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SERVIDOR WEB CON PHP Y ACCESO A BASE DE DATOS .TOMCAT.

LINKIA FP. FORMACIÓN PROFESIONAL OFICIAL A DISTANCIA

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La actividad consiste en instalar servidores de aplicaciones en una máquina virtual. Para ellos necesitarás:

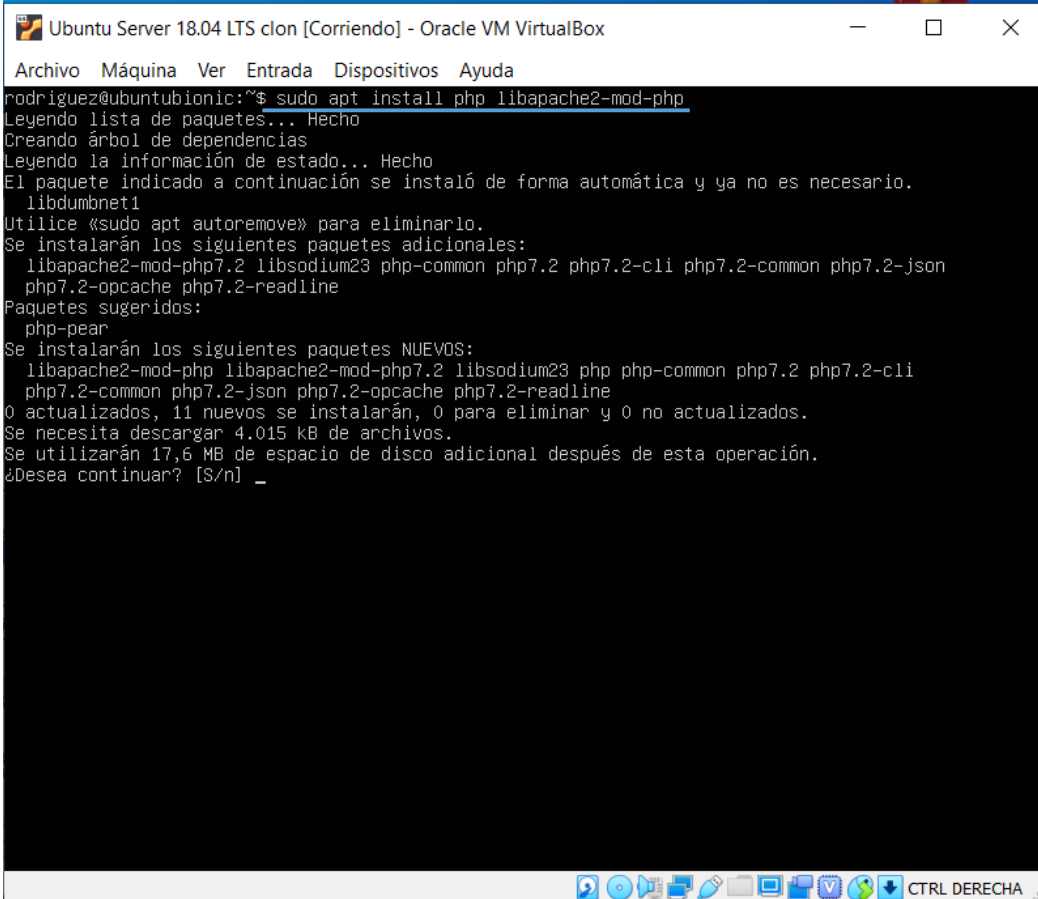
- Máquina virtual con un servidor Linux Ubuntu 18.04. El servidor debe tener instalado el servicio Apache.
- Máquina virtual con el sistema operativo que quieras. El único requisito que debe cumplir es que tenga instalado el cliente de MySQL para utilizarlo desde la línea de comandos.

Una vez, dispongas de los elementos necesarios para realizar la actividad, tienes que hacer lo siguiente:

1. Instala el paquete php para el sistema operativo y el módulo de apache correspondiente. **(0.50 puntos)**

Una vez instalado el servidor Web Apache en la máquina, para que ésta pueda interpretar código PHP se debe instalar el paquete de php para el sistema operativo y el módulo de apache correspondiente.

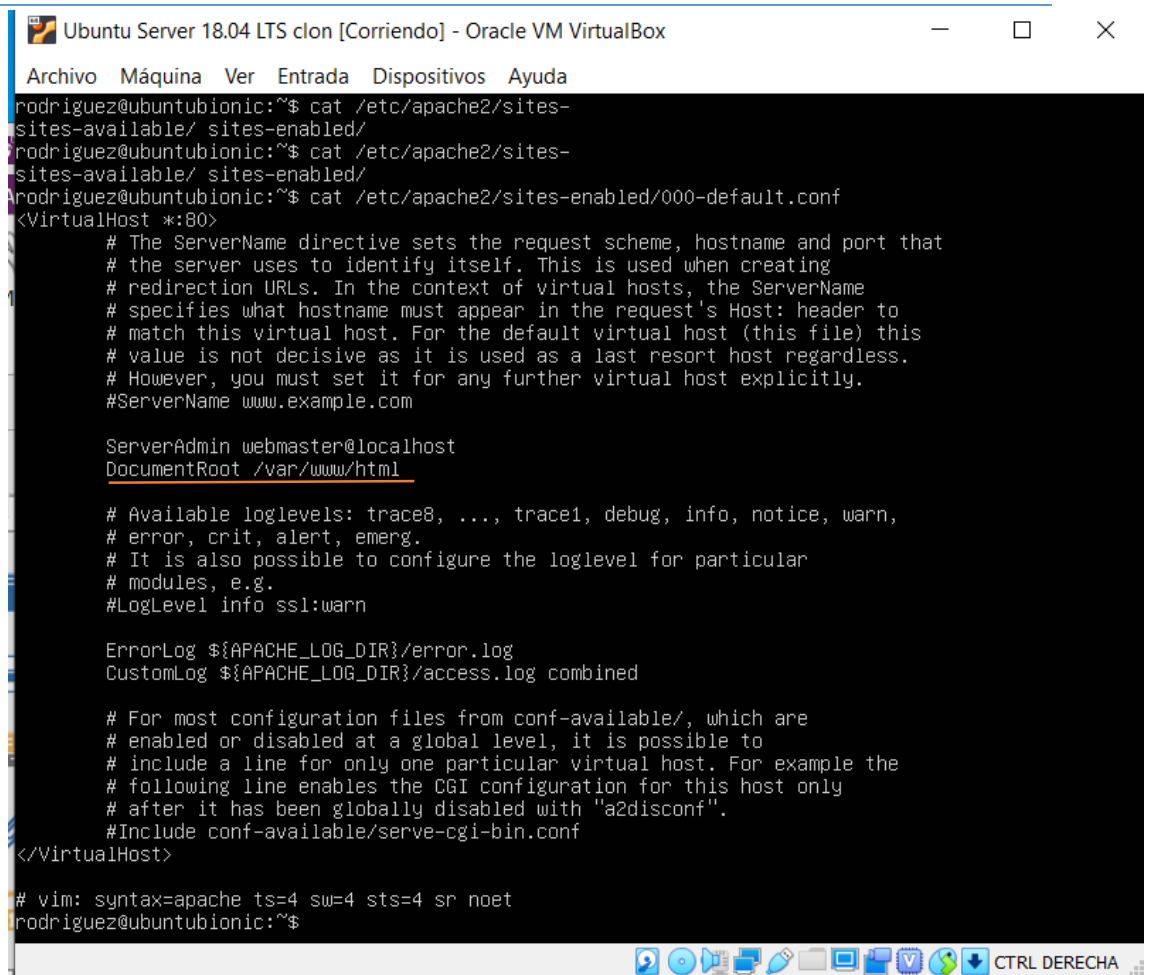
Los instalamos mediante el código: `sudo apt install php libapache2-mod-php`



The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox". The terminal output shows the command `sudo apt install php libapache2-mod-php` being executed. The system reports that the package is already installed and suggests removing it with `sudo apt autoremove`. It then lists additional packages to be installed, including `libapache2-mod-php7.2`, `libsodium23`, `php-common`, `php7.2`, `php7.2-cli`, `php7.2-common`, `php7.2-json`, `php7.2-opcache`, and `php7.2-readline`. The terminal also shows the size of the files to be downloaded (4.015 kB) and the additional disk space required (17.6 MB). The prompt `¿Desea continuar? [S/n]` is visible at the bottom of the terminal output.

```
Archivo Máquina Ver Entrada Dispositivos Ayuda
rodriguez@ubuntubionic:~$ sudo apt install php libapache2-mod-php
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
El paquete indicado a continuación se instaló de forma automática y ya no es necesario.
  libdumbnet1
Utilice «sudo apt autoremove» para eliminarlo.
Se instalarán los siguientes paquetes adicionales:
  libapache2-mod-php7.2 libsodium23 php-common php7.2 php7.2-cli php7.2-common php7.2-json
  php7.2-opcache php7.2-readline
Paquetes sugeridos:
  php-pear
Se instalarán los siguientes paquetes NUEVOS:
  libapache2-mod-php libapache2-mod-php7.2 libsodium23 php php-common php7.2 php7.2-cli
  php7.2-common php7.2-json php7.2-opcache php7.2-readline
0 actualizados, 11 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
Se necesita descargar 4.015 kB de archivos.
Se utilizarán 17,6 MB de espacio de disco adicional después de esta operación.
¿Desea continuar? [S/n] _
```

2. Crea un archivo llamado `hello.php`. Este archivo tiene que contener el código php necesario para mostrar un “Hola mundo” por pantalla. Tienes que ubicar el archivo en el DocumentRoot del servidor Apache. Accede al archivo creado desde un navegador para comprobar que el módulo php funciona correctamente. (0.50 puntos)



```
Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
rodriguez@ubuntubionic:~$ cat /etc/apache2/sites-
sites-available/ sites-enabled/
rodriguez@ubuntubionic:~$ cat /etc/apache2/sites-
sites-available/ sites-enabled/
rodriguez@ubuntubionic:~$ cat /etc/apache2/sites-enabled/000-default.conf
<VirtualHost *:80>
    # The ServerName directive sets the request scheme, hostname and port that
    # 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) this
    # 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/html

    # 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

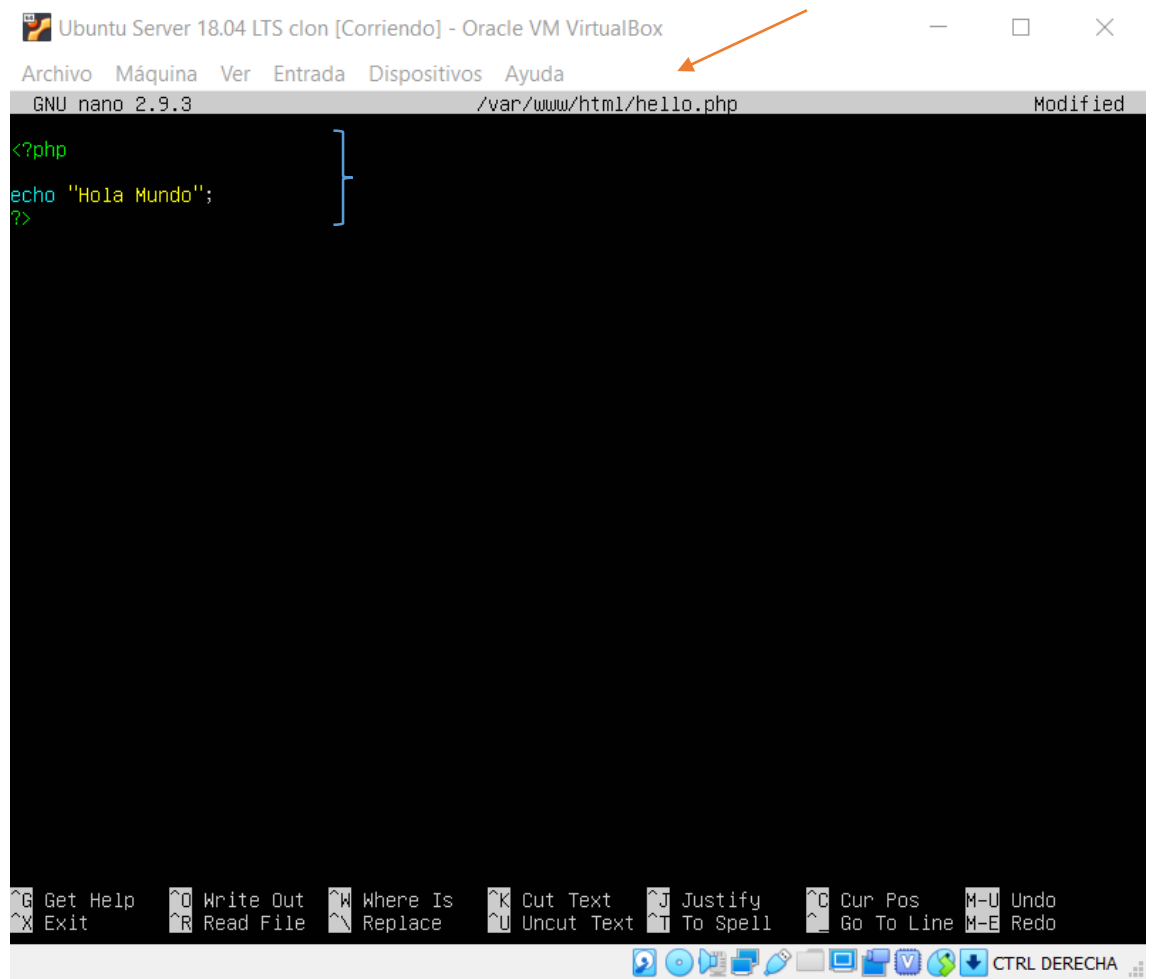
    ErrorLog ${APACHE_LOG_DIR}/error.log
    CustomLog ${APACHE_LOG_DIR}/access.log combined

    # For most configuration files from conf-available/, which are
    # enabled or disabled at a global level, it is possible to
    # include a line for only one particular virtual host. For example the
    # following line enables the CGI configuration for this host only
    # after it has been globally disabled with "a2disconf".
    #Include conf-available/serve-cgi-bin.conf
</VirtualHost>

# vim: syntax=apache ts=4 sw=4 sts=4 sr noet
rodriguez@ubuntubionic:~$
```

Creamos un archivo llamado `hello.php` ubicado en el DocumentRoot del servidor Apache.

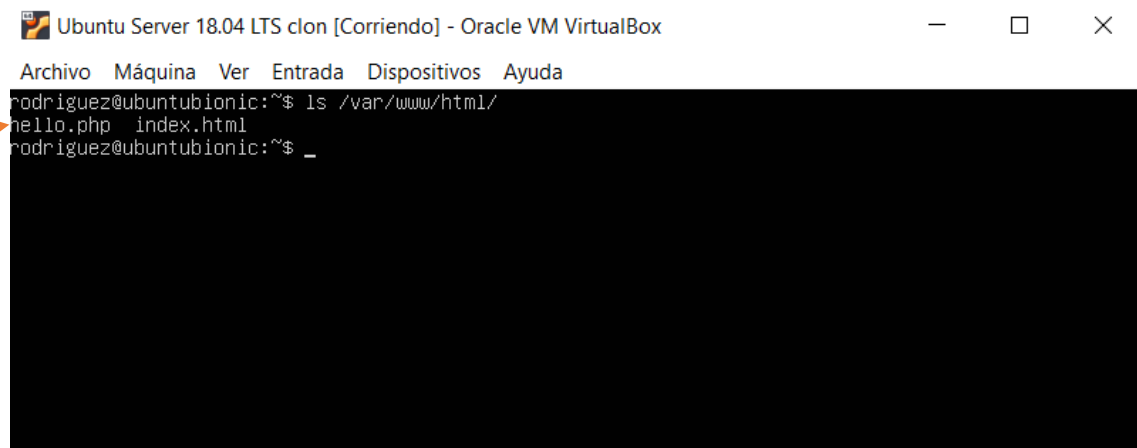
Escribimos `sudo nano /var/www/html/hello.php`



The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox". The terminal is running the nano text editor, editing the file `/var/www/html/hello.php`. The code in the editor is:

```
<?php
echo "Hola Mundo";
?>
```

The nano editor's status bar at the bottom shows various keyboard shortcuts like `^G Get Help`, `^O Write Out`, etc. An orange arrow points to the `Ayuda` menu item in the terminal's menu bar.



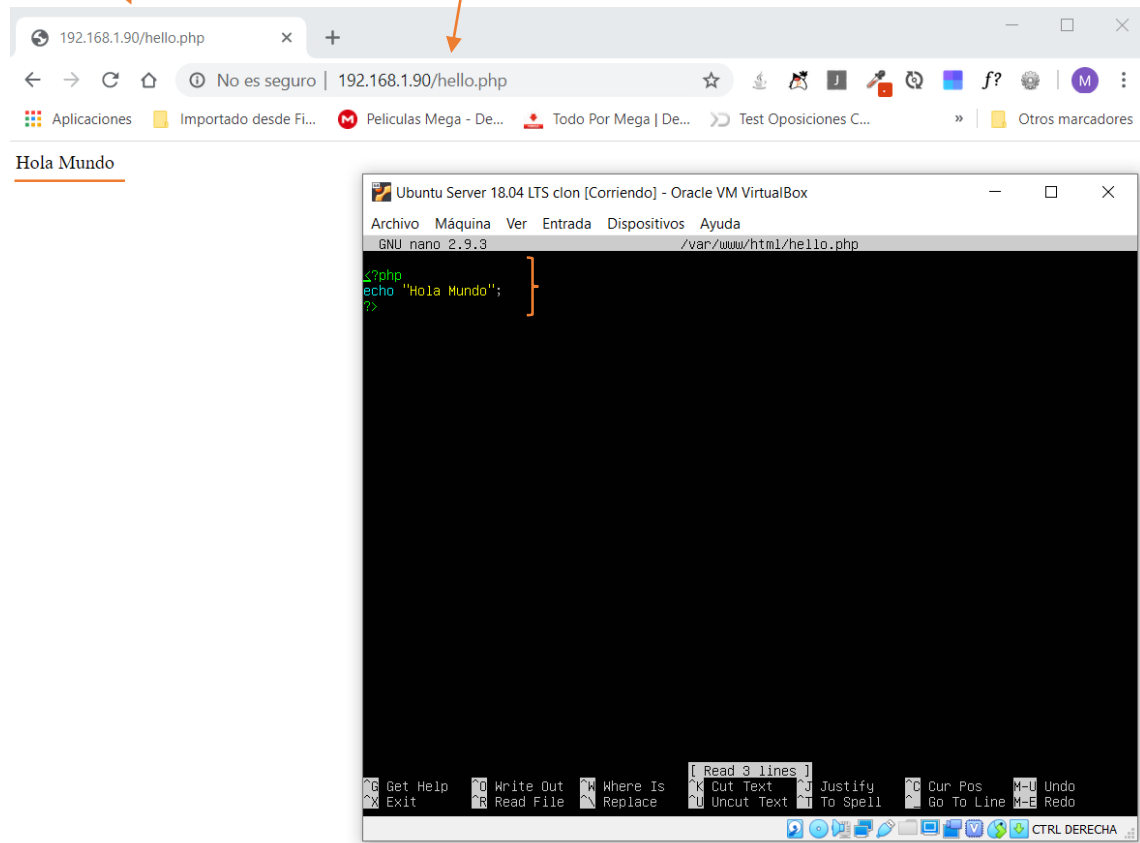
The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox". The terminal is running the command `ls /var/www/html/` to list the contents of the directory. The output is:

```
rodriguez@ubuntubionic:~$ ls /var/www/html/
hello.php  index.html
rodriguez@ubuntubionic:~$ _
```

An orange arrow points to the `hello.php` file in the output.

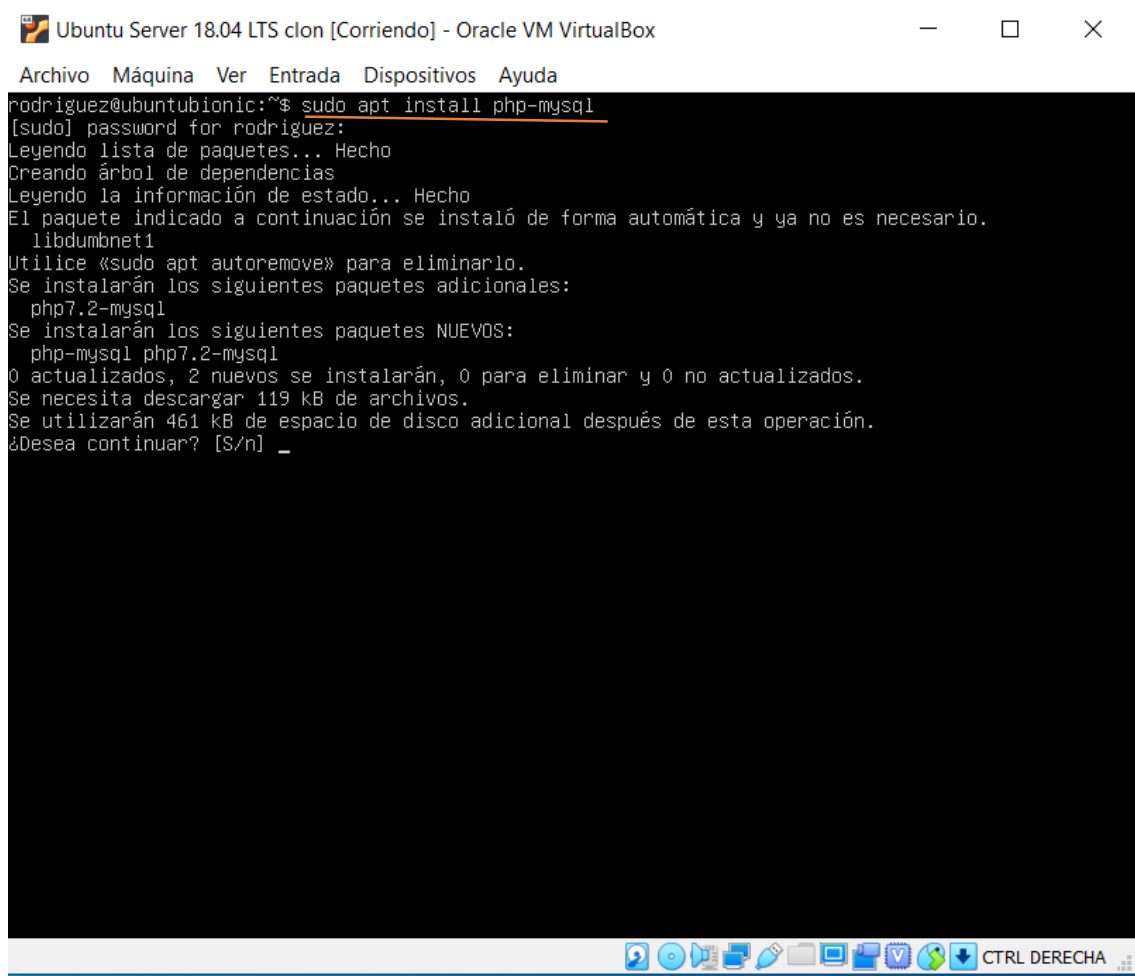
Una vez hemos creado el archivo y escrito el código en él, accedemos desde el navegador para comprobar que muestra el contenido correctamente. Introducimos la dirección `192.168.1.90/hello.php`.

Manuel Fernando Rodríguez Borrero



3. Instala el módulo que permite el uso de funciones php que acceden a bases de datos MySQL. (0.50 puntos)

Ponemos el siguiente código: `sudo apt install php-mysql`

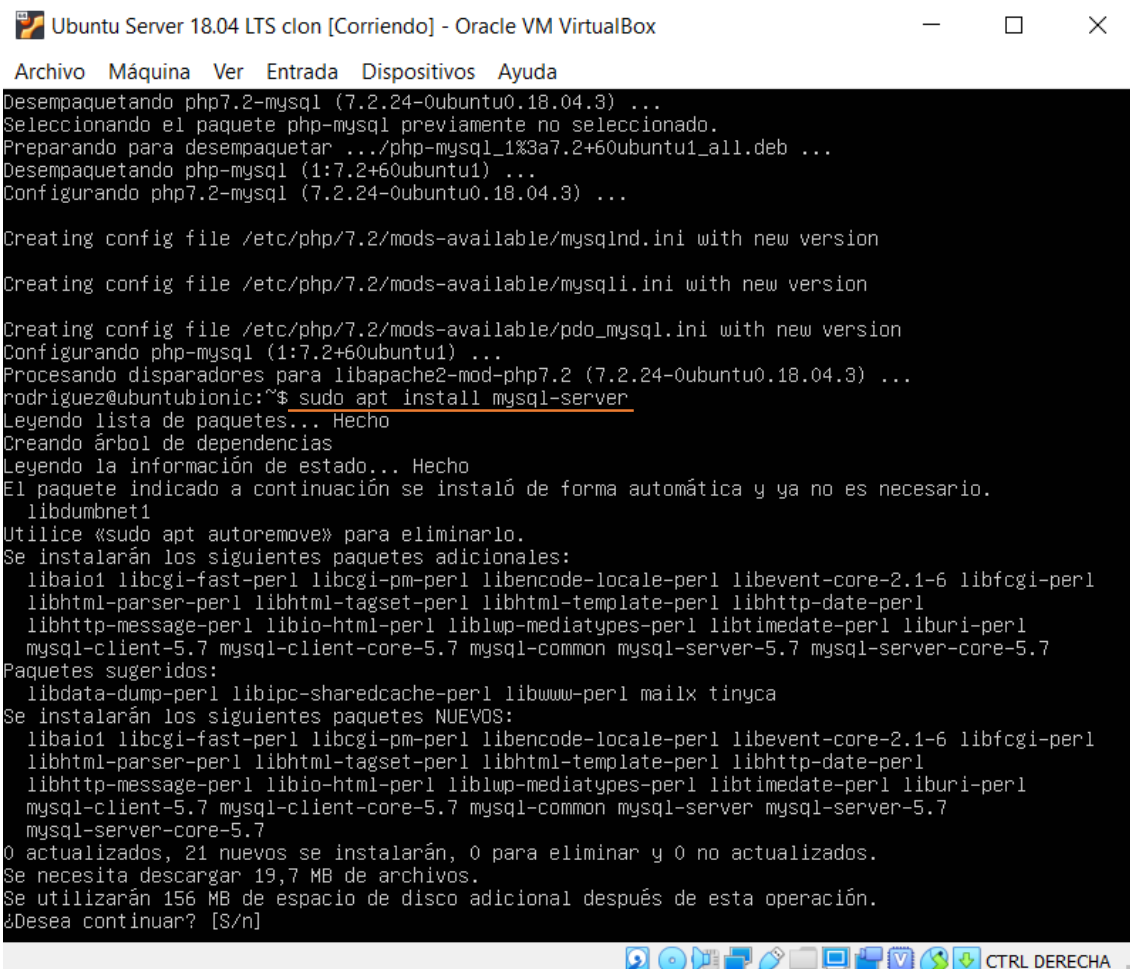


The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox". The terminal output shows the command `sudo apt install php-mysql` being executed. The system prompts for a password, then proceeds to read the package list, create a dependency tree, and read the state information. It informs that the package is installed automatically and is no longer necessary. It lists additional packages to be installed: `libdumbnet1` and `php7.2-mysql`. It also shows the disk space requirements: 119 kB for download and 461 kB for additional disk space. The prompt `¿Desea continuar? [S/n]` is shown at the bottom.

```
rodriguez@ubuntubionic:~$ sudo apt install php-mysql
[sudo] password for rodriguez:
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
El paquete indicado a continuación se instaló de forma automática y ya no es necesario.
  libdumbnet1
Utilice «sudo apt autoremove» para eliminarlo.
Se instalarán los siguientes paquetes adicionales:
  php7.2-mysql
Se instalarán los siguientes paquetes NUEVOS:
  php-mysql php7.2-mysql
0 actualizados, 2 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
Se necesita descargar 119 kB de archivos.
Se utilizarán 461 kB de espacio de disco adicional después de esta operación.
¿Desea continuar? [S/n] _
```

4. Instala el servicio de MySQL. Cuando finalice la instalación del servicio, ejecuta el módulo que permite asegurar la instalación. Comprueba que el servicio de MySQL está en marcha. (1 punto).

Instalamos el servicio de MySQL con `sudo apt install mysql-server`



```
Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
Desempaquetando php7.2-mysql (7.2.24-0ubuntu0.18.04.3) ...
Seleccionando el paquete php-mysql previamente no seleccionado.
Preparando para desempaquetar .../php-mysql_1%3a7.2+60ubuntu1_all.deb ...
Desempaquetando php-mysql (1:7.2+60ubuntu1) ...
Configurando php7.2-mysql (7.2.24-0ubuntu0.18.04.3) ...

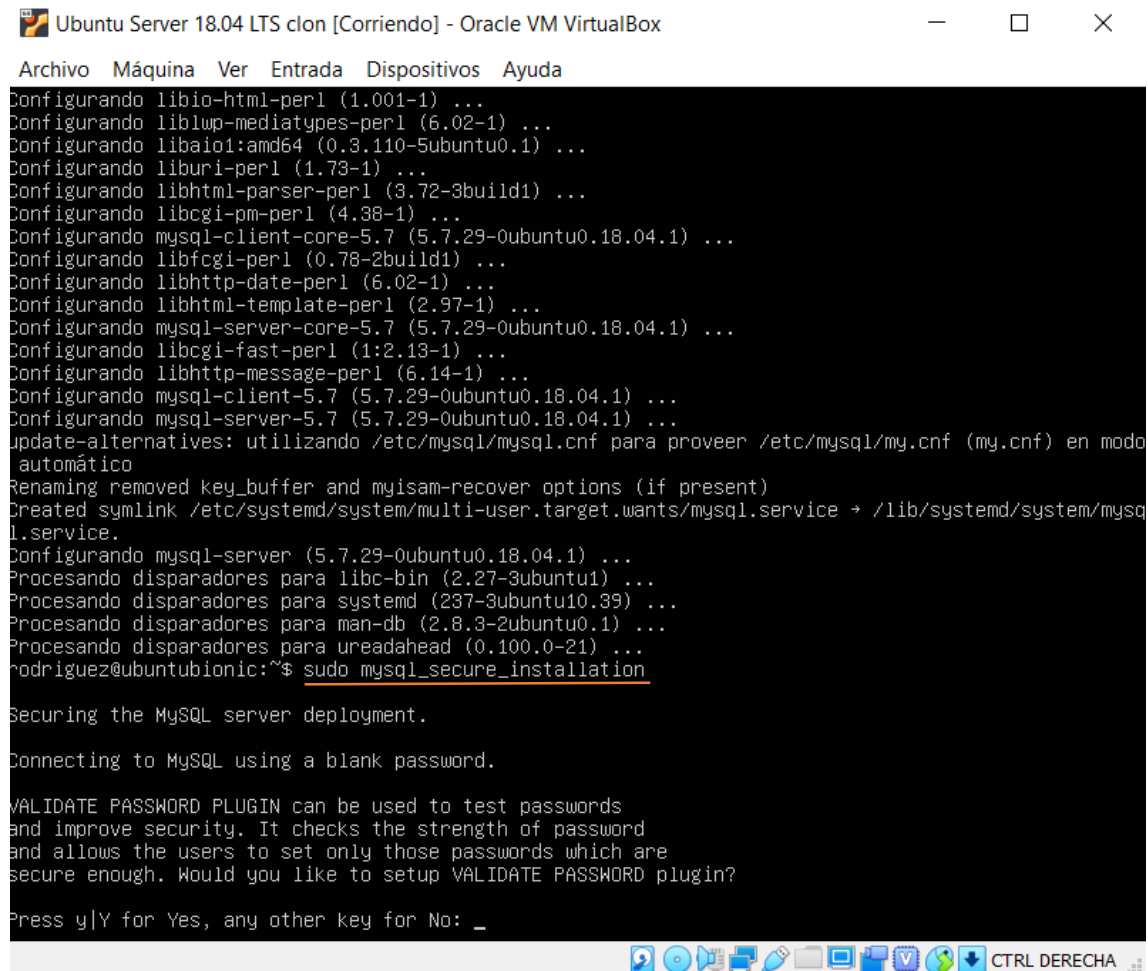
Creating config file /etc/php/7.2/mods-available/mysqlnd.ini with new version

Creating config file /etc/php/7.2/mods-available/mysql.ini with new version

Creating config file /etc/php/7.2/mods-available/pdo_mysql.ini with new version
Configurando php-mysql (1:7.2+60ubuntu1) ...
Procesando disparadores para libapache2-mod-php7.2 (7.2.24-0ubuntu0.18.04.3) ...
rodriguez@ubuntubionic:~$ sudo apt install mysql-server
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
El paquete indicado a continuación se instaló de forma automática y ya no es necesario.
  libdumbnet1
Utilice «sudo apt autoremove» para eliminarlo.
Se instalarán los siguientes paquetes adicionales:
  libaio1 libcgi-fast-perl libcgi-pm-perl libencode-locale-perl libevent-core-2.1-6 libfcgi-perl
  libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl
  libhttp-message-perl libio-html-perl liblwp-mediatypes-perl libtimedate-perl liburi-perl
  mysql-client-5.7 mysql-client-core-5.7 mysql-common mysql-server-5.7 mysql-server-core-5.7
Paquetes sugeridos:
  libdata-dump-perl libipc-sharedcache-perl libwww-perl mailx tinycd
Se instalarán los siguientes paquetes NUEVOS:
  libaio1 libcgi-fast-perl libcgi-pm-perl libencode-locale-perl libevent-core-2.1-6 libfcgi-perl
  libhtml-parser-perl libhtml-tagset-perl libhtml-template-perl libhttp-date-perl
  libhttp-message-perl libio-html-perl liblwp-mediatypes-perl libtimedate-perl liburi-perl
  mysql-client-5.7 mysql-client-core-5.7 mysql-common mysql-server mysql-server-5.7
  mysql-server-core-5.7
0 actualizados, 21 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
Se necesita descargar 19,7 MB de archivos.
Se utilizarán 156 MB de espacio de disco adicional después de esta operación.
¿Desea continuar? [S/n]
```

Ejecutamos el módulo que permite asegurar la instalación:

`sudo mysql_secure_installation`



```
Archivo Máquina Ver Entrada Dispositivos Ayuda
Configurando libio-html-perl (1.001-1) ...
Configurando liblwp-mediatypes-perl (6.02-1) ...
Configurando libaio1:amd64 (0.3.110-5ubuntu0.1) ...
Configurando liburi-perl (1.73-1) ...
Configurando libhtml-parser-perl (3.72-3build1) ...
Configurando libcgi-pm-perl (4.38-1) ...
Configurando mysql-client-core-5.7 (5.7.29-0ubuntu0.18.04.1) ...
Configurando libfcgi-perl (0.78-2build1) ...
Configurando libhttp-date-perl (6.02-1) ...
Configurando libhtml-template-perl (2.97-1) ...
Configurando mysql-server-core-5.7 (5.7.29-0ubuntu0.18.04.1) ...
Configurando libcgi-fast-perl (1:2.13-1) ...
Configurando libhttp-message-perl (6.14-1) ...
Configurando mysql-client-5.7 (5.7.29-0ubuntu0.18.04.1) ...
Configurando mysql-server-5.7 (5.7.29-0ubuntu0.18.04.1) ...
update-alternatives: utilizando /etc/mysql/mysql.cnf para proveer /etc/mysql/my.cnf (my.cnf) en modo
automático
Renaming removed key_buffer and myisam-recover options (if present)
Created symlink /etc/systemd/system/multi-user.target.wants/mysql.service → /lib/systemd/system/mysql
.service.
Configurando mysql-server (5.7.29-0ubuntu0.18.04.1) ...
Procesando disparadores para libc-bin (2.27-3ubuntu1) ...
Procesando disparadores para systemd (237-3ubuntu10.39) ...
Procesando disparadores para man-db (2.8.3-2ubuntu0.1) ...
Procesando disparadores para ureadahead (0.100.0-21) ...
rodriguez@ubuntubionic:~$ sudo mysql_secure_installation

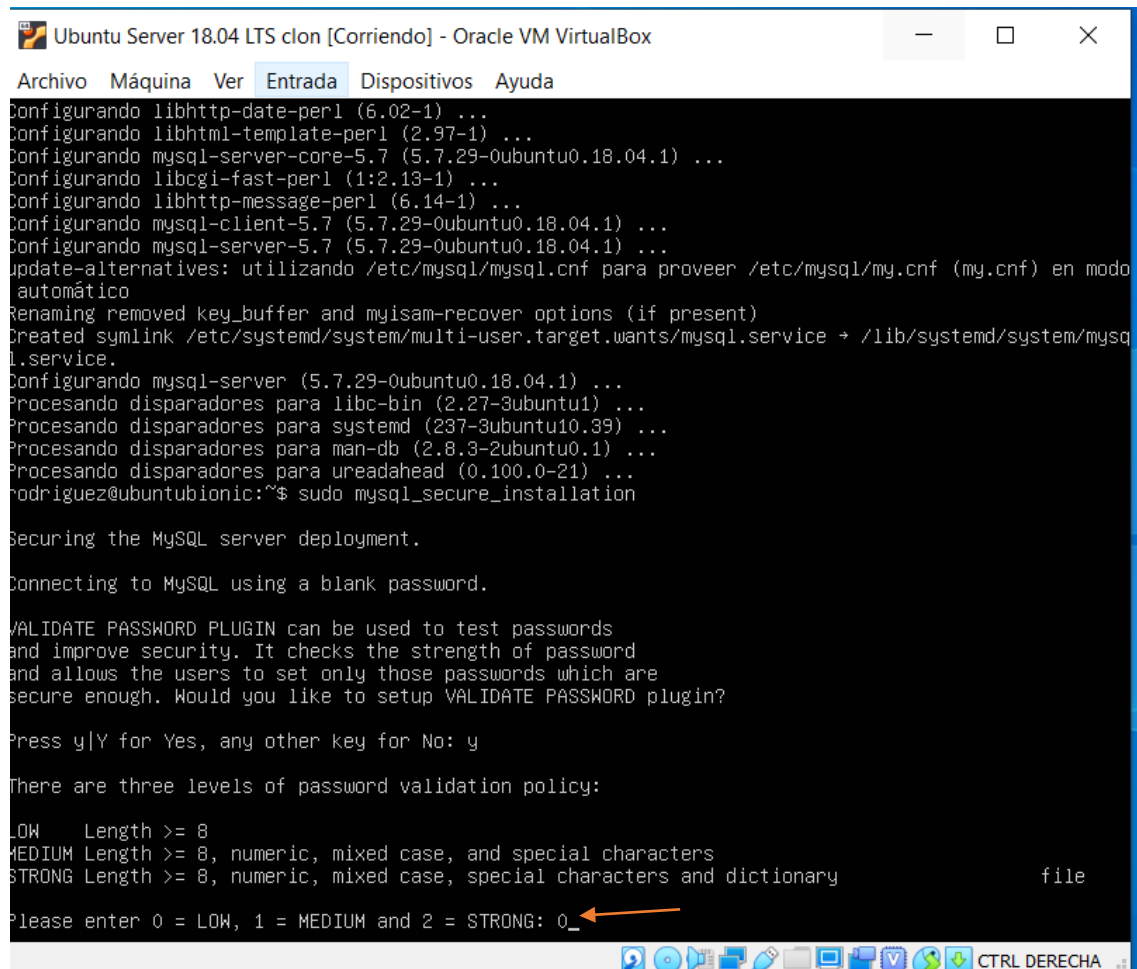
Securing the MySQL server deployment.

Connecting to MySQL using a blank password.

VALIDATE PASSWORD PLUGIN can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD plugin?

Press y|Y for Yes, any other key for No: _
```

He elegido el nivel de seguridad LOW.



```
Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
Configurando libhttp-date-perl (6.02-1) ...
Configurando libhtml-template-perl (2.97-1) ...
Configurando mysql-server-core-5.7 (5.7.29-0ubuntu0.18.04.1) ...
Configurando libcgi-fast-perl (1:2.13-1) ...
Configurando libhttp-message-perl (6.14-1) ...
Configurando mysql-client-5.7 (5.7.29-0ubuntu0.18.04.1) ...
Configurando mysql-server-5.7 (5.7.29-0ubuntu0.18.04.1) ...
update-alternatives: utilizando /etc/mysql/mysql.cnf para proveer /etc/mysql/my.cnf (my.cnf) en modo
automático
Renaming removed key_buffer and myisam-recover options (if present)
Created symlink /etc/systemd/system/multi-user.target.wants/mysql.service → /lib/systemd/system/mysql
.service.
Configurando mysql-server (5.7.29-0ubuntu0.18.04.1) ...
Procesando disparadores para libc-bin (2.27-3ubuntu1) ...
Procesando disparadores para systemd (237-3ubuntu10.39) ...
Procesando disparadores para man-db (2.8.3-2ubuntu0.1) ...
Procesando disparadores para ureadahead (0.100.0-21) ...
rodriguez@ubuntubionic:~$ sudo mysql_secure_installation

Securing the MySQL server deployment.

Connecting to MySQL using a blank password.

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and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD plugin?

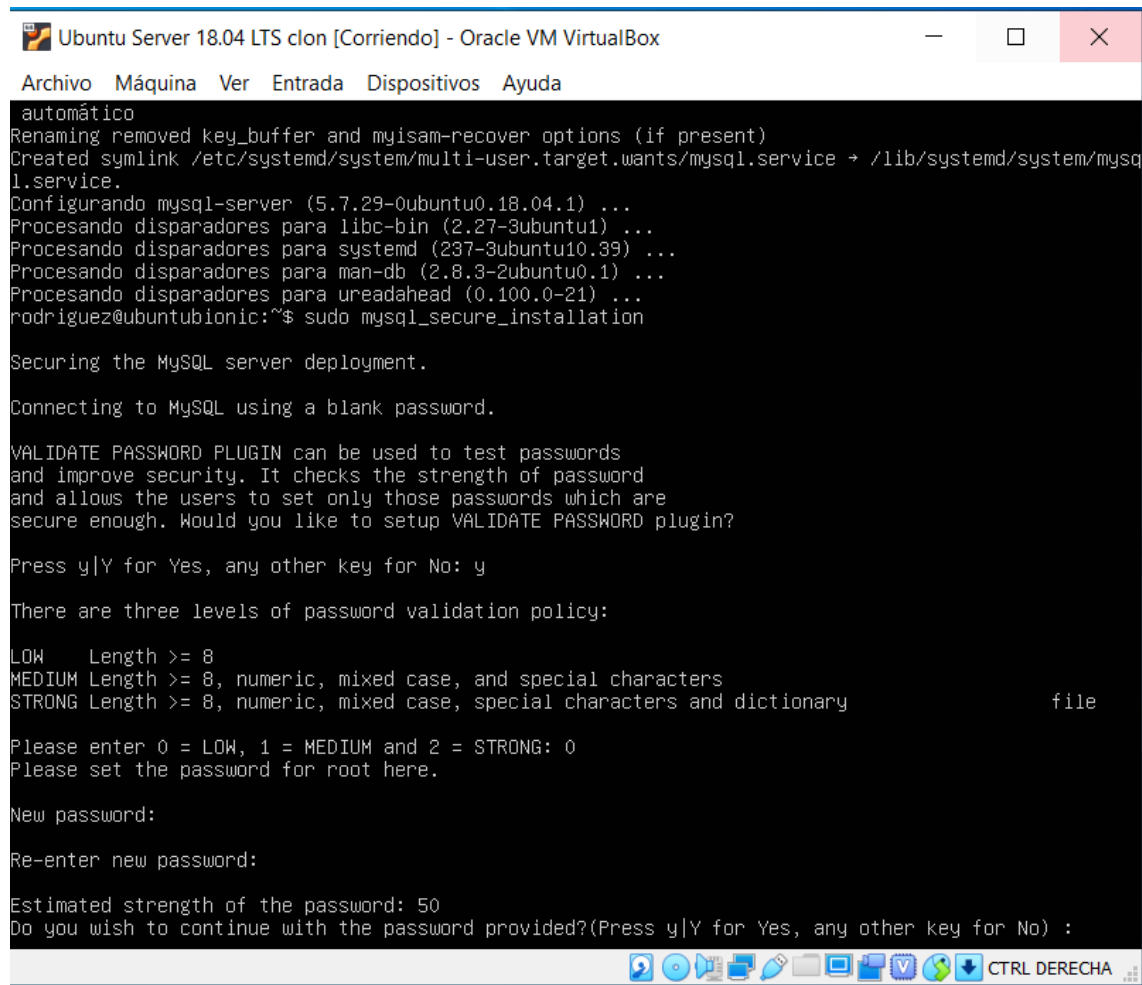
Press y|Y for Yes, any other key for No: y

There are three levels of password validation policy:

LOW      Length >= 8
MEDIUM  Length >= 8, numeric, mixed case, and special characters
STRONG  Length >= 8, numeric, mixed case, special characters and dictionary          file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 0_
```

Ahora agregamos la contraseña para el usuario root de la base de datos:



```
Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
automático
Renaming removed key_buffer and myisam-recover options (if present)
Created symlink /etc/systemd/system/multi-user.target.wants/mysql.service → /lib/systemd/system/mysql.service.
Configurando mysql-server (5.7.29-0ubuntu0.18.04.1) ...
Procesando disparadores para libc-bin (2.27-3ubuntu1) ...
Procesando disparadores para systemd (237-3ubuntu10.39) ...
Procesando disparadores para man-db (2.8.3-2ubuntu0.1) ...
Procesando disparadores para ureadahead (0.100.0-21) ...
rodriguez@ubuntubionic:~$ sudo mysql_secure_installation

Securing the MySQL server deployment.

Connecting to MySQL using a blank password.

VALIDATE PASSWORD PLUGIN can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD plugin?

Press y|Y for Yes, any other key for No: y

There are three levels of password validation policy:

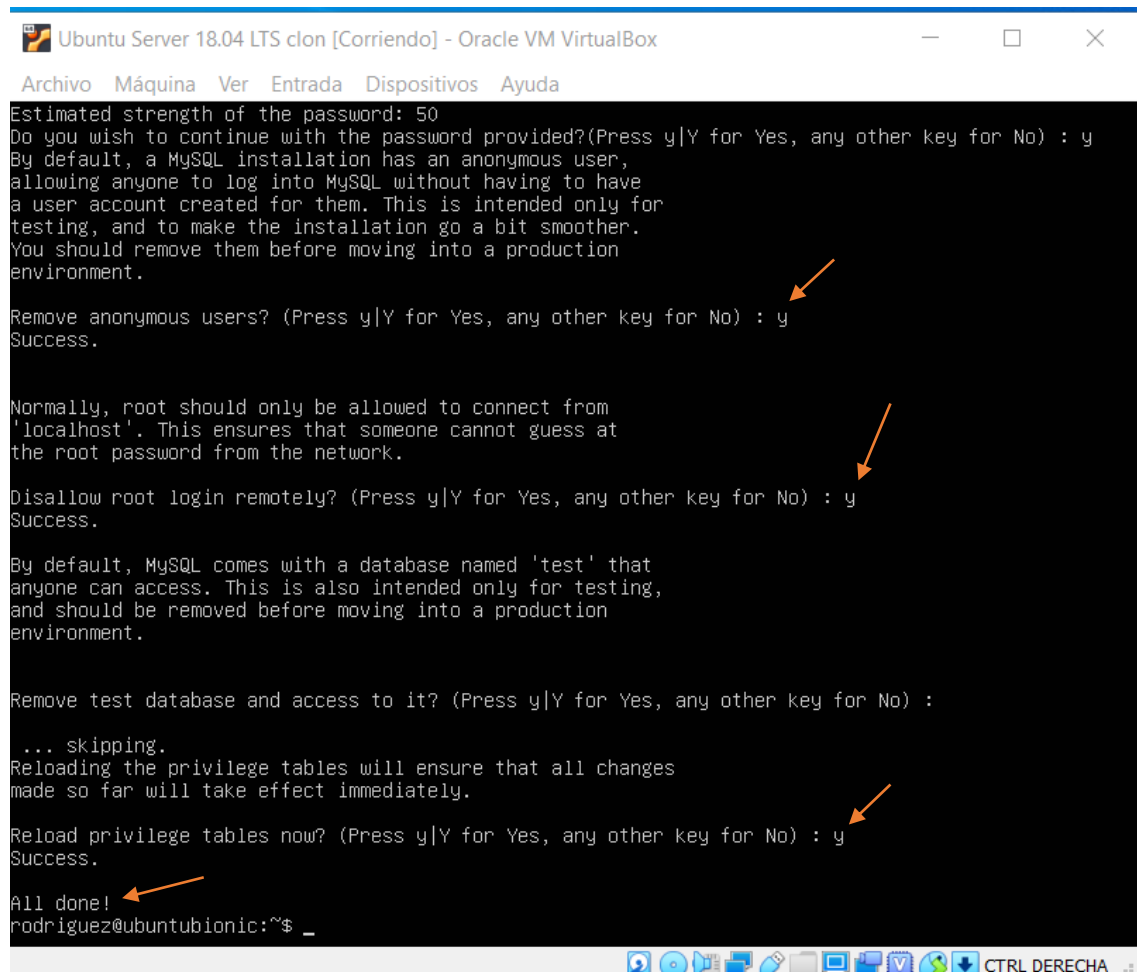
LOW      Length >= 8
MEDIUM  Length >= 8, numeric, mixed case, and special characters
STRONG  Length >= 8, numeric, mixed case, special characters and dictionary      file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 0
Please set the password for root here.

New password:

Re-enter new password:

Estimated strength of the password: 50
Do you wish to continue with the password provided?(Press y|Y for Yes, any other key for No) :
```



```
Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
Estimated strength of the password: 50
Do you wish to continue with the password provided?(Press y|Y for Yes, any other key for No) : y
By default, a MySQL installation has an anonymous user,
allowing anyone to log into MySQL without having to have
a user account created for them. This is intended only for
testing, and to make the installation go a bit smoother.
You should remove them before moving into a production
environment.

Remove anonymous users? (Press y|Y for Yes, any other key for No) : y
Success.

Normally, root should only be allowed to connect from
'localhost'. This ensures that someone cannot guess at
the root password from the network.

Disallow root login remotely? (Press y|Y for Yes, any other key for No) : y
Success.

By default, MySQL comes with a database named 'test' that
anyone can access. This is also intended only for testing,
and should be removed before moving into a production
environment.

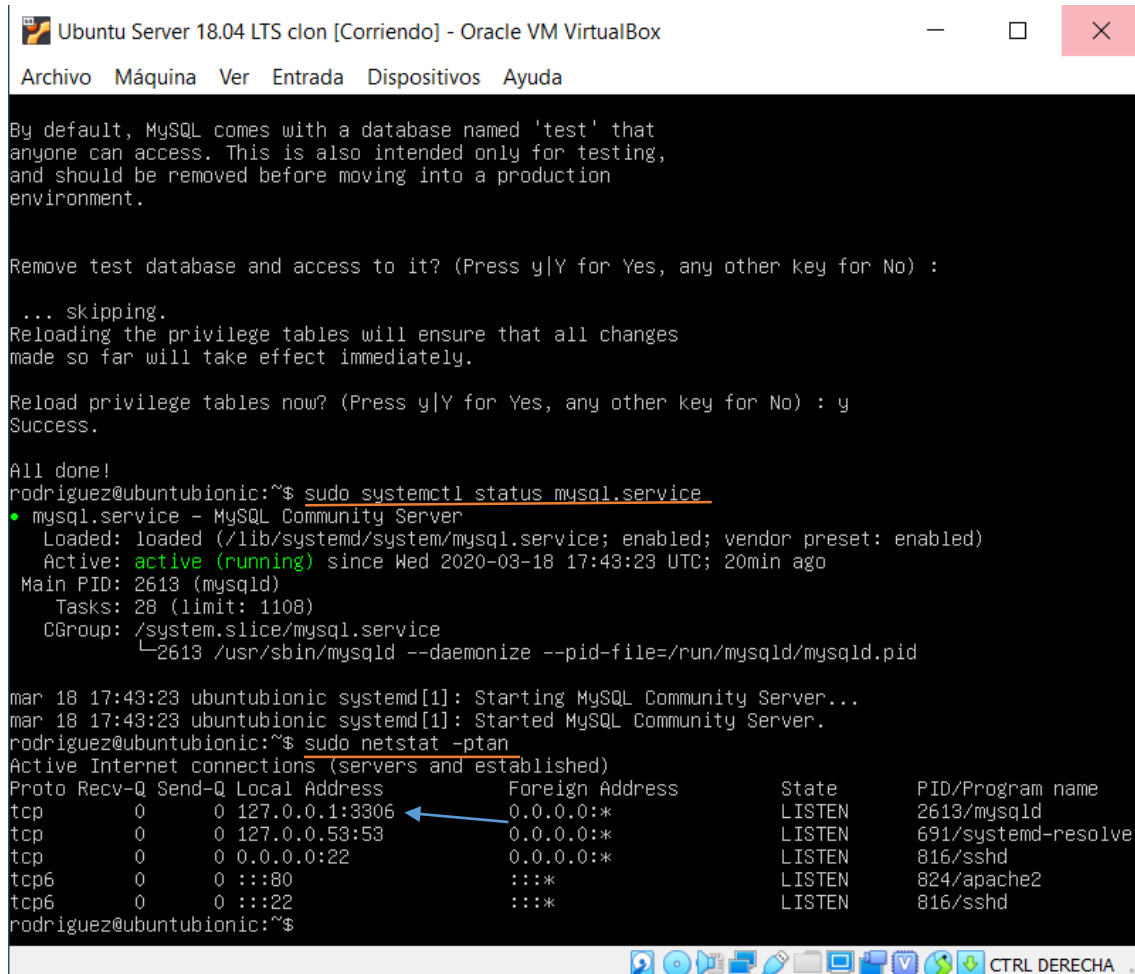
Remove test database and access to it? (Press y|Y for Yes, any other key for No) :
... skipping.
Reloading the privilege tables will ensure that all changes
made so far will take effect immediately.

Reload privilege tables now? (Press y|Y for Yes, any other key for No) : y
Success.

All done!
rodriguez@ubuntubionic:~$ _
```

Ahora comprobamos que el servicio de MySQL está en marcha:

`sudo systemctl status mysql.service`



```

Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

By default, MySQL comes with a database named 'test' that
anyone can access. This is also intended only for testing,
and should be removed before moving into a production
environment.

Remove test database and access to it? (Press y|Y for Yes, any other key for No) :

... skipping.
Reloading the privilege tables will ensure that all changes
made so far will take effect immediately.

Reload privilege tables now? (Press y|Y for Yes, any other key for No) : y
Success.

All done!
rodriguez@ubuntubionic:~$ sudo systemctl status mysql.service
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2020-03-18 17:43:23 UTC; 20min ago
   Main PID: 2613 (mysqld)
     Tasks: 28 (limit: 1108)
    CGroup: /system.slice/mysql.service
            └─2613 /usr/sbin/mysqld --daemonize --pid-file=/run/mysqld/mysqld.pid

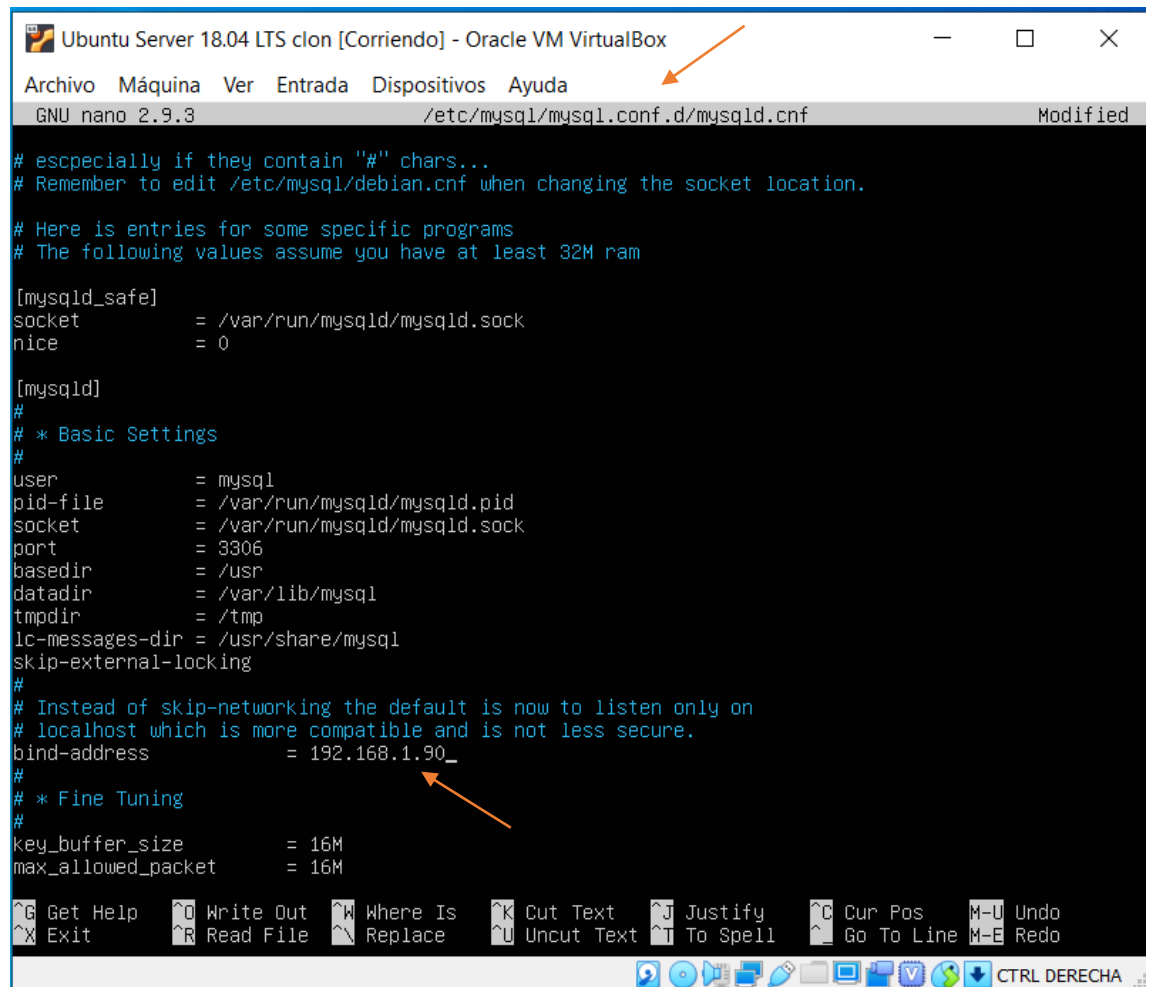
mar 18 17:43:23 ubuntubionic systemd[1]: Starting MySQL Community Server...
mar 18 17:43:23 ubuntubionic systemd[1]: Started MySQL Community Server.
rodriguez@ubuntubionic:~$ sudo netstat -ptan
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 127.0.0.1:3306          0.0.0.0:*               LISTEN      2613/mysqld
tcp        0      0 127.0.0.53:53          0.0.0.0:*               LISTEN      691/systemd-resolve
tcp        0      0 0.0.0.0:22             0.0.0.0:*               LISTEN      816/sshd
tcp6       0      0 :::80                  :::*                   LISTEN      824/apache2
tcp6       0      0 :::22                  :::*                   LISTEN      816/sshd
rodriguez@ubuntubionic:~$

```

- Modifica la configuración del servidor MySQL para que pueda dar servicio a través de la red. Comprueba que los cambios son efectivos. (1 punto).

`sudo nano /etc/mysql/mysql.conf.d/mysqld.cnf`

y ponemos la ip de la máquina de nuestro ubuntu server



The screenshot shows a VirtualBox window titled "Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox". Inside, the nano text editor is open, editing the file `/etc/mysql/mysql.conf.d/mysqld.cnf`. The editor's status bar at the top indicates "GNU nano 2.9.3" and "Modified". The configuration file content is as follows:

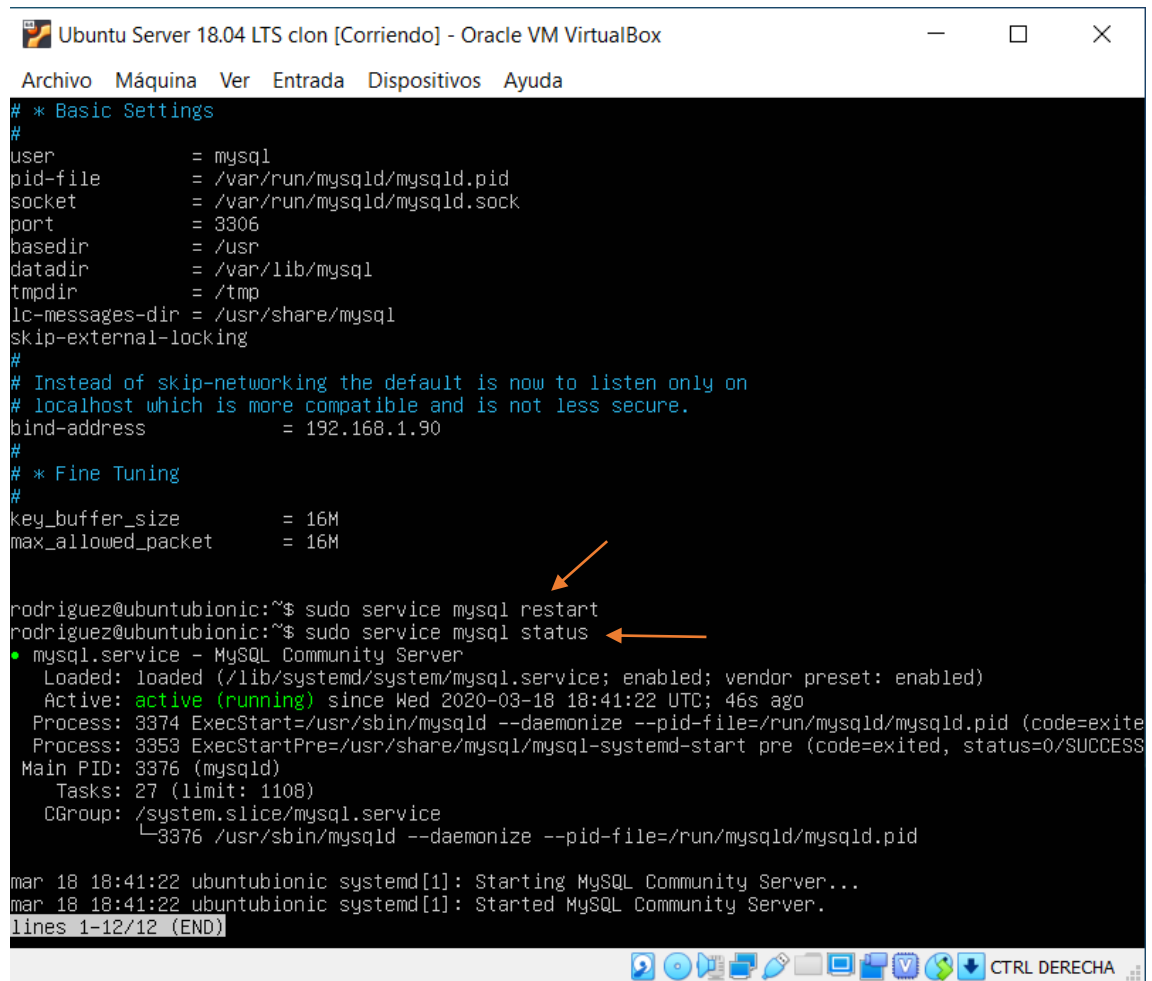
```
# especially if they contain "#" chars...
# Remember to edit /etc/mysql/debian.cnf when changing the socket location.

# Here is entries for some specific programs
# The following values assume you have at least 32M ram

[mysqld_safe]
socket      = /var/run/mysqld/mysqld.sock
nice        = 0

[mysqld]
#
# * Basic Settings
#
user        = mysql
pid-file    = /var/run/mysqld/mysqld.pid
socket      = /var/run/mysqld/mysqld.sock
port        = 3306
basedir     = /usr
datadir     = /var/lib/mysql
tmpdir      = /tmp
lc-messages-dir = /usr/share/mysql
skip-external-locking
#
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
bind-address = 192.168.1.90_
#
# * Fine Tuning
#
key_buffer_size      = 16M
max_allowed_packet   = 16M
```

Two orange arrows point to the `bind-address = 192.168.1.90_` line and the `mysql.conf.d/mysqld.cnf` file path in the title bar. The bottom of the window shows a menu bar with options like "Get Help", "Write Out", "Where Is", "Cut Text", "Justify", "Cur Pos", "Exit", "Read File", "Replace", "Uncut Text", "To Spell", "Go To Line", "Undo", and "Redo". A system tray at the very bottom contains icons for network, volume, and other system functions, along with the text "CTRL DERECHA".



The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox". The terminal displays the MySQL configuration file content, followed by commands to restart and check the status of the MySQL service. Two orange arrows point to the commands: "sudo service mysql restart" and "sudo service mysql status". The status output shows that the MySQL service is active and running.

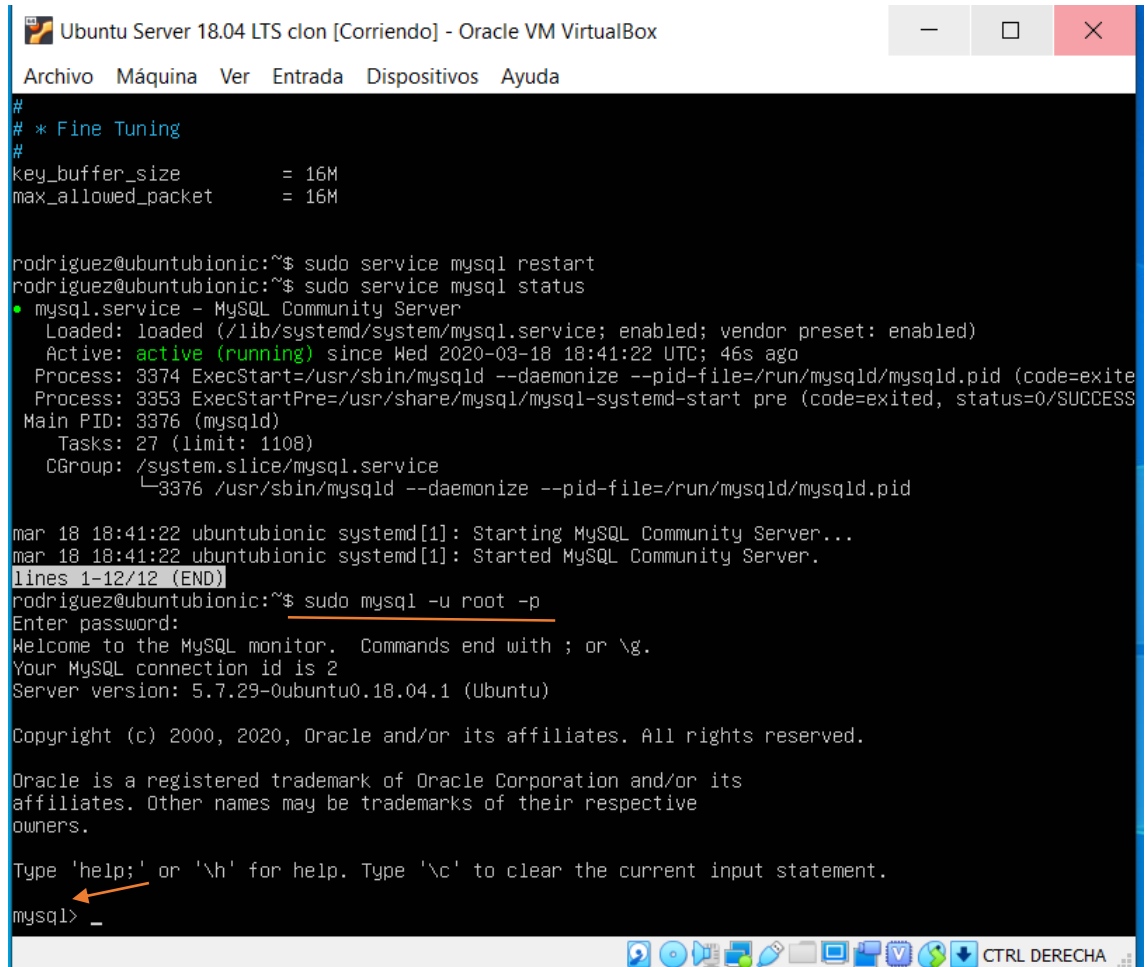
```
# * Basic Settings
#
user                = mysql
pid-file            = /var/run/mysqld/mysqld.pid
socket              = /var/run/mysqld/mysqld.sock
port                = 3306
basedir             = /usr
datadir             = /var/lib/mysql
tmpdir              = /tmp
lc-messages-dir     = /usr/share/mysql
skip-external-locking
#
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
bind-address         = 192.168.1.90
#
# * Fine Tuning
#
key_buffer_size      = 16M
max_allowed_packet   = 16M

rodriguez@ubuntubionic:~$ sudo service mysql restart
rodriguez@ubuntubionic:~$ sudo service mysql status
● mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2020-03-18 18:41:22 UTC; 46s ago
     Process: 3374 ExecStart=/usr/sbin/mysqld --daemonize --pid-file=/run/mysqld/mysqld.pid (code=exited, status=0/SUCCESS)
     Process: 3353 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS)
    Main PID: 3376 (mysqld)
      Tasks: 27 (limit: 1108)
   CGroup: /system.slice/mysql.service
           └─3376 /usr/sbin/mysqld --daemonize --pid-file=/run/mysqld/mysqld.pid

mar 18 18:41:22 ubuntubionic systemd[1]: Starting MySQL Community Server...
mar 18 18:41:22 ubuntubionic systemd[1]: Started MySQL Community Server.
lines 1-12/12 (END)
```

6. Accede a MySQL mediante línea de comandos desde el propio servidor. Una vez hayas accedido, ejecuta los comandos SQL que correspondan para: (0.75 puntos)

A. Crear una BBDD llamada SMM_transformers (Donde SMM son las iniciales de tu nombre, SMM=Sílvía Macho Muñiz).
Accedemos a MySQL con el usuario root y pondremos el password creado anteriormente.



The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox". The terminal output includes the following commands and results:

```
#
# * Fine Tuning
#
key_buffer_size      = 16M
max_allowed_packet    = 16M

rodriguez@ubuntubionic:~$ sudo service mysql restart
rodriguez@ubuntubionic:~$ sudo service mysql status
• mysql.service - MySQL Community Server
   Loaded: loaded (/lib/systemd/system/mysql.service; enabled; vendor preset: enabled)
   Active: active (running) since Wed 2020-03-18 18:41:22 UTC; 46s ago
     Process: 3374 ExecStart=/usr/sbin/mysqld --daemonize --pid-file=/run/mysqld/mysqld.pid (code=exite
     Process: 3353 ExecStartPre=/usr/share/mysql/mysql-systemd-start pre (code=exited, status=0/SUCCESS
    Main PID: 3376 (mysqld)
      Tasks: 27 (limit: 1108)
     CGroup: /system.slice/mysql.service
             └─3376 /usr/sbin/mysqld --daemonize --pid-file=/run/mysqld/mysqld.pid

mar 18 18:41:22 ubuntubionic systemd[1]: Starting MySQL Community Server...
mar 18 18:41:22 ubuntubionic systemd[1]: Started MySQL Community Server.
lines 1-12/12 (END)
rodriguez@ubuntubionic:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 2
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

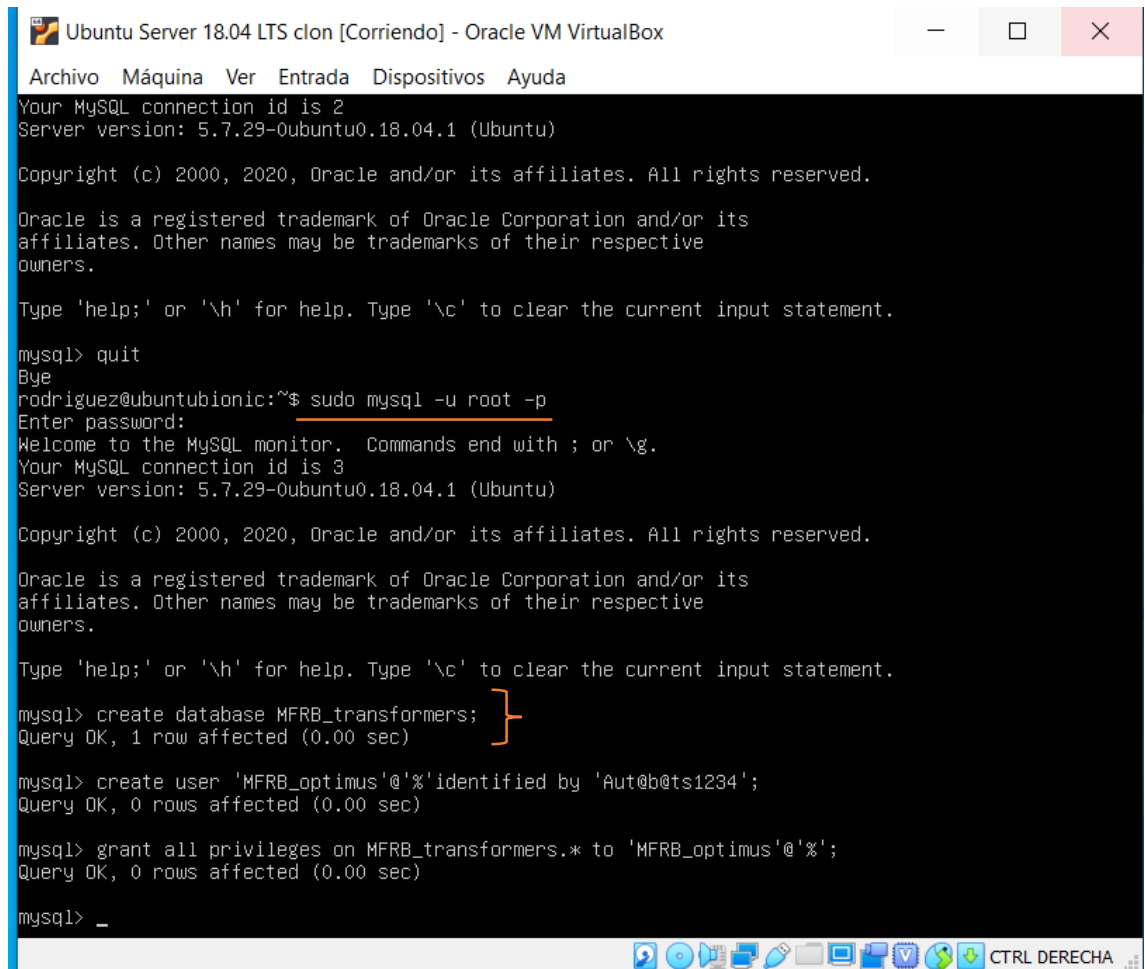
Copyright (c) 2000, 2020, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.
mysql> _
```

An orange arrow points to the prompt "mysql> _". The bottom of the window shows a standard Linux desktop taskbar with various icons and the text "CTRL DERECHA".

Creamos la base de datos



The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox". The window has a menu bar with "Archivo", "Máquina", "Ver", "Entrada", "Dispositivos", and "Ayuda". The terminal output shows the following sequence of commands and responses:

```
Your MySQL connection id is 2
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> quit
Bye
rodriguez@ubuntubionic:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 3
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> create database MFRB_transformers; }
Query OK, 1 row affected (0.00 sec)

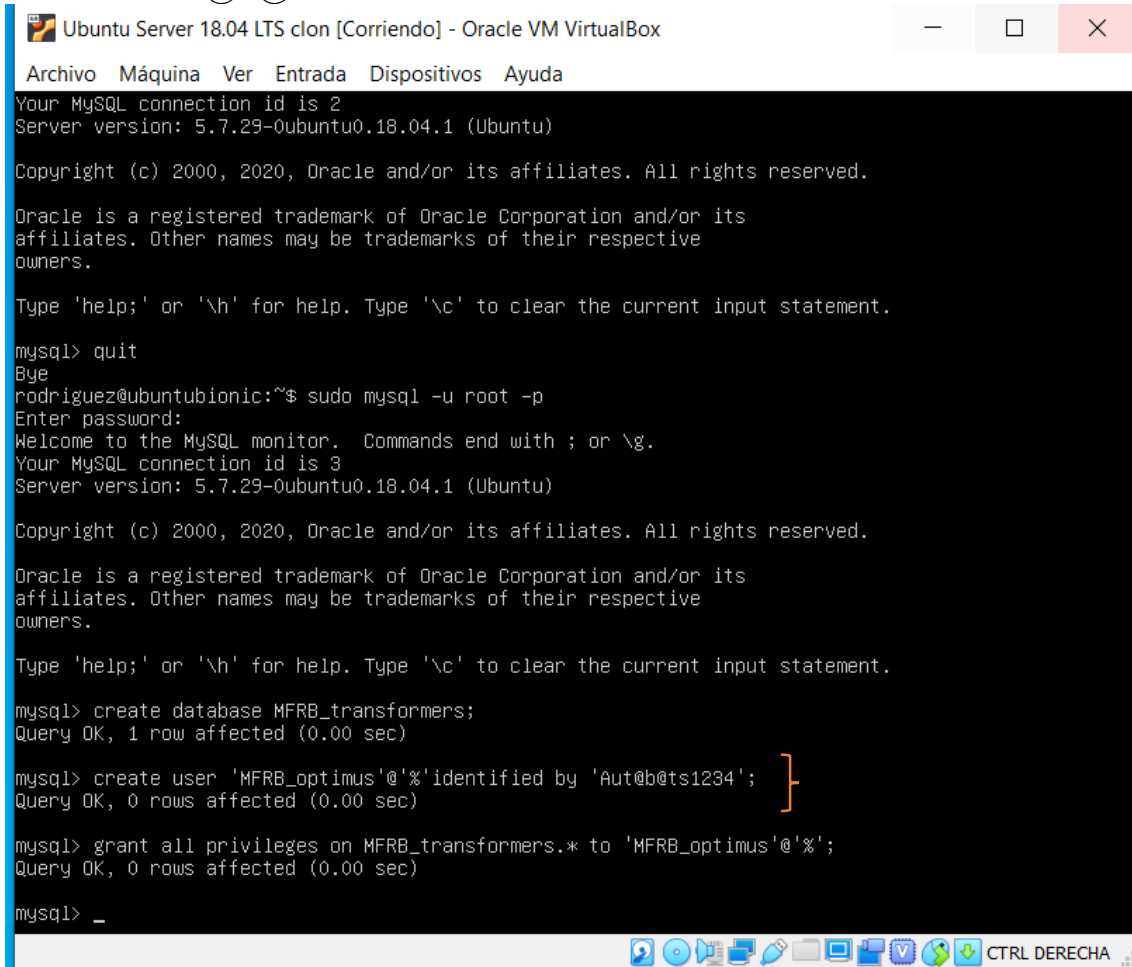
mysql> create user 'MFRB_optimus'@'%'identified by 'Aut@b@ts1234';
Query OK, 0 rows affected (0.00 sec)

mysql> grant all privileges on MFRB_transformers.* to 'MFRB_optimus'@'%;
Query OK, 0 rows affected (0.00 sec)

mysql> _
```

The terminal window has a taskbar at the bottom with various icons and the text "CTRL DERECHA".

B. Crea un usuario llamado SMM_optimus con contraseña Aut@b@ts1234.



```
Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
Your MySQL connection id is 2
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> quit
Bye
rodriguez@ubuntubionic:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 3
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

Copyright (c) 2000, 2020, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

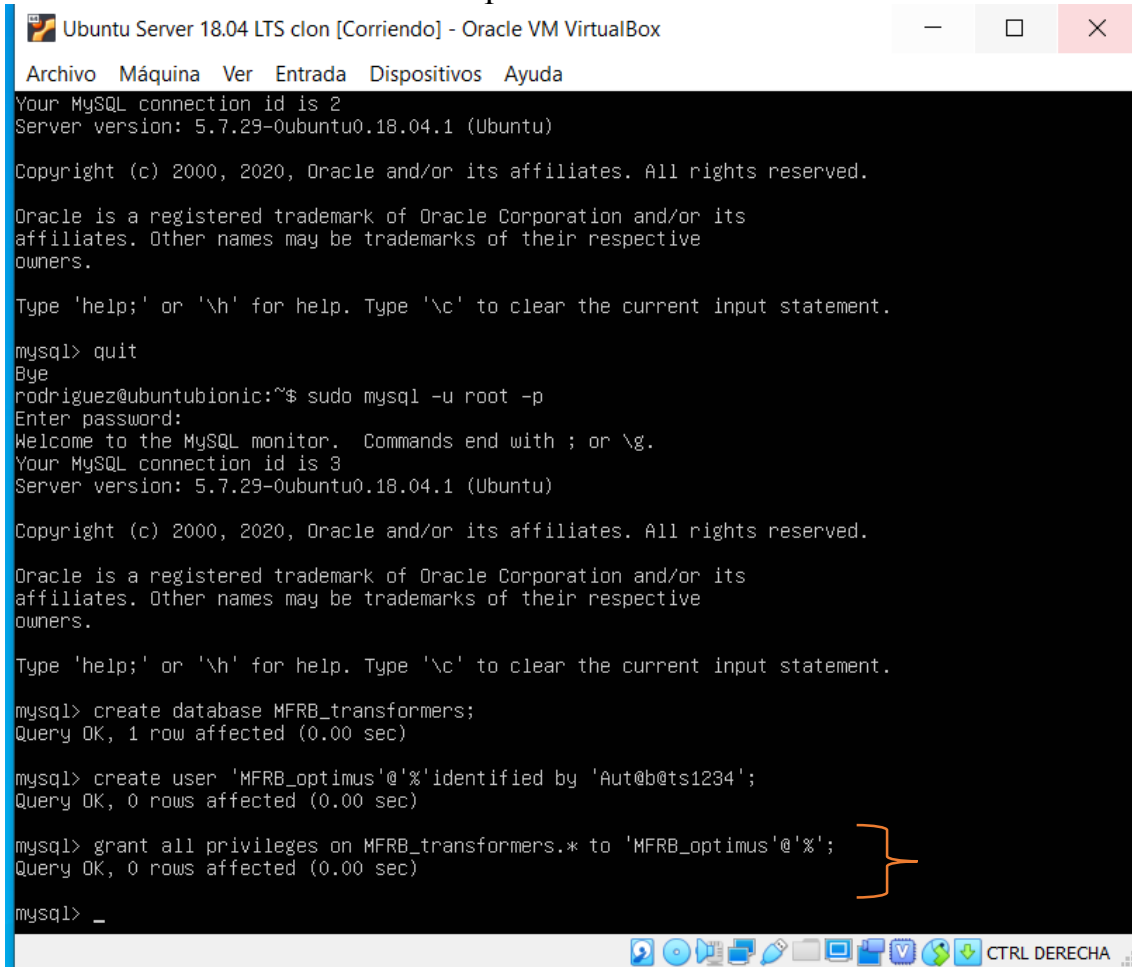
mysql> create database MFRB_transformers;
Query OK, 1 row affected (0.00 sec)

mysql> create user 'MFRB_optimus'@'%'identified by 'Aut@b@ts1234'; }
Query OK, 0 rows affected (0.00 sec)

mysql> grant all privileges on MFRB_transformers.* to 'MFRB_optimus'@'%';
Query OK, 0 rows affected (0.00 sec)

mysql> _
```

C. Asigna todos los privilegios al usuario creado en el punto b sobre la BBDD creada en el punto a.



```
Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda
Your MySQL connection id is 2
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> quit
Bye
rodriguez@ubuntubionic:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 3
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

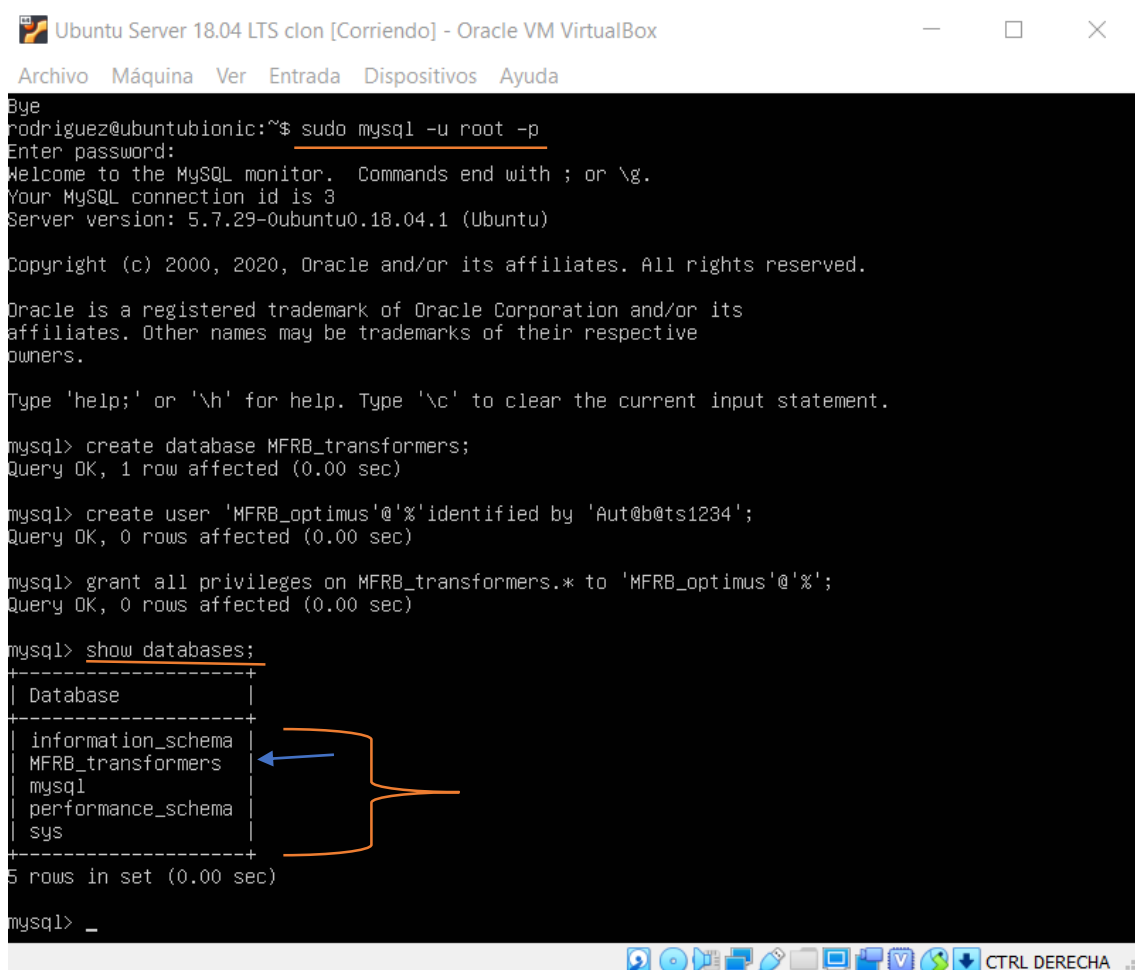
mysql> create database MFRB_transformers;
Query OK, 1 row affected (0.00 sec)

mysql> create user 'MFRB_optimus'@'%'identified by 'Aut@b@ts1234';
Query OK, 0 rows affected (0.00 sec)

mysql> grant all privileges on MFRB_transformers.* to 'MFRB_optimus'@'%'
Query OK, 0 rows affected (0.00 sec)

mysql> _
```

7. Accede a MySQL mediante línea de comandos desde el propio servidor. Haz un listado de las BBDD que hay en el servidor. (0.25 puntos).
-



```
Bye
rodriguez@ubuntubionic:~$ sudo mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 3
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> create database MFRB_transformers;
Query OK, 1 row affected (0.00 sec)

mysql> create user 'MFRB_optimus'@'%' identified by 'Aut@b@ts1234';
Query OK, 0 rows affected (0.00 sec)

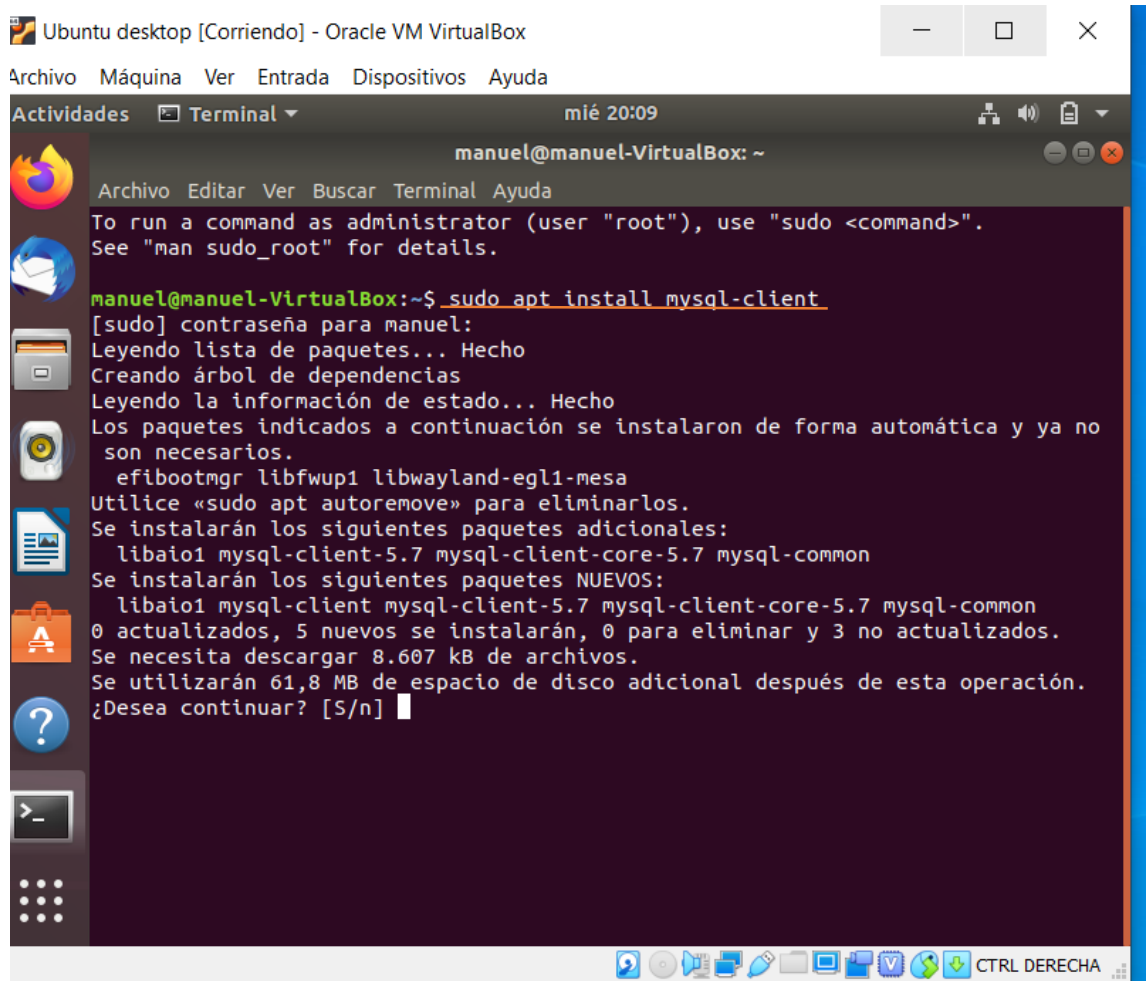
mysql> grant all privileges on MFRB_transformers.* to 'MFRB_optimus'@'%;
Query OK, 0 rows affected (0.00 sec)

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| MFRB_transformers |
| mysql |
| performance_schema |
| sys |
+-----+
5 rows in set (0.00 sec)

mysql> _
```

8. Desde la máquina virtual cliente, accede al servidor MySQL a través de la línea de comandos. (0.50 puntos).
-

Instalamos el cliente MySQL en la máquina virtual



The screenshot shows a terminal window titled "manuel@manuel-VirtualBox: ~" running on an Ubuntu desktop. The terminal output shows the command `sudo apt install mysql-client` being executed. The system prompts for a password, then lists the packages to be installed and the disk space requirements. The output is as follows:

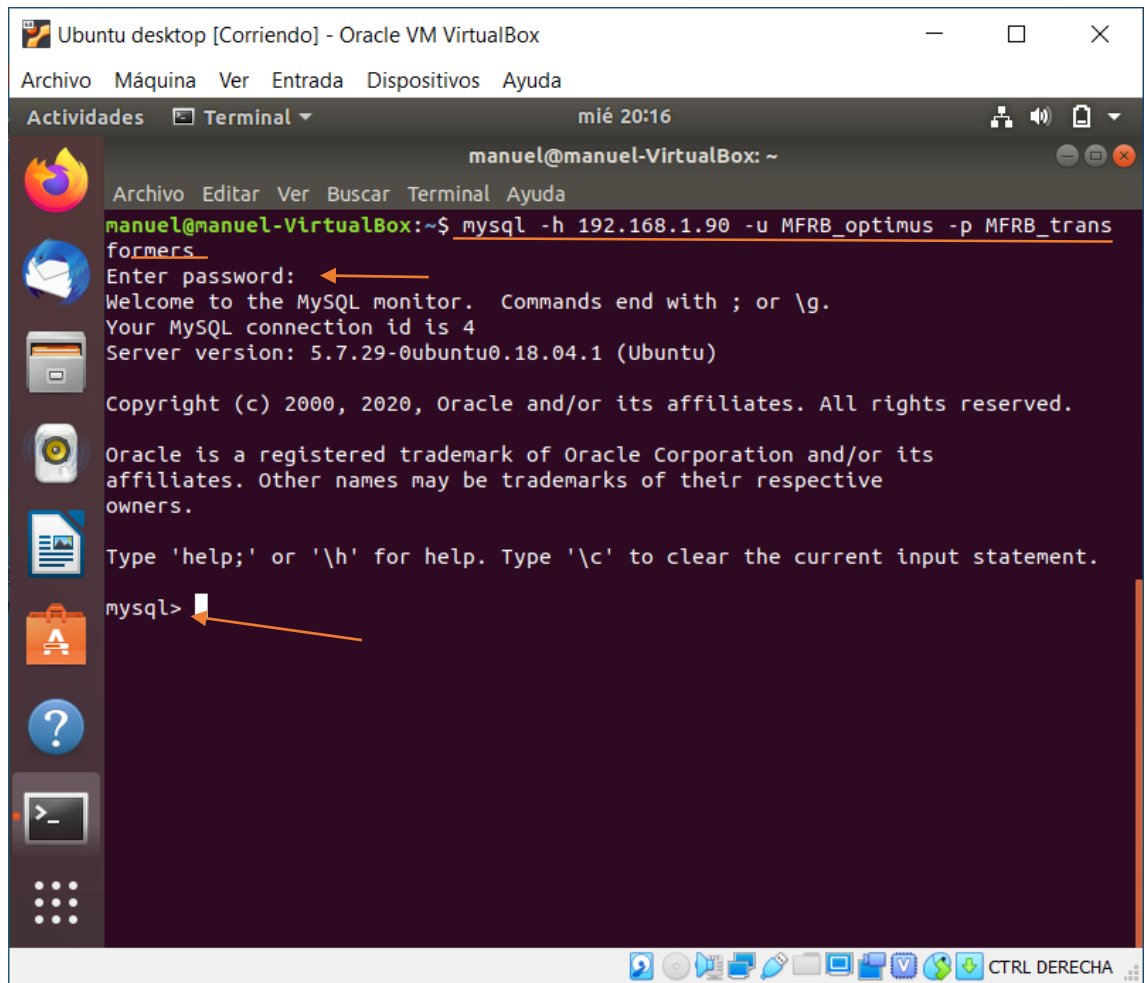
```
manuel@manuel-VirtualBox:~$ sudo apt install mysql-client
[sudo] contraseña para manuel:
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Los paquetes indicados a continuación se instalaron de forma automática y ya no
son necesarios.
  efibootmgr libfwup1 libwayland-egl1-mesa
Utilice «sudo apt autoremove» para eliminarlos.
Se instalarán los siguientes paquetes adicionales:
  libaio1 mysql-client-5.7 mysql-client-core-5.7 mysql-common
Se instalarán los siguientes paquetes NUEVOS:
  libaio1 mysql-client mysql-client-5.7 mysql-client-core-5.7 mysql-common
0 actualizados, 5 nuevos se instalarán, 0 para eliminar y 3 no actualizados.
Se necesita descargar 8.607 kB de archivos.
Se utilizarán 61,8 MB de espacio de disco adicional después de esta operación.
¿Desea continuar? [S/n]
```

Ahora nos conectamos al server a través del cliente (desktop).

Ponemos el siguiente código:

Ponemos la ip del server, le indicamos también el usuario para iniciar sesión y la base de datos donde queremos conectarnos. Seguidamente nos pedirá el password de MFRB_optimus .

```
mysql -h 192.168.1.90 -u MFRB_optimus -p MFRB_transformers
```



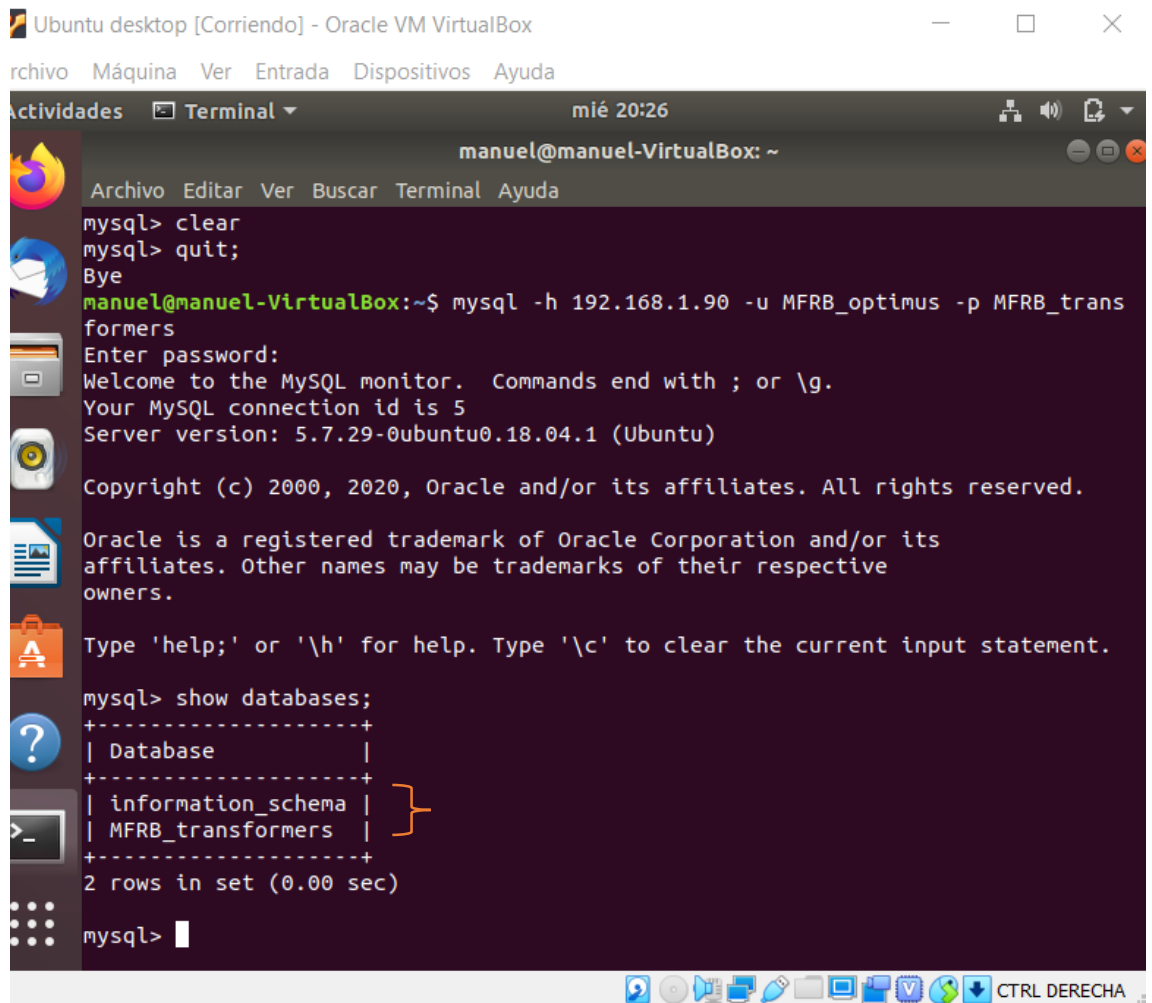
```
Ubuntu desktop [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
Actividades  Terminal  mié 20:16
manuel@manuel-VirtualBox: ~
Archivo  Editar  Ver  Buscar  Terminal  Ayuda
manuel@manuel-VirtualBox:~$ mysql -h 192.168.1.90 -u MFRB_optimus -p MFRB_trans
formers
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql>
```



The screenshot shows a terminal window titled 'Ubuntu desktop [Corriendo] - Oracle VM VirtualBox'. The terminal prompt is 'manuel@manuel-VirtualBox: ~'. The user enters 'mysql> clear' and 'mysql> quit;', followed by 'Bye'. Then, the user runs 'mysql -h 192.168.1.90 -u MFRB_optimus -p MFRB_transformers'. The terminal displays the MySQL login sequence, including the password prompt, a welcome message, connection ID 5, and server version 5.7.29-0ubuntu0.18.04.1 (Ubuntu). It also shows copyright and trademark information. The user then enters 'mysql> show databases;', and the terminal displays a table of databases: 'information_schema' and 'MFRB_transformers'. A hand-drawn orange bracket groups these two databases. The terminal prompt is 'mysql>'.

```
mysql> clear
mysql> quit;
Bye
manuel@manuel-VirtualBox:~$ mysql -h 192.168.1.90 -u MFRB_optimus -p MFRB_transformers
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 5
Server version: 5.7.29-0ubuntu0.18.04.1 (Ubuntu)

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owners.

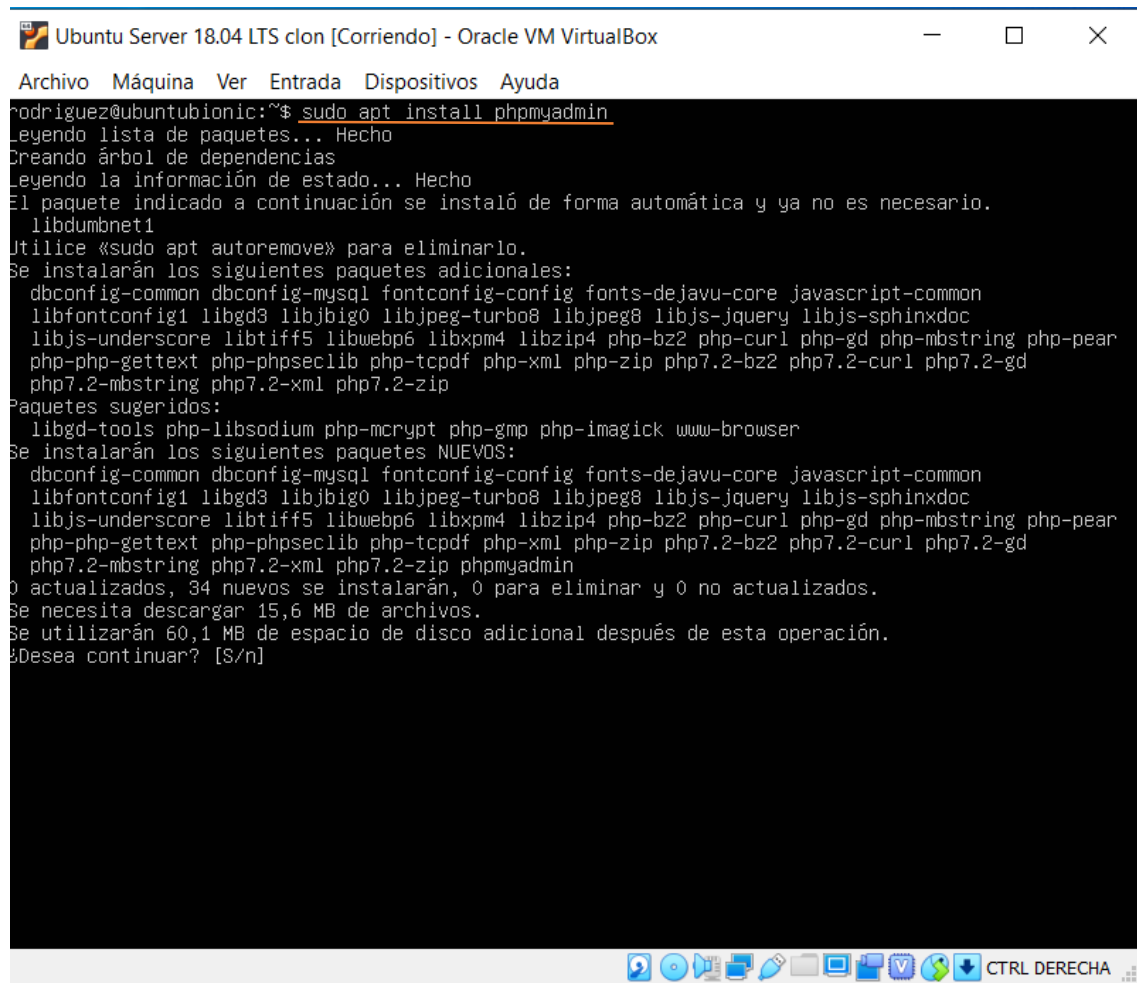
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| MFRB_transformers |
+-----+
2 rows in set (0.00 sec)

mysql>
```

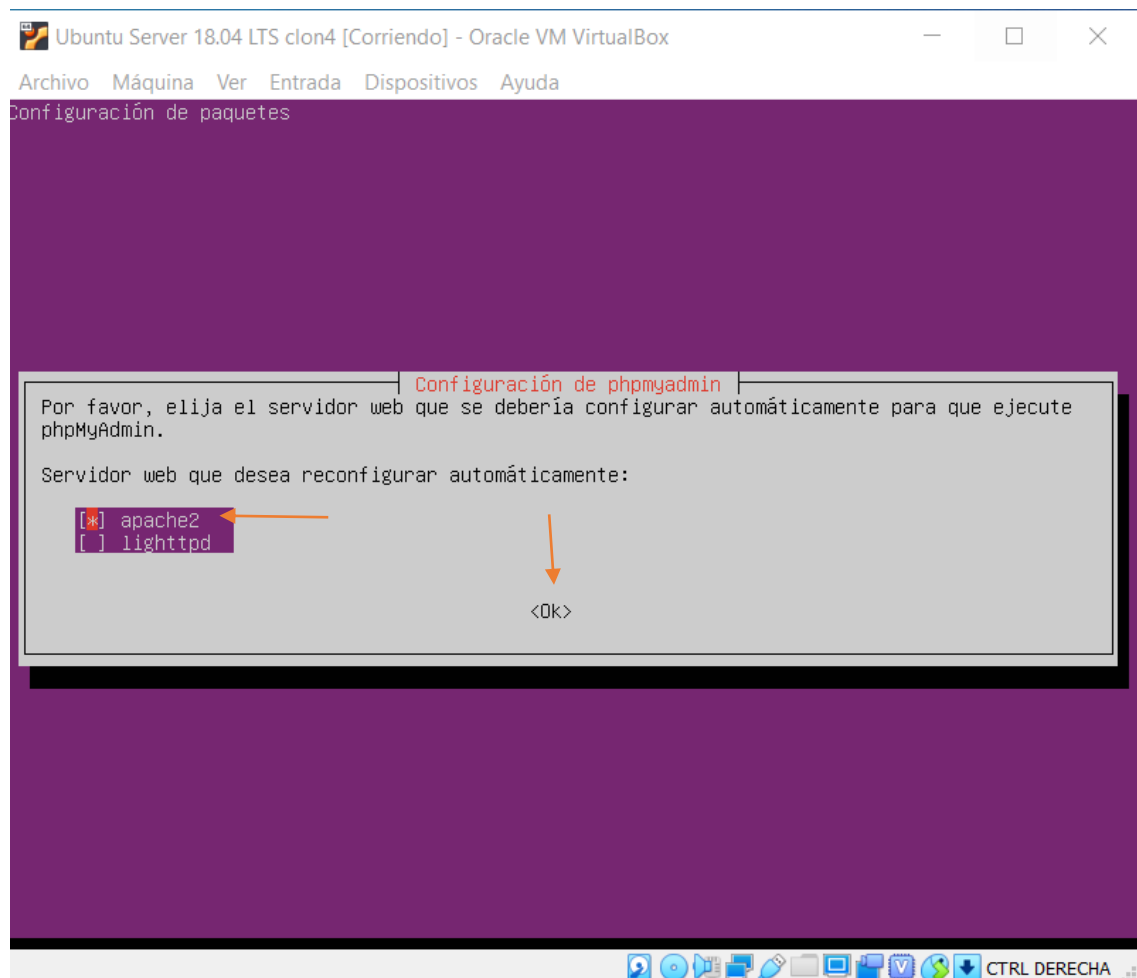
9. Instala phpmyadmin en la máquina servidor. Modifica la configuración para que sea accesible desde otra máquina. Comprueba que se ha instalado correctamente accediendo a través de un navegador desde la máquina virtual cliente. Para acceder tienes que utilizar el usuario creado en el punto 6. Comprueba de la BBDD creada en ese mismo punto existe. (1 punto)

Procedemos entonces a instalar phpmyadmin:

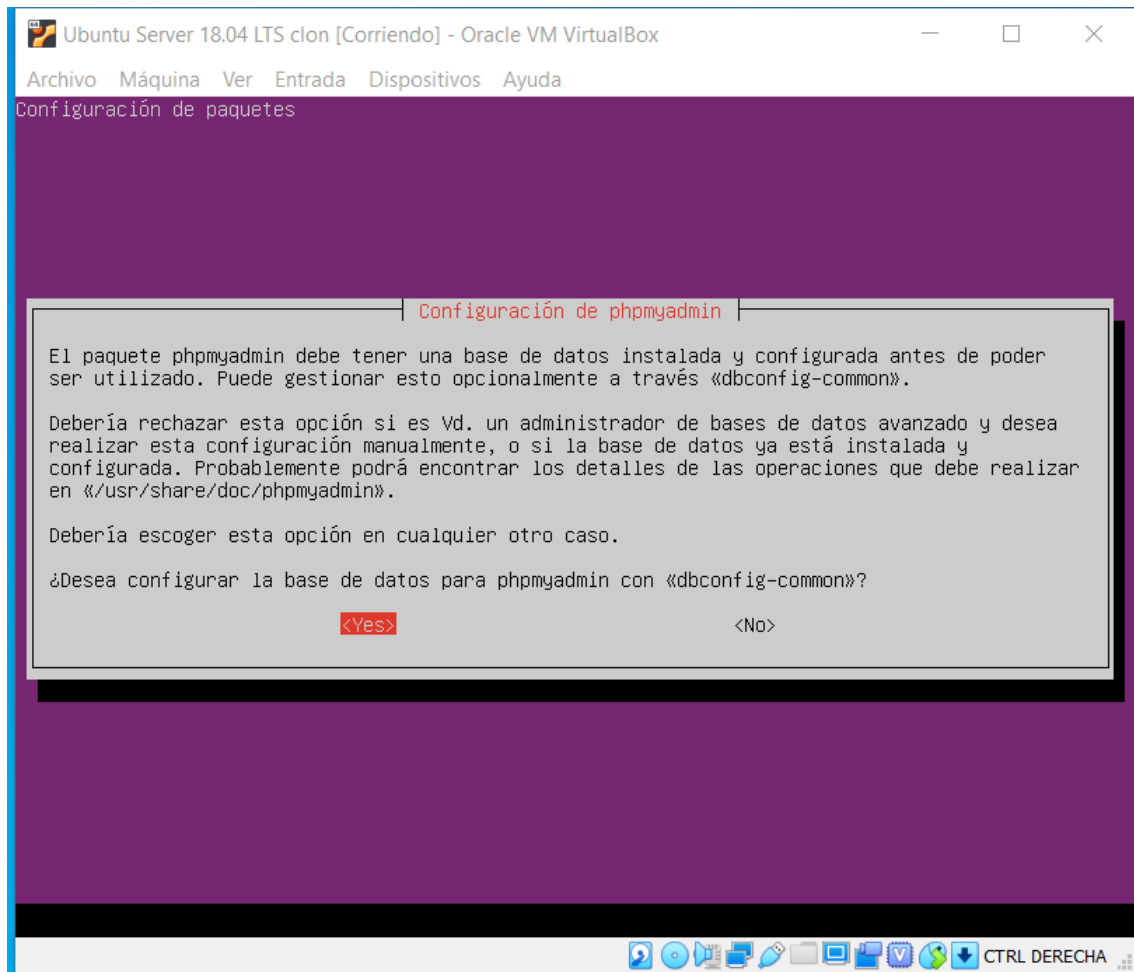


```
Ubuntu Server 18.04 LTS clon [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
rodriguez@ubuntubionic:~$ sudo apt install phpmyadmin
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
El paquete indicado a continuación se instaló de forma automática y ya no es necesario.
  libdumbnet1
Utilice «sudo apt autoremove» para eliminarlo.
Se instalarán los siguientes paquetes adicionales:
  dbconfig-common dbconfig-mysql fontconfig-config fonts-dejavu-core javascript-common
  libfontconfig1 libgd3 libjbig0 libjpeg-turbo8 libjpeg8 libjs-jquery libjs-sphinxdoc
  libjs-underscore libtiff5 libwebp6 libxpm4 libzip4 php-bz2 php-curl php-gd php-mbstring php-pear
  php-php-gettext php-phpseclib php-tcpdf php-xml php-zip php7.2-bz2 php7.2-curl php7.2-gd
  php7.2-mbstring php7.2-xml php7.2-zip
Paquetes sugeridos:
  libgd-tools php-libsodium php-mcrypt php-gmp php-imagick www-browser
Se instalarán los siguientes paquetes NUEVOS:
  dbconfig-common dbconfig-mysql fontconfig-config fonts-dejavu-core javascript-common
  libfontconfig1 libgd3 libjbig0 libjpeg-turbo8 libjpeg8 libjs-jquery libjs-sphinxdoc
  libjs-underscore libtiff5 libwebp6 libxpm4 libzip4 php-bz2 php-curl php-gd php-mbstring php-pear
  php-php-gettext php-phpseclib php-tcpdf php-xml php-zip php7.2-bz2 php7.2-curl php7.2-gd
  php7.2-mbstring php7.2-xml php7.2-zip phpmyadmin
0 actualizados, 34 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
Se necesita descargar 15,6 MB de archivos.
Se utilizarán 60,1 MB de espacio de disco adicional después de esta operación.
¿Desea continuar? [S/n]
```

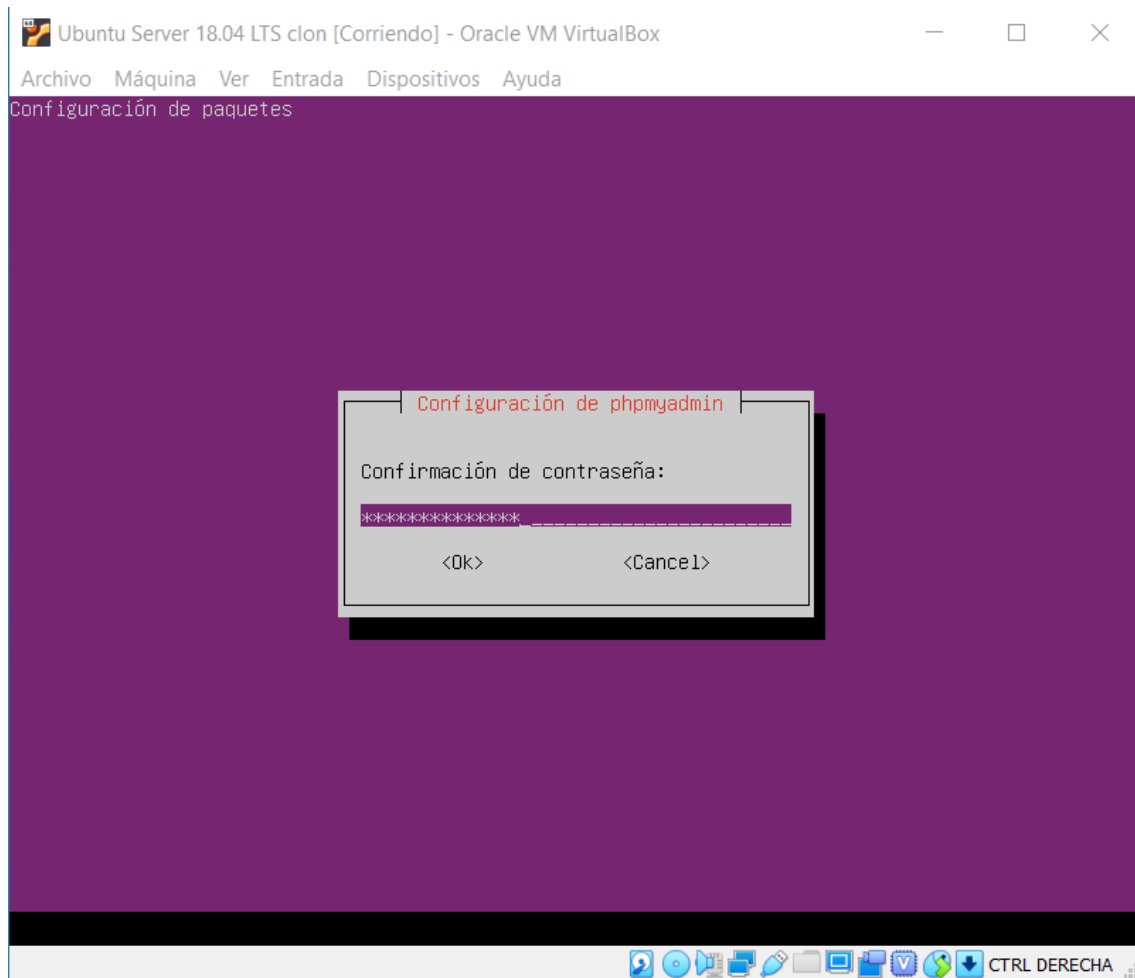
Durante la instalación elegimos el servidor web a configurar por parte de phpmyadmin, en nuestro caso es apache2, lo seleccionamos con la barra espaciadora y pulsamos intro para continuar con la instalación.



Elegimos la opción YES y pulsamos Intro para continuar.



Seguidamente proporcionaremos el password del usuario root de MySQL y pulsamos ok + Intro.

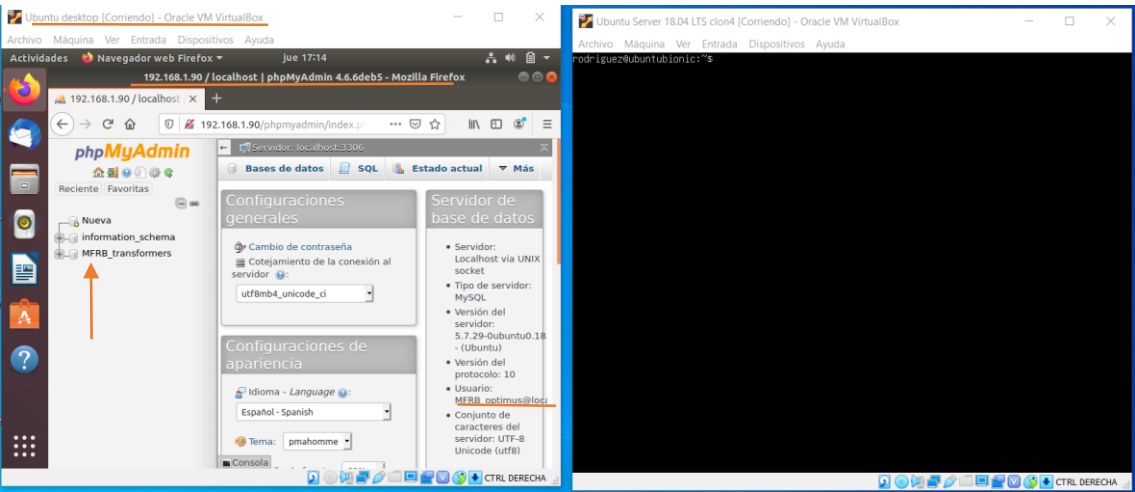
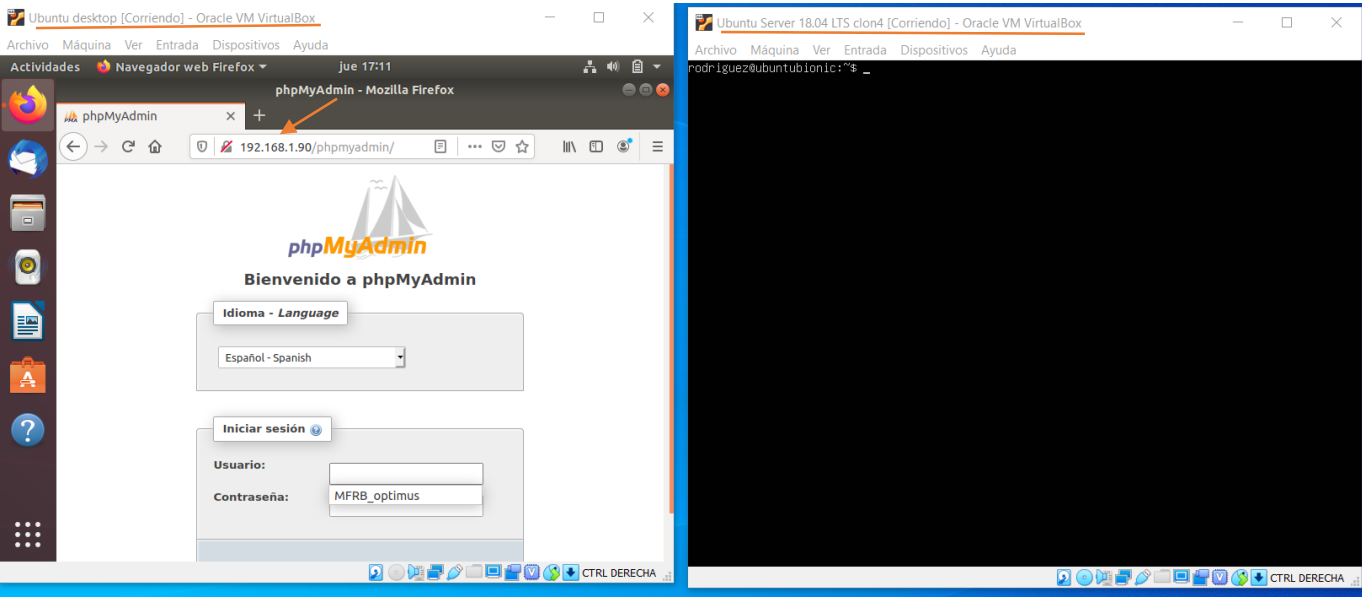


Ahora accedemos desde el navegador de la máquina virtual cliente con el usuario creado en el ejercicio 6.

Abrimos el navegador en la máquina cliente y ponemos:

<http://192.168.1.90/phpmyadmin>..... esa ip es en mi caso, es la ip del servidor.

Accedemos con el usuario creado anteriormente...MFRB_optimus y su correspondiente contraseña.

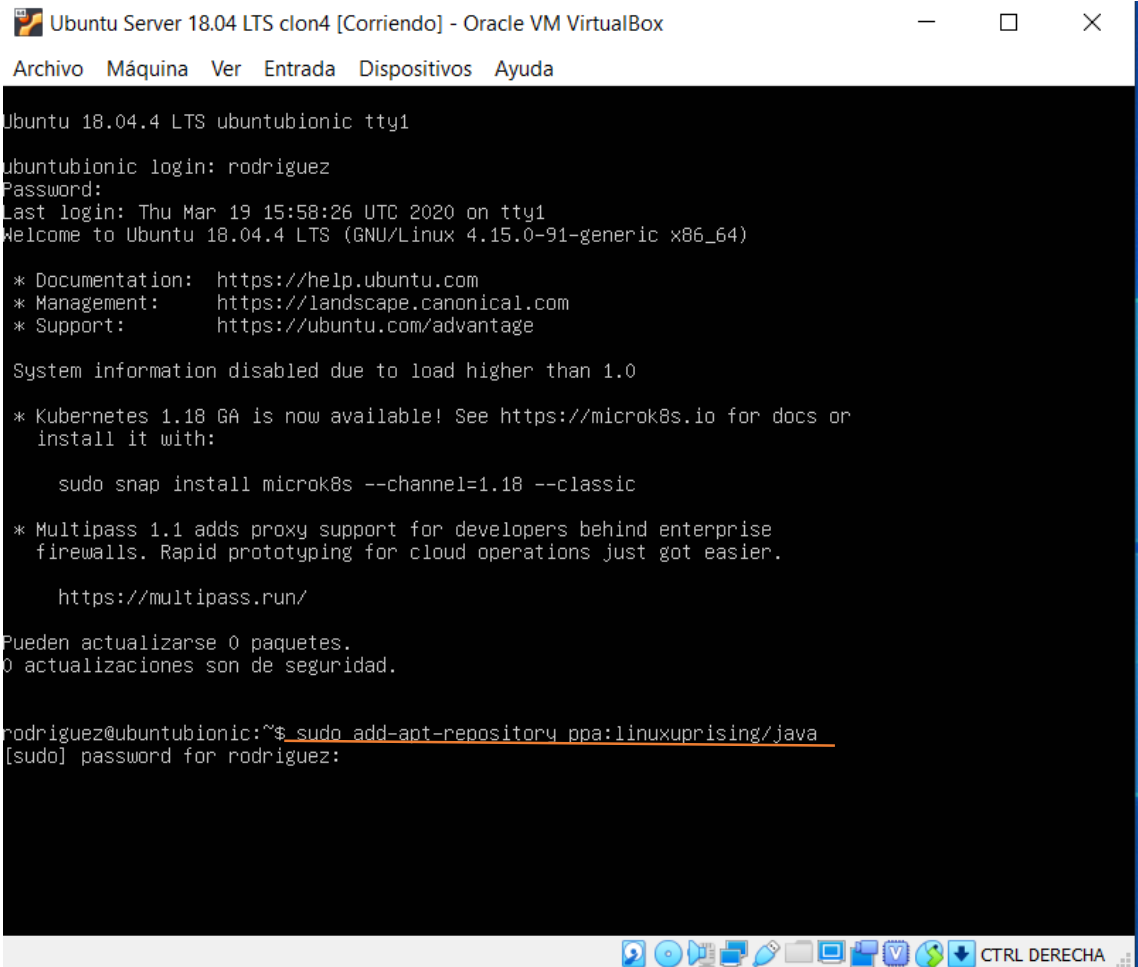


10. Instala Tomcat en la máquina con Linux Server. (2.50 puntos)

- A. Recuerda que previo a la instalación de Tomcat, tienes que instalar Java y comprobar las variables de entorno.

Voy a instalar Java utilizando la versión propietaria de Oracle y dado que no está disponible en los repositorios de Ubuntu, pues voy añadir el repositorio correspondiente para que encuentre el software y se pueda descargar correctamente.

Código `sudo add-apt-repository ppa:linuxuprising/java`



```
Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda

Ubuntu 18.04.4 LTS ubuntubionic tty1
ubuntubionic login: rodriguez
Password:
Last login: Thu Mar 19 15:58:26 UTC 2020 on tty1
Welcome to Ubuntu 18.04.4 LTS (GNU/Linux 4.15.0-91-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

System information disabled due to load higher than 1.0

 * Kubernetes 1.18 GA is now available! See https://microk8s.io for docs or
   install it with:

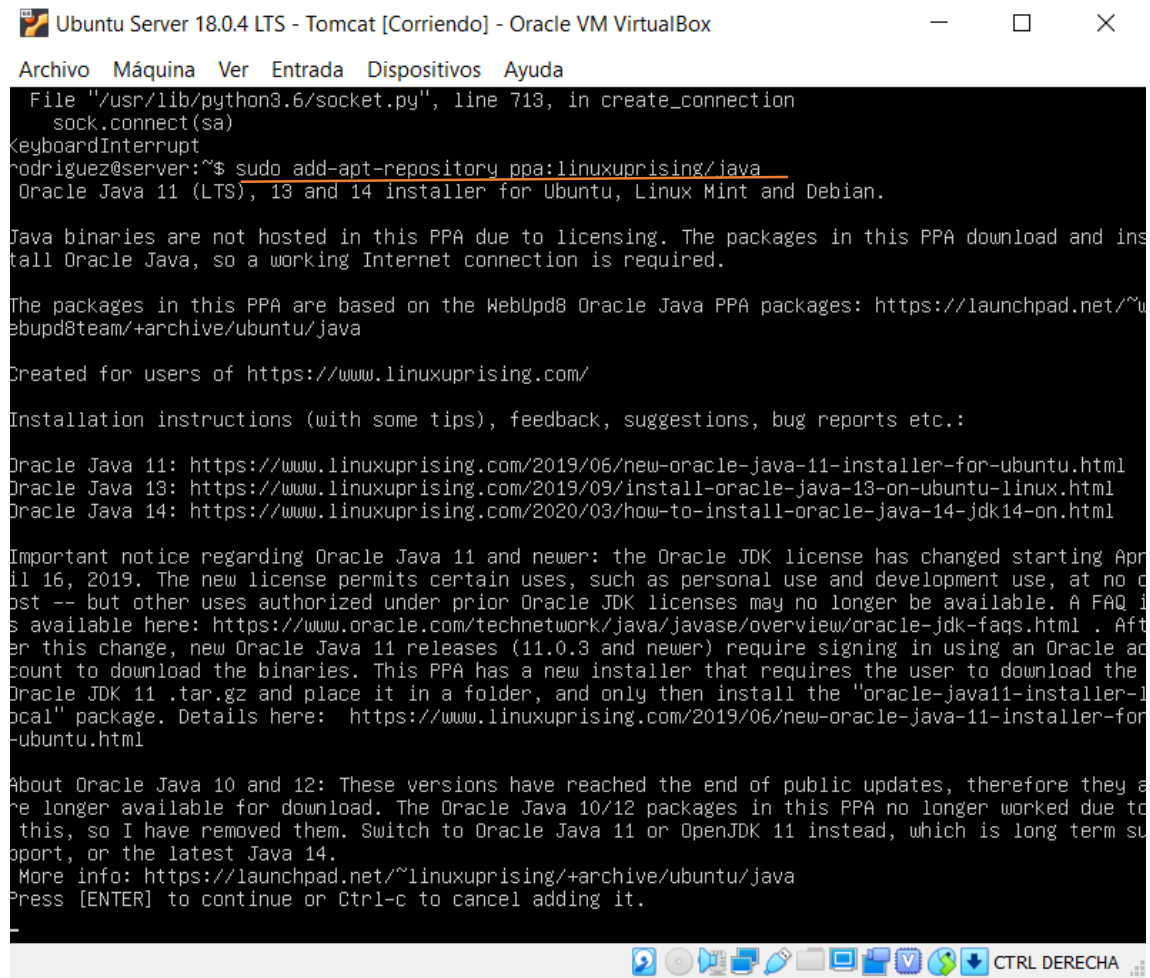
     sudo snap install microk8s --channel=1.18 --classic

 * Multipass 1.1 adds proxy support for developers behind enterprise
   firewalls. Rapid prototyping for cloud operations just got easier.

     https://multipass.run/

Pueden actualizarse 0 paquetes.
0 actualizaciones son de seguridad.

rodriguez@ubuntubionic:~$ sudo add-apt-repository ppa:linuxuprising/java
[sudo] password for rodriguez:
```



```
File "/usr/lib/python3.6/socket.py", line 713, in create_connection
    sock.connect(sa)
KeyboardInterrupt
rodriguez@server:~$ sudo add-apt-repository ppa:linuxuprising/java
Oracle Java 11 (LTS), 13 and 14 installer for Ubuntu, Linux Mint and Debian.

Java binaries are not hosted in this PPA due to licensing. The packages in this PPA download and install Oracle Java, so a working Internet connection is required.

The packages in this PPA are based on the WebUpd8 Oracle Java PPA packages: https://launchpad.net/~webupd8team/+archive/ubuntu/java

Created for users of https://www.linuxuprising.com/

Installation instructions (with some tips), feedback, suggestions, bug reports etc.:

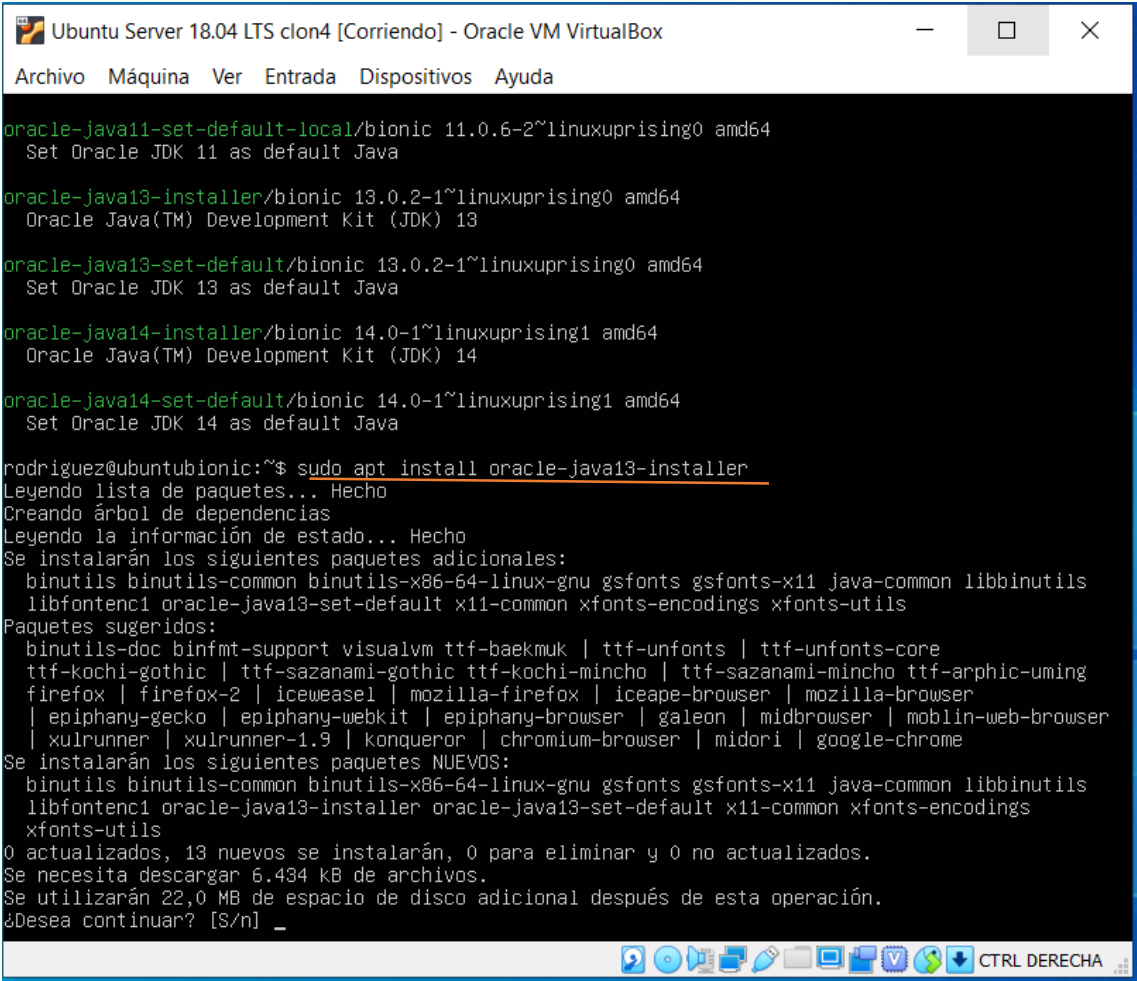
Oracle Java 11: https://www.linuxuprising.com/2019/06/new-oracle-java-11-installer-for-ubuntu.html
Oracle Java 13: https://www.linuxuprising.com/2019/09/install-oracle-java-13-on-ubuntu-linux.html
Oracle Java 14: https://www.linuxuprising.com/2020/03/how-to-install-oracle-java-14-jdk14-on-ubuntu.html

Important notice regarding Oracle Java 11 and newer: the Oracle JDK license has changed starting April 16, 2019. The new license permits certain uses, such as personal use and development use, at no cost -- but other uses authorized under prior Oracle JDK licenses may no longer be available. A FAQ is available here: https://www.oracle.com/technetwork/java/javase/overview/oracle-jdk-faq.html . After this change, new Oracle Java 11 releases (11.0.3 and newer) require signing in using an Oracle account to download the binaries. This PPA has a new installer that requires the user to download the Oracle JDK 11 .tar.gz and place it in a folder, and only then install the "oracle-java11-installer-local" package. Details here: https://www.linuxuprising.com/2019/06/new-oracle-java-11-installer-for-ubuntu.html

About Oracle Java 10 and 12: These versions have reached the end of public updates, therefore they are no longer available for download. The Oracle Java 10/12 packages in this PPA no longer worked due to this, so I have removed them. Switch to Oracle Java 11 or OpenJDK 11 instead, which is long term supported, or the latest Java 14.

More info: https://launchpad.net/~linuxuprising/+archive/ubuntu/java
Press [ENTER] to continue or Ctrl-c to cancel adding it.
```

Procedo a instalar Oracle-java13-installer



```
oracle-java11-set-default-local/bionic 11.0.6-2~linuxuprising0 amd64
Set Oracle JDK 11 as default Java

oracle-java13-installer/bionic 13.0.2-1~linuxuprising0 amd64
Oracle Java(TM) Development Kit (JDK) 13

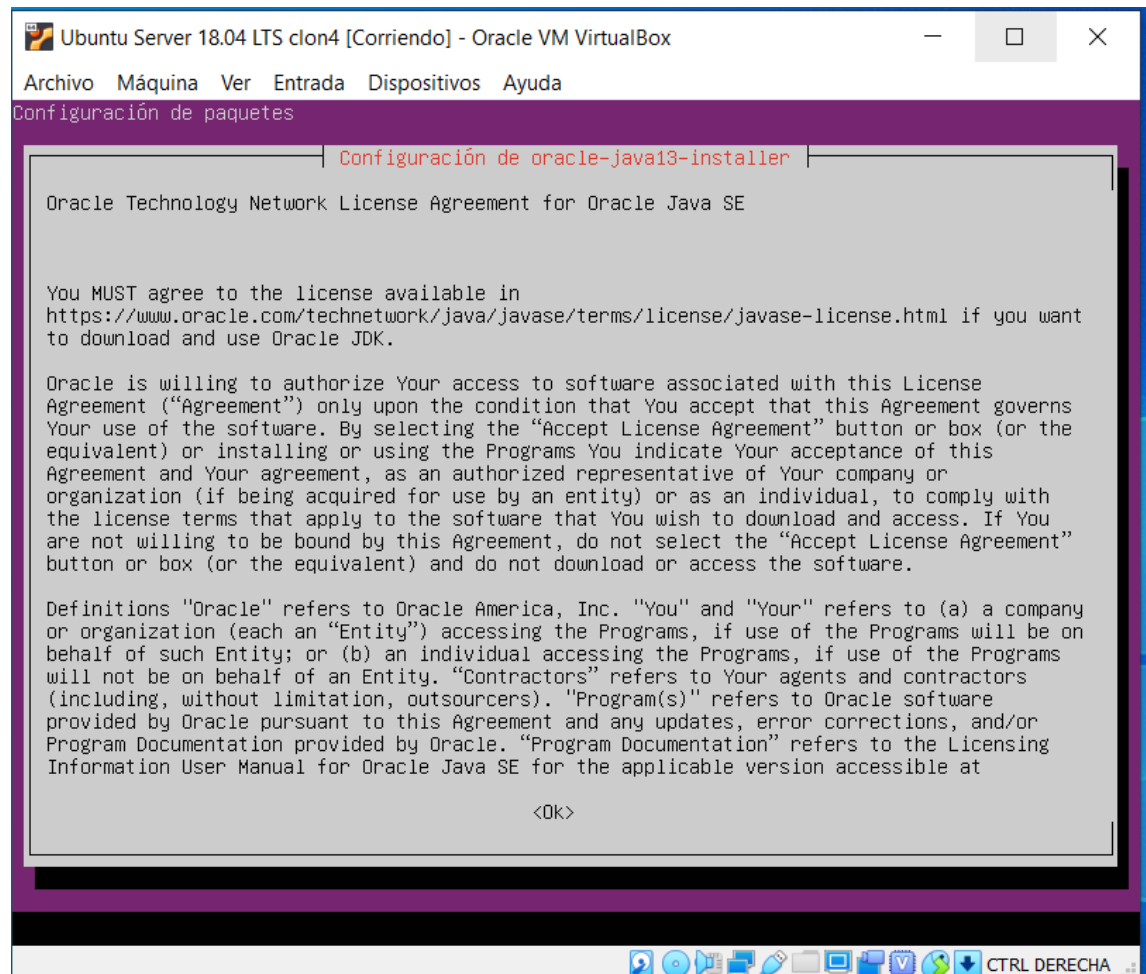
oracle-java13-set-default/bionic 13.0.2-1~linuxuprising0 amd64
Set Oracle JDK 13 as default Java

oracle-java14-installer/bionic 14.0-1~linuxuprising1 amd64
Oracle Java(TM) Development Kit (JDK) 14

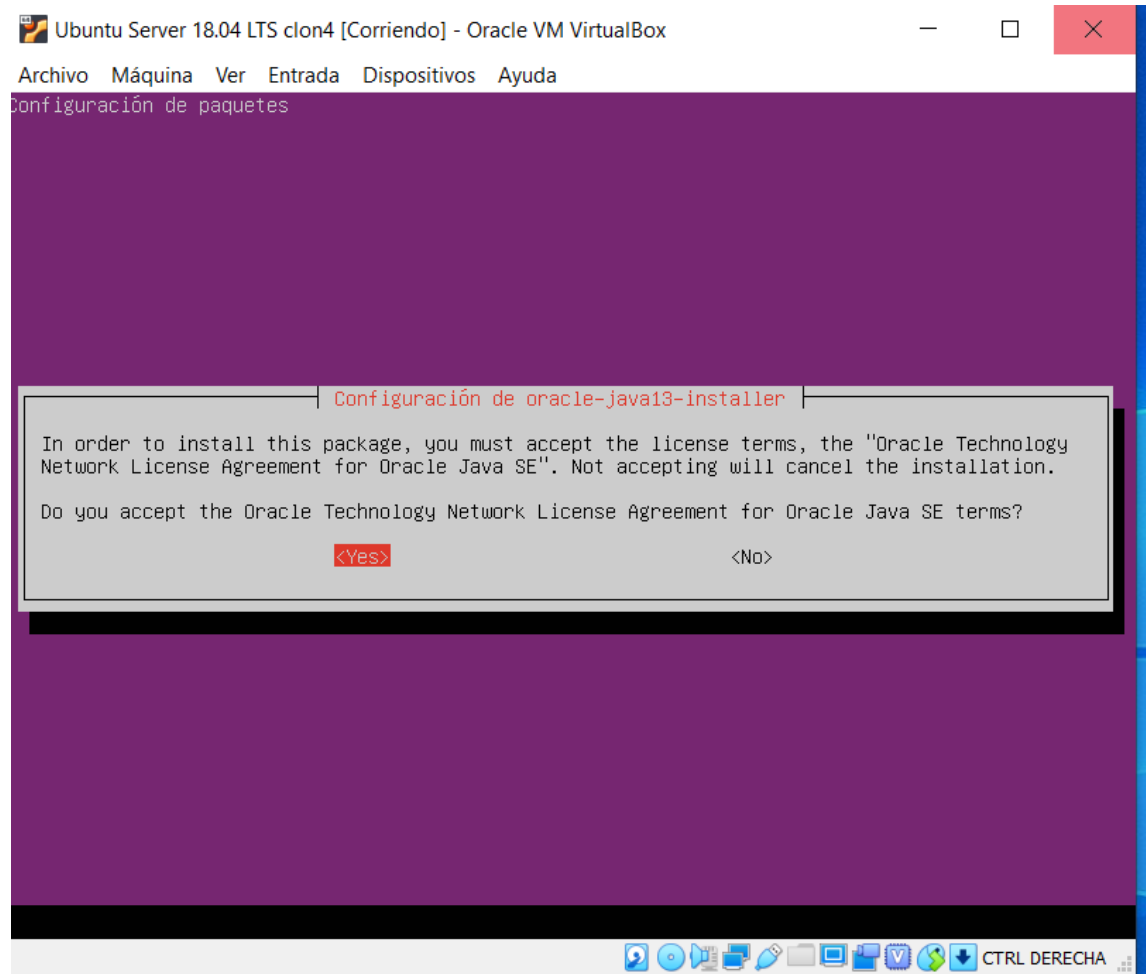
oracle-java14-set-default/bionic 14.0-1~linuxuprising1 amd64
Set Oracle JDK 14 as default Java

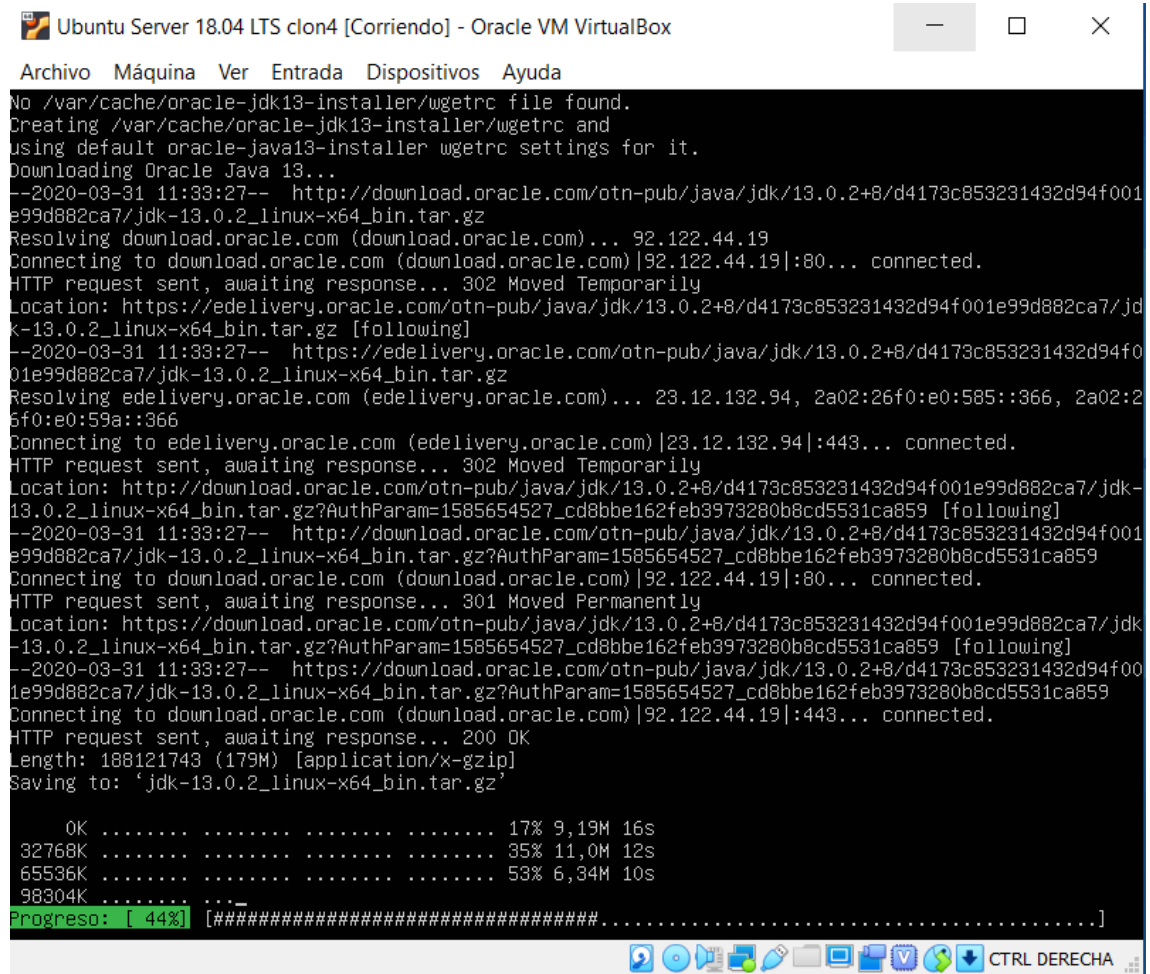
rodriguez@ubuntubionic:~$ sudo apt install oracle-java13-installer
Leyendo lista de paquetes... Hecho
Creando árbol de dependencias
Leyendo la información de estado... Hecho
Se instalarán los siguientes paquetes adicionales:
  binutils binutils-common binutils-x86-64-linux-gnu gsfonts gsfonts-x11 java-common libbinutils
  libfontenc1 oracle-java13-set-default x11-common xfonts-encodings xfonts-utils
Paquetes sugeridos:
  binutils-doc binfmt-support visualvm ttf-baekmuk | ttf-unfonts | ttf-unfonts-core
  ttf-kochi-gothic | ttf-sazanami-gothic ttf-kochi-mincho | ttf-sazanami-mincho ttf-arphic-uming
  firefox | firefox-2 | iceweasel | mozilla-firefox | iceape-browser | mozilla-browser
  | epiphany-gecko | epiphany-webkit | epiphany-browser | galeon | midbrowser | moblin-web-browser
  | xulrunner | xulrunner-1.9 | konqueror | chromium-browser | midori | google-chrome
Se instalarán los siguientes paquetes NUEVOS:
  binutils binutils-common binutils-x86-64-linux-gnu gsfonts gsfonts-x11 java-common libbinutils
  libfontenc1 oracle-java13-installer oracle-java13-set-default x11-common xfonts-encodings
  xfonts-utils
0 actualizados, 13 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
Se necesita descargar 6.434 kB de archivos.
Se utilizarán 22,0 MB de espacio de disco adicional después de esta operación.
¿Desea continuar? [S/n] _
```


Aquí nos explica qué tipo de licencia es...pulsamos OK + Intro.



Pulsamos en YES + Intro





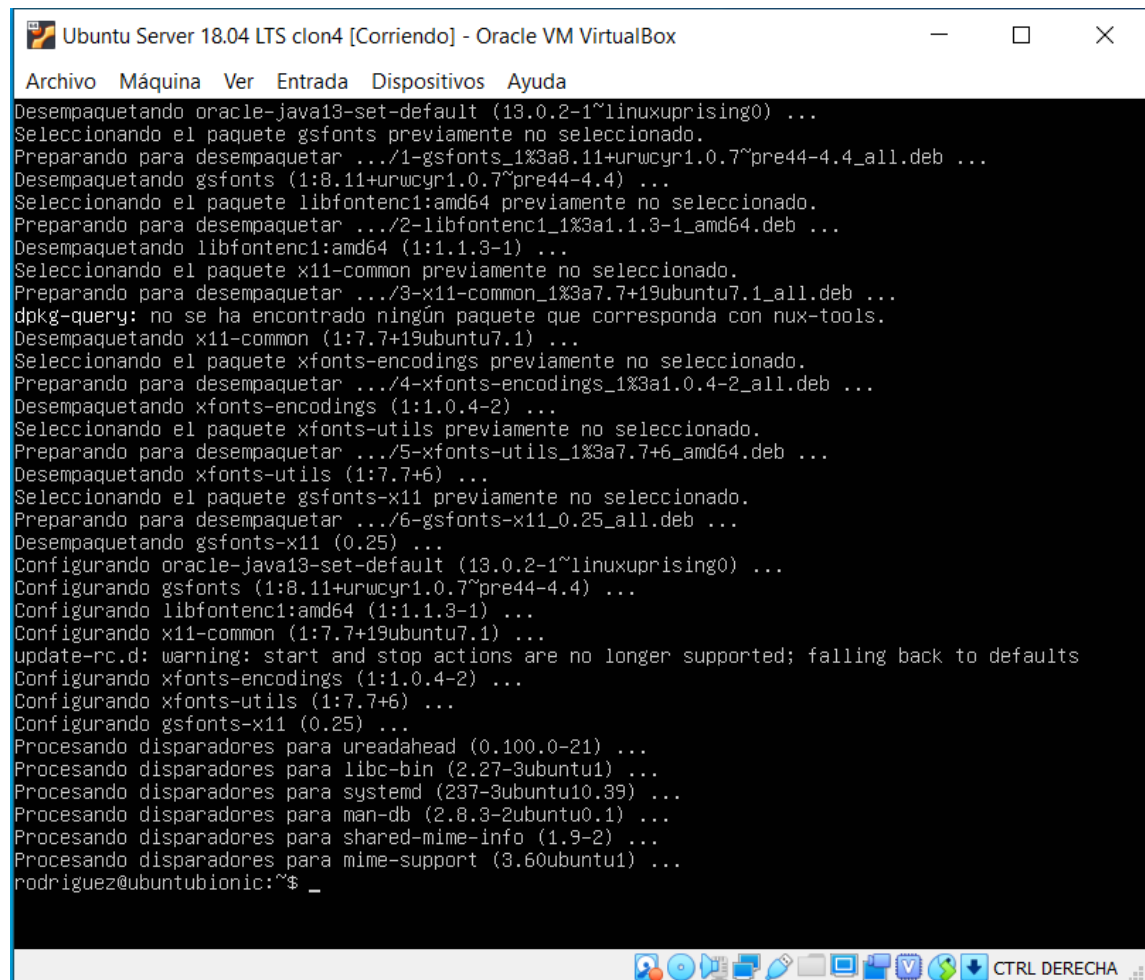
```

Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
No /var/cache/oracle-jdk13-installer/wgetrc file found.
Creating /var/cache/oracle-jdk13-installer/wgetrc and
using default oracle-java13-installer wgetrc settings for it.
Downloading Oracle Java 13...
--2020-03-31 11:33:27-- http://download.oracle.com/otn-pub/java/jdk/13.0.2+8/d4173c853231432d94f001e99d882ca7/jdk-13.0.2_linux-x64_bin.tar.gz
Resolving download.oracle.com (download.oracle.com)... 92.122.44.19
Connecting to download.oracle.com (download.oracle.com)|92.122.44.19|:80... connected.
HTTP request sent, awaiting response... 302 Moved Temporarily
Location: https://edelivery.oracle.com/otn-pub/java/jdk/13.0.2+8/d4173c853231432d94f001e99d882ca7/jdk-13.0.2_linux-x64_bin.tar.gz [following]
--2020-03-31 11:33:27-- https://edelivery.oracle.com/otn-pub/java/jdk/13.0.2+8/d4173c853231432d94f001e99d882ca7/jdk-13.0.2_linux-x64_bin.tar.gz
Resolving edelivery.oracle.com (edelivery.oracle.com)... 23.12.132.94, 2a02:26f0:e0:585::366, 2a02:26f0:e0:59a::366
Connecting to edelivery.oracle.com (edelivery.oracle.com)|23.12.132.94|:443... connected.
HTTP request sent, awaiting response... 302 Moved Temporarily
Location: http://download.oracle.com/otn-pub/java/jdk/13.0.2+8/d4173c853231432d94f001e99d882ca7/jdk-13.0.2_linux-x64_bin.tar.gz?AuthParam=1585654527_cd8bbe162feb3973280b8cd5531ca859 [following]
--2020-03-31 11:33:27-- http://download.oracle.com/otn-pub/java/jdk/13.0.2+8/d4173c853231432d94f001e99d882ca7/jdk-13.0.2_linux-x64_bin.tar.gz?AuthParam=1585654527_cd8bbe162feb3973280b8cd5531ca859
Connecting to download.oracle.com (download.oracle.com)|92.122.44.19|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://download.oracle.com/otn-pub/java/jdk/13.0.2+8/d4173c853231432d94f001e99d882ca7/jdk-13.0.2_linux-x64_bin.tar.gz?AuthParam=1585654527_cd8bbe162feb3973280b8cd5531ca859 [following]
--2020-03-31 11:33:27-- https://download.oracle.com/otn-pub/java/jdk/13.0.2+8/d4173c853231432d94f001e99d882ca7/jdk-13.0.2_linux-x64_bin.tar.gz?AuthParam=1585654527_cd8bbe162feb3973280b8cd5531ca859
Connecting to download.oracle.com (download.oracle.com)|92.122.44.19|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 188121743 (179M) [application/x-gzip]
Saving to: 'jdk-13.0.2_linux-x64_bin.tar.gz'

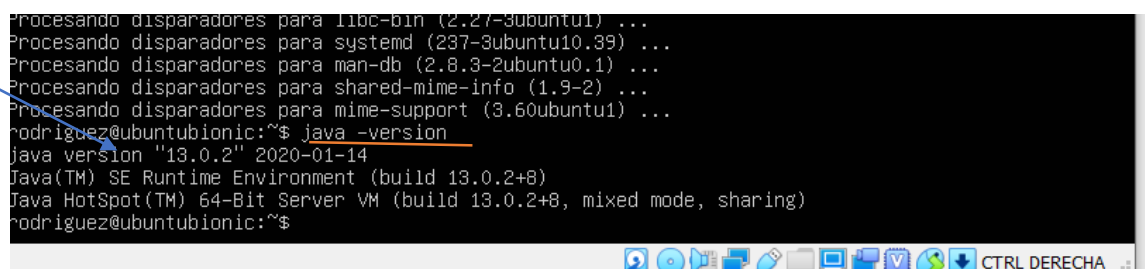
OK ..... 17% 9,19M 16s
32768K ..... 35% 11,0M 12s
65536K ..... 53% 6,34M 10s
98304K ..... _
Progreso: [ 44%] [#####.....]

```

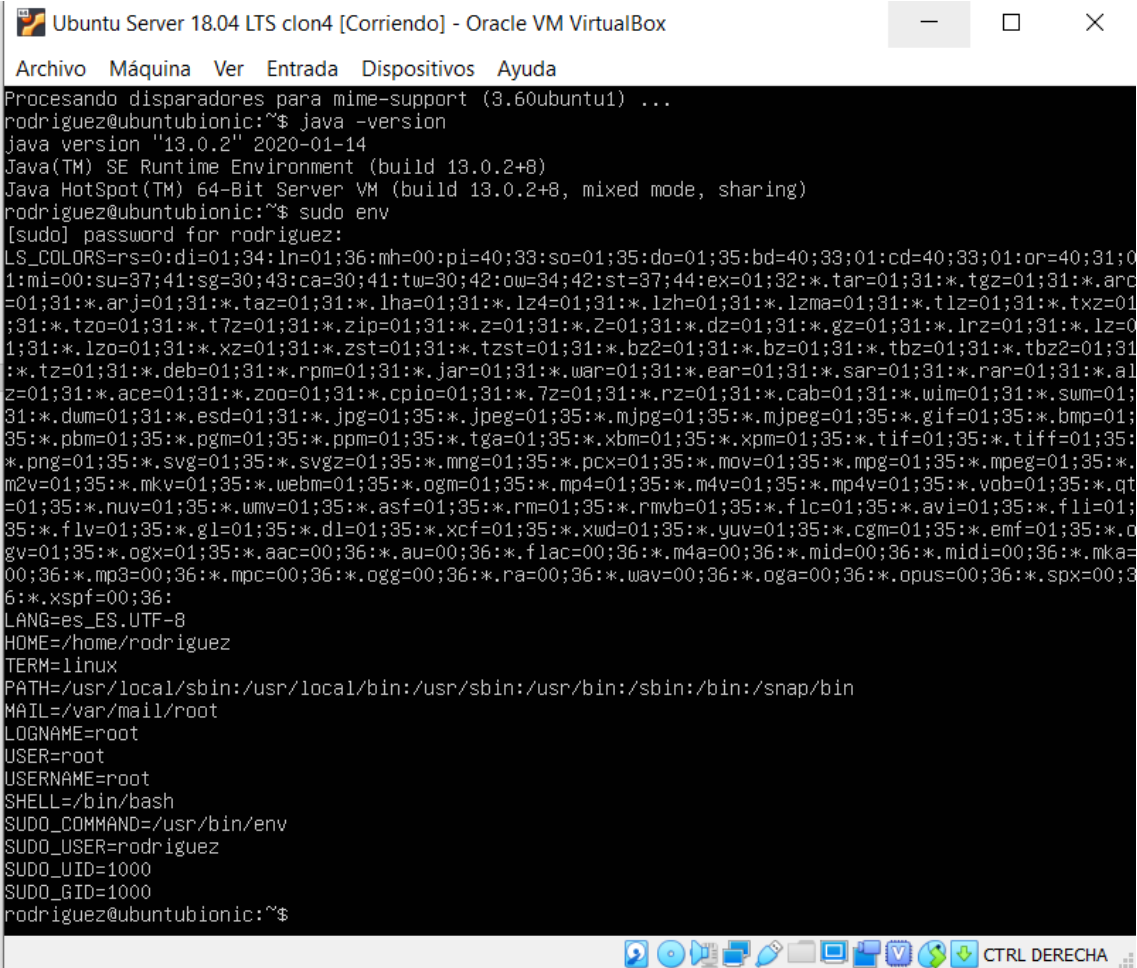
Finalizada la instalación.



Ahora podríamos comprobar que versión de java tenemos instalada con el comando `java -version`.



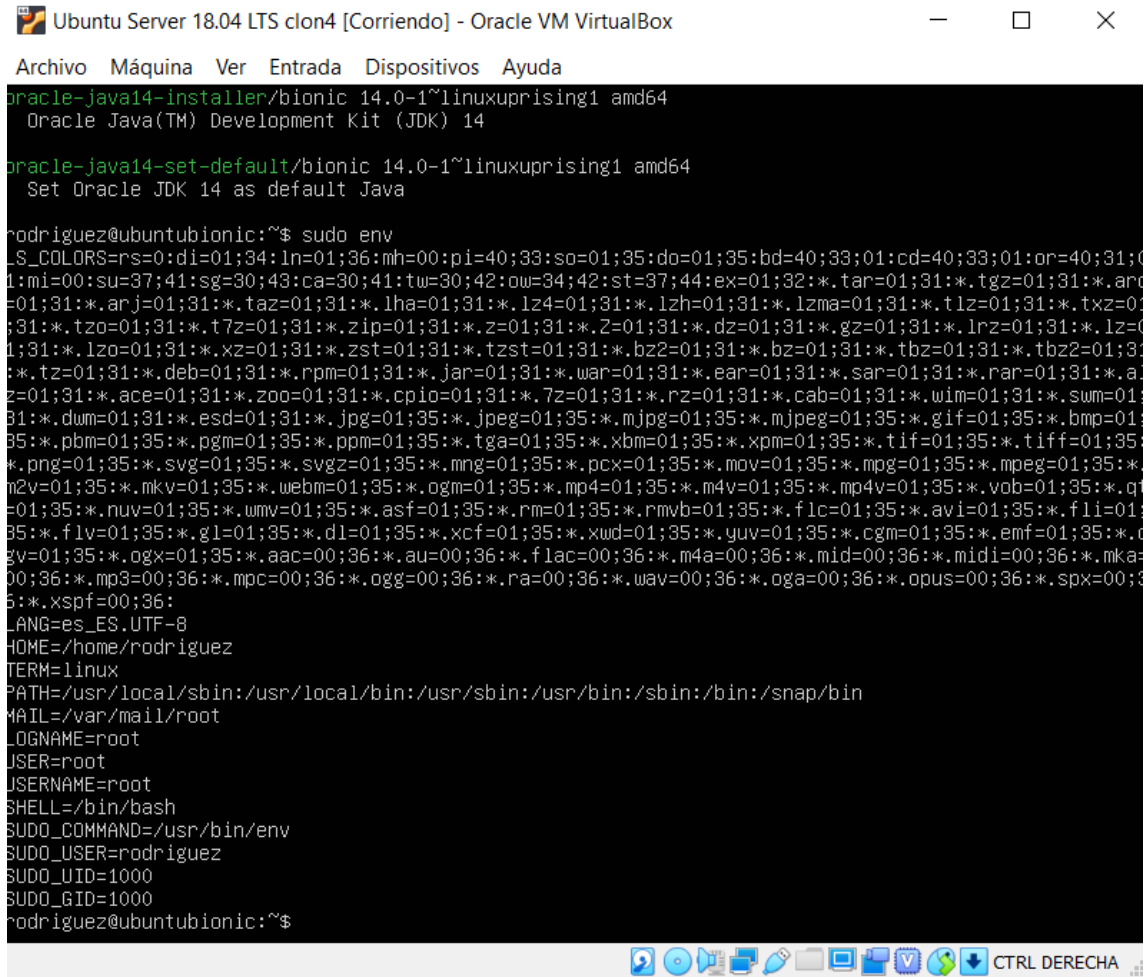
Utilizamos el comando `sudo env` y vemos las variables de entorno que hay en el sistema y podemos observar que NO se encuentra la variable `JAVA_HOME`



```
Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
Procesando disparadores para mime-support (3.60ubuntu1) ...
rodriguez@ubuntubionic:~$ java -version
java version "13.0.2" 2020-01-14
Java(TM) SE Runtime Environment (build 13.0.2+8)
Java HotSpot(TM) 64-Bit Server VM (build 13.0.2+8, mixed mode, sharing)
rodriguez@ubuntubionic:~$ sudo env
[sudo] password for rodriguez:
LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33;01:cd=40;33;01:or=40;31;01:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc=01;31:*.arj=01;31:*.taz=01;31:*.lha=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=01;31:*.tzo=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.Z=01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*.lz=01;31:*.lzo=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01;31:*.taz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.alz=01;31:*.ace=01;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;31:*.dwm=01;31:*.esd=01;31:*.jpg=01;35:*.jpeg=01;35:*.mjpg=01;35:*.mjpeg=01;35:*.gif=01;35:*.bmp=01;35:*.pbm=01;35:*.pgm=01;35:*.ppm=01;35:*.tga=01;35:*.xbm=01;35:*.xpm=01;35:*.tif=01;35:*.tiff=01;35:*.png=01;35:*.svg=01;35:*.svgz=01;35:*.mng=01;35:*.pcx=01;35:*.mov=01;35:*.mpg=01;35:*.mpeg=01;35:*.m2v=01;35:*.mkv=01;35:*.webm=01;35:*.ogm=01;35:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vob=01;35:*.qt=01;35:*.nuv=01;35:*.wmv=01;35:*.asf=01;35:*.rm=01;35:*.rmvb=01;35:*.flc=01;35:*.avi=01;35:*.fli=01;35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf=01;35:*.xwd=01;35:*.yuv=01;35:*.cgm=01;35:*.emf=01;35:*.cgv=01;35:*.ogx=01;35:*.aac=00;36:*.au=00;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.midi=00;36:*.mka=00;36:*.mp3=00;36:*.mpc=00;36:*.ogg=00;36:*.ra=00;36:*.wav=00;36:*.oga=00;36:*.opus=00;36:*.spx=00;36:*.xspf=00;36:
LANG=es_ES.UTF-8
HOME=/home/rodriguez
TERM=linux
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin
MAIL=/var/mail/root
LOGNAME=root
USER=root
USERNAME=root
SHELL=/bin/bash
SUDO_COMMAND=/usr/bin/env
SUDO_USER=rodriguez
SUDO_UID=1000
SUDO_GID=1000
rodriguez@ubuntubionic:~$
```

Ejecuto el paquete `sudo apt install oracle-java13-set-default` para que se configure la variable de entorno `JAVA_HOME` y hacemos un reboot para que se apliquen los cambios.

Comprobamos que ya esté la variable con el comando `sudo env`. Observamos que aún no aparece, por lo tanto tenemos que agregarla manualmente en el fichero `/etc/environment`.



```


Oracle Java(TM) Development Kit (JDK) 14

oracle-java14-set-default/bionic 14.0-1~linuxuprising1 amd64
Set Oracle JDK 14 as default Java

rodriguez@ubuntubionic:~$ sudo env
LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33;01:cd=40;33;01:or=40;31;0
1:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc
=01;31:*.arj=01;31:*.taz=01;31:*.lha=01;31:*.lz4=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=0
1;31:*.tzo=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.Z=01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*.lzo
1;31:*.lzo=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01;3
1:*.taz=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.a
z=01;31:*.ace=01;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;
31:*.dwm=01;31:*.esd=01;31:*.jpg=01;35:*.jpeg=01;35:*.mjpg=01;35:*.mjpeg=01;35:*.gif=01;35:*.bmp=01;
35:*.pbm=01;35:*.pgm=01;35:*.ppm=01;35:*.tga=01;35:*.xbm=01;35:*.xpm=01;35:*.tif=01;35:*.tiff=01;35
*.png=01;35:*.svg=01;35:*.svgz=01;35:*.mng=01;35:*.pcx=01;35:*.mov=01;35:*.mpg=01;35:*.mpeg=01;35:*.
m2v=01;35:*.mkv=01;35:*.webm=01;35:*.ogm=01;35:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vob=01;35:*.qt
=01;35:*.nuv=01;35:*.wmv=01;35:*.asf=01;35:*.rm=01;35:*.rmvb=01;35:*.flc=01;35:*.avi=01;35:*.fli=01;
35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf=01;35:*.xwd=01;35:*.yuv=01;35:*.cgm=01;35:*.emf=01;35:*.d
gv=01;35:*.ogx=01;35:*.aac=00;36:*.au=00;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.midi=00;36:*.mka=
00;36:*.mp3=00;36:*.mpc=00;36:*.ogg=00;36:*.ra=00;36:*.wav=00;36:*.oga=00;36:*.opus=00;36:*.spx=00;3
6:*.xspf=00;36:
LANG=es_ES.UTF-8
HOME=/home/rodriguez
TERM=linux
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin
MAIL=/var/mail/root
LOGNAME=root
USER=root
USERNAME=root
SHELL=/bin/bash
SUDO_COMMAND=/usr/bin/env
SUDO_USER=rodriguez
SUDO_UID=1000
SUDO_GID=1000
rodriguez@ubuntubionic:~$

```

Escribimos `sudo nano /etc/environment` y agregamos `JAVA_HOME=/usr/lib/jvm/java-13-oracle` y hacemos un reboot para que se apliquen los cambios.

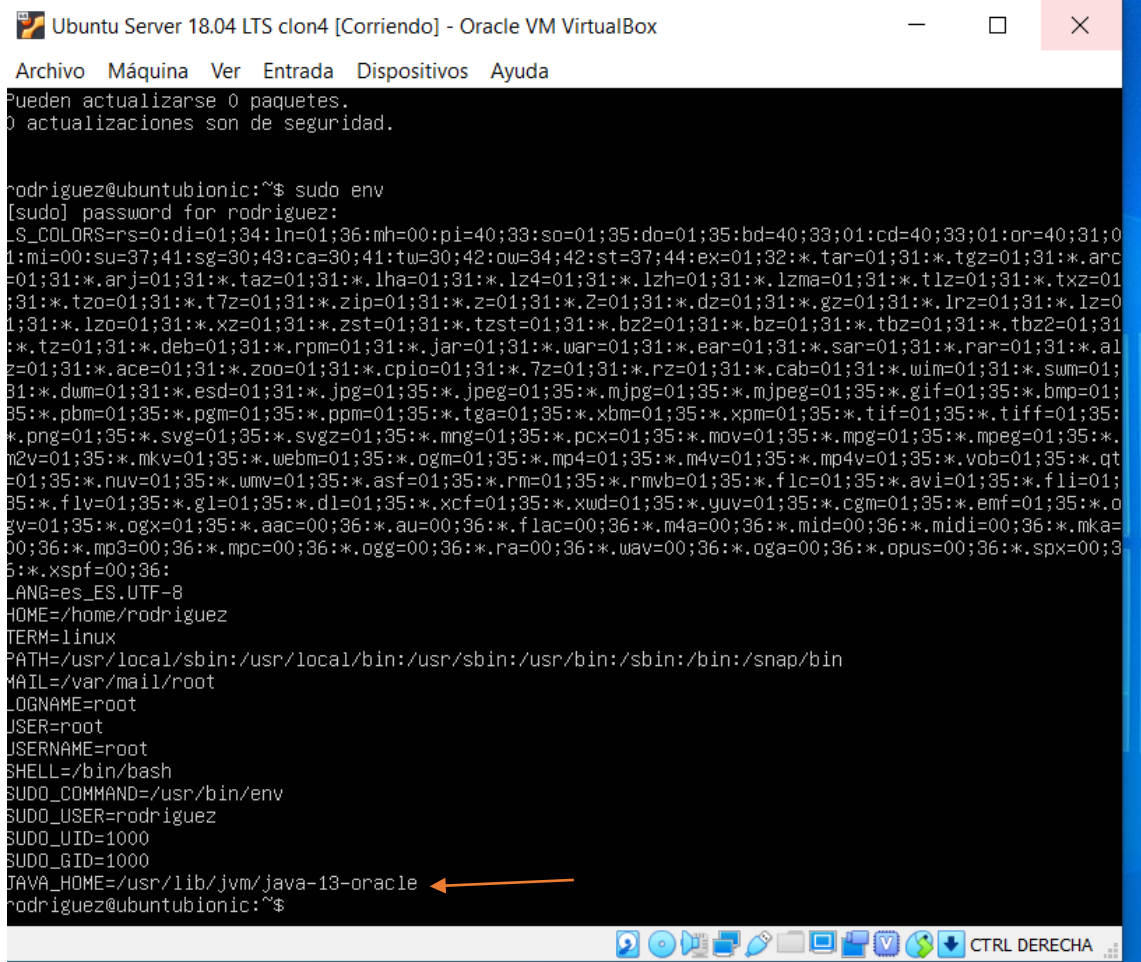


The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox". The terminal is running the nano text editor on the file `/etc/environment`. The current content of the file is:

```
PATH="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games"
JAVA_HOME=/usr/lib/jvm/java-13-oracle_
```

An orange arrow points to the `JAVA_HOME` line. The nano editor's status bar at the bottom shows various commands like `^G Get Help`, `^O Write Out`, `^W Where Is`, `^K Cut Text`, `^J Justify`, `^C Cur Pos`, `M-U Undo`, `^X Exit`, `^R Read File`, `^H Replace`, `^U Uncut Text`, `^T To Spell`, `^G Go To Line`, `M-E Redo`, and a keyboard indicator `CTRL DERECHA`.

Volvemos a comprobar las variables de entorno con `sudo env` y vemos que ya aparece con la ruta escrita anteriormente.

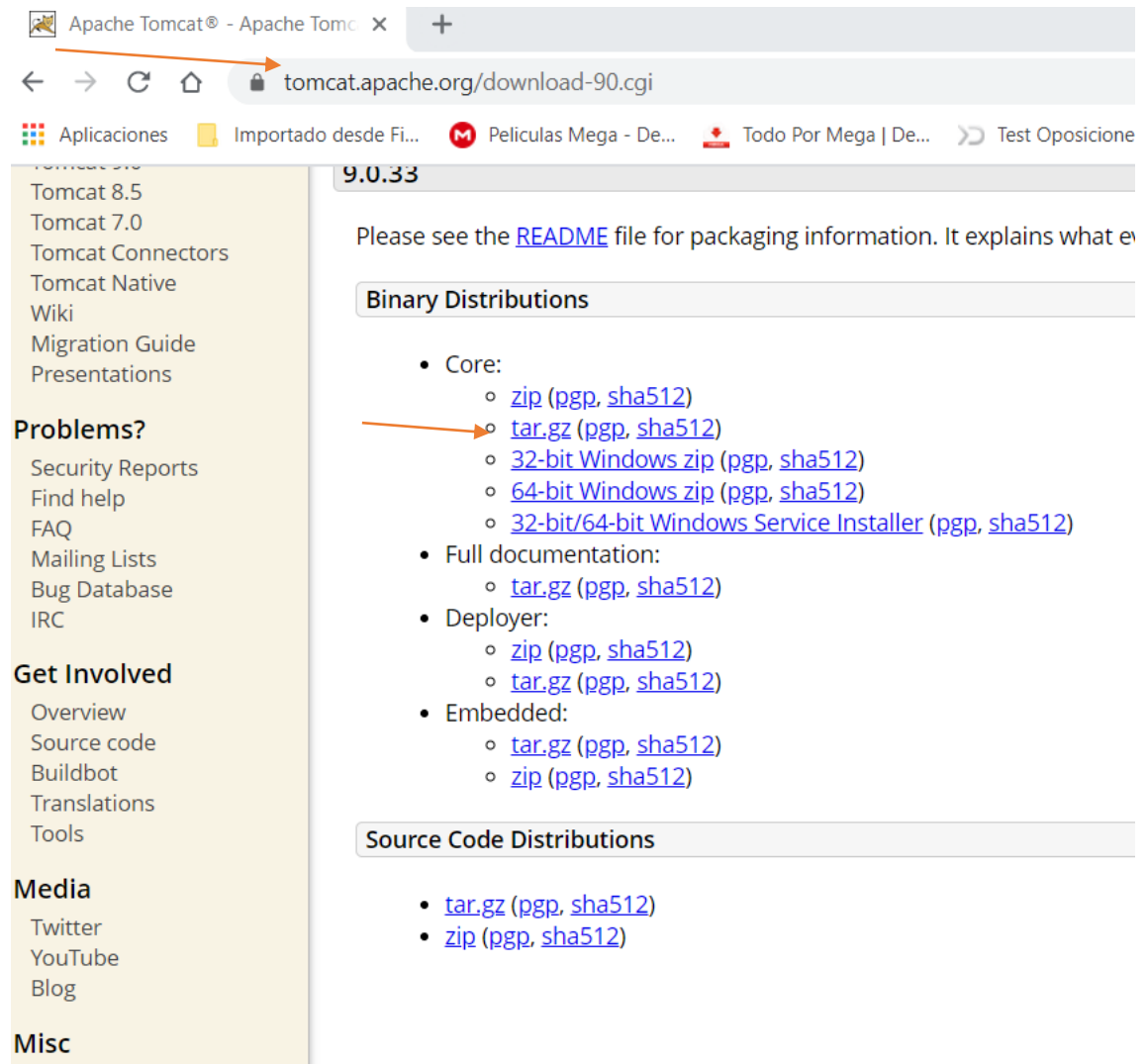


```

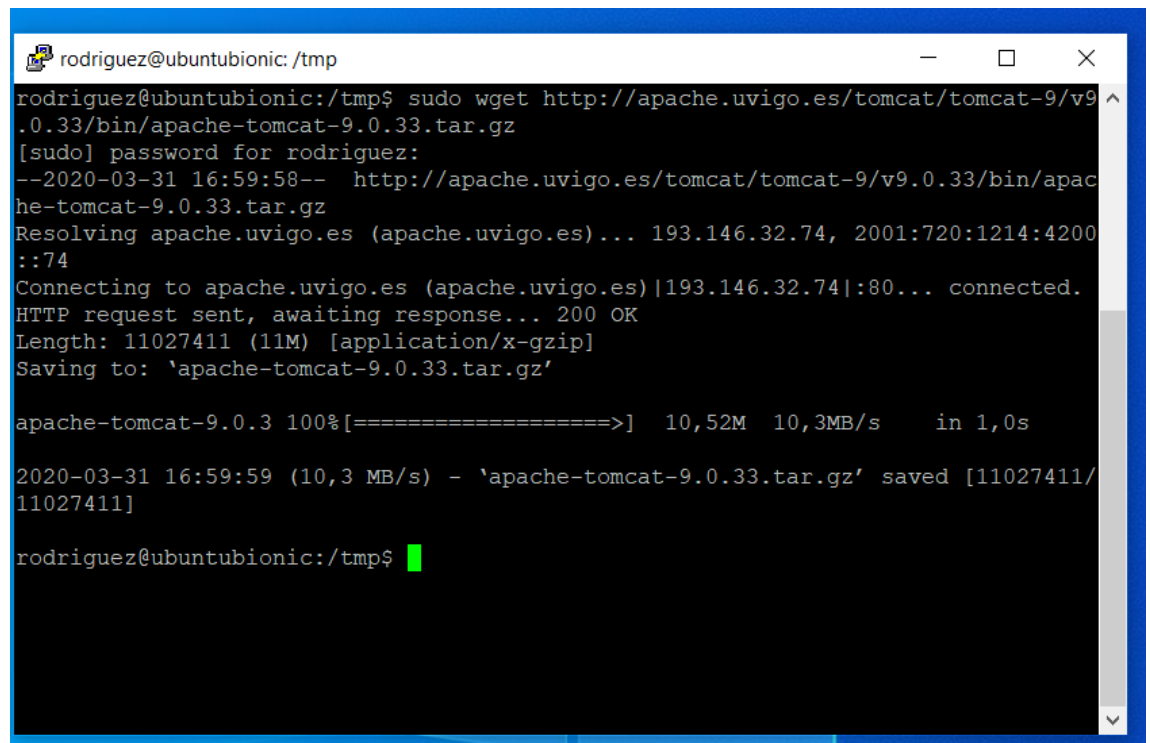
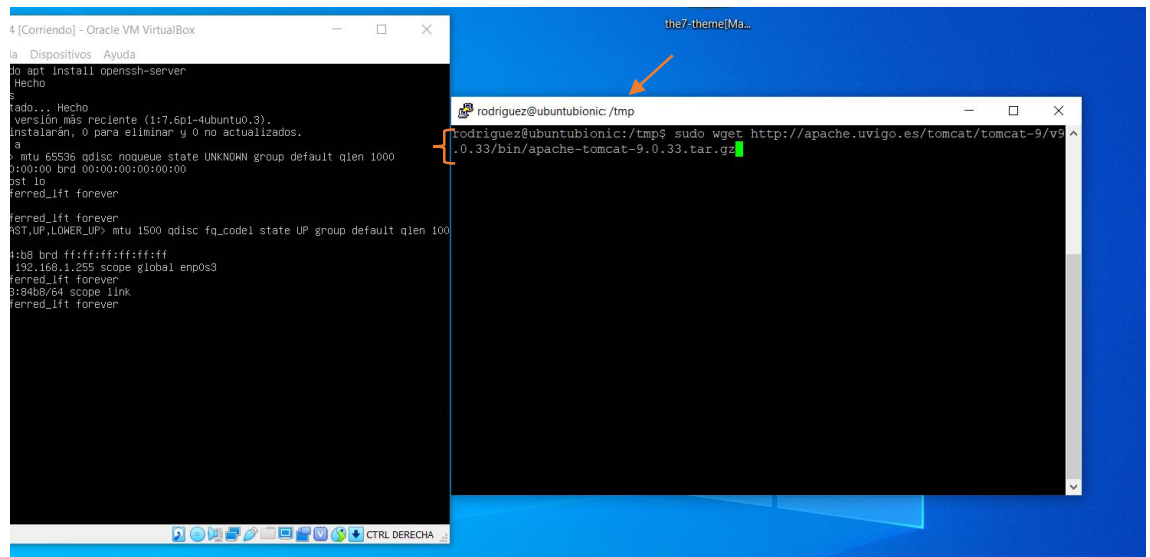
rodriguez@ubuntubionic:~$ sudo env
[sudo] password for rodriguez:
LS_COLORS=rs=0:di=01;34:ln=01;36:mh=00:pi=40;33:so=01;35:do=01;35:bd=40;33:01:cd=40;33:01:or=40;31;0
1:mi=00:su=37;41:sg=30;43:ca=30;41:tw=30;42:ow=34;42:st=37;44:ex=01;32:*.tar=01;31:*.tgz=01;31:*.arc
=01;31:*.arj=01;31:*.taz=01;31:*.lha=01;31:*.lzh=01;31:*.lzma=01;31:*.tlz=01;31:*.txz=01
;31:*.tzo=01;31:*.t7z=01;31:*.zip=01;31:*.z=01;31:*.Z=01;31:*.dz=01;31:*.gz=01;31:*.lrz=01;31:*.lz=0
1;31:*.lzo=01;31:*.xz=01;31:*.zst=01;31:*.tzst=01;31:*.bz2=01;31:*.bz=01;31:*.tbz=01;31:*.tbz2=01;31
:*.tzo=01;31:*.deb=01;31:*.rpm=01;31:*.jar=01;31:*.war=01;31:*.ear=01;31:*.sar=01;31:*.rar=01;31:*.al
z=01;31:*.ace=01;31:*.zoo=01;31:*.cpio=01;31:*.7z=01;31:*.rz=01;31:*.cab=01;31:*.wim=01;31:*.swm=01;
31:*.dwm=01;31:*.esd=01;31:*.jpg=01;35:*.jpeg=01;35:*.mjpg=01;35:*.mjpeg=01;35:*.gif=01;35:*.bmp=01;
35:*.pbm=01;35:*.pgm=01;35:*.ppm=01;35:*.tga=01;35:*.xbm=01;35:*.xpm=01;35:*.tif=01;35:*.tiff=01;35:
*.png=01;35:*.svg=01;35:*.svgz=01;35:*.mng=01;35:*.pcx=01;35:*.mov=01;35:*.mpg=01;35:*.mpeg=01;35:*.
m2v=01;35:*.mkv=01;35:*.webm=01;35:*.ogm=01;35:*.mp4=01;35:*.m4v=01;35:*.mp4v=01;35:*.vob=01;35:*.qt
=01;35:*.nuv=01;35:*.wmv=01;35:*.asf=01;35:*.rm=01;35:*.rmvb=01;35:*.flc=01;35:*.avi=01;35:*.fli=01;
35:*.flv=01;35:*.gl=01;35:*.dl=01;35:*.xcf=01;35:*.xwd=01;35:*.yuv=01;35:*.cgm=01;35:*.emf=01;35:*.o
gv=01;35:*.ogx=01;35:*.aac=00;36:*.au=00;36:*.flac=00;36:*.m4a=00;36:*.mid=00;36:*.midi=00;36:*.mka=
00;36:*.mp3=00;36:*.mpc=00;36:*.ogg=00;36:*.ra=00;36:*.wav=00;36:*.oga=00;36:*.opus=00;36:*.spx=00;3
6:*.xspf=00;36:
LANG=es_ES.UTF-8
HOME=/home/rodriguez
TERM=linux
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/snap/bin
MAIL=/var/mail/root
LOGNAME=root
USER=root
USERNAME=root
SHELL=/bin/bash
SUDO_COMMAND=/usr/bin/env
SUDO_USER=rodriguez
SUDO_UID=1000
SUDO_GID=1000
JAVA_HOME=/usr/lib/jvm/java-13-oracle
rodriguez@ubuntubionic:~$

```


Ahora procedemos a instalar Tomcat. Tenemos que copiarnos el enlace de descarga. En mi caso, he utilizado el cliente putty para conectarme al server de forma remota . Me voy a la página de Tomcat, copio la ruta de de enlace de tar.gz clic derecho ratón->copiar ruta de enlace.



Ahora por medio de putty , nos situamos en el directorio donde queremos descargar en este caso es en /tmp y escribimos el código sudo wget + clic derecho con el ratón para copiarnos la ruta + Intro



Comprobamos que se ha descargado el fichero.

```
rodriguez@ubuntubionic: /tmp
rodriguez@ubuntubionic:/tmp$ sudo wget http://apache.uvigo.es/tomcat/tomcat-9/v9
.0.33/bin/apache-tomcat-9.0.33.tar.gz
[sudo] password for rodriguez:
--2020-03-31 16:59:58-- http://apache.uvigo.es/tomcat/tomcat-9/v9.0.33/bin/apac
he-tomcat-9.0.33.tar.gz
Resolving apache.uvigo.es (apache.uvigo.es)... 193.146.32.74, 2001:720:1214:4200
::74
Connecting to apache.uvigo.es (apache.uvigo.es)|193.146.32.74|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 11027411 (11M) [application/x-gzip]
Saving to: 'apache-tomcat-9.0.33.tar.gz'

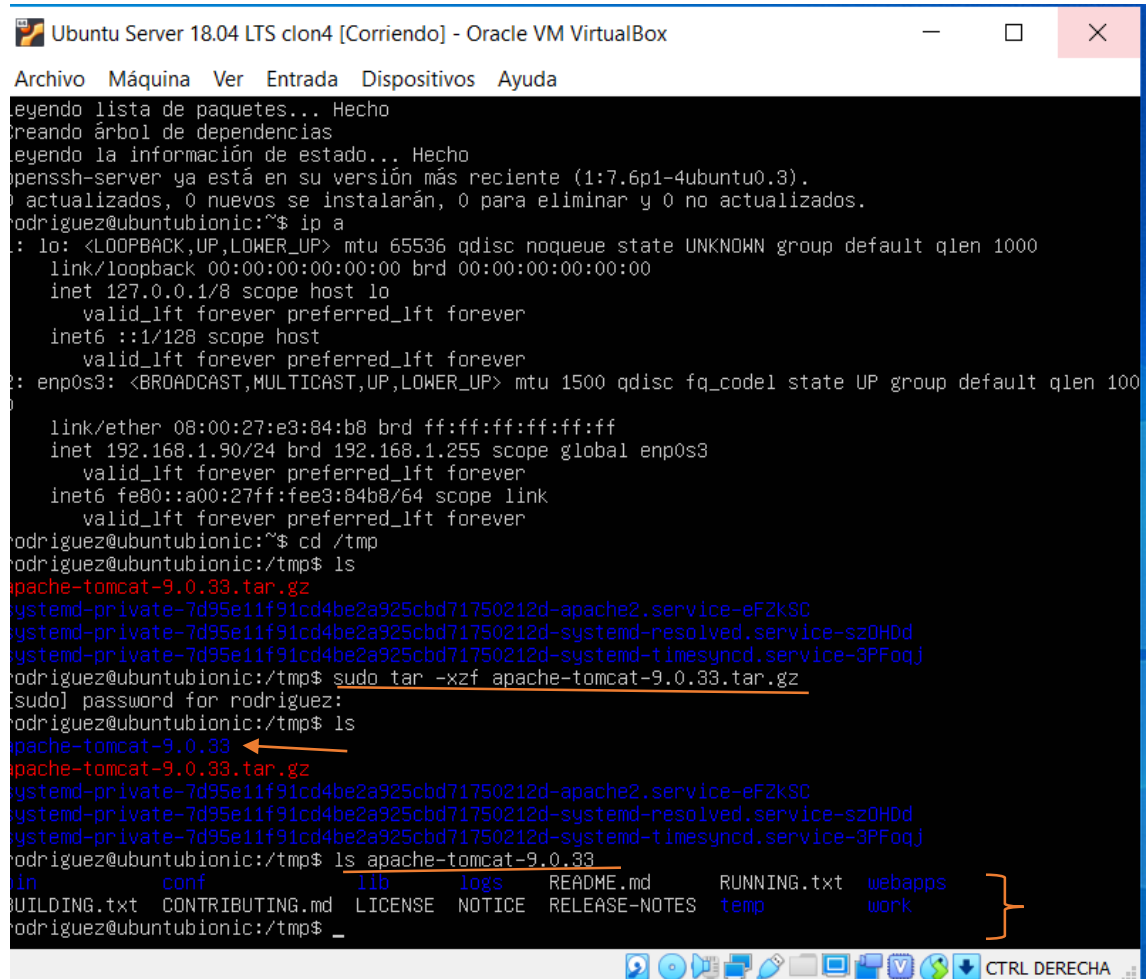
apache-tomcat-9.0.3 100%[=====>] 10,52M 10,3MB/s in 1,0s

2020-03-31 16:59:59 (10,3 MB/s) - 'apache-tomcat-9.0.33.tar.gz' saved [11027411/
11027411]

rodriguez@ubuntubionic:/tmp$ ls
apache-tomcat-9.0.33.tar.gz
systemd-private-7d95e11f91cd4be2a925cbd71750212d-apache2.service-eFZkSC
systemd-private-7d95e11f91cd4be2a925cbd71750212d-systemd-resolved.service-szOHDd
systemd-private-7d95e11f91cd4be2a925cbd71750212d-systemd-timesyncd.service-3PFoq
j
rodriguez@ubuntubionic:/tmp$
```

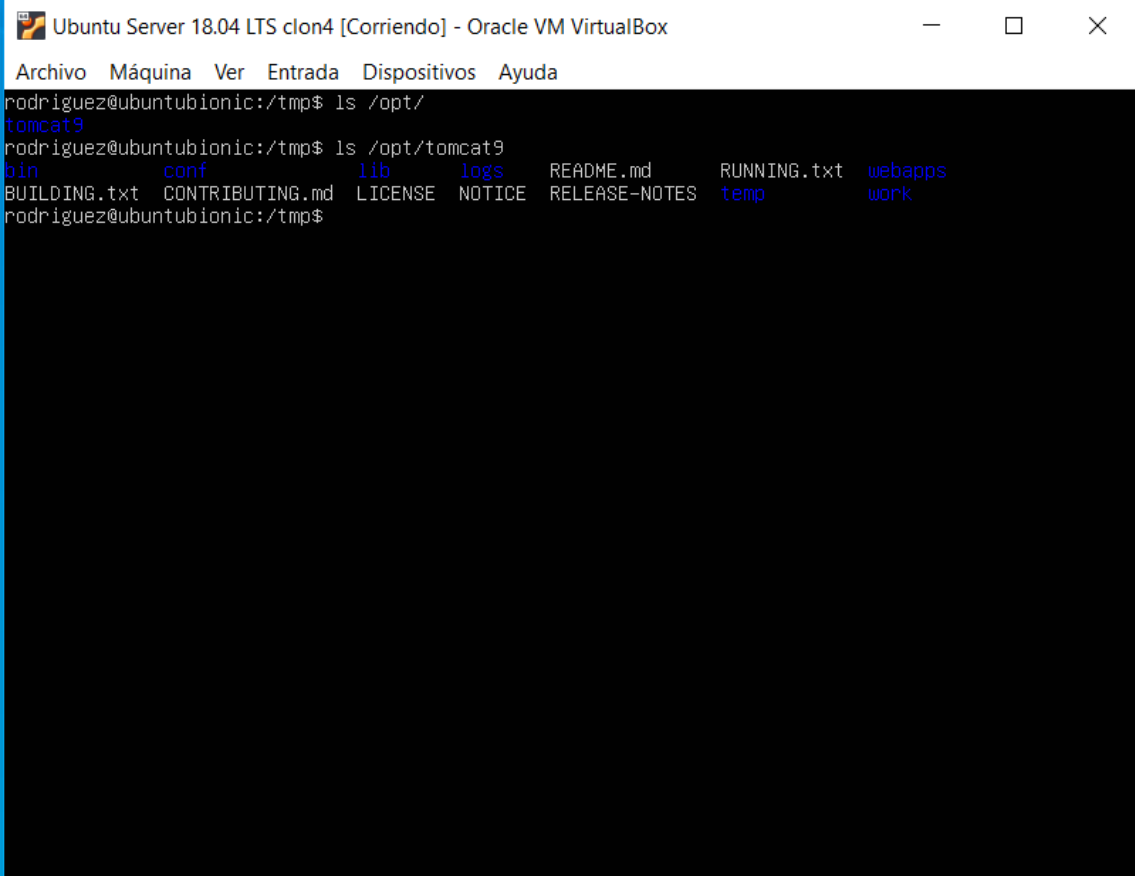
El siguiente paso es descomprimir el paquete descargado por medio del comando `sudo tar -xzf apache-tomcat.9.0.33.tar.gz` y

vemos que se nos ha creado una nueva carpeta con todos los archivos.



```
Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
leyendo lista de paquetes... Hecho
creando árbol de dependencias
leyendo la información de estado... Hecho
openssh-server ya está en su versión más reciente (1:7.6p1-4ubuntu0.3).
0 actualizados, 0 nuevos se instalarán, 0 para eliminar y 0 no actualizados.
rodriguez@ubuntubionic:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:e3:84:b8 brd ff:ff:ff:ff:ff:ff
    inet 192.168.1.90/24 brd 192.168.1.255 scope global enp0s3
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fee3:84b8/64 scope link
        valid_lft forever preferred_lft forever
rodriguez@ubuntubionic:~$ cd /tmp
rodriguez@ubuntubionic:/tmp$ ls
apache-tomcat-9.0.33.tar.gz
systemd-private-7d95e11f91cd4be2a925cbd71750212d-apache2.service-eFZkSC
systemd-private-7d95e11f91cd4be2a925cbd71750212d-systemd-resolved.service-sz0HDd
systemd-private-7d95e11f91cd4be2a925cbd71750212d-systemd-timesyncd.service-3PFoqj
rodriguez@ubuntubionic:/tmp$ sudo tar -xzf apache-tomcat-9.0.33.tar.gz
[sudo] password for rodriguez:
rodriguez@ubuntubionic:/tmp$ ls
apache-tomcat-9.0.33
apache-tomcat-9.0.33.tar.gz
systemd-private-7d95e11f91cd4be2a925cbd71750212d-apache2.service-eFZkSC
systemd-private-7d95e11f91cd4be2a925cbd71750212d-systemd-resolved.service-sz0HDd
systemd-private-7d95e11f91cd4be2a925cbd71750212d-systemd-timesyncd.service-3PFoqj
rodriguez@ubuntubionic:/tmp$ ls apache-tomcat-9.0.33
bin      conf      lib      logs     README.md  RUNNING.txt  webapps
BUILDING.txt  CONTRIBUTING.md  LICENSE  NOTICE  RELEASE-NOTES  temp         work
rodriguez@ubuntubionic:/tmp$ _
```

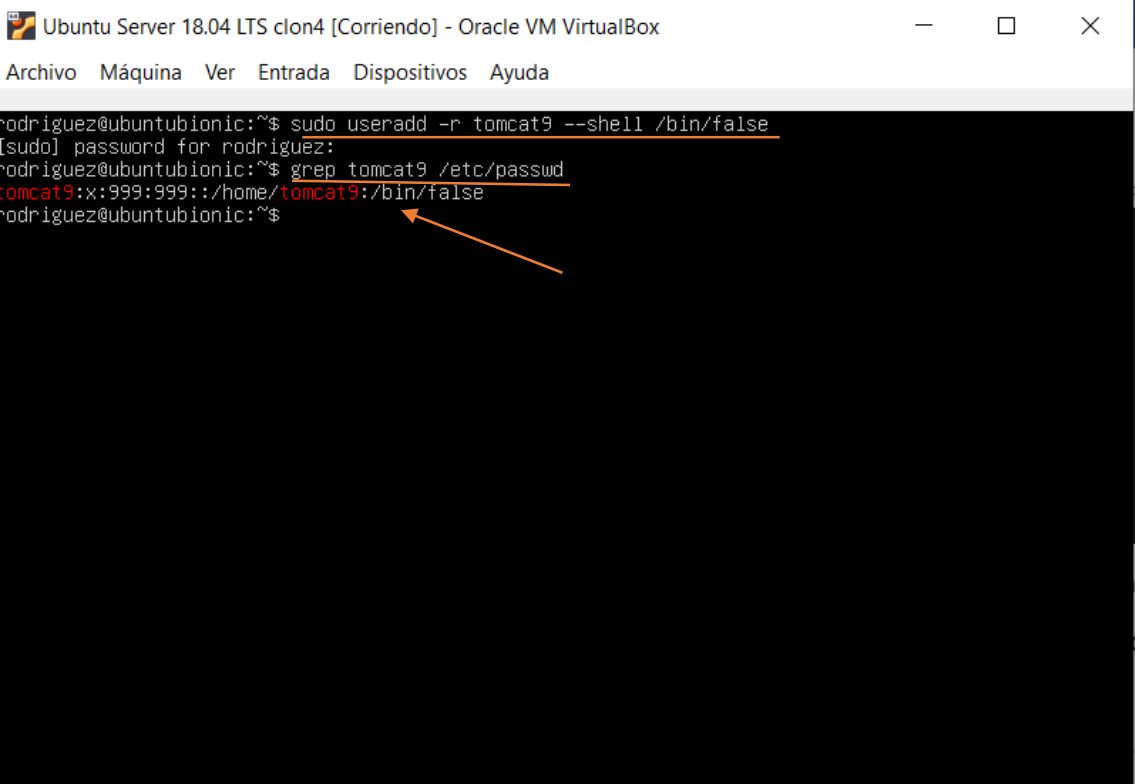
Movemos todo el contenido de la carpeta apache-tomcat-9.9.0.33 a /opt/tomcat9 mediante el comando `sudo mv apache-tomcat-9.0.33 /opt/tomcat9` y con el comando `ls /opt/` comprobamos que se ha movido correctamente.



A terminal window titled "Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox". The terminal shows the user 'rodriguez@ubuntubionic' in the directory '/tmp'. They run 'ls /opt/' which shows 'tomcat9'. Then they run 'ls /opt/tomcat9' which shows a directory listing: 'bin', 'conf', 'lib', 'logs', 'README.md', 'BUILDING.txt', 'CONTRIBUTING.md', 'LICENSE', 'NOTICE', 'RELEASE-NOTES', 'RUNNING.txt', 'temp', 'webapps', and 'work'.

```
rodriguez@ubuntubionic:/tmp$ ls /opt/
tomcat9
rodriguez@ubuntubionic:/tmp$ ls /opt/tomcat9
bin      conf      lib       logs      README.md  BUILDING.txt  CONTRIBUTING.md  LICENSE  NOTICE  RELEASE-NOTES  RUNNING.txt  temp  webapps  work
rodriguez@ubuntubionic:/tmp$
```

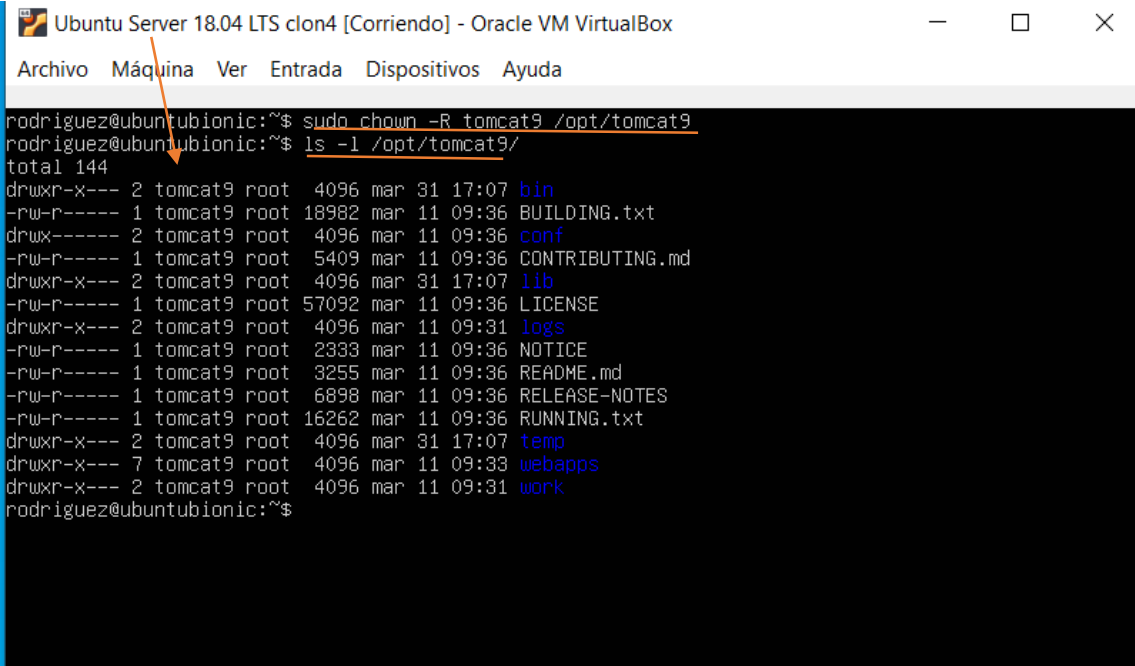
Ahora nos creamos un usuario tomcat9 y comprobamos que se ha creado.



A terminal window titled "Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox". The user 'rodriguez@ubuntubionic' runs 'sudo useradd -r tomcat9 --shell /bin/false'. They are prompted for a password. Then they run 'grep tomcat9 /etc/passwd' which shows 'tomcat9:x:999:999::/home/tomcat9:/bin/false'. An orange arrow points to the output line.

```
rodriguez@ubuntubionic:~$ sudo useradd -r tomcat9 --shell /bin/false
[sudo] password for rodriguez:
rodriguez@ubuntubionic:~$ grep tomcat9 /etc/passwd
tomcat9:x:999:999::/home/tomcat9:/bin/false
rodriguez@ubuntubionic:~$
```

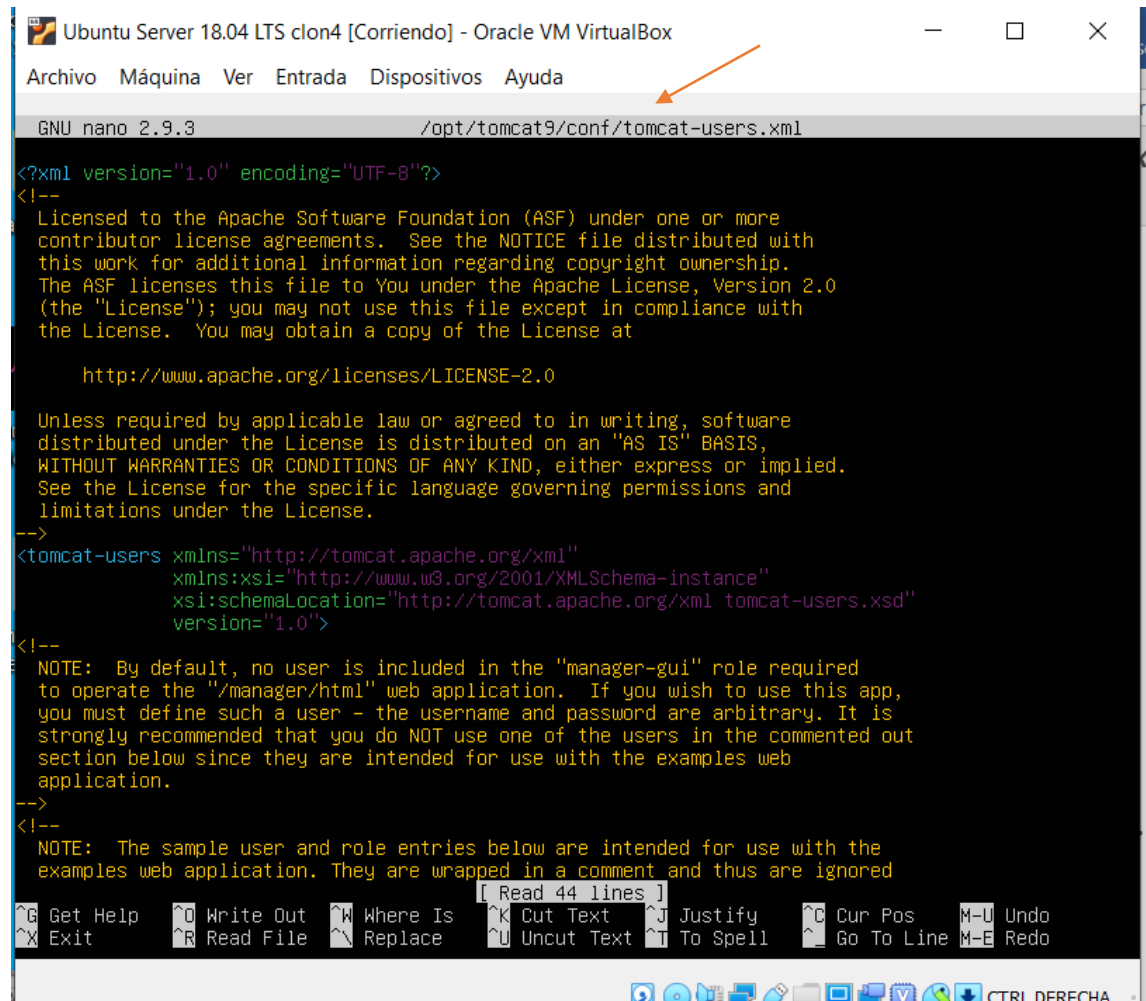
Asignamos permisos de propietario sobre el directorio creado anteriormente al usuario tomcat9 y comprobamos que aparece en la primera columna como propietario.



```
Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
rodriguez@ubuntubionic:~$ sudo chown -R tomcat9 /opt/tomcat9
rodriguez@ubuntubionic:~$ ls -l /opt/tomcat9/
total 144
drwxr-x--- 2 tomcat9 root  4096 mar 31 17:07 bin
-rw-r----- 1 tomcat9 root 18982 mar 11 09:36 BUILDING.txt
drwx----- 2 tomcat9 root  4096 mar 11 09:36 conf
-rw-r----- 1 tomcat9 root  5409 mar 11 09:36 CONTRIBUTING.md
drwxr-x--- 2 tomcat9 root  4096 mar 31 17:07 lib
-rw-r----- 1 tomcat9 root 57092 mar 11 09:36 LICENSE
drwxr-x--- 2 tomcat9 root  4096 mar 11 09:31 logs
-rw-r----- 1 tomcat9 root  2333 mar 11 09:36 NOTICE
-rw-r----- 1 tomcat9 root  3255 mar 11 09:36 README.md
-rw-r----- 1 tomcat9 root  6898 mar 11 09:36 RELEASE-NOTES
-rw-r----- 1 tomcat9 root 16262 mar 11 09:36 RUNNING.txt
drwxr-x--- 2 tomcat9 root  4096 mar 31 17:07 temp
drwxr-x--- 7 tomcat9 root  4096 mar 11 09:33 webapps
drwxr-x--- 2 tomcat9 root  4096 mar 11 09:31 work
rodriguez@ubuntubionic:~$
```

- B. El usuario que tienes que crear en el archivo tomcat-users.xml tiene que llamarse SMM_decepticons (SMM son las iniciales de tu nombre, SMM=Sílvia Macho Muñiz).

Escribimos el código `sudo nano /opt/tomcat9/conf/tomcat-users.xml` para editar el archivo y agregar el usuario `MFRB_decepticons`



```
Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
GNU nano 2.9.3 /opt/tomcat9/conf/tomcat-users.xml
<?xml version="1.0" encoding="UTF-8"?>
<!--
Licensed to the Apache Software Foundation (ASF) under one or more
contributor license agreements.  See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License.  You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

Unless required by applicable law or agreed to in writing, software
distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->
<tomcat-users xmlns="http://tomcat.apache.org/xml"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://tomcat.apache.org/xml tomcat-users.xsd"
  version="1.0">
<!--
NOTE: By default, no user is included in the "manager-gui" role required
to operate the "/manager/html" web application.  If you wish to use this app,
you must define such a user - the username and password are arbitrary.  It is
strongly recommended that you do NOT use one of the users in the commented out
section below since they are intended for use with the examples web
application.
-->
<!--
NOTE: The sample user and role entries below are intended for use with the
examples web application.  They are wrapped in a comment and thus are ignored
[ Read 44 lines ]
^G Get Help  ^O Write Out  ^W Where Is  ^K Cut Text  ^J Justify  ^C Cur Pos  M-U Undo
^X Exit      ^R Read File  ^_ Replace   ^U Uncut Text ^T To Spell  ^_ Go To Line M-E Redo
CTRL DERECHA
```

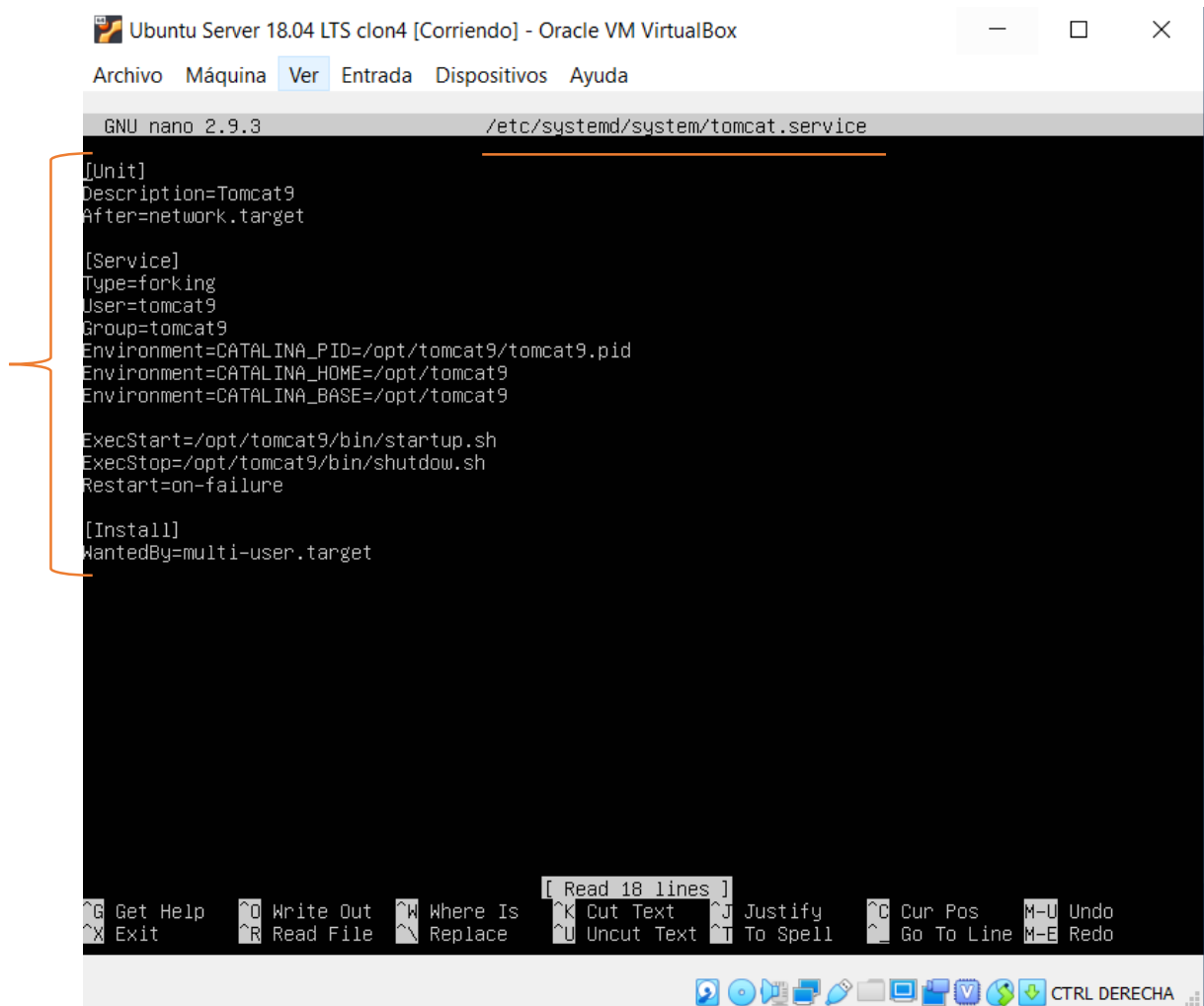
```
GNU nano 2.9.3 /opt/tomcat9/conf/tomcat-users.xml Modified
-->
<tomcat-users xmlns="http://tomcat.apache.org/xml"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
  xsi:schemaLocation="http://tomcat.apache.org/xml tomcat-users.xsd"
  version="1.0">
<!--
NOTE: By default, no user is included in the "manager-gui" role required
to operate the "/manager/html" web application.  If you wish to use this app,
you must define such a user - the username and password are arbitrary. It is
strongly recommended that you do NOT use one of the users in the commented out
section below since they are intended for use with the examples web
application.
-->
<!--
NOTE: The sample user and role entries below are intended for use with the
examples web application. They are wrapped in a comment and thus are ignored
when reading this file. If you wish to configure these users for use with the
examples web application, do not forget to remove the <!-- ... --> that surrounds
them. You will also need to set the passwords to something appropriate.
-->
<!--
<role rolename="tomcat"/>
<role rolename="role1"/>
<user username="tomcat" password="<must-be-changed>" roles="tomcat"/>
<user username="both" password="<must-be-changed>" roles="tomcat,role1"/>
<user username="role1" password="<must-be-changed>" roles="role1"/>
-->
<role rolename="manager-gui"/>
<role rolename="admin-gui"/>
<user username="MFRB_decepticons" password="Linkia.2020" roles="manager-gui,admin-gui"/>
-->
</tomcat-users>
```

C. Comprueba que el servicio está iniciado correctamente.

Creamos una cuenta en el servidor para que Tomcat funcione como servicio. Para eso es necesario crear un archivo llamado tomcat.service y añadir el contenido necesario para que el servicio Tomcat funcione correctamente.

Para crear el archivo ponemos el comando siguiente:

sudo nano /etc/systemd/system/tomcat.service con el contenido que se muestra.



The screenshot shows a terminal window titled "Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox". The terminal is running the nano text editor, editing the file `/etc/systemd/system/tomcat.service`. The configuration is as follows:

```
[Unit]
Description=Tomcat9
After=network.target

[Service]
Type=forking
User=tomcat9
Group=tomcat9
Environment=CATALINA_PID=/opt/tomcat9/tomcat9.pid
Environment=CATALINA_HOME=/opt/tomcat9
Environment=CATALINA_BASE=/opt/tomcat9

ExecStart=/opt/tomcat9/bin/startup.sh
ExecStop=/opt/tomcat9/bin/shutdown.sh
Restart=on-failure

[Install]
WantedBy=multi-user.target
```

An orange bracket on the left side of the terminal highlights the `[Service]` section. The bottom of the terminal shows the nano editor's status bar with various shortcuts and a message that says "Read 18 lines".

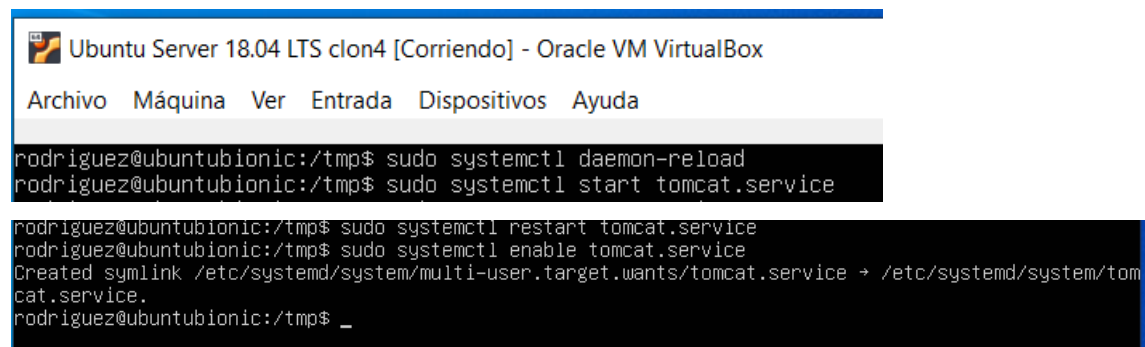
Después de guardar y salir del fichero , ejecutamos los siguientes comandos para cargar el servicio.

`sudo systemctl daemon-reload`

`sudo systemctl start tomcat.service`

`sudo systemctl restart tomcat.service`

`sudo systemctl enable tomcat.service`




The screenshot shows a terminal window with the following commands and output:

```
rodriguez@ubuntubionic:/tmp$ sudo systemctl daemon-reload
rodriguez@ubuntubionic:/tmp$ sudo systemctl start tomcat.service

rodriguez@ubuntubionic:/tmp$ sudo systemctl restart tomcat.service
rodriguez@ubuntubionic:/tmp$ sudo systemctl enable tomcat.service
Created symlink /etc/systemd/system/multi-user.target.wants/tomcat.service → /etc/systemd/system/tomcat.service.
rodriguez@ubuntubionic:/tmp$ _
```

Ahora comprobamos el estado del servicio



```
rodriguez@ubuntubionic:/tmp$ sudo systemctl status tomcat.service
● tomcat.service - Tomcat9
   Loaded: loaded (/etc/systemd/system/tomcat.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2020-03-31 18:50:31 UTC; 3min 57s ago
     Main PID: 1704 (java)
        Tasks: 29 (limit: 1108)
      CGroup: /system.slice/tomcat.service
              └─1704 /usr/bin/java -Djava.util.logging.config.file=/opt/tomcat9/conf/logging.properties


mar 31 18:50:31 ubuntubionic systemd[1]: tomcat.service: Main process exited, code=exited, status=14
mar 31 18:50:31 ubuntubionic systemd[1]: tomcat.service: Failed with result 'exit-code'.
mar 31 18:50:31 ubuntubionic systemd[1]: Stopped Tomcat9.
mar 31 18:50:31 ubuntubionic systemd[1]: Starting Tomcat9...
mar 31 18:50:31 ubuntubionic startup.sh[1680]: Existing PID file found during start.
mar 31 18:50:31 ubuntubionic startup.sh[1680]: Removing/clearing stale PID file.
mar 31 18:50:31 ubuntubionic startup.sh[1680]: Tomcat started.
mar 31 18:50:31 ubuntubionic systemd[1]: Started Tomcat9.
lines 1-16/16 (END)
```

D. Modificar el firewall para que sea accesible desde otra máquina.

Para que sea accesible desde otra máquina ponemos:

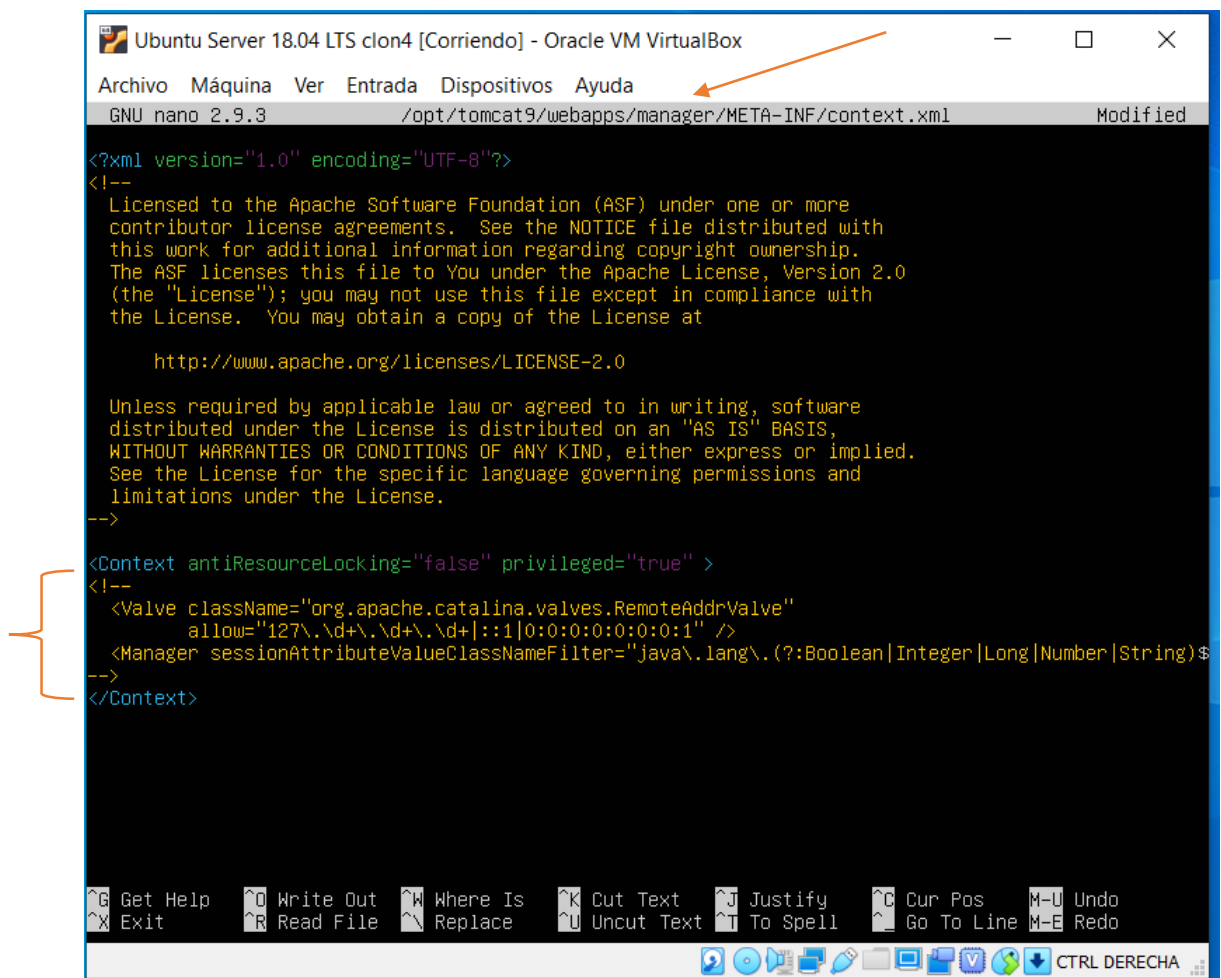
`sudo ufw allow 8080`

```
rodriguez@ubuntubionic:/tmp$ sudo ufw allow 8080
Rules updated
Rules updated (v6)
rodriguez@ubuntubionic:/tmp$ sudo netstat -ptan
Active Internet connections (servers and established)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 192.168.1.90:3306       0.0.0.0:*               LISTEN      834/mysql
tcp        0      0 127.0.0.53:53          0.0.0.0:*               LISTEN      636/systemd-resolve
tcp        0      0 0.0.0.0:22             0.0.0.0:*               LISTEN      785/sshd
tcp6       0      0 127.0.0.1:8005         :::*                    LISTEN      1704/java
tcp6       0      0 :::8080                :::*                    LISTEN      1704/java
tcp6       0      0 :::80                  :::*                    LISTEN      837/apache2
tcp6       0      0 :::22                  :::*                    LISTEN      785/sshd
rodriguez@ubuntubionic:/tmp$
```



11. Modifica los ficheros context.xml de las aplicaciones Manager y Host Manager de Tomcat para que el servicio sea accesible desde otra máquina. Comprueba desde la máquina virtual cliente que el acceso funciona correctamente. (0.50 puntos)

Escribimos `sudo nano /opt/tomcat9/webapps/manager/META-INF/context.xml` para editar ese archivo y comentamos unas líneas de código que restringen las peticiones que reciba desde otras máquinas.



```
Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
GNU nano 2.9.3 /opt/tomcat9/webapps/manager/META-INF/context.xml Modified

<?xml version="1.0" encoding="UTF-8"?>
<!--
Licensed to the Apache Software Foundation (ASF) under one or more
contributor license agreements.  See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License.  You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

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distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->

<Context antiResourceLocking="false" privileged="true" >
<!--
  <Valve className="org.apache.catalina.valves.RemoteAddrValve"
    allow="127\.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1" />
  <Manager sessionAttributeValueClassNameFilter="java\.lang\.(?:Boolean|Integer|Long|Number|string)$"
-->
</Context>
```

Hacemos lo mismo para el host-manager

`sudo nano /opt/tomcat9/webapps/host-manager/META-INF/context.xml`

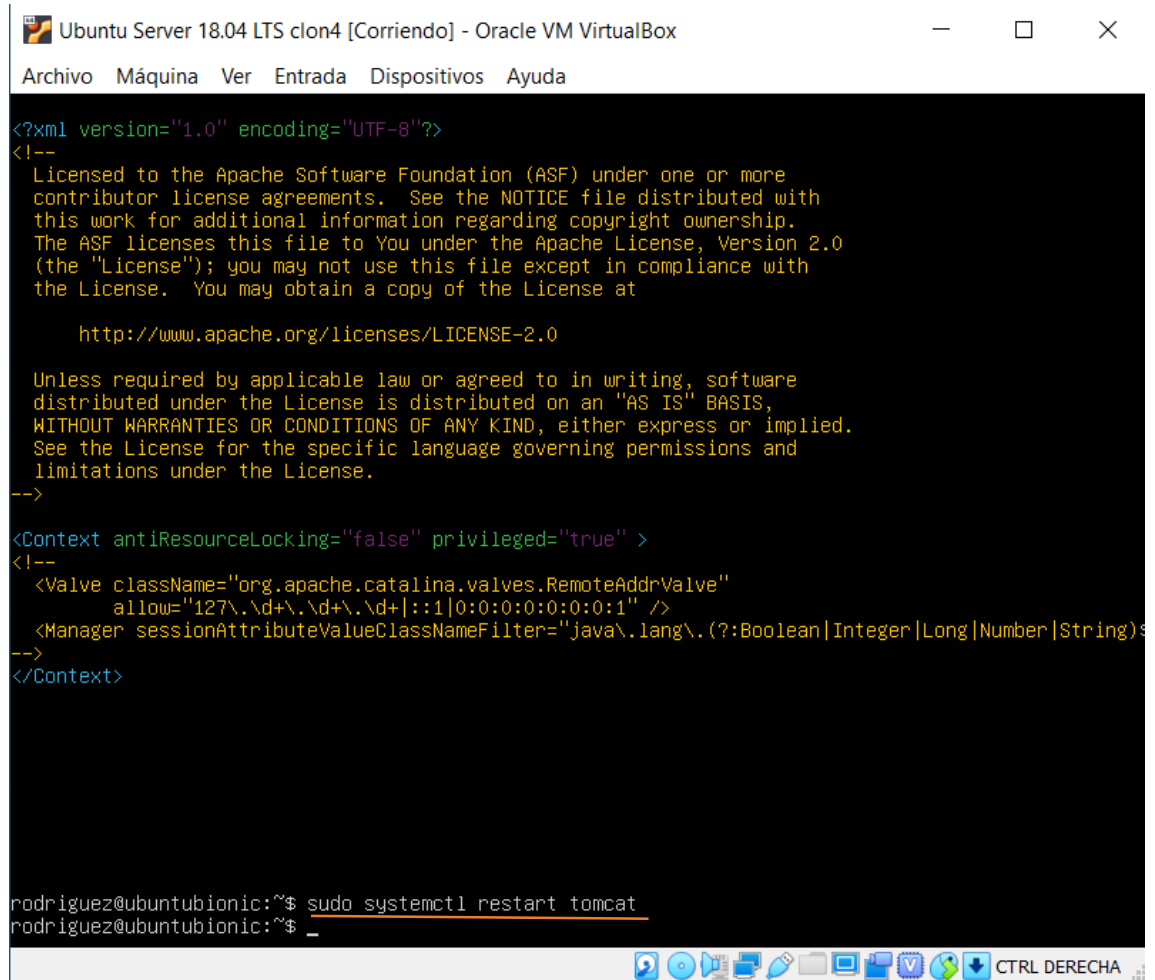
```

<?xml version="1.0" encoding="UTF-8"?>
<!--
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contributor license agreements.  See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License.  You may obtain a copy of the License at

    http://www.apache.org/licenses/LICENSE-2.0

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distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->
<Context antiResourceLocking="false" privileged="true" >
  <!--
    <Valve className="org.apache.catalina.valves.RemoteAddrValve"
      allow="127\.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1" />
    <Manager sessionAttributeValueClassNameFilter="java\.lang\.(?:Boolean|Integer|Long|Number|string)$
  -->
</Context>
  
```

Para que los cambios se hagan efectivos hay que reiniciar el servicio tomcat



```
Ubuntu Server 18.04 LTS clon4 [Corriendo] - Oracle VM VirtualBox
Archivo Máquina Ver Entrada Dispositivos Ayuda

<?xml version="1.0" encoding="UTF-8"?>
<!--
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contributor license agreements. See the NOTICE file distributed with
this work for additional information regarding copyright ownership.
The ASF licenses this file to You under the Apache License, Version 2.0
(the "License"); you may not use this file except in compliance with
the License. You may obtain a copy of the License at

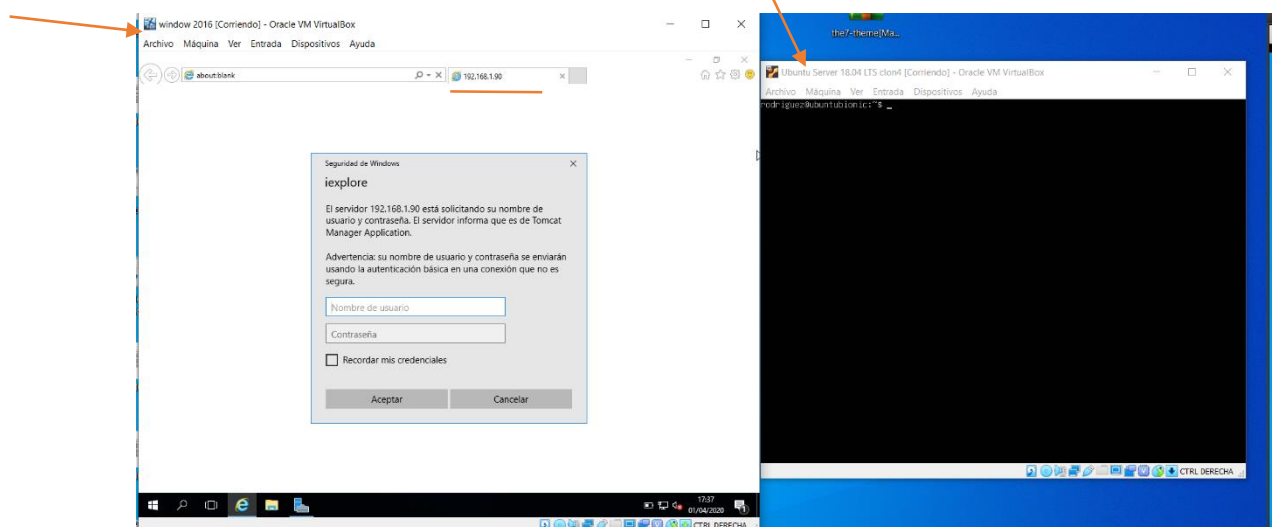
    http://www.apache.org/licenses/LICENSE-2.0

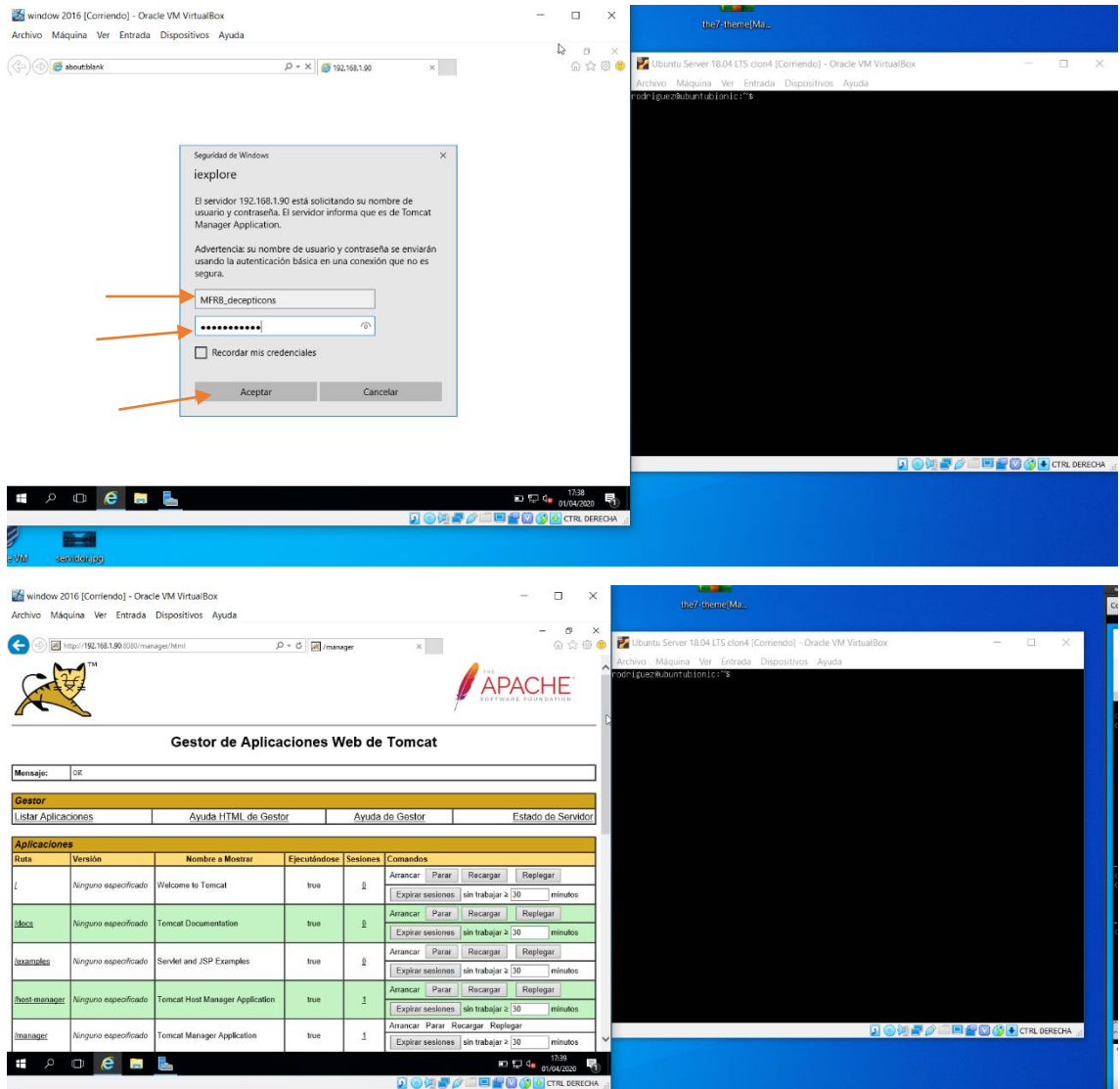
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distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
See the License for the specific language governing permissions and
limitations under the License.
-->

<Context antiResourceLocking="false" privileged="true" >
<!--
  <Valve className="org.apache.catalina.valves.RemoteAddrValve"
    allow="127\.\d+\.\d+\.\d+|::1|0:0:0:0:0:0:0:1" />
  <Manager sessionAttributeValueClassNameFilter="java\.lang\.(?:Boolean|Integer|Long|Number|string)"
-->
</Context>

rodriguez@ubuntubionic:~$ sudo systemctl restart tomcat
rodriguez@ubuntubionic:~$
```

Ahora hacemos la comprobación desde un cliente.





Comprobación del funcionamiento ok del servidor entrando en algún ejemplo que ya existe.

