

[tutoriel](#)

# Construisez votre propre NAS

Un NAS est un périphérique de stockage de films, photos, musique et autre, accessible depuis n'importe où sur le réseau auquel il est connecté.

## Pré-requis

- Un Raspberry avec sa carte Sd, installé et accessible pas SSH.
- 2 Clés USB externes ou 2 disques avec un hub USB 3.0 alimenté
- Gigabit Ethernet (recommended)

## Première étape

Assurez-vous que tout est à jour avec

```
pi@framboise:~ $ sudo apt update && sudo apt -y upgrade
```

puis redémarrez.

Branchez vos lecteurs de disque USB sur le hub USB 3.0 alimenté connecté à votre Raspberry Pi. Laissez au système quelques secondes puis entrez :

```
pi@framboise4:~ $ lsblk
NAME            MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda              8:0    1 250G  0 disk
└─sda1           8:1    1 250G  0 part
sdb              8:16   1 250G  0 disk
└─sdb1           8:17   1 250G  0 part
mmcblk0         179:0    0 59,6G  0 disk
├─mmcblk0p1     179:1    0 256M  0 part /boot
└─mmcblk0p2     179:2    0 59,4G  0 part /
```

Cette commande informe sur les périphériques connectés au système. Celui qui commence par «mmcblk0» est la carte microSD contenant Raspbian. **sda** et **sdb** sont les deux disques USB. B).

## Autres étapes

La méthode RAID protège les données en les dupliquant sur plusieurs disques. Nous le plus simple : RAID 1, ou mise en miroir. Tout ce qui est écrit sur un disque est automatiquement écrit sur l'autre.

En cas de panne d'un disque, votre NAS continue de fonctionner et vous ne perdez rien : remplacez le

disque défectueux dès que possible et la matrice est «reconstruite».

Partitionnez les disques avec **fdisk** :

```
pi@framboise4:~ $ sudo fdisk /dev/sda

Welcome to fdisk (util-linux 2.33.1).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.

Command (m for help): p
Disk /dev/sda: 250 GiB, 268436504576 bytes, 524290048 sectors
Disk model: STORAGE DEVICE
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: 0xdecc595d

Device      Boot Start          End  Sectors  Size Id Type
/dev/sda1                2048 524290047 524288000  250G 83 Linux

Command (m for help): d
Selected partition 1
Partition 1 has been deleted.

Command (m for help): n
Partition type
   p   primary (0 primary, 0 extended, 4 free)
   e   extended (container for logical partitions)
Select (default p):

Using default response p.
Partition number (1-4, default 1):
First sector (2048-524290047, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-524290047, default
524290047):

Created a new partition 1 of type 'Linux' and of size 250 GiB.
Partition #1 contains a vfat signature.

Do you want to remove the signature? [Y]es/[N]o: y

The signature will be removed by a write command.

Command (m for help): w
The partition table has been altered.
Calling ioctl() to re-read partition table.
Syncing disks.
```

```
pi@framboise4:~ $
```

À la demande de commande,

- Tapez `p` pour voir les partitions existantes.
- S'il y a une partition, tapez `d` pour l'effacer
- Tapez `n` pour en créer une nouvelle partition puis répondez `↵ Entrée` aux questions pour accepter les valeurs par défaut et `Y` s'il est proposé d'effacer une signature.
- Au retour à l'invite de commande, tapez `w` pour écrire les modifications sur le disque.
- fdisk quitte et revient à l'invite de commande

2. Répétez le processus pour le deuxième lecteur :

```
pi@framboise4:~ $ sudo fdisk /dev/sdb
```

```
Welcome to fdisk (util-linux 2.33.1).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.
```

```
Command (m for help): p
Disk /dev/sdb: 250 GiB, 268436504576 bytes, 524290048 sectors
Disk model: STORAGE DEVICE
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: 0xdecc595d
```

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/sdb1		2048	524290047	524288000	250G	83	Linux

```
Command (m for help): d
Selected partition 1
Partition 1 has been deleted.
```

```
Command (m for help): n
Partition type
  p   primary (0 primary, 0 extended, 4 free)
  e   extended (container for logical partitions)
Select (default p):
```

```
Using default response p.
Partition number (1-4, default 1):
First sector (2048-524290047, default 2048):
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-524290047, default
524290047):
```

```
Created a new partition 1 of type 'Linux' and of size 250 GiB.
Partition #1 contains a vfat signature.
```

```
Do you want to remove the signature? [Y]es/[N]o: y
```

```
The signature will be removed by a write command.
```

```
Command (m for help): w
```

```
The partition table has been altered.
```

```
Calling ioctl() to re-read partition table.
```

```
Syncing disks.
```

```
pi@framboise4:~ $
```

3. Installez **mdadm**, le logiciel de gestion RAID :

```
pi@framboise4:~ $ sudo apt install mdadm
```

4. Demandez maintenant à mdadm de créer la matrice RAID-1 (répondez **Y** pour accepter) :

```
pi@framboise4:~ $ sudo mdadm --create --verbose /dev/md0 --level=mirror --  
raid-devices=2 /dev/sda1 /dev/sdb1
```

```
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: size set to 262011904K
```

```
mdadm: automatically enabling write-intent bitmap on large array
```

```
Continue creating array? y
```

```
mdadm: Defaulting to version 1.2 metadata
```

```
mdadm: array /dev/md0 started.
```

5. Raspbian voit désormais les deux disques physiques comme un seul périphérique. Partitionnez le nouveau lecteur virtuel (ici, nous créons 3 partitions) :

```
pi@framboise4:~ $ sudo fdisk /dev/md0
```

```
Welcome to fdisk (util-linux 2.33.1).
```

```
Changes will remain in memory only, until you decide to write them.
```

```
Be careful before using the write command.
```

```
The old ext4 signature will be removed by a write command.
```

```
Device does not contain a recognized partition table.
```

```
Created a new DOS disklabel with disk identifier 0xd399b01c.
```

```
Command (m for help): p
```

```
Disk /dev/md0: 249,9 GiB, 268300189696 bytes, 524023808 sectors
```

```
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: 0xd399b01c
```

```
Command (m for help): n
```

```
Partition type
```

- p primary (0 primary, 0 extended, 4 free)
- e extended (container for logical partitions)

```
Select (default p):
```

```
Using default response p.
```

```
Partition number (1-4, default 1):
```

```
First sector (2048-524023807, default 2048):
```

```
Last sector, +/-sectors or +/-size{K,M,G,T,P} (2048-524023807, default 524023807): +100G
```

```
Created a new partition 1 of type 'Linux' and of size 100 GiB.
```

```
Command (m for help): p
```

```
Disk /dev/md0: 249,9 GiB, 268300189696 bytes, 524023808 sectors
```

```
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: 0xd399b01c
```

Device	Boot	Start	End	Sectors	Size	Id	Type
/dev/md0p1		2048	209717247	209715200	100G	83	Linux

```
Command (m for help): n
```

```
Partition type
```

- p primary (1 primary, 0 extended, 3 free)
- e extended (container for logical partitions)

```
Select (default p):
```

```
Using default response p.
```

```
Partition number (2-4, default 2):
```

```
First sector (209717248-524023807, default 209717248):
```

```
Last sector, +/-sectors or +/-size{K,M,G,T,P} (209717248-524023807, default 524023807): +96G
```

```
Created a new partition 2 of type 'Linux' and of size 96 GiB.
```

```
Command (m for help): p
```

```
Disk /dev/md0: 249,9 GiB, 268300189696 bytes, 524023808 sectors
```

```
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: 0xd399b01c
```

```
Device      Boot      Start          End    Sectors   Size Id Type
/dev/md0p1                2048 209717247 209715200   100G 83 Linux
/dev/md0p2      209717248 411043839 201326592    96G 83 Linux
```

Command (m for help): n

Partition type

p primary (2 primary, 0 extended, 2 free)

e extended (container for logical partitions)

Select (default p):

Using default response p.

Partition number (3,4, default 3):

First sector (411043840-524023807, default 411043840):

Last sector, +/-sectors or +/-size{K,M,G,T,P} (411043840-524023807, default 524023807):

Created a new partition 3 of type 'Linux' and of size 53,9 GiB.

Command (m for help): p

Disk /dev/md0: 249,9 GiB, 268300189696 bytes, 524023808 sectors

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: 0xd399b01c

```
Device      Boot      Start          End    Sectors   Size Id Type
/dev/md0p1                2048 209717247 209715200   100G 83 Linux
/dev/md0p2      209717248 411043839 201326592    96G 83 Linux
/dev/md0p3      411043840 524023807 112979968   53,9G 83 Linux
```

Command (m for help): w

The partition table has been altered.

Calling ioctl() to re-read partition table.

Syncing disks.

## 6. Créez les répertoires de montage :

```
pi@framboise4:~ $ sudo mkdir -p /media/{home,data,nas}
```

## 7. Formatez et montez les partitions du nouveau lecteur virtuel :

```
pi@framboise4:~ $ sudo mkfs.ext4 -O ^has_journal -L home /dev/md0p1
mke2fs 1.44.5 (15-Dec-2018)
/dev/md0p1 contains a ext4 file system labelled 'home'
   created on Sat Aug 22 20:02:26 2020
Proceed anyway? (y,N) y
Creating filesystem with 26214400 4k blocks and 6553600 inodes
```

```
Filesystem UUID: e659b8c1-36fb-4bb3-9e8f-50c2db9d2335
Superblock backups stored on blocks:
 32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
 4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done

pi@framboise4:~ $ sudo mkfs.ext4 -0 ^has_journal -L data /dev/md0p2
mke2fs 1.44.5 (15-Dec-2018)
Creating filesystem with 25165824 4k blocks and 6291456 inodes
Filesystem UUID: 41d98dbc-d710-4a9c-bfb4-0fb6463238a1
Superblock backups stored on blocks:
 32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
 4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done

pi@framboise4:~ $ sudo mkfs.ext4 -0 ^has_journal -L nas /dev/md0p3
mke2fs 1.44.5 (15-Dec-2018)
Creating filesystem with 14122496 4k blocks and 3530752 inodes
Filesystem UUID: 93e7445d-5004-4517-ad3b-c6f5b128d653
Superblock backups stored on blocks:
 32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
 4096000, 7962624, 11239424

Allocating group tables: done
Writing inode tables: done
Writing superblocks and filesystem accounting information: done
```

8. Montez les nouvelles partitions :

## Conclusion

## Problèmes connus

## Voir aussi

- (fr) <https://www.framboise314.fr/docs/MagPi85.pdf>

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Basé sur « *Build your own NAS* » par PJ Evans.

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<https://nfrappe.fr/doc-0/> - **Documentation du Dr Nicolas Frappé**

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<https://nfrappe.fr/doc-0/doku.php?id=tutorial:disque:sd:raspi:nas:raid1:start-new>

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