

Raid

Install mdadm:

```
sudo apt-get install mdadm
```

Creating a RAID 1 Array

The RAID 1 array type is implemented by mirroring data across all available disks. Each disk in a RAID 1 array gets a full copy of the data, providing redundancy in the event of a device failure.

Identify the Devices

To get started, find the identifiers for the raw disks that you will be using:

```
lsblk -o NAME,SIZE,FSTYPE,TYPE,MOUNTPOINT
```

Output

NAME	SIZE	FSTYPE	TYPE	MOUNTPOINT
sda	100G	ext4	disk	
sdb	100G		disk	
sdc	100G		disk	

As you can see above, we have two disks without a filesystem, each 100G in size. In this example, these devices have been given the `/dev/sdb` and `/dev/sdc` identifiers for this session. These will be the raw components we will use to build the array.

Create the Array

To create a RAID 1 array with these components, pass them in to the `mdadm --create` command. You will have to specify the device name you wish to create (`/dev/md0` in our case), the RAID level, and the number of devices:

```
sudo mdadm --create --verbose /dev/md0 --level=1 --raid-devices=2 /dev/sdb /dev/sdc
```

If the component devices you are using are not partitions with the boot flag enabled, you will likely be given the following warning. It is safe to type `y` to continue:

Output

```
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 104792064K
Continue creating array? y
```

The mdadm tool will start to mirror the drives. This can take some time to complete, but the array can be used during this time. You can monitor the progress of the mirroring by checking the `/proc/mdstat` file:

```
cat /proc/mdstat
-----
Output
Personalities : [raid1] [linear] [multipath] [raid0] [raid6] [raid5] [raid4]
[raid10]
md0 : active raid1 sdc1[1] sdb1[0]
      1953382464 blocks super 1.2 [2/2] [UU]
      bitmap: 0/15 pages [0KB], 65536KB chunk
      [====>.....]    resync = 20.2% (21233216/104792064)
finish=6.9min speed=199507K/sec
unused devices: <none>
```

As you can see in the first highlighted line, the `/dev/md0` device has been created in the RAID 1 configuration using the `/dev/sda` and `/dev/sdb` devices. The second highlighted line shows the progress on the mirroring. You can continue the guide while this process completes.

Create and Mount the Filesystem

Next, create a filesystem on the array:

```
sudo mkfs.ext4 -F /dev/md0
```

Create a mount point to attach the new filesystem:

```
sudo mkdir -p /media/md0
```

You can mount the filesystem by typing:

```
sudo mount /dev/md0 /media/md0
```

Check whether the new space is available by typing:

```
df -h -x devtmpfs -x tmpfs
-----
Output
Filesystem      Size  Used Avail Use% Mounted on
/dev/vda1       20G   1.1G   18G   6% /
/dev/md0        99G   60M   94G   1% /mnt/md0
```

The new filesystem is mounted and accessible.

Save the Array Layout

To make sure that the array is reassembled automatically at boot, we will have to adjust the **/etc/mdadm/mdadm.conf** file. You can automatically scan the active array and append the file by typing:

```
sudo mdadm --detail --scan | sudo tee -a /etc/mdadm/mdadm.conf
```

Add the new filesystem mount options to the **/etc/fstab** file for automatic mounting at boot:

```
echo '/dev/md0 /mnt/md0 ext4 defaults,nofail,discard 0 0' | sudo tee -a /etc/fstab
```

Your RAID 1 array should now automatically be assembled and mounted each boot.

Check Array Status

Short status overview

```
cat /proc/mdstat
-----
Personalities : [raid1] [linear] [multipath] [raid0] [raid6] [raid5] [raid4]
[raid10]
md0 : active raid1 sdc1[1] sdb1[0]
      1953382464 blocks super 1.2 [2/2] [UU]
      bitmap: 0/15 pages [0KB], 65536KB chunk

unused devices: <none>
```

Long status overview

```
mdadm -D /dev/md0
-----
/dev/md0:
   Version : 1.2
  Creation Time : Sat Sep  2 18:49:16 2017
   Raid Level : raid1
   Array Size : 1953382464 (1862.89 GiB 2000.26 GB)
  Used Dev Size : 1953382464 (1862.89 GiB 2000.26 GB)
   Raid Devices : 2
  Total Devices : 2
 Persistence : Superblock is persistent

Intent Bitmap : Internal

   Update Time : Fri Apr 16 17:01:07 2021
     State : clean
```

```
Active Devices : 2
Working Devices : 2
Failed Devices : 0
Spare Devices : 0
```

```
    Name : backupserver:0 (local to host backupserver)
    UUID : 2de2b9e9:b9d74a05:32c8e471:8a6437b2
    Events : 4925
```

Number	Major	Minor	RaidDevice	State	
0	8	17	0	active sync	/dev/sdb1
1	8	33	1	active sync	/dev/sdc1

More detailed

To obtain detailed information about each raid device, run this command:

```
sudo mdadm --examine /dev/sdb1 /dev/sdc1
-----
/dev/sdb1:
    Magic : a92b4efc
    Version : 1.2
    Feature Map : 0x1
    Array UUID : 2de2b9e9:b9d74a05:32c8e471:8a6437b2
    Name : backupserver:0 (local to host backupserver)
    Creation Time : Sat Sep  2 18:49:16 2017
    Raid Level : raid1
    Raid Devices : 2

    Avail Dev Size : 3906764976 (1862.89 GiB 2000.26 GB)
    Array Size : 1953382464 (1862.89 GiB 2000.26 GB)
    Used Dev Size : 3906764928 (1862.89 GiB 2000.26 GB)
    Data Offset : 262144 sectors
    Super Offset : 8 sectors
    Unused Space : before=262056 sectors, after=48 sectors
    State : clean
    Device UUID : c22a3b70:493acf3d:caa4fd40:1c3787c3

    Internal Bitmap : 8 sectors from superblock
    Update Time : Fri Apr 16 22:29:11 2021
    Bad Block Log : 512 entries available at offset 72 sectors
    Checksum : 3dc3d8da - correct
    Events : 4943

    Device Role : Active device 0
    Array State : AA ('A' == active, '.' == missing, 'R' == replacing)
/dev/sdc1:
    Magic : a92b4efc
    Version : 1.2
```

```
Feature Map : 0x1
Array UUID : 2de2b9e9:b9d74a05:32c8e471:8a6437b2
Name : backupserver:0 (local to host backupserver)
Creation Time : Sat Sep  2 18:49:16 2017
Raid Level : raid1
Raid Devices : 2

Avail Dev Size : 3906764943 (1862.89 GiB 2000.26 GB)
Array Size : 1953382464 (1862.89 GiB 2000.26 GB)
Used Dev Size : 3906764928 (1862.89 GiB 2000.26 GB)
Data Offset : 262144 sectors
Super Offset : 8 sectors
Unused Space : before=262056 sectors, after=15 sectors
State : clean
Device UUID : b6935080:9c85db10:9ba82f62:e28ae364

Internal Bitmap : 8 sectors from superblock
Update Time : Fri Apr 16 22:29:11 2021
Bad Block Log : 512 entries available at offset 72 sectors
Checksum : e373e497 - correct
Events : 4943

Device Role : Active device 1
Array State : AA ('A' == active, '.' == missing, 'R' == replacing)
```

Force Check

You can force a check of the entire array while it's online. For example, to check the array on /dev/md0, run as root:

```
echo check > /sys/block/md0/md/sync_action
```

Migrate raid array to different system

You should see your inactive RAID with:

```
cat /proc/mdstat
```

Reassemble the array:

```
sudo mdadm --assemble /dev/md_d0 /dev/sdb1 /dev/sdc1
sudo mdadm --detail --scan
```

The output on my system is:

```
ARRAY /dev/md/d0 level=raid1 num-devices=2 metadata=00.90
UUID=bcb40263:0fe2be0e:4a925ea7:19eea675
```

Copy the whole ARRAY .. line to the end of **/etc/mdadm/mdadm.conf** Now your raidconfig is preserved and you can use /dev/md0 as a normal device For example `sudo mount /dev/md0 /mnt/raid`

Links

- [A guide to mdadm](#)
- [how-to-create-raid-arrays-with-mdadm-on-ubuntu](#)

From:
<https://wiki.oscardegroot.nl/> - **HomeWiki**

Permanent link:
<https://wiki.oscardegroot.nl/doku.php?id=linux:system:disk:mdadm>

Last update: **2022/01/15 11:38**

