



Debian 11 "Bullseye"

Network services installation guide

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In this guide, you'll learn how to install an operating system on a Qemu/KVM virtual machine and configure it to host the following network services:

- Apache
- Postgresql
- PHP

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Operating system

Before installing any network services, you need to set up a server to host them. For this installation, we will use a Qemu/KVM virtual machine which will act as the server. We will install Debian 11 as the operating system.

Download ISO file

To download the iso file of Debian 11, you need to visit

this [website](#). Here, you must scroll to the bottom of the page and download the file named `debian-11.X.X-amd64-netinst.iso`.

Name
 Parent Directory
 SHA256SUMS
 SHA256SUMS.sign
 SHA512SUMS
 SHA512SUMS.sign
 debian-11.7.0-amd64-netinst.iso
 debian-edu-11.7.0-amd64-netinst.iso
 debian-mac-11.7.0-amd64-netinst.iso

Then, verify the checksum to make sure that the file you have downloaded is correct. For this, you have to run the following command: `sha512sum PATH/TO/ISO/FILE`

Then compare the result with the characters in the SHA512SUMS file, which you can find on the ISO image download page.

```

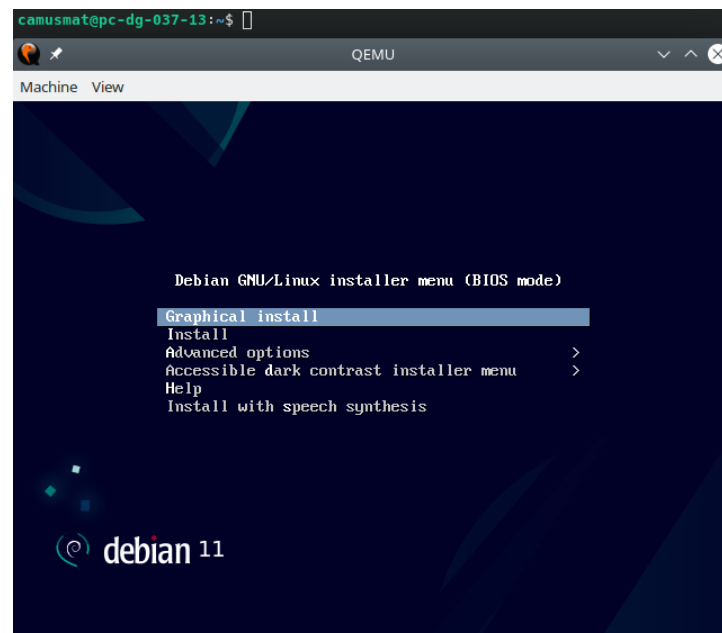
camusmat@pc-dg-037-13: /usr/local/images-ISO$ sha512sum debian-11.7.0-amd64-netinst.iso
4460ef6470f6d8ae193c268e213d33a6a5a0da90c2d30c1024784faa4e4473f0c9b546a41e2d34c43fbbd43542ae4fb93cfd5cb6ac9b88a476f1a6877c478674  debian-11.7.0-amd64-netinst.iso
4460ef6470f6d8ae193c268e213d33a6a5a0da90c2d30c1024784faa4e4473f0c9b546a41e2d34c43fbbd43542ae4fb93cfd5cb6ac9b88a476f1a6877c478674  debian-11.7.0-amd64-netinst.iso
d08b69dbfa0758c98086a90d70ede587e5c04230ec783a571e0df8157eb4411cd8aadf4824f64abc4b033c2bb35e95d61ccca1dbb4a6707f07861f6748491cb4  debian-edu-11.7.0-amd64-netinst.iso
2bb4911db43d6fcb16f8abbf28f412a3ef2891e49237584b38ef6a7462adb53b7ea929bf87527ec8af4808d0ba3379097fe6ce232c25b9e40c9cd0d19333609b  debian-mac-11.7.0-amd64-netinst.iso

```

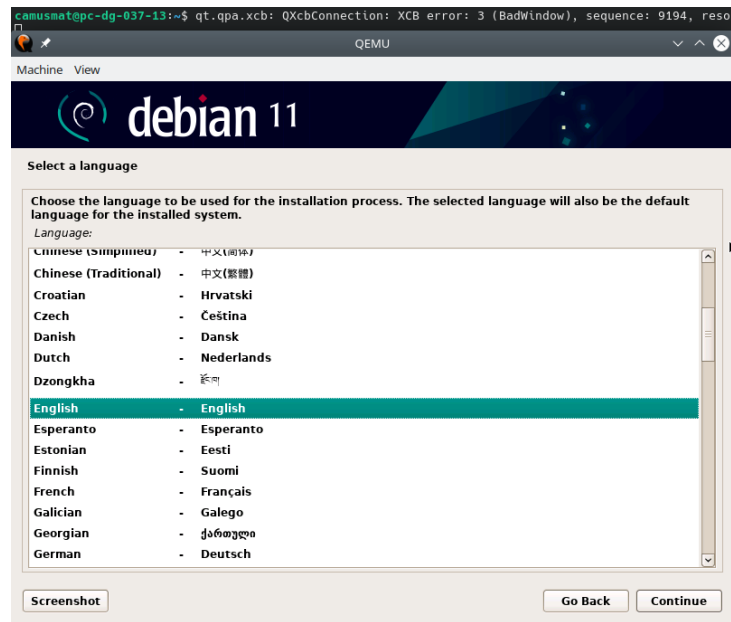
Installation

Here are the steps to install Debian 11:

1. Select *Graphical install*



2. Select your language, your keyboard layout, etc.



3. Enter the hostname (unique name for a device on a network.) of your server



4. Set up the root user.



5. Set up the regular user.



6. Choose the partitioning method. For this installation, we will select “Guided - use entire disks”



7. Choose whether you want to put all files in the same partition or separate home directories. Here, we'll choose all files in one partition.



8. Select Yes to write the changes to the disks.



- Disable all graphical interfaces for a server installation. Select only SSH server and standard system utilities.



- Select Yes to install GRUB boot loader.



11. Select the partition on which you want to install GRUB.

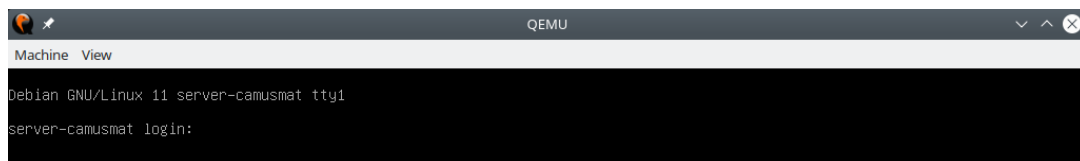


12. The installation is complete!



Once installed

When the installation is completed, you should see this interface:



You must log in as root and type the command `poweroff` to shut down the machine.



You must use this command to shut down the server properly.

Installation check

Network access

1. Check the machine's ethernet and ip characteristics with the command `ip a`


```
Machine View
camusmat@server-camusmat:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s2: <BRROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast 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 86099sec preferred_lft 86099sec
    inet6 fec0::5054:ff:fe12:3456/64 scope site dynamic mngtmpaddr
        valid_lft 86103sec preferred_lft 14103sec
    inet6 fe80::5054:ff:fe12:3456/64 scope link
        valid_lft forever preferred_lft forever
camusmat@server-camusmat:~$
```

2. Check that the machine can access outside with the command:

```
traceroute EXTERNAL_SERVER
```

For example `traceroute google.fr`

You should get a result similar to this one:

```
Machine View
camusmat@server-camusmat:~$ traceroute google.fr
traceroute to google.fr (142.250.179.67), 30 hops max, 60 byte packets
 1 10.0.2.2 (10.0.2.2) 0.066 ms 0.133 ms 0.104 ms
 2 sw-dg-40d-1-tx.lut2.upmf-grenoble.fr (192.168.141.13) 2.774 ms 3.506 ms 3.470 ms
 3 rt-uem.lut2.upmf-grenoble.fr (193.55.51.1) 2.605 ms 3.353 ms 3.319 ms
 4 r-viallet1.grenet.fr (193.54.184.185) 0.946 ms 0.868 ms 0.836 ms
 5 tigre1.grenet.fr (193.54.185.17) 11.983 ms 11.916 ms 11.883 ms
 6 te1-4-grenoble-rtr-021.noc.renater.fr (193.51.181.94) 1.523 ms 2.114 ms 1.534 ms
 7 te0-0-0-12-ren-nr-lyon2-rtr-091.noc.renater.fr (193.51.177.57) 6.898 ms te0-0-0-1-ren-nr-lyon2-rtr-091.noc.renater.fr (193.51.180.210) 8.186 ms te0-0-0-1-0-12-ren-nr-lyon2-rtr-091.noc.renater.fr (193.51.180.67) 7.750 ms
 8 te1-5-marseille2-rtr-021.noc.renater.fr (193.51.177.169) 14.713 ms xe-0-0-0-14-marseille2-rtr-131.noc.renater.fr (193.51.180.105) 14.301 ms reserve-ren-nr-marseille2-rtr-091.noc.renater.fr (193.51.177.23) 13.876 ms
 9 72.14.218.132 (72.14.218.132) 6.963 ms 6.533 ms 6.579 ms
10 108.170.252.242 (108.170.252.242) 6.824 ms 108.170.252.243 (108.170.252.243) 7.603 ms 74.125.244.211 (74.125.244.211) 7.199 ms
11 216.239.35.209 (216.239.35.209) 13.345 ms 12.967 ms 64.233.175.243 (64.233.175.243) 15.254 ms
12 209.85.248.116 (209.85.248.116) 14.115 ms 72.14.238.54 (72.14.238.54) 13.455 ms 209.85.251.217 (209.85.251.217) 13.481 ms
13 108.170.245.1 (108.170.245.1) 14.987 ms 14.580 ms 14.485 ms
14 142.251.49.133 (142.251.49.133) 13.051 ms 142.251.49.131 (142.251.49.131) 13.343 ms 142.251.49.133 (142.251.49.133) 13.196 ms
15 par21s19-ln-f3.1e100.net (142.250.179.67) 13.278 ms 13.080 ms 12.950 ms
camusmat@server-camusmat:~$
```

3. Check that no Xorg server is installed with the following command: `dpkg -l | grep xorg`

If it is not installed, nothing should be displayed.

```
Machine View
camusmat@server-camusmat:~$ dpkg -l | grep xorg
camusmat@server-camusmat:~$
```

SSH connection

First, check that an SSH server is running on the virtual machine with the following command: `systemctl status ssh`

```
root@server-camusmat:~# systemctl status ssh
● ssh.service - OpenBSD Secure Shell server
   Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2023-05-09 15:36:04 CEST; 1h 35min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
   Main PID: 423 (sshd)
     Tasks: 1 (limit: 4661)
    Memory: 5.2M
      CPU: 128ms
   CGroup: /system.slice/ssh.service
           └─423 sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups
```

To connect to your server via an SSH connection from the machine running the virtual machine, type this command in a terminal: `ssh LOGIN@localhost -p 2222`

```
camusmat@pc-dg-037-13:~$ ssh camusmat@localhost -p 2222
The authenticity of host '[localhost]:2222 ([127.0.0.1]:2222)' can't be established.
ECDSA key fingerprint is SHA256:9f/qeZb1Ycp1J3f0RvsHqiWRB7beQfxr/nR/93qX3Hw.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '[localhost]:2222' (ECDSA) to the list of known hosts.
camusmat@localhost's password:
Linux server-camusmat 5.10.0-22-amd64 #1 SMP Debian 5.10.178-3 (2023-04-22) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Fri May 5 16:03:11 2023
camusmat@server-camusmat:~$
camusmat@server-camusmat:~$
```

Once logged in, you can change to the root user with the following command: `su -`. Then enter the root password.

```
camusmat@server-camusmat:~$ su -
Password:
root@server-camusmat:~#
```

To test that everything works, you can install a package, such as `micro`, with the following command (as root) :

```
apt install micro
```

Network services

Apache

Installation

To install Apache, enter the following command as root (source): `apt install apache2`

Installation check

Next, check that apache has been started with the following command: `systemctl status apache2`

You should get this result:

```
root@server-camusmat:~# systemctl status apache2
● apache2.service - The Apache HTTP Server
   Loaded: loaded (/lib/systemd/system/apache2.service; enabled; vendor preset: enabled)
   Active: active (running) since Tue 2023-05-09 15:39:56 CEST; 4min 19s ago
     Docs: https://httpd.apache.org/docs/2.4/
    Main PID: 904 (apache2)
      Tasks: 55 (limit: 4661)
    Memory: 9.0M
       CPU: 41ms
    CGroup: /system.slice/apache2.service
            └─904 /usr/sbin/apache2 -k start
              └─906 /usr/sbin/apache2 -k start
                └─907 /usr/sbin/apache2 -k start

May 09 15:39:55 server-camusmat systemd[1]: Starting The Apache HTTP Server...
May 09 15:39:55 server-camusmat apachectl[903]: AH00558: apache2: Could not reliably determine the server's fully qualified domain name, please edit the 'ServerName' line in the default configuration file to assign a fully qualified domain name.
May 09 15:39:56 server-camusmat systemd[1]: Started The Apache HTTP Server.
```

If you don't get this result, restart `apache2` with the following command and try again: `systemctl restart apache2`.

As the server has no graphical interface, it is impossible to display an HTML page. However, you can check that the Apache server is running using `telnet`. To do this, follow these steps:

1. `telnet localhost 80`

2. `HEAD / HTTP/1.0`
3. The server should reply `HTTP/1.1 200 OK` as follows:

```
root@server-camusmat:~# exit
logout
camusmat@server-camusmat:~$ telnet localhost 80
Trying ::1...
Connected to localhost.
Escape character is '^]'.
HEAD / HTTP/1.0

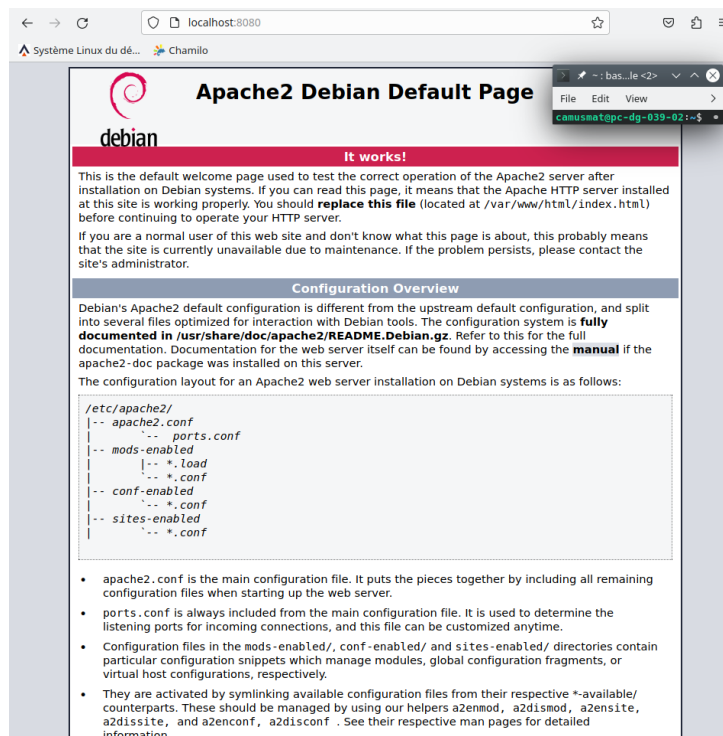
HTTP/1.1 200 OK
Date: Tue, 09 May 2023 13:46:22 GMT
Server: Apache/2.4.56 (Debian)
Last-Modified: Tue, 09 May 2023 13:39:54 GMT
ETag: "29cd-5fb42e3f4981c"
Accept-Ranges: bytes
Content-Length: 10701
Vary: Accept-Encoding
Connection: close
Content-Type: text/html

Connection closed by foreign host.
```

You can also access Apache server HTML pages from the machine running the VM, thanks to the redirection of port 80 to port 8080 in the VM launch script.

In a browser on the host machine, access the following URL: `http://localhost:8080`

You should see the following page:



Postgresql

Installation

To install Postgresql, enter the following command as root (source): `apt install postgresql`

Installation check

First, check that the postgresql server is running on the virtual machine with the following command: `systemctl status postgresql`

```

root@server-camusmat:~# systemctl status postgresql
● postgresql.service - PostgreSQL RDBMS
   Loaded: loaded (/lib/systemd/system/postgresql.service; enabled; vendor preset: enabled)
   Active: active (exited) since Tue 2023-05-09 16:21:19 CEST; 50min ago
 Main PID: 4380 (code=exited, status=0/SUCCESS)
    Tasks: 0 (limit: 4661)
   Memory: 0B
      CPU: 0
   CGroup: /system.slice/postgresql.service

```

Then, log in with the postgres login using the following command from the root account: `su - postgres`

You can list default tables with `psql -l` as shown below:

```

root@server-camusmat:~# su - postgres
postgres@server-camusmat:~$ psql -l

```

Name	Owner	Encoding	Collate	Ctype	Access privileges
postgres	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	=c/postgres +
template0	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	postgres=Ctc/postgres +
template1	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	=c/postgres + postgres=Ctc/postgres

```

(3 rows)

postgres@server-camusmat:~$ _

```

Usage

Connect to PostgreSQL with the command: `psql`

Create a new user with the command: `CREATE USER username;`

Then, you can create a database for this user with the command:

`CREATE DATABASE basename WITH OWNER=username;`

You can check the creation of a user with `\du` and you can check the creation of a new base with `\l`.

Here is an example:

```

postgres=# CREATE USER camusmat;
CREATE ROLE
postgres=# CREATE DATABASE camusmatbase WITH OWNER=camusmat;
CREATE DATABASE
postgres=# \du

```

Role name	Attributes	Member of
camusmat		{ }
postgres	Superuser, Create role, Create DB, Replication, Bypass RLS	{ }

```

postgres=# \l

```

Name	Owner	Encoding	Collate	Ctype	Access privileges
camusmatbase	camusmat	UTF8	en_US.UTF-8	en_US.UTF-8	
postgres	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	=c/postgres +
template0	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	postgres=Ctc/postgres +
template1	postgres	UTF8	en_US.UTF-8	en_US.UTF-8	=c/postgres + postgres=Ctc/postgres

```

(4 rows)

postgres=# _

```

To create tables, you need to connect to psql with the user who owns the database.

To do so, log out of PostgreSQL with `\q`, then change the user to your database owner with `su username`. Then reconnect to the database with the command: `psql basename`.

Finally, create a table with `CREATE TABLE tablename ([type columnname ...]);`

You can insert values with this command:

`INSERT INTO tablename VALUES (some values) [, (other values) ...];`

Here is an example:

```
camusmat@server-camusmat:~$ psql camusmatbase
psql (13.10 (Debian 13.10-0+deb11u1))
Type "help" for help.

camusmatbase=> CREATE TABLE MATABLE (id int primary key, info varchar);
CREATE TABLE
camusmatbase=> INSERT INTO matable (0, 'info1'), (1, 'info2'), (2, 'info3');
ERROR: syntax error at or near "0"
LINE 1: INSERT INTO matable (0, 'info1'), (1, 'info2'), (2, 'info3')...
                           ^
camusmatbase=> INSERT INTO matable VALUES (0, 'info1'), (1, 'info2'), (2, 'info3');
INSERT 0 3
camusmatbase=> SELECT * FROM matable ;
 id | info
-----+-----
  0 | info1
  1 | info2
  2 | info3
(3 rows)
```

Access PostgreSQL from the host machine

To access PostgreSQL from the host machine, you need to modify some configuration files. You can use nano to edit a file.

First, you need to modify the `postgresql.conf` file located at `/etc/postgresql/13/main/`. Uncomment the line where it is written “listen_addresses” and change the value to `*` as shown below.

```
#-----
# CONNECTIONS AND AUTHENTICATION
#-----

# - Connection Settings -

listen_addresses = '*'          # what IP address(es) to listen on;
                                # comma-separated list of addresses;
                                # defaults to 'localhost'; use '*' for all
                                # (change requires restart)
port = 5432                     # (change requires restart)
max_connections = 100           # (change requires restart)
#superuser_reserved_connections = 3 # (change requires restart)
unix_socket_directories = '/var/run/postgresql' # comma-separated list of directories
                                # (change requires restart)
#unix_socket_group = ''         # (change requires restart)
#unix_socket_permissions = 0777 # begin with 0 to use octal notation
                                # (change requires restart)
#bonjour = off                  # advertise server via Bonjour
                                # (change requires restart)
#bonjour_name = ''              # defaults to the computer name
                                # (change requires restart)
```

Uncomment the line where it is written “password_encryption” and change the value to `scram-sha-256` as shown below:

```
# - Authentication -

#authentication_timeout = 1min      # 1s-600s
password_encryption = scram-sha-256 # md5 or scram-sha-256
#db_user_namespace = off
```

In the `pg_hba.conf` file located in the same directory, modify as follows:

```
# Database administrative login by Unix domain socket
local all postgres peer

# TYPE DATABASE USER ADDRESS METHOD
# "local" is for Unix domain socket connections only
local all all peer
# IPv4 local connections:
host all all 0.0.0.0/0 scram-sha-256
# IPv6 local connections:
host all all ::1/128 scram-sha-256
# Allow replication connections from localhost, by a user with the
# replication privilege.
local replication all peer
host replication all 127.0.0.1/32 scram-sha-256
host replication all ::1/128 scram-sha-256
```

Finally, restart postgresql with the command `systemctl restart postgresql` as root. You should be able to connect to PostgreSQL from the host machine with `psql -h localhost -U username basename`

```
camusmat@pc-dg-039-02:~$ psql -h localhost -U camusmat camusmatbase
Password for user camusmat:
psql (13.10 (Debian 13.10-0+deb11u1))
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, bits: 256, compression: off)
Type "help" for help.

camusmat@camusmatbase=> \du

          List of roles
Role name | Attributes | Member of
-----+-----+-----
camusmat |            | {}
postgres | Superuser, Create role, Create DB, Replication, Bypass RLS | {}

camusmat@camusmatbase=> \d

          List of relations
Schema | Name | Type | Owner
-----+-----+-----+-----
public | matable | table | camusmat
(1 row)

camusmat@camusmatbase=> █
```

Password hashing with the SHA-256 function (pg_shadow content):

```
postgres=# SELECT * FROM pg_shadow;
username | usesysid | usecreatedb | usesuper | userepl | usebypassrls | passwd | valuntil | useconfig
-----+-----+-----+-----+-----+-----+-----+-----+-----
postgres | 10 | t | t | t | t |  |  | 
camusmat | 16385 | f | f | f | f | SCRAM-SHA-256$4096:rXSLqJdKGcd5BvP16enMyA==$XpfQmSooHnX
u2N6p011pQ3W9ESEAvG1kqdtqLy1F5PE=:98ckmXnbau4fGR2/uG4fPBAYfNzPqJw0oMKD1jfrb0Y= |  | 
(2 rows)

(END)
```

PHP

PHP

Installation

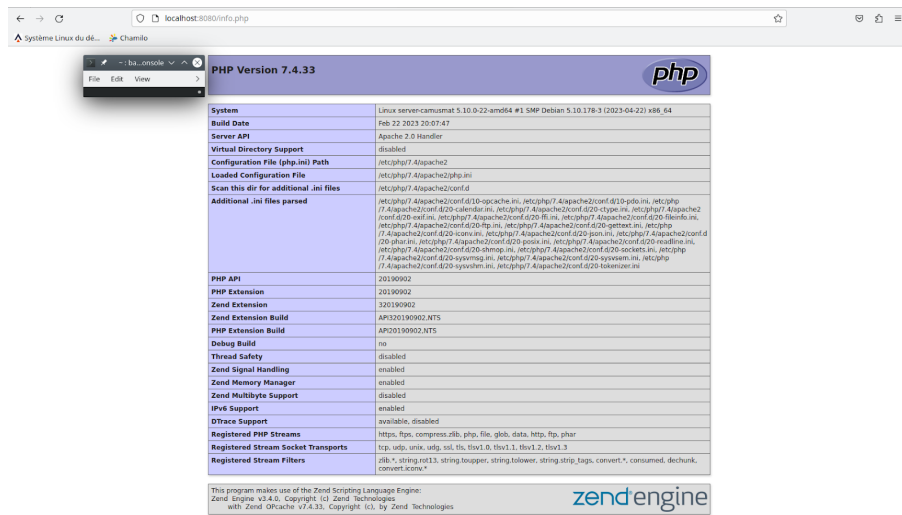
To install PHP, enter the following command as root (source): `apt install php-common libapache2-mod-php php-cli`

Installation check

To check the installation, place an `info.php` file in the `/var/www/html/` directory, containing the following code:

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

Once done, access the URL `http://localhost:8080/info.php` from a browser on the host machine. You should see the next page:



PHP Version 7.4.33	
System	Linux server-camusmat 5.10.0-22-amd64 #1 SMP Debian 5.10.178-3 (2023-04-22) x86_64
Build Date	Feb 22 2023 20:07:47
Server API	Apache 2.0 Handler
Virtual Directory Support	disabled
Configuration File (php.ini) Path	/etc/php/7.4/apache2
Loaded Configuration File	/etc/php/7.4/apache2/php.ini
Scan this dir for additional .ini files	/etc/php/7.4/apache2/conf.d
Additional .ini files parsed	/etc/php/7.4/apache2/conf.d/10-opcache.ini, /etc/php/7.4/apache2/conf.d/10-pdo.ini, /etc/php/7.4/apache2/conf.d/20-calendar.ini, /etc/php/7.4/apache2/conf.d/20-ctype.ini, /etc/php/7.4/apache2/conf.d/20-exif.ini, /etc/php/7.4/apache2/conf.d/20-ffi.ini, /etc/php/7.4/apache2/conf.d/20-fileinfo.ini, /etc/php/7.4/apache2/conf.d/20-ftp.ini, /etc/php/7.4/apache2/conf.d/20-gettext.ini, /etc/php/7.4/apache2/conf.d/20-iconv.ini, /etc/php/7.4/apache2/conf.d/20-intl.ini, /etc/php/7.4/apache2/conf.d/20-ldap.ini, /etc/php/7.4/apache2/conf.d/20-mbstring.ini, /etc/php/7.4/apache2/conf.d/20-mcrypt.ini, /etc/php/7.4/apache2/conf.d/20-mysqlnd.ini, /etc/php/7.4/apache2/conf.d/20-openssl.ini, /etc/php/7.4/apache2/conf.d/20-pdo_mysql.ini, /etc/php/7.4/apache2/conf.d/20-redis.ini, /etc/php/7.4/apache2/conf.d/20-soap.ini, /etc/php/7.4/apache2/conf.d/20-tokenizer.ini, /etc/php/7.4/apache2/conf.d/20-xml.ini, /etc/php/7.4/apache2/conf.d/20-xmlrpc.ini, /etc/php/7.4/apache2/conf.d/20-zip.ini
PHP API	20190902
PHP Extension	20190902
Zend Extension	20190902
Zend Extension Build	AP1320190902.NTS
PHP Extension Build	AP020190902.NTS
Debug Build	no
Thread Safety	disabled
Zend Signal Handling	enabled
Zend Memory Manager	enabled
Zend Multibyte Support	disabled
IPv6 Support	enabled
OTrace Support	available, disabled
Registered PHP Streams	https, ftps, compress.zlib, php, file, glob, data, http, ftp, phar
Registered Stream Socket Transports	tcp, udp, unix, udg, ssl, tls, tlsv1.0, tlsv1.1, tlsv1.2, tlsv1.3
Registered Stream Filters	zlib.*, string.rot13, string.toupper, string.tolower, string.strip_tags, convert.*, consumed, dechunk, convert.iconv.*
This program makes use of the Zend Scripting Language Engine: Zend Engine v3.4.0, Copyright (c) Zend Technologies with Zend OPcache v7.4.33, Copyright (c), by Zend Technologies	

PhpPgAdmin

Installation

To install PhpPgAdmin, enter the following command as root (source): `apt install phpPgAdmin`

Edit the `phpPgAdmin.conf` configuration file located in the `/etc/apache2/conf-enabled/` directory as follow:

```
Alias /phpPgAdmin /usr/share/phpPgAdmin

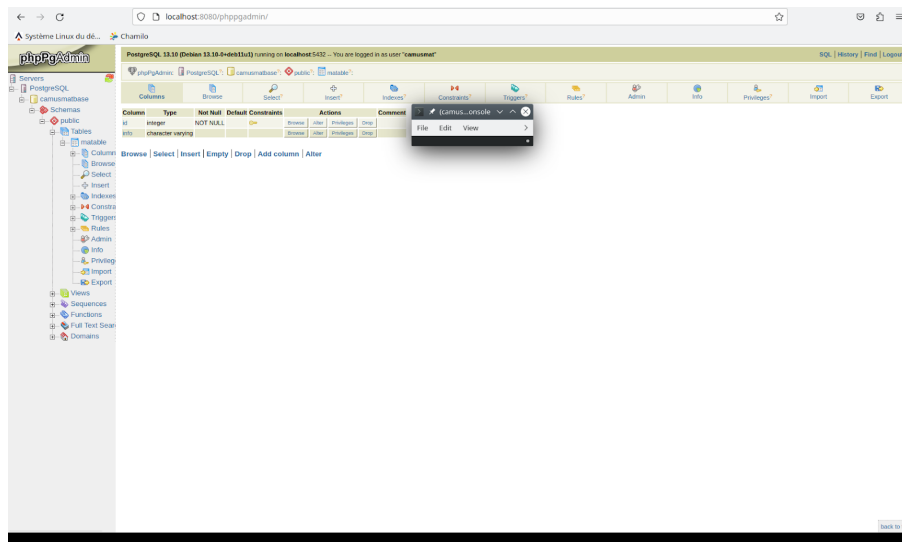
<Directory /usr/share/phpPgAdmin>

<IfModule mod_dir.c>
DirectoryIndex index.php
</IfModule>
AllowOverride None

# Only allow connections from localhost:
#Require local
Require all granted

<IfModule mod_php.c>
    php_flag magic_quotes_gpc Off
    php_flag track_vars On
    #php_value include_path .
</IfModule>
<IfModule !mod_php.c>
    <IfModule mod_actions.c>
        <IfModule mod_cgi.c>
            AddType application/x-httpd-php .php
            Action application/x-httpd-php /cgi-bin/php
        </IfModule>
        <IfModule mod_cgid.c>
            AddType application/x-httpd-php .php
            Action application/x-httpd-php /cgi-bin/php
        </IfModule>
    </IfModule>
</IfModule>
</Directory>
```

You can now access the PhpPgAdmin interface via the URL <http://localhost:8080/phpPgAdmin/> on the host machine.



Other

`cat /etc/fstab` command result:


```
root@server-camusmat:~# exit
logout
camusmat@server-camusmat:~$ cat /etc/fstab
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# systemd generates mount units based on this file, see systemd.mount(5).
# Please run 'systemctl daemon-reload' after making changes here.
#
# <file system> <mount point> <type> <options> <dump> <pass>
# / was on /dev/sda1 during installation
UUID=ab4b2141-c4f5-45f0-af72-dd5e87f57c75 / ext4 errors=remount-ro 0 1
# swap was on /dev/sda5 during installation
UUID=a772f428-de62-4087-82b4-8ea45ed642e7 none swap sw 0 0
/dev/sr0 /media/cdrom0 udf,iso9660 user,noauto 0 0
camusmat@server-camusmat:~$
```

Capture of the PHP page given in the specifications:

```
Bonjour

Je suis www-data

Qui est connecté ?

camusmat pts/0 Jun 1 18:37 (10.0.2.2)

Mes disques sont

/dev/sda1: UUID="ab4b2141-c4f5-45f0-af72-dd5e87f57c75" BLOCK_SIZE="4096" TYPE="ext4" PARTUUID="18a8b5f6-01"
/dev/sda5: UUID="a772f428-de62-4087-82b4-8ea45ed642e7" TYPE="swap" PARTUUID="18a8b5f6-05"

Mes interfaces

1: lo: mtu 65536 qlen 1000 state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: enp0s2: mtu 1500 qlen 1000 fast 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 86400sec preferred_lft 86400sec
    inet6 fe80::5054:ff:fe12:3456/64 scope site dynamic mngtaddr
        valid_lft 86400sec preferred_lft 14400sec
    inet6 fe80::5054:ff:fe12:3456/64 scope link
        valid_lft forever preferred_lft forever

My apache install is

11 apache2 2.4.56-1-deb11u1 amd64 Apache HTTP Server
11 apache2-bin 2.4.56-1-deb11u1 amd64 Apache HTTP Server (modules and other binary files)
11 apache2-data 2.4.56-1-deb11u1 all Apache HTTP Server (common files)
11 apache2-utils 2.4.56-1-deb11u1 amd64 Apache HTTP Server (utility programs for web servers)
11 libapache2-mod-php 7.2-4+deb11u1 all server-side, HTML-embedded scripting language (Apache 2 module) (default)
11 libapache2-mod-php7.4 7.4.33-1-deb11u1 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; vendor preset: enabled)
Active: active (running) since Thu 2023-06-01 18:35:11 CEST; 16min ago
Docs: https://httpd.apache.org/docs/2.4/
Process: 419 ExecStart=/usr/sbin/apachectl start (code=exited, status=0/SUCCESS)
Main PID: 402 (apache2)
Tasks: 9 (limit: 4961)
Memory: 24.0M
CGroup: /system.slice/apache2.service
        402 /usr/sbin/apache2 -k start
        477 /usr/sbin/apache2 -k start
        478 /usr/sbin/apache2 -k start
        479 /usr/sbin/apache2 -k start
        480 /usr/sbin/apache2 -k start
        481 /usr/sbin/apache2 -k start
        728 /usr/sbin/apache2 -k start
        1084 sh -c systemctl status apache2
        485 systemctl status apache2

My postgresql install is

11 postgresql 13-25 all object-relational SQL database (supported version)
11 postgresql-13 13-10-deb11u1 amd64 The World's Most Advanced Open Source Relational Database
11 postgresql-client-13 13-10-deb11u1 amd64 Front-end programs for PostgreSQL 13
11 postgresql-client-common 225 all manager for multiple PostgreSQL client versions
11 postgresql-common 225 all PostgreSQL database-cluster manager

My postgresql status is

* postgresql.service - PostgreSQL RPM95
Loaded: loaded (/lib/systemd/system/postgresql.service; enabled; vendor preset: enabled)
Active: active (exited) since Thu 2023-06-01 18:35:14 CEST; 16min ago
Process: 534 ExecStart=/usr/bin/pg_ctl start -D /var/lib/postgresql/13/main -l /var/log/postgresql/postgresql-13.log -s (code=exited, status=0/SUCCESS)
Main PID: 534 (code=exited, status=0/SUCCESS)
CGroup: /bpo

My ssh install is

11 libssh2-1:amd64 1.9.0-2 amd64 SSh2 client-side library
11 openssh-client 1:8.9p1-5-deb11u1 amd64 secure shell (SSH) client, for secure access to remote machines
11 openssh-server 1:8.9p1-5-deb11u1 amd64 secure shell (SSH) server, for secure access from remote machines
11 openssh-sftp-server 1:8.9p1-5-deb11u1 amd64 secure shell (SSH) sftp server module, for SFTP access from remote machines
11 task-ssh-server 3.60-deb11u1 all SSH server

My ssh status is

* ssh.service - OpenSSH Secure Shell server
Loaded: loaded (/lib/systemd/system/ssh.service; enabled; vendor preset: enabled)
Active: active (running) since Thu 2023-06-01 18:35:11 CEST; 16min ago
Docs: man:ssh(8)
       man:ssh_config(5)
Process: 419 ExecStart=/usr/sbin/sshd -t (code=exited, status=0/SUCCESS)
Main PID: 457 (sshd)
Tasks: 1 (limit: 4961)
Memory: 3.4M
CGroup: /system.slice/ssh.service
        457 sshd: /usr/sbin/sshd -o [listener] 0 of 10-100 startups
```

Disk space at end of installation:

```
camusmat@server-camusmat:~$ df -h | grep sda1
/dev/sda1 3.0G 1.4G 1.5G 49% /
```