

**Falcon MG**

## 1. About FalconMG

One of the most important digital innovations that has taken place in recent years is the cloud, which consists of a computing model where users and companies depend and trust a third party to manage their information via the Internet. Therefore, it is a utility that is increasingly usable and is becoming a resource almost as essential as electricity or water within society.

Although external storage media (external hard drives, flash drives, or CDs and DVDs) continue to be used as tools for data backup, it is undeniable that the storage and management of data in The cloud has experienced increasing demand. We are therefore faced with a technology designed for both the present and the future, which is subject to rapid and constant evolution and which seeks to improve our lives by saving, protecting, securing and perpetuating one of our most precious assets: data.

This project, called FalconMG, aims to be one more of the existing ways of defining the concept of cloud and aims to become a low-cost, fast and effective technology that is also easily accessible to all those who aspire to a system capable of satisfying the digital needs of their homes or their small and medium-sized businesses.

# **FalconMG**

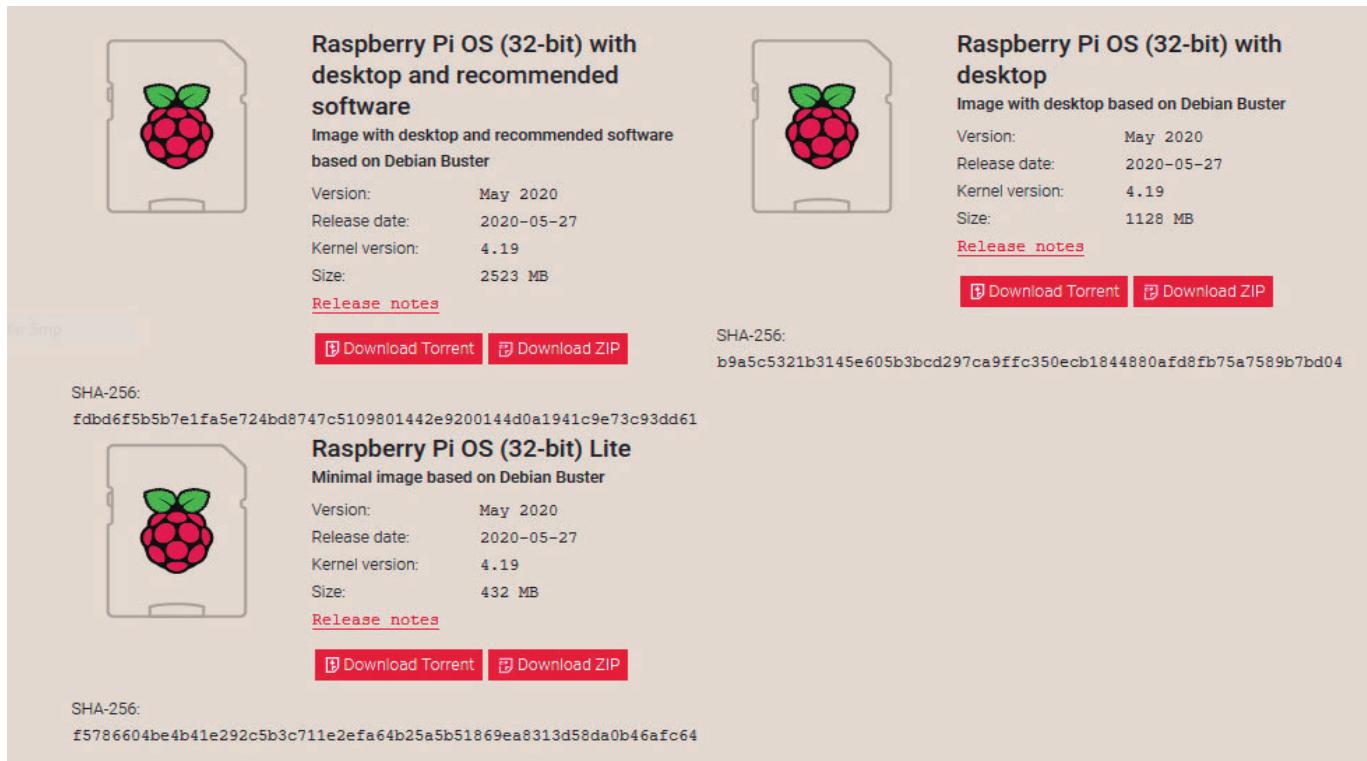
**Gabriel Mailat**

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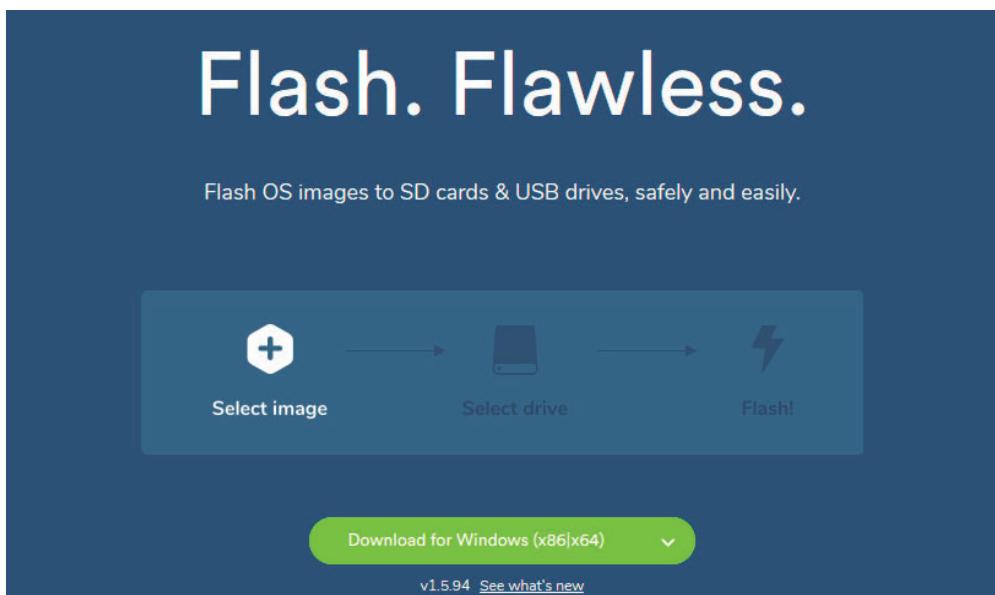
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## 2-Installation of the operating system

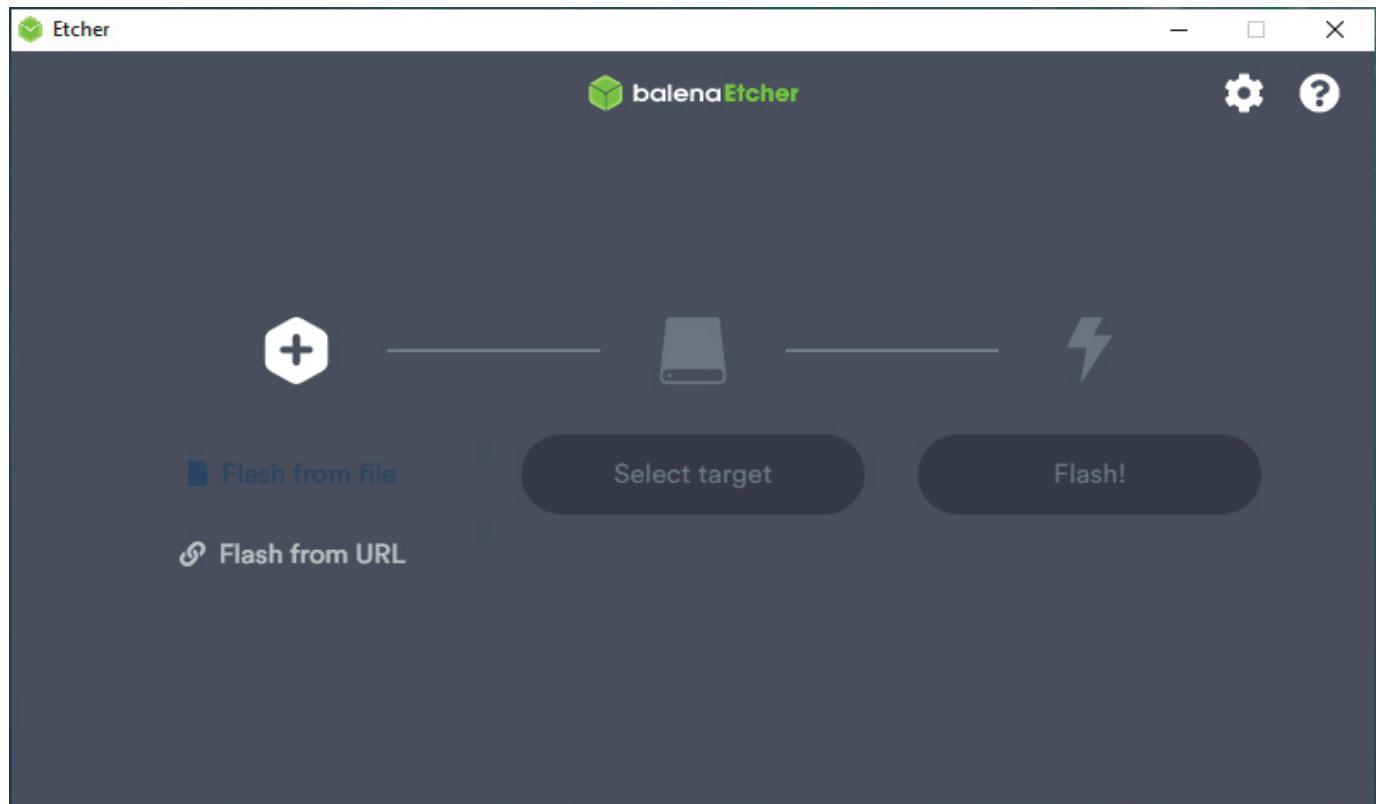
To develop this project we have chosen the Raspbian operating system due to its simplicity and robustness. It is an operating system based on Debian and optimized for Raspberry Pi, the platform on which this project will be developed.



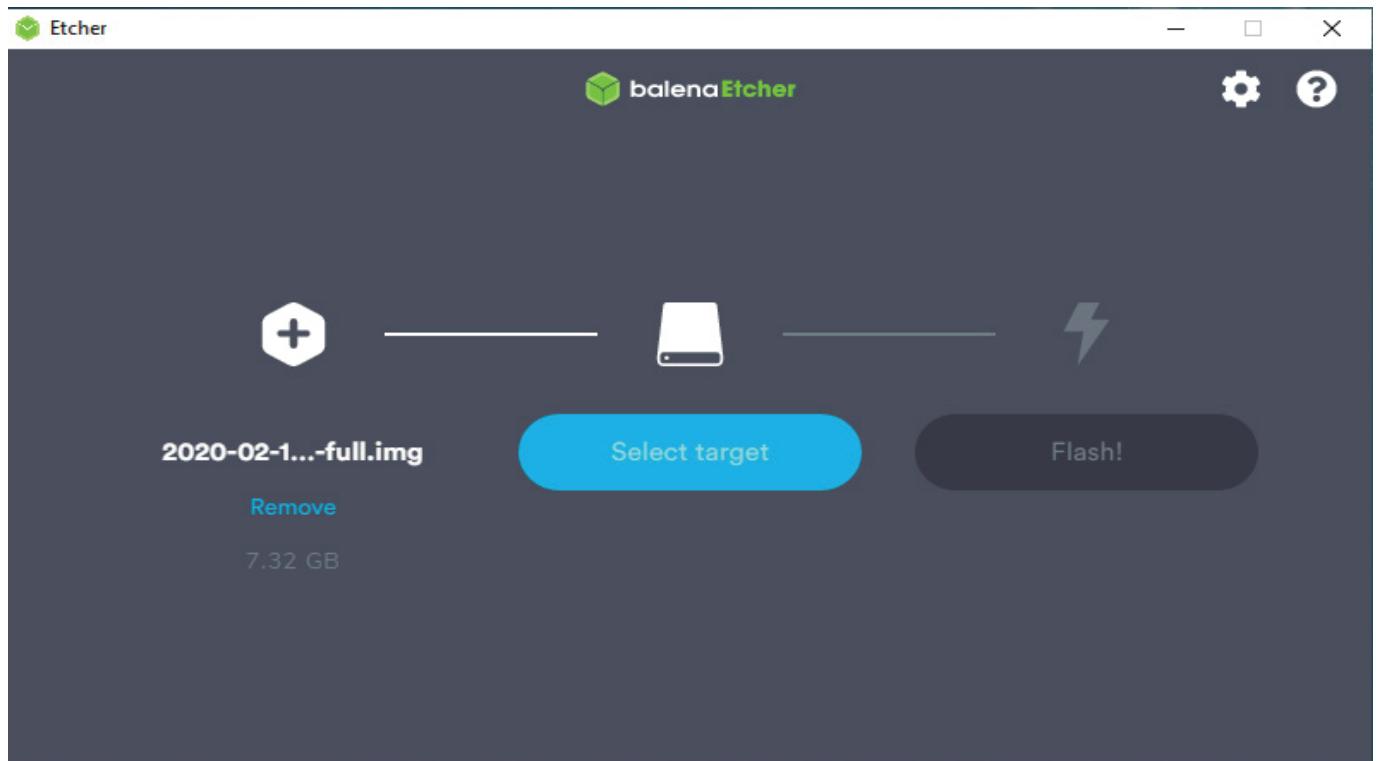
Next we download and install the balenaEtcher tool, which will help us write the Raspbian image file to a microSD card.

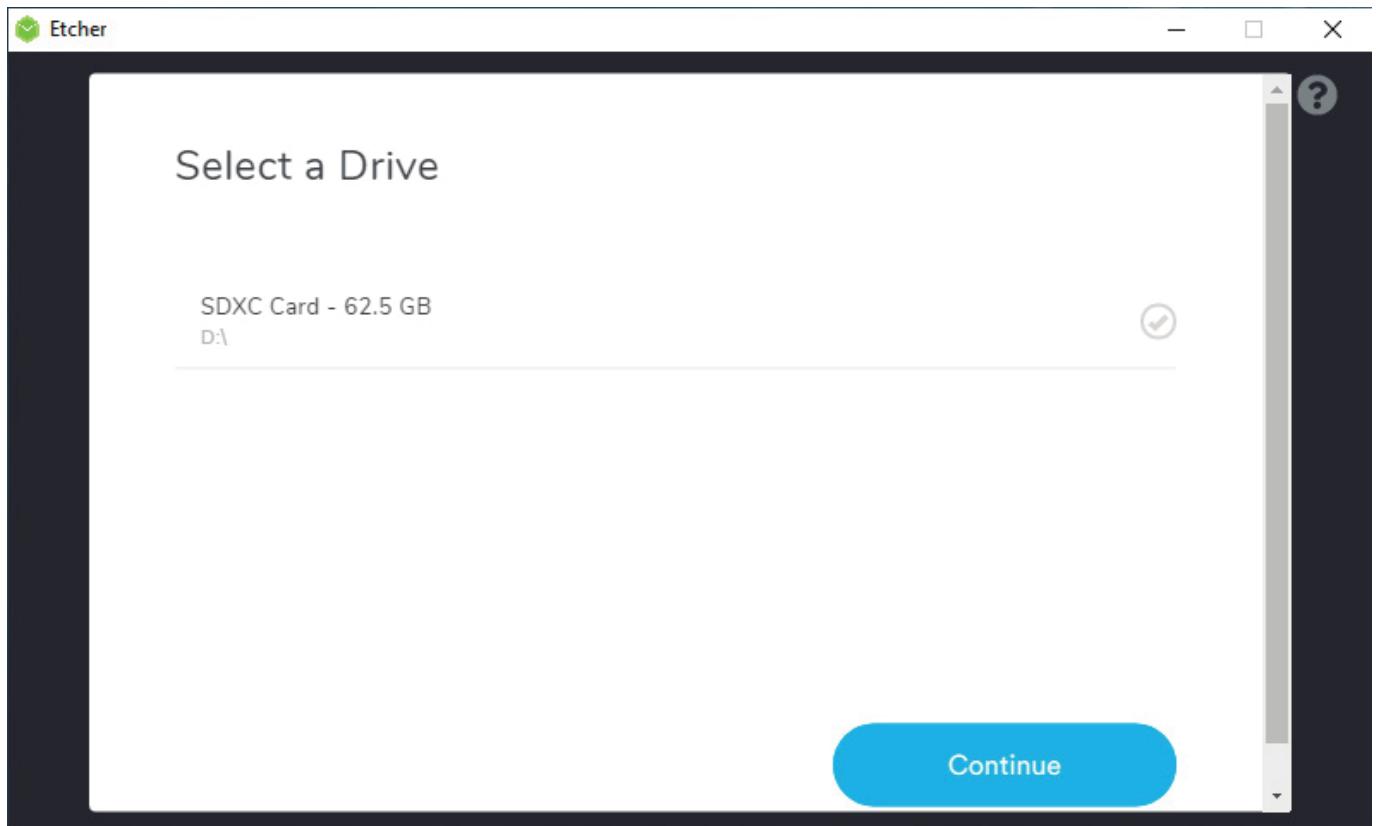


We run balenaEtcher and select the “flash from file” option:

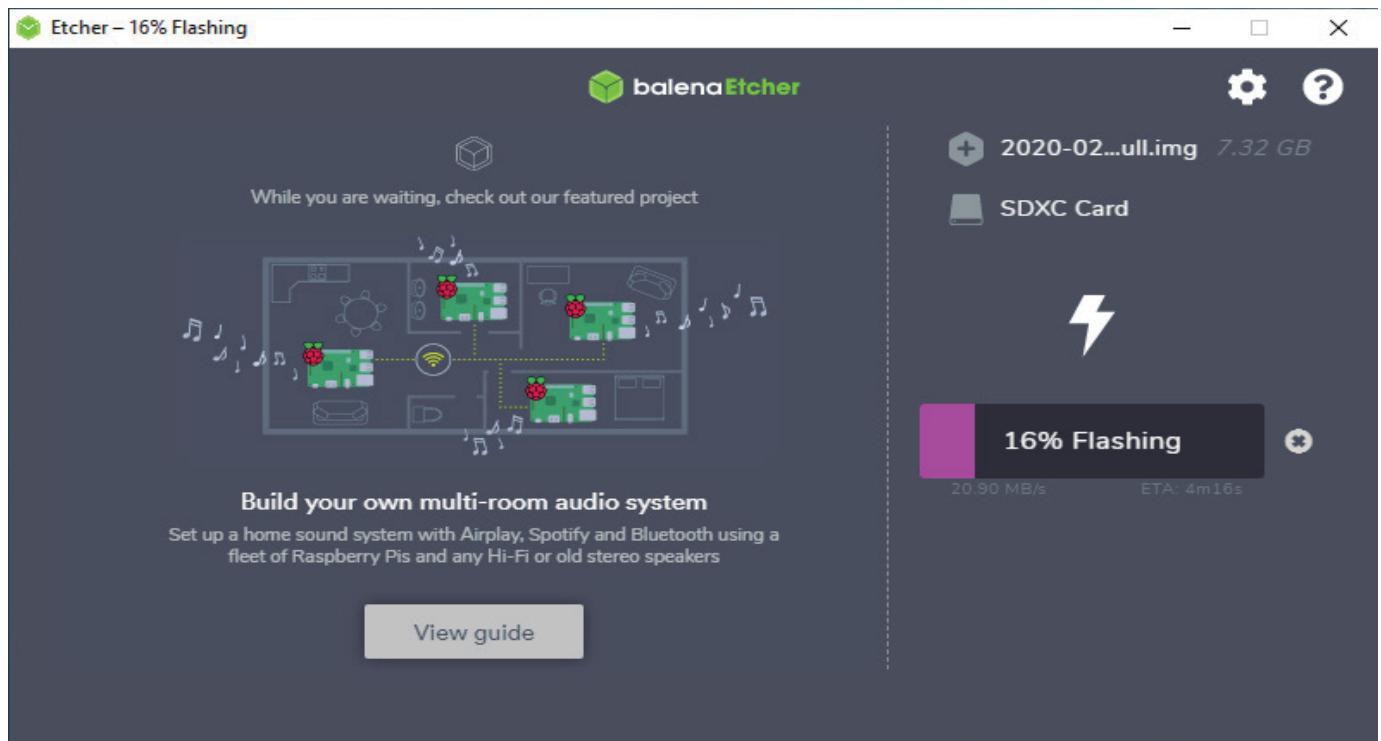


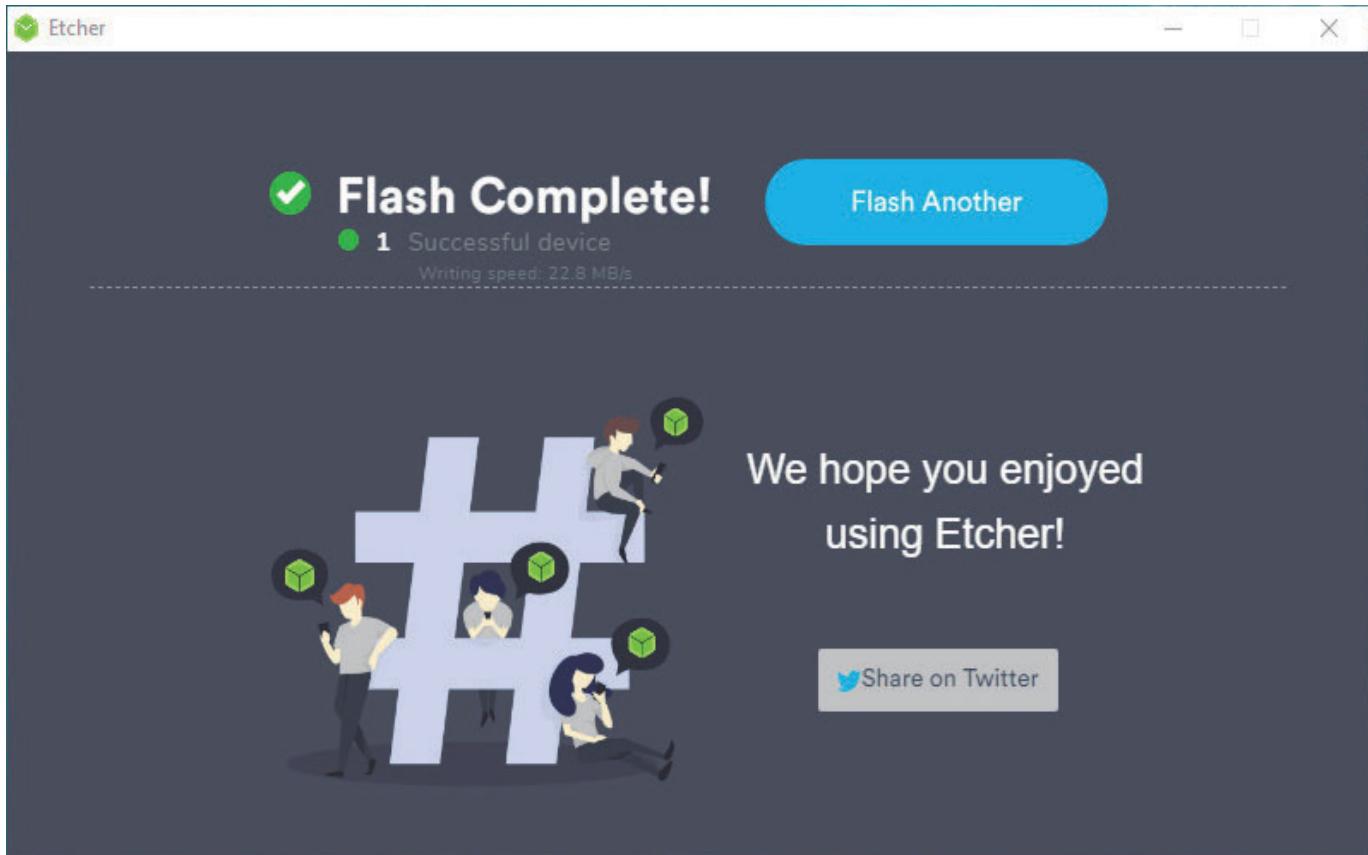
Later we choose the destination, which in this case will be the microSD card:





We mark Continue and the writing process will begin:





We insert the microSD card into the Raspberry Pi slot since it will be the main storage unit and begin the installation of the operating system.

We begin the installation of the operating system:





**Partition disks**

The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.

If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.

*Partitioning method:*

- Guided - use entire disk**
- Guided - use entire disk and set up LVM
- Guided - use entire disk and set up encrypted LVM
- Manual

**Screenshot** **Go Back** **Continue**



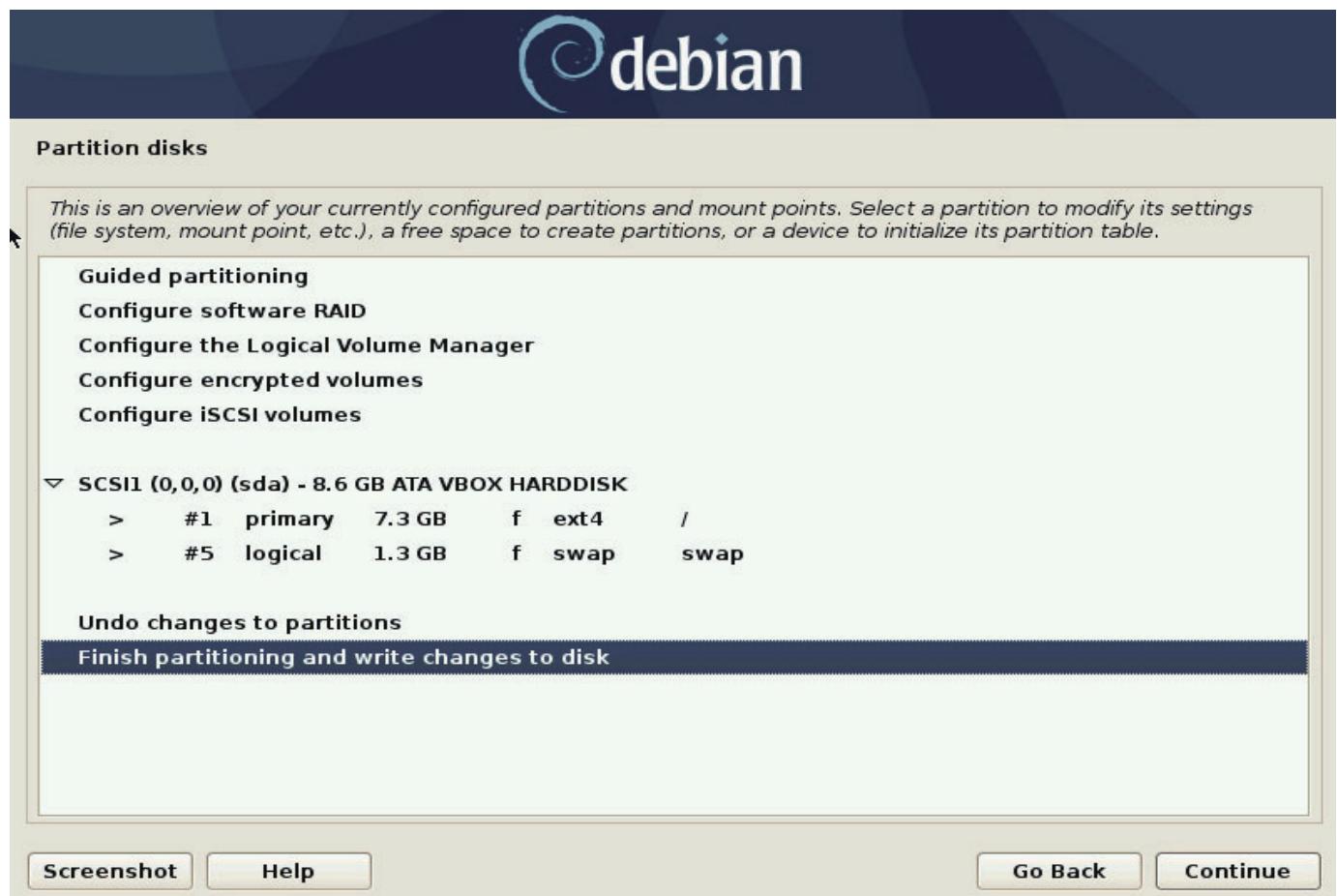
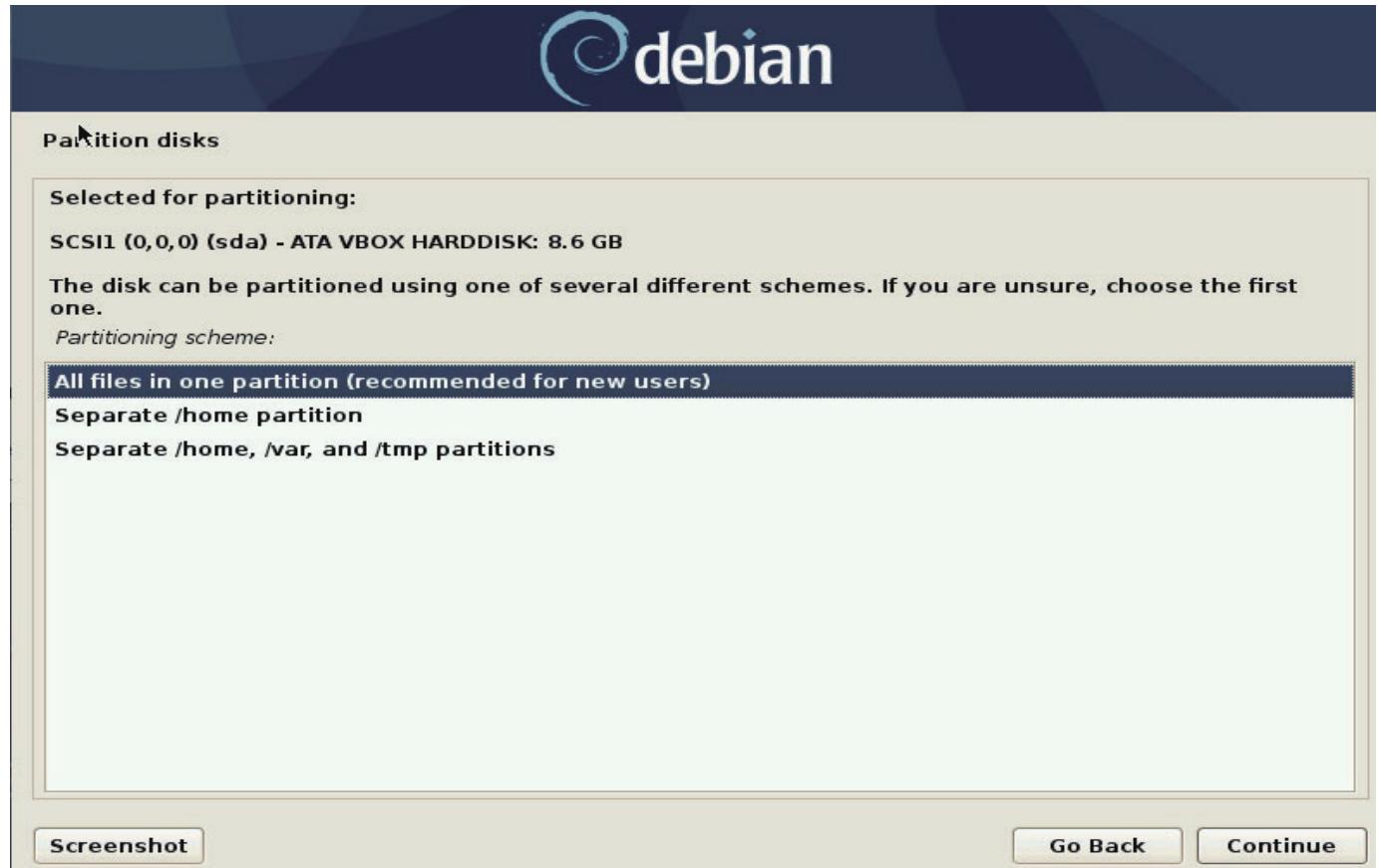
**Partition disks**

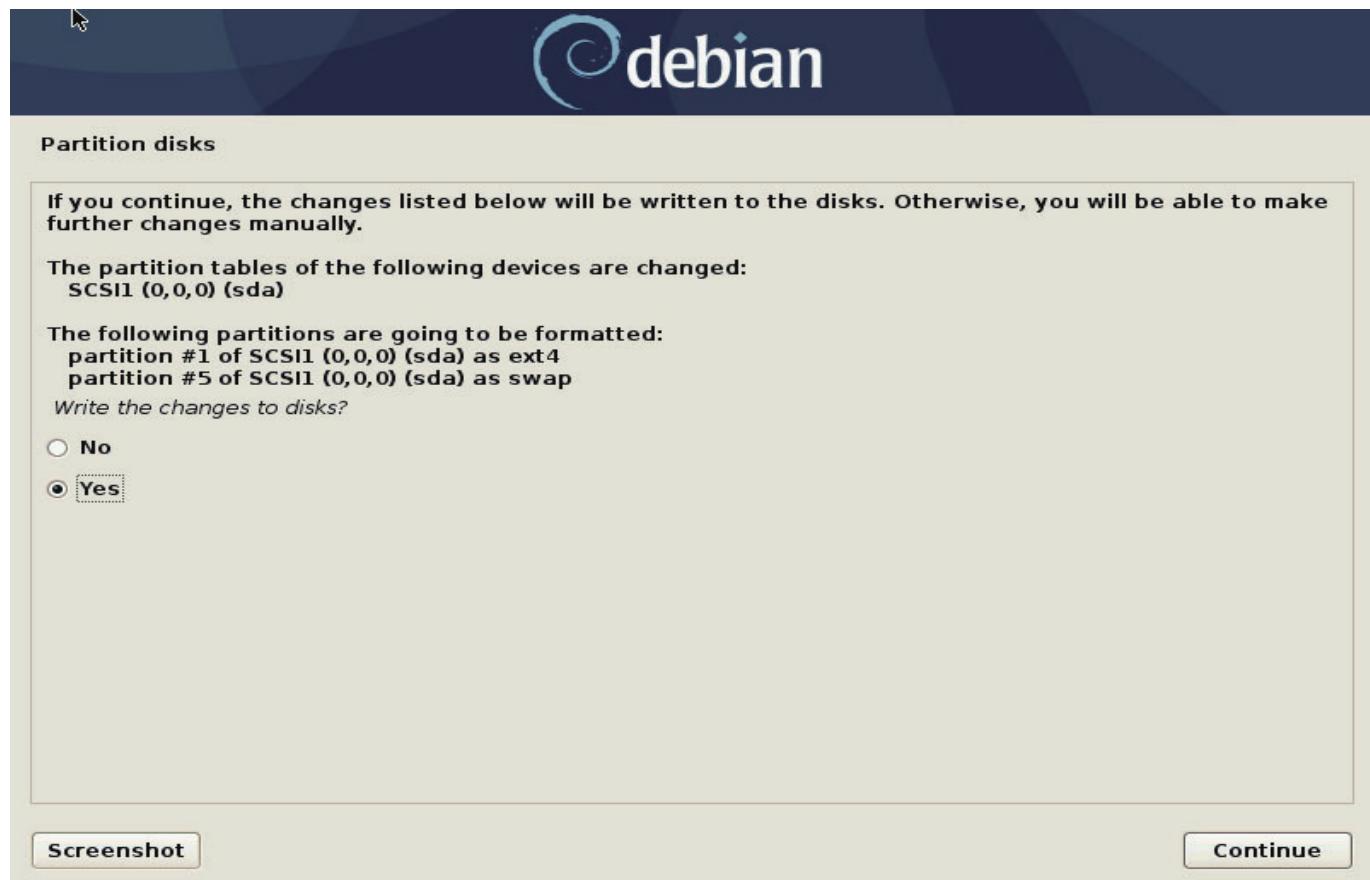
Note that all data on the disk you select will be erased, but not before you have confirmed that you really want to make the changes.

Select disk to partition:

- SCSI1 (0,0,0) (sda) - 8.6 GB ATA VBOX HARDDISK**

**Screenshot** **Go Back** **Continue**







### Install the GRUB boot loader on a hard disk

**It seems that this new installation is the only operating system on this computer. If so, it should be safe to install the GRUB boot loader to the master boot record of your first hard drive.**

**Warning:** If the installer failed to detect another operating system that is present on your computer, modifying the master boot record will make that operating system temporarily unbootable, though GRUB can be manually configured later to boot it.

*Install the GRUB boot loader to the master boot record?*

- No
- Yes

[Screenshot](#)

[Go Back](#)

[Continue](#)



### Install the GRUB boot loader on a hard disk

**You need to make the newly installed system bootable, by installing the GRUB boot loader on a bootable device. The usual way to do this is to install GRUB on the master boot record of your first hard drive. If you prefer, you can install GRUB elsewhere on the drive, or to another drive, or even to a floppy.**

*Device for boot loader installation:*

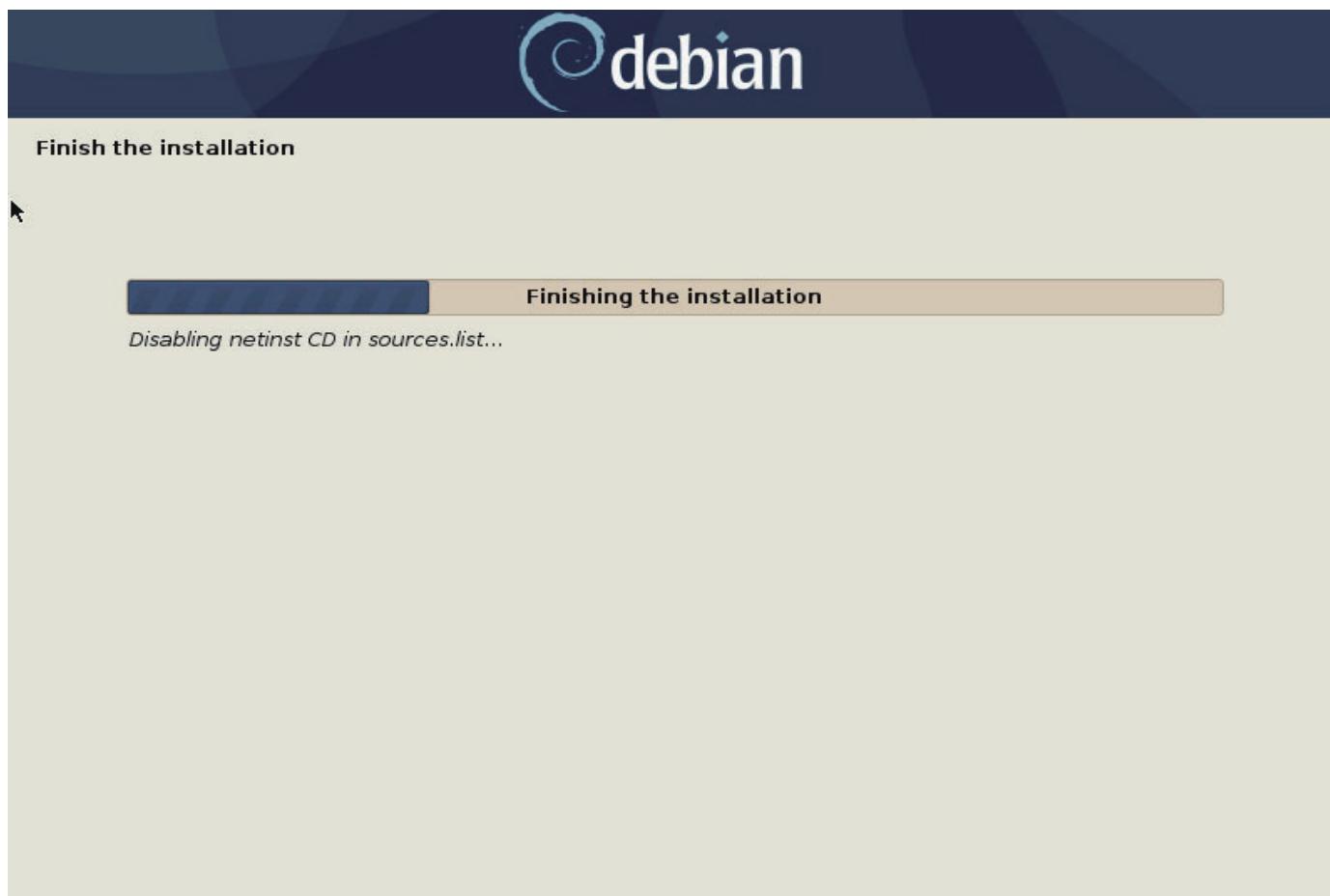
Enter device manually

/dev/sda (ata-VBOX\_HARDDISK\_VB4dd70040-d6d3e6e2)

[Screenshot](#)

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[Continue](#)



### 3-Nextcloud installation

A static IP address is assigned by editing the etc/network/interfaces file. In this case the Raspberry will have the IP address 192.168.1.48 within the local area network.

```
GNU nano 3.2                                     /etc/network/interfaces

# interfaces(5) file used by ifup(8) and ifdown(8)

# Please note that this file is written to be used with dhcpcd
# For static IP, consult /etc/dhcpcd.conf and 'man dhcpcd.conf'

# Include files from /etc/network/interfaces.d:
source-directory /etc/network/interfaces.d

auto lo

iface lo inet loopback

allow-hotplug eth0
iface eth0 inet static
address 192.168.1.48
netmask 255.255.255.0
gateway 192.168.1.1
```

We install the Apache service by executing the command “apt-get install apache2”:

```
pi@raspberry:~                                         -   X
root@raspberry:/home/pi# apt-get install apache2
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap ssl-cert
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom openssl-blacklist
The following NEW packages will be installed:
  apache2 apache2-bin apache2-data apache2-utils libapr1 libaprutil1 libaprutil1-dbd-sqlite3 libaprutil1-ldap ssl-cert
0 upgraded, 9 newly installed, 0 to remove and 103 not upgraded.
Need to get 2,296 kB of archives.
After this operation, 7,598 kB of additional disk space will be used.
Do you want to continue? [Y/n]
```

Next we install the PHP service:

```
pi@raspberry: ~
root@raspberry:/home/pi# root@raspberry:/home/pi# sudo apt install php7.3 php7.3-gd php7.3-sqlite3 php7.3-curl php7.3-zip
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'php-smbclient' instead of 'php7.3-smbclient'
The following additional packages will be installed:
  libapache2-mod-php7.3 libc-client2007e libzip4 mlock php-common php7.3-cli php7.3-common php7.3-json php7.3-opcache
  php7.3-readline
Suggested packages:
  php-pear uw-mailutils
The following NEW packages will be installed:
  libapache2-mod-php7.3 libc-client2007e libzip4 mlock php-common php-smbclient php7.3 php7.3-bz2 php7.3-cli
  php7.3-common php7.3-curl php7.3-gd php7.3-gmp php7.3-imap php7.3-intl php7.3-json php7.3-mbstring php7.3-mysql
  php7.3-opcache php7.3-readline php7.3-sqlite3 php7.3-xml php7.3-zip
0 upgraded, 23 newly installed, 0 to remove and 103 not upgraded.
Need to get 5,867 kB of archives.
After this operation, 22.1 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

We restart Apache by executing “service apache2 restart”:

```
root@raspberry:/home/pi# sudo service apache2 restart
```

Now we install MySQL:

```
root@raspberry:/home/pi# apt-get install default-mysql-server
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  galera-3 gawk libcgi-fast-perl libcgi-pm-perl libconfig-inifiles-perl libdbd-mysql-perl libdbi-perl
  libencode-locale-perl libfcgi-perl libhtml-parser-perl libhtml-treetagset-perl libhtml-template-perl libhttp-date-perl
  libhttp-message-perl libio-html-perl liblwp-mediatypes-perl libsigsegv2 libterm-readkey-perl libtimedate-perl
  liburi-perl mariadb-client-10.3 mariadb-client-core-10.3 mariadb-server-10.3 mariadb-server-core-10.3 socat
Suggested packages:
  gawk-doc libclone-perl libmlbm-perl libnet-daemon-perl libsql-statement-perl libdata-dump-perl
  libipc-sharedcache-perl libwww-perl mariadb-test netcat-openbsd tinyca
The following NEW packages will be installed:
  default-mysql-server galera-3 gawk libcgi-fast-perl libcgi-pm-perl libconfig-inifiles-perl libdbd-mysql-perl
  libdbi-perl libencode-locale-perl libfcgi-perl libhtml-parser-perl libhtml-treetagset-perl libhtml-template-perl
  libhttp-date-perl libhttp-message-perl libio-html-perl liblwp-mediatypes-perl libsigsegv2 libterm-readkey-perl
  libtimedate-perl liburi-perl mariadb-client-10.3 mariadb-client-core-10.3 mariadb-server-10.3
  mariadb-server-core-10.3 socat
0 upgraded, 26 newly installed, 0 to remove and 103 not upgraded.
Need to get 20.5 MB of archives.
After this operation, 157 MB of additional disk space will be used.
Do you want to continue? [Y/n]
```

We create a new database with the corresponding user:

```
Welcome to the MariaDB monitor. Commands end with ; or \g.
Your MariaDB connection id is 47
Server version: 10.3.22-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)]>
```

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

MariaDB [(none)]> use nextcloud
Database changed
MariaDB [nextcloud]> CREATE USER 'user'@'localhost' IDENTIFIED BY '1234';
Query OK, 0 rows affected (0.000 sec)

MariaDB [nextcloud]> GRANT ALL PRIVILEGES ON nextcloud.* TO 'user'@'localhost' WITH GRANT OPTION;
Query OK, 0 rows affected (0.000 sec)

MariaDB [nextcloud]>
```

We download and install Nextcloud since it will be the platform with which we will work throughout this project.

We go to var/www and there we will have downloaded and extracted the Nextcloud installation file:

```
root@raspberry:/home/pi# cd /var/www/
```

```
root@raspberry:/var/www# curl https://download.nextcloud.com/server/releases/latest.tar.bz2 | sudo tar -jxv
```

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We will also create a folder in which the Nextcloud data will be stored and configure permissions:

```
root@raspberry:/var/www# sudo mkdir -p /var/www/nextcloud/data
root@raspberry:/var/www# sudo chown -R www-data:www-data /var/www/nextcloud/
root@raspberry:/var/www# sudo chmod 750 /var/www/nextcloud/data
```

We edit the file /etc/apache2/sites-available/nextcloud.conf and write the following configuration:

```
Alias /nextcloud "/var/www/nextcloud/"
```

```
<Directory /var/www/nextcloud/>
    Require all granted
    AllowOverride All
    Options FollowSymLinks MultiViews
```

```
<IfModule mod_dav.c>
    Dav off
</IfModule>
```

```
</Directory>
```

```
GNU nano 3.2                               /etc/apache2/sites-available/nextcloud.conf

Alias /nextcloud "/var/www/nextcloud/"

<Directory /var/www/nextcloud/>
    Require all granted
    AllowOverride All
    Options FollowSymLinks MultiViews

    <IfModule mod_dav.c>
        Dav off
    </IfModule>

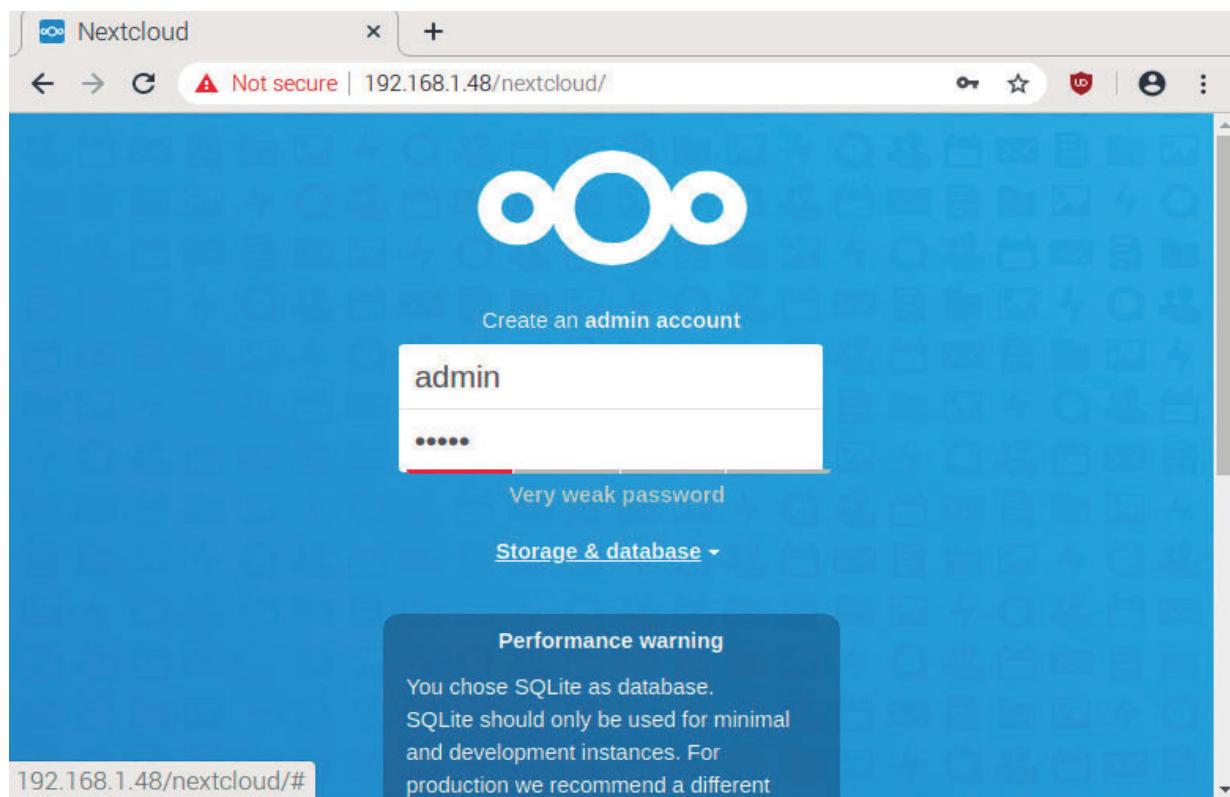
</Directory>
```

We save the file, enable it and restart Apache so that the configuration takes effect:

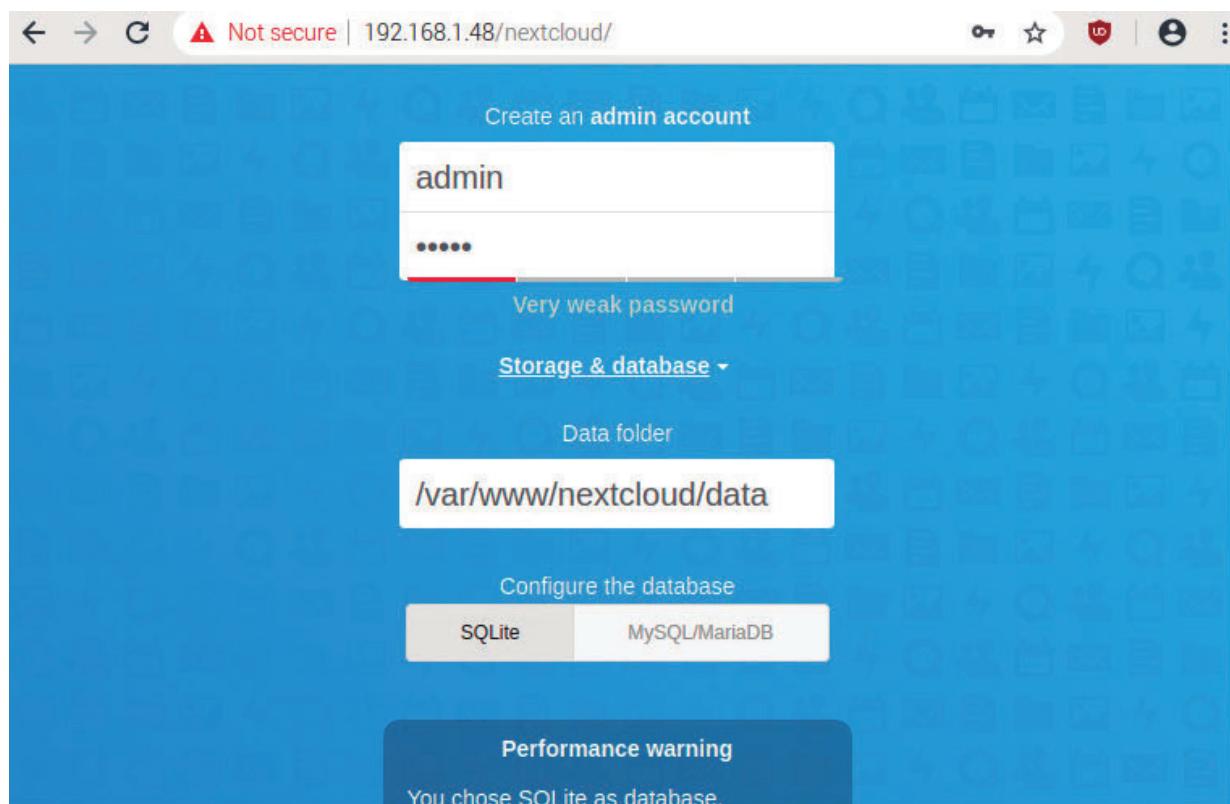
```
root@raspberry:/var/www# sudo a2ensite nextcloud.conf
Enabling site nextcloud.
To activate the new configuration, you need to run:
    systemctl reload apache2
root@raspberry:/var/www# sudo systemctl reload apache2
root@raspberry:/var/www#
```

## FalconMG

We access the Nextcloud platform from a browser using the IP of our Raspberry, which in this case is 192.168.1.48 and create an administrator account:

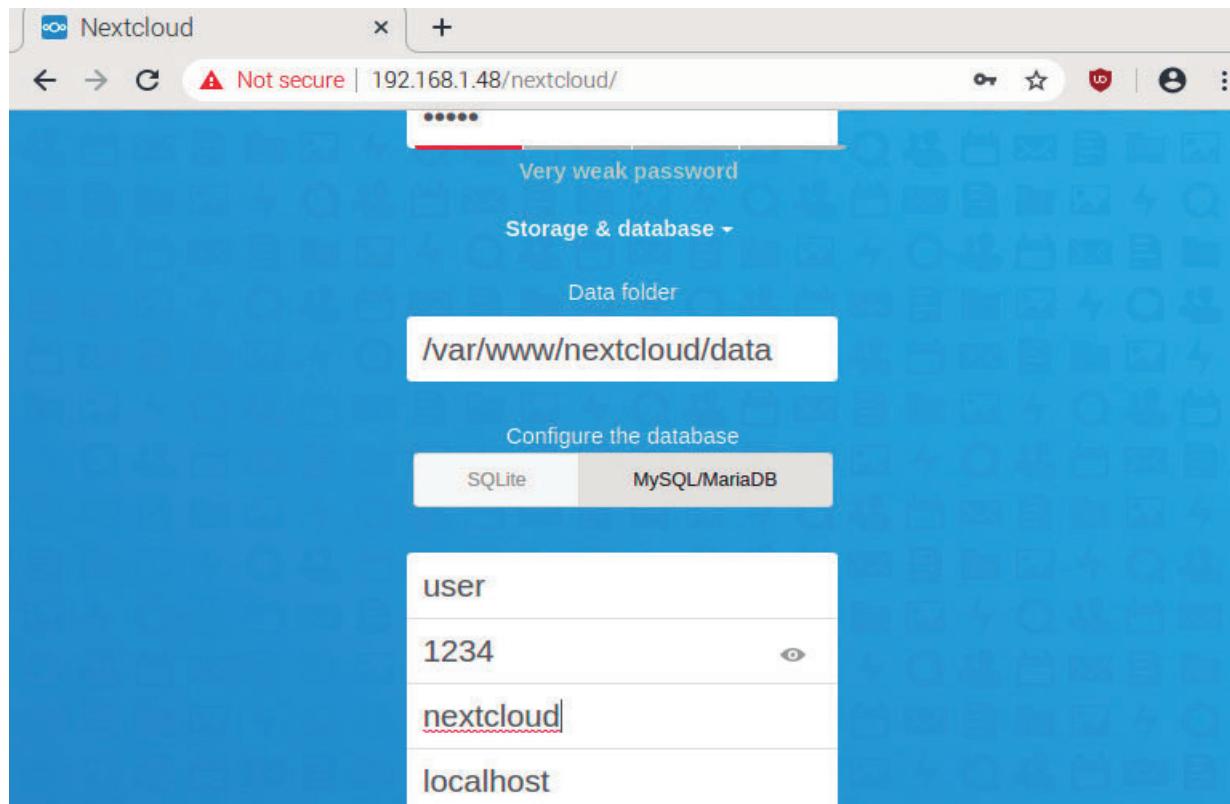


We mark “Storage & database” and select “MySQL/MariaDB” so we can use the database that we had previously created:

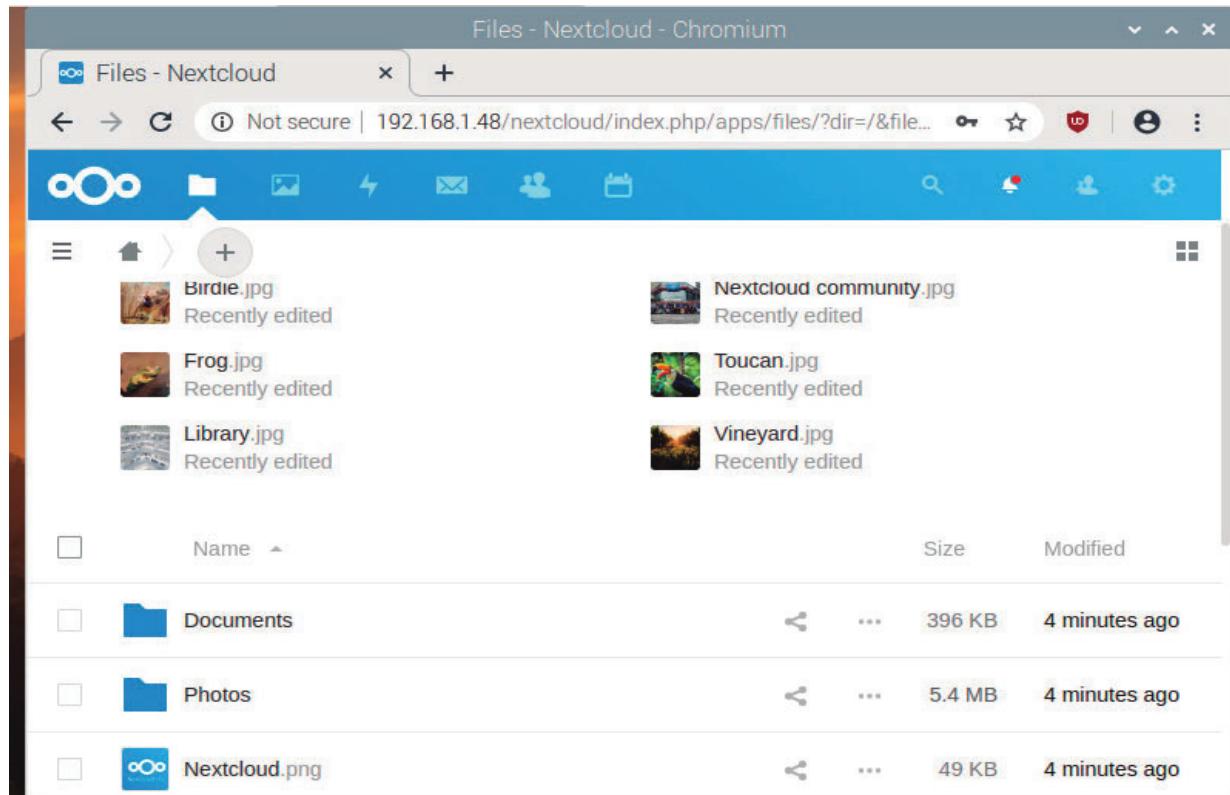


## FalconMG

We enter the username, password, and database name and continue:



We already have the Nextcloud platform configured and working as we can see:



## 4-RAID installation

We will install a RAID 1 that consists of an exact copy of a data set of two or more disks. Two disks will be used, which in this case will be two flash drives of 32 GB each. This system provides us with security against a possible failure of one of the disks and also the performance is doubled since the data will be read on two disks simultaneously.

In addition, RAID 1 allows us to have one of the disks inactive and if a disk were to fail, the data would not have to be rebuilt, since it would only have to be copied from the active disk.

Therefore we achieve reliability and performance.

For this we will use “mdadm”, an ideal tool for RAID management.

We run fdisk-l to see the available partitions and identify the two flash drives (sdb1 and sdc1):

```
pi@raspberry: ~
Device      Boot   Start     End   Sectors  Size Id Type
/dev/sda1    *       2048 41070591 41068544 19.6G 83 Linux
/dev/sda2        41072638 45262847 4190210    2G  5 Extended
/dev/sda5        41072640 45262847 4190208    2G 82 Linux swap / Solaris

Disk /dev/sdb: 28.9 GiB, 30970740736 bytes, 60489728 sectors
Disk model: DataTraveler 3.0
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xd8a3f4a2

Device      Boot Start     End   Sectors  Size Id Type
/dev/sdb1        2048 60489727 60487680 28.9G  c W95 FAT32 (LBA)

Disk /dev/sdc: 28.9 GiB, 31029460992 bytes, 60604416 sectors
Disk model: x765w
Units: sectors of 1 * 512 = 512 bytes
Sector size (logical/physical): 512 bytes / 512 bytes
I/O size (minimum/optimal): 512 bytes / 512 bytes
Disklabel type: dos
Disk identifier: 0xd8a3f4a5

Device      Boot Start     End   Sectors  Size Id Type
/dev/sdc1        2048 60604415 60602368 28.9G  c W95 FAT32 (LBA)
root@raspberry:/#
```

## FalconMG

We proceed to create an array by executing the command sudo mdadm --create --verbose /dev/md0 --level=mirror --raid-devices=2 /dev/sdb1 /dev/sdc1

```
pi@raspberry: ~
root@raspberry:/# sudo mdadm --create --verbose /dev/md0 --level=mirror --raid-devices=2 /dev/sdb1 /dev/sdc1
mdadm: partition table exists on /dev/sdb1
mdadm: partition table exists on /dev/sdb1 but will be lost or
      meaningless after creating array
mdadm: Note: this array has metadata at the start and
      may not be suitable as a boot device. If you plan to
      store '/boot' on this device please ensure that
      your boot-loader understands md/v1.x metadata, or use
      --metadata=0.90
mdadm: partition table exists on /dev/sdc1
mdadm: partition table exists on /dev/sdc1 but will be lost or
      meaningless after creating array
mdadm: size set to 30226432K
Continue creating array? y
mdadm: Defaulting to version 1.2 metadata
mdadm: array /dev/md0 started.
root@raspberry:/#
```

We check the status of the array with sudo mdadm --detail /dev/md0

```
root@raspberry:/# mdadm --detail /dev/md0
/dev/md0:
      Version : 1.2
      Creation Time : Sat May 30 12:51:46 2020
      Raid Level : raid1
      Array Size : 30226432 (28.83 GiB 30.95 GB)
      Used Dev Size : 30226432 (28.83 GiB 30.95 GB)
      Raid Devices : 2
      Total Devices : 2
      Persistence : Superblock is persistent

      Update Time : Sat May 30 12:54:03 2020
                  State : clean, resyncing
      Active Devices : 2
      Working Devices : 2
      Failed Devices : 0
      Spare Devices : 0

Consistency Policy : resync

      Resync Status : 8% complete

                  Name : raspberry:0  (local to host raspberry)
                  UUID : 7839e25b:4b1ce007:f80bf657:189790d0
                  Events : 1

      Number  Major  Minor  RaidDevice State
          0      8      17        0    active sync   /dev/sdb1
          1      8      33        1    active sync   /dev/sdc1
root@raspberry:/#
```

We save the array by executing the command mdadm --detail --scan >> /etc/mdadm/mdadm.conf

```
root@raspberry:/# mdadm --detail --scan >> /etc/mdadm/mdadm.conf
root@raspberry:/#
```

We verify that the array has been saved correctly by reading the file “/etc/mdadm/mdadm.conf”:

```
pi@raspberry: ~
GNU nano 3.2                               /etc/mdadm/mdadm.conf

# mdadm.conf
#
# !NB! Run update-initramfs -u after updating this file.
# !NB! This will ensure that initramfs has an uptodate copy.
#
# Please refer to mdadm.conf(5) for information about this file.
#
# by default (built-in), scan all partitions (/proc/partitions) and all
# containers for MD superblocks. alternatively, specify devices to scan, using
# wildcards if desired.
#DEVICE partitions containers

# automatically tag new arrays as belonging to the local system
HOMEHOST <system>

# instruct the monitoring daemon where to send mail alerts
MAILADDR root

# This configuration was auto-generated on Wed, 12 Feb 2020 13:23:17 +0000 by mkconf
ARRAY /dev/md0 metadata=1.2 name=raspberry:0 UUID=7839e25b:4b1ce007:f80bf657:189790d0
```

Now we create a file system, which in this case will be “ext4” since it is the most appropriate option for the previously created array. To do this we will use the command sudo mkfs.ext4 -v -m .1 -b 4096 -E stride=32,stripe-width=64 /dev/md0

```
root@raspberry:/# root@raspberry:/# sudo mkfs.ext4 -v -m .1 -b 4096 -E stride=32,stripe-width=64 /dev/md0
mke2fs 1.44.5 (15-Dec-2018)
/dev/md0 contains a ext4 file system
      last mounted on /mnt on Sat May 30 10:22:21 2020
Proceed anyway? (y,N) y
fs_types for mke2fs.conf resolution: 'ext4'
Filesystem label=
OS type: Linux
Block size=4096 (log=2)
Fragment size=4096 (log=2)
Stride=32 blocks, Stripe width=64 blocks
1892352 inodes, 7556608 blocks
7556 blocks (0.10%) reserved for the super user
First data block=0
Maximum filesystem blocks=2155872256
231 block groups
32768 blocks per group, 32768 fragments per group
8192 inodes per group
Filesystem UUID: 130e8f73-0889-4c61-a801-5973b9c6ba04
Superblock backups stored on blocks:
      32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
      4096000

Allocating group tables: done
Writing inode tables: done
Creating journal (32768 blocks): done
Writing superblocks and filesystem accounting information: done

root@raspberry:/#
```

We mount the file system by executing mount /dev/md0 /mnt

```
root@raspberry:/# mount /dev/md0 /mnt
root@raspberry:/#
```

And to ensure that the file system is mounted automatically when booting, we will have to edit the “/etc/fstab” file. First we run sudo blkid:

```
root@raspberry:/# blkid
/dev/sda1: UUID="76dadfe8-659f-41ac-8b75-4c76e19719bf" TYPE="ext4" PARTUUID="953dce96-01"
/dev/sda5: UUID="b8d214a6-a26d-41a2-b29b-864dbcb7dfc1" TYPE="swap" PARTUUID="953dce96-05"
/dev/md0: UUID="130e8f73-0889-4c61-a801-5973b9c6ba04" TYPE="ext4"
/dev/sdb1: UUID="7839e25b-4b1c-e007-f80b-f657189790d0" UUID_SUB="32a4b140-e0d3-e29c-6717-b1d5c1c1ad31" LABEL="raspberry
:0" TYPE="linux_raid_member" PARTUUID="d8a3f4a2-01"
/dev/sdc1: UUID="7839e25b-4b1c-e007-f80b-f657189790d0" UUID_SUB="e3e5f54e-1395-deed-aa9e-345158f73613" LABEL="raspberry
:0" TYPE="linux_raid_member" PARTUUID="d8a3f4a5-01"
root@raspberry:/#
```

We identify the UUID of our file system and include it in the “/etc/fstab” file:

```
# /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).
#
# <file system> <mount point> <type> <options>      <dump> <pass>
# / was on /dev/sda1 during installation
UUID=76dadfe8-659f-41ac-8b75-4c76e19719bf /          ext4    errors=remount-ro 0      1
# swap was on /dev/sda5 during installation
UUID=b8d214a6-a26d-41a2-b29b-864dbc7dfc1 none        swap     sw      0      0
/dev/sr0      /media/cdrom0 udf,iso9660 user,noauto 0      0
UUID="130e8f73-0889-4c61-a801-5973b9c6ba04"           /mnt      ext4    defaults      0      0
# a swapfile is not a swap partition, no line here
# use dphys-swapfile swap[on|off] for that
```

Next, we assign the root user read and write permissions on “/mnt”:

```
root@raspberry:/# root@raspberry:/# sudo chown -R pi:pi /mnt
root@raspberry:/# sudo chmod -R 0777 /mnt
root@raspberry:/#
```

Now we move the Nextcloud data repository to the previously created RAID volume. We first generate the directory structure on the new RAID volume:

```
root@raspberry:/home/pi# sudo mkdir -p /mnt/nextcloud
root@raspberry:/home/pi#
```

Now we move the /data directory to the new structure:

```
root@raspberry:/home/pi# sudo mkdir -p /mnt/nextcloud
root@raspberry:/home/pi# sudo mv -v /var/www/nextcloud/data /mnt/nextcloud/data
created directory '/mnt/nextcloud/data'
copied '/var/www/nextcloud/data/nextcloud.log' -> '/mnt/nextcloud/data/nextcloud.log'
copied '/var/www/nextcloud/data/.htaccess' -> '/mnt/nextcloud/data/.htaccess'
copied '/var/www/nextcloud/data/index.html' -> '/mnt/nextcloud/data/index.html'
created directory '/mnt/nextcloud/data/appdata_ocsvd5hdgyil'
created directory '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/avatar'
created directory '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/avatar/admin'
created directory '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/appstore'
copied '/var/www/nextcloud/data/appdata_ocsvd5hdgyil/appstore/apps.json' -> '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/appstore/apps.json'
created directory '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/js'
created directory '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/js/core'
copied '/var/www/nextcloud/data/appdata_ocsvd5hdgyil/js/core/merged-template-prepend.js' -> '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/js/core/merged-template-prepend.js'
copied '/var/www/nextcloud/data/appdata_ocsvd5hdgyil/js/core/merged-template-prepend.js.deps' -> '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/js/core/merged-template-prepend.js.deps'
copied '/var/www/nextcloud/data/appdata_ocsvd5hdgyil/js/core/merged-template-prepend.js.gzip' -> '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/js/core/merged-template-prepend.js.gzip'
created directory '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/js/files'
copied '/var/www/nextcloud/data/appdata_ocsvd5hdgyil/js/files/merged-index.js' -> '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/js/files/merged-index.js'
copied '/var/www/nextcloud/data/appdata_ocsvd5hdgyil/js/files/merged-index.js.deps' -> '/mnt/nextcloud/data/appdata_ocsvd5hdgyil/js/files/merged-index.js.deps'
```

Now we go to the Nextcloud configuration file to establish the new location:

```
root@raspberry:/# cd /var/www/nextcloud/config/
root@raspberry:/var/www/nextcloud/config# sudo nano config.php
```

We modify the line "'datadirectory' => '/var/www/nextcloud/data'," to "'datadirectory' => '/mnt/next-cloud/data',"

```
GNU nano 3.2 config.php

<?php
$CONFIG = array (
    'instanceid' => 'ocsvd5hdgyil',
    'passwordsalt' => '69avwtBSoglxUby3o5AVvNRQu9lqpK',
    'secret' => 'rbnxvbMj3uTG00oviS5oeRW5HAZNnS0Sl+6vThNnDRMgnuB1',
    'trusted_domains' => [
        array (
            0 => '192.168.1.48',
        ),
        'datadirectory' => '/var/www/nextcloud/data',
        'dbtype' => 'mysql',
        'version' => '18.0.4.2',
        'overwrite.cli.url' => 'http://192.168.1.48/nextcloud',
        'dbname' => 'nextcloud',
        'dbhost' => 'localhost',
        'dbport' => '',
        'dbtableprefix' => 'oc_',
        'mysql.utf8mb4' => true,
        'dbuser' => 'user',
        'dbpassword' => '1234',
        'installed' => true,
    );
);
```

```
GNU nano 3.2 config.php

<?php
$CONFIG = array (
    'instanceid' => 'ocsvd5hdgyil',
    'passwordsalt' => '69avwtBSoglxUby3o5AVvNRQu9lqpK',
    'secret' => 'rbnxvbMj3uTG00oviS5oeRW5HAZNnS0Sl+6vThNnDRMgnuB1',
    'trusted_domains' => [
        array (
            0 => '192.168.1.48',
        ),
        'datadirectory' => '/mnt/nextcloud/data',
        'dbtype' => 'mysql',
        'version' => '18.0.4.2',
        'overwrite.cli.url' => 'http://192.168.1.48/nextcloud',
        'dbname' => 'nextcloud',
        'dbhost' => 'localhost',
        'dbport' => '',
        'dbtableprefix' => 'oc_',
        'mysql.utf8mb4' => true,
        'dbuser' => 'user',
        'dbpassword' => '1234',
        'installed' => true,
    );
);
```

## 5-Increase in the maximum file upload size

We edit the file “/etc/php/7.3/apache2/php.ini” and specifically locate the parameters “post\_max\_size” and “upload\_max\_filesize” assigning each one 8129MB.

```
GNU nano 3.2                               /etc/php/7.3/apache2/php.ini

; This option is enabled by default.
; Most likely, you won't want to disable this option globally. It causes $_POST
; and $_FILES to always be empty; the only way you will be able to read the
; POST data will be through the php://input stream wrapper. This can be useful
; to proxy requests or to process the POST data in a memory efficient fashion.
; http://php.net/enable-post-data-reading
;enable_post_data_reading = Off

; Maximum size of POST data that PHP will accept.
; Its value may be 0 to disable the limit. It is ignored if POST data reading
; is disabled through enable_post_data_reading.
; http://php.net/post-max-size
post_max_size = 8129M

; Automatically add files before PHP document.
; http://php.net/auto-prepend-file
auto_prepend_file =

; Automatically add files after PHP document.
; http://php.net/auto-append-file
auto_append_file =

; By default, PHP will output a media type using the Content-Type header. To
; disable this, simply set it to be empty.
;
```

```
GNU nano 3.2                               /etc/php/7.3/apache2/php.ini

; Temporary directory for HTTP uploaded files (will use system default if not
; specified).
; http://php.net/upload-tmp-dir
;upload_tmp_dir =

; Maximum allowed size for uploaded files.
; http://php.net/upload-max-filename
upload_max_filesize = 8129M

; Maximum number of files that can be uploaded via a single request
max_file_uploads = 100

;;;;;;
; Fopen wrappers ;
;;;;;;

; Whether to allow the treatment of URLs (like http:// or ftp://) as files.
; http://php.net/allow-url-fopen
allow_url_fopen = On

; Whether to allow include/require to open URLs (like http:// or ftp://) as files.
; http://php.net/allow-url-include
allow_url_include = Off
```

In this way, each file that we upload to the cloud can occupy up to 8 GB. Now we restart the apache2 service so that the above configurations take effect:

```
root@raspberry:/home/pi# root@raspberry:/home/pi# sudo nano /etc/php/7.3/apache2/php.ini
root@raspberry:/home/pi# root@raspberry:/home/pi# sudo service apache2 restart
root@raspberry:/home/pi#
```

## 6-Access to the cloud from outside the local area network

To make the cloud accessible from outside the LAN, we will need a DDNS, which in this case we will configure using NoIP by accessing <https://www.noip.com/sign-up>

The screenshot shows the 'Create Your No-IP Account' page. It includes fields for email (buy\_it@hotmail.es), password (\*\*\*\*\*), hostname (nextcloudforever), and domain (ddns.net). A note says 'Choose a hostname for your account. You can change your hostname or add more later.' Below is a checkbox for 'Create my hostname later'. A note about Enhanced vs Free accounts follows:

If you have chosen an Enhanced domain, but wish to sign up for a No-IP Free account, please choose the ddns.net domain option.

**Why not upgrade?**

Upgrade to Enhanced Dynamic DNS Today. Learn more about the benefits of upgrading below.

	Enhanced DDNS	Free DDNS
Domain Choices	80+	1
Hostnames	25+	3
No Ads	✓	✗
No 30-Day Hostname Confirmation	✓	✗
Phone Support	✓	✗
	\$24.95 a year	\$0

**Terms of Service and Privacy Policy \***

By checking this box, I agree to the [Terms of Service](#) and [Privacy Policy](#). I also agree that I will only create one free account.

**Email Opt-In**

Send me newsletters & special offers

**Get Enhanced** **Free Sign Up**

©2020 • No-IP.com • All Rights Reserved. [Privacy Policy](#) & [Terms of Service](#)

Your account is now active! ✓

Find the services that best fit your needs and get started.

**Dynamic DNS** **Managed DNS** **Email Services** **Domain Services** **All Services**

### Remote Access / Dynamic DNS

Trying to remote access a web cam, home security system, home automation system, computer or other internet connected device?

Our Dynamic DNS service allows you to create an easy to remember hostname to point to your home IP address. Dynamic DNS allows you to no longer worry about your IP address. Create an easy to remember hostname to point to your IP address.

How to remote access your device:

- Step 1 - Create a Hostname.** (this step is already complete)
- Step 2 - Download** the Dynamic Update Client (DUC).  
The DUC keeps your hostname updated with your current IP address.
- Step 3 - Port Forward** your router.

Done with all 3 steps?

[Get started with Dynamic DNS](#)

Our [Getting Started](#) Guide has all the information you need to get started.

We register and create a non-existing DDNS name. We have chosen `nextcloudforever.ddns.net`

**Dashboard**

**Dynamic DNS** **My Services** **Account** **Support Center** **Add Priority Support**

**2 Active hostnames** ✓

**2 hosts without recent dynamic updates** Configure your hostnames now ⚠

**Quick Add**

**Hostname** `forevernextcloud` **Domain** `ddns.net`

**Record Type** `A` [More Records](#)

`forevernextcloud.ddns.net has been created. Manage it now.`

**Need help setting up your device?** [Add Hostname](#)

Now we access our router and configure it by associating the DDNS created:

### Configuración NAT/PAT/CGNAT

Estas normas son necesarias para autorizar una conexión remota desde internet que llegue a un dispositivo específico de tu red LAN. También puedes definir los puertos(s) que utilizará esta comunicación.

dirección IPv4 externa: 213.179.125.93



atención: asegúrate de que no has filtrado estos puertos en el firewall.

personalizar reglas								
estado	aplicación / servicio	puerto interno	puerto externo	protocolo	dispositivo	aceptar propuesta alternativa puerto (PCP)	activar	
	Web Server (HTTP)	80	80	TCP	192.168.1.48			<button>guardar</button>
<input checked="" type="checkbox"/>	Web Server (HTTP)	80	80	TCP	raspberry		<input checked="" type="checkbox"/>	<button>borrar</button>
<input checked="" type="checkbox"/>	Secure Web Server (HTTPS)	443	443	TCP	raspberry		<input checked="" type="checkbox"/>	<button>borrar</button>

In addition, we will associate ports 80 and 443 with the Raspberry's IP so that every time there is a request from outside the network through these ports, it will be redirected.

### Configuración NAT/PAT/CGNAT

Estas normas son necesarias para autorizar una conexión remota desde internet que llegue a un dispositivo específico de tu red LAN. También puedes definir los puertos(s) que utilizará esta comunicación.

dirección IPv4 externa: 213.179.125.93



atención: asegúrate de que no has filtrado estos puertos en el firewall.

personalizar reglas								
estado	aplicación / servicio	puerto interno	puerto externo	protocolo	dispositivo	aceptar propuesta alternativa puerto (PCP)	activar	
	Web Server (HTTP)	80	80	TCP	192.168.1.48			<button>guardar</button>
<input checked="" type="checkbox"/>	Web Server (HTTP)	80	80	TCP	raspberry		<input checked="" type="checkbox"/>	<button>borrar</button>
<input checked="" type="checkbox"/>	Secure Web Server (HTTPS)	443	443	TCP	raspberry		<input checked="" type="checkbox"/>	<button>borrar</button>

Now we modify the Nextcloud configuration file again to add the DDNS in the “trusted\_domains” parameter exactly as can be seen:

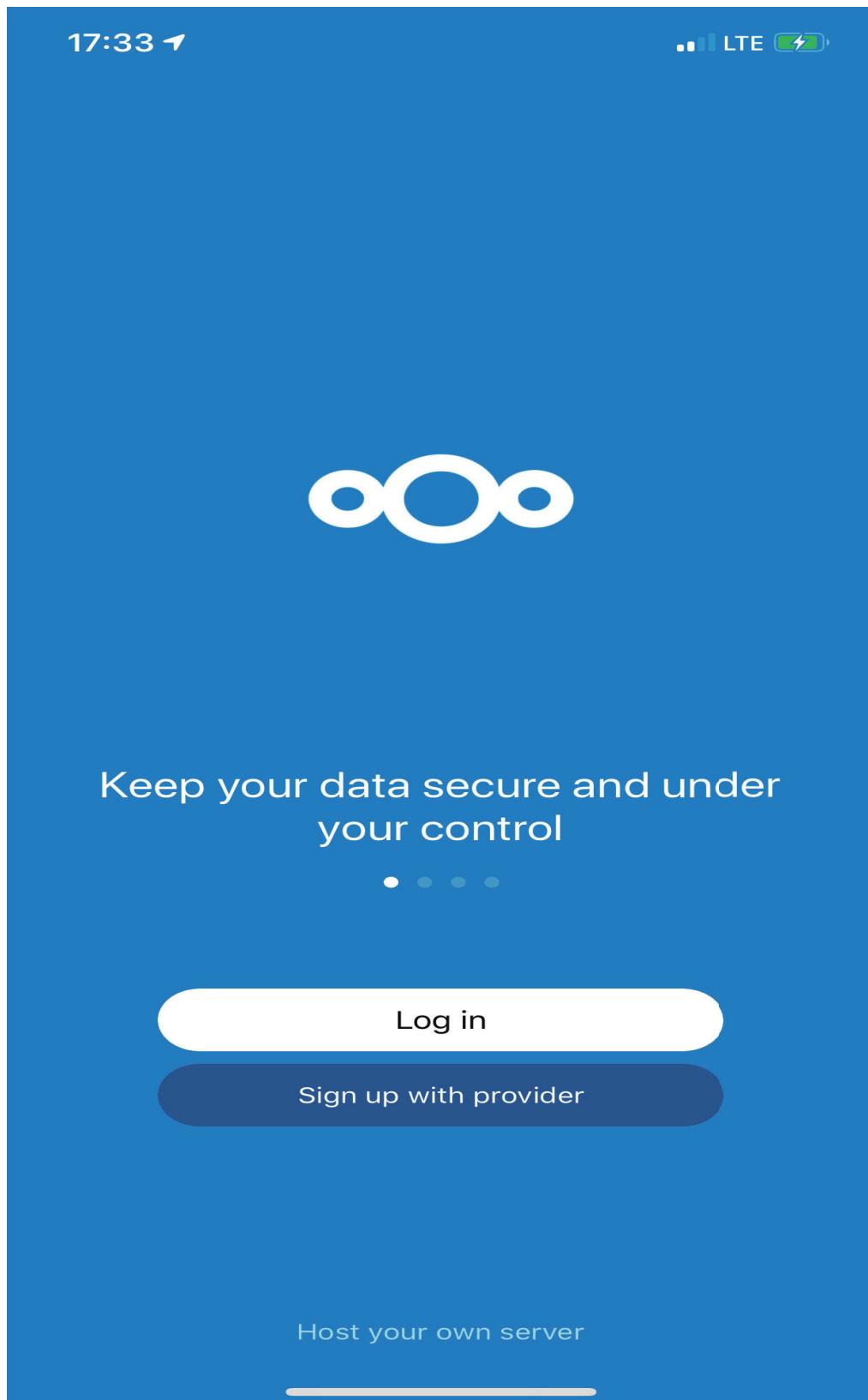
```
GNU nano 3.2                                     config/config.php

<?php
$CONFIG = array (
    'instanceid' => 'ocsvd5hdgyil',
    'passwordsalt' => '69avwtBSoglXUby3o5AVvNRQu9lqpK',
    'secret' => 'rbnxvbMj3uTG00oviS5oeRW5HAZNnS0Sl+6vThNnDRMgnuB1',
    'trusted_domains' => [
        array (
            0 => '192.168.1.48',
            1 => 'forevernextcloud.ddns.net',
        ),
        'datadirectory' => '/mnt/nextcloud/data',
        'dbtype' => 'mysql',
        'version' => '18.0.4.2',
        'overwrite.cli.url' => 'http://192.168.1.48/nextcloud',
        'dbname' => 'nextcloud',
        'dbhost' => 'localhost',
        'dbport' => '',
        'dbtableprefix' => 'oc_',
        'mysql.utf8mb4' => true,
        'dbuser' => 'user',
        'dbpassword' => '1234',
        'installed' => true,
    );
);
```

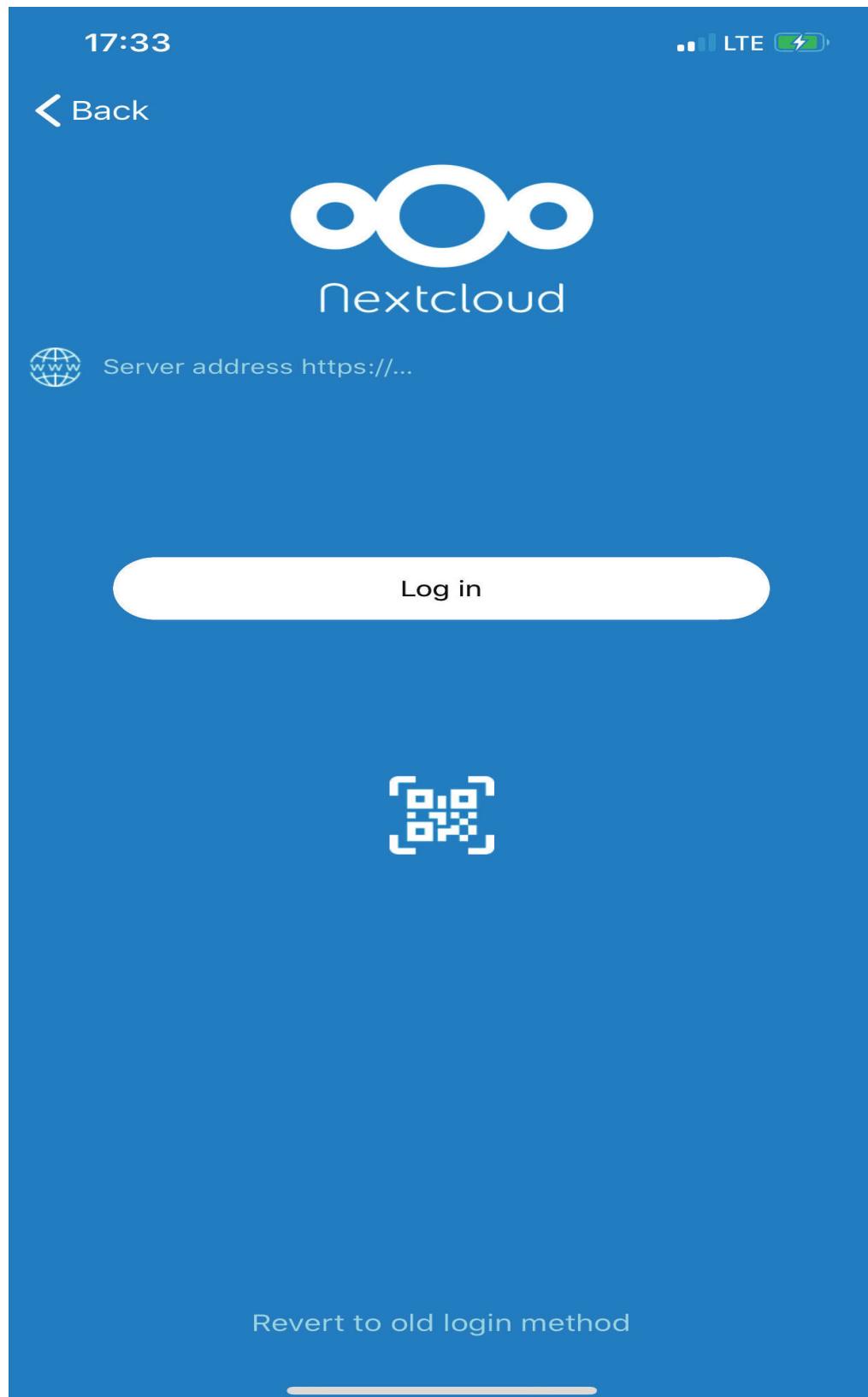
We verify that the DDNS configuration was successful by pinging forevernextcloud.ddns.net:

```
root@raspberry:/home/pi# ping forevernextcloud.ddns.net
PING forevernextcloud.ddns.net (213.179.125.93) 56(84) bytes of data.
64 bytes from 93.125.179.213.dynamic.jazztel.es (213.179.125.93): icmp_seq=1 ttl=64 time=4.83 ms
64 bytes from 93.125.179.213.dynamic.jazztel.es (213.179.125.93): icmp_seq=2 ttl=64 time=6.78 ms
64 bytes from 93.125.179.213.dynamic.jazztel.es (213.179.125.93): icmp_seq=3 ttl=64 time=5.26 ms
^C
--- forevernextcloud.ddns.net ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 5ms
rtt min/avg/max/mdev = 4.833/5.626/6.784/0.837 ms
root@raspberry:/home/pi#
```

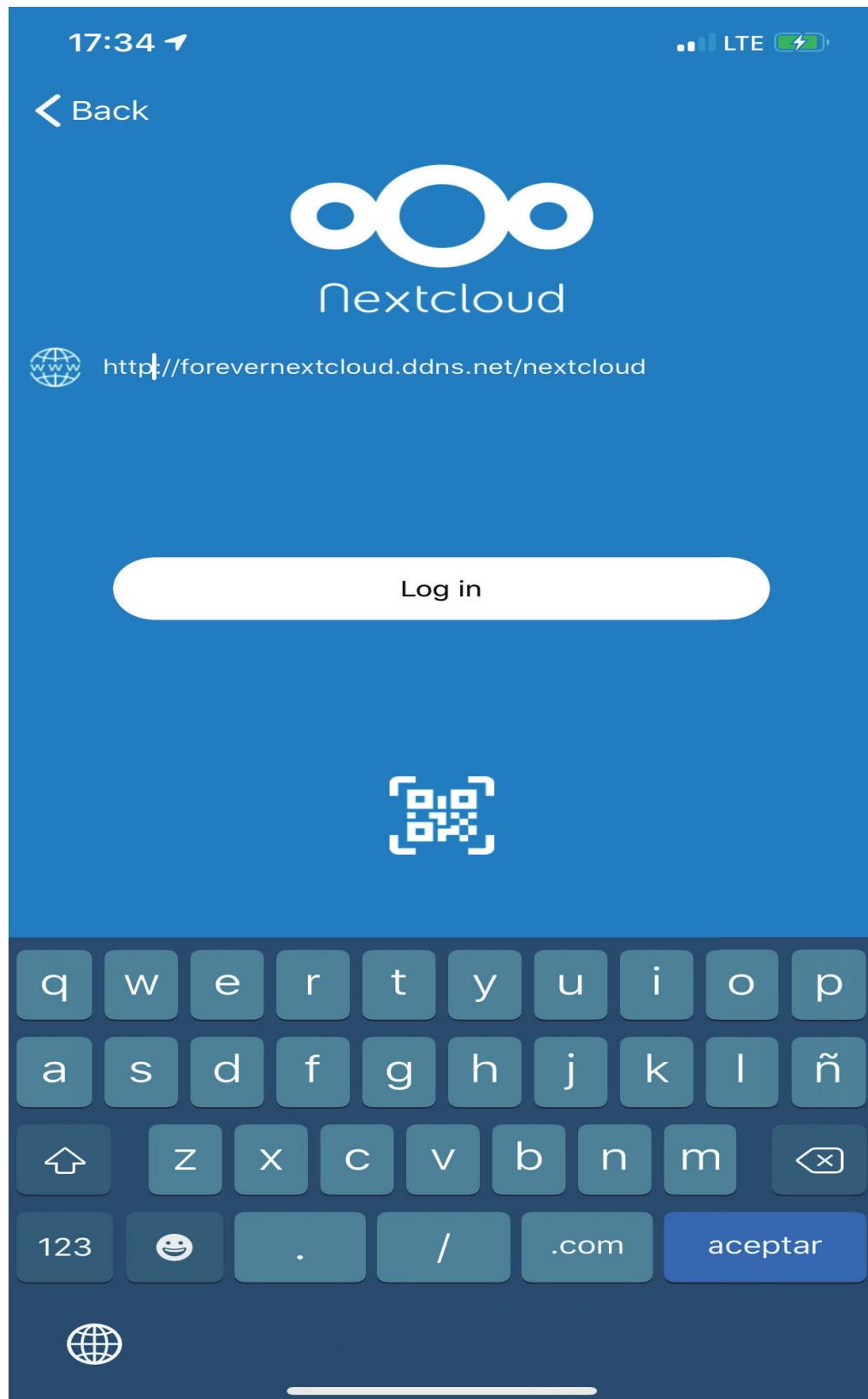
From the Nextcloud application for mobile phones we access the cloud from outside the LAN. In this case the mobile device is connected to the Internet using mobile data:



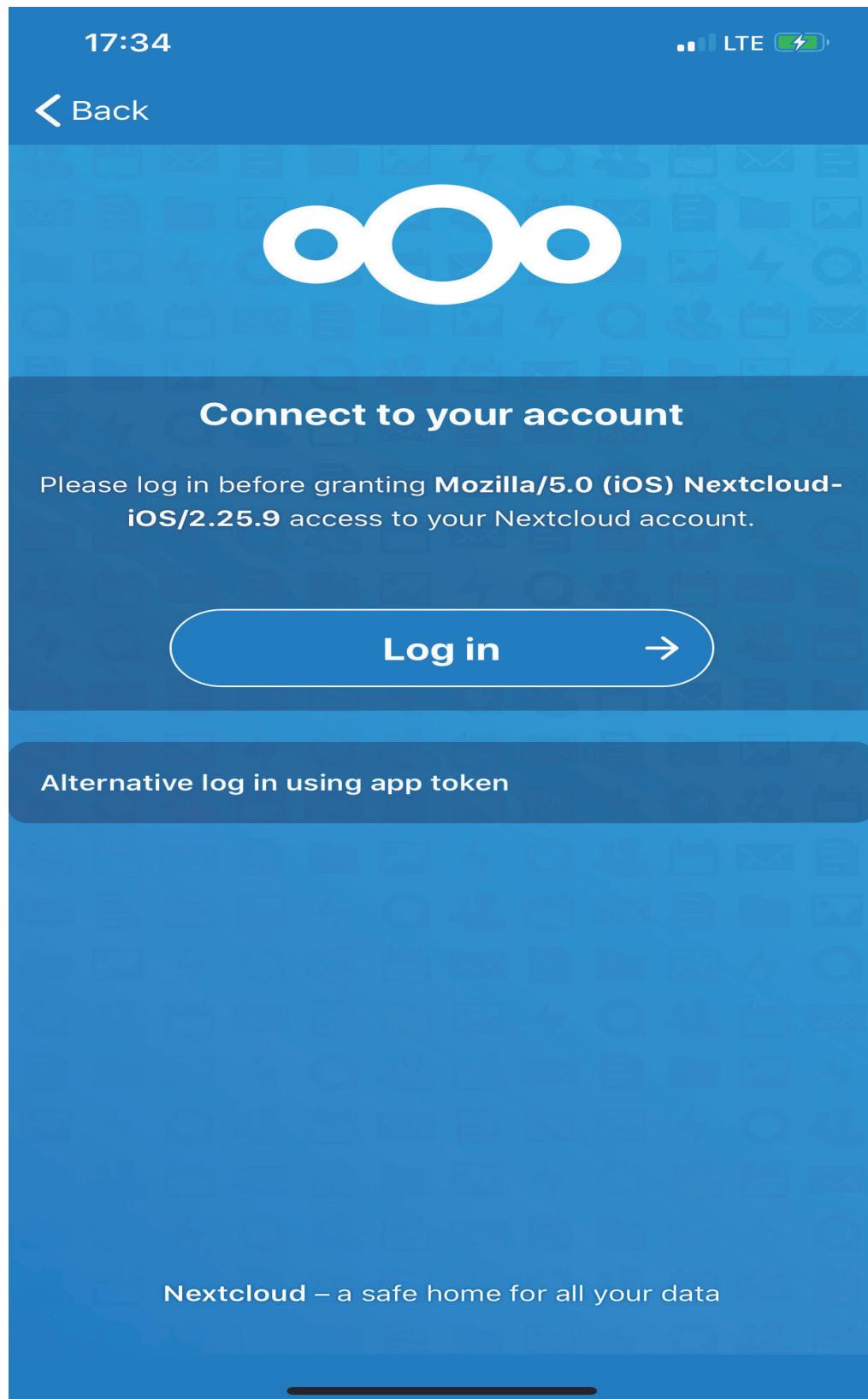
Marcamos en “Revert to old login method”:



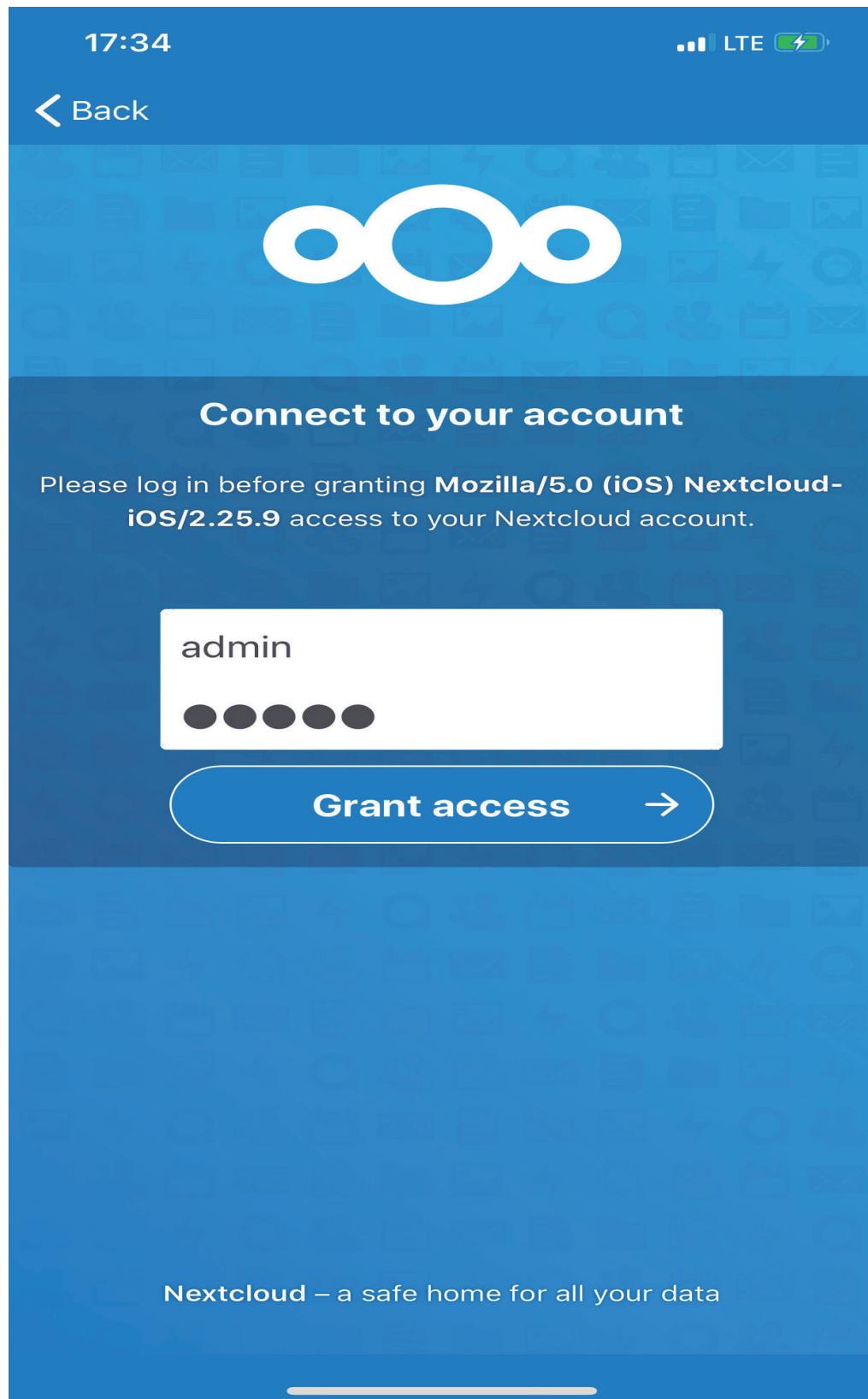
We write the address <http://forevernextcloud.ddns.net/nextcloud> and mark Log in:



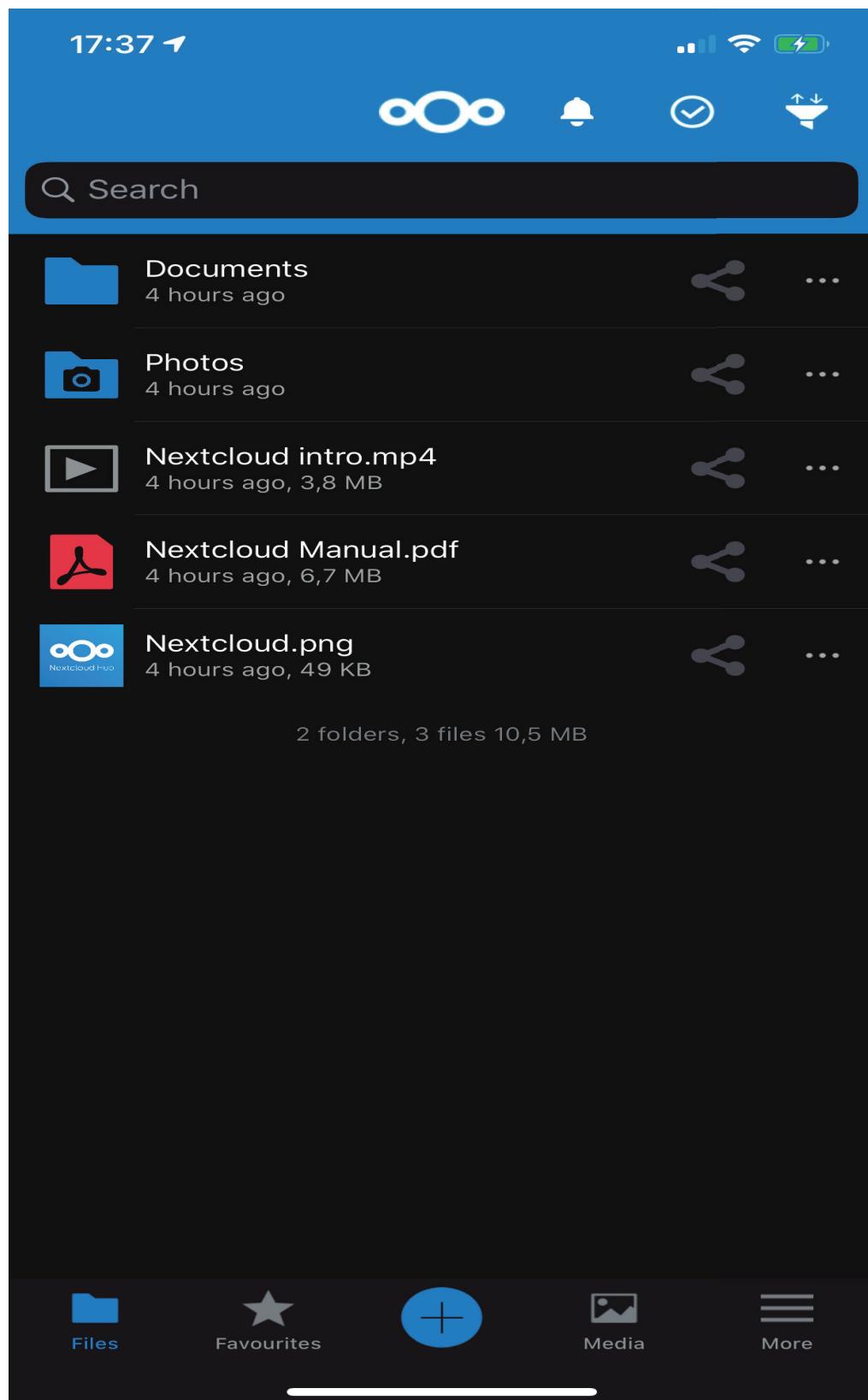
We mark again in Log in:



We access with the administrator credentials and click on “Grant access”:



As you can see, the cloud created is accessible from outside our LAN so you can upload and download or even delete files.



## 7-Groups, users and quotas

Another aspect that can be useful when configuring a cloud is the possibility of creating users who, in turn, may have certain limitations. In this case we will establish a file upload limit of 1 GB.

First we go to Settings and create a new group called “guests”:

The screenshot shows the Nextcloud web interface. On the left, there's a sidebar with icons for Home, Back, and Add. Below that is a note: "Añadir notas, listas o enlaces ...". The main area displays a list of files:

	Gorilla.jpg Editado recientemente		Frog.jpg Editado recientemente
	Nextcloud intro.mp4 Editado recientemente		Nextcloud.png Editado recientemente
	Nextcloud flyer.pdf Editado recientemente		Readme.md Editado recientemente

Below this is a table listing folder contents:

<input type="checkbox"/>	Nombre	Tamaño	Modificado
<input type="checkbox"/>	Documents	396 KB	hace 12 horas
<input type="checkbox"/>	Photos	5,4 MB	hace 12 horas
<input type="checkbox"/>	Nextcloud.png	49 KB	hace 12 horas
<input type="checkbox"/>	Nextcloud intro.mp4	3,8 MB	hace 12 horas

The right side of the screen has a sidebar menu with the following options:

- Configuración
- Aplicaciones
- Usuarios
- Acerca de
- Ayuda
- Cerrar sesión

+ Nuevo usuario

Nombre de usuario  
Nombre para mostrar

Contraseña

Correo electrónico

Grupos

invitados → x

Todos 2

Administradores 1

No hay usuarios aquí

We associate a new user to the “guests” group that we will create below:

+ Nuevo usuario

Nombre de usuario  
Nombre para mostrar

Contraseña

Correo electrónico

Grupos

+ Añadir grupo

Todos 2

Administradores 1

Grupos

invitados

No hay usuarios aquí

The screenshot shows the FalconMG web interface for managing users. On the left, a sidebar lists groups: Todos (2), Administradores (1), Grupos, and invitados. The main area is titled '+ Nuevo usuario' and contains fields for 'Nombre de usuario' (gabriel), 'Nombre para mostrar' (gabriel), 'Contraseña' (represented by a series of dots), 'Correo electrónico' (invitados), and 'Grupos' (checkbox checked). A '+' button is next to the 'Nombre de usuario' field.

We have created the user “gabriel” who belongs to the “guests” group:

The screenshot shows the same FalconMG interface after the user 'gabriel' has been created. The 'invitados' group now has a checked checkbox under 'Grupos'. The user 'gabriel' is listed in the 'invitados' group section with a green circular icon containing a white 'G'.

We proceed to assign the user “gabriel” a quota, limiting his available space to 1 GB:

The screenshot shows the FalconMG user management interface. At the top, there are tabs for 'Nombre de usuario', 'Contraseña', 'Correo electrónico', 'Grupos', 'Administrador de grupo para', and 'Espacio asignado'. Below these tabs, there are input fields for 'Nombre para mostrar' (set to 'gabriel'), 'Contraseña' (empty), 'Correo electrónico' (empty), 'Grupos' (set to 'invitados'), and 'Administrador de grupo para' (checkbox checked). The 'Espacio asignado' section has a dropdown menu titled 'Seleccionar cuota de us' with options: 'Espacio predefinido' (selected), 'Ilimitado', '1 GB' (highlighted with a blue border), and '5 GB'. A small orange circle with the letter 'A' is visible in the top right corner.

Next we verify

Now we access the cloud by logging in with the user “gabriel”:



The screenshot shows the FalconMG web interface. On the left, there's a sidebar with navigation links: 'All files', 'Recent' (with a clock icon), 'Favorites' (with a star icon), 'Shares' (with a person icon), and 'Tags'. Below these are 'Deleted files' (with a trash bin icon) and a progress bar indicating '16.3 MB of 1 GB used'. At the bottom of the sidebar is a 'Settings' link. The main area displays a list of files and folders. At the top of the list are four recently edited items: 'Nextcloud.png' (Recently edited), 'Nextcloud flyer.pdf' (Recently edited), 'Readme.md' (Recently edited), and 'Example.md' (Recently edited). The list then continues with other files: 'Documents' (396 KB, a minute ago), 'Photos' (5.4 MB, a minute ago), 'Nextcloud.png' (49 KB, a minute ago), 'Nextcloud intro.mp4' (3.8 MB, a minute ago), and 'Nextcloud Manual.pdf' (6.7 MB, a minute ago). Below this list, it says '2 folders and 3 files' and '16.3 MB'. The bottom of the page has a footer with a 'G' icon.

The user “gabriel” has a storage capacity of 1 GB available, as established above.

As a test, we upload a file to the cloud to check how it works:

This screenshot shows the same FalconMG interface after a file has been uploaded. The file list now includes a new item at the bottom: 'test.rar' (98.4 MB, a minute ago). The rest of the file list remains the same as in the previous screenshot. The bottom of the page still shows '114.7 MB of 1 GB used'.

After uploading the “test” folder to our cloud, the available space that the user “gabriel” has is reduced.

## 8-Printers

To ensure that prints can be made from our cloud, we need to have the CUPS service installed:

```
root@raspberry:/home/pi# apt-get install cups cups-bsd cups-pdf
Reading package lists... Done
Building dependency tree
Reading state information... Done
Note, selecting 'printer-driver-cups-pdf' instead of 'cups-pdf'
The following additional packages will be installed:
  acl bc colord colord-data cups-browsed cups-client cups-common cups-core-drivers cups-daemon cups-filters
  cups-filters-core-drivers cups-ipp-utils cups-ppdc cups-server-common ghostscript gsfonts libcolorhug2 libcups2
  libcupsimage2 libfontembed1 libgusb2 libgutenprint-common libgutenprint9 libieee1284-3 liblouis-data liblouis17
  liblouisutdml-bin liblouisutdml-data liblouisutdml8 libqpdf21 libsane libsane-common libsnmp-base libsnmp30
  poppler-utils printer-driver-gutenprint sane-utils update-inetd
Suggested packages:
  colord-sensor-argyll foomatic-db-compressed-ppds | foomatic-db printer-driver-hpcups hplip smbclient inetutils-inetd
  | inet-superserver antiword docx2txt imagemagick ghostscript-x gutenprint-locales ooo2dbk rtf2xml
  snmp-mibs-downloader system-config-printer gutenprint-doc unpaper
The following NEW packages will be installed:
  acl bc colord colord-data cups cups-browsed cups-bsd cups-client cups-common cups-core-drivers cups-daemon
  cups-filters cups-filters-core-drivers cups-ipp-utils cups-ppdc cups-server-common ghostscript gsfonts libcolorhug2
  libfontembed1 libgusb2 libgutenprint-common libgutenprint9 libieee1284-3 liblouis-data liblouis17 liblouisutdml-bin
  liblouisutdml-data liblouisutdml8 libqpdf21 libsane libsane-common libsnmp-base libsnmp30 poppler-utils
  printer-driver-cups-pdf printer-driver-gutenprint sane-utils update-inetd
The following packages will be upgraded:
  libcups2 libcupsimage2
2 upgraded, 39 newly installed, 0 to remove and 205 not upgraded.
Need to get 19.5 MB of archives.
After this operation, 66.8 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
```

We grant permissions to the user “pi” so that he can manage the printers:

```
root@raspberry:/home/pi# sudo usermod -a -G lpadmin pi
root@raspberry:/home/pi#
```

Now we edit the file “/etc/cups/cupsd.conf” so that the administration of the printers can be done remotely:

```
#  
# Configuration file for the CUPS scheduler. See "man cupsd.conf" for a  
# complete description of this file.  
#  
  
# Log general information in error_log - change "warn" to "debug"  
# for troubleshooting...  
LogLevel warn  
PageLogFormat  
  
# Deactivate CUPS' internal logrotating, as we provide a better one, especially  
# LogLevel debug2 gets usable now  
MaxLogSize 0  
  
# Only listen for connections from the local machine.  
#Listen localhost:631  
Listen *:631  
Listen /run/cups/cups.sock  
  
# Show shared printers on the local network.  
Browsing On  
BrowseLocalProtocols dnssd  
  
# Default authentication type, when authentication is required...  
DefaultAuthType Basic
```

```
# Web interface setting...  
WebInterface Yes  
  
# Restrict access to the server...  
<Location />  
    Order allow,deny  
    allow 192.168.1.*  
</Location>  
  
# Restrict access to the admin pages...  
<Location /admin>  
    Order allow,deny  
    allow 192.168.1.*  
</Location>  
  
# Restrict access to configuration files...  
<Location /admin/conf>  
    AuthType Default  
    # Require user @SYSTEM  
    allow 192.168.1.*  
    Order allow,deny  
</Location>  
  
# Restrict access to log files...  
<Location /admin/log>
```

We save the configuration made and restart the printing service:

```
root@raspberry:/home/pi# sudo service cups restart
```

Using a browser we access the IP of the Raspberry Pi and port 631:

CUPS es el sistema de impresión de código abierto basado en estándares desarrollado por Apple Inc. para macOS® y otros sistemas operativos tipo UNIX®.

CUPS para usuarios	CUPS para administradores	CUPS para desarrolladores
Descripción de CUPS	Añadir impresoras y clases	Introducción a la programación de CUPS
Impresión desde la línea de comandos y opciones	Gestión de políticas de funcionamiento	La API de CUPS
Foro de usuarios	Uso de impresoras de red	Programación de filtros y programas de conexión
	Referencia de cupsd.conf	Las APIs HTTP e IPP
		Foro de desarrollo

We access the “Administration” section to add a new printer:

**Administración**

**Impresoras**

**Servidor**

**Configuración del servidor:**

**Avanzada**

Compartir impresoras conectadas a este sistema  
 Permitir la impresión desde Internet  
 Permitir administración remota  
 Usar autentificación Kerberos (FAQ)  
 Permitir a los usuarios cancelar cualquier trabajo (no sólo los suyos propios)  
 Guardar información de depuración para búsqueda de problemas

**Cambiar configuración**

# Administración

## Impresoras

[Añadir impresora](#) [Encontrar nuevas impresoras](#) [Administrar impresoras](#)

## Clases

[Añadir clase](#) [Administrar clases](#)

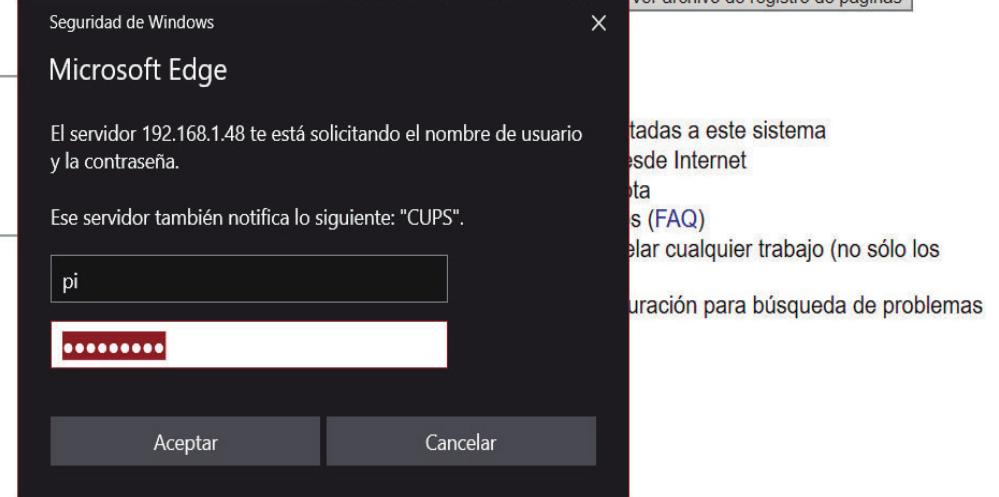
## Trabajos

[Administrar trabajos](#)

## Servidor

[Editar archivo de configuración](#) [Ver archivo de registro de accesos](#)

[Ver archivo de registro de errores](#) [Ver archivo de registro de páginas](#)



# Añadir impresora

## Añadir impresora

- Impresoras locales:**  CUPS-PDF (Virtual PDF Printer)  
 CUPS-BRF (Virtual Braille BRF Printer)

### Impresoras en red descubiertas:

- Otras impresoras en red:**  Protocolo de Impresión de Internet IPP (https)  
 Equipo o impresora LPD/LPR  
 Backend Error Handler  
 AppSocket/HP JetDirect  
 Protocolo de Impresión de Internet IPP (ippss)  
 Protocolo de Impresión de Internet IPP (ipp)  
 Protocolo de Impresión de Internet IPP (http)

[Siguiente](#)

# Añadir impresora

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**Nombre:** Virtual\_PDF\_Printer

(Puede contener cualquier carácter imprimible excepto "/", "#", y espacio)

**Descripción:** Virtual PDF Printer

(Descripción fácilmente leíble tal como "HP LaserJet de doble cara")

**Ubicación:**

(Ubicación fácilmente leíble tal como "Lab 1")

**Conexión:** cups-pdf:/Virtual PDF Printer

**Compartición:**  Compartir esta impresora

# Añadir impresora

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**Nombre:** Virtual\_PDF\_Printer

**Descripción:** Virtual PDF Printer

**Ubicación:**

**Conexión:** cups-pdf:/Virtual PDF Printer

**Compartición:** No compartir esta impresora

**Marca:** (Fuji Xerox)

- Apollo
- Apple
- Brother
- Canon
- CIAAT
- Citizen
- Compaq
- Dai Nippon Printing
- DatamaxOneil

O proporcione un archivo PPD:  Examinar...

## FalconMG

Once we have our printer ready, we access the cloud with the administrator user and click on “Settings”:

The screenshot shows the Nextcloud web interface. At the top, there's a blue header bar with a search icon, a user profile icon, and a gear icon labeled 'A'. Below the header is a navigation bar with icons for home, back, forward, and a plus sign. A message 'Añadir notas, listas o enlaces ...' is displayed. The main area shows a list of files and folders:

Nombre	Tamaño	Última modificación
Gorilla.jpg Editado recientemente	396 KB	hace 13 horas
Frog.jpg Editado recientemente	5,4 MB	hace 13 horas
Nextcloud intro.mp4 Editado recientemente	49 KB	hace 13 horas
Nextcloud.png Editado recientemente	3,8 MB	hace 13 horas
Documents	396 KB	hace 13 horas
Photos	5,4 MB	hace 13 horas
Nextcloud.png	49 KB	hace 13 horas
Nextcloud intro.mp4	3,8 MB	hace 13 horas

At the bottom left, it says '2 carpetas y 2 archivos'. On the right, it shows a total size of '9,6 MB'. The sidebar on the right contains links: 'Configuración' (highlighted), 'Aplicaciones', 'Usuarios', 'Acerca de', 'Ayuda', and 'Cerrar sesión'.

We select the “Tools” option

The screenshot shows the 'Tools' section of the Nextcloud interface. On the left, a sidebar lists categories: 'Lotes de apps', 'Personalización', 'Archivos', 'Juegos', 'Integración', 'Monitorización', 'Multimedia', 'Oficina y texto', 'Organización' (highlighted), 'Buscar', 'Seguridad', 'Social y comunicación', 'Herramientas' (highlighted), and 'Flujo'. At the bottom of the sidebar, it says 'Documentación de desarrollador'. The main area lists various tools with their versions and update buttons:

Nombre	Versión	Opciones
Federation	1.8.0	update
File sharing	1.10.1	update
First run wizard	2.7.0	update
Log Reader	2.3.0	update
Monitoring	1.8.0	update
Nextcloud announcements	1.7.0	update
Notifications	2.6.0	update
Password policy	1.8.0	update
PDF viewer	1.7.0	update
Photos	1.0.0	update
Privacy	1.2.0	update
Recommendations	0.6.0	update
Right click	0.15.2	update

We download and activate the “Printer” application:

The screenshot shows the Nextcloud app store interface. On the left, there is a sidebar with various categories: Lotes de apps, Personalización, Archivos, Juegos, Integración, Monitorización (which is selected), Multimedia, Oficina y texto, Organización, Buscar, Seguridad, Social y comunicación, and Herramientas. At the top right, there is a search bar with the text "print" and a close button. In the main area, there is a preview window for the "Printer" application. The preview shows a Windows-style file explorer window with several files. Below the preview, the app's name is "Printer" and its description is "Allows to print files directly inside Nextcloud to a printer." A prominent button labeled "Descargar y activar" (Download and activate) is visible.

Once the installation of “Printer” has finished, we access the “Documents” section and select a document as an example by clicking

The screenshot shows the "Documents" section in Nextcloud. At the top, there is a breadcrumb navigation: Home > Documents. Below the navigation, the word "Documents" is displayed in large, bold letters. A subtext states: "Nextcloud works well with all the common document formats. You can even collaborate with others on ODT and Markdown files!" The main area is a list of files with checkboxes, names, and icons. The files listed are: Example.md (document icon), Example.odt (document icon), Nextcloud flyer.pdf (PDF icon), and Readme.md (document icon). Each file entry has a "..." button at the end. At the bottom of the list, it says "4 archivos".

We check on options and then choose the "Details" section:

Documents

Nextcloud works well with all the common document formats. You can even collaborate with others on ODT and Markdown files!

	Nombre	Tam
<input type="checkbox"/>	Example.md	
<input type="checkbox"/>	Example.odt	
<input type="checkbox"/>	Nextcloud flyer.pdf	
<input type="checkbox"/>	Readme.md	

4 archivos

- Añadir a favoritos
- Detalles
- Renombrar
- Mover o copiar
- Descargar
- Eliminar archivo

In the right column we see the "Printer" option since we have just installed the application for printers.

The screenshot shows the Nextcloud Hub interface. At the top, there's a navigation bar with icons for home, documents, and a plus sign for creating new files. The main title "Documents" is displayed prominently. Below it, a sub-section title "Nextcloud works well with all the common document formats. You can even collaborate with others on ODT and Markdown files!" is shown. A table lists four files: "Example.md" (1 KB, 13 hours ago), "Example.odt" (29 KB, 13 hours ago), "Nextcloud flyer.pdf" (365 KB, 13 hours ago), and "Readme.md" (< 1 KB, 13 hours ago). Each file row has a checkbox, a preview icon, sharing and more options buttons, and a timestamp. To the right, a sidebar titled "# Nextcloud Hub" provides an introduction and a list of features like sync, communication, and calendar management. Below that, a section titled "Example.md" shows a preview of the file content, including a star icon, a printer icon, and other sharing options. At the bottom, there's a "Choose orientation" dropdown menu.

	Nombre	Tamaño	Modificado
<input type="checkbox"/>	Example.md	1 KB	hace 13 horas
<input type="checkbox"/>	Example.odt	29 KB	hace 13 horas
<input type="checkbox"/>	Nextcloud flyer.pdf	365 KB	hace 13 horas
<input type="checkbox"/>	Readme.md	< 1 KB	hace 13 horas

4 archivos 396 KB

# Nextcloud Hub

\*\*Welcome to Nextcloud Hub, your self-hosted coll

Nextcloud Hub is the open source file sync and sha

With Nextcloud Hub you can:

- Sync and share and access all your files and docur
- Communicate with other via chat, audio or video c
- Manage access and share your calendars
- View and share you photos and media files
- Access your emails
- Manage your contacts
- Edit your documents

You can all of this in the web interface, via you desk

Whether using a mobile device, a workstation, or a

All example pictures, videos & documents are licen

★ Example.md  
1 KB, hace 13 horas

Actividad Comentarios Compartir i Printer Versiones

Choose orientation ▾

We simply have to choose an orientation and the printing will be done automatically:

The screenshot shows the Nextcloud Hub interface. On the left, there's a sidebar with a house icon, a 'Documents' folder icon, a share icon, and a plus sign icon. The main area has a title 'Documents'. Below it, a message says 'Nextcloud works well with all the common document formats. You can even collaborate with others on ODT and Markdown files!'. A table lists four files: 'Example.md' (1 KB, modified 13 hours ago), 'Example.odt' (29 KB, modified 13 hours ago), 'Nextcloud flyer.pdf' (365 KB, modified 13 hours ago), and 'Readme.md' (< 1 KB, modified 13 hours ago). At the bottom, it says '4 archivos' and '396 KB'. On the right, there's a sidebar with a title '# Nextcloud Hub' and a message about the open source nature of Nextcloud. Below that is a file card for 'Example.md', showing its details (1 KB, modified 13 hours ago) and a printer icon. A dropdown menu for 'Choose orientation' is open, with 'Landscape' selected.

This screenshot is similar to the one above, showing the 'Documents' section in Nextcloud Hub. The file list and sidebar are identical. The file card for 'Example.md' now includes a success message: 'landscape: Print succeeded!'.

## 9. Recursos

La realización de este proyecto ha sido llevada cabo utilizando los siguientes recursos y servicios:

Raspberry Pi 3 Model B, dos unidades flash de 32 GB (HP y Kingston), tarjeta microSD de 64 GB, adaptador para tarjeta de memoria, ordenador portátil Asus TUF FX505DT (RYZEN 5, 8 GB de RAM, 512 GB de SSD), router Livebox Fibra, cable Ethernet con conectores RJ45 (Cat. 6) de 2 m, iPhone XS Max, monitor HP 22W, Raspberry Pi OS, Windows 10, balenaEtcher, Diskpart, SSH, Apache2, PHP, MySQL, CUPS, Nextcloud, VirtualBox, NoIP, LibreOffice Writer, Adobe InDesign, Mozilla Firefox, Google Chrome, Microsoft Edge, Safari.

## 10. References

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