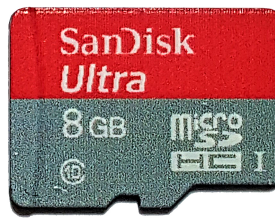
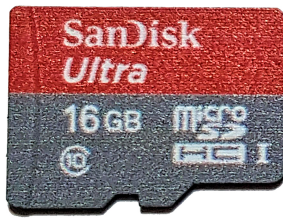


Copy Larger SD Card to Smaller SD Card

Jan 2017



In this example I am going to copy the contents of a 16Gb SD Card, to an 8Gb SD Card. This will of course only work if your 16Gb SD card has at least 8Gb of free space.

I had a situation where I had created a project, using a 16Gb card and realised that even a 4Gb SD Card was enough, so after many frustrating hours I managed to get the contents to another smaller card, and thought I would document the process.

What you will require

For this process, I used the following:

A Windows PC with SD Formatter and Win32 Disk Imager (see this link [here](#)) A Linux PC (had Linux Mint on, so still Debian based) with gparted. Larger and smaller SD Cards and a reader.

You can mix and match your own method and hardware using this guide. This is not necessarily the best method, but it is the first method I found that worked for me.

BEFORE YOU START use the tools on this page [here](#) to **BACKUP YOUR SD CARD** so you don't lose any data.

Check Source SD Card

While in your Raspberry Pi, check how much free space you have on your SD Card. Remember, my example is copying a 16Gb card to an 8Gb card, so I need at least 8Gb free.

From the command line, use the following:

```
df -h
```

This gives the output:

Filesystem	Size	Used	Avail	Use%	Mounted on
/dev/root	15G	1.1G	14G	8%	/
devtmpfs	214M	0	214M	0%	/dev
tmpfs	218M	0	218M	0%	/dev/shm
tmpfs	218M	4.4M	213M	3%	/run
tmpfs	5.0M	4.0K	5.0M	1%	/run/lock
tmpfs	218M	0	218M	0%	/sys/fs/cgroup
/dev/mmcblk0p1	63M	21M	43M	34%	/boot

As we can see from the line **/dev/root 15G 1.1G 14G 8%** / this SD Card which is a reported size of 15Gb has 14Gb free. So I have plenty of space to shrink this card by.

Shrink Existing Partition

Most Pi Raspbian SD Cards that I have seen contain two partitions:

- Boot - Contains the boot files
- Ext4 - Contains the OS and Data files

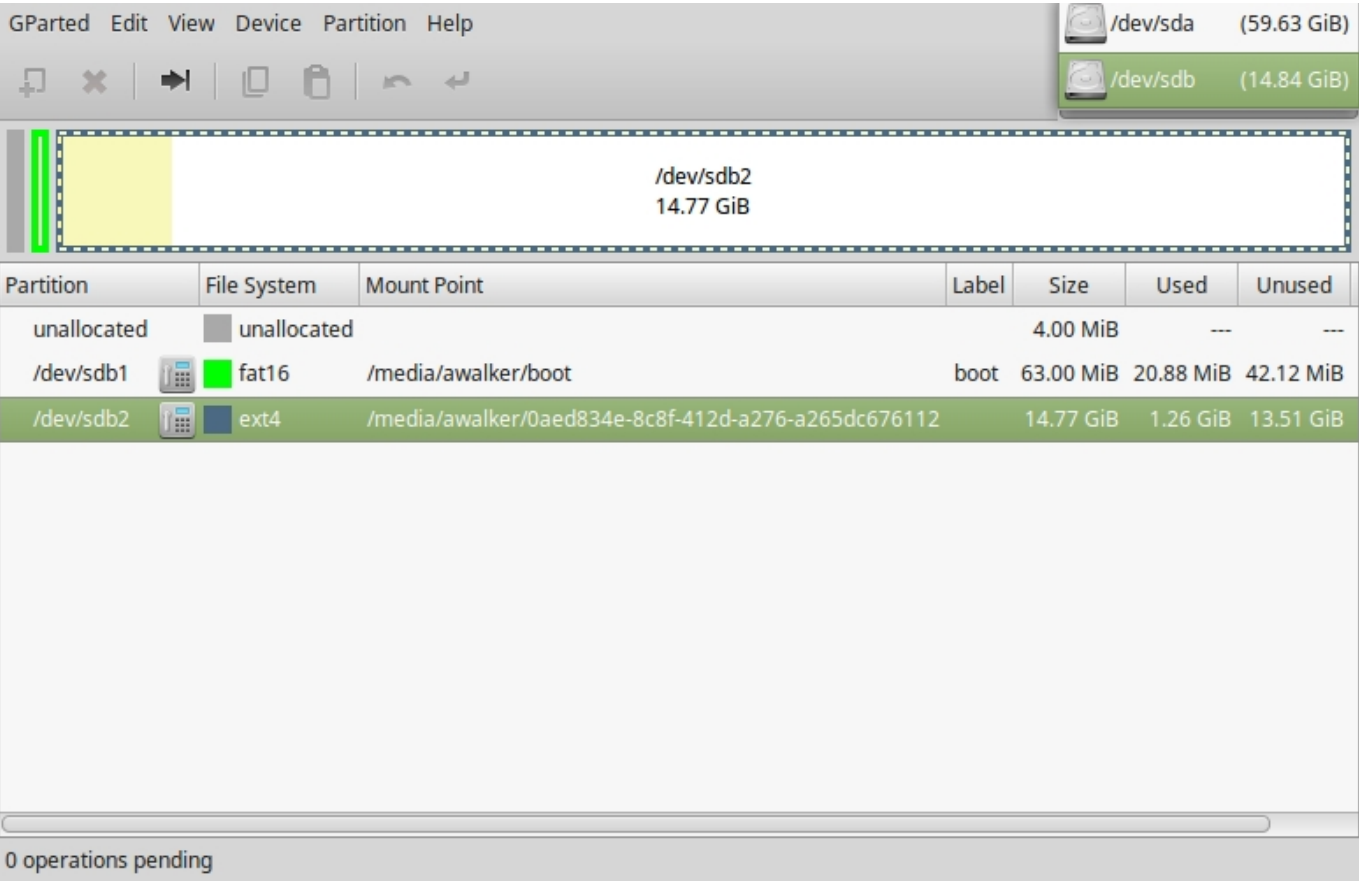
It is the Ext4 partition that we need to shrink. Unfortunately, there is no tool that I know that will shrink this partition while it is mounted. When I say shrink, I mean move any data that exists there and shrink. My first attempt to shrink the partition I used 'parted'. But this just shrank the partition without preserving any data.

If you had another RPi SD Card, you could do this from the Pi, but I just found it simpler by using a Linux PC. If you don't have a computer with Linux on it, just use one of the live CD/USB images to temporarily boot your computer to Linux.

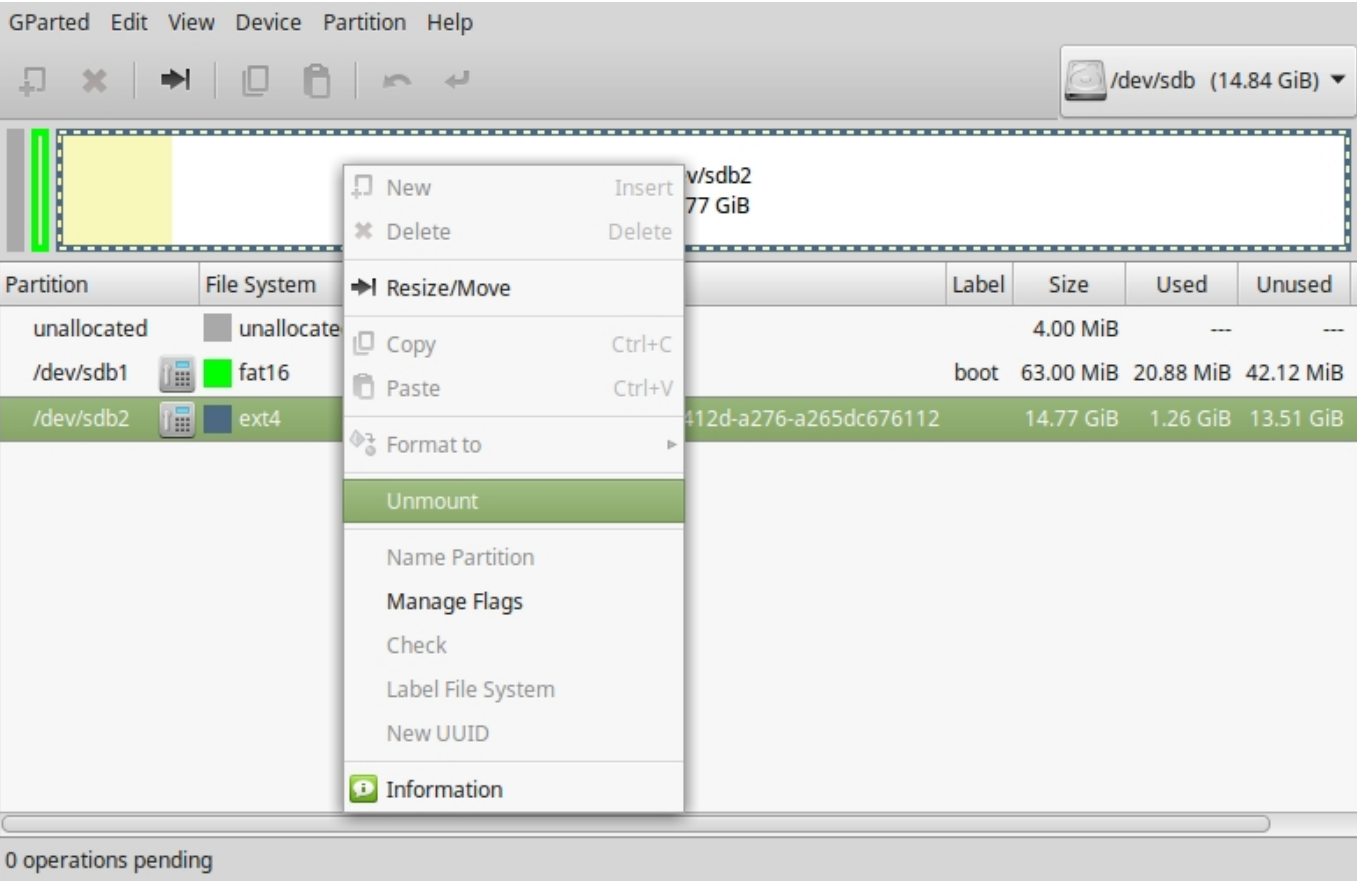
On the Linux computer, you need to run gparted (you may have to install it, you will have to google that because it's not covered here, suffice to say that will take you around 60 seconds).

Once gparted is up and running, with your source SD Card inserted check the following:

Ensure that the correct storage device is selected (don't delete your hdd partitions, or it's going to be a long day).

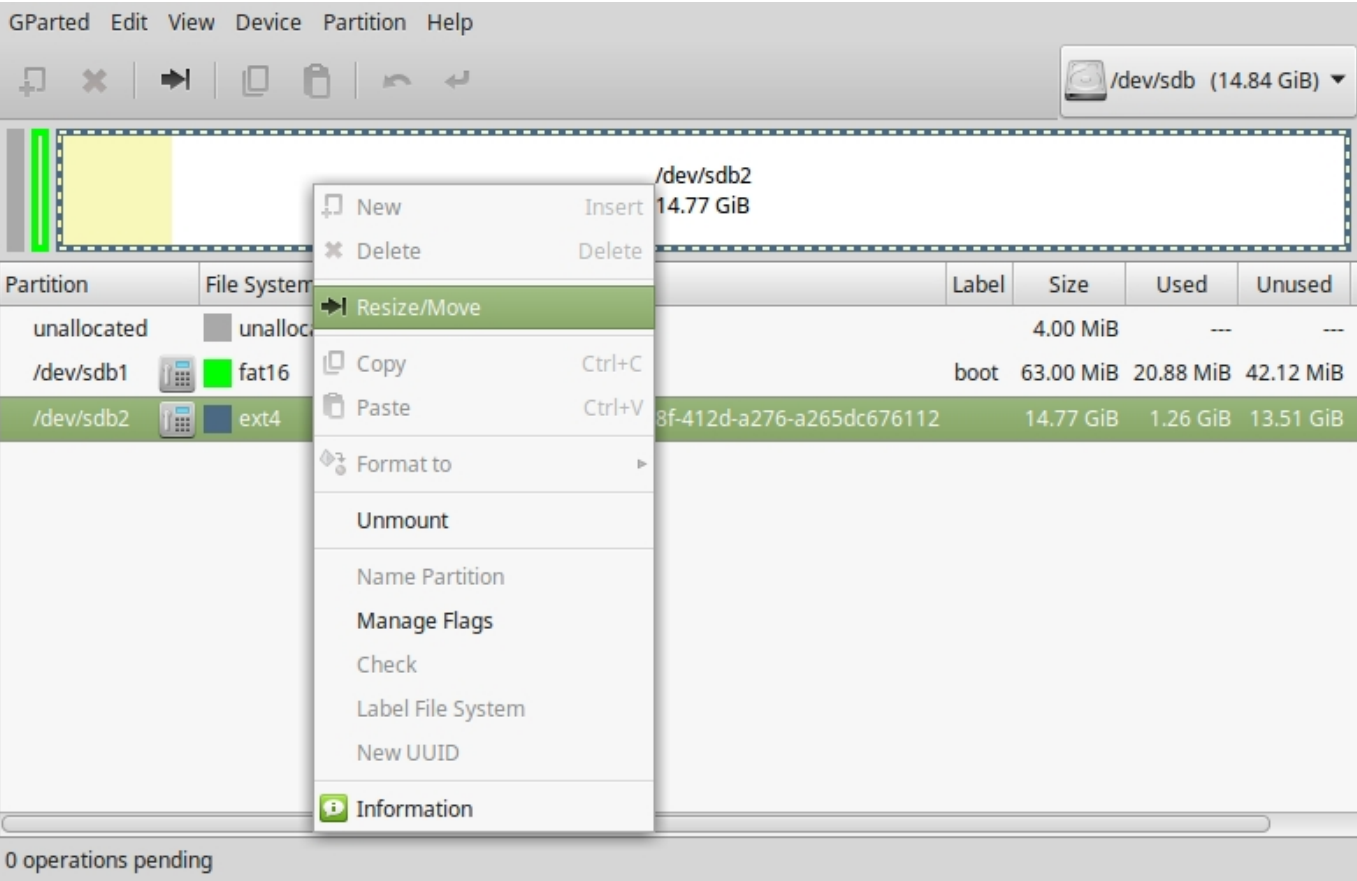


Ensure that the partitions are un-mounted before you start, or you won't have the option to resize.



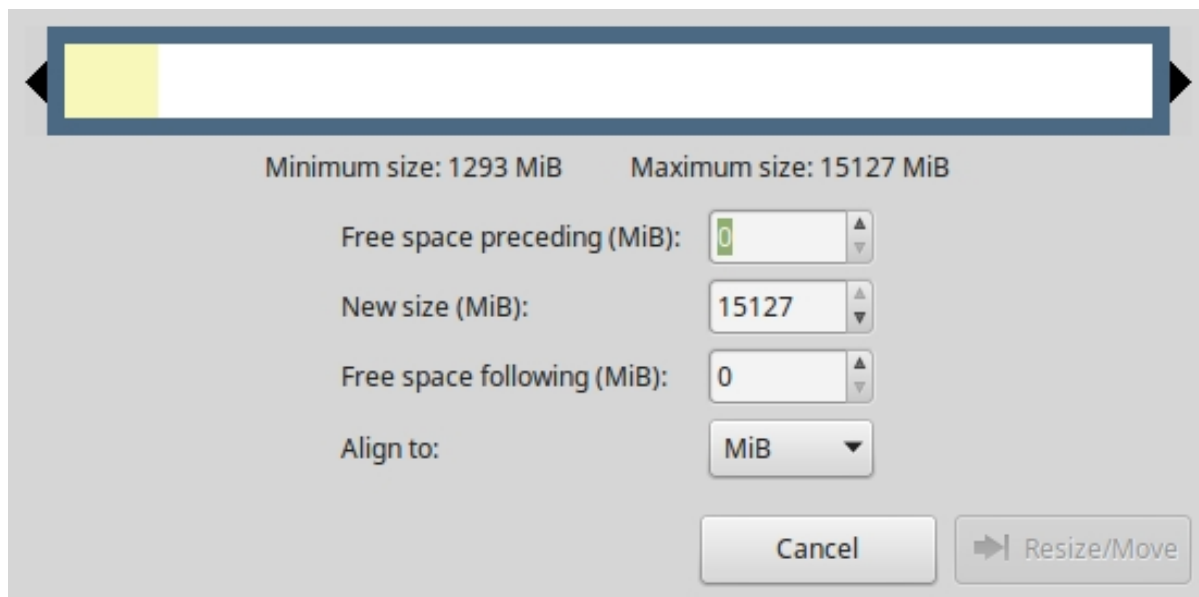
Now it's time to resize your partition.

On the EXT4 partition (we won't do anything to the boot partition) right click and select the Resize/Move option.



Now we have a resize window for our partition. You can set the size by dragging from the right (don't drag from the left) or by typing in the value of the new size (say 2GB = 2048). I am reducing my partition to 2GB because then it will fit on almost any card.

Even if you are writing the partition back to say an 8Gb card, it's worth using as little space as possible as this makes your backups smaller and faster, and the restore process is quicker too.



Minimum size: 1293 MiB Maximum size: 15127 MiB

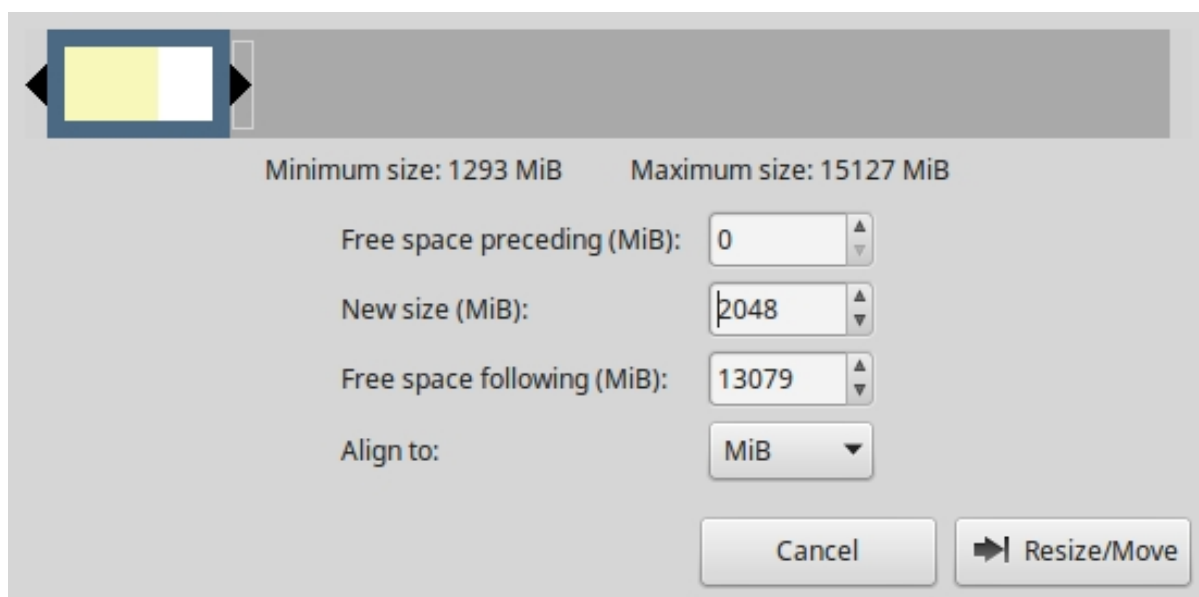
Free space preceding (MiB):

New size (MiB):

Free space following (MiB):

Align to:

Below you can see where the partition has been dragged down to 2GB.



Minimum size: 1293 MiB Maximum size: 15127 MiB

Free space preceding (MiB):

New size (MiB):

Free space following (MiB):

Align to:

Click Resize/Move to set the changes.

Before the changes are committed, you have to click the Apply All Operations arrow at the top of the gparted interface.

The screenshot shows the GParted application window. The top menu bar includes 'GParted', 'Edit', 'View', 'Device', 'Partition', and 'Help'. Below the menu is a toolbar with icons for creating, deleting, moving, copying, pasting, and undo/redo. On the right, a dropdown menu shows the selected device: '/dev/sdb (14.84 GiB)'. The main window displays a disk layout with a 2.00 GiB partition (fat16) and a 12.77 GiB unallocated space. A yellow tooltip 'Apply All Operations' is visible. Below the main window, a status bar shows '1 operation pending' and a message 'Shrink /dev/sdb2 from 14.77 GiB to 2.00 GiB'.

Partition	File System	Mount Point	Label	Size	Used	Unused	Flags
unallocated	unallocated			4.00 MiB	---	---	
/dev/sdb1	fat16	/media/awalker/boot	boot	63.00 MiB	20.88 MiB	42.12 MiB	boot, lba
/dev/sdb2	ext4			2.00 GiB	1.26 GiB	755.00 MiB	
unallocated	unallocated			12.77 GiB	---	---	

1 operation pending

Shrink /dev/sdb2 from 14.77 GiB to 2.00 GiB

Accept the confirmation and the changes will be made.

Backup the SD Card

Now we can backup the SD Card. For this we will use a utility called 'dd' which is installed on Linux by default.

```
df -h Filesystem      Size  Used Avail Use% Mounted on
/dev/root             2.0G  1.1G  880M  54% /
/devtmpfs             214M    0  214M   0% /dev
tmpfs                 218M    0  218M   0% /dev/shm
tmpfs                 218M  4.4M  213M   3% /run
tmpfs                 5.0M  4.0K   5.0M   1% /run/lock
tmpfs                 218M    0  218M   0% /sys/fs/cgroup
/dev/mmcblk0p1        63M
21M  43M  34% /boot
```

```
df -h Filesystem Size Used Avail Use% Mounted on /dev/root 7.2G 1.1G 5.9G 15% / devtmpfs 214M 0 214M 0% /dev tmpfs 218M 0 218M 0% /dev/shm tmpfs 218M 4.4M 213M 3% /run tmpfs 5.0M 4.0K 5.0M 1% /run/lock tmpfs 218M 0 218M 0% /sys/fs/cgroup /dev/mmcblk0p1 63M 21M 43M 34% /boot
```

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