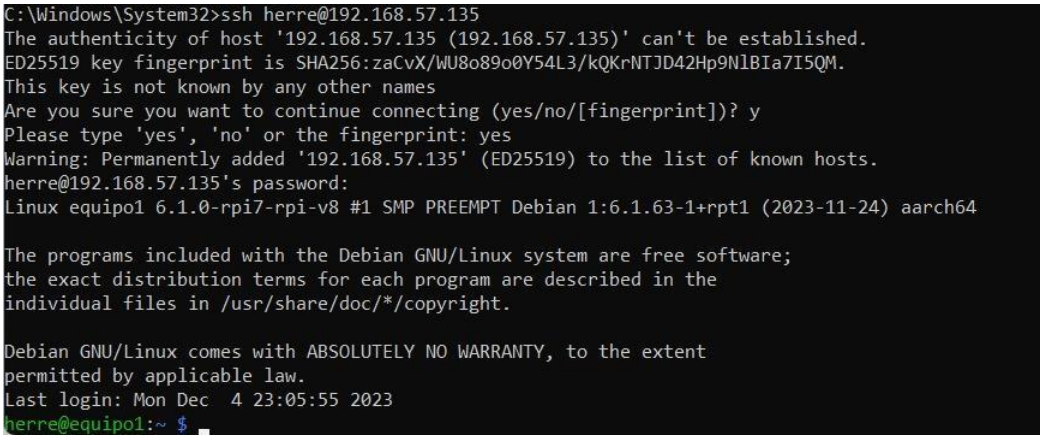
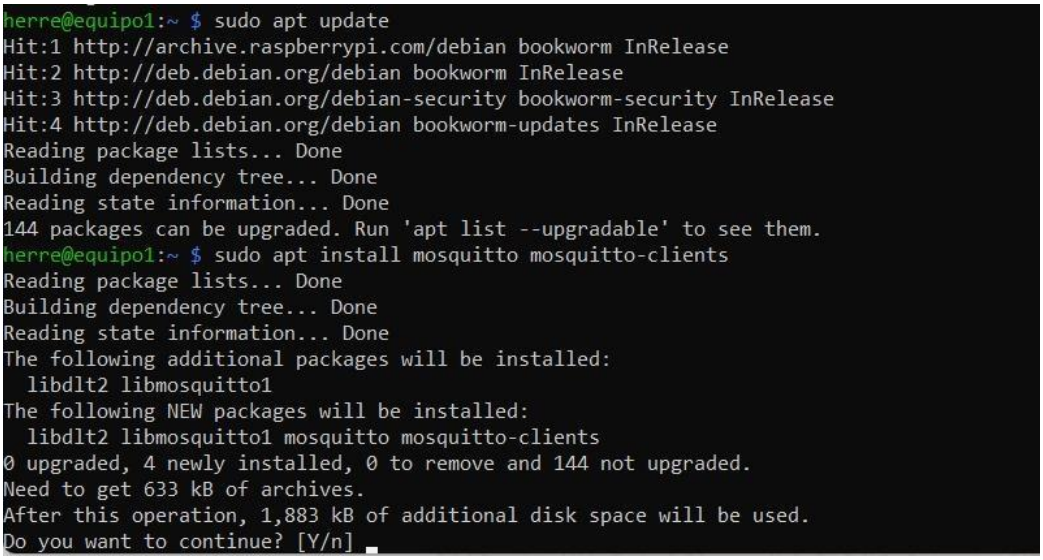
BRAYAN DANIEL MENDIOLA GUTIERREZ – Equipo1 – GDS0552

Clase 15: Raspbeííy Pi Funcionando Remotamente

- Evidencia: Capturas y/o Video demostrativo de Node-RED, PostgreSQL y Mosquitto en la Raspberry Pi.

Mosquitto





```
herre@equipo1:~ $ sudo systemctl status mosquitto
● mosquitto.service - Mosquitto MQTT Broker
     Loaded: loaded (/lib/systemd/system/mosquitto.service; enabled; preset: enabled)
     Active: active (running) since Tue 2024-02-13 15:04:55 CST; 52s ago
       Docs: man:mosquitto.conf(5)
             man:mosquitto(8)
    Process: 2387 ExecStartPre=/bin/mkdir -m 740 -p /var/log/mosquitto (code=exited, status=0/SUCCESS)
    Process: 2391 ExecStartPre=/bin/chown mosquitto /var/log/mosquitto (code=exited, status=0/SUCCESS)
    Process: 2392 ExecStartPre=/bin/mkdir -m 740 -p /run/mosquitto (code=exited, status=0/SUCCESS)
    Process: 2393 ExecStartPre=/bin/chown mosquitto /run/mosquitto (code=exited, status=0/SUCCESS)
   Main PID: 2394 (mosquitto)
      Tasks: 1 (limit: 1578)
        CPU: 60ms
     CGroup: /system.slice/mosquitto.service
             └─2394 /usr/sbin/mosquitto -c /etc/mosquitto/mosquitto.conf

Feb 13 15:04:55 equipo1 systemd[1]: Starting mosquitto.service - Mosquitto MQTT Broker...
Feb 13 15:04:55 equipo1 systemd[1]: Started mosquitto.service - Mosquitto MQTT Broker.
```

```
 GNU nano 7.2                          /etc/mosquitto/mosquitto.conf
# Place your local configuration in /etc/mosquitto/conf.d/
#
# A full description of the configuration file is at
# /usr/share/doc/mosquitto/examples/mosquitto.conf.example

pid_file /run/mosquitto/mosquitto.pid

persistence true
persistence_location /var/lib/mosquitto/

log_dest file /var/log/mosquitto/mosquitto.log

include_dir /etc/mosquitto/conf.d

allow_anonymous true

listener 1883
```

```
See https://mosquitto.org/ for more information.

herre@equipo1:~ $ sudo nano /etc/mosquitto/mosquitto.conf
```

```
herre@equipo1:~ $ sudo nano /etc/mosquitto/mosquitto.conf
herre@equipo1:~ $ sudo systemctl restart mosquitto
herre@equipo1:~ $
```

```
herre@equipo1:~ $ mosquitto_sub -h 192.168.43.135 -t cocina/led
Encender LED
EQUIPO1:
Ramiro:
Alejandro:
Roxana
Anaid
Adrian
Oscar
Jose manuel
```

```
Microsoft Windows [Versión 10.0.19045.4046]
(c) Microsoft Corporation. Todos los derechos reservados.

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "Encender LED"

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "EQUIPO1:"

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "Ramiro:"

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "Alejandro:"

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "Roxana"

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "Anaid"

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "Adrian"

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "Oscar"

C:\Users\herre>mosquitto_pub -h 192.168.43.135 -t cocina/led -m "Jose manuel"

C:\Users\herre>_
```

Node-RED

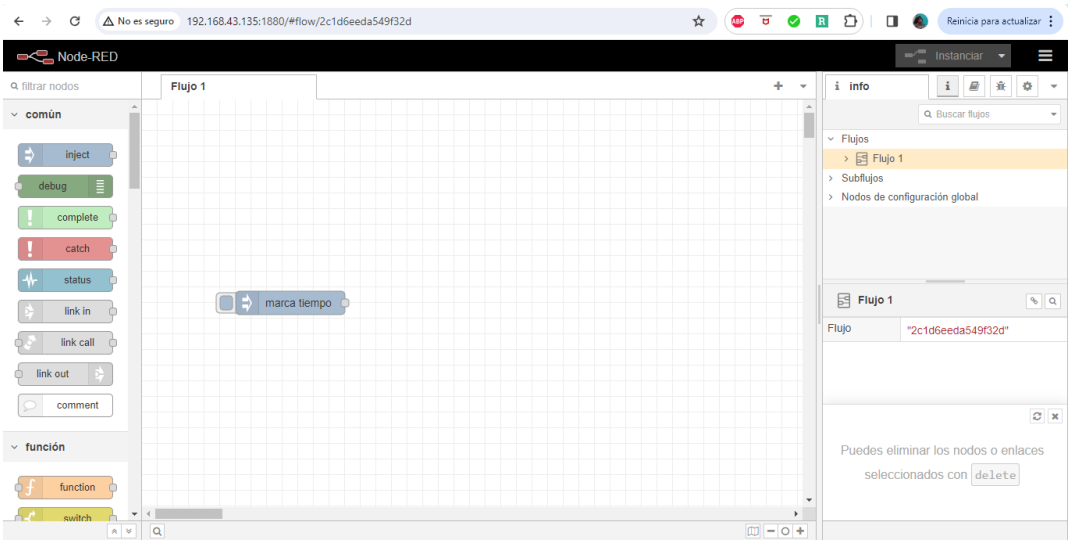
Se ejecutó el siguiente comando el cual actualiza y descarga todo lo necesario para utilizar Node-RED:

bash <(curl -sL https://raw.githubusercontent.com/node-red/linux-installers/master/deb/update-nodejs-and-nodered)

```
  Stop Node-RED                       ✓
  Remove old version of Node-RED      ✓
  Remove old version of Node.js       ✓
  Install Node.js 14 LTS              ✓   v14.19.3   Npm 6.14.17
  Clean npm cache                     ✓
  Install Node-RED core               ✓   2.2.2
  Move global nodes to local          -
  Npm rebuild existing nodes          ✓
  Install extra Pi nodes              ✓
  Add shortcut commands               ✓
  Update systemd script               ✓


Any errors will be logged to   /var/log/nodered-install.log
All done.
You can now start Node-RED with the command  node-red-start
  or using the icon under   Menu / Programming / Node-RED
Then point your browser to localhost:1880 or http://{your_pi_ip-address}:1880

Started :  Mon  6 Jun 17:26:50 WEST 2022
Finished:  Mon  6 Jun 17:32:27 WEST 2022

You may want to run   node-red admin init
to configure your initial options and settings.
```

Herrera Ramiro – Equipo1 – GDS0552

```
Last login: Tue Feb 13 18:27:17 2024 from 192.168.43.92
herre@equipo1:~ $ node-red
20 Feb 23:15:43 - [info]

Welcome to Node-RED
===================

20 Feb 23:15:43 - [info] Node-RED version: v3.1.5
20 Feb 23:15:43 - [info] Node.js  version: v18.19.0
20 Feb 23:15:43 - [info] Linux 6.1.0-rpi7-rpi-v8 arm64 LE
20 Feb 23:15:47 - [info] Loading palette nodes
20 Feb 23:15:50 - [info] Settings file  : /home/herre/.node-red/settings.js
20 Feb 23:15:50 - [info] Context store  : 'default' [module=memory]
20 Feb 23:15:50 - [info] User directory : /home/herre/.node-red
20 Feb 23:15:50 - [warn] Projects disabled : editorTheme.projects.enabled=false
20 Feb 23:15:50 - [info] Flows file     : /home/herre/.node-red/flows.json
20 Feb 23:15:50 - [warn]

---------------------------------------------------------------------
Your flow credentials file is encrypted using a system-generated key.

If the system-generated key is lost for any reason, your credentials
file will not be recoverable, you will have to delete it and re-enter
your credentials.

You should set your own key using the 'credentialSecret' option in
your settings file. Node-RED will then re-encrypt your credentials
file using your chosen key the next time you deploy a change.
---------------------------------------------------------------------

20 Feb 23:15:50 - [warn] Encrypted credentials not found
20 Feb 23:15:50 - [info] Server now running at http://127.0.0.1:1880/
20 Feb 23:15:50 - [info] Starting flows
20 Feb 23:15:50 - [info] Started flows
```



PostgresSQL

```
Last login: Tue Feb 13 18:24:20 2024
herre@equipo1:~ $ sudo apt update
Hit:1 http://deb.debian.org/debian bookworm InRelease
Get:2 http://deb.debian.org/debian-security bookworm-security InRelease [48.0 kB]
Get:3 http://archive.raspberrypi.com/debian bookworm InRelease [23.6 kB]
Get:4 http://deb.debian.org/debian bookworm-updates InRelease [55.4 kB]
Get:5 https://deb.nodesource.com/node_18.x nodistro InRelease [12.1 kB]
Get:6 http://deb.debian.org/debian-security bookworm-security/main armhf Packages [134 kB]
Get:7 http://deb.debian.org/debian-security bookworm-security/main arm64 Packages [136 kB]
Get:8 http://archive.raspberrypi.com/debian bookworm/main arm64 Packages [354 kB]
Get:9 https://deb.nodesource.com/node_18.x nodistro/main arm64 Packages [7,392 B]
Get:10 http://deb.debian.org/debian-security bookworm-security/main Translation-en [83.0 kB]
Get:11 http://deb.debian.org/debian bookworm-updates/contrib arm64 Packages [768 B]
Get:12 http://deb.debian.org/debian bookworm-updates/contrib Translation-en [408 B]
Get:13 http://deb.debian.org/debian bookworm-updates/non-free armhf Packages [492 B]
Get:14 http://deb.debian.org/debian bookworm-updates/non-free arm64 Packages [12.0 kB]
Get:15 http://deb.debian.org/debian bookworm-updates/non-free Translation-en [7,744 B]
Get:16 http://deb.debian.org/debian bookworm-updates/non-free-firmware arm64 Packages [616 B]
Get:17 http://deb.debian.org/debian bookworm-updates/non-free-firmware Translation-en [384 B]
Get:18 https://deb.nodesource.com/node_18.x nodistro/main armhf Packages [7,416 B]
Get:19 http://archive.raspberrypi.com/debian bookworm/main armhf Packages [363 kB]
Fetched 1,246 kB in 4s (310 kB/s)
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
161 packages can be upgraded. Run 'apt list --upgradable' to see them.
herre@equipo1:~ $
```

```
herre@equipo1:~ $ sudo apt upgrade
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Calculating upgrade... Done
The following packages were automatically installed and are no longer required:
  libcamera0.1 rpi.gpio-common
Use 'sudo apt autoremove' to remove them.
The following NEW packages will be installed:
  libcamera0.2 linux-headers-6.1.0-rpi8-common-rpi linux-headers-6.1.0-rpi8-rpi-2712 linux-headers-6.1.0-rpi8-rpi-v8
  linux-image-6.1.0-rpi8-rpi-2712 linux-image-6.1.0-rpi8-rpi-v8
The following packages will be upgraded:
  base-files bluez chromium-browser chromium-browser-l10n chromium-codecs-ffmpeg-extra cups cups-client cups-common
  cups-core-drivers cups-daemon cups-ipp-utils cups-ppdc cups-server-common distro-info-data exfatprogs ffmpeg firefox
  firmware-atheros firmware-brcm80211 firmware-libertas firmware-misc-nonfree firmware-realtek geany geany-common
  ghostscript gir1.2-gtk-3.0 gir1.2-handy-1 gstreamer1.0-plugins-bad gtk-update-icon-cache kms++-utils libavcodec59
  libavdevice59 libavfilter8 libavformat59 libavutil57 libbluetooth3 libc-bin libc-dev-bin libc-devtools libc-l10n
  libc6 libc6-dbg libc6-dev libcamera-apps libcamera-ipa libcamera-tools libcryptsetup12 libcups2 libcupsimage2
  libde265-0 libegl-mesa0 libfm-data libfm-extra4 libfm-gtk-data libfm-gtk4 libfm-modules libfm4 libgbm1
  libgl1-mesa-dev libgl1-mesa-dri libglapi-mesa libglx-mesa0 libgnutls30 libgs-common libgs10 libgs10-common
  libgstreamer-plugins-bad1.0-0 libgtk-3-0 libgtk-3-common libhandy-1-0 libisl23 libjavascriptcoregtk-4.1-0 libkms++0
  libneatvnc0 libpam-systemd libperl5.36 libpipewire-0.3-0 libpipewire-0.3-common libpipewire-0.3-modules
  libpisp-common libpisp1 libpostproc56 libqpdf29 libspa-0.2-bluetooth libspa-0.2-modules libssh-gcrypt-4
  libswresample4 libswscale6 libsystemd-shared libsystemd0 libudev1 libvlc-bin libvlc5 libvlccore9 libwebkit2gtk-4.1-0
  libwlroots11 libzbar0 linux-headers-rpi-2712 linux-headers-rpi-v8 linux-image-rpi-2712 linux-image-rpi-v8
  linux-kbuild-6.1 linux-libc-dev locales lxplug-volumepulse lxtask mesa-vdpau-drivers nodejs openssh-client
  openssh-server openssh-sftp-server perl perl-base perl-modules-5.36 pipewire pipewire-bin pipewire-libcamera
  pipewire-pulse pixflat-icons pixflat-theme python3-av python3-kms++ python3-libcamera python3-picamera2 python3-v4l2
```

```
herre@equipo1:~ $ sudo apt install postgresql postgresql-contrib
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  rpi.gpio-common
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  libcommon-sense-perl libjson-perl libjson-xs-perl libllvm14 libpq5 libtypes-serialiser-perl postgresql-15
  postgresql-client-15 postgresql-client-common postgresql-common sysstat
Suggested packages:
  postgresql-doc postgresql-doc-15 isag
The following NEW packages will be installed:
  libcommon-sense-perl libjson-perl libjson-xs-perl libllvm14 libpq5 libtypes-serialiser-perl postgresql postgresql-15
  postgresql-client-15 postgresql-client-common postgresql-common postgresql-contrib sysstat
0 upgraded, 13 newly installed, 0 to remove and 161 not upgraded.
Need to get 38.5 MB of archives.
After this operation, 173 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
```

Configuración de usuario

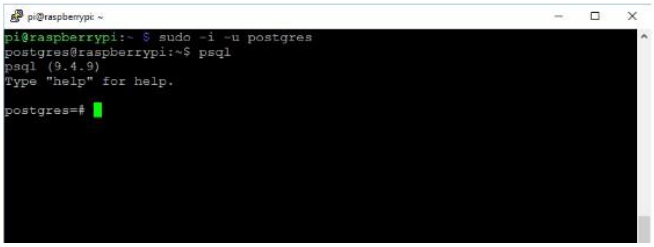
Cuando instalamos postgres, por defecto crea el siguiente usuario **postgres**, en donde vamos a realizar el cambio de contraseña de la siguiente forma:

```
#Cambiar contraseña usuario postgres
sudo passwd postgres
```

Ahora vamos a acceder por el usuario postgres, ya que es el único que puede arrancar el comando **psql** para acceder a la base de datos, para ello usamos.

```
#Acceder usuario postgres
sudo -i -u postgress
```

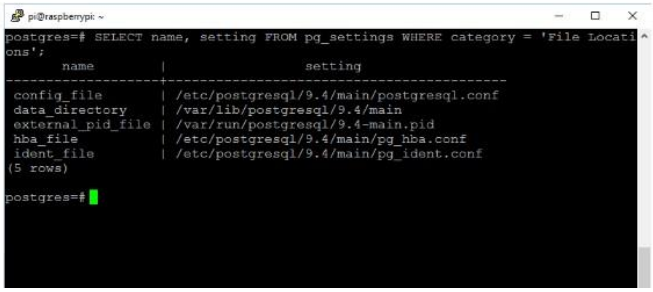
Una vez que nos muestre el usuario ya podemos ingresar a postgres por el comando **psql**.



Configuración de postgres

Procedemos a realizar las siguientes configuraciones en postgres, para ello nuestros archivos de configuración los podemos encontrar en las siguientes rutas, donde las extraemos directamente en una consulta sql.

```
#Consultar ruta de archivos configuración
SELECT name, setting FROM pg_settings WHERE category = 'File Locations';
```

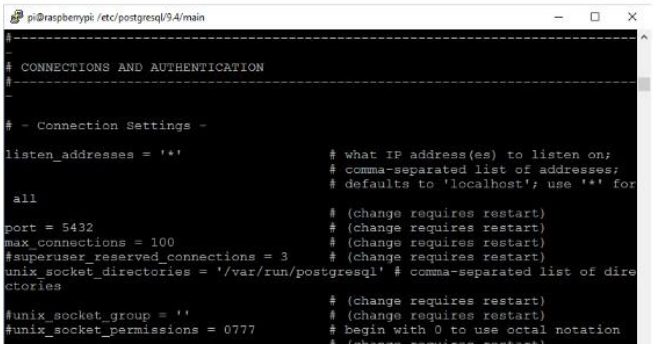


Conexión remota

Para realizar una conexión remota por medio de pgadmin u otro sistemas realizamos los siguientes pasos.

```
#Nos dirigimos a la siguiente ruta
cd /etc/postgresql/9.4/main/

#Editamos el siguinete archivo
sudo nano postgresql.conf
```

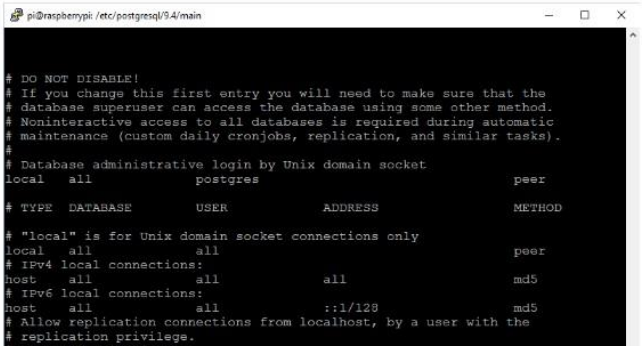
Allí buscamos la línea "CONNECTION AND AUTHENTICATION" donde modificamos el parámetro **listen_addresses** a el cual vamos a cambiar localhost por "*" para que acepte todas las conexiones, de la siguiente forma.



Con esto aceptamos las conexiones de otros sistemas, pero nos hace falta realizar un último cambio para que se pueda recibir cualquier tipo de conexión, para ello nos dirigimos al archivo pg_hba y realizamos el siguiente cambio.

```
#Nos dirigimos a la siguiente ruta
cd /etc/postgresql/9.4/main/

#Editamos el siguinete archivo
sudo nano pg_hba.conf
```

En este archivo vamos a buscar el comentario **IPv4 local connections** donde realizamos el cambio en la columna de address que está en 127.0.0.1/32 se cambia por "all" para que pueda conectarse cualquier servidor.



Por ultimo nos queda reiniciar el servidor para que tome los cambios que acabamos de realizar.

Comandos importantes

Iniciar servidor

Para arrancar el servidor usaremos el siguiente comando.

```
sudo service postgresql start
```

Detener servidor

Para detener el servidor usaremos el siguiente comando.

```
sudo service postgresql stop
```

Reiniciar servidor

Para reiniciar el servidor usaremos el siguiente comando.

```
sudo service postgresql restart
```

Como podemos observar ya instalamos postgres en nuestra raspberry pi y podemos realizar las conexiones remotas, con esto podemos trabajar una base de datos y almacenar información de algún proyecto que tengamos.