bluetooth, Linux Monitor) [Wireless]
5.wl (Linux netfilter log (NFLOG) interface) [none]
6.inetqueue (Linux netfilter queue (NFQUEUE) interface) [none]
7 dbus-system (D-Bus system bus) [none]
8.dbus-session (D-Bus session bus) [none]
andrefcg1@andrefcg1-VirtualBox:~$ 

```

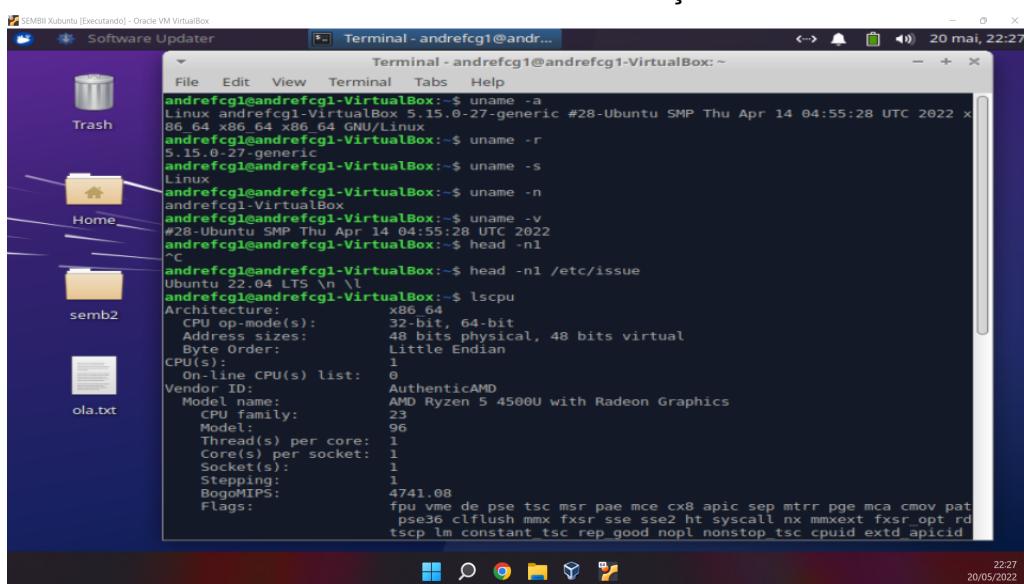
comando lynx



instalação e remoção de pacotes



versão do kernel e distribuição



```

SEMBII Xubuntu [Executando] - Oracle VM VirtualBox
Software Updater Terminal - andrefcg1@andrefcg1-VirtualBox: ~
File Edit View Terminal Tabs Help
andrefcg1@andrefcg1-VirtualBox:~$ lsusb
Bus 001 Device 002: ID 80ee:0021 VirtualBox USB Tablet
Bus 001 Device 001: ID 1d6b:0001 Linux Foundation 1.1 root hub
andrefcg1@andrefcg1-VirtualBox:~$ lspci
00:00.0 Host bridge: Intel Corporation 440FX - 82441FX PMC [Natoma] (rev 02)
00:00.1 I/O bridge: Intel Corporation 82371SB PIIX3 ISA [Natoma/Triton II]
00:01.0 IDE interface: Intel Corporation 82371AB/EB/MB PIIX4 IDE (rev 01)
00:02.0 VGA compatible controller: VMware SVGA II Adapter
00:03.0 Ethernet controller: Intel Corporation 82540EM Gigabit Ethernet Controller (rev 02)
00:04.0 System peripheral: InnoTek Systemberatung GmbH VirtualBox Guest Service
00:05.0 Multimedia audio controller: Intel Corporation 82801AA AC'97 Audio Controller (rev 01)
00:06.0 USB controller: Apple Inc. KeyLargo/Intrepid USB
00:07.0 Bridge: Intel Corporation 82371AB/EB/MB PIIX4 ACPI (rev 08)
00:0d.0 SATA controller: Intel Corporation 82801HM/HEM (ICH8M/ICH8M-E) SATA Controller (AHCI mode) (rev 02)
andrefcg1@andrefcg1-VirtualBox:~$ lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINTS
loop0 7:0 0 4K 1 loop /snap/bare/5
loop1 7:1 0 61,9M 1 loop /snap/core20/1405
loop2 7:2 0 61,9M 1 loop /snap/core20/1434
loop3 7:3 0 155,6M 1 loop /snap/firefox/1232
loop4 7:4 0 160,5M 1 loop /snap/firefox/1377
loop5 7:5 0 248,8M 1 loop /snap/gnome-3-38-2004/99
loop6 7:6 0 81,3M 1 loop /snap/gtk-common-themes/1534
loop7 7:7 0 43,4M 1 loop /snap/snappyd/15177
loop8 7:8 0 44,7M 1 loop /snap/snappyd/15534
sda 8:0 0 50G 0 disk
└─sda1 8:1 0 1M 0 part
  ├─sda2 8:2 0 513M 0 part /boot/efi
  ├─sda3 8:3 0 49,5G 0 part /
sr0 11:0 1 2,5G 0 rom
andrefcg1@andrefcg1-VirtualBox:~$ 

```

informações gerais do hardware

```

SEMBII Xubuntu [Executando] - Oracle VM VirtualBox
Software Updater Terminal - andrefcg1@andrefcg1-VirtualBox: ~
File Edit View Terminal Tabs Help
Device Start End Sectors Size Type
/dev/sda1 2048 4095 2048 1M BIOS boot
/dev/sda2 4096 1054719 1050624 513M EFI System
/dev/sda3 1054720 104855551 103800832 49,5G Linux filesystem

Disk /dev/loop8: 44,68 MiB, 46845952 bytes, 91496 sectors
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
andrefcg1@andrefcg1-VirtualBox:~$ sudo apt-get install pcmciautils
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
pcmciautils is already the newest version (018-13build1).
pcmciautils set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 49 not upgraded.
andrefcg1@andrefcg1-VirtualBox:~$ lspcmcia
andrefcg1@andrefcg1-VirtualBox:~$ free
total used free shared buff/cache available
Mem: 2025196 555232 419916 216 1050048 1303028
Swap: 2097148 0 2097148
andrefcg1@andrefcg1-VirtualBox:~$ free -m
total used free shared buff/cache available
Mem: 1977 542 410 2 1025 1272
Swap: 2047 0 2047
andrefcg1@andrefcg1-VirtualBox:~$ cat /proc/meminfo
MemTotal: 2025196 KB
MemFree: 419916 KB
MemAvailable: 1303028 KB
Buffers: 5348 KB
Cached: 929156 KB
SwapCached: 0 KB
Active: 502952 KB

```

Em seguida foi instalado o apt hwinfo, que traz diversas informações detalhadas a respeito da máquina. Devido às informações extensas não irei inserir prints nesta etapa.

Conclusão

Através da atividade proposta foi possível ter uma melhor noção do linux em si, uma maior capacidade de entendimento do sistema através do terminal, que nos proporciona a experiência de realmente programar a máquina e não só guiá-la como é feito na interface visual. Sendo esta uma etapa importante, principalmente para os que ainda não são familiares ao sistema operacional, concluo que foi um processo de aprendizado relevante e que com certeza será usado futuramente, não só neste, mas em outros projetos e trabalhos.