

# How to Boot Linux ISO Image Directly from Hard Drive

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To Boot Linux ISO Image Directly from Hard Drive, you must have a Linux operating system installed on your hard drive and your computer must be using a GRUB2 bootloader. The GRUB2 bootloader is a standard bootloader on most Linux systems.

**Note:** The downloaded ISO file of Linux must be a live CD release of each Linux ISO image.

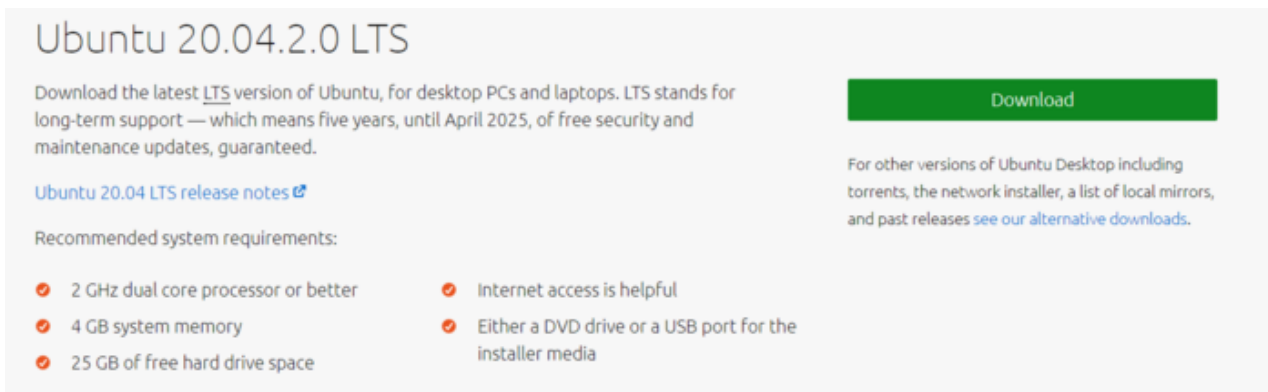
## How to Get ISO files from Linux:

1) First of all, search for the ISO file on Google which you want to download. To download these Linux distributions you may visit:

- Ubuntu : <https://ubuntu.com/download>
- debian : <https://www.debian.org/CD/http-ftp/>
- LinuxMint : <https://linuxmint.com/download.php>
- RedHat: <https://www.redhat.com/en/store>

2) Let us take the example of downloading Ubuntu.

- Visit the official website and navigate to the download tab.
- Select the Ubuntu desktop for downloading.
- Select the LTS(Long Term Support) version of Ubuntu for downloading.



The screenshot shows the Ubuntu 20.04.2.0 LTS download page. It features a green 'Download' button and a list of recommended system requirements. The text on the page includes: 'Ubuntu 20.04.2.0 LTS', 'Download the latest LTS version of Ubuntu, for desktop PCs and laptops. LTS stands for long-term support — which means five years, until April 2025, of free security and maintenance updates, guaranteed.', 'Ubuntu 20.04 LTS release notes', 'Recommended system requirements:', and a list of requirements: '2 GHz dual core processor or better', '4 GB system memory', '25 GB of free hard drive space', 'Internet access is helpful', and 'Either a DVD drive or a USB port for the installer media'.

Ubuntu 20.04.2.0 LTS

Download the latest [LTS](#) version of Ubuntu, for desktop PCs and laptops. LTS stands for long-term support — which means five years, until April 2025, of free security and maintenance updates, guaranteed.

[Ubuntu 20.04 LTS release notes](#)

Recommended system requirements:

- 2 GHz dual core processor or better
- 4 GB system memory
- 25 GB of free hard drive space
- Internet access is helpful
- Either a DVD drive or a USB port for the installer media

Download

For other versions of Ubuntu Desktop including torrents, the network installer, a list of local mirrors, and past releases [see our alternative downloads](#).

Your download will start in a few seconds.

## Determine the Hard Drive Partition's Path:

The “device name” scheme used by GRUB is a different scheme than Linux. In your Linux system, /dev/sda1 is the first partition on the first hard disk, where **a** means the first hard disk and **1** means its first partition. In GRUB, (hd0,1) is equivalent to /dev/sda0 where **0** means the first hard disk and **1** means the first partition on it. That means that in a GRUB device name, the disk numbers start counting at 0 and the partition numbers start counting at 1. For example, (hd2,5) refers to the fifth partition on the third hard disk.

To view the information, we use **the fdisk -l** command on Ubuntu’s terminal and use the following command:

```
sudo fdisk -l
```

A list of Linux device paths is shown, which you can convert to GRUB device names on your own.

```
Disk /dev/sda: 20 GiB, 21474836480 bytes, 41943040 sectors
Disk model: VMware Virtual S
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: 0x3f35618f

Device      Boot    Start        End    Sectors    Size Id Type
/dev/sda1   *         2048    1050623    1048576    512M  b W95 FAT32
/dev/sda2             1052670  41940991  40888322   19.5G  5 Extended
/dev/sda5             1052672  41940991  40888320   19.5G  83 Linux
```

## Adding Boot Menu To GRUB:

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The best way by which you can add a custom boot entry is by editing the /etc/grub.d/40\_custom script, which is a file designed for user-added custom boot entries. After you are done editing the file, every content of your /etc/default/grub file and the /etc/grub.d/ scripts will get combined and create a /boot/grub/grub.cfg file.

**Note:** You shouldn’t edit this file by hand. It’s designed to be automatically generated from the settings you specify in other files.

You’ll need to open the /etc/grub.d/40\_custom file for editing with root privileges. On Ubuntu, you can do this by opening a Terminal window and running the following command:

```
sudo gedit /etc/grub.d/40_custom
```

You can open this file in your favorite editor by just replacing gedit with your editor name.



```
Open 40_custom /etc/grub.d Save
1 #!/bin/sh
2 exec tail -n +3 $0
3 # This file provides an easy way to add custom menu entries. Simply type the
4 # menu entries you want to add after this comment. Be careful not to change
5 # the 'exec tail' line above.
```

So to boot an Ubuntu or Ubuntu-based distribution from an ISO file. We tested this with Ubuntu 20.04:

```
menuentry "Ubuntu 20.04 ISO" {
    set isofile="/home/nikhil/ubuntu-20.04.1-desktop-amd64.iso"

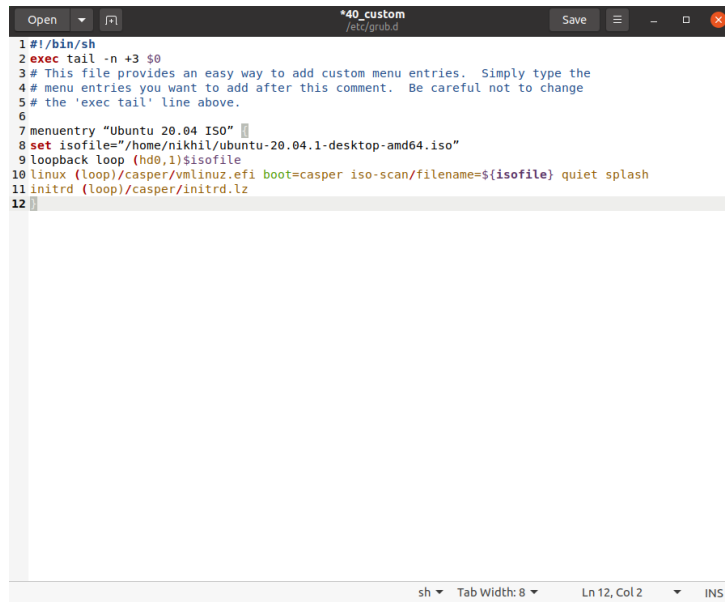
    loopback loop (hd0,1)$isofile

    linux (loop)/casper/vmlinuz.efi boot=casper iso-scan/filename=${isofile} quiet splash

    initrd (loop)/casper/initrd.lz
}
```

**Note:**

- You can customize the boot entry to contain your desired menu entry name, the correct path to the ISO file on your pc, and the device name of the hard disk and partition containing the ISO file. If the vmlinuz and initrd files have different names or paths, be sure to specify the correct path to those files, too.
- Different Linux distributions require different boot entries with different boot options. The GRUB Live ISO Multiboot project offers a variety of menu entries for different Linux distributions. You should be able to adapt these example menu entries for the ISO file you want to boot or you can also just perform a web search for the name and release number of the Linux distribution you want to boot along with “boot from ISO in GRUB” to find more information.



```
1 #!/bin/sh
2 exec tail -n +3 $0
3 # This file provides an easy way to add custom menu entries.  Simply type the
4 # menu entries you want to add after this comment.  Be careful not to change
5 # the 'exec tail' line above.
6
7 menuentry "Ubuntu 20.04 ISO" {
8     set isofile="/home/nikhil/ubuntu-20.04.1-desktop-amd64.iso"
9     loopback loop (hd0,1)$isofile
10    linux (loop)/casper/vmlinuz.efi boot=casper iso-scan/filename=${isofile} quiet splash
11    initrd (loop)/casper/initrd.lz
12 }
```

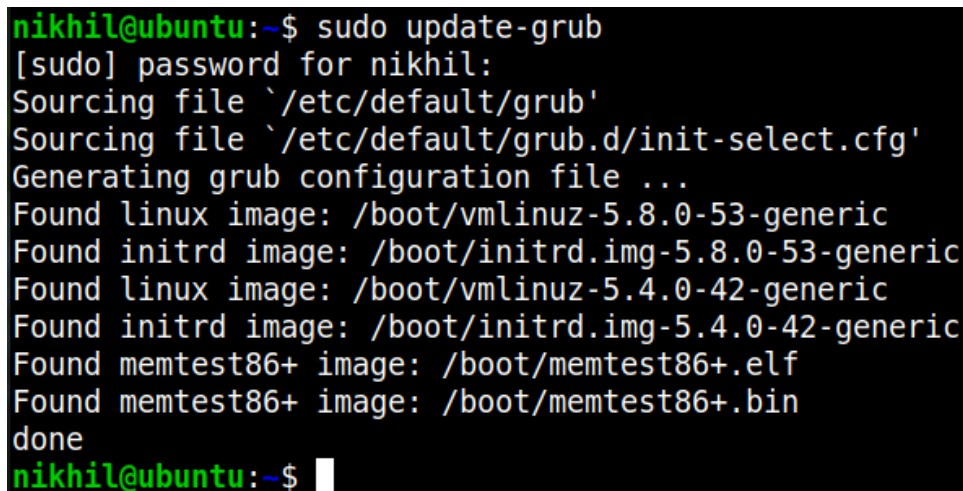
If you want to add more ISO boot options, add additional sections to the file, otherwise just save the file and return to the terminal window.

## Update GRUB:

---

To update GRUB run the following command:

```
sudo update-grub
```



```
nikhil@ubuntu:~$ sudo update-grub
[sudo] password for nikhil:
Sourcing file `/etc/default/grub'
Sourcing file `/etc/default/grub.d/init-select.cfg'
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-5.8.0-53-generic
Found initrd image: /boot/initrd.img-5.8.0-53-generic
Found linux image: /boot/vmlinuz-5.4.0-42-generic
Found initrd image: /boot/initrd.img-5.4.0-42-generic
Found memtest86+ image: /boot/memtest86+.elf
Found memtest86+ image: /boot/memtest86+.bin
done
nikhil@ubuntu:~$
```

The next time you boot your computer, you'll see the ISO boot entry and you can choose to boot the ISO file. You may have to hold Shift while booting to see the GRUB menu.

**Note:** If you see an error message or a black screen when you attempt to boot the ISO file, you misconfigured the boot entry somewhere. Even if you got the ISO file path and device name right, the paths to the vmlinuz and intird files on the ISO file may not be correct or the Linux system you're booting may require different options.

