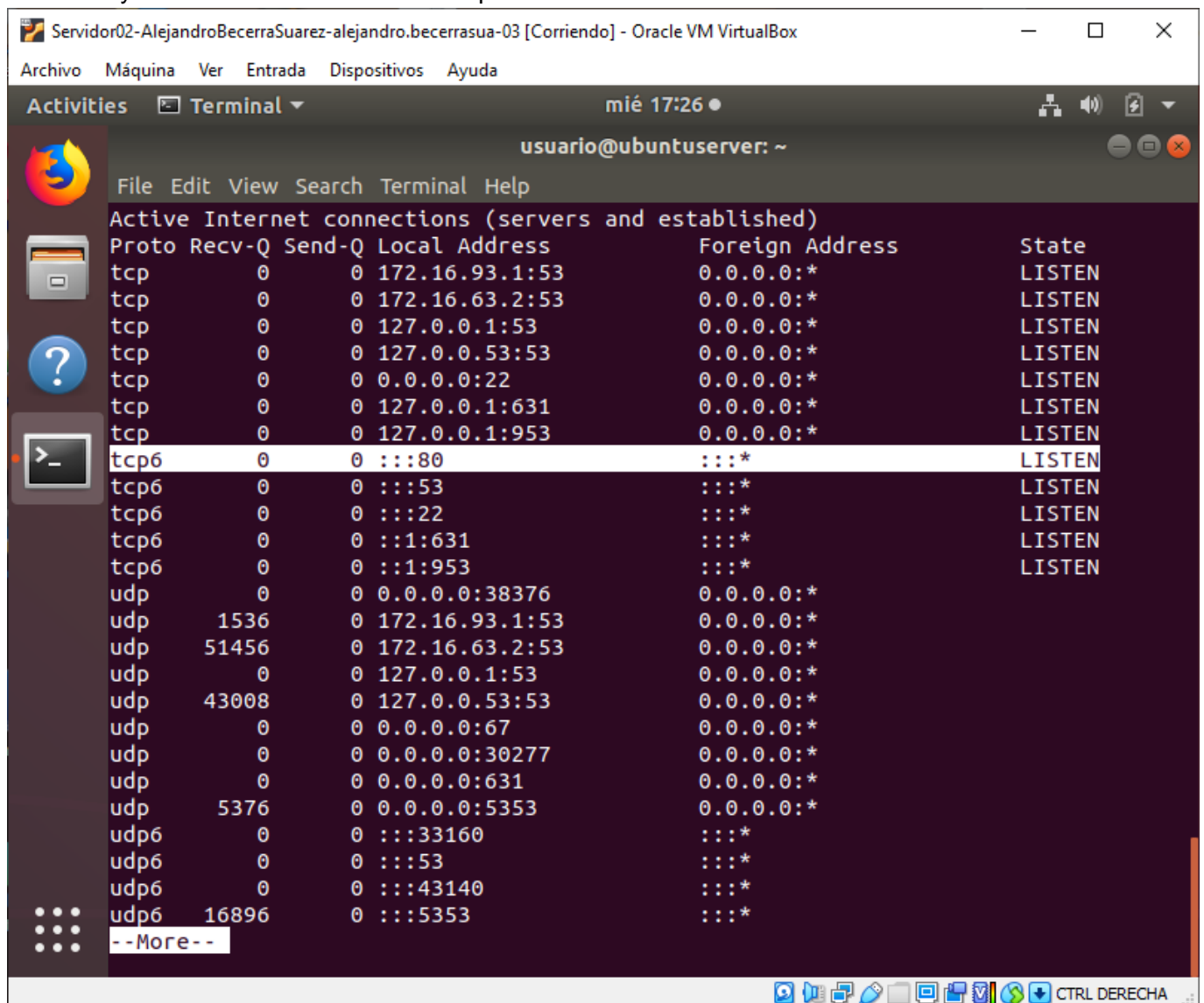


Actividad 6: Servidor web en Linux: instalación de Apache.

1. Instrucciones:

- Todas las capturas de navegador que se pidan a continuación deberán ser realizadas desde Cliente03 Ubuntu Desktop en intnet3 mediante **Firefox**. Además, deberán mostrar siempre la **barra de direcciones**.
- En Servidor02, se deberá actualizar Firefox para que reconozca los certificados a la hora de conectarse con HTTPS. Ejecutar.
 - `apt-get update`
 - `apt-get install firefox`

- Tras instalar Apache capturar el listado de conexiones de Servidor02 en el que se muestre que hay un servicio escuchando en el puerto 80.



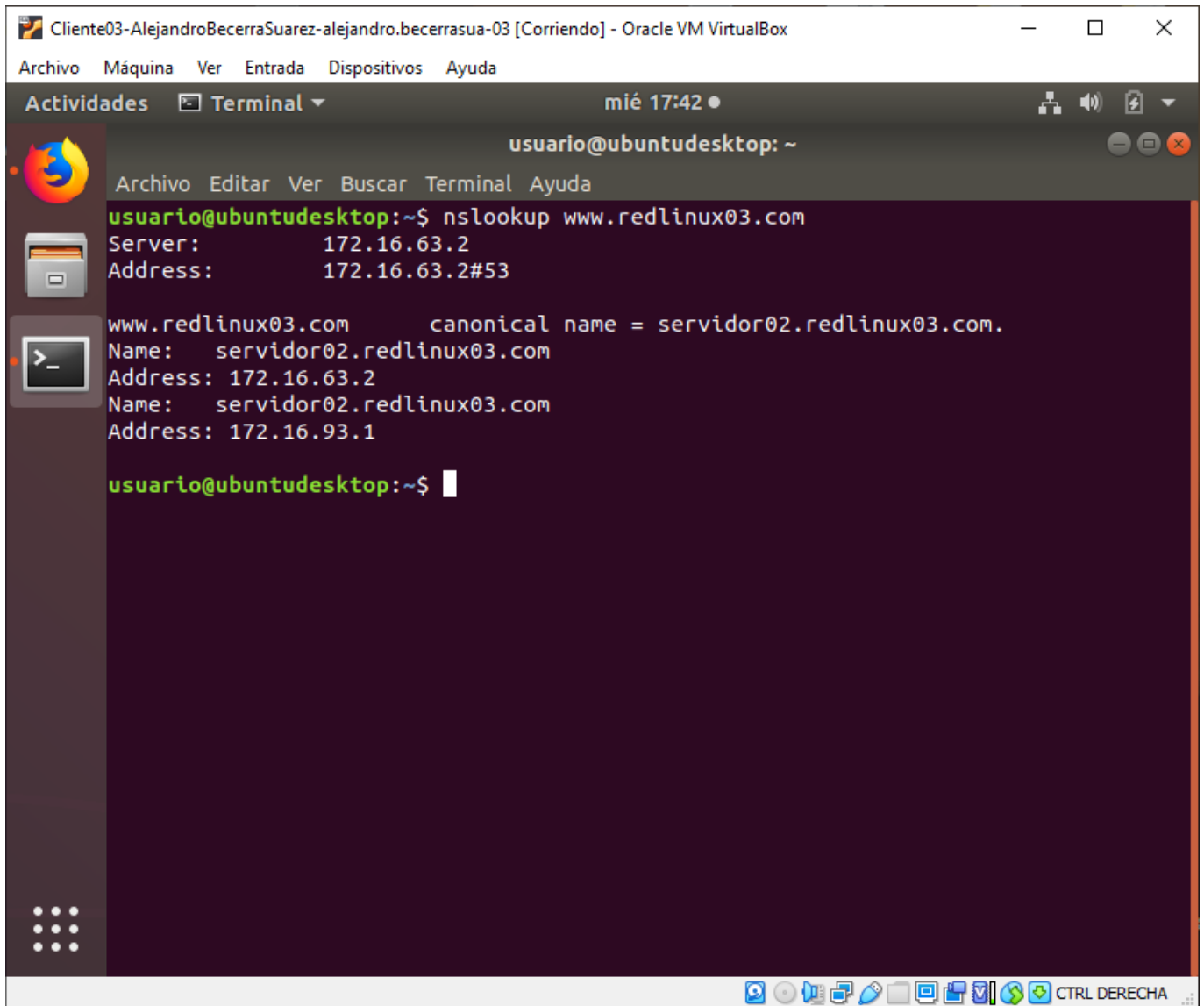
The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal output displays the command `ss -ttn` and its results, showing active internet connections (servers and established). The output is as follows:

Proto	Recv-Q	Send-Q	Local Address	Foreign Address	State
tcp	0	0	172.16.93.1:53	0.0.0.0:*	LISTEN
tcp	0	0	172.16.63.2:53	0.0.0.0:*	LISTEN
tcp	0	0	127.0.0.1:53	0.0.0.0:*	LISTEN
tcp	0	0	127.0.0.53:53	0.0.0.0:*	LISTEN
tcp	0	0	0.0.0.0:22	0.0.0.0:*	LISTEN
tcp	0	0	127.0.0.1:631	0.0.0.0:*	LISTEN
tcp	0	0	127.0.0.1:953	0.0.0.0:*	LISTEN
tcp6	0	0	:::80	:::*	LISTEN
tcp6	0	0	:::53	:::*	LISTEN
tcp6	0	0	:::22	:::*	LISTEN
tcp6	0	0	:::1:631	:::*	LISTEN
tcp6	0	0	:::1:953	:::*	LISTEN
udp	0	0	0.0.0.0:38376	0.0.0.0:*	
udp	1536	0	172.16.93.1:53	0.0.0.0:*	
udp	51456	0	172.16.63.2:53	0.0.0.0:*	
udp	0	0	127.0.0.1:53	0.0.0.0:*	
udp	43008	0	127.0.0.53:53	0.0.0.0:*	
udp	0	0	0.0.0.0:67	0.0.0.0:*	
udp	0	0	0.0.0.0:30277	0.0.0.0:*	
udp	0	0	0.0.0.0:631	0.0.0.0:*	
udp	5376	0	0.0.0.0:5353	0.0.0.0:*	
udp6	0	0	:::33160	:::*	
udp6	0	0	:::53	:::*	
udp6	0	0	:::43140	:::*	
udp6	16896	0	:::5353	:::*	

The terminal window also shows a sidebar with icons for Firefox, a file manager, and a help icon. The bottom of the window displays a taskbar with various system icons and the text "CTRL DERECHA".

3. DNS:

- En el dominio redlinuxXY.com, definir el registro `www` como alias al Servidor02 (pudiendo así resolverse en cualquiera de las dos IPs).
- En el dominio extlinuxXY.com, definir el registro `www` como alias al Servidor02 (pudiendo así resolverse en cualquiera de las dos IPs).
- Desde el cliente, capturar resultado de realizar `nslookup` a `www` en el dominio `redlinuxXY.com`



The screenshot shows a terminal window titled "Cliente03-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running on a system with the prompt "usuario@ubuntudesktop: ~". The user has entered the command "nslookup www.redlinux03.com". The output of the command is as follows:

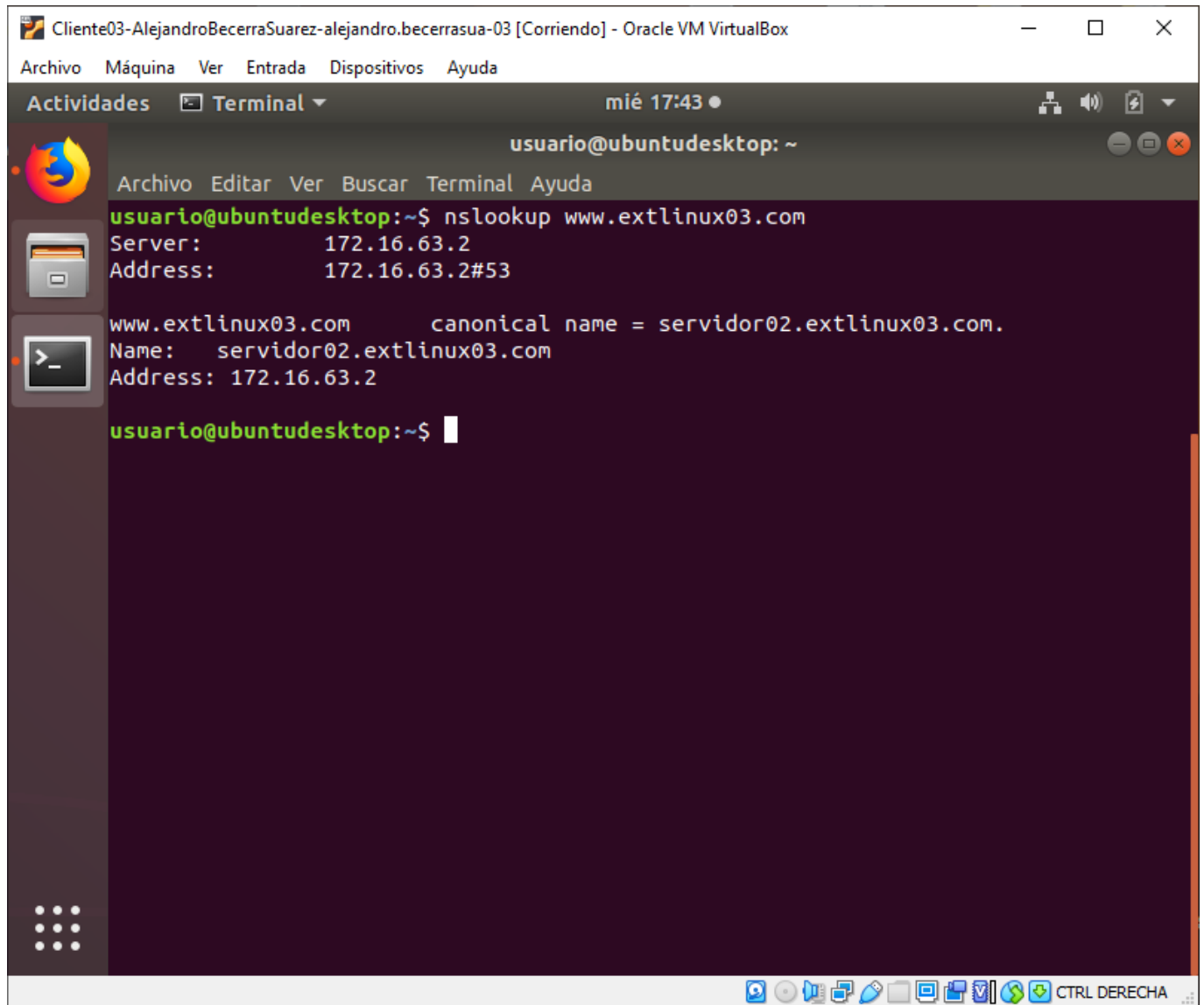
```
usuario@ubuntudesktop:~$ nslookup www.redlinux03.com
Server:         172.16.63.2
Address:        172.16.63.2#53

www.redlinux03.com    canonical name = servidor02.redlinux03.com.
Name:   servidor02.redlinux03.com
Address: 172.16.63.2
Name:   servidor02.redlinux03.com
Address: 172.16.93.1

usuario@ubuntudesktop:~$
```

The terminal window includes a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda". The status bar at the bottom shows system icons and the text "CTRL DERECHA".

- d. Desde el cliente, capturar resultado de realizar nslookup a www en el dominio extlinuxXY.com



The screenshot shows a terminal window titled "Cliente03-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running on a system with the username "usuario@ubuntudesktop: ~". The user has executed the command "nslookup www.extlinux03.com". The output of the command is as follows:

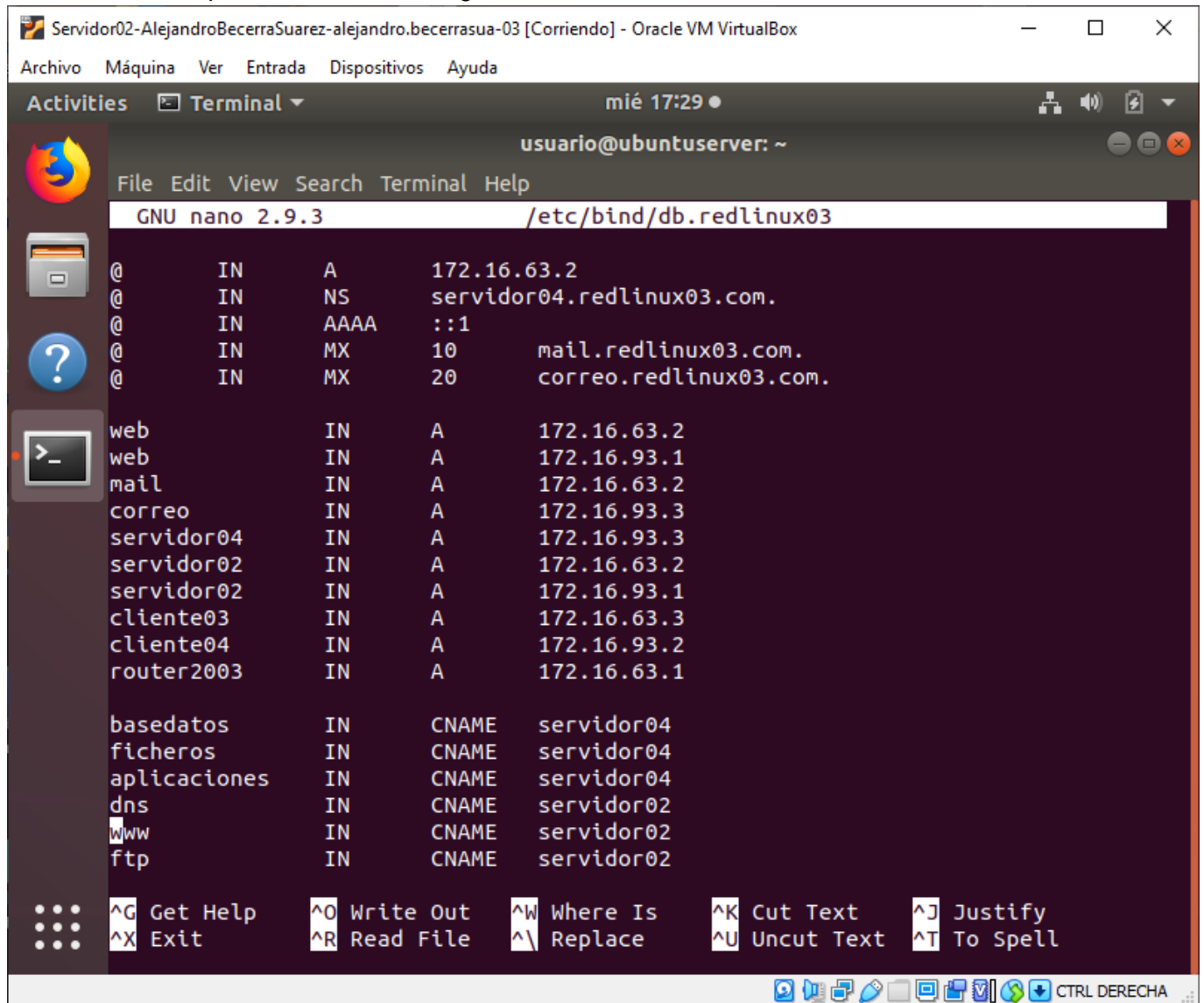
```
usuario@ubuntudesktop:~$ nslookup www.extlinux03.com
Server:      172.16.63.2
Address:     172.16.63.2#53

www.extlinux03.com    canonical name = servidor02.extlinux03.com.
Name:   servidor02.extlinux03.com
Address: 172.16.63.2

usuario@ubuntudesktop:~$
```

The terminal window includes a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda". The status bar at the bottom shows system icons and the text "CTRL DERECHA".

e. Capturar el archivo de registro del dominio redlinuxXY.com



Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox

Archivo Máquina Ver Entrada Dispositivos Ayuda

Activities Terminal mié 17:29

usuario@ubuntuserver: ~

File Edit View Search Terminal Help

GNU nano 2.9.3 /etc/bind/db.redlinux03

```
@      IN      A       172.16.63.2
@      IN      NS      servidor04.redlinux03.com.
@      IN      AAAA    ::1
@      IN      MX      10      mail.redlinux03.com.
@      IN      MX      20      correo.redlinux03.com.

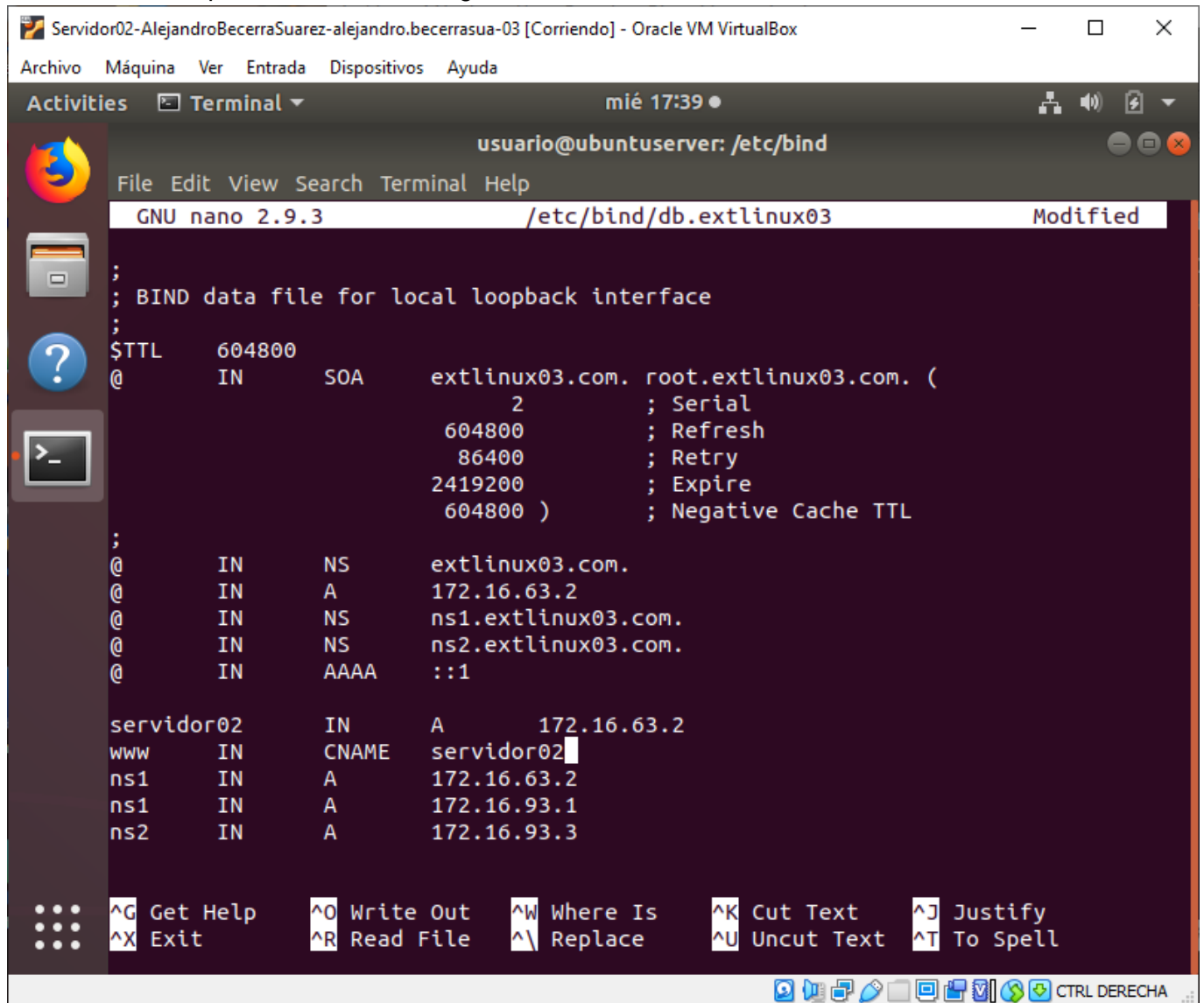
web     IN      A       172.16.63.2
web     IN      A       172.16.93.1
mail    IN      A       172.16.63.2
correo  IN      A       172.16.93.3
servidor04 IN    A       172.16.93.3
servidor02 IN    A       172.16.63.2
servidor02 IN    A       172.16.93.1
cliente03 IN    A       172.16.63.3
cliente04 IN    A       172.16.93.2
router2003 IN   A       172.16.63.1

basedatos  IN      CNAME   servidor04
ficheros   IN      CNAME   servidor04
aplicaciones IN    CNAME   servidor04
dns        IN      CNAME   servidor02
www        IN      CNAME   servidor02
ftp        IN      CNAME   servidor02
```

Get Help Write Out Where Is Cut Text Justify
Exit Read File Replace Uncut Text To Spell

CTRL DERECHA

f. Capturar el archivo de registro del dominio extlinuxXY.com



The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running the GNU nano 2.9.3 editor, editing the file `/etc/bind/db.extlinux03`. The file content is a BIND database entry for the domain `extlinux03.com`. The entry includes a TTL of 604800, a serial number of 2, and refresh, retry, expire, and negative cache TTL values of 604800, 86400, 2419200, and 604800 respectively. The entry also lists the authoritative nameservers: `ns1.extlinux03.com` and `ns2.extlinux03.com`, and the IP addresses of the servers: `172.16.63.2`, `172.16.93.1`, and `172.16.93.3`. The terminal window has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom shows the current cursor position and the file name.

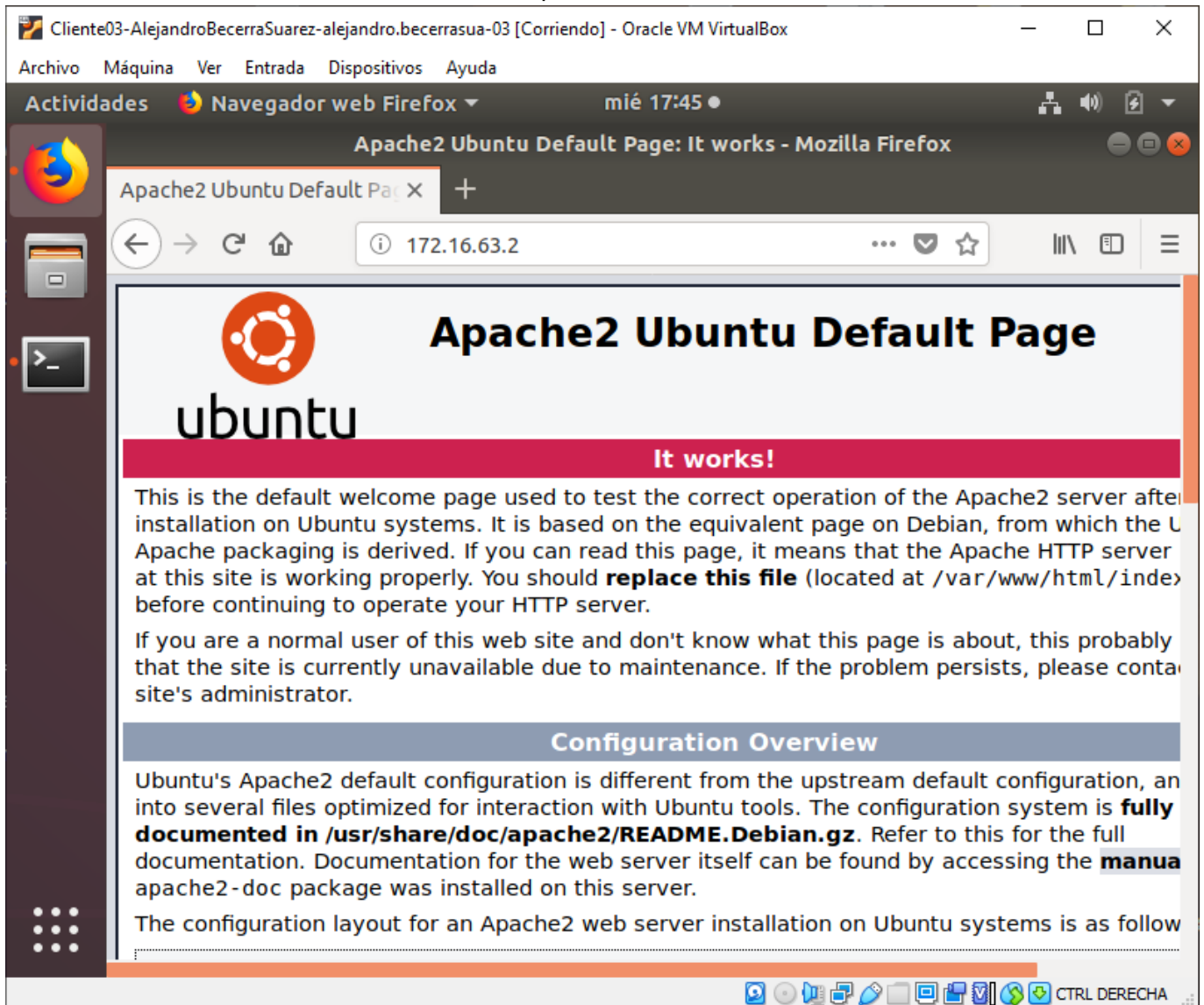
```
GNU nano 2.9.3 /etc/bind/db.extlinux03 Modified
;
; BIND data file for local loopback interface
;
$TTL      604800
@         IN      SOA      extlinux03.com. root.extlinux03.com. (
; Serial
                        2
                        604800      ; Refresh
                        86400       ; Retry
                        2419200     ; Expire
                        604800 )    ; Negative Cache TTL
;
@         IN      NS       extlinux03.com.
@         IN      A        172.16.63.2
@         IN      NS       ns1.extlinux03.com.
@         IN      NS       ns2.extlinux03.com.
@         IN      AAAA     ::1

servidor02      IN      A        172.16.63.2
www             IN      CNAME     servidor02
ns1             IN      A        172.16.63.2
ns1             IN      A        172.16.93.1
ns2             IN      A        172.16.93.3

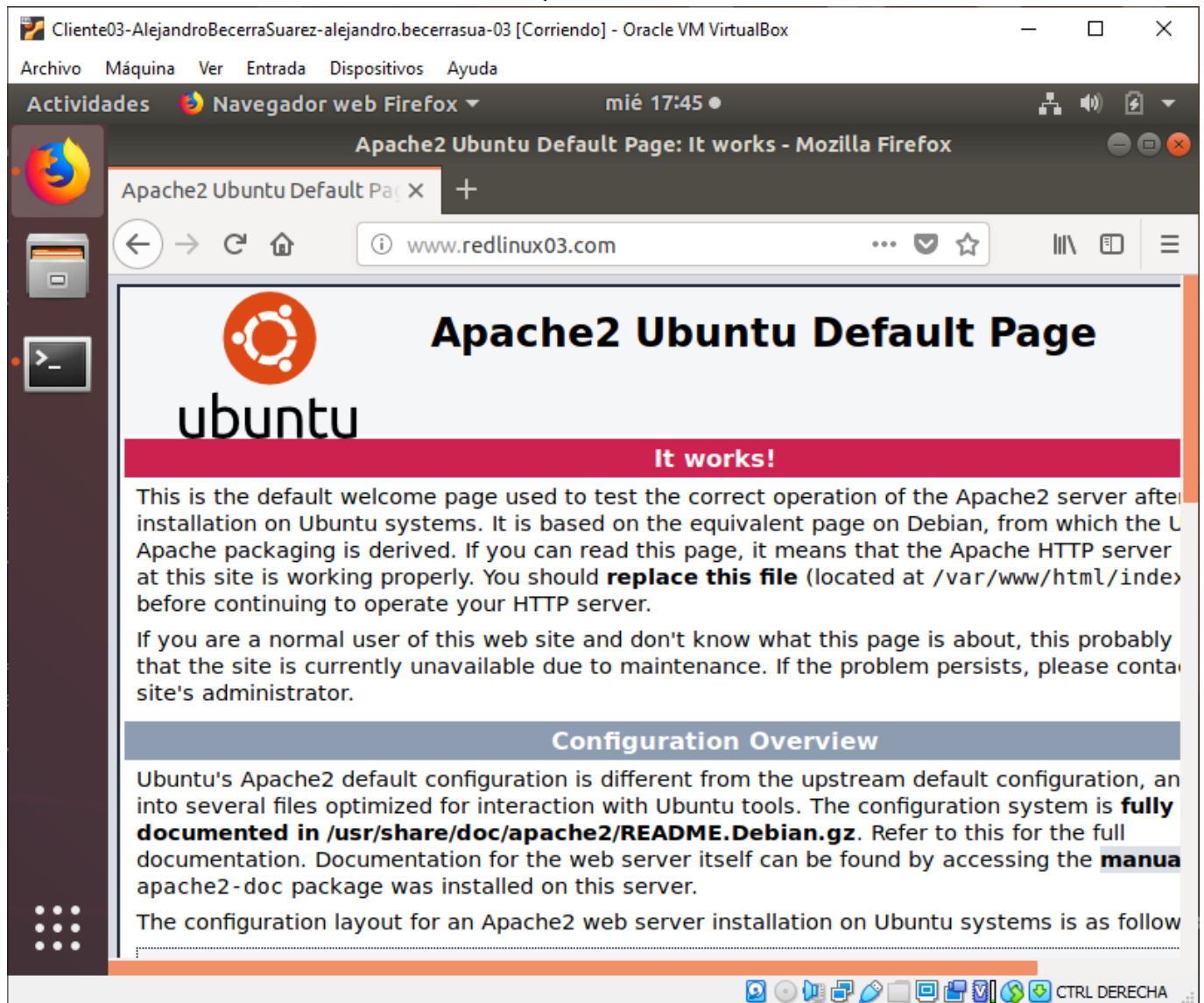
^G Get Help      ^O Write Out     ^W Where Is      ^K Cut Text       ^J Justify
^X Exit          ^R Read File     ^\ Replace       ^U Uncut Text    ^T To Spell
```

4. Desde el cliente, realizar las siguientes capturas:

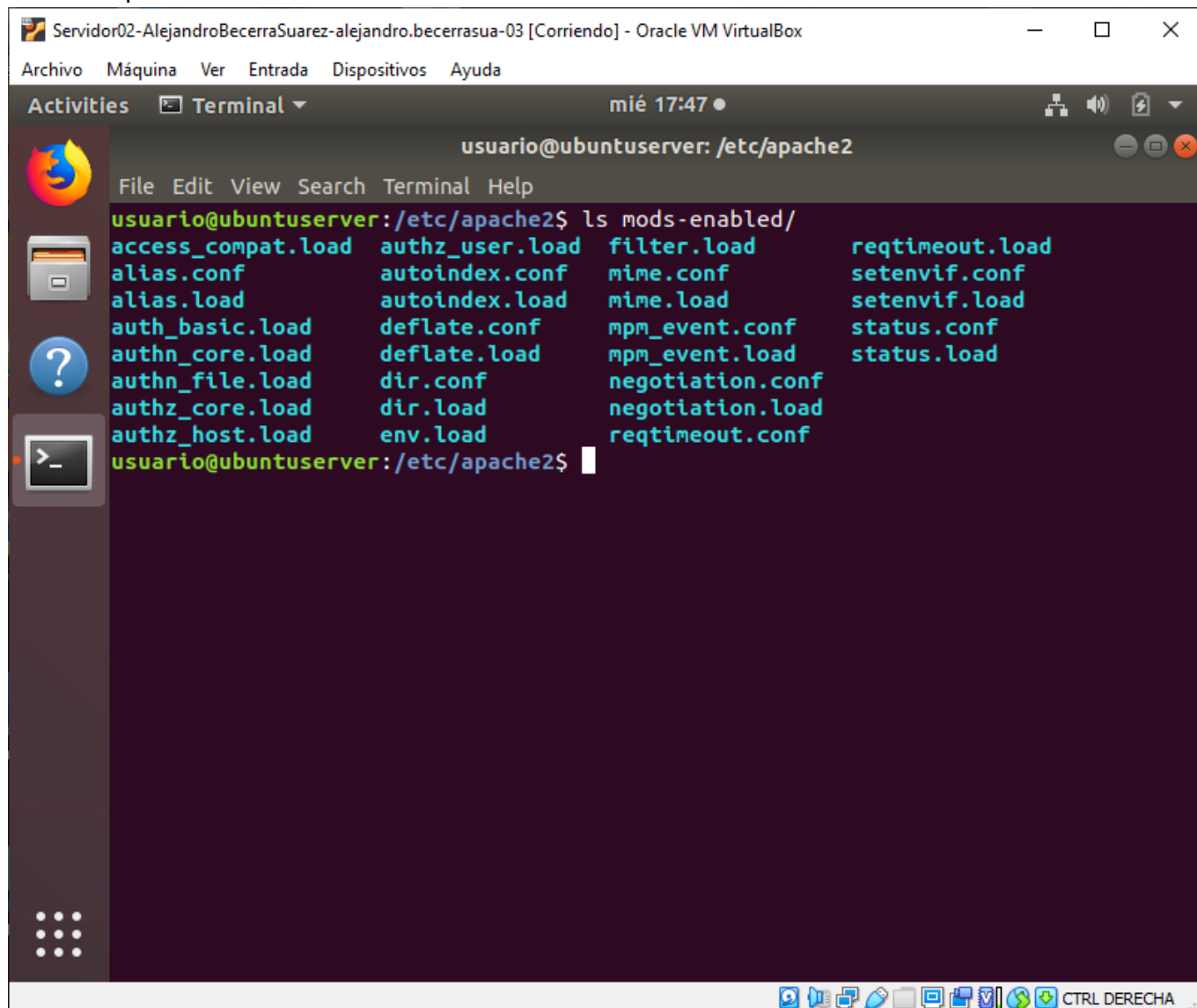
a. Resultado de visitar el sitio web por defecto usando la IP en la *intnet3*.



b. Resultado de visitar el sitio web por defecto `www` en el dominio `redlinuxXY.com`



5. Capturar el listado de módulos activados.

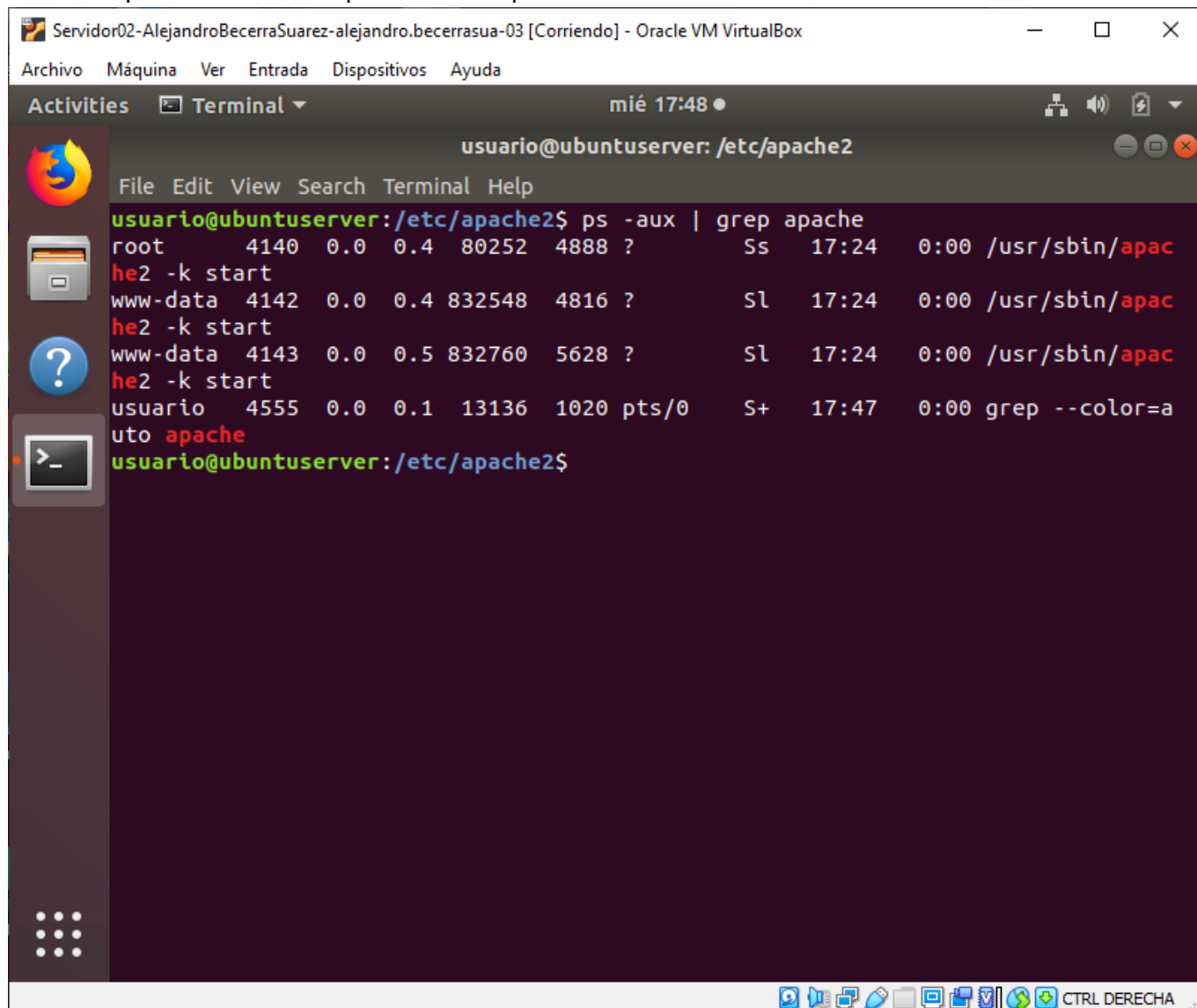


The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running the command `ls mods-enabled/` in the directory `/etc/apache2`. The output lists various Apache modules and configuration files in a grid-like format.

```
usuario@ubuntuserver:/etc/apache2$ ls mods-enabled/
access_compat.load  authz_user.load  filter.load       reqtimeout.load
alias.conf          autoindex.conf  mime.conf         setenvif.conf
alias.load          autoindex.load  mime.load         setenvif.load
auth_basic.load     deflate.conf     mpm_event.conf    status.conf
authn_core.load     deflate.load     mpm_event.load    status.load
authn_file.load     dir.conf        negotiation.conf
authz_core.load     dir.load        negotiation.load
authz_host.load     env.load        negotiation.conf
                    reqtimeout.conf
```

The terminal window includes a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The status bar at the bottom shows system icons and the text "CTRL DERECHA".

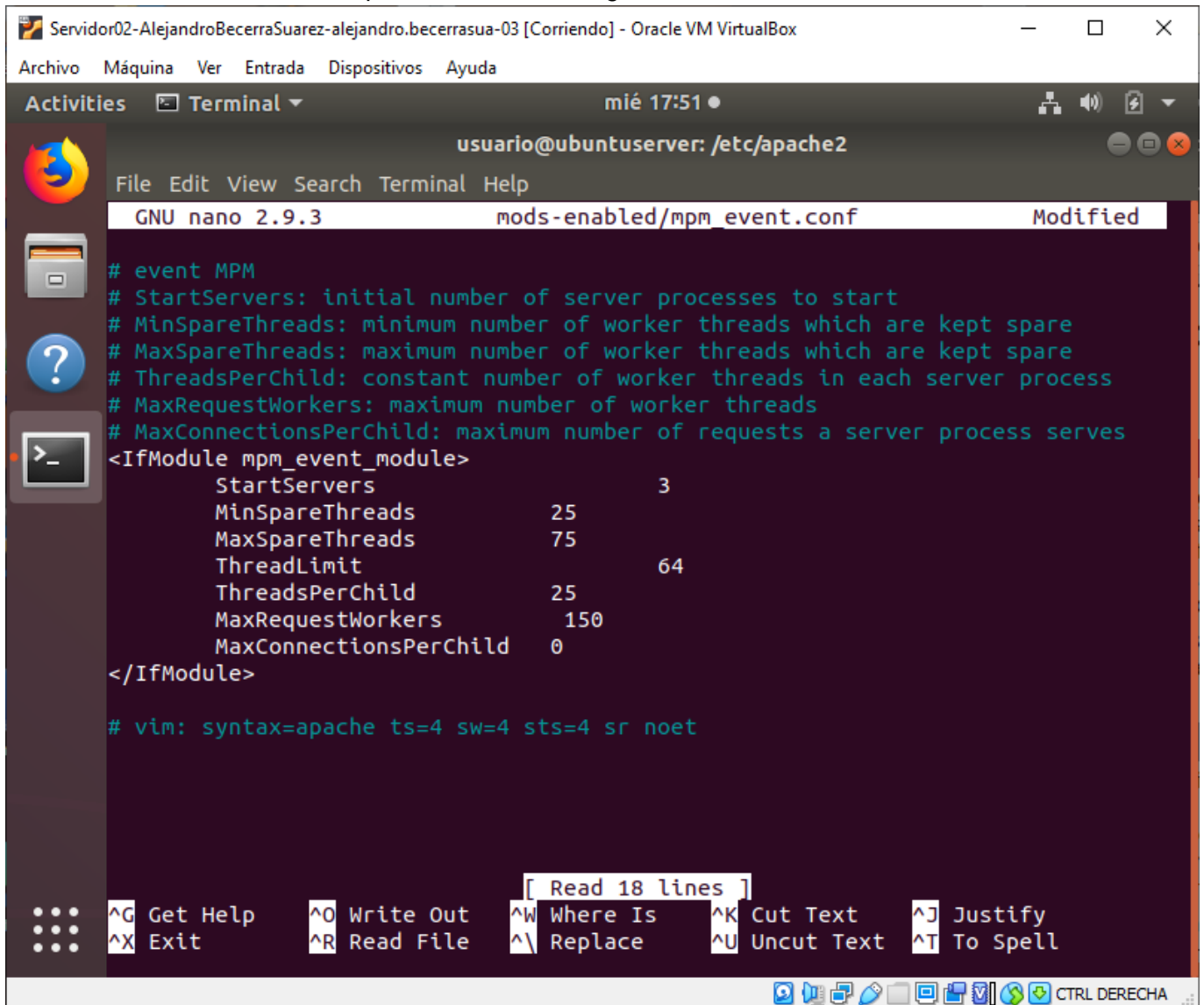
6. Capturar el listado de procesos de Apache.



The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running the command `ps -aux | grep apache` in the directory `/etc/apache2`. The output lists several processes related to Apache, including the root process and multiple `www-data` worker processes. The terminal also shows the user `usuario@ubuntuserver` and the current directory `/etc/apache2`.

```
usuario@ubuntuserver: /etc/apache2
File Edit View Search Terminal Help
usuario@ubuntuserver:/etc/apache2$ ps -aux | grep apache
root      4140  0.0  0.4 80252 4888 ?        Ss   17:24   0:00 /usr/sbin/apac
he2 -k start
www-data  4142  0.0  0.4 832548 4816 ?        Sl   17:24   0:00 /usr/sbin/apac
he2 -k start
www-data  4143  0.0  0.5 832760 5628 ?        Sl   17:24   0:00 /usr/sbin/apac
he2 -k start
usuario   4555  0.0  0.1  13136  1020 pts/0    S+   17:47   0:00 grep --color=a
uto apache
usuario@ubuntuserver:/etc/apache2$
```

7. Hacer que Apache lance 3 procesos al iniciarse. Capturar:
 - a. El archivo en el que se realiza la configuración.



The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running the nano text editor, editing the file "/etc/apache2/mods-enabled/mpm_event.conf". The user is "usuario@ubuntuserver". The configuration file content is as follows:

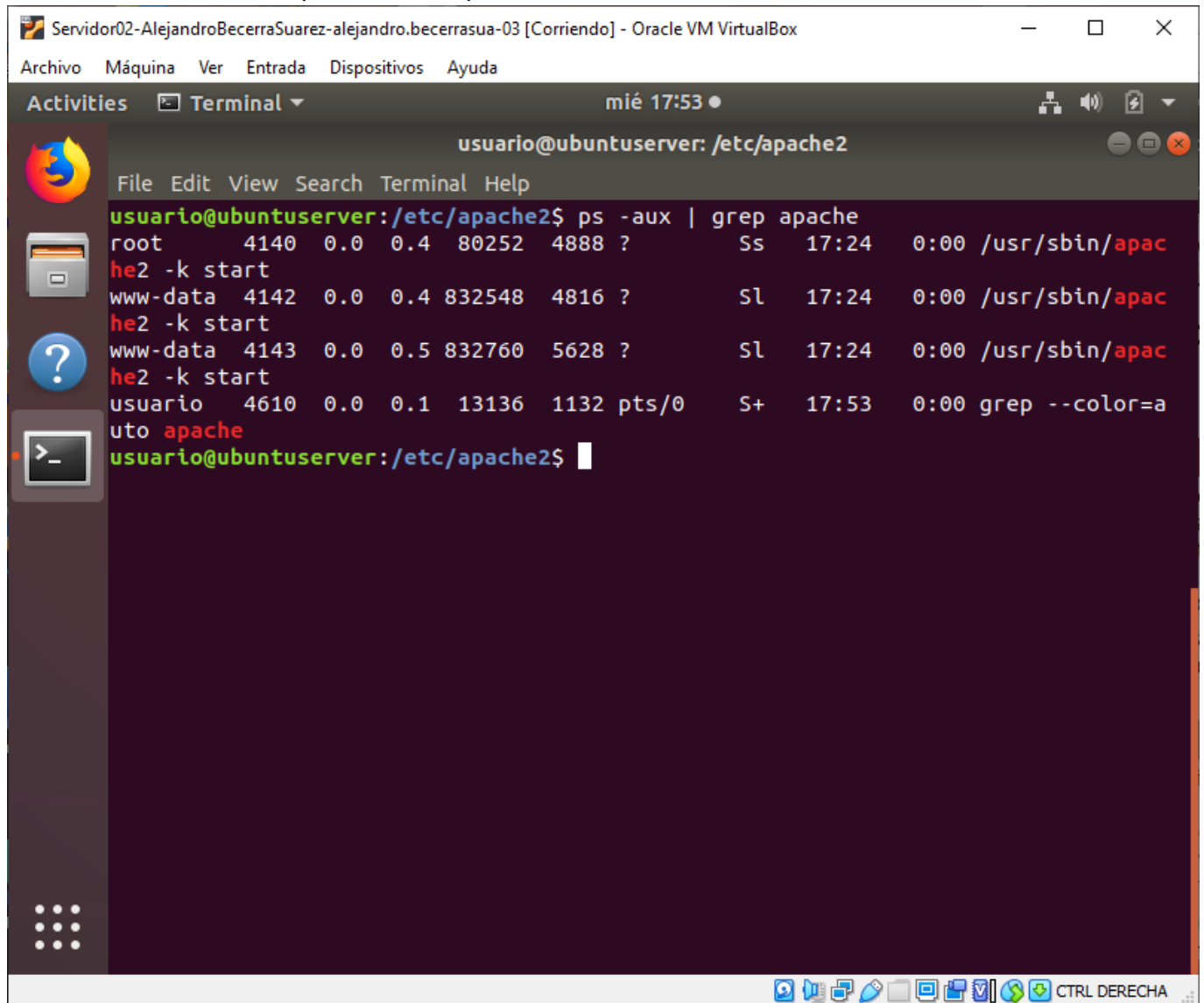
```
GNU nano 2.9.3 mods-enabled/mpm_event.conf Modified

# event MPM
# StartServers: initial number of server processes to start
# MinSpareThreads: minimum number of worker threads which are kept spare
# MaxSpareThreads: maximum number of worker threads which are kept spare
# ThreadsPerChild: constant number of worker threads in each server process
# MaxRequestWorkers: maximum number of worker threads
# MaxConnectionsPerChild: maximum number of requests a server process serves
<IfModule mpm_event_module>
    StartServers                3
    MinSpareThreads             25
    MaxSpareThreads             75
    ThreadLimit                 64
    ThreadsPerChild             25
    MaxRequestWorkers           150
    MaxConnectionsPerChild      0
</IfModule>

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet
```

At the bottom of the terminal, there is a status bar with various keyboard shortcuts: ^G Get Help, ^O Write Out, ^W Where Is, ^K Cut Text, ^J Justify, ^X Exit, ^R Read File, ^\ Replace, ^U Uncut Text, ^T To Spell. A tooltip "Read 18 lines" is visible over the status bar. The bottom of the window shows the VirtualBox taskbar with icons for the host, guest, and other applications, along with the text "CTRL DERECHA".

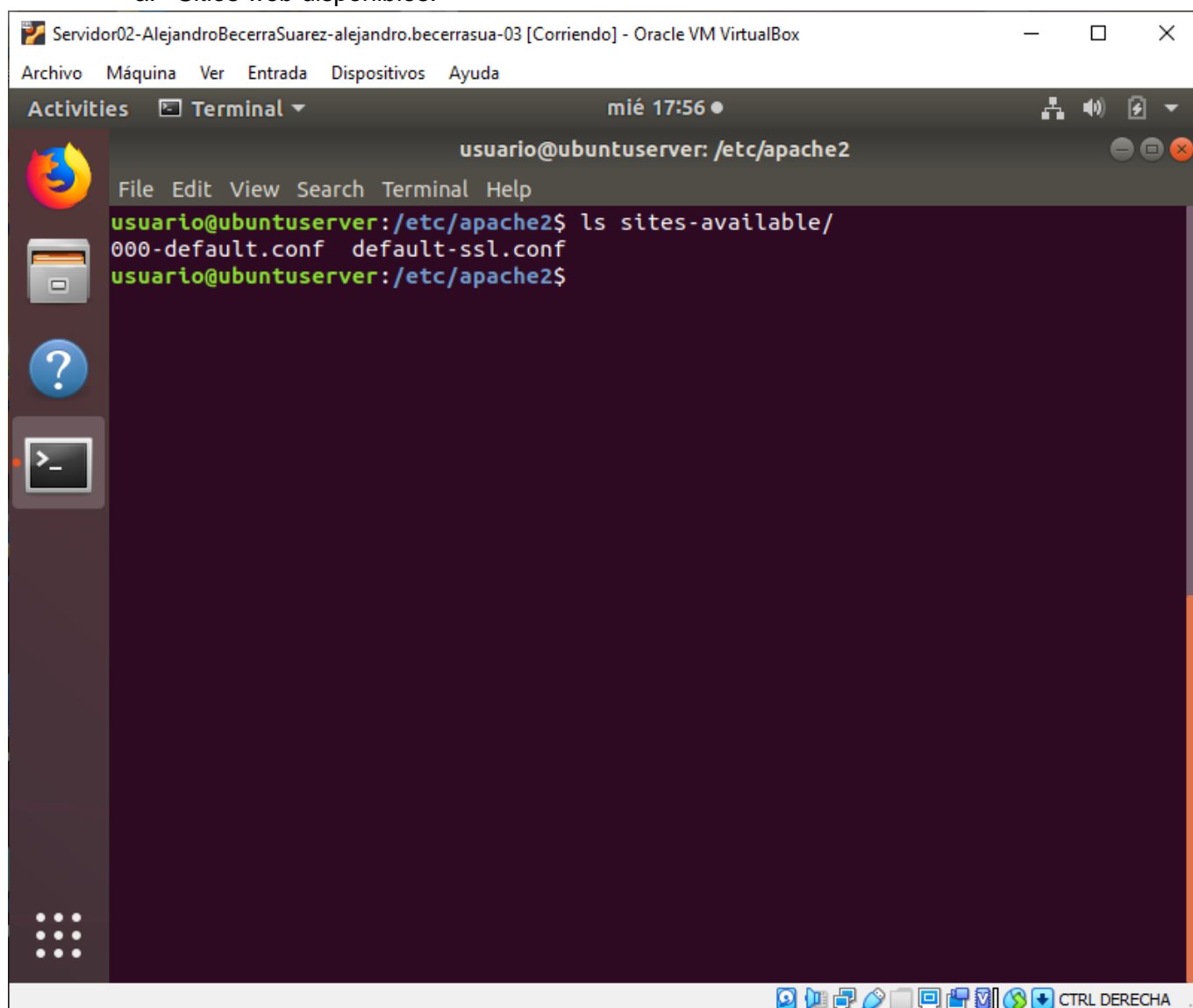
b. Listado de procesos de Apache.



The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running the command `ps -aux | grep apache` in the directory `/etc/apache2`. The output lists several processes related to Apache, including the root process and two `www-data` processes. The terminal also shows the user `usuario` and the command `grep --color=a`.

```
usuario@ubuntuserver: /etc/apache2
File Edit View Search Terminal Help
usuario@ubuntuserver:/etc/apache2$ ps -aux | grep apache
root      4140  0.0  0.4 80252 4888 ?        Ss   17:24   0:00 /usr/sbin/apac
he2 -k start
www-data  4142  0.0  0.4 832548 4816 ?        Sl   17:24   0:00 /usr/sbin/apac
he2 -k start
www-data  4143  0.0  0.5 832760 5628 ?        Sl   17:24   0:00 /usr/sbin/apac
he2 -k start
usuario   4610  0.0  0.1  13136  1132 pts/0    S+   17:53   0:00 grep --color=a
uto apache
usuario@ubuntuserver:/etc/apache2$
```

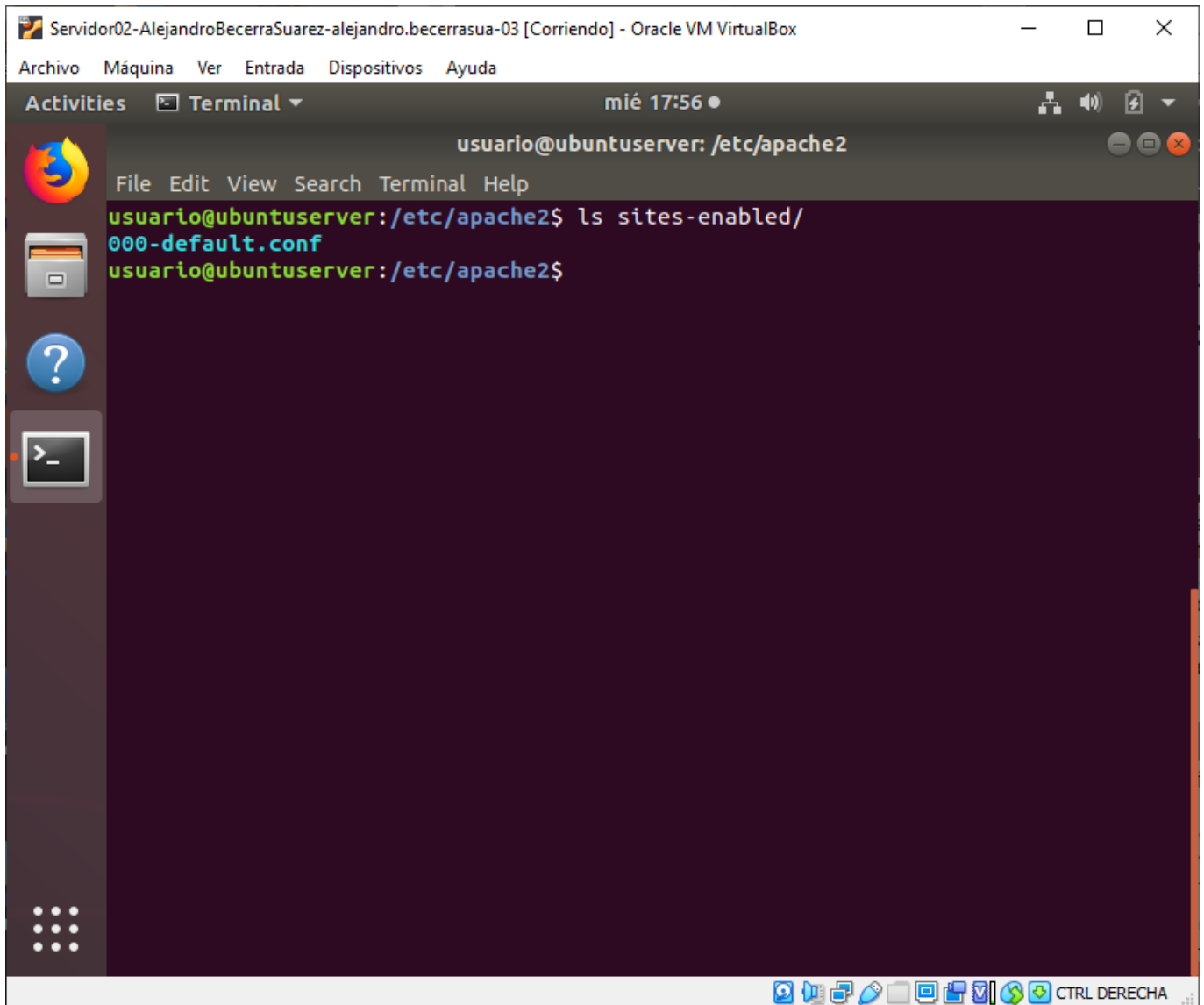
8. Capturar la lista de:
 - a. Sitios web disponibles.



The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running on a system with the prompt "usuario@ubuntuuserver: /etc/apache2". The command "ls sites-available/" has been executed, resulting in the output "000-default.conf default-ssl.conf". The terminal window includes a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda". The left sidebar shows the "Activities" panel with icons for Firefox, a file manager, a help icon, and a terminal icon. The bottom status bar displays system icons and the text "CTRL DERECHA".

```
usuario@ubuntuuserver: /etc/apache2
File Edit View Search Terminal Help
usuario@ubuntuuserver:/etc/apache2$ ls sites-available/
000-default.conf default-ssl.conf
usuario@ubuntuuserver:/etc/apache2$
```

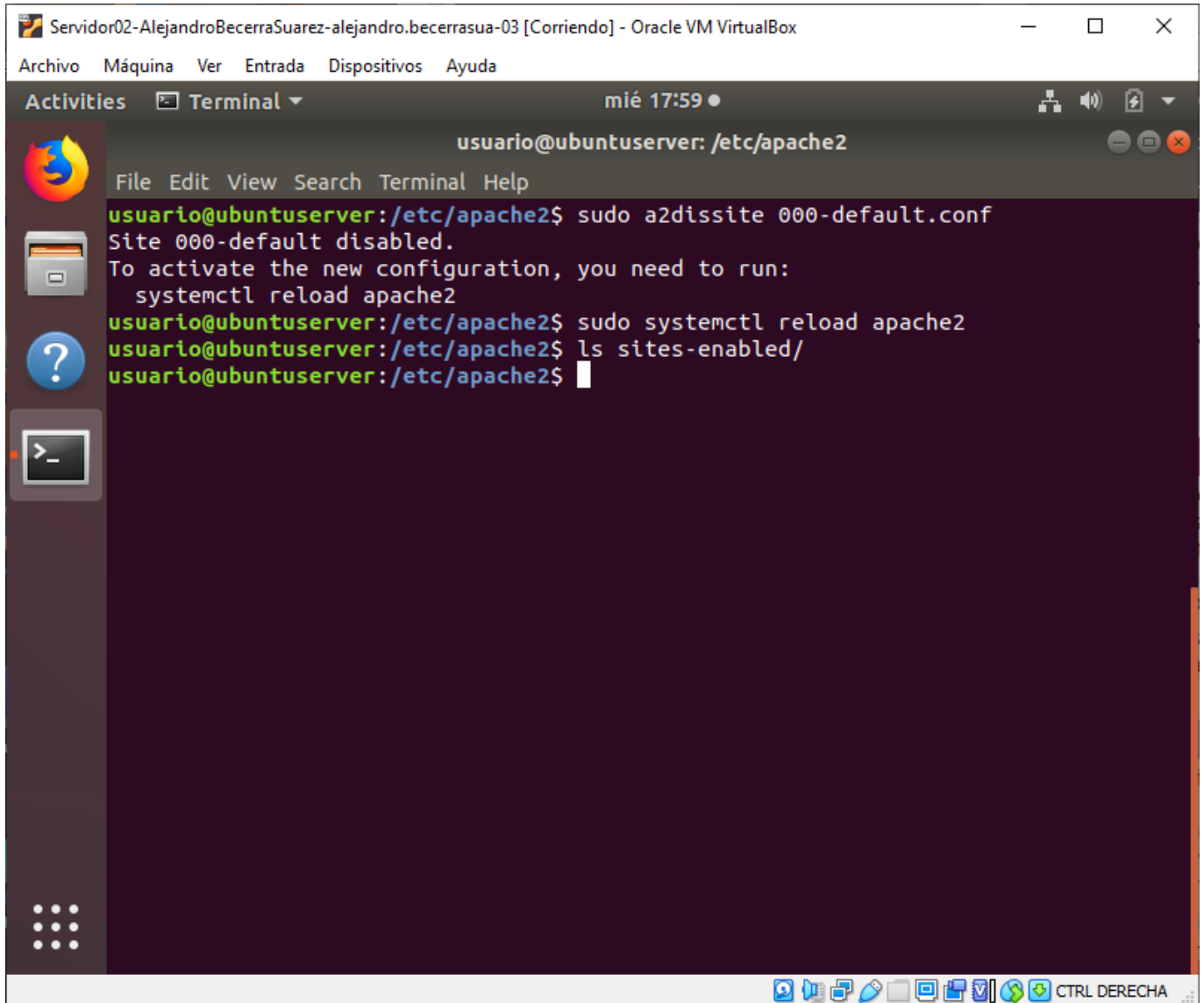
b. Sitios web activados.



The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The window has a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda". Below the menu bar is a toolbar with "Activities" and "Terminal". The terminal window itself has a title bar "usuario@ubuntuserver: /etc/apache2" and a menu bar "File Edit View Search Terminal Help". The terminal output shows the command "ls sites-enabled/" and its output "000-default.conf". The terminal prompt is "usuario@ubuntuserver: /etc/apache2\$".

```
usuario@ubuntuserver: /etc/apache2$ ls sites-enabled/
000-default.conf
usuario@ubuntuserver: /etc/apache2$
```

9. Capturar el resultado de ejecutar el comando que permite desactivar el sitio web por defecto.



The screenshot shows a terminal window titled 'Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox'. The terminal is running on a system with the prompt 'usuario@ubuntuserver: /etc/apache2'. The user has executed the following commands:

```
usuario@ubuntuserver:/etc/apache2$ sudo a2dissite 000-default.conf
Site 000-default disabled.
To activate the new configuration, you need to run:
systemctl reload apache2
usuario@ubuntuserver:/etc/apache2$ sudo systemctl reload apache2
usuario@ubuntuserver:/etc/apache2$ ls sites-enabled/
usuario@ubuntuserver:/etc/apache2$
```

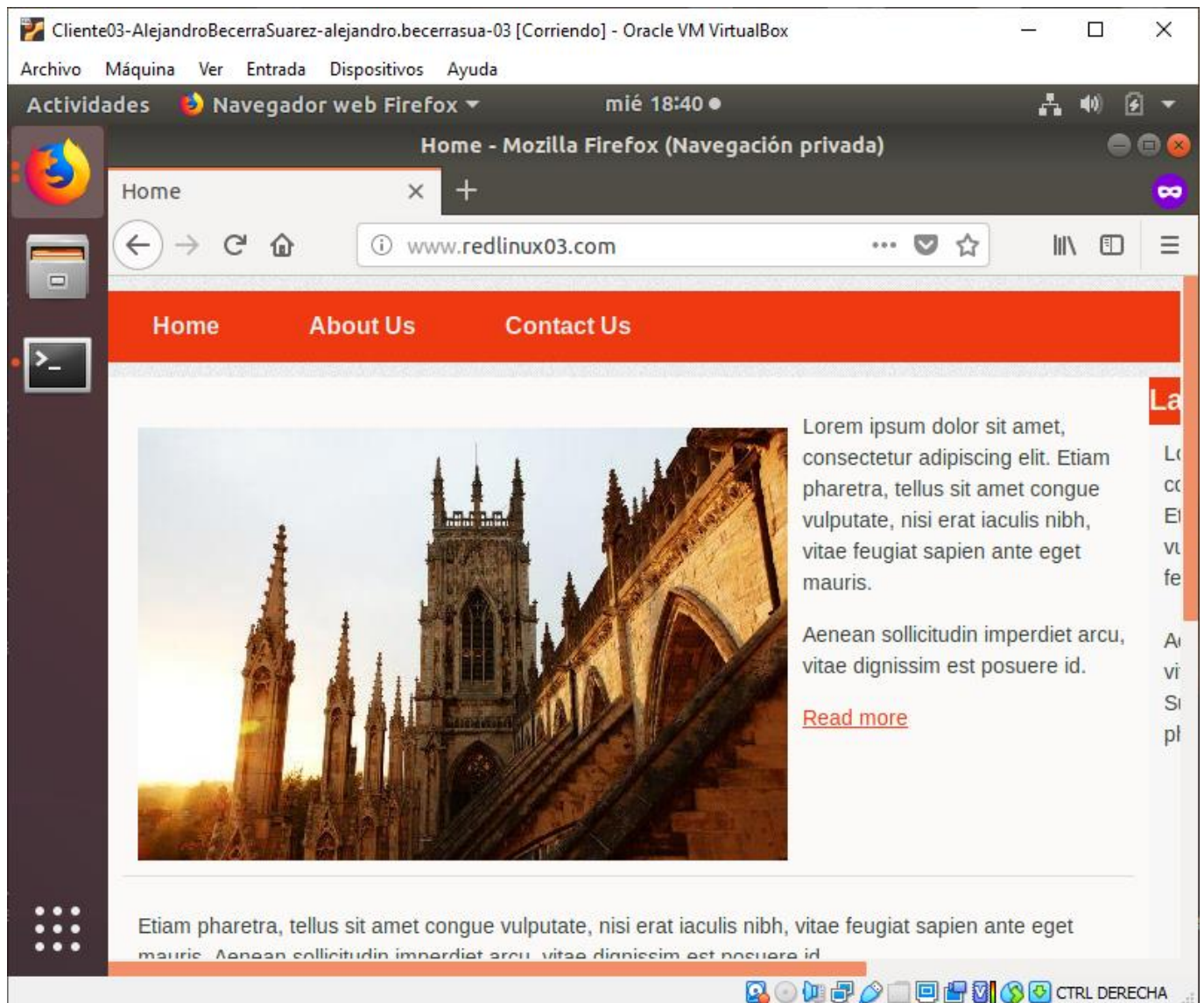
10. Crear y activar **dos sitios web** con las siguientes características (leer todos los puntos antes de hacer nada):

- a. Cada sitio web tendrá una plantilla web a elegir entre las que se pueden descargar de la página:
 - i. <http://www.openwebdesign.org/>
 - ii. Ambas plantillas deberán incluir archivos css.
- b. El sitio web *uno* tendrá como URL:
 - i. `www.redlinuxXY.com`
 1. XY es el número de lista de xade de cada alumno.
- c. El sitio web *dos* tendrá como URL:
 - i. `www.extlinuxXY.com`
 1. XY es el número de lista de xade de cada alumno.
- d. Ambos sitios web atenderán peticiones HTTP dirigidas a cualquier IP de Servidor02 en el puerto 80.
- e. Cada sitio web estará almacenado en una subcarpeta dentro de `/var/www` con los nombres `unoXY` y `dosXY` (XY es el número de lista de xade de cada alumno).
 - i. Para crear las carpetas y descomprimir los archivos, se puede hacer uso del explorador de archivos de Ubuntu. Para que el explorador de archivos de Ubuntu se ejecute con permisos de administrador, será necesario llamarlo desde la línea de comandos, con usuario root, escribiendo `nautilus &`
 1. Pulsar intro para continuar trabajando en el terminal.

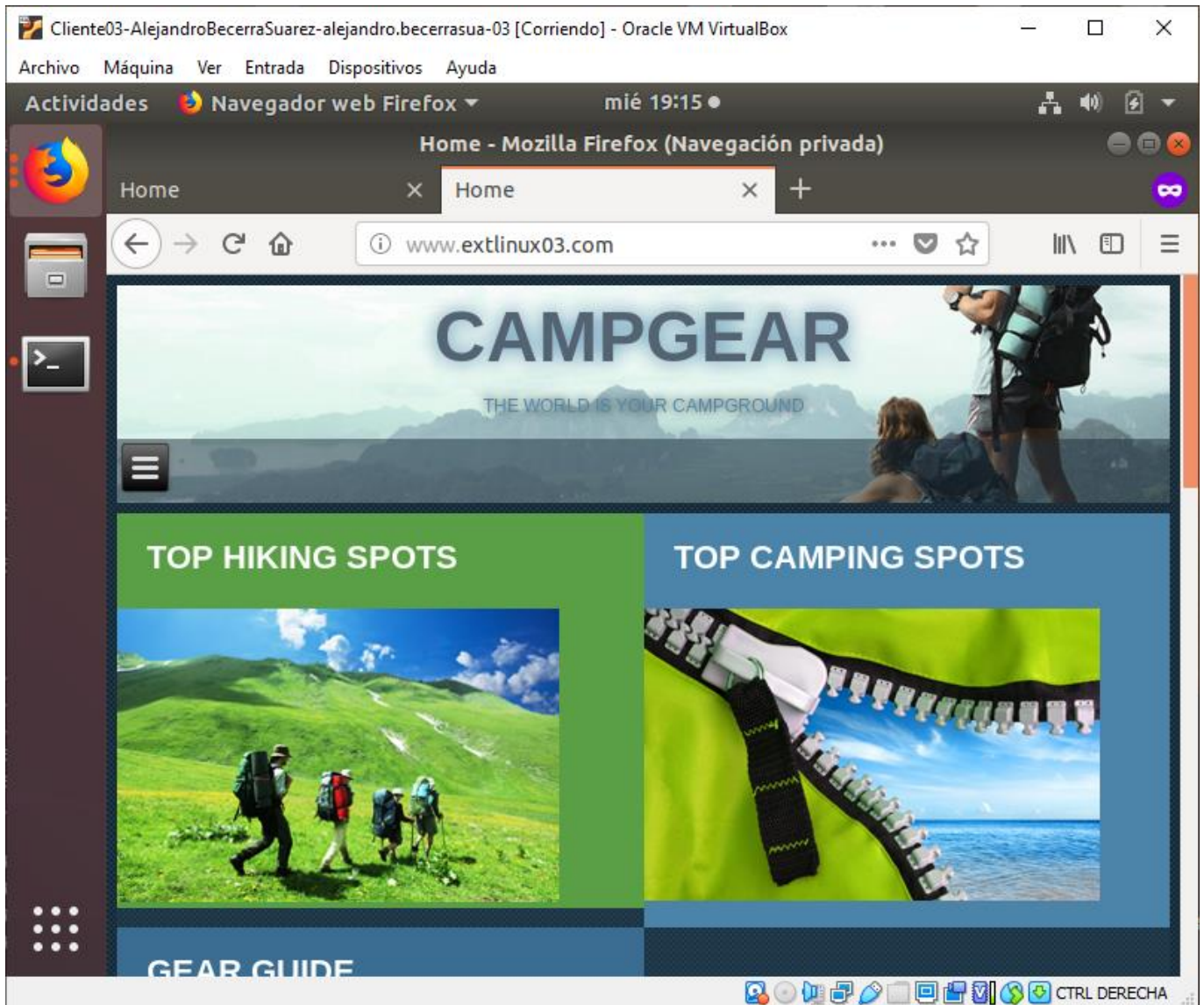
- ii. Será necesario comprobar que los archivos de cada sitio web tienen permisos para ser accesibles desde grupo y usuario (`ls -lisa /var/www/unoXY` y `ls -lisa /var/www/dosXY`). En caso de no existir esos permisos, ejecutar `chmod -R 755 /var/www/`

11. Desde el cliente, realizar las siguientes capturas:

- a. Resultado de visitar el sitio web *uno* haciendo uso de la URL.

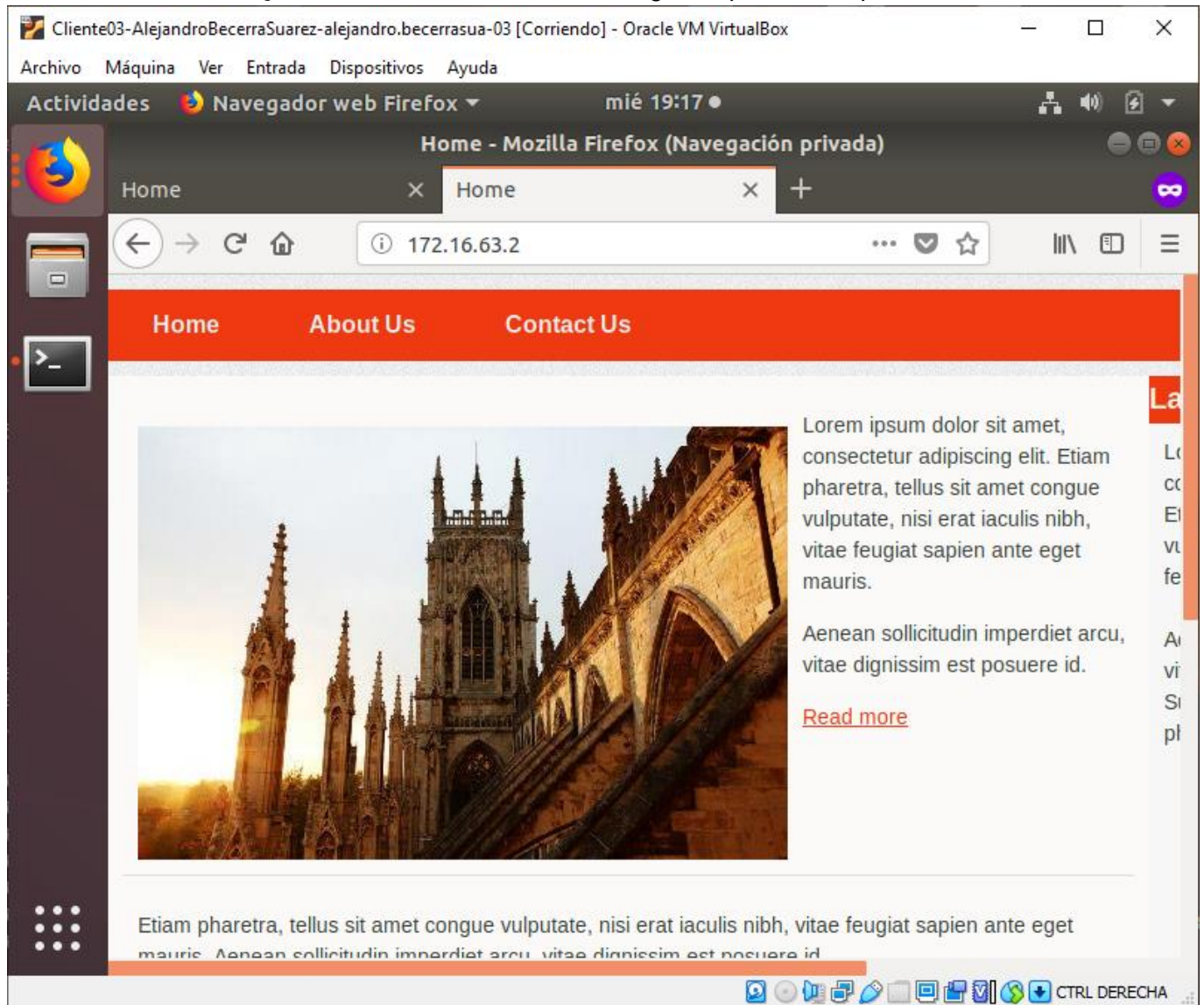


b. Resultado de visitar el sitio web *dos* haciendo uso de la URL.



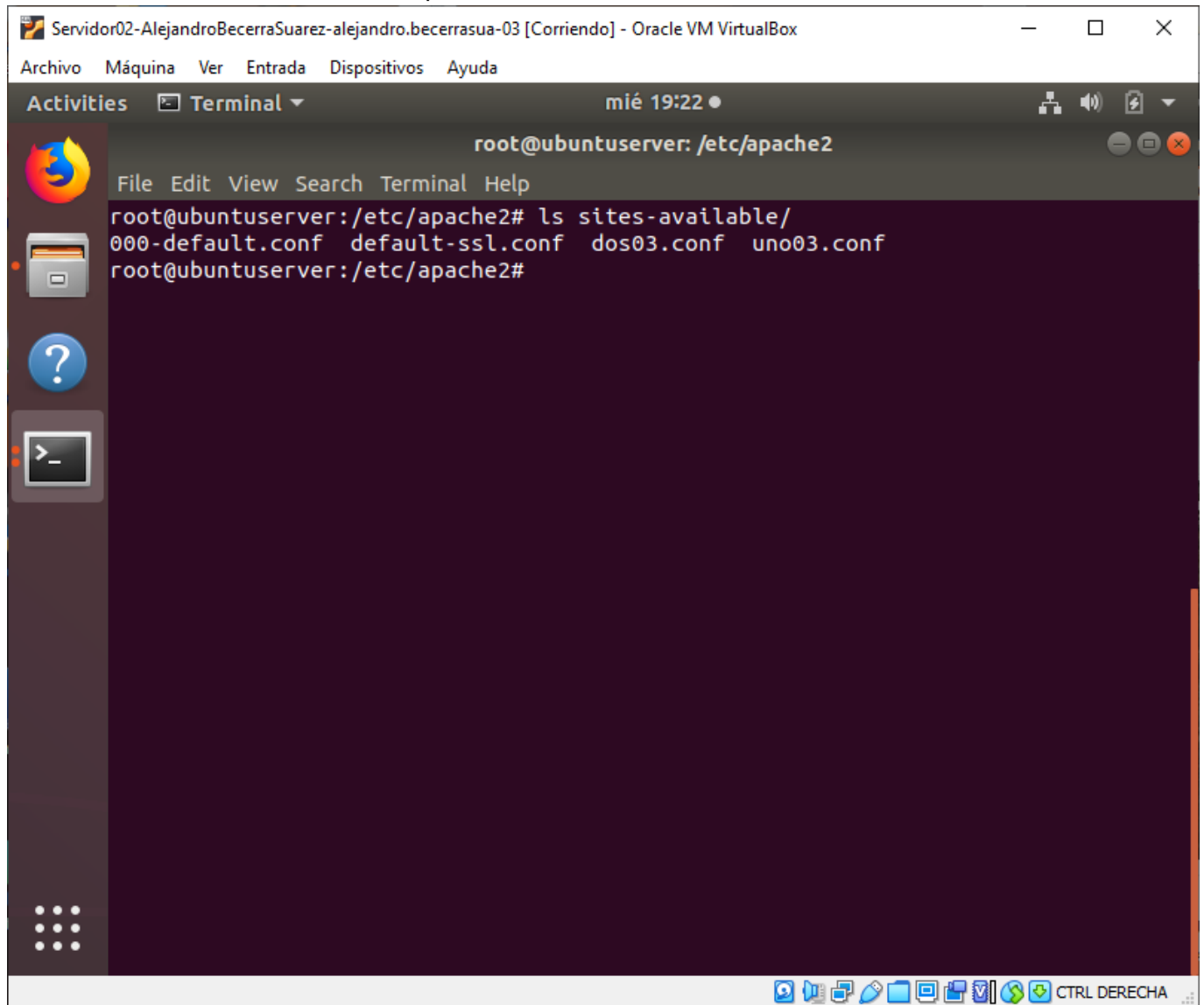
c. Resultado de visitar la IP de Servidor02 en la intnet3.

i. ¿Cuál de los dos sitios web se carga? Explicar la respuesta.



Como cada sitio web fue definido en un archivo distinto se mostrará aquel que tenga un nombre menos en orden alfabético.

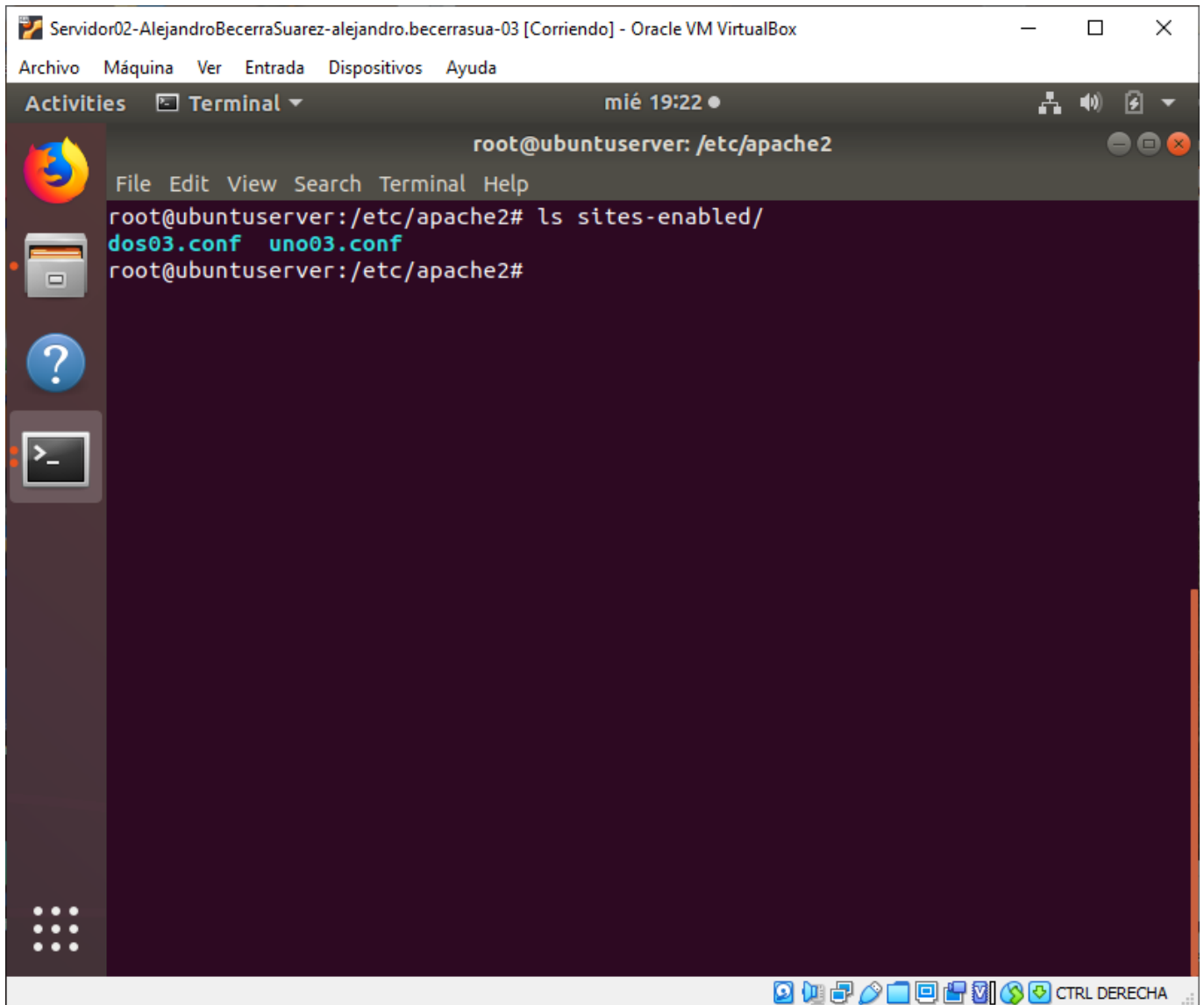
12. Realizar las siguientes capturas:
- Lista de sitios web disponibles.



The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running as root on a system named "ubuntuserver". The user is in the directory "/etc/apache2". The command "ls sites-available/" has been executed, and the output is displayed on the next line. The terminal window has a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda". The terminal itself has a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal window is part of a desktop environment with a sidebar on the left containing icons for Firefox, a file manager, a help icon, and a terminal icon. The bottom of the screen shows a taskbar with various system icons and a "CTRL DERECHA" button.

```
root@ubuntuserver: /etc/apache2
File Edit View Search Terminal Help
root@ubuntuserver:/etc/apache2# ls sites-available/
000-default.conf  default-ssl.conf  dos03.conf  uno03.conf
root@ubuntuserver:/etc/apache2#
```

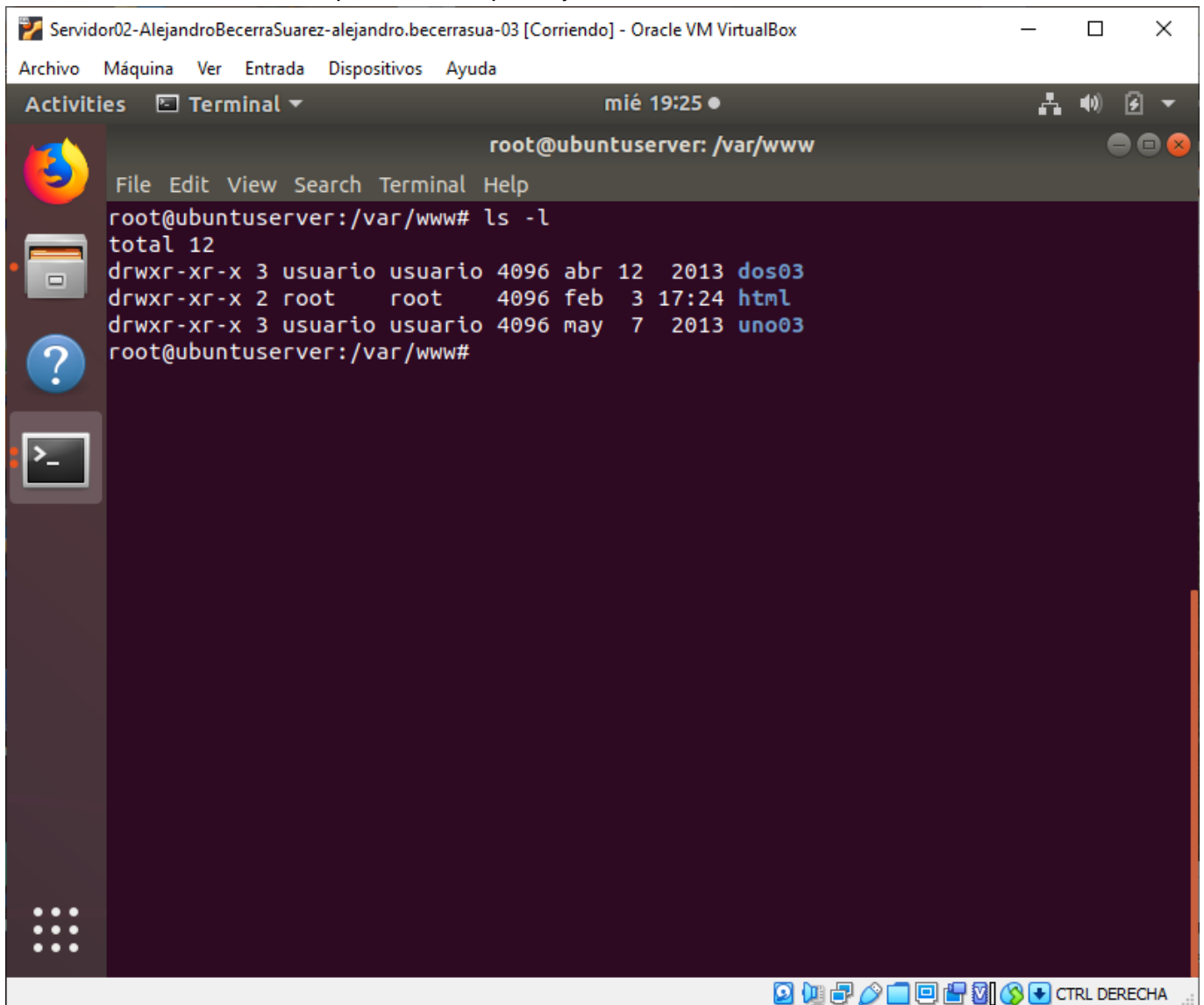
b. Lista de sitios web activados.



The image shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The window has a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda". Below the menu bar, there is a status bar showing "mié 19:22". The terminal itself has a title bar "root@ubuntuserver: /etc/apache2" and a menu bar with "File", "Edit", "View", "Search", "Terminal", and "Help". The terminal content shows the command "ls sites-enabled/" being executed, resulting in the output "dos03.conf uno03.conf". The terminal prompt is "root@ubuntuserver: /etc/apache2#". The terminal window is part of a desktop environment with a sidebar on the left containing icons for Firefox, a file manager, a help icon, and a terminal icon. The bottom of the screen shows a taskbar with various application icons and the text "CTRL DERECHA".

```
root@ubuntuserver: /etc/apache2# ls sites-enabled/
dos03.conf  uno03.conf
root@ubuntuserver: /etc/apache2#
```

c. Listado de carpetas, subcarpetas y archivos del directorio /var/www



The screenshot shows a terminal window titled "Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox". The terminal is running as root on a system named "ubuntuserver". The user has navigated to the directory "/var/www" and executed the command "ls -l". The output shows three entries: a directory named "dos03" owned by "usuario", a file named "html" owned by "root", and a directory named "uno03" owned by "usuario".

```
root@ubuntuserver: /var/www
File Edit View Search Terminal Help
root@ubuntuserver:/var/www# ls -l
total 12
drwxr-xr-x 3 usuario usuario 4096 abr 12 2013 dos03
drwxr-xr-x 2 root    root    4096 feb 3 17:24 html
drwxr-xr-x 3 usuario usuario 4096 may 7 2013 uno03
root@ubuntuserver:/var/www#
```

d. Captura del código de cada virtual host.

Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox

Archivo Máquina Ver Entrada Dispositivos Ayuda

Activities Terminal mié 19:26

root@ubuntuserver: /etc/apache2/sites-available

GNU nano 2.9.3 uno03.conf

```
<VirtualHost *:80>
# The ServerName directive sets the request scheme, hostname and port $
# the server uses to identify itself. This is used when creating
# redirection URLs. In the context of virtual hosts, the ServerName
# specifies what hostname must appear in the request's Host: header to
# match this virtual host. For the default virtual host (this file) th$
# value is not decisive as it is used as a last resort host regardless.
# However, you must set it for any further virtual host explicitly.
#ServerName www.example.com

ServerAdmin webmaster@localhost
DocumentRoot /var/www/uno03
ServerName www.redlinu03.com

# Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
# error, crit, alert, emerg.
# It is also possible to configure the loglevel for particular
# modules, e.g.
#LogLevel info ssl:warn

ErrorLog ${APACHE_LOG_DIR}/error.log
CustomLog ${APACHE_LOG_DIR}/access.log combined
```

[Read 32 lines]

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Servidor02-AlejandroBecerraSuarez-alejandro.becerrasua-03 [Corriendo] - Oracle VM VirtualBox

Archivo Máquina Ver Entrada Dispositivos Ayuda

Activities Terminal mié 19:26

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# value is not decisive as it is used as a last resort host regardless.
# However, you must setit for any further virtual host explicitly.
#ServerName www.example.com

ServerAdmin webmaster@localhost
DocumentRoot /var/www/dos03
ServerName www.extlinux03.com

# Available loglevels: trace8, ..., trace1, debug, info, notice, warn,
# error, crit, alert, emerg.
# It is also possible to configure the loglevel for particular
# modules, e.g.
#LogLevel info ssl:warn

ErrorLog ${APACHE_LOG_DIR}/error.log
CustomLog ${APACHE_LOG_DIR}/access.log combined
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[Read 32 lines]

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