IUT2 Université Grenoble Alpes
Département INFO

Installation guide for a Debian 12 server equipped with Apache, PostgreSQL and PHP

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Table des matières

Chapter 1 : Prepare the installation

The goal is to install:

- Debian version 12.x, nicknamed "bookworm"
- For 64-bit x86 processors
- With the “netinst” type ISO image

1. The ISO image and files to verify its integrity are available here:

```
https://cdimage.debian.org/cdimage/release/current/amd64/iso-cd/
```

2. To save you time and disk space, the ISO file has already been downloaded and made available in the /usr/local/images-ISO/ directory. View the contents of this directory.

3. Verify the integrity of the image by visually comparing the two prints with:

```
sha512sum NOM_FICHIER
```

Chapter 2 : Install the Debian system

2.1. Installation

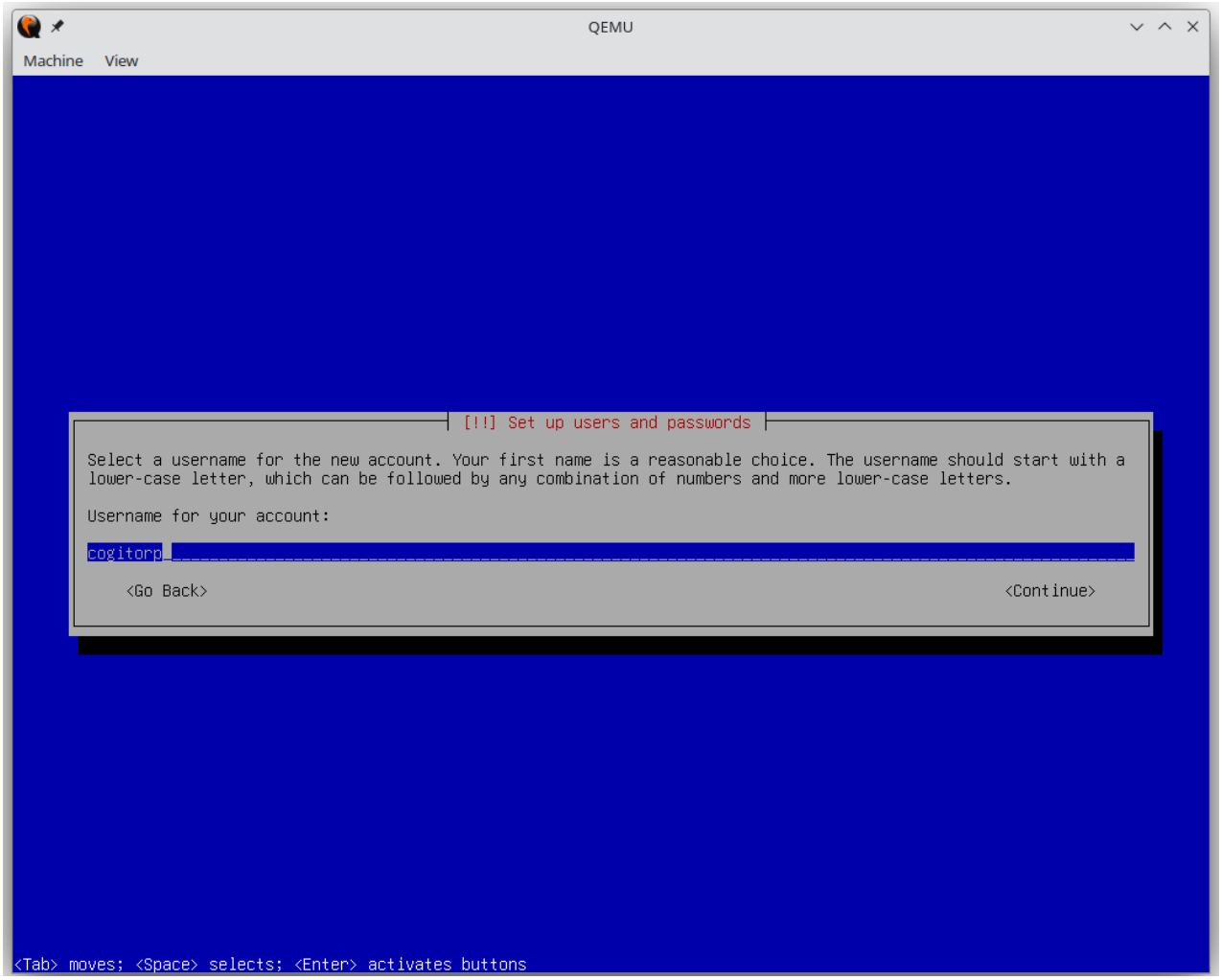
To launch the virtual machines under Linux, we will use Qemu/KVM.

Boot the machine to the installation ISO image

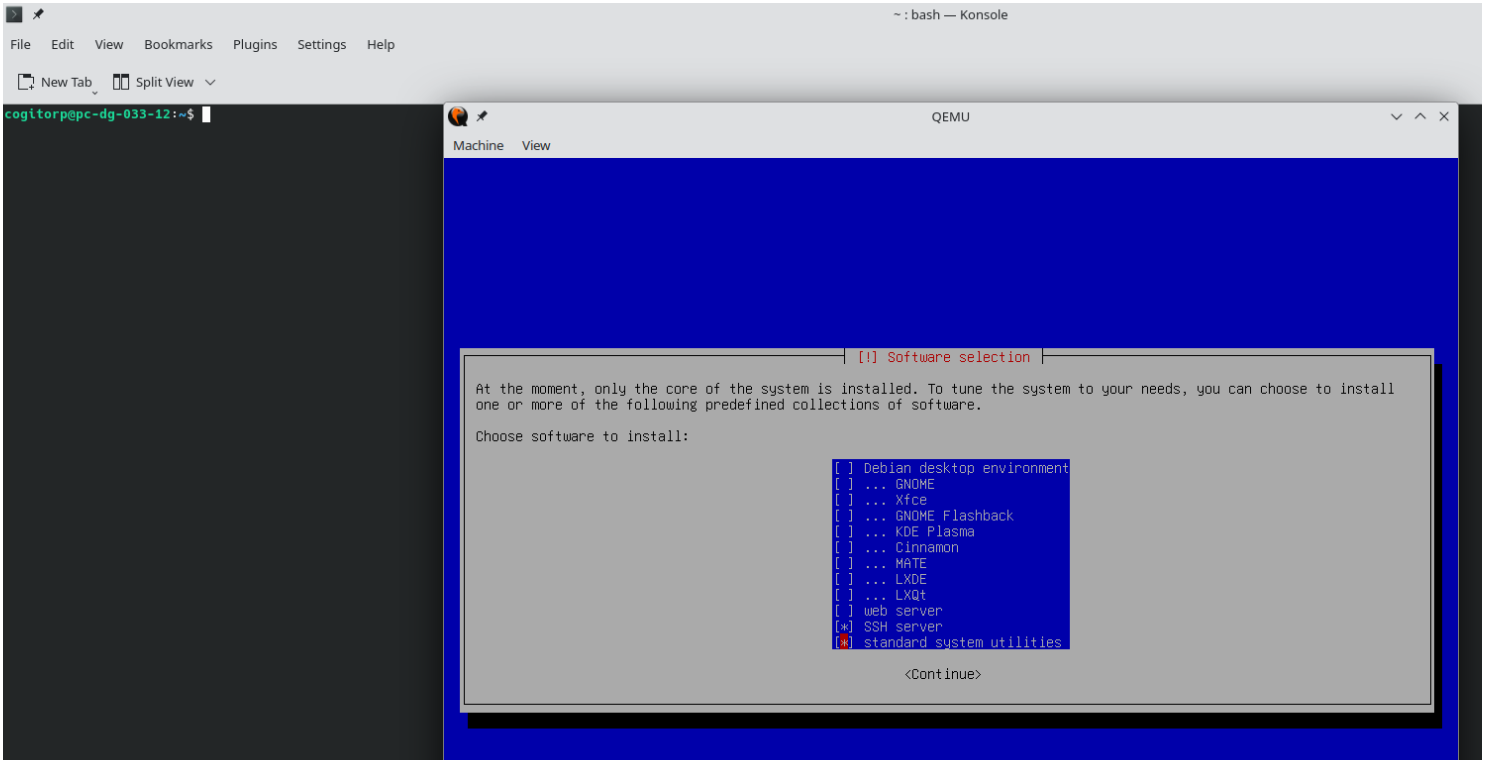
S2.03-lance-installation

Go through the installation steps one by one. When nothing is specified, make the choice proposed by default. The most crucial choice is to install Debian without a GUI. Here are the main steps:

- Language : English
- Location : other/Europe/France
- Locales : United States, en_US.UTF-8
- Keyboard : French
- Hostname : use server-"VOTRE_LOGIN_UGA"
- Root Password : a simple password is recommended, for example "root". In this context, this does not pose a security problem. Check the “Show Password” box to be sure that the password entered is the one you want.
- User Account - Full Name : your full name, for example "Jean Toto"
- User Name : enter your login UGA name like this :



• User Password : enter a simple password, for example "etu". Check the “Show Password” box to be sure that the password entered is the one you want.
• Partition disks : Guided - use entire disk
• Partition disks : All files in one partition
• Partition disks : Yes
• Software Selection : check that "Debian desktop" is not checked and that "ssh server" is checked, like this :



•Install GRUB : Yes

•Device for boot loader : /dev/sda

Once the installation is complete, the virtual machine restarts. We must turn it off before moving on to the next step. Log into the root account and execute the following command:

```
# poweroff
```

This is the command you will need to use to properly shut down your virtual machine after each use.

2.2. Moving the disk image

The file was created on the local disk of the Linux station. You must therefore move this image to the erebus4 server to be able to use your virtual machine more easily later. You can also copy this image to a USB key.

1. Check that the virtual machine is turned off.
2. Run command

```
S2.03-déplace-image-disque-sur-erebus4
```

Chapter 3 : Checking Debian Server

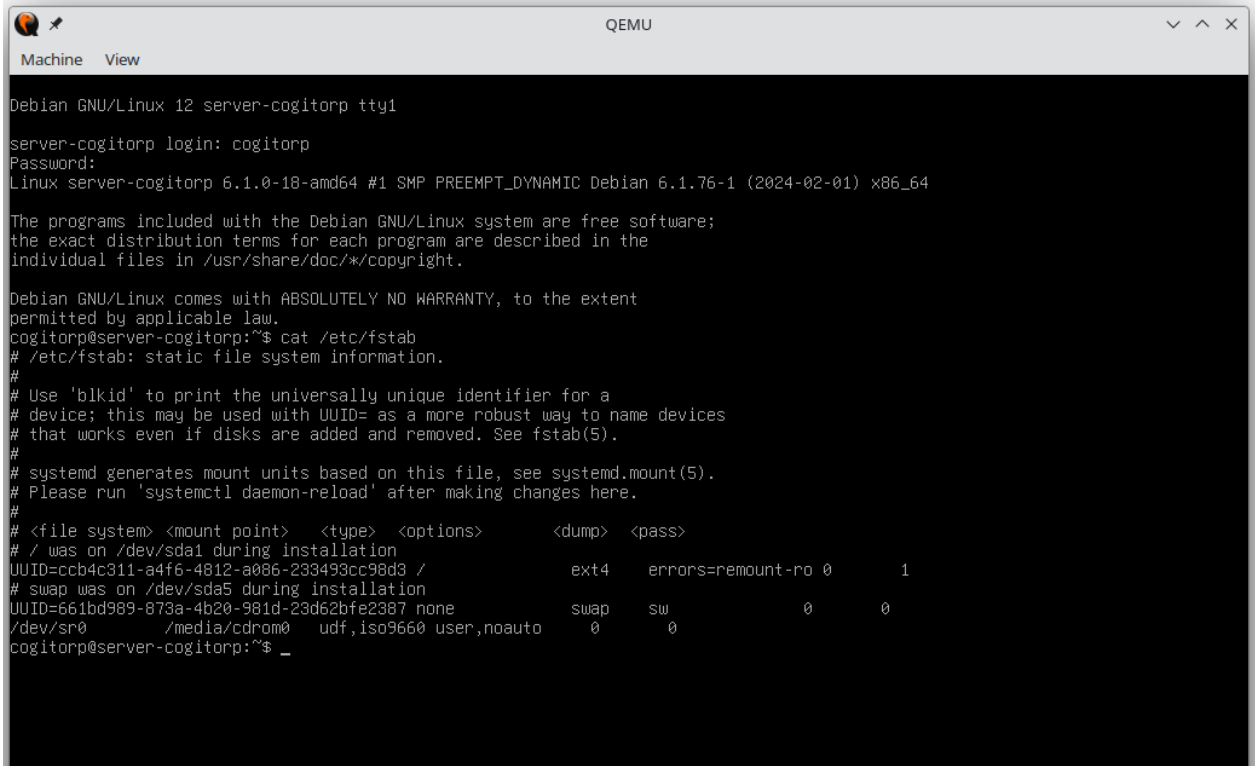
Now that the installation is done, run the following command to launch your virtual machine:

```
S2.03-lance-machine-virtuelle
```

1. Verify that your virtual machine is functional, for this you can run command :

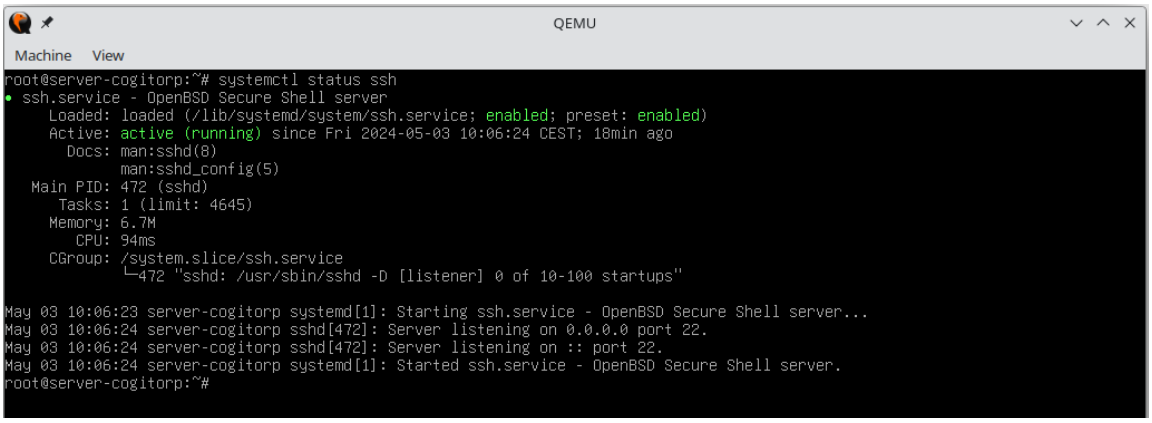
```
cat /etc/fstab
```

you should have this result :



2. Check if SSH is installed and launched correctly with this command:

```
systemctl status SSH
```



3. Note the Ethernet and IP specifications of your machine and verify that you can reach outside.

4. Check for the absence of the Xorg server on your machine (using dpkg -l | grep xorg).

Chapter 4 : Port forwarding and SSH access

To allow you to access the servers running in your virtual machine from clients running on your Linux station, port redirections have been set up (see file S2.03-commun):

Network service	VM port	Port on Linux station	Example of use from the Linux station
SSH	22	2222	$ ssh toto@localhost -p 2222
HTTP	80	8080	URL: http://localhost:8080/
HTTPS	443	4443	URL: https://localhost:4443/
PostgreSQL	5432	5432	$ psql -h localhost -U postgres

			postgres

1. Access the simple user account of your virtual machine by SSH (direct access to the root account by password is prohibited by default).
2. From there switch to the root account (with one of the commands seen in S1.03).
3. To test if everything works, try installing a Debian package, for example the "micro" text editor with this command

```
#apt install micro
```

Chapter 5 : Install Apache

1. Visit the Apache Installation Guide and install apache on your machine.

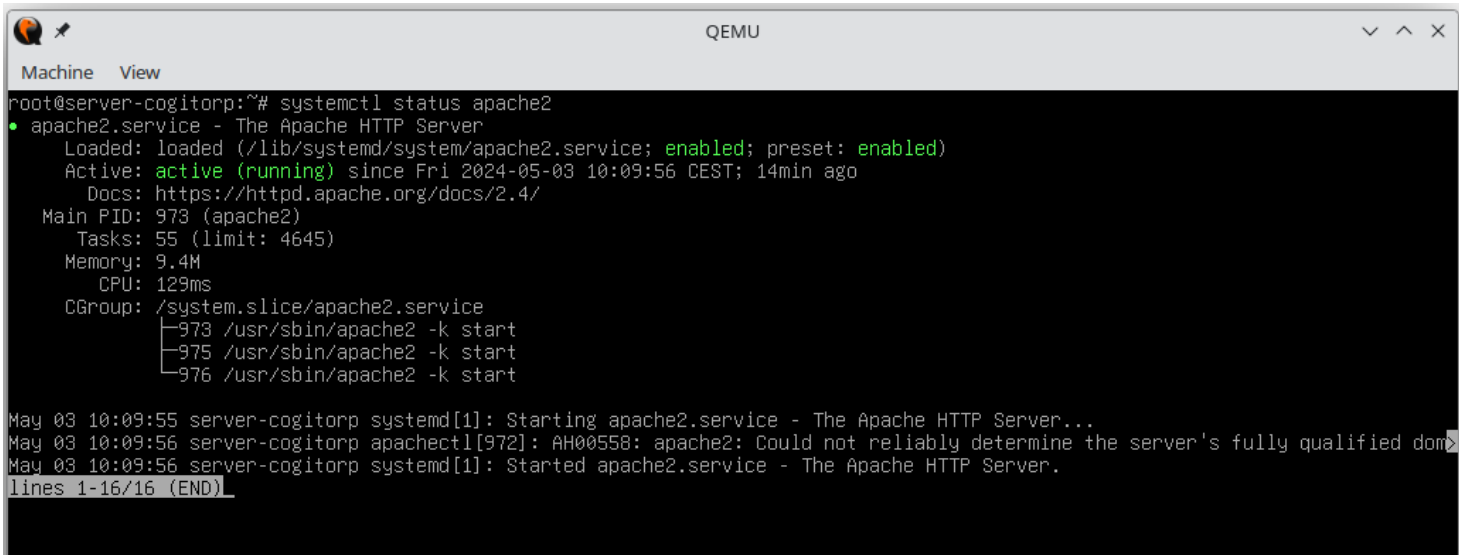
Or run this command :

```
# apt install apache2
```

2. Verify using the following command that Apache is started.

```
# systemctl status apache2
```

You should get this result :



3. If Apache is not started

```
# systemctl start apache2
```

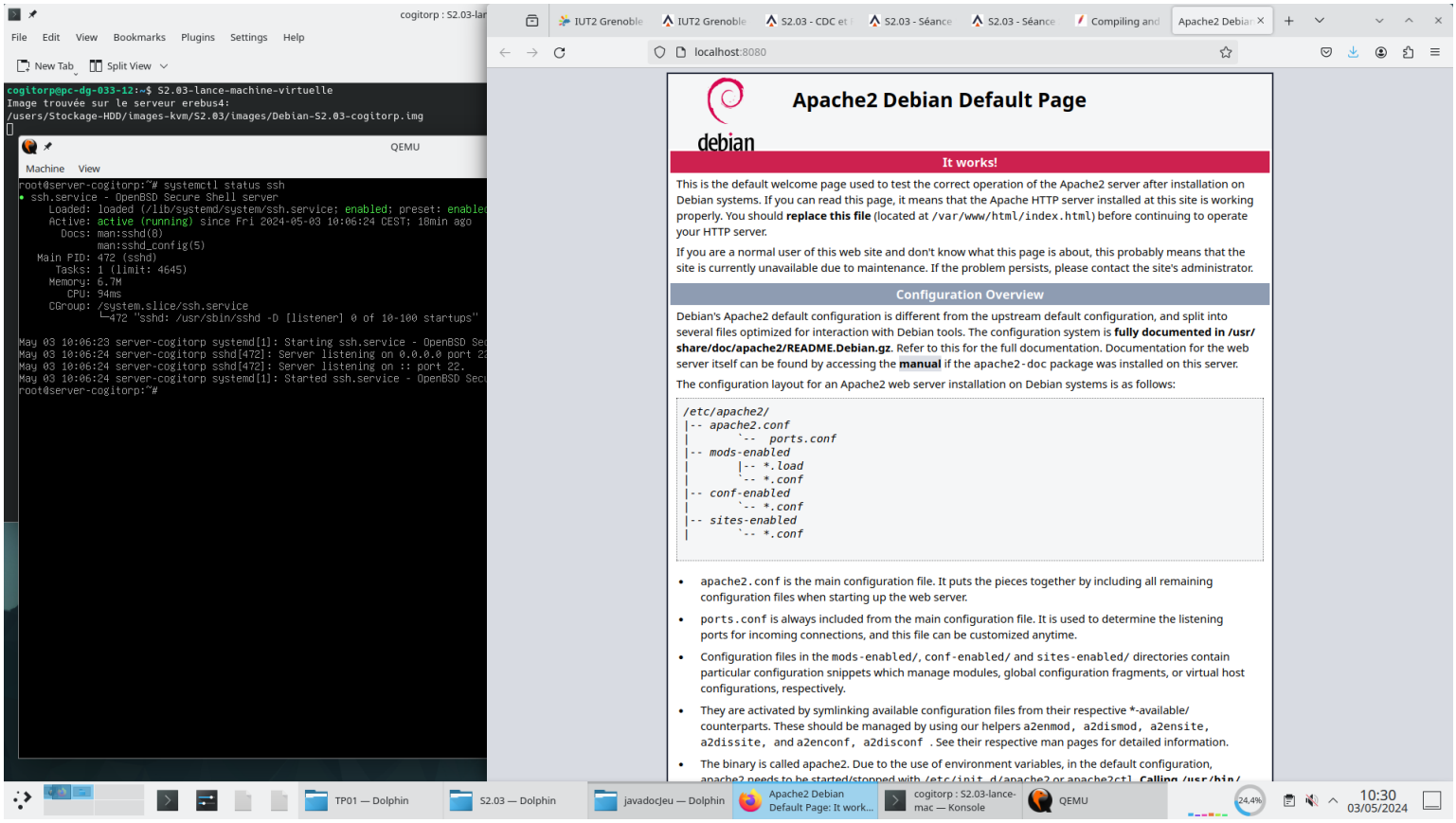
4. Since your machine is a server without a graphical interface it is not possible to display an HTML page. You can connect to the Apache server using telnet and entering the string “HEAD / HTTP/1.0” followed by two newlines. The server should respond "HTTP/1.1 200 OK" as follows

```
$ telnet localhost 80
Trying ::1...
Connected to localhost.
Escape character is '^]'.
HEAD / HTTP/1.0

HTTP/1.1 200 OK
[...]
```

5. Although it is not possible to display a web page on the virtual machine, it is possible to do so from the host machine. To do this, you must redirect a port on the host machine (for example 8080) to port 80 (default port for web servers) on the virtual machine. This is done by the provided launch script.

So we can open a web browser on the host Linux machine and navigate to the URL http://localhost:8080. Check that you arrive on the default page of the virtual machine's Apache server. You should have this result :


cogitorp : S2.03-lar
File Edit View Bookmarks Plugins Settings Help
New Tab Split View
cogitorp@pc-dg-033-12:~$ S2.03-lance-machine-virtuelle
Image trouvée sur le serveur erebus4:
/users/Stockage-HDD/images-kvm/S2.03/images/Debian-S2.03-cogitorp.img
QEMU
Machine View
root@server-cogitorp:~# systemctl status ssh
ssh.service - OpenBSD Secure Shell server
Loaded: loaded (/lib/systemd/system/ssh.service; enabled; preset: enable
Active: active (running) since Fri 2024-05-03 10:06:24 CEST; 18min ago
Docs: man:sshd(8)
man:sshd_config(5)
Main PID: 472 (sshd)
Tasks: 1 (limit: 4645)
Memory: 6.7M
CPU: 94ms
CGroup: /system.slice/ssh.service
└472 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"
May 03 10:06:23 server-cogitorp systemd[1]: Starting ssh.service - OpenBSD Se
May 03 10:06:24 server-cogitorp sshd[472]: Server listening on 0.0.0.0 port 2
May 03 10:06:24 server-cogitorp sshd[472]: Server listening on :: port 22.
May 03 10:06:24 server-cogitorp systemd[1]: Started ssh.service - OpenBSD Secu
root@server-cogitorp:~#
IUT2 Grenoble
IUT2 Grenoble
S2.03 - CDC et
S2.03 - Séance
S2.03 - Séance
Compiling and
Apache2 Debian
localhost:8080
Apache2 Debian Default Page
debian
It works!
This is the default welcome page used to test the correct operation of the Apache2 server after installation on Debian systems. If you can read this page, it means that the Apache HTTP server installed at this site is working properly. You should replace this file (located at /var/www/html/index.html) before continuing to operate your HTTP server.
If you are a normal user of this web site and don't know what this page is about, this probably means that the site is currently unavailable due to maintenance. If the problem persists, please contact the site's administrator.
Configuration Overview
Debian's Apache2 default configuration is different from the upstream default configuration, and split into several files optimized for interaction with Debian tools. The configuration system is fully documented in /usr/share/doc/apache2/README.Debian.gz. Refer to this for the full documentation. Documentation for the web server itself can be found by accessing the manual if the apache2-doc package was installed on this server.
The configuration layout for an Apache2 web server installation on Debian systems is as follows:
/etc/apache2/
|-- apache2.conf
| `-- ports.conf
|-- mods-enabled
| |-- *.load
| `-- *.conf
|-- conf-enabled
| `-- *.conf
|-- sites-enabled
| `-- *.conf
apache2.conf is the main configuration file. It puts the pieces together by including all remaining configuration files when starting up the web server.
ports.conf is always included from the main configuration file. It is used to determine the listening ports for incoming connections, and this file can be customized anytime.
Configuration files in the mods-enabled/, conf-enabled/ and sites-enabled/ directories contain particular configuration snippets which manage modules, global configuration fragments, or virtual host configurations, respectively.
They are activated by symlinking available configuration files from their respective *-available/ counterparts. These should be managed by using our helpers a2enmod, a2dismod, a2ensite, a2dissite, and a2enconf, a2disconf . See their respective man pages for detailed information.
The binary is called apache2. Due to the use of environment variables, in the default configuration,
TP01 — Dolphin
S2.03 — Dolphin
javadocJeu — Dolphin
Apache2 Debian Default Page: It work...
cogitorp : S2.03-lance-mac — Konsole
QEMU
24,4%
10:30
03/05/2024

Chapter 6 : Install PostgreSQL

6.1. Installation

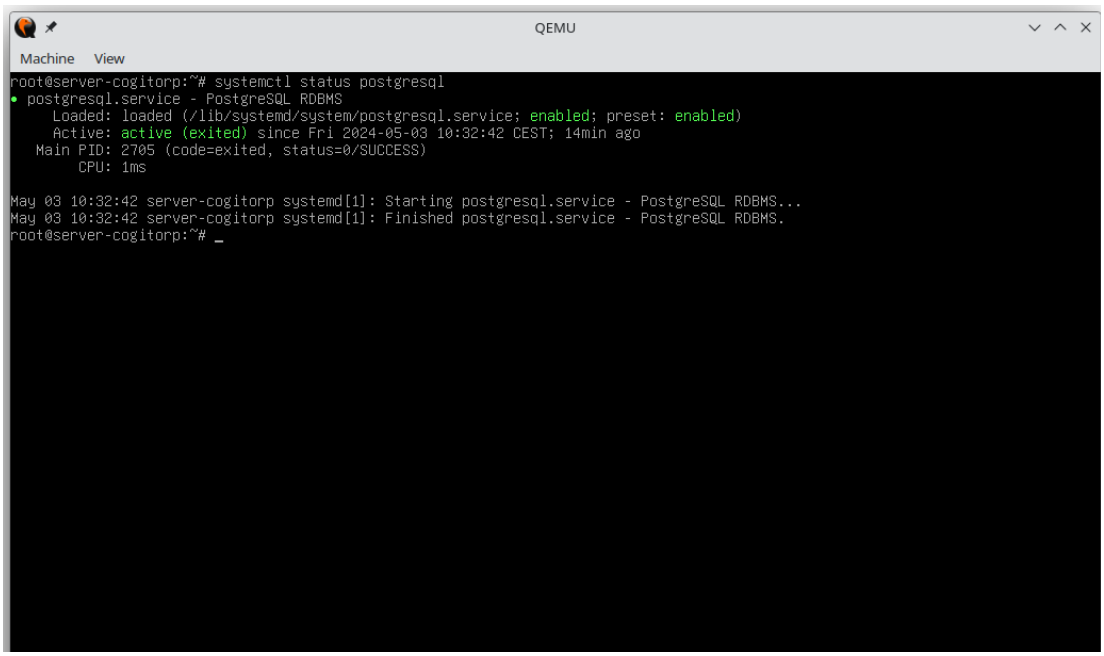
1. visit [the PostgreSQL website](#) as well as the R2.06 resource documents.
2. Install the server and client on your machine using the following command:

```
# apt install postgresql
```

3. To check the installation, you can execute this command :

```
# systemctl status postgresql
```

you should get this result :



After you can log in with the postgres login using the following command from the root account:

```
# su - postgres
```

4. Use this command to display the list of default databases.

```
$ psql -l
```

6.2. Configuration

5. Connect to PostgreSQL from the same shell running on the virtual machine.

```
Su - postgres
```

to switch to the postgres user and

```
psql
```

to launch postgres service

6. In PostgreSQL, create a user with your UGA login name.

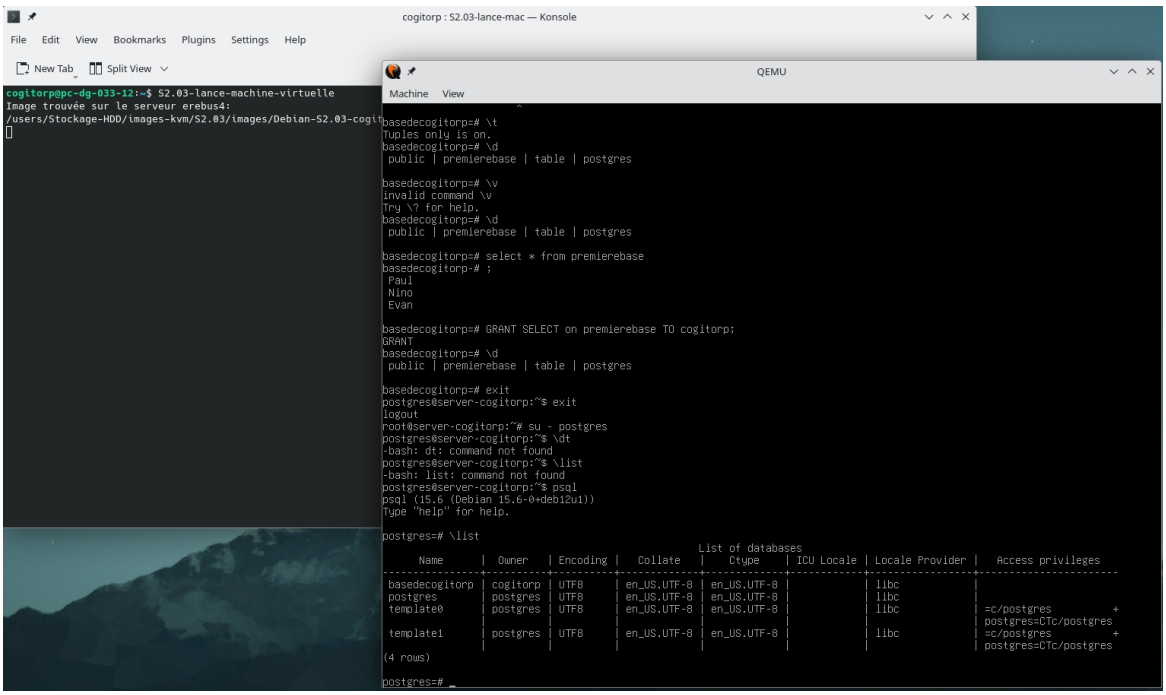
```
CREATE ROLE your_login WITH LOGIN;
```

7. Create a database whose owner must be your user.

```
CREATE DATABASE database_name WITH OWNER=your_login;
```

run this command to chek if it works :

```
\list
```



8. Create a password to access to your database:

   connect to your database with the command

```
\c database_name
```

   and choose a password with this command :

```
\password your_login
```

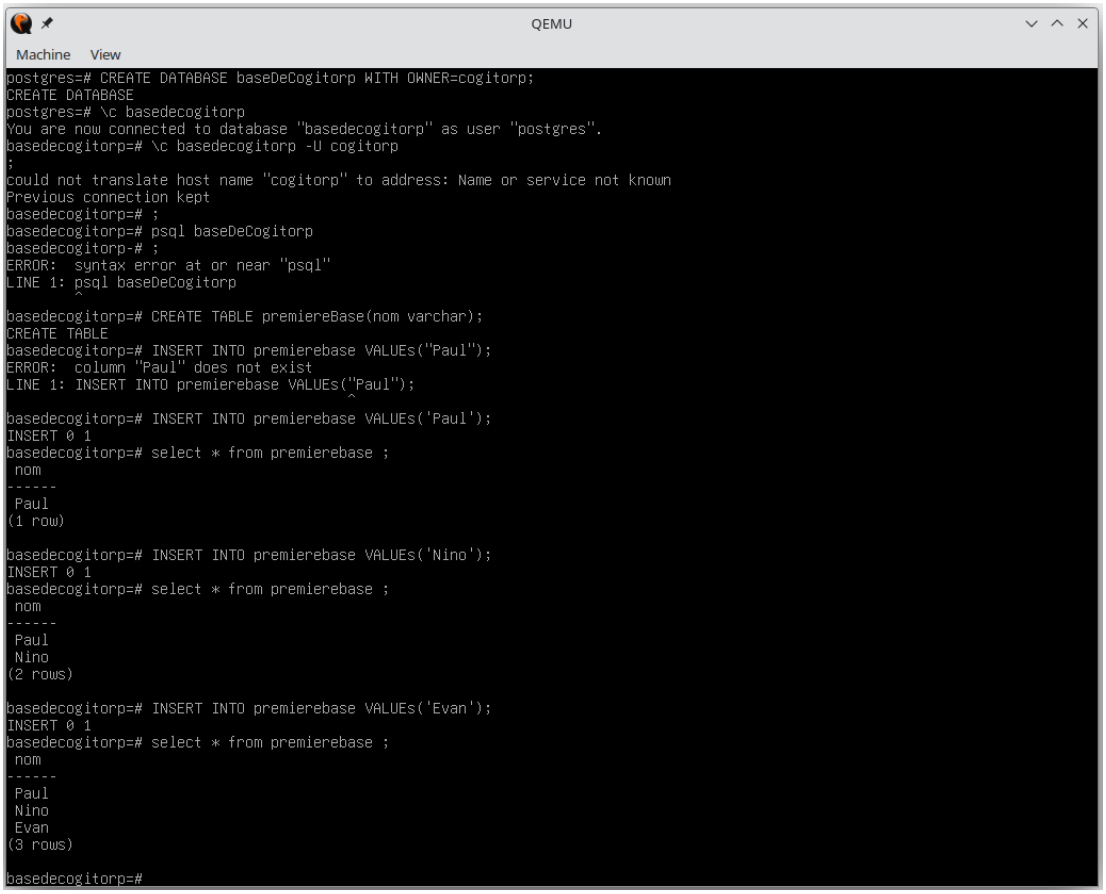
9. Creating a simple table

```
CREATE TABLE table_name;
```

10. Insert a few rows of data in the table.

```
INSERT INTO table_name .....
```

11. database queries should look something like this:



12. Configure PostgreSQL so that it can be accessed from your Linux workstation. To do this, you'll need to modify 2 configuration files, then restart the PostgreSQL server.
    The 2 files are «postgresql.conf» and «pg_hba.conf».

    To find the exact path of the two files, we will use «find». The commands are

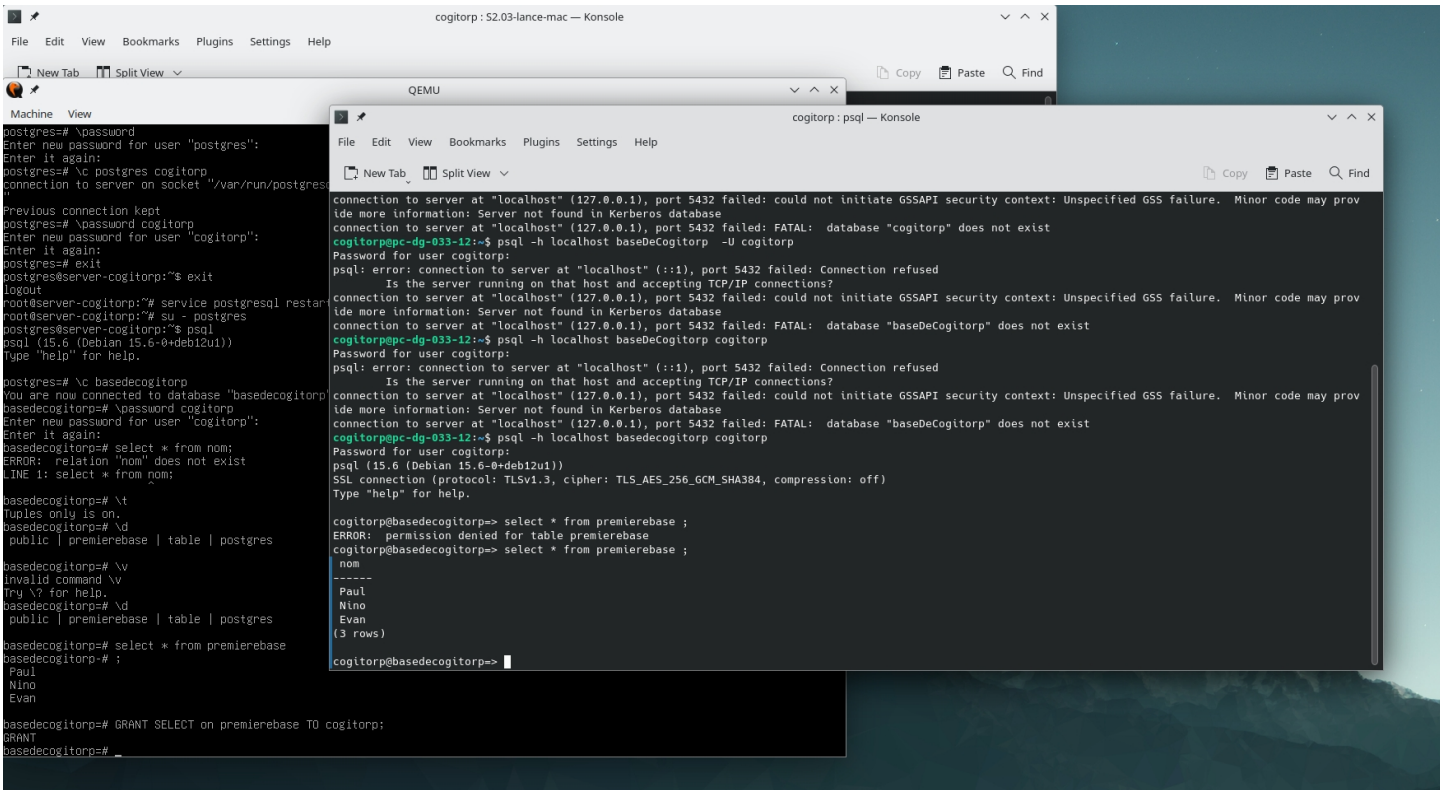
```
find / -name postgresql.conf
```

```
find / -name pg_hba.conf
```

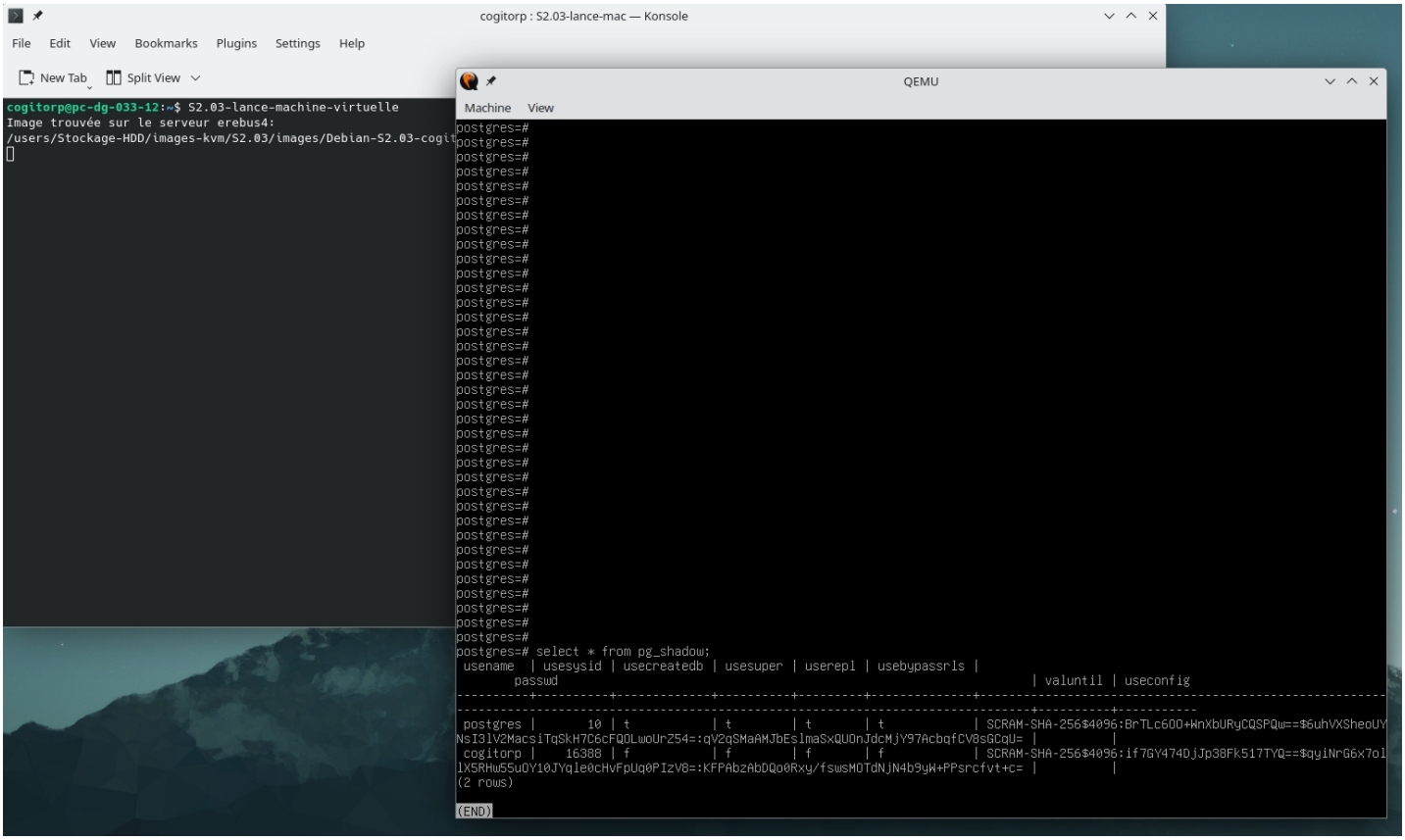
    Now, open path_find/postgresql.conf with nano and modify the line listen_adresses='localhost' to listen_adresses='*'

after, open the second file, find the section «IPv4 local connections :» and your row has to be like: «host all all 127.0.0.1 scram-sha-256»

now if you query the base from the linux station, it looks like this:



13. List the contents of the pg_shadow system table and check that the passwords have been hashed using the SHA-256 hash function. You should have this result :



Chapter 7 : Install PHP

1. Consult the PHP Installation Manual and install PHP on your machine.
2. Test your installation by placing an info.php file containing the following code

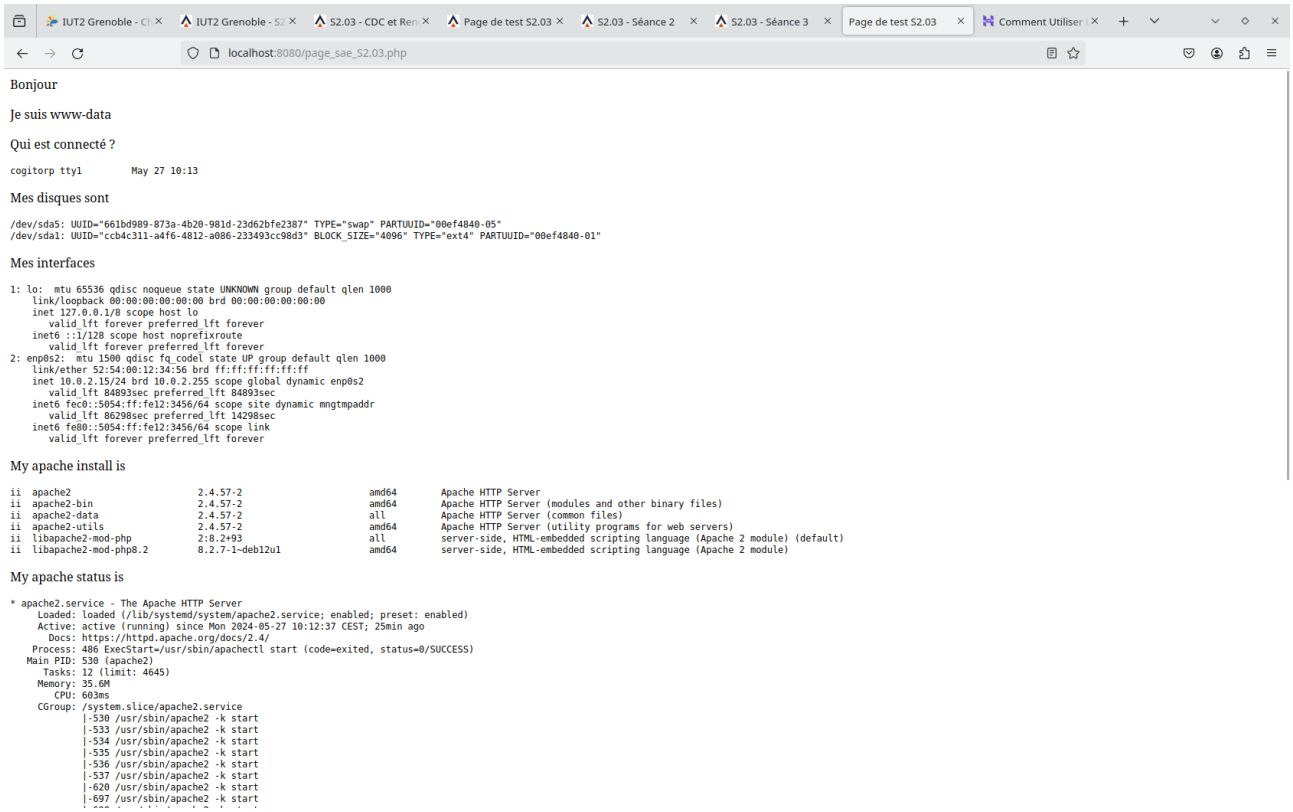
   ```
   <?php
   phpinfo();
   phpinfo(INFO_MODULES);
   ?>
   ```

   go to directory /var/www/html/ and access http://localhost:8080/info.php from the host machine. A page containing the main features of your PHP installation should appear.

3. You can also open a file from your linux machine with a SCP transfer :

```
scp
your_login@name_host_machine:/users/info/www/intranet/enseignements/S2.03/page_sae_S2.03.php /var/www/html/
```

and now you can open this page :


IUT2 Grenoble - Cl
IUT2 Grenoble - S2
S2.03 - CDC et Re
Page de test S2.03
S2.03 - Séance 2
S2.03 - Séance 3
Page de test S2.03
Comment Utiliser
localhost:8080/page_sae_S2.03.php
Bonjour
Je suis www-data
Qui est connecté ?
cogitorp tty1 May 27 10:13
Mes disques sont
/dev/sda5: UUID="661bd989-873a-4b20-981d-23d62bfe2387" TYPE="swap" PARTUUID="00ef4840-05"
/dev/sda1: UUID="ccb4c311-a4f6-4812-a086-233493cc98d3" BLOCK_SIZE="4096" TYPE="ext4" PARTUUID="00ef4840-01"
Mes interfaces
1: lo: 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 noprefixroute
valid_lft forever preferred_lft forever
2: enp0s2: mtu 1500 qdisc fq_codel state UP group default qlen 1000
link/ether 52:54:00:12:34:56 brd ff:ff:ff:ff:ff:ff
inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic enp0s2
valid_lft 84893sec preferred_lft 84893sec
inet6 fec0::5054:ff:fe12:3456/64 scope site dynamic mngtmpaddr
valid_lft 86298sec preferred_lft 14298sec
inet6 fe80::5054:ff:fe12:3456/64 scope link
valid_lft forever preferred_lft forever
My apache install is
ii apache2 2.4.57-2 amd64 Apache HTTP Server
ii apache2-bin 2.4.57-2 amd64 Apache HTTP Server (modules and other binary files)
ii apache2-data 2.4.57-2 all Apache HTTP Server (common files)
ii apache2-utils 2.4.57-2 amd64 Apache HTTP Server (utility programs for web servers)
ii libapache2-mod-php 2:8.2+93 all server-side, HTML-embedded scripting language (Apache 2 module) (default)
ii libapache2-mod-php8.2 8.2.7-1~deb12u1 amd64 server-side, HTML-embedded scripting language (Apache 2 module)
My apache status is
* apache2.service - The Apache HTTP Server
Loaded: loaded (/lib/systemd/system/apache2.service; enabled; preset: enabled)
Active: active (running) since Mon 2024-05-27 10:12:37 CEST; 25min ago
Docs: https://httpd.apache.org/docs/2.4/
Process: 486 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
Main PID: 530 (apache2)
Tasks: 12 (limit: 4645)
Memory: 35.6M
CPU: 603ms
CGroup: /system.slice/apache2.service
|-530 /usr/sbin/apache2 -k start
|-533 /usr/sbin/apache2 -k start
|-534 /usr/sbin/apache2 -k start
|-535 /usr/sbin/apache2 -k start
|-536 /usr/sbin/apache2 -k start
|-537 /usr/sbin/apache2 -k start
|-620 /usr/sbin/apache2 -k start
|-697 /usr/sbin/apache2 -k start

Chapter 8 : Install PHPpgadmin

To install, run this commmand :

```
#apt install phppgadmin
```

After, open connection.php and change the line

```
case '14': return 'Postgres';break;
```

to

```
case '15': return 'Postgres';break;
```

To access PhpPgAdmin's Web interface you need to modify a file, type

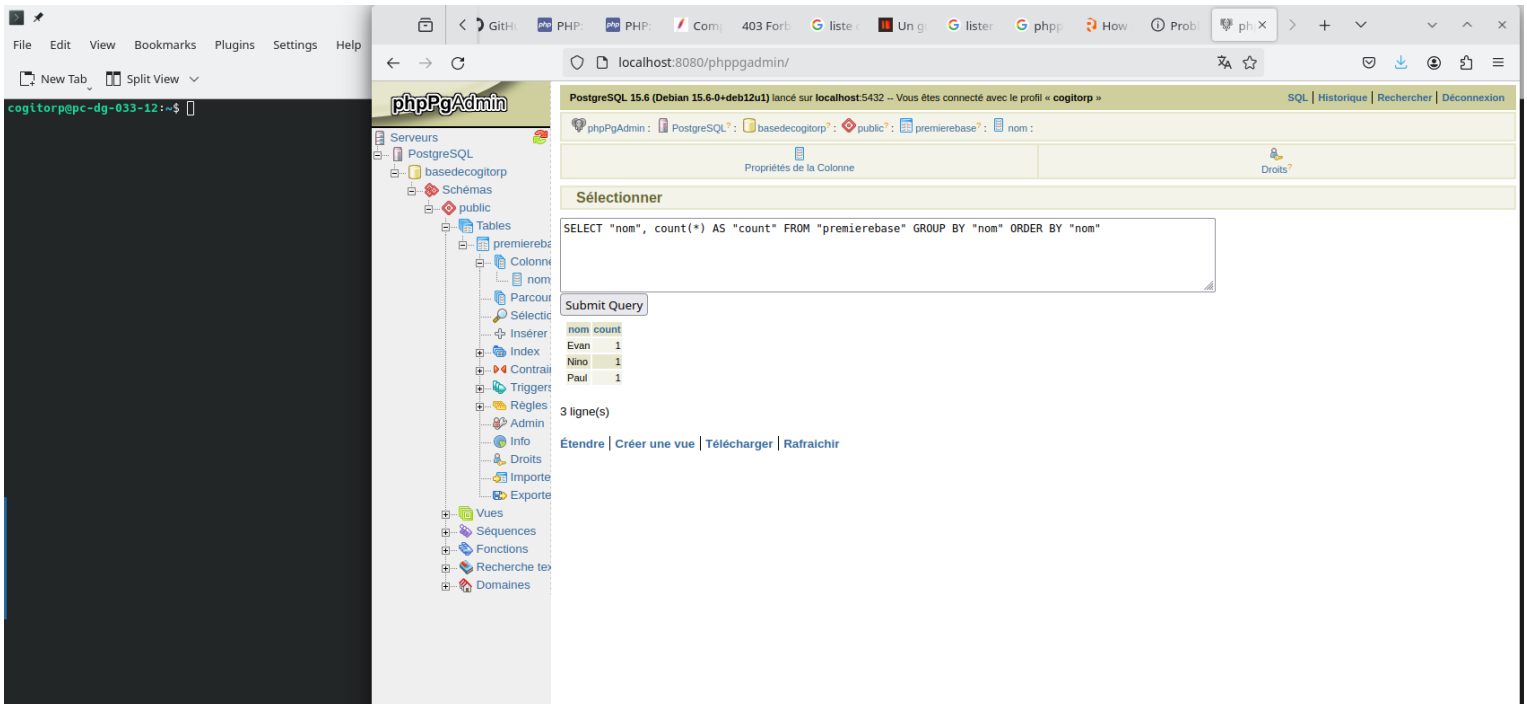
```
# nano /etc/apache2/conf-enabled/phppgadmin.conf
```

And you just have to comment the line «#Require local». Then, type

```
#  systemctl reload apache2.service
```

to reload and save the changes.

Now you can access PhpPgAdmin's Web interface and use it to view and edit your table, like this :


File Edit View Bookmarks Plugins Settings Help
New Tab
Split View
cogitorp@pc-dg-033-12:~$
localhost:8080/phppgadmin/
phpPgAdmin
PostgreSQL 15.6 (Debian 15.6-0+deb12u1) lancé sur localhost:5432 -- Vous êtes connecté avec le profil « cogitorp »
SQL | Historique | Rechercher | Déconnexion
Serveurs
PostgreSQL
basedecogitorp
Schémas
public
Tables
Propriétés de la Colonne
Droits
Sélectionner
SELECT "nom", count(*) AS "count" FROM "premierebase" GROUP BY "nom" ORDER BY "nom"
Submit Query
nom count
Evan 1
Nino 1
Paul 1
3 ligne(s)
Étendre | Créer une vue | Télécharger | Rafraichir

Webographie

https://www.php.net

https://www.debian.org

https://fr.wikipedia.org/wiki/PhpPgAdmin

https://www.postgresql.org