

Connect your Raspberry Pi to a USB hard disk



The amount of space available on an SD card is much more limited than the amount of space on a hard disk, so it's worth attaching a hard disk to your Pi. The simplest to expand your Pi's storage capacity is with a USB hard disk.

If you're planning on leaving the same USB hard disk connected to your Raspberry Pi all the time, then you need to make sure that your Pi mounts the drive automatically every time it boots. You can do this by editing the file system table file.

When Linux detects the USB drive, it will create a file in /dev that is used as an interface to your disk. You can list all the disk device files in /dev by typing this command:

```
$ sudo fdisk -l

Disk /dev/mmcblk0: 3965 MB, 3965190144
bytes

4 heads, 16 sectors/track, 121008
cylinders, total 7744512 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
```

Disk identifier: 0x00014d34

End	Device	Boot	Start	System
Blocks	Id			
	/dev/mmcblk0p1		8192	
122879	57344	c	W95	FAT32

(LBA)

	/dev/mmcblk0p2		122880	
7744511	3810816	83	Linux	

Disk /dev/sda: 320.1 GB, 320072933376 bytes

255 heads, 63 sectors/track, 38913 cylinders, total 625142448 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

Disk identifier: 0x8be4e163

Device	Boot	Start	End
Blocks	Id	System	
/dev/sda1	*	63	625137344
312568641	b	W95	FAT32

My USB disk is listed in /dev/sda1, and the file system type is Fat32. If your USB drive has an NTFS 3g file system, you will need to install an NTFS driver.

```
sudo apt-get install ntfs-3g
```

In order to access the files and folders on a disk, Linux needs to mount it. The contents of the disk will appear as a folder in /media. You can mount disks in other folders, but it's conventional to use /media. You need to create a directory where the mounted disk will appear in the media directory, and change its owner to pi (or any other user account that you might have created).

```
$ sudo mkdir /media/usbhdd
$ sudo chown pi:pi /media/usbhdd
```

In order to mount the disk, type this command:

```
$ sudo mount -t vfat -o uid=pi,gid=pi
/dev/sda1 /media/usbhdd
```

The '-t vfat' tells the mount command that your drive has a fat32 file system. If your drive is formatted with NTFS, you should use '-t ntfs-3g' instead. The '-o uid=pi,gid=pi' part of the command means that the disk will be owned by user pi. You can use this command to unmount the disk:

```
$ sudo umount /media/usbhdd
```

Now you need to edit the file system table so that this disk is mounted every time your Raspberry Pi starts up:

```
$ sudo leafpad /etc/fstab &
```

You need to use sudo because the fstab file is owned by root. If you don't use sudo, you'll be able to open the file in leafpad, but you won't be able to save changes. The '&' means the command runs in the background, and you can keep using the terminal for other commands while leafpad is running. You should see something like this:

```
proc          /proc          proc
defaults      0              0

/dev/mmcblk0p1 /boot          vfat
defaults      0              2

/dev/mmcblk0p2 /              ext4
defaults,noatime 0              1
```

Add the following line, and save the file.

```
/dev/sda1      /media/usbhdd  vfat
uid=pi,gid=pi  0              0
```

Reboot your Pi to and you should be able to access your USB drive via `/media/usbhdd`.