

Instalación y configuración de MariaDB

Práctica 2 de ASGBD

29/09/2020

2ºASIR

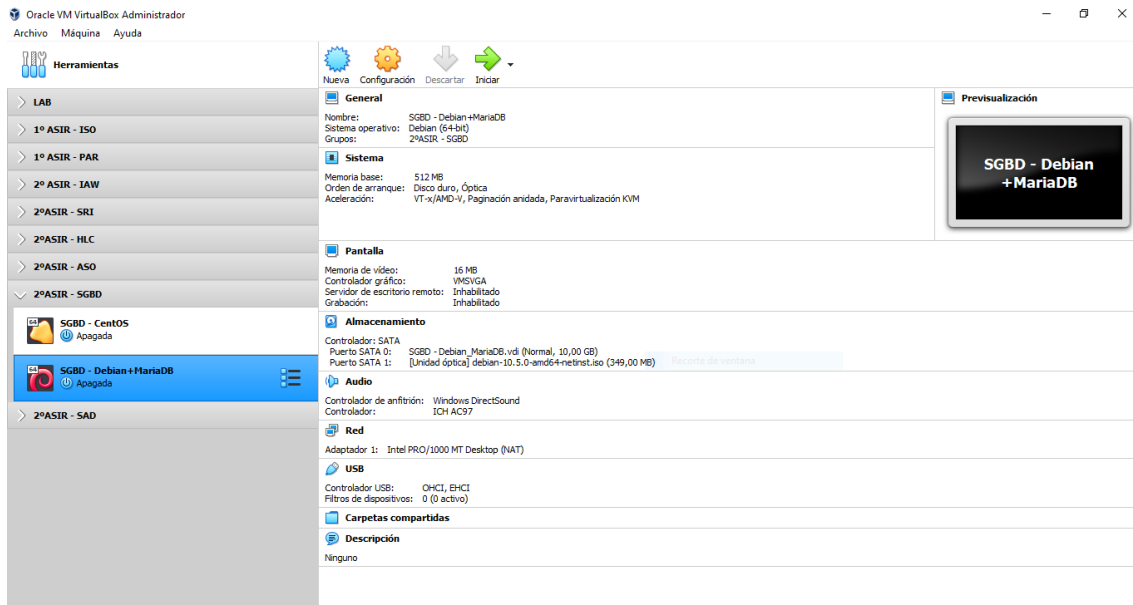
Rafael Jiménez Cobos

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Configuración del hardware de la Máquina Virtual

Esta es la configuración que he realizado en la máquina virtual.

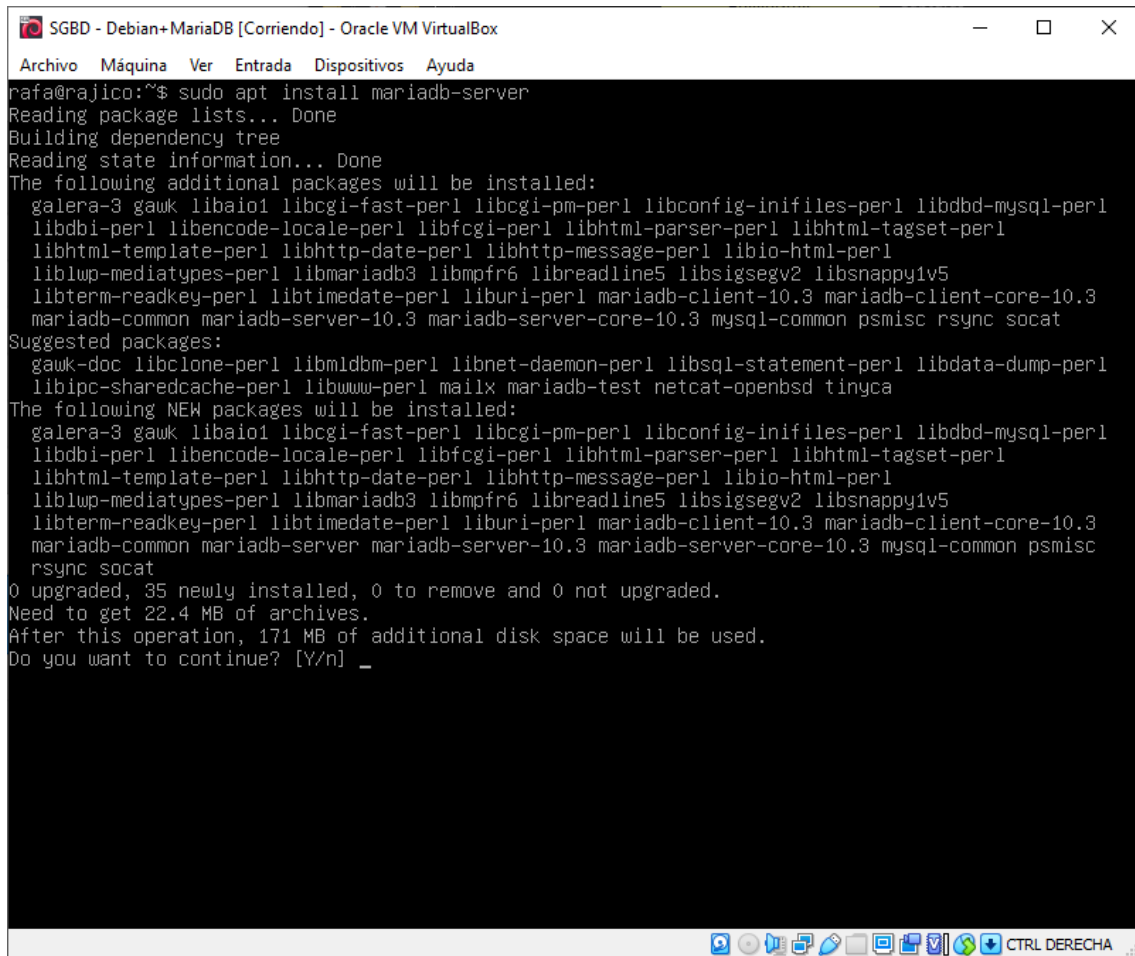


- Sistema operativo: Debian 10, especificado por el enunciado de la práctica, sin entorno gráfico. Arquitectura de 64 bits.
- Memoria RAM: 512 MB. Mínimo recomendado para Debian sin GUI y para MariaDB.
- Disco duro: 10GB. Recomendado para Debian, y es más que suficiente para MariaDB.
- El resto de parámetros son las opciones por defecto.

Instalación de MariaDB

Antes de nada, debemos actualizar el sistema operativo. Esto lo podemos hacer con los comandos `apt update` y `apt upgrade`.

Para instalar MariaDB debemos instalar el paquete `mariadb-server`.

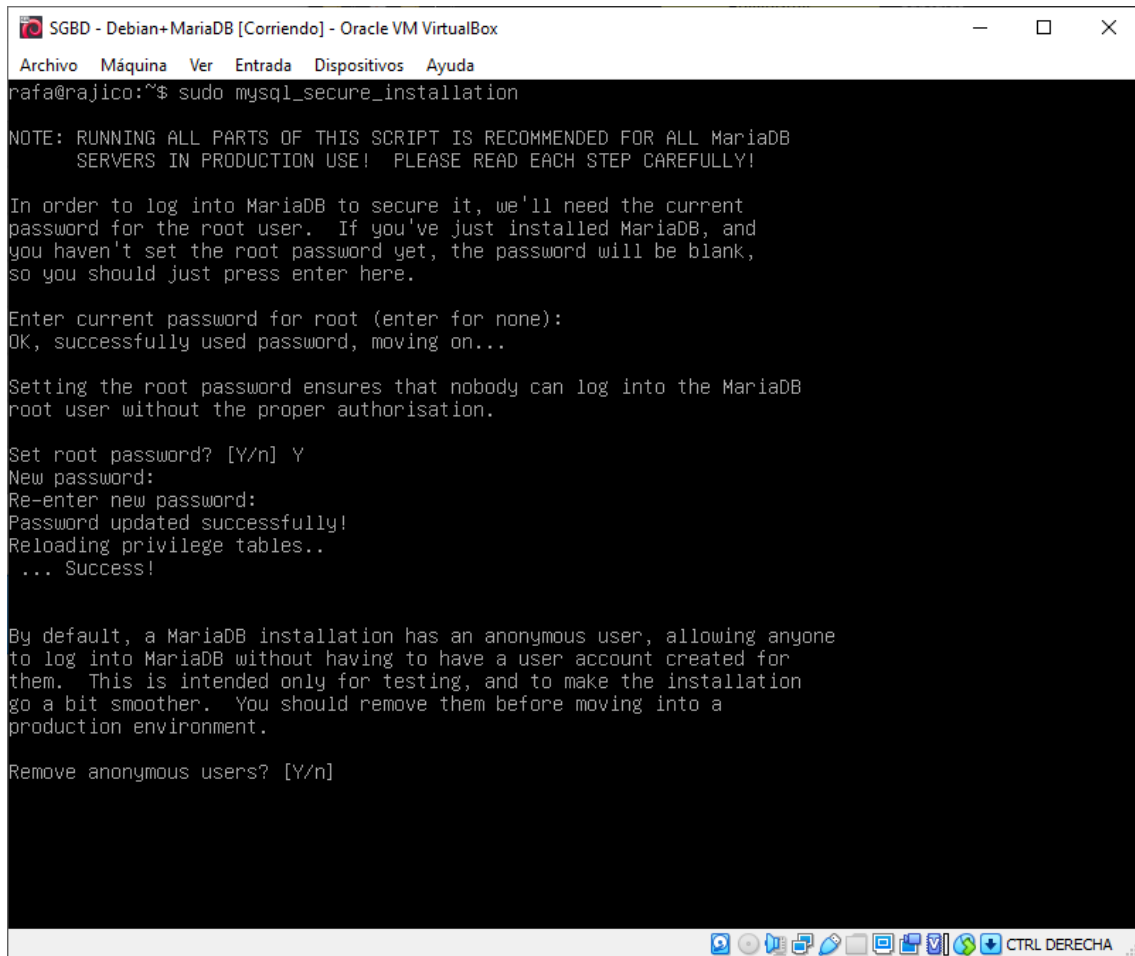


```
SGBD - Debian+MariaDB [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
rafa@rajico:~$ sudo apt install mariadb-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  galera-3 gawk libaio1 libbcgi-fast-perl libbcgi-pm-perl libconfig-inifiles-perl libdbd-mysql-perl
  libdbi-perl libencode-locale-perl libfcgi-perl libhtml-parser-perl libhtml-tagset-perl
  libhtml-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl
  liblwp-mediatypes-perl libmariadb3 libmpfr6 libreadline5 libsigsegv2 libsnappy1v5
  libterm-readkey-perl libtimedate-perl liburi-perl mariadb-client-10.3 mariadb-client-core-10.3
  mariadb-common mariadb-server-10.3 mariadb-server-core-10.3 mysql-common psmisc rsync socat
Suggested packages:
  gawk-doc libclone-perl libmldbm-perl libnet-daemon-perl libsql-statement-perl libdata-dump-perl
  libipc-sharedcache-perl libwww-perl mailx mariadb-test netcat-openbsd tinycat
The following NEW packages will be installed:
  galera-3 gawk libaio1 libbcgi-fast-perl libbcgi-pm-perl libconfig-inifiles-perl libdbd-mysql-perl
  libdbi-perl libencode-locale-perl libfcgi-perl libhtml-parser-perl libhtml-tagset-perl
  libhtml-template-perl libhttp-date-perl libhttp-message-perl libio-html-perl
  liblwp-mediatypes-perl libmariadb3 libmpfr6 libreadline5 libsigsegv2 libsnappy1v5
  libterm-readkey-perl libtimedate-perl liburi-perl mariadb-client-10.3 mariadb-client-core-10.3
  mariadb-common mariadb-server mariadb-server-10.3 mariadb-server-core-10.3 mysql-common psmisc
  rsync socat
0 upgraded, 35 newly installed, 0 to remove and 0 not upgraded.
Need to get 22.4 MB of archives.
After this operation, 171 MB of additional disk space will be used.
Do you want to continue? [Y/n] _
```

Como se puede apreciar, necesitamos una serie de paquetes adicionales que no se encuentran en el sistema. Al finalizar la instalación se levantará el servicio con la configuración por defecto.

Asegurando la instalación del SGBD

Debemos darle seguridad a la instalación de MariaDB. Esto lo podemos hacer con el comando `mysql_secure_installation`.



```
SGBD - Debian+MariaDB [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
rafa@rajico:~$ sudo mysql_secure_installation

NOTE: RUNNING ALL PARTS OF THIS SCRIPT IS RECOMMENDED FOR ALL MariaDB
SERVERS IN PRODUCTION USE!  PLEASE READ EACH STEP CAREFULLY!

In order to log into MariaDB to secure it, we'll need the current
password for the root user.  If you've just installed MariaDB, and
you haven't set the root password yet, the password will be blank,
so you should just press enter here.

Enter current password for root (enter for none):
OK, successfully used password, moving on...

Setting the root password ensures that nobody can log into the MariaDB
root user without the proper authorisation.

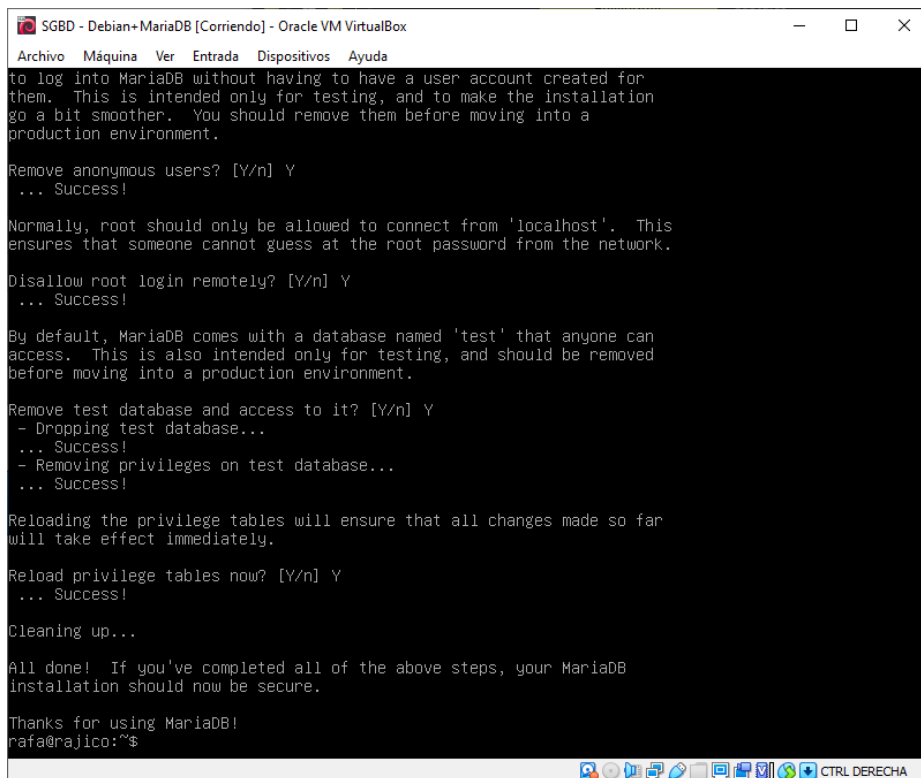
Set root password? [Y/n] Y
New password:
Re-enter new password:
Password updated successfully!
Reloading privilege tables..
... Success!

By default, a MariaDB installation has an anonymous user, allowing anyone
to log into MariaDB 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? [Y/n]
```

Nos hará una serie de preguntas:

- ¿Queremos asignarle contraseña al usuario root de MariaDB? Aceptamos y asignamos la contraseña.
- ¿Queremos borrar usuarios anónimos? Aceptamos, ya que de lo contrario, cualquiera podría conectarse al servidor en estos momentos.



```
SGBD - Debian+MariaDB [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
to log into MariaDB 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? [Y/n] 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? [Y/n] Y
... Success!

By default, MariaDB 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? [Y/n] Y
- Dropping test database...
... Success!
- Removing privileges on test database...
... Success!

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

Reload privilege tables now? [Y/n] Y
... Success!

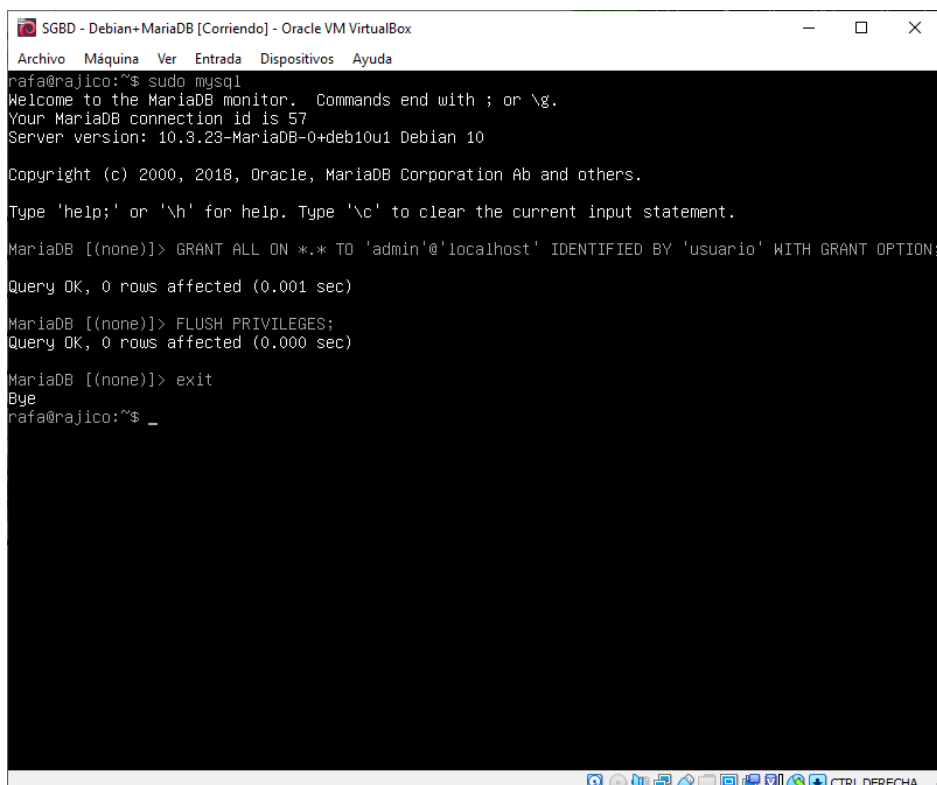
Cleaning up...

All done! If you've completed all of the above steps, your MariaDB
installation should now be secure.

Thanks for using MariaDB!
rafa@rajico:~$
```

- ¿Queremos que el usuario root no pueda conectarse remotamente? Aceptamos.
- ¿Queremos eliminar la base de datos de prueba y el acceso a ella? Aceptamos.
- ¿Queremos recargar las tablas de privilegios? Aceptamos.

Para finalizar, ejecutamos `sudo mysql` y creamos un usuario con permisos de root, para no tener que utilizar dicha cuenta.



```
SGBD - Debian+MariaDB [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
rafa@rajico:~$ sudo mysql
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 57
Server version: 10.3.23-MariaDB-0+deb10u1 Debian 10

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

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

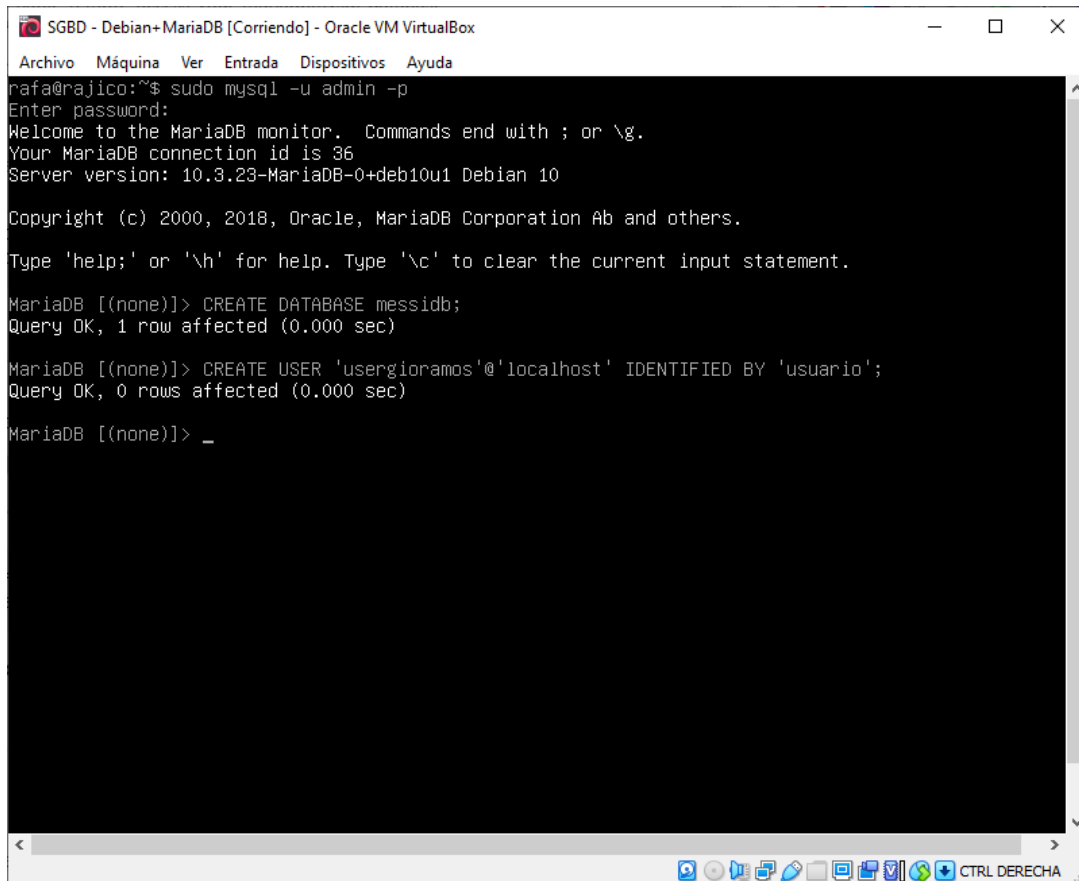
MariaDB [(none)]> GRANT ALL ON *.* TO 'admin'@'localhost' IDENTIFIED BY 'usuario' WITH GRANT OPTION;
Query OK, 0 rows affected (0.001 sec)

MariaDB [(none)]> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> exit
Bye
rafa@rajico:~$ _
```

NOTA: Las contraseñas utilizadas en esta práctica no son recomendables al no ser muy seguras. Las he utilizado porque es un entorno controlado.

Una vez terminamos la instalación y aseguración de mysql, vamos a crear el usuario con el que realizaremos la práctica y la base de datos. Para ello, entramos en mysql y creamos la base de datos messidb y el usuario usergioramos.

A screenshot of a terminal window titled "SGBD - Debian+MariaDB [Corriendo] - Oracle VM VirtualBox". The terminal shows a user named "rafa@rajico" running the command "sudo mysql -u admin -p". The prompt "Enter password:" is shown, followed by the MariaDB monitor welcome message. The user then enters two SQL commands: "CREATE DATABASE messidb;" and "CREATE USER 'usergioramos'@'localhost' IDENTIFIED BY 'usuario';". Both commands execute successfully, with the first showing "Query OK, 1 row affected (0.000 sec)" and the second showing "Query OK, 0 rows affected (0.000 sec)". The terminal ends with a prompt "MariaDB [(none)]> _".

```
SGBD - Debian+MariaDB [Corriendo] - Oracle VM VirtualBox
Archivo  Máquina  Ver  Entrada  Dispositivos  Ayuda
rafa@rajico:~$ sudo mysql -u admin -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 36
Server version: 10.3.23-MariaDB-0+deb10u1 Debian 10

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

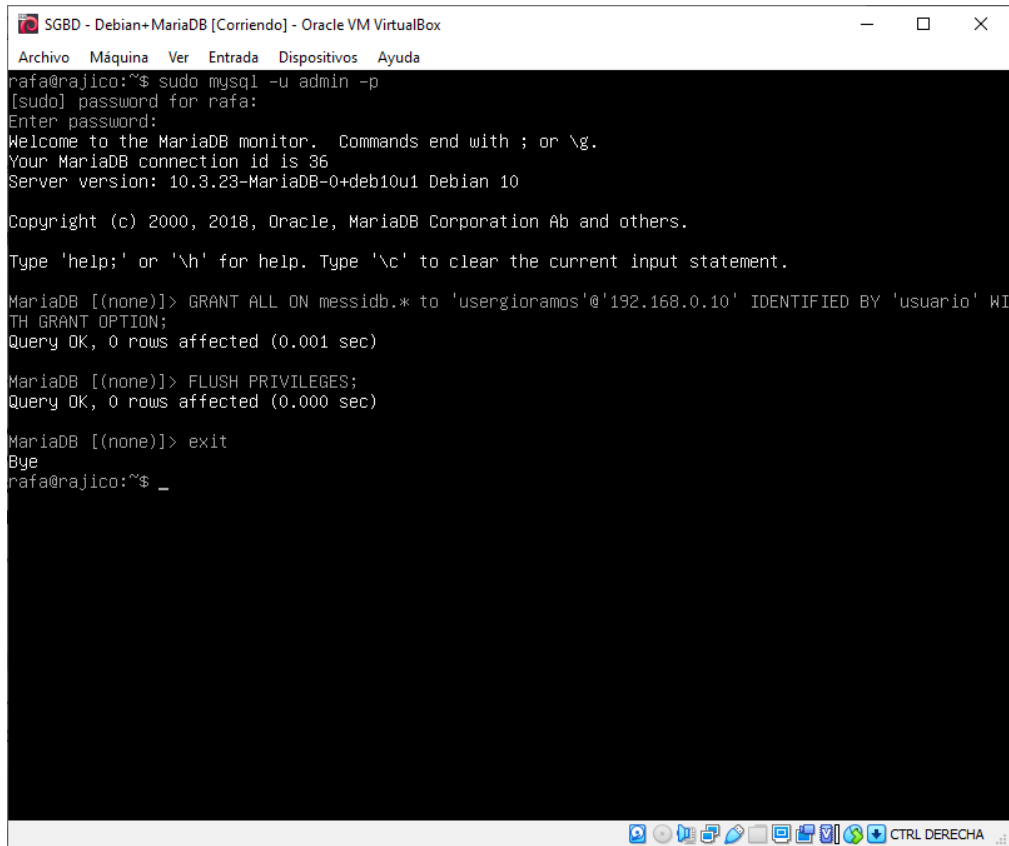
Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE DATABASE messidb;
Query OK, 1 row affected (0.000 sec)

MariaDB [(none)]> CREATE USER 'usergioramos'@'localhost' IDENTIFIED BY 'usuario';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> _
```

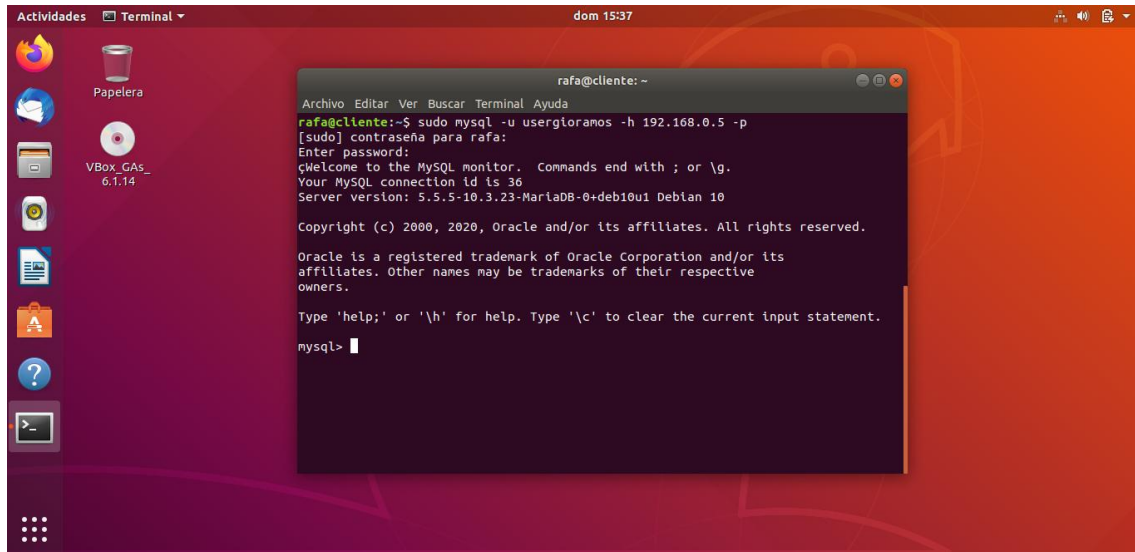
Y por último, le asignamos permisos SOLO en la base de datos messidb, y habilitamos la conexión mediante el host 192.168.0.10:

A screenshot of a terminal window titled "SGBD - Debian+ MariaDB [Corriendo] - Oracle VM VirtualBox". The terminal shows a user named 'rafa' at a host named 'rajico' running the command 'sudo mysql -u admin -p'. The user enters a password, and the terminal displays the MariaDB monitor interface. The user then runs the command 'GRANT ALL ON messidb.* to 'usengioramos'@'192.168.0.10' IDENTIFIED BY 'usuario' WITH GRANT OPTION;', which is successful. Next, the user runs 'FLUSH PRIVILEGES;', also successful. Finally, the user types 'exit' to leave the monitor. The terminal window has a menu bar with 'Archivo', 'Máquina', 'Ver', 'Entrada', 'Dispositivos', and 'Ayuda'. The bottom status bar shows various icons and the text 'CTRL DERECHA'.

Ya tenemos lo necesario para que el usuario usengioramos se conecte remotamente y administre la base de datos.

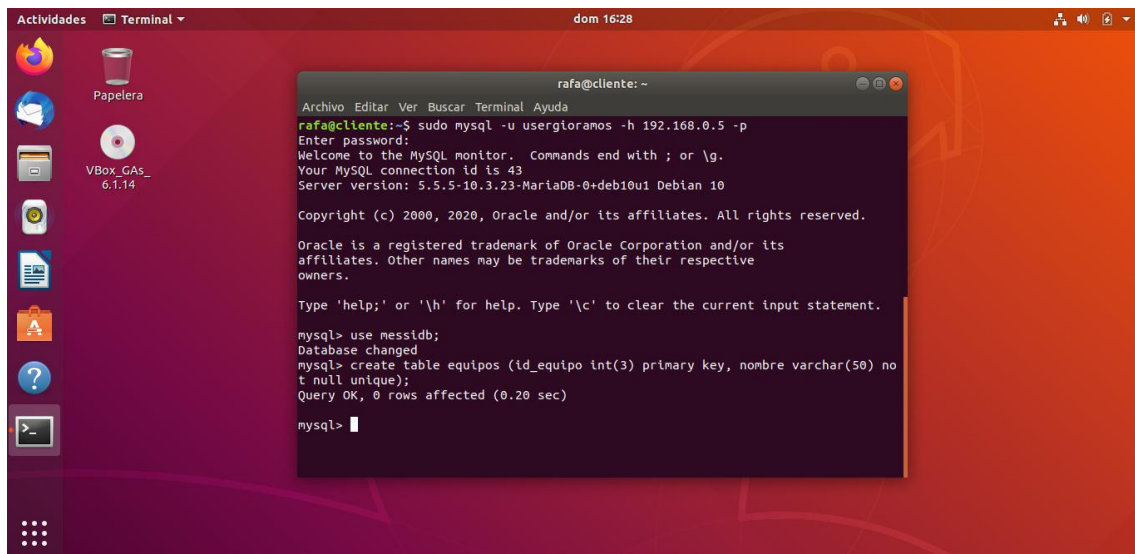
Creando las tablas e insertando datos

Nos conectamos al servidor mysql mediante el cliente.

A terminal window titled 'rafa@cliente: ~' is open on a Linux desktop. The user has executed the command 'sudo mysql -u usergioramos -h 192.168.0.5 -p'. The terminal shows the password prompt, the MySQL monitor welcome message, the connection ID (36), and the server version (5.5.5-10.3.23-MariaDB-0+deb10u1 Debian 10). The prompt 'mysql>' is visible at the bottom.

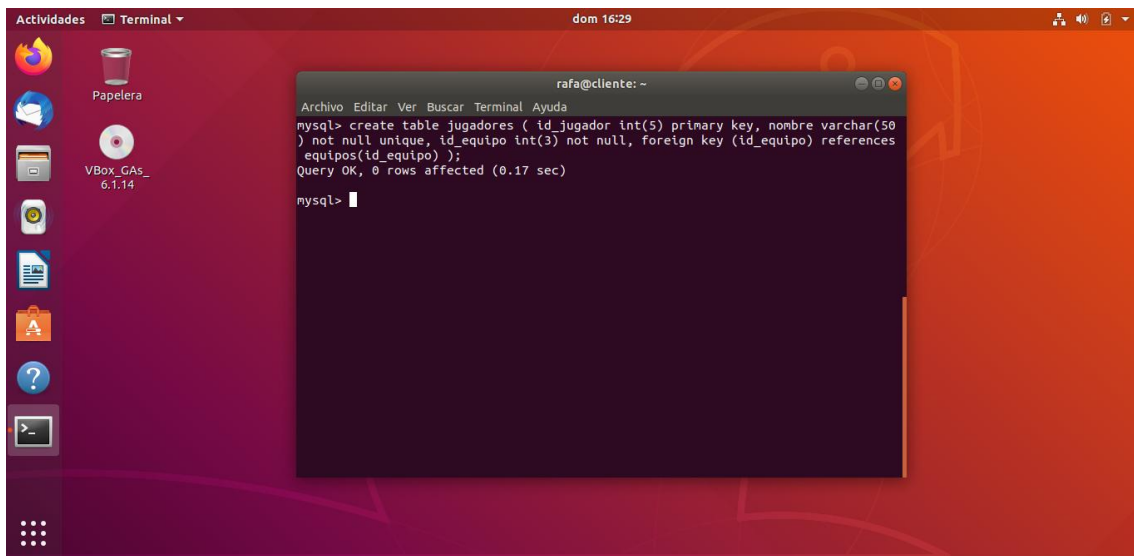
```
rafa@cliente: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
rafa@cliente:~$ sudo mysql -u usergioramos -h 192.168.0.5 -p  
[sudo] contraseña para rafa:  
Enter password:  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 36  
Server version: 5.5.5-10.3.23-MariaDB-0+deb10u1 Debian 10  
  
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>
```

Creamos la tabla equipos:

A terminal window titled 'rafa@cliente: ~' is open on a Linux desktop. The user has executed the command 'sudo mysql -u usergioramos -h 192.168.0.5 -p'. The terminal shows the password prompt, the MySQL monitor welcome message, the connection ID (43), and the server version (5.5.5-10.3.23-MariaDB-0+deb10u1 Debian 10). The user has then entered 'use messidb;' and 'create table equipos (id_equipo int(3) primary key, nombre varchar(50) not null unique);'. The terminal shows the database changed, the table creation command, and the query OK message. The prompt 'mysql>' is visible at the bottom.

```
rafa@cliente: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
rafa@cliente:~$ sudo mysql -u usergioramos -h 192.168.0.5 -p  
Enter password:  
Welcome to the MySQL monitor.  Commands end with ; or \g.  
Your MySQL connection id is 43  
Server version: 5.5.5-10.3.23-MariaDB-0+deb10u1 Debian 10  
  
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> use messidb;  
Database changed  
mysql> create table equipos (id_equipo int(3) primary key, nombre varchar(50) no  
t null unique);  
Query OK, 0 rows affected (0.20 sec)  
  
mysql>
```

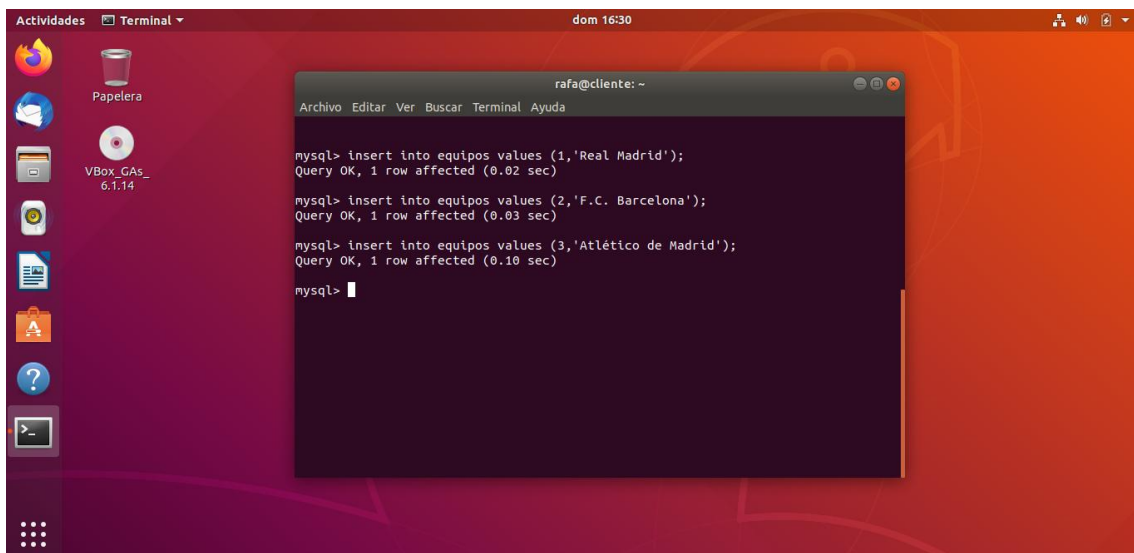
Y la tabla jugadores:



The screenshot shows a Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
rafa@cliente: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
mysql> create table jugadores ( id_jugador int(5) primary key, nombre varchar(50  
) not null unique, id_equipo int(3) not null, foreign key (id_equipo) references  
equipos(id_equipo) );  
Query OK, 0 rows affected (0.17 sec)  
mysql>
```

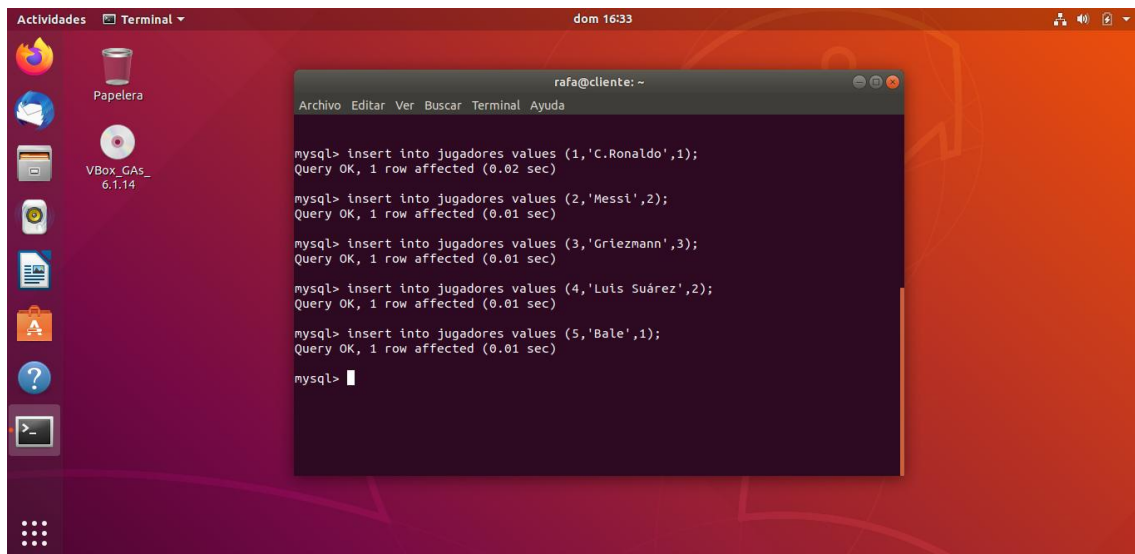
A continuación, insertamos datos en equipos:



The screenshot shows a Linux desktop environment with a terminal window open. The terminal displays the following commands and output:

```
rafa@cliente: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
mysql> insert into equipos values (1,'Real Madrid');  
Query OK, 1 row affected (0.02 sec)  
mysql> insert into equipos values (2,'F.C. Barcelona');  
Query OK, 1 row affected (0.03 sec)  
mysql> insert into equipos values (3,'Atlético de Madrid');  
Query OK, 1 row affected (0.10 sec)  
mysql>
```

Y por último, en jugadores:



```
mysql> insert into jugadores values (1,'C.Ronaldo',1);
Query OK, 1 row affected (0.02 sec)

mysql> insert into jugadores values (2,'Messi',2);
Query OK, 1 row affected (0.01 sec)

mysql> insert into jugadores values (3,'Griezmann',3);
Query OK, 1 row affected (0.01 sec)

mysql> insert into jugadores values (4,'Luis Suárez',2);
Query OK, 1 row affected (0.01 sec)

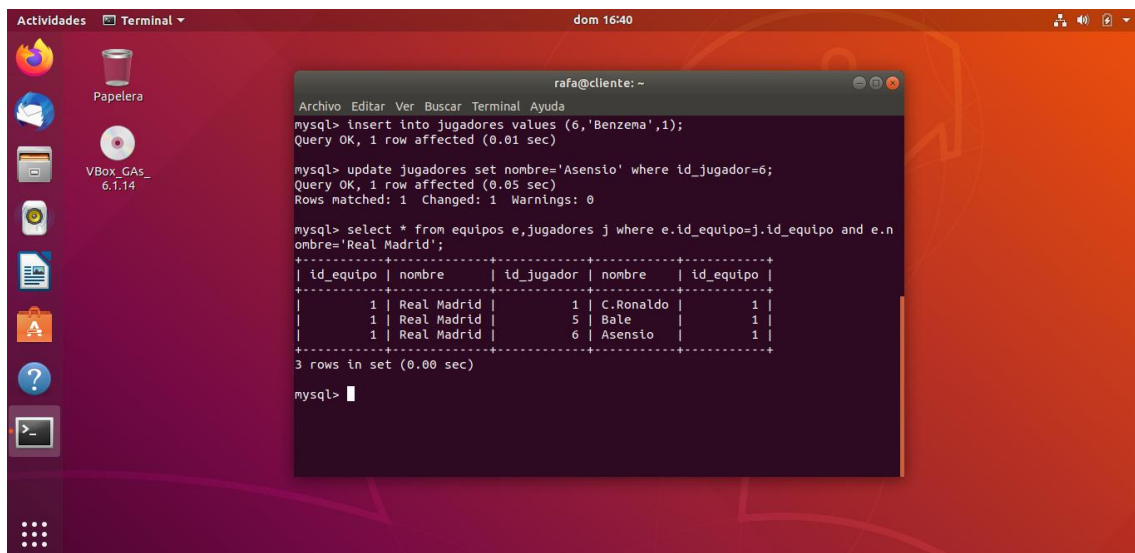
mysql> insert into jugadores values (5,'Bale',1);
Query OK, 1 row affected (0.01 sec)

mysql>
```

Demonstración de consultas

A continuación voy a realizar una serie de consultas.

- Inserción del jugador Benzema: insert into jugadores values (6,'Benzema',1);
- Modificar el jugador Benzema para que su nombre sea Asensio: update jugadores set nombre='Asensio' where id_jugadores=6
- Mostrar todos los jugadores que estén en el Real Madrid: select * from equipos e, jugadores j where e.id_equipo=j.id_equipo and e.nombre='Real Madrid';



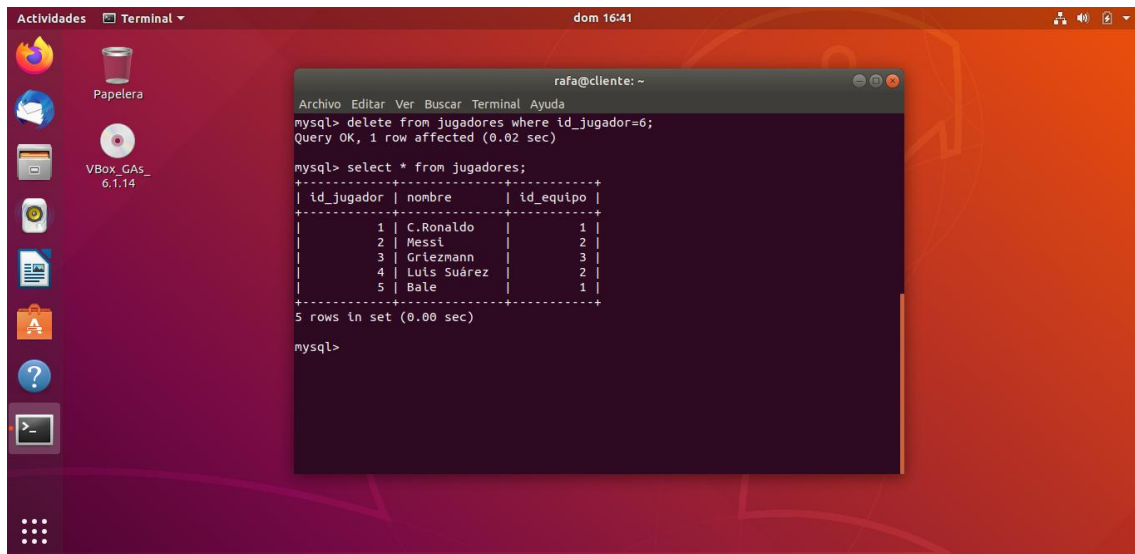
```
mysql> insert into jugadores values (6,'Benzema',1);
Query OK, 1 row affected (0.01 sec)

mysql> update jugadores set nombre='Asensio' where id_jugador=6;
Query OK, 1 row affected (0.05 sec)
Rows matched: 1  Changed: 1  Warnings: 0

mysql> select * from equipos e,jugadores j where e.id_equipo=j.id_equipo and e.nombre='Real Madrid';
+-----+-----+-----+-----+
| id_equipo | nombre | id_jugador | nombre | id_equipo |
+-----+-----+-----+-----+
| 1 | Real Madrid | 1 | C.Ronaldo | 1 |
| 1 | Real Madrid | 5 | Bale | 1 |
| 1 | Real Madrid | 6 | Asensio | 1 |
+-----+-----+-----+-----+
3 rows in set (0.00 sec)

mysql>
```

Borra el jugador Benzema, que es el que tiene el id 6: delete from jugadores where id_jugador=6;



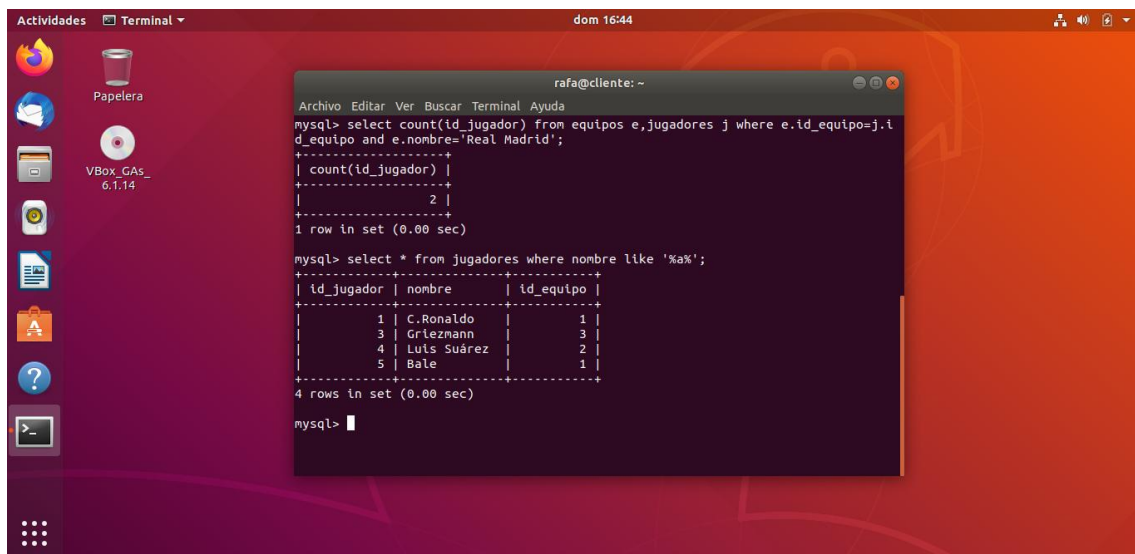
The screenshot shows a terminal window titled 'rafa@cliente: ~' with the following commands and output:

```
mysql> delete from jugadores where id_jugador=6;
Query OK, 1 row affected (0.02 sec)

mysql> select * from jugadores;
+-----+-----+-----+
| id_jugador | nombre | id_equipo |
+-----+-----+-----+
| 1 | C.Ronaldo | 1 |
| 2 | Messi | 2 |
| 3 | Griezmann | 3 |
| 4 | Luis Suárez | 2 |
| 5 | Bale | 1 |
+-----+-----+-----+
5 rows in set (0.00 sec)

mysql>
```

- Cuenta cuantos jugadores hay en el equipo Real Madrid: select count(id_jugador) from equipos e,jugadores j where e.id_equipo=j.id_equipo and e.nombre='Real Madrid';
- Muéstrame los jugadores cuyo nombre contenga la letra a: select * from jugadores where nombre like "%a%";



The screenshot shows a terminal window titled 'rafa@cliente: ~' with the following commands and output:

```
mysql> select count(id_jugador) from equipos e,jugadores j where e.id_equipo=j.id_equipo and e.nombre='Real Madrid';
+-----+
| count(id_jugador) |
+-----+
| 2 |
+-----+
1 row in set (0.00 sec)

mysql> select * from jugadores where nombre like '%a%';
+-----+-----+-----+
| id_jugador | nombre | id_equipo |
+-----+-----+-----+
| 1 | C.Ronaldo | 1 |
| 3 | Griezmann | 3 |
| 4 | Luis Suárez | 2 |
| 5 | Bale | 1 |
+-----+-----+-----+
4 rows in set (0.00 sec)

mysql>
```

Mysqtuner

Antes de empezar la instalación de mysqtuner, vamos a comprobar el rendimiento de la máquina tras reiniciarla:

CPU [0.7%]				Tasks: 17, 34 thr: 1 running							
Mem [121M/483M]				Load average: 0.00 0.00 0.00							
Swp [0K/510M]				Uptime: 00:00:38							
PID	USER	PRI	NI	VIRT	RES	SHR	S	CPU%	MEM%	TIME+	Command
593	rafa	20	0	4924	3348	2776	R	0.7	0.7	0:00.01	http
1	root	20	0	21868	9900	7828	S	0.0	2.0	0:00.72	/sbin/init
395	root	20	0	220M	3724	3028	S	0.0	0.8	0:00.01	/usr/sbin/rsyslogd -n -iNONE
208	root	20	0	30908	7728	6696	S	0.0	1.6	0:00.09	/lib/systemd/systemd-journald
232	root	20	0	21932	4660	3868	S	0.0	0.9	0:00.05	/lib/systemd/systemd-udev
400	systemd-t	20	0	93084	6432	5580	S	0.0	1.3	0:00.00	/lib/systemd/systemd-timesyncd
330	systemd-t	20	0	93084	6432	5580	S	0.0	1.3	0:00.03	/lib/systemd/systemd-timesyncd
391	root	20	0	9488	5580	4296	S	0.0	1.1	0:00.00	/sbin/dhclient -4 -v -i -pf /run/dhcl
411	root	20	0	220M	3724	3028	S	0.0	0.8	0:00.00	/usr/sbin/rsyslogd -n -iNONE
412	root	20	0	220M	3724	3028	S	0.0	0.8	0:00.00	/usr/sbin/rsyslogd -n -iNONE
414	root	20	0	220M	3724	3028	S	0.0	0.8	0:00.00	/usr/sbin/rsyslogd -n -iNONE
396	root	20	0	19520	7184	6232	S	0.0	1.5	0:00.02	/lib/systemd/systemd-logind
397	root	20	0	5512	2256	2052	S	0.0	0.5	0:00.00	/usr/sbin/cron -f
398	messagebu	20	0	8984	3672	3320	S	0.0	0.7	0:00.02	/usr/bin/dbus-daemon --system --adre
403	root	20	0	19768	5220	4612	S	0.0	1.1	0:00.00	/sbin/wpa_supplicant -u -s -O /run/wp
437	root	20	0	6924	3432	2912	S	0.0	0.7	0:00.02	/bin/login -p --
442	root	20	0	15852	6724	5884	S	0.0	1.4	0:00.00	/usr/sbin/sshd -D
497	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
498	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
499	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
500	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
501	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
502	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
503	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
504	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
505	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
506	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
507	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
508	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
509	mysql	20	0	1225M	78984	18088	S	0.0	16.0	0:00.00	/usr/sbin/mysqld
F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice -F8Nice +F9Kill F10Quit											

A continuación, vamos a descargar mysqtuner, una utilidad para afinar mysql y mejorar su rendimiento.

```
rafa@rajico:~$ wget http://mysqtuner.pl/ -O mysqtuner.pl
--2020-09-27 17:05:16-- http://mysqtuner.pl/
Resolving mysqtuner.pl (mysqtuner.pl)... 217.70.184.38
Connecting to mysqtuner.pl (mysqtuner.pl)|217.70.184.38|:80... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://raw.githubusercontent.com/major/MySQLTuner-perl/master/mysqtuner.pl [following]
--2020-09-27 17:05:16-- https://raw.githubusercontent.com/major/MySQLTuner-perl/master/mysqtuner.pl
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 151.101.0.133, 151.101.64.133, 151.101.128.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|151.101.0.133|:443... connected.
HTTP request sent, awaiting response... 301 Moved Permanently
Location: https://raw.githubusercontent.com/major/MySQLTuner-perl/master/mysqtuner.pl [following]
--2020-09-27 17:05:17-- https://raw.githubusercontent.com/major/MySQLTuner-perl/master/mysqtuner.pl
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 151.101.0.133, 151.101.64.133, 151.101.128.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)|151.101.0.133|:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 226093 (221K) [text/plain]
Saving to: 'mysqtuner.pl'

mysqtuner.pl          100%[=====] 220.79K  1.40MB/s   in 0.2s

2020-09-27 17:05:17 (1.40 MB/s) - 'mysqtuner.pl' saved [226093/226093]

rafa@rajico:~$ _
```

Nos bajamos también el archivo vulnerabilities.csv.

```
rafa@rajico:~$ wget https://raw.githubusercontent.com/major/MySQLTuner-perl/master/basic_passwords.txt
--2020-09-27 17:06:22-- https://raw.githubusercontent.com/major/MySQLTuner-perl/master/basic_passwords.txt
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 151.101.0.133, 151.101.64.133, 151.101.128.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)[151.101.0.133]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 3988 (3.9K) [text/plain]
Saving to: 'basic_passwords.txt'

basic_passwords.txt      100%[=====] 3.89K --.-KB/s  in 0.001s

2020-09-27 17:06:22 (2.66 MB/s) - 'basic_passwords.txt' saved [3988/3988]

rafa@rajico:~$ wget https://raw.githubusercontent.com/major/MySQLTuner-perl/master/vulnerabilities.csv
--2020-09-27 17:06:53-- https://raw.githubusercontent.com/major/MySQLTuner-perl/master/vulnerabilities.csv
Resolving raw.githubusercontent.com (raw.githubusercontent.com)... 151.101.0.133, 151.101.64.133, 151.101.128.133, ...
Connecting to raw.githubusercontent.com (raw.githubusercontent.com)[151.101.0.133]:443... connected.
HTTP request sent, awaiting response... 200 OK
Length: 1185249 (1.1M) [text/plain]
Saving to: 'vulnerabilities.csv'

vulnerabilities.csv      100%[=====] 1.13M 3.73MB/s  in 0.3s

2020-09-27 17:06:54 (3.73 MB/s) - 'vulnerabilities.csv' saved [1185249/1185249]

rafa@rajico:~$ _
```

Ejecutamos mysqltuner:

```
rafa@rajico:~$ ./mysqltuner.pl
>> MySQLTuner 1.7.19 - Major Hayden <major@mhtx.net>
>> Bug reports, feature requests, and downloads at http://mysqltuner.pl/
>> Run with '--help' for additional options and output filtering

[--] Skipped version check for MySQLTuner script
Please enter your MySQL administrative login: admin
Please enter your MySQL administrative password: [OK] Currently running supported MySQL version 10.3.23-MariaDB-0+deb10u1
[OK] Operating on 64-bit architecture

----- Log file Recommendations -----
[!!] Log file /var/log/mysql/error.log doesn't exist

----- Storage Engine Statistics -----
[--] Status: +Aria +CSV +InnoDB +MEMORY +MRG_MyISAM +MyISAM +PERFORMANCE_SCHEMA +SEQUENCE
[--] Data in InnoDB tables: 80.0K (Tables: 2)
[OK] Total fragmented tables: 0

----- Analysis Performance Metrics -----
[--] innodb_stats_on_metadata: OFF
[OK] No stat updates during querying INFORMATION_SCHEMA.

----- Security Recommendations -----
[OK] There are no anonymous accounts for any database users
[OK] All database users have passwords assigned
[--] There are 620 basic passwords in the list.
```

Cuando termine de analizar el entorno y la configuración, nos dará una serie de recomendaciones y variables que ajustar.

```
----- XtraDB Metrics -----
[--] XtraDB is disabled.

----- Galera Metrics -----
[--] Galera is disabled.

----- Replication Metrics -----
[--] Galera Synchronous replication: NO
[--] No replication slave(s) for this server.
[--] Binlog format: MIXED
[--] XA support enabled: ON
[--] Semi synchronous replication Master: OFF
[--] Semi synchronous replication Slave: OFF
[--] This is a standalone server

----- Recommendations -----
General recommendations:
  MySQL was started within the last 24 hours - recommendations may be inaccurate
  Reduce your overall MySQL memory footprint for system stability
  Dedicate this server to your database for highest performance.
  Configure your accounts with ip or subnets only, then update your configuration with skip-name-r
  resolve=1
  Performance schema should be activated for better diagnostics
  Consider installing Sys schema from https://github.com/mysql/mysql-sys for MySQL
  Consider installing Sys schema from https://github.com/FromDual/mariadb-sys for MariaDB
  Before changing innodb_log_file_size and/or innodb_log_files_in_group read this: https://bit.ly/
  2TcGgtU
Variables to adjust:
  *** MySQL's maximum memory usage is dangerously high ***
  *** Add RAM before increasing MySQL buffer variables ***
  query_cache_size (=0)
  query_cache_type (=0)
  query_cache_limit (> 1M, or use smaller result sets)
  performance_schema = ON enable PFS
  innodb_log_file_size should be (=16M) if possible, so InnoDB total log files size equals to 25%
  of buffer pool size.
rafa@rajico:~$
```

Recomendaciones:

- No serán del todo acertadas, debido a que Mysql fue iniciado en las últimas 24 horas por primera vez.
- Reducir las huellas de memoria para estabilidad en el sistema.
- Dedicar el servidor para que la base de datos tenga el más alto rendimiento.
- Configurar las cuentas con direcciones ip o subredes y actualizar la configuración con la opción skip-name-resolve=1. (hecho)
- Activar el esquema de rendimiento para mejores diagnósticos. (hecho)
- Instalar esquema del sistema para mysql (no se puede).
- Instalar esquema del sistema para mariadb (instalado).

Variables que ajustar:

- Query_cache_size=0 (hecho).
- Query_cache_type=0(hecho).
- Query_cache_limit >1M (hecho).
- Activar esquema de rendimiento (hecho).
- Tamaño del fichero de logs innodb=16M (hecho).

A continuación, muestro las recomendaciones y variables que he ajustado:

```
GNU nano 3.2 /etc/mysql/mariadb.conf.d/50-server.cnf
#
# These groups are read by MariaDB server.
# Use it for options that only the server (but not clients) should see
#
# See the examples of server my.cnf files in /usr/share/mysql
#
# this is read by the standalone daemon and embedded servers
[server]
#
# this is only for the mysqld standalone daemon
mysqld
skip-name-resolve      = 1
performance_schema     = ON
#
# * Basic Settings
#
user                   = mysql
pid-file               = /run/mysqld/mysqld.pid
socket                 = /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           = 127.0.0.1
#
[ Read 138 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
```

```
GNU nano 3.2 /etc/mysql/mariadb.conf.d/50-server.cnf
#
# * Query Cache Configuration
#
query_cache_limit      = 2M
query_cache_size        = 0M
query_cache_type        = 0
#
# * Logging and Replication
#
# Both location gets rotated by the cronjob.
# Be aware that this log type is a performance killer.
# As of 5.1 you can enable the log at runtime!
#general_log_file       = /var/log/mysql/mysql.log
#general_log             = 1
#
# Error log - should be very few entries.
#
log_error = /var/log/mysql/error.log
#
# Enable the slow query log to see queries with especially long duration
#slow_query_log_file     = /var/log/mysql/mariadb-slow.log
#long_query_time         = 10
#log_slow_rate_limit     = 1000
#log_slow_verbosity      = query_plan
#log-queries-not-using-indexes
#
# The following can be used as easy to replay backup logs or for replication.
# note: if you are setting up a replication slave, see README.Debian about
# other settings you may need to change.
#server-id               = 1
#
^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
```



```
GNU nano 3.2 /etc/mysql/mariadb.conf.d/50-server.cnf

#
# * InnoDB
#
# InnoDB is enabled by default with a 10MB datafile in /var/lib/mysql/.
# Read the manual for more InnoDB related options. There are many!
innodb_log_file_size = 16M
#
# * Unix socket authentication plugin is built-in since 10.0.22-6
#
# Needed so the root database user can authenticate without a password but
# only when running as the unix root user.
#
# Also available for other users if required.
# See https://mariadb.com/kb/en/unix_socket-authentication-plugin/
# this is only for embedded server
[embedded]

# This group is only read by MariaDB servers, not by MySQL.
# If you use the same .cnf file for MySQL and MariaDB,
# you can put MariaDB-only options here
[mariadb]

# This group is only read by MariaDB-10.3 servers.
# If you use the same .cnf file for MariaDB of different versions,
# use this group for options that older servers don't understand
[mariadb-10.3]

^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   ^G Go To Line M-E Redo
```

SGBD - Debian+ MariaDB [Corriendo] - Oracle VM VirtualBox

Archivo Máquina Ver Entrada Dispositivos Ayuda

```
rafa@rajico:~$ cd mariadb-sys/
rafa@rajico:~/mariadb-sys$ sudo mysql -u admin -p < ./mariadb_sys_install.sql
```

Tras esto, volvemos a ejecutar htop, a ver si algo ha cambiado:

```

CPU[|] 0.7% Tasks: 16, 4 thr; 1 running
Mem[|||||] 59.1M/483M Load average: 0.00 0.00 0.00
Sup[|] 0K/510M Uptime: 00:00:17

  PID USER   PRI  NI  VIRT   RES   SHR  S  CPU% MEM%   TIME+  Command
  528 rafa    20   0  4924   3320  2748 R   0.0   0.7   0:00.03 htop
    1 root    20   0  21860  9708  7632 S   0.0   2.0   0:00.70 /sbin/init
  211 root    20   0  28840  7624  6604 S   0.0   1.5   0:00.09 /lib/systemd/systemd-journald
  232 root    20   0  21932  4820  3980 S   0.0   1.0   0:00.05 /lib/systemd/systemd-udev
  402 systemd-t 20   0  93084  6492  5636 S   0.0   1.3   0:00.00 /lib/systemd/systemd-timesyncd
  313 systemd-t 20   0  93084  6492  5636 S   0.0   1.3   0:00.03 /lib/systemd/systemd-timesyncd
  389 root    20   0   9488  5556  4272 S   0.0   1.1   0:00.00 /sbin/dhclient -4 -v -i -pf /run/dhc1
  398 messagebu 20   0   8984  4312  3768 S   0.0   0.9   0:00.02 /usr/bin/dbus-daemon --system --addre
  399 root    20   0  19520  7176  6220 S   0.0   1.4   0:00.02 /lib/systemd/systemd-logind
  404 root    20   0   5512  2256  2052 S   0.0   0.5   0:00.00 /usr/sbin/cron -f
  406 root    20   0  19768  5180  4572 S   0.0   1.0   0:00.00 /sbin/wpa_supplicant -u -s -O /run/wp
  419 root    20   0   220M  3740  3044 S   0.0   0.8   0:00.00 /usr/sbin/rsyslogd -n -iNONE
  420 root    20   0   220M  3740  3044 S   0.0   0.8   0:00.00 /usr/sbin/rsyslogd -n -iNONE
  422 root    20   0   220M  3740  3044 S   0.0   0.8   0:00.00 /usr/sbin/rsyslogd -n -iNONE
  407 root    20   0   220M  3740  3044 S   0.0   0.8   0:00.00 /usr/sbin/rsyslogd -n -iNONE
  434 root    20   0   6924  3416  2892 S   0.0   0.7   0:00.02 /bin/login -p --
  441 root    20   0  15852  6664  5828 S   0.0   1.3   0:00.00 /usr/sbin/sshd -D
  518 rafa    20   0  21028  8420  7300 S   0.0   1.7   0:00.02 /lib/systemd/systemd --user
  519 rafa    20   0  23108  2240    36 S   0.0   0.5   0:00.00 (sd-pam)
  524 rafa    20   0   4924  4208  2748 S   0.0   0.9   0:00.04 -bash

F1Help F2Setup F3Search F4Filter F5Tree F6SortBy F7Nice F8Nice F9Kill F10Quit

```

Se puede apreciar que utiliza aproximadamente la mitad de memoria que usaba antes.

Por último, esta es la comparación tras ejecutar `mysqltuner` después de realizar la configuración recomendada:

```
[OK] Ratio InnoDB log file size / InnoDB Buffer pool size: 16.0M * 2/128.0M should be equal to 25%
[OK] InnoDB buffer pool instances: 1
[--] Number of InnoDB Buffer Pool Chunk : 1 for 1 Buffer Pool Instance(s)
[OK] Innodb_buffer_pool_size aligned with Innodb_buffer_pool_chunk_size & Innodb_buffer_pool_instances
[OK] InnoDB Read buffer efficiency: 90.93% (2176 hits/ 2393 total)
[!!] InnoDB Write Log efficiency: 0% (3 hits/ 0 total)
[OK] InnoDB log waits: 0.00% (0 waits / 3 writes)

----- AriaDB Metrics -----
[--] AriaDB is enabled.
[OK] Aria pagecache size / total Aria indexes: 128.0M/1B

----- TokuDB Metrics -----
[--] TokuDB is disabled.

----- XtraDB Metrics -----
[--] XtraDB is disabled.

----- Galera Metrics -----
[--] Galera is disabled.

----- Replication Metrics -----
[--] Galera Synchronous replication: NO
[--] No replication slave(s) for this server.
[--] Binlog format: MIXED
[--] XA support enabled: ON
[--] Semi synchronous replication Master: OFF
[--] Semi synchronous replication Slave: OFF
[--] This is a standalone server

----- Recommendations -----
General recommendations:
  MySQL was started within the last 24 hours - recommendations may be inaccurate
  Reduce your overall MySQL memory footprint for system stability
  Dedicate this server to your database for highest performance.
rafa@rajiro:~$ _
```

El sistema no necesita la misma cantidad de recursos para ejecutar mariadb.