

Etapa 3 - Prácticas de instalaciones de MV y productos de MV

Resumen

Este documento detalla el proceso de instalación y configuración de tres máquinas virtuales con diferentes propósitos: un servidor SQL, un servidor de correo electrónico en CentOS, y un servidor de e-learning en Debian. Se incluyen capturas de pantalla con fecha y hora, además de documentación paso a paso sobre cada instalación.

Introducción

En esta práctica se requiere instalar y configurar tres máquinas virtuales con diferentes propósitos. Se utilizará CentOS para la instalación de un servidor SQL y un servidor de correo electrónico, mientras que Debian se empleará para la configuración de un servidor de e-learning. Se documentará cada proceso y se evaluará el funcionamiento de las máquinas virtuales en conjunto.

Desarrollo

1. Documentación de la instalación del servidor SQL

1.2 Instalación de SQL Server en CentOS

- Actualización del sistema: `sudo yum update -y`
- Instalación de los paquetes necesarios.
- Configuración del servidor y usuarios.
- Pruebas de conexión.
- Descargar SQL Server desde el repositorio
- `sudo wget -O /etc/yum.repos.d/mssql-server.repo https://packages.microsoft.com/config/rhel/7/mssql-server-2019.repo`
- `sudo yum install -y mssql-server`
- Configurar SQL Server
- `sudo /opt/mssql/bin/mssql-conf setup`

```
Applications  Places  Terminal  Mon 14:13  [Icons]

root@localhost:~

File Edit View Search Terminal Help

=====
Package Arch Version Repository Size
=====
Installing:
mssql-server x86_64 15.0.4375.4-1 packages-microsoft-com-mssql-server-2019 229 M
Installing for dependencies:
libatomic x86_64 4.8.5-44.el7 base 51 k
python3 x86_64 3.6.8-21.el7_9 updates 71 k
python3-libs x86_64 3.6.8-21.el7_9 updates 7.0 M
python3-pip noarch 9.0.3-8.el7 base 1.6 M
python3-setuptools noarch 39.2.0-10.el7 base 629 k

Transaction Summary
=====
Install 1 Package (+5 Dependent packages)

Total download size: 238 M
Installed size: 1.1 G
Downloading packages:
(1/6): python3-3.6.8-21.el7_9.x86_64.rpm | 71 kB 00:00:00
(2/6): libatomic-4.8.5-44.el7.x86_64.rpm | 51 kB 00:00:00
(3/6): python3-setuptools-39.2.0-10.el7.noarch.rpm | 629 kB 00:00:00
(4/6): python3-pip-9.0.3-8.el7.noarch.rpm | 1.6 MB 00:00:01
(5/6): python3-libs-3.6.8-21.el7_9.x86_64.rpm | 7.0 MB 00:00:03
(6/6): mssql-server-15.0.4375.4-1.x86_64.rpm | 229 MB 00:00:38 ETA
] 5.0 MB/s

[Icons] root@localhost:~ [Icon] Instalación de servidores MV — M...
```

- sudo systemctl enable mssql-server
 - sudo systemctl start mssql-server
 - sudo systemctl status mssql-server
-
- Instalar herramientas
 - sudo yum install -y mssql-tools unixODBC-devel

```
Applications  Places  Terminal  Mon 14:17  [Icons]

root@localhost:~

File Edit View Search Terminal Help

[root@localhost ~]# sudo systemctl enable mssql-server
[root@localhost ~]# sudo systemctl start mssql-server
[root@localhost ~]# sudo systemctl status mssql-server
● mssql-server.service - Microsoft SQL Server Database Engine
   Loaded: loaded (/usr/lib/systemd/system/mssql-server.service; enabled; vendor preset: disabled)
   Active: active (running) since Mon 2025-03-03 14:16:56 EST; 19s ago
     Docs: https://docs.microsoft.com/en-us/sql/linux
   Main PID: 4104 (sqlservr)
    CGroup: /system.slice/mssql-server.service
            └─4104 /opt/mssql/bin/sqlservr
               4144 /opt/mssql/bin/sqlservr

Mar 03 14:17:03 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:03.49 spid9s....
Mar 03 14:17:03 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:03.67 spid9s....
Mar 03 14:17:03 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:03.85 spid12....
Mar 03 14:17:05 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:05.17 spid12....
Mar 03 14:17:05 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:05.17 spid12....
Mar 03 14:17:05 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:05.60 spid12....
Mar 03 14:17:05 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:05.63 spid27....
Mar 03 14:17:05 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:05.63 spid27....
Mar 03 14:17:05 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:05.65 spid27....
Mar 03 14:17:05 localhost.localdomain sqlservr[4104]: 2025-03-03 14:17:05.68 spid9s....
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost ~]#
```

```
Applications  Places  Terminal  Mon 14:18  [Icons]

root@localhost:~

File Edit View Search Terminal Help

=====
Package           Arch           Version        Repository      Size
=====
Installing:
unixODBC-devel     x86_64         2.3.1-14.el7   base            55 k
Installing for dependencies:
unixODBC           x86_64         2.3.1-14.el7   base            413 k
=====

Transaction Summary
=====
Install 1 Package (+1 Dependent package)

Total download size: 468 k
Installed size: 1.4 M
Downloading packages:
(1/2): unixODBC-devel-2.3.1-14.el7.x86_64.rpm | 55 kB  00:00:00
(2/2): unixODBC-2.3.1-14.el7.x86_64.rpm      | 413 kB  00:00:00
-----
Total                                           616 kB/s | 468 kB  00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
  Installing : unixODBC-2.3.1-14.el7.x86_64                                1/2
  Installing : unixODBC-devel-2.3.1-14.el7.x86_64                        2/2

[Icons] root@localhost:~ [Instalación de servidores MV — M...]
```

sqlcmd -S localhost -U sa -P "TuContraseña"

- Prueba de conexión

```
Applications  Places  Terminal  Mon 14:23  [Icons]

root@localhost:~

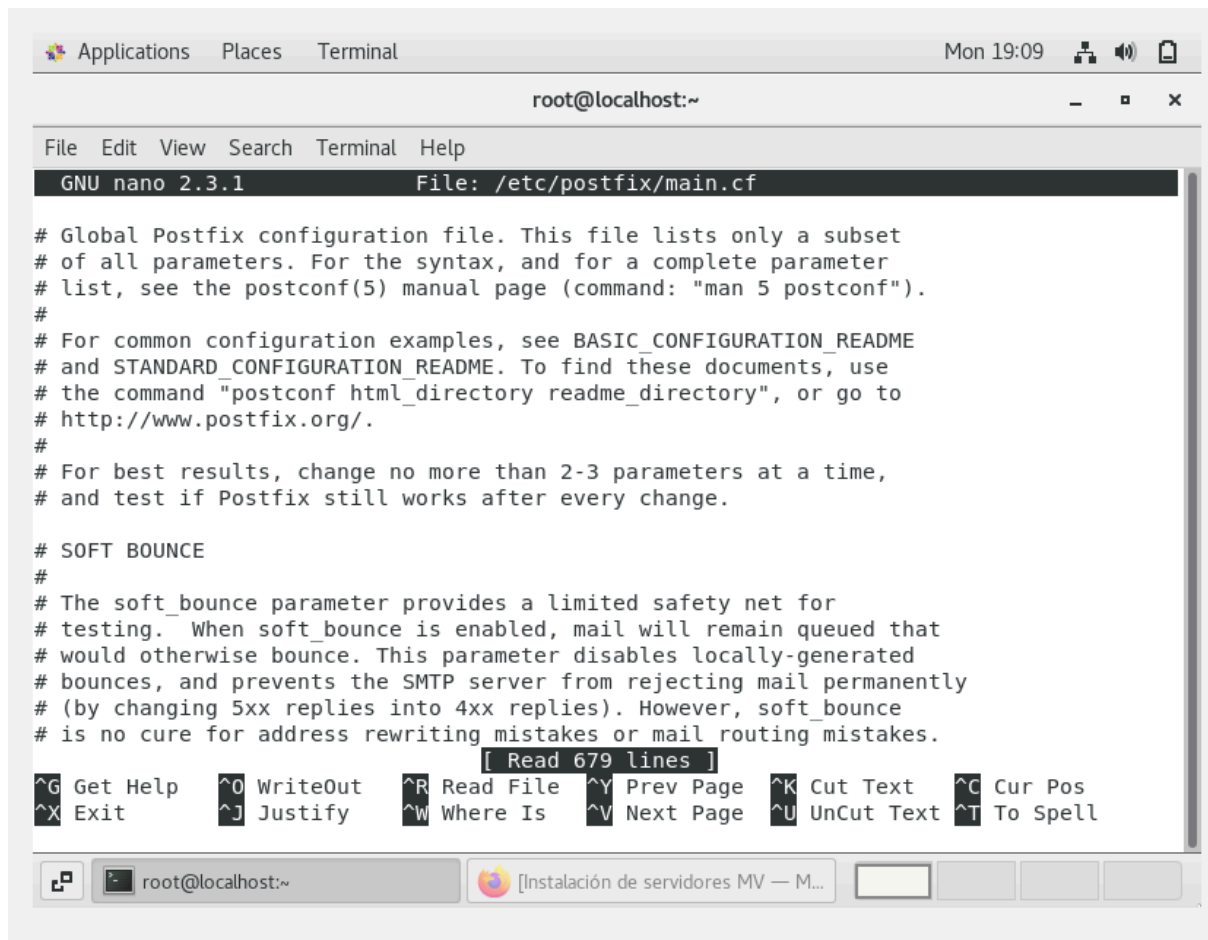
File Edit View Search Terminal Help

[-a packetsize]      [-e echo input]      [-I Enable Quoted Identifiers]
[-c cmdend]
[-q "cmdline query"] [-Q "cmdline query" and exit]
[-m errorlevel]      [-V severitylevel]   [-W remove trailing spaces]
[-u unicode output]  [-r[0|1] msgs to stderr]
[-i inputfile]       [-o outputfile]
[-k[1|2] remove[replace] control characters]
[-y variable length type display width]
[-Y fixed length type display width]
[-p[1] print statistics[colon format]]
[-R use client regional setting]
[-K application intent]
[-M multisubnet failover]
[-b On error batch abort]
[-D Dsn flag, indicate -S is Dsn]
[-X[1] disable commands, startup script, environment variables [and exit]]
[-x disable variable substitution]
[-g enable column encryption]
[-G use Azure Active Directory for authentication]
[-? show syntax summary]

[root@localhost ~]# sqlcmd -S localhost -U sa -P "Guepardo3218"
1>
2>
3>
4> █

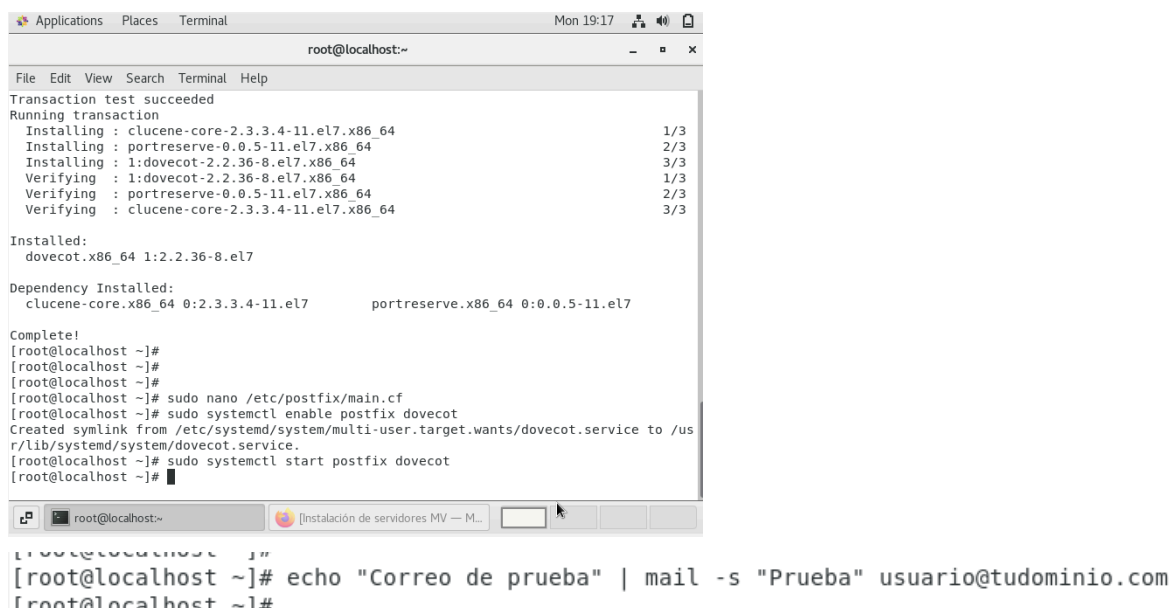
[Icons] root@localhost:~ [Instalación de servidores MV — M...]
```

- Editar el archivo main.cf
- `sudo nano /etc/postfix/main.cf`
- `myhostname = mail.tudominio.com`
- `mydestination = $myhostname, localhost.$mydomain, localhost`

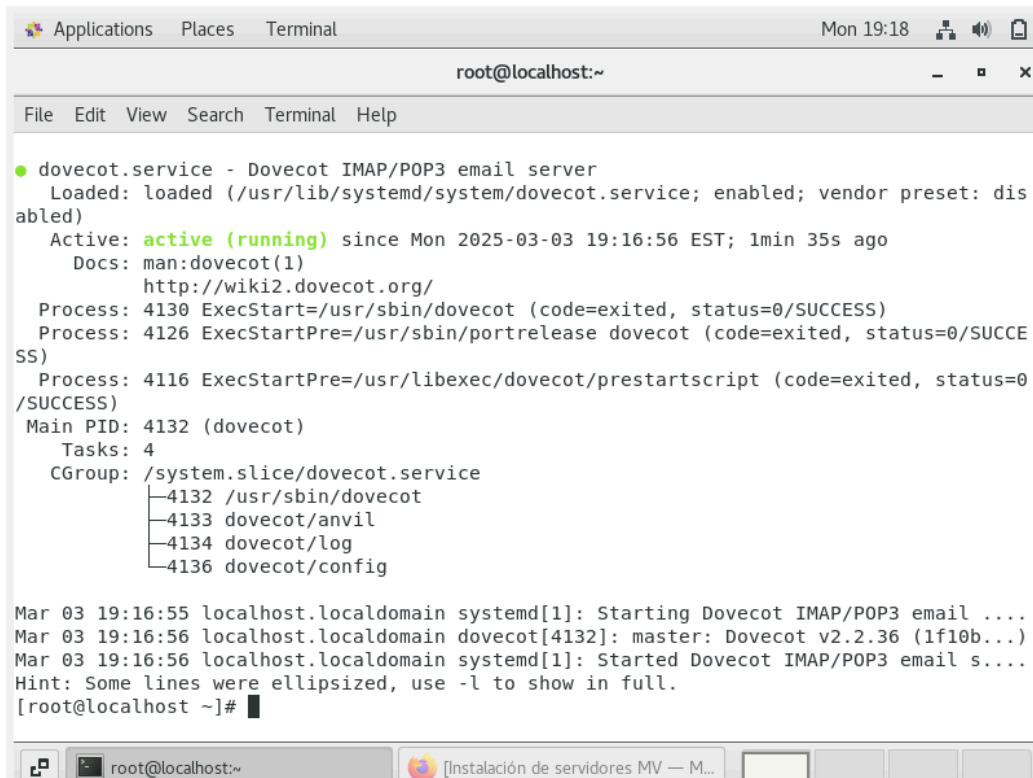


```
root@localhost:~  
File Edit View Search Terminal Help  
GNU nano 2.3.1 File: /etc/postfix/main.cf  
  
# Global Postfix configuration file. This file lists only a subset  
# of all parameters. For the syntax, and for a complete parameter  
# list, see the postconf(5) manual page (command: "man 5 postconf").  
#  
# For common configuration examples, see BASIC_CONFIGURATION_README  
# and STANDARD_CONFIGURATION_README. To find these documents, use  
# the command "postconf html_directory readme_directory", or go to  
# http://www.postfix.org/.  
#  
# For best results, change no more than 2-3 parameters at a time,  
# and test if Postfix still works after every change.  
  
# SOFT BOUNCE  
#  
# The soft_bounce parameter provides a limited safety net for  
# testing. When soft_bounce is enabled, mail will remain queued that  
# would otherwise bounce. This parameter disables locally-generated  
# bounces, and prevents the SMTP server from rejecting mail permanently  
# (by changing 5xx replies into 4xx replies). However, soft_bounce  
# is no cure for address rewriting mistakes or mail routing mistakes.  
[ Read 679 lines ]  
^G Get Help ^O WriteOut ^R Read File ^Y Prev Page ^K Cut Text ^C Cur Pos  
^X Exit ^J Justify ^W Where Is ^V Next Page ^U UnCut Text ^T To Spell
```

- Reinicia los servicios
- `sudo systemctl enable postfix dovecot`
- `sudo systemctl start postfix dovecot`
- Prueba de envío de correos
- `echo "Correo de prueba" | mail -s "Prueba" usuario@tudominio.com`



```
root@localhost:~  
File Edit View Search Terminal Help  
Transaction test succeeded  
Running transaction  
Installing : clucene-core-2.3.3.4-11.el7.x86_64 1/3  
Installing : portreserve-0.0.5-11.el7.x86_64 2/3  
Installing : 1:dovecot-2.2.36-8.el7.x86_64 3/3  
Verifying : 1:dovecot-2.2.36-8.el7.x86_64 1/3  
Verifying : portreserve-0.0.5-11.el7.x86_64 2/3  
Verifying : clucene-core-2.3.3.4-11.el7.x86_64 3/3  
  
Installed:  
dovecot.x86_64 1:2.2.36-8.el7  
  
Dependency Installed:  
clucene-core.x86_64 0:2.3.3.4-11.el7 portreserve.x86_64 0:0.0.5-11.el7  
  
Complete!  
[root@localhost ~]#  
[root@localhost ~]#  
[root@localhost ~]#  
[root@localhost ~]# sudo nano /etc/postfix/main.cf  
[root@localhost ~]# sudo systemctl enable postfix dovecot  
Created symlink from /etc/systemd/system/multi-user.target.wants/dovecot.service to /usr/lib/systemd/system/dovecot.service.  
[root@localhost ~]# sudo systemctl start postfix dovecot  
[root@localhost ~]#  
[root@localhost ~]#  
[root@localhost ~]# echo "Correo de prueba" | mail -s "Prueba" usuario@tudominio.com  
[root@localhost ~]#
```



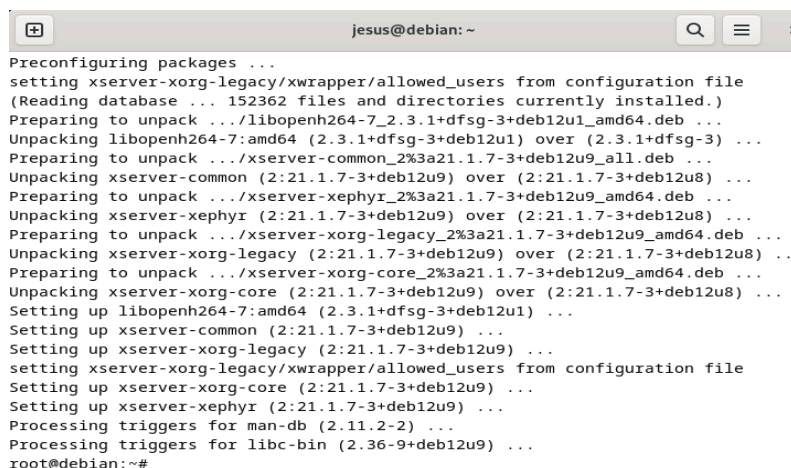
```
● dovecot.service - Dovecot IMAP/POP3 email server
   Loaded: loaded (/usr/lib/systemd/system/dovecot.service; enabled; vendor preset: disabled)
   Active: active (running) since Mon 2025-03-03 19:16:56 EST; 1min 35s ago
     Docs: man:dovecot(1)
           http://wiki2.dovecot.org/
   Process: 4130 ExecStart=/usr/sbin/dovecot (code=exited, status=0/SUCCESS)
   Process: 4126 ExecStartPre=/usr/sbin/portrelease dovecot (code=exited, status=0/SUCCESS)
   Process: 4116 ExecStartPre=/usr/libexec/dovecot/prestartscript (code=exited, status=0/SUCCESS)
   Main PID: 4132 (dovecot)
     Tasks: 4
    CGroup: /system.slice/dovecot.service
            └─4132 /usr/sbin/dovecot
              └─4133 dovecot/anvil
                └─4134 dovecot/log
                  └─4136 dovecot/config

Mar 03 19:16:55 localhost.localdomain systemd[1]: Starting Dovecot IMAP/POP3 email ....
Mar 03 19:16:56 localhost.localdomain dovecot[4132]: master: Dovecot v2.2.36 (1f10b...)
Mar 03 19:16:56 localhost.localdomain systemd[1]: Started Dovecot IMAP/POP3 email s....
Hint: Some lines were ellipsized, use -l to show in full.
[root@localhost ~]#
```

3. Documentación de la instalación del servidor e-learning

3.2 Instalación de Moodle o plataforma e-learning en Debian

- Instalación de LAMP (Linux, Apache, MySQL, PHP).
- Descarga e instalación de Moodle.
- Configuración de base de datos y usuarios.
- Pruebas de acceso.
- Instalar servidor web y base de datos
- Descargar e instalar Moodle



```
Preconfiguring packages ...
setting xserver-xorg-legacy/xwrapper/allowed_users from configuration file
(Reading database ... 152362 files and directories currently installed.)
Preparing to unpack .../libopenh264-7_2.3.1+dfsg-3+deb12u1_amd64.deb ...
Unpacking libopenh264-7:amd64 (2.3.1+dfsg-3+deb12u1) over (2.3.1+dfsg-3) ...
Preparing to unpack .../xserver-common_2%3a21.1.7-3+deb12u9_all.deb ...
Unpacking xserver-common (2:21.1.7-3+deb12u9) over (2:21.1.7-3+deb12u8) ...
Preparing to unpack .../xserver-xephyr_2%3a21.1.7-3+deb12u9_amd64.deb ...
Unpacking xserver-xephyr (2:21.1.7-3+deb12u9) over (2:21.1.7-3+deb12u8) ...
Preparing to unpack .../xserver-xorg-legacy_2%3a21.1.7-3+deb12u9_amd64.deb ...
Unpacking xserver-xorg-legacy (2:21.1.7-3+deb12u9) over (2:21.1.7-3+deb12u8) ...
Preparing to unpack .../xserver-xorg-core_2%3a21.1.7-3+deb12u9_amd64.deb ...
Unpacking xserver-xorg-core (2:21.1.7-3+deb12u9) over (2:21.1.7-3+deb12u8) ...
Setting up libopenh264-7:amd64 (2.3.1+dfsg-3+deb12u1) ...
Setting up xserver-common (2:21.1.7-3+deb12u9) ...
Setting up xserver-xorg-legacy (2:21.1.7-3+deb12u9) ...
setting xserver-xorg-legacy/xwrapper/allowed_users from configuration file
Setting up xserver-xorg-core (2:21.1.7-3+deb12u9) ...
Setting up xserver-xephyr (2:21.1.7-3+deb12u9) ...
Processing triggers for man-db (2.11.2-2) ...
Processing triggers for libc-bin (2.36-9+deb12u9) ...
root@debian:~#
```

- sudo apt install -y apache2 mariadb-server php libapache2-mod-php php-mysql php-gd php-xml php-mbstring
- cd /var/www/html
- sudo wget https://download.moodle.org/download.php/stable402/moodle-latest-402.tgz
- sudo tar -xvzf moodle-latest-402.tgz
- sudo chown -R www-data:www-data /var/www/html/moodle

```

jesus@debian: ~
Setting up libndctl6:amd64 (76.1-1) ...
Setting up libfcgi-perl (0.82+ds-2) ...
Setting up php8.2-gd (8.2.26-1~deb12u1) ...

Creating config file /etc/php/8.2/mods-available/gd.ini with new version
Setting up php-gd (2:8.2+93) ...
Setting up libterm-readkey-perl (2.38-2+b1) ...
Setting up liburing2:amd64 (2.3-3) ...
Setting up php8.2-cli (8.2.26-1~deb12u1) ...
update-alternatives: using /usr/bin/php8.2 to provide /usr/bin/php (php) in aut
mode
update-alternatives: using /usr/bin/phar8.2 to provide /usr/bin/phar (phar) in
uto mode
update-alternatives: using /usr/bin/phar.phar8.2 to provide /usr/bin/phar.phar
ohar.phar) in auto mode

Creating config file /etc/php/8.2/cli/php.ini with new version
Setting up libpmem1:amd64 (1.12.1-2) ...
Setting up libdbi-perl:amd64 (1.643-4) ...
Setting up rsync (3.2.7-1+deb12u2) ...
rsync.service is a disabled or a static unit, not starting it.
Setting up php-xml (2:8.2+93) ...
Setting up php-mysql (2:8.2+93) ...

```

```

jesus@debian: ~
moodle/blocks/calendar_upcoming/classes/
moodle/blocks/calendar_upcoming/classes/privacy/
moodle/blocks/calendar_upcoming/classes/privacy/provider.php
moodle/blocks/calendar_upcoming/tests/
moodle/blocks/calendar_upcoming/tests/generator/
moodle/blocks/calendar_upcoming/tests/generator/lib.php
moodle/blocks/calendar_upcoming/tests/behat/
moodle/blocks/calendar_upcoming/tests/behat/block_calendar_upcoming_frontpage.feature
moodle/blocks/calendar_upcoming/tests/behat/block_calendar_upcoming_course.feature
moodle/blocks/calendar_upcoming/tests/behat/block_calendar_upcoming_dashboard.feature
moodle/blocks/calendar_upcoming/upgrade.txt
moodle/blocks/calendar_upcoming/db/
moodle/blocks/calendar_upcoming/db/upgrade.php
moodle/blocks/calendar_upcoming/db/access.php
moodle/blocks/calendar_upcoming/version.php
moodle/blocks/calendar_upcoming/lang/
moodle/blocks/calendar_upcoming/lang/en/
moodle/blocks/calendar_upcoming/lang/en/block_calendar_upcoming.php
moodle/blocks/calendar_upcoming/block_calendar_upcoming.php
moodle/behat.yml.dist
root@debian: /var/www/html#

```



```
total 63920
-rw-r--r-- 1 root    root      1121 Mar  3 07:28 index.html
-rw-r--r-- 1 root    root        615 Feb 26 09:20 index.nginx-debian.html
-rw-r--r-- 1 jesu    jesu      6669 Mar  3 07:28 logo.png
drwxr-xr-x 59 www-da  www-da    4096 Oct  4 11:41 moodle
-rw-r--r-- 1 root    root    65432192 Oct  4 08:48 moodle.tgz
-rw-r--r-- 1 root    root         0 Mar  3 18:35 www-data
root@debian:/var/www/html#
root@debian:/var/www/html#
root@debian:/var/www/html#
root@debian:/var/www/html# sudo mysql -u root -p
Enter password:
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 31
Server version: 10.11.6-MariaDB-0+deb12u1 Debian 12

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)]>
MariaDB [(none)]>
MariaDB [(none)]>
MariaDB [(none)]> █
```

```
jesus@debian: ~
| debiandb      |
| information_schema |
| mysql         |
| performance_schema |
| sys           |
+-----+
5 rows in set (0.000 sec)

MariaDB [(none)]>
MariaDB [(none)]>
MariaDB [(none)]>
MariaDB [(none)]> create user 'userdebian'@'localhost' identified by 'manzana123';
Query OK, 0 rows affected (0.021 sec)

MariaDB [(none)]>
MariaDB [(none)]> grant all privileges on debiandb.* to 'userdebian'@'localhost';
Query OK, 0 rows affected (0.006 sec)

MariaDB [(none)]> flush privileges;
Query OK, 0 rows affected (0.006 sec)

MariaDB [(none)]> █
```



```
jesus@debian: ~  
MariaDB [(none)]>  
MariaDB [(none)]>  
MariaDB [(none)]>  
MariaDB [(none)]>  
MariaDB [(none)]>  
MariaDB [(none)]> grant all privileges on debiandb.* to 'userdebian'@'localhost'  
;  
Query OK, 0 rows affected (0.001 sec)  
  
MariaDB [(none)]>  
MariaDB [(none)]>  
MariaDB [(none)]>  
MariaDB [(none)]> exit;  
Bye  
root@debian:/var/www/html#  
root@debian:/var/www/html#  
root@debian:/var/www/html#  
root@debian:/var/www/html# sudo nano /etc/apache2/sites-available/moodle.conf  
root@debian:/var/www/html# sudo a2ensite moodle  
Enabling site moodle.  
To activate the new configuration, you need to run:  
    systemctl reload apache2  
root@debian:/var/www/html# sudo systemctl restart apache2  
root@debian:/var/www/html#
```

- Configuración de Moodle

← → ↺

🔒 192.168.203.132/moodle/install.php

☆

🔍 🗂 📄 ☰

Installation


Language

Choose a language

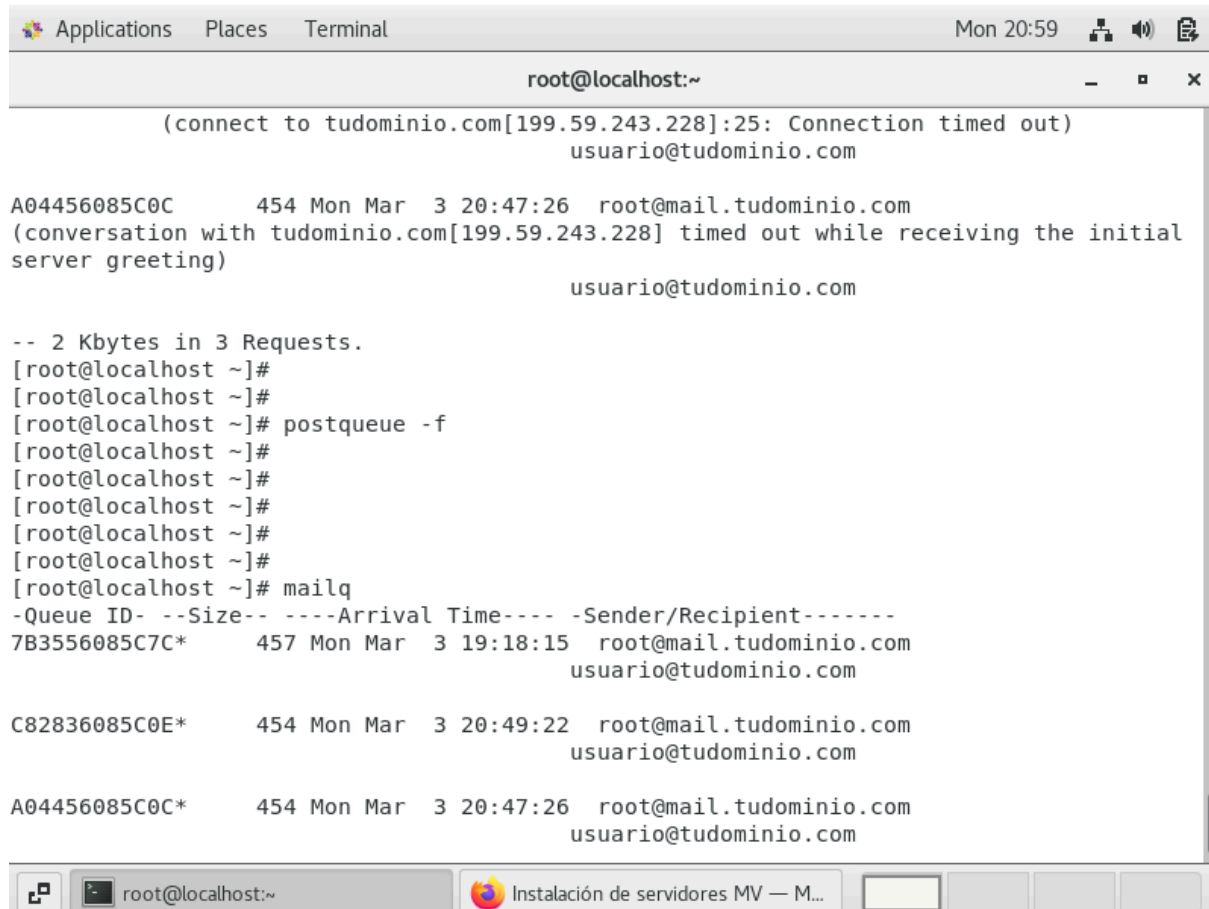
Please choose a language for the installation. This language will also be used as the default language for the site, though it may be changed later.

Language

Next »



4. Resultados del funcionamiento de las máquinas virtuales trabajando simultáneamente



The screenshot shows a terminal window titled 'root@localhost:~' with a menu bar containing 'Applications', 'Places', and 'Terminal'. The system clock shows 'Mon 20:59'. The terminal output includes:

```
(connect to tudominio.com[199.59.243.228]:25: Connection timed out)
usuario@tudominio.com

A04456085C0C      454 Mon Mar  3 20:47:26  root@mail.tudominio.com
(conversation with tudominio.com[199.59.243.228] timed out while receiving the initial
server greeting)
                        usuario@tudominio.com

-- 2 Kbytes in 3 Requests.
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# postqueue -f
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]#
[root@localhost ~]# mailq
-Queue ID- --Size--  ----Arrival Time---- -Sender/Recipient-----
7B3556085C7C*      457 Mon Mar  3 19:18:15  root@mail.tudominio.com
                        usuario@tudominio.com

C82836085C0E*      454 Mon Mar  3 20:49:22  root@mail.tudominio.com
                        usuario@tudominio.com

A04456085C0C*      454 Mon Mar  3 20:47:26  root@mail.tudominio.com
                        usuario@tudominio.com
```

The terminal window has a taskbar at the bottom with icons for a window manager, the terminal itself, and a window titled 'Instalación de servidores MV — M...'. There are also several empty window slots.

Conclusión

La instalación y configuración de servidores en máquinas virtuales es un proceso fundamental para la implementación de infraestructuras tecnológicas eficientes. Durante este proyecto, se instalaron y configuraron tres servidores en entornos Linux: un servidor SQL en CentOS, un servidor de correo electrónico en CentOS y un servidor e-learning en Debian.

Cada una de estas implementaciones requirió el uso de herramientas específicas y la configuración de parámetros adecuados para su correcto funcionamiento. A través de este proceso, se logró comprender la importancia de la administración de servidores, la gestión de bases de datos, la configuración de servicios de correo y la implementación de plataformas educativas.

Como resultado, se verificó el correcto funcionamiento de cada servidor y su interacción en un entorno virtualizado. Este ejercicio permitió desarrollar habilidades en la instalación, configuración y solución de problemas en sistemas Linux, esenciales para la gestión de infraestructuras TI en entornos empresariales.

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