Linux Commands

How to Make Disk Images in Linux with DD Command

7 months ago • by Aqsa Yasin

Whenever it comes to wiping, backing up, or restoring Linux files, you have few tools. Although there is one alternative that still works, regardless of the Linux distribution you're using, and that is the DD command. Creating an image of a partition or cloning a complete hard disk drive are simply the acts of making a copy of the whole disk or partition, and it is very simple with the dd command. The DD command is good for cloning disks, backups, and restoration, among other things. In this guide, we will see how to make a disk image using the DD command. Make sure you have the Ubuntu Linux system installed.

DD circumvents this by making an identical replica of the whole hard drive or partitions. So if you recover this backup, your machine will be restored to its original state. You'll regain access to your folders, games, browser history, and sometimes even device settings. We'll want another drive with more capacity than the one we're cloning to replicate your drive. There would most probably be a big hard drive for this purpose.

Install LSSCSI Utility

Open the command-line terminal of the Ubuntu 20.04 Linux system. Make sure to have the "lsscsi" utility installed on your system. If it is not installed, try to install it using the below "apt" command followed by the keyword "install" and "lsscsi". It will take not more than 5 minutes to get installed, and you are good to go.

```
$ sudo apt install lsscsi
```

```
ubuntu@ubuntu:~$ sudo apt install lsscsi
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  lsscsi
0 upgraded, 1 newly installed, 0 to remove and 470 not upgraded.
Need to get 46.1 kB of archives.
After this operation, 114 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu focal/main amd64 lsscsi amd64 0.30-0.1 [
46.1 kB]
Fetched 46.1 kB in 2s (21.0 kB/s)
Selecting previously unselected package lsscsi.
(Reading database ... 187886 files and directories currently installed.)
Preparing to unpack .../lsscsi_0.30-0.1_amd64.deb ...
Unpacking lsscsi (0.30-0.1) ...
Setting up lsscsi (0.30-0.1) ...
Processing triggers for man-db (2.9.1-1) ...
```

After installing the "lsscsi" utility, now it's time to use it for listing all the storage devices of our Linux system. To list the storage drives and DVD's execute the below command. You can see we have one disk drive and one cd/DVD device in our system.

```
$ lsscsi
ubuntu@ubuntu:~$ lsscsi
[1:0:0:0]    cd/dvd  VBOX       CD-ROM          1.0    /dev/sr0
[2:0:0:0]    disk    ATA        VBOX HARDDISK   1.0    /dev/sda
```

Check Disk Information

Firstly, we have to find out some information regarding the disk drive "/dev/sda". And for this reason, we have to use the "fdisk" instruction in our command-shell with sudo privileges as below.

```
$ sudo fdisk /dev/sda
ubuntu@ubuntu:~$ sudo fdisk /dev/sda

Welcome to fdisk (util-linux 2.34).
Changes will remain in memory only, until you decide to write them.
Be careful before using the write command.
```

It will navigate to its command theme. Type "p" to check the information of disks as below. You can see it shows the total memory of the "/dev/sda" drive, its sectors, and bytes. It is showing the disk type as DOS. On the other hand, the last three lines of the snapshot show the partitions of the /dev/sda drive and their further information.

```
: P
```

```
Command (m for help): p
Disk /dev/sda: 31.3 GiB, 33312931840 bytes, 65064320 sectors
Disk model: VBOX HARDDISK
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: 0xbc630ab1

Device     Boot    Start       End  Sectors  Size Id Type
/dev/sda1  *        2048   1050623  1048576  512M  b W95 FAT32
/dev/sda2        1052670  65062911 64010242 30.5G  5 Extended
/dev/sda5        1052672  65062911 64010240 30.5G 83 Linux
```

Create a Clone Disk Image

Now you have almost every piece of information regarding the "/dev/sda" drive. Press "q" to exit the commanding theme. Now, you are ready to make a disk image using the DD command. So, make yourself clear that the DD command always needs "sudo" privileges to execute. As we already know from the above image, the "/dev/sda" has three partitions, and we will make an image of one of them. So, we choose "sda1" for making its clone. You have to execute the below "DD" command followed by the "if" path and "of" path. The "if" path is of the input disk drive, which is meant to be cloned and the "of" path is for the output device disk, where it would be copied as an image. So, from this, you can understand that "sda1.img" is the cloned file for disk and sda1 is the actual drive. We have specified the bytes per second to be copied from one location to another. We assigned it a value of 1000. The command is as follows:

```
$ sudo dd if=/dev/sda1 of=/tmp/sda.img bs=1k conv=noerror
```

The output shows the number of records inputted and outputted from two locations, e.g., source and destination. It also shows the number of bytes with time seconds, copied into a destination in MB's. This means that the clone has been effectively done.

```
ubuntu@ubuntu:~$ sudo dd if=/dev/sda1 of=/tmp/sda1.img bs=1k conv=noerror
524288+0 records in
524288+0 records out
536870912 bytes (537 MB, 512 MiB) copied, 10.1445 s, 52.9 MB/s
```

Let's check the destination image file to see if all the data from the source drive has been cloned into it properly or not. Use the below list command along with the path of an image file of the drive as:

```
$ ls —lh /tmp/sda1.img
```

The output shows the rights assigned to this image file, its size, and location. You can say that it has similar rights and size as the original disk drive have.

```
ubuntu@ubuntu:~$ ls -lh /tmp/sda1.img
-rw-r--r-- 1 root root 512M Apr  5 16:18 /tmp/sda1.img
```

To see some more information regarding the disk image file, you have to try the below "fdisk" command followed by the flag "-l" as below.

```
$ fdisk —l /tmp/sda1.img
```

The output shows the exact same information regarding this image file as we have seen for the original disk drive before creating this image file. It shows the size of the image drive, its total number of bytes, and total sectors.

```
ubuntu@ubuntu:~$ fdisk -l /tmp/sda1.img
Disk /tmp/sda1.img: 512 MiB, 536870912 bytes, 1048576 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: 0x00000000
```

Restore the Drive from Clone Image

Now, if you want to restore your original disk drive along with all the data it has, you have to use the DD command again to do so. While using the DD command, there is a little change in it. You have to swipe the input and output paths this time. This means you have to place the image disk file path into the "if" path, and in the "of" output path, you have to mention the location where you want to restore the image file data. Here is the command to restore the drive data from the image file:

```
$ sudo dd if=/tmp/sda1.img of=/dev/sda1 bs=1k conv=noerror
```

The output shows the transfer of backup files into their actual destination. You can see the input and output number of total records and some further information regarding the numbers of bytes transferred, the total size of the disk image, and the time taken to transfer it.

```
ubuntu@ubuntu:~$ sudo dd if=/tmp/sda1.img of=/dev/sda1 bs=1k conv=noerror
524288+0 records in
524288+0 records out
536870912 bytes (537 MB, 512 MiB) copied, 8.81947 s, 60.9 MB/s
```

Conclusion

Indeed, The method discussed before is the easiest and simplest way to clone a disk into an image file and restore the backup to get all the files and folders back.

ABOUT THE AUTHOR
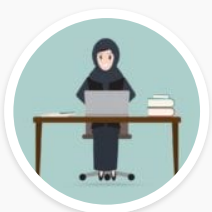
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I am a self-motivated information technology professional with a passion for writing. I am a technical writer and love to write for all Linux flavors and Windows.

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