

How to Run Any Linux Distribution Directly from Hard Disk

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[Ubuntu](#)[28 Comments](#)

Most [Linux distributions](#) provide ISO files that are designed and built to run in **Live Mode** directly from a bootable media such as **CD /DVD**, **Flash/USB** cards, or even directly from a **Hard Drive** using the **Linux Grub** menu without the need to burn it to a **CD/DVD** or [create a bootable USB](#) using [USB creator tools](#).

This tutorial will concentrate on presenting a way you can run some **Linux ISO** distributions directly from your hard disk by editing **Ubuntu 22.04 GRUB2** (works on **Ubuntu 20.04** or earlier) menu which is the default boot loader in [most modern Linux distributions](#).

Running an operating system from a hard disk provides a faster way of using Linux, and also has a great impact on privacy because all your settings and live sessions are not preserved by default.

The distributions presented in this topic are **Rocky Linux**, **Fedora**, **Kali Linux**, **Arch Linux** and [Gentoo](#) Live DVD.

Requirements

A newly installed **Ubuntu 22.04** (or any other Linux distribution with the GRUB2 bootloader) is on your system's hard drive.

Step 1: Download Linux Live ISO Files

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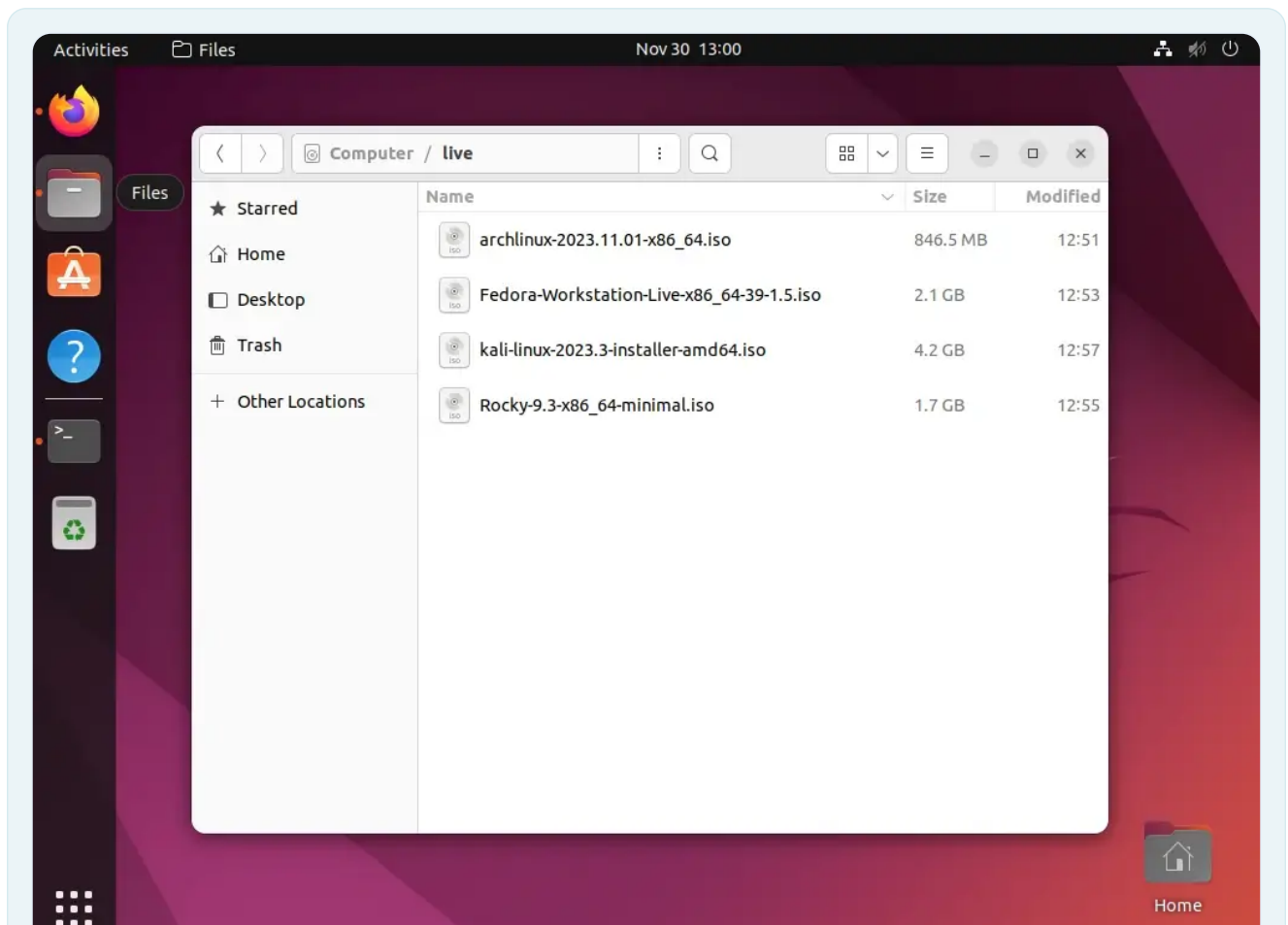
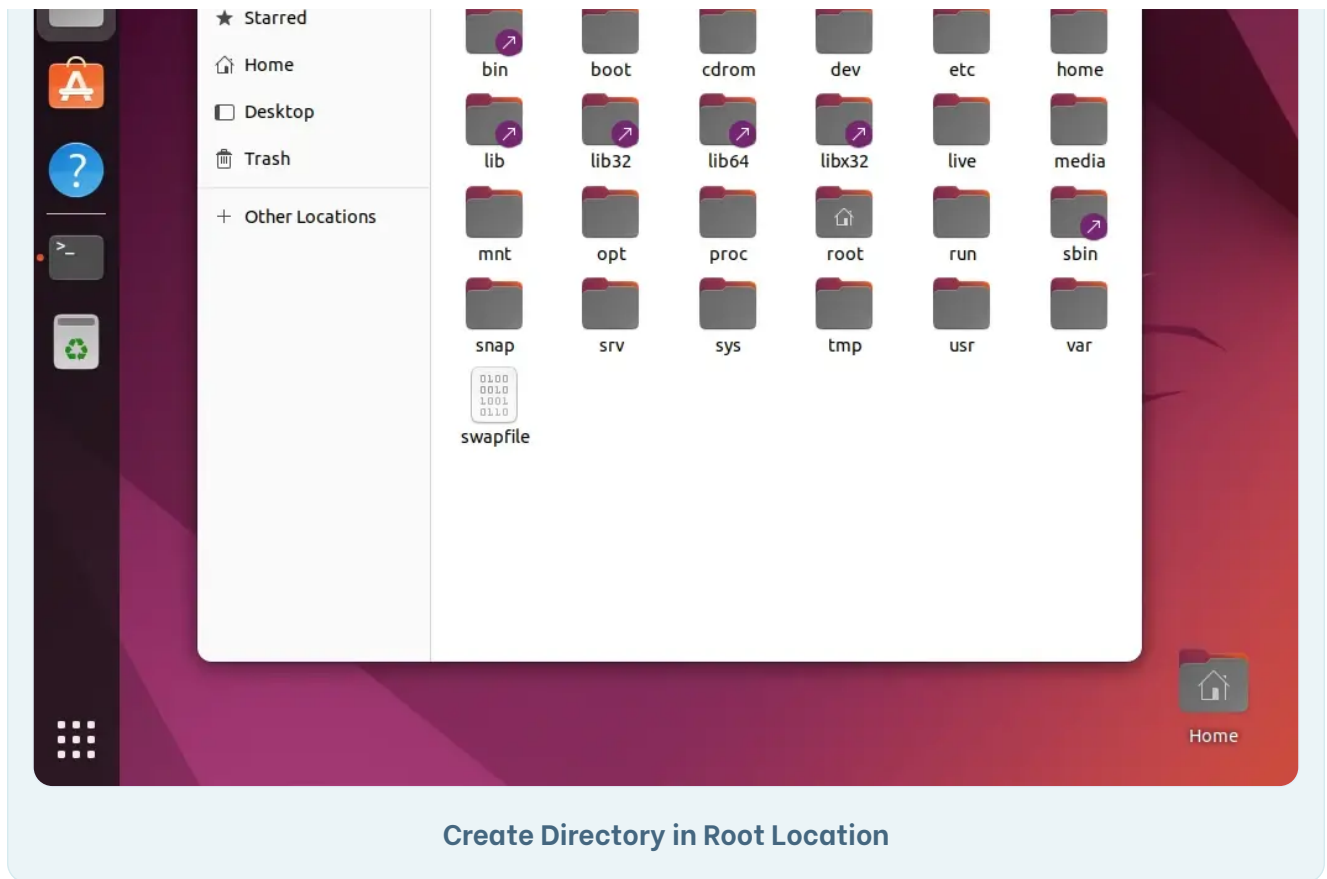
1. To be able to boot and run any Linux distribution without installing them to your hard drive, make sure to download the “**Live CD/DVD**” release of each Linux ISO image.

- [Download Rocky Linux Live ISO Image](#)
- [Download Fedora Live ISO Image](#)
- [Download Kali Linux Live ISO Image](#)
- [Download Arch Linux Live ISO Image](#)
- [Download Gentoo Linux Live ISO Image](#)

Step 2: Add ISO Images to the Directory

2. After you have downloaded your favorite **Linux ISO Live DVD Images**, open **Ubuntu Nautilus** with root privileges using the ‘**sudo nautilus**’ command from the terminal and create a directory called `live` in your system root path and move the ISO file to this folder.

```
$ sudo nautilus
```



Step 3: Find Disk Partition UUID

3. To continue further will need to provide **Grub2** with our disk partition **UUID** – **Universally Unique Identifier** (the partition where ISO files are located).

To get partition **UUID** run the following [blkid command](#).

```
$ sudo blkid
```

For automatically mounted partitions or hard disks on the system boot run the following [cat command](#).

```
$ sudo cat /etc/fstab
```

```
tecmin@Tecmint: ~/Desktop

/dev/sda3: UUID="51567f31-1236-49b4-8c4a-bf8cb84856e0" BLOCK_SIZE="4096" TYPE="ext4" PA
RTUUID="3a88d7de-09e2-4649-9b53-19a54e119db3"
/dev/loop1: TYPE="squashfs"
/dev/loop8: TYPE="squashfs"
/dev/loop6: TYPE="squashfs"
/dev/loop4: TYPE="squashfs"
/dev/loop2: TYPE="squashfs"
/dev/loop0: TYPE="squashfs"
/dev/loop9: TYPE="squashfs"
/dev/loop7: TYPE="squashfs"
/dev/sda2: UUID="537C-EE96" BLOCK_SIZE="512" TYPE="vfat" PARTLABEL="EFI System Partitio
n" PARTUUID="9e67b3d7-cea7-4d6a-ae46-5ae6c4f531d4"
/dev/loop5: TYPE="squashfs"
/dev/loop3: TYPE="squashfs"
/dev/sda1: PARTUUID="fa07050e-178f-4ffd-83bf-bfbdbed29da7"
tecmin@Tecmint:~/Desktop$
tecmin@Tecmint:~/Desktop$ sudo cat /etc/fstab
# /etc/fstab: static file system information.
#
# Use 'blkid' to print the universally unique identifier for a
# device; this may be used with UUID= as a more robust way to name devices
# that works even if disks are added and removed. See fstab(5).
#
# <file system> <mount point> <type> <options> <dump> <pass>
# / was on /dev/sda3 during installation
UUID=51567f31-1236-49b4-8c4a-bf8cb84856e0 / ext4 errors=remount-ro 0
1
# /boot/efi was on /dev/sda2 during installation
UUID=537C-EE96 /boot/efi vfat umask=0077 0 1
/swapfile none swap sw 0
0
tecmin@Tecmint:~/Desktop$
```

Find Linux Partition UUID

4. Another method to get your partition UUID is, to open and visualize `grub.cfg` file content located in `/boot/grub/` path and search for `--fs-uuid` a string (in case you don't have a separated partition for `/boot`).

```
Open ▾ | grub.cfg | Save | /boot/grub

81 }
82 }
83
84 if [ x$feature_default_font_path = xy ] ; then
85     font=unicode
86 else
87     insmod part_gpt
88     insmod ext2
89     set root='hd0,gpt3'
90 if [ x$feature_platform_search_hint = xy ] ; then
91     search --no-floppy --fs-uuid --set=root --hint-bios=hd0,gpt3 --hint-efi=hd0,gpt3 --hint-
    baremetal=ahci0,gpt3 51567f31-1236-49b4-8c4a-bf8cb84856e0
92 else
```

```

100 load_video
101 insmod gfxterm
102 set locale_dir=$prefix/locale
103 set lang=en_IN
104 insmod gettext
105 fi
106 terminal_output gfxterm

```

Plain Text ▾ Tab Width: 8 ▾ Ln 93, Col 79 ▾ INS

Check Partition UUID in the Grub File

Step 4: Add ISO Images to the GRUB2 Menu

5. After you obtain your root partition **UUID** code move to **/etc/grub.d/** directory, open the **40_custom** file for editing and add the following lines at the bottom of this file.

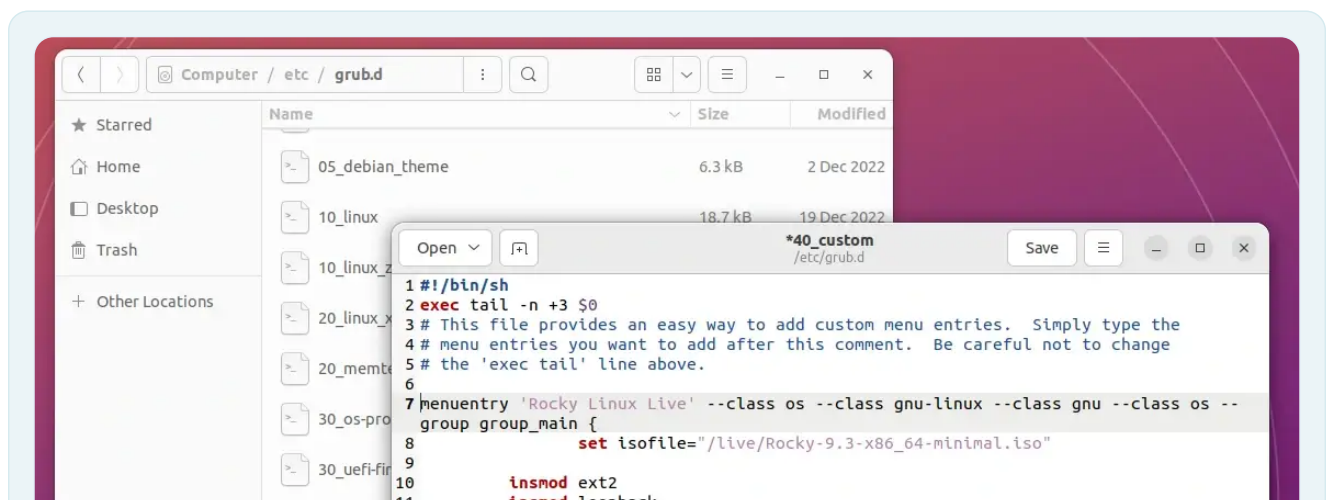
```

menuentry 'Rocky Linux Live' --class os --class gnu-linux --class gnu --class os {
    set isofile="/live/Rocky-9.3-x86_64-minimal.iso"

    insmod ext2
    insmod loopback
    insmod iso9660

    set root=(hd0,3)
    search --no-floppy --fs-uuid --set=root 51567f31-1236-4911-9f82-123456789012
    linux /live/Rocky-9.3-x86_64-minimal/isolinux/vmlinuz noinit
    initrd /live/Rocky-9.3-x86_64-minimal/isolinux/initrd.img
}

```



Add Rocky Linux to the Grub Menu

Here the following directives represent:

- **set isofile** = A variable that holds ISO system path location.
- **(hd0,msdos1)** = First partition from first hard disk (In Linux disks are numbered starting with 0) – the same as **/dev/sda3**.
- **-fs-uuid -set=root 51567f31-1236-49b4-8c4a-bf8cb84856e0** = First partition from first hard disk UUID code.
- **linux and initrd** = Custom kernel booting parameters – they are different depending on every Linux distribution.

6. After you finish editing the file, **update-grub** to add the new ISO (in this case **Rocky Linux**) to your Grub2 menu.

```
$ sudo update-grub
```

```
tecmin@Tecmint:/live$  
tecmin@Tecmint:/live$ sudo update-grub  
Sourcing file `/etc/default/grub'  
Sourcing file `/etc/default/grub.d/init-select.cfg'  
Generating grub configuration file ...  
Found linux image: /boot/vmlinuz-6.2.0-37-generic  
Found initrd image: /boot/initrd.img-6.2.0-37-generic  
Found linux image: /boot/vmlinuz-6.2.0-26-generic  
Found initrd image: /boot/initrd.img-6.2.0-26-generic  
Found memtest86+ image: /boot/memtest86+.elf  
Found memtest86+ image: /boot/memtest86+.bin  
Warning: os-prober will not be executed to detect other bootable partitions.  
Systems on them will not be added to the GRUB boot configuration.  
Check GRUB_DISABLE_OS_PROBER documentation entry.  
done  
tecmin@Tecmint:/live$
```

Update Grub to Add ISO Image



To verify it open **/boot/grub/grub.cfg** and search at the bottom for your ISO entry.

```
### BEGIN /etc/grub.d/35_fwupd ###
### END /etc/grub.d/35_fwupd ###

### BEGIN /etc/grub.d/40_custom ###
# This file provides an easy way to add custom menu entries.  Simply type the
# menu entries you want to add after this comment.  Be careful not to change
# the 'exec tail' line above.

menuentry 'Rocky Linux Live' --class os --class gnu-linux --class gnu --class os --group
p group_main {
    set isofile="/live/Rocky-9.3-x86_64-minimal.iso"

    insmod ext2
    insmod loopback
    insmod iso9660
    loopback loop (hd0,msdos1)$isofile
    search --no-floppy --fs-uuid --set=root 51567f31-1236-49b4-8c4a-bf8cb84
856e0
    linux (loop)/isolinux/vmlinuz boot=live fromiso=/dev/sda3/$isofile noco
nfig=sudo username=root hostname=tecmint
    initrd (loop)/isolinux/initrd.img
}
### END /etc/grub.d/40_custom ###

### BEGIN /etc/grub.d/41_custom ###
if [ -f ${config_directory}/custom.cfg ]; then
    source ${config_directory}/custom.cfg
elif [ -z "${config_directory}" -a -f $prefix/custom.cfg ]; then
    source $prefix/custom.cfg
fi
### END /etc/grub.d/41_custom ###
tecmint@tecmint:/live$
```

Verify Grub Menu Entry

7. To run **Rocky Linux Live ISO**, reboot your computer, select **Rocky Linux** entry from the GRUB menu then press the **Enter** key.

```
GNU GRUB version 2.06

Ubuntu
Advanced options for Ubuntu
Memory test (memtest86+.elf)
Memory test (memtest86+.bin, serial console)
*Rocky Linux Live

Use the ↑ and ↓ keys to select which entry is highlighted.
Press enter to boot the selected OS, 'e' to edit the commands
before booting or 'c' for a command-line.
```

Boot Rocky Linux from Hard Disk

```
[ 0.174000] NetLabel: unlabeled traffic allowed by default
[ 0.174000] clocksource: Switched to clocksource kvm-clock
[ 0.183438] VFS: Disk quotas dquot_6.6.0
[ 0.183438] VFS: Dquot-cache hash table entries: 512 (order 0, 4096 bytes)
[ 0.183438] pnp: PnP ACPI init
[ 0.189084] pnp: PnP ACPI: found 2 devices
[ 0.195246] clocksource: acpi_pm: mask: 0xffffff max_cycles: 0xffffff, max_idle_ns: 2085701024 ns
[ 0.195743] NET: Registered protocol family 2
[ 0.196211] tcp_listen_portaddr_hash hash table entries: 2048 (order: 3, 32768 bytes)
[ 0.196237] TCP established hash table entries: 32768 (order: 6, 262144 bytes)
[ 0.196237] TCP bind hash table entries: 32768 (order: 7, 524288 bytes)
[ 0.196237] TCP: Hash tables configured (established 32768 bind 32768)
[ 0.196237] UDP hash table entries: 2048 (order: 4, 65536 bytes)
[ 0.196237] UDP-Lite hash table entries: 2048 (order: 4, 65536 bytes)
[ 0.196237] NET: Registered protocol family 1
[ 0.196237] NET: Registered protocol family 44
[ 0.196237] pci 0000:00:00.0: Limiting direct PCI/PCI transfers
[ 0.199253] pci 0000:00:01.0: Activating ISA DMA hang workarounds
[ 0.199594] pci 0000:00:02.0: Video device with shadowed ROM at [mem 0x000c0000-0x000dffff]
[ 0.201889] Unpacking initramfs...
```

In the same way, you can add the other **Linux Live ISO** distribution images to the GRUB2 menu as shown. Again open and edit `/etc/grub.d/40_custom` grub file and add the following entries.

For Fedora Live DVD

```
menuentry 'Fedora Live' --class os --class gnu-linux --class gnu --class
    set isofile="/live/Fedora-Workstation-Live-x86_64-39-1.5.

    insmod ext2
    insmod loopback
    insmod iso9660
        loopback loop (hd0,msdos1)$isofile
        search --no-floppy --fs-uuid --set=root 3b87d941-8ee7-43
        linux (loop)/isolinux/vmlinuz boot=live fromiso=/dev/sda
        initrd (loop)/isolinux/initrd.img

}
```

For Kali Linux Live DVD

```
menuentry 'Kali Linux Live' --class os --class gnu-linux --class gnu --c
    set isofile="/live/kali-linux-2023.3-installer-amd64.iso

    insmod ext2
    insmod loopback
    insmod iso9660
        loopback loop (hd0,msdos1)$isofile
        search --no-floppy --fs-uuid --set=root 3b87d941-8ee7-43
        linux (loop)/live/vmlinuz boot=live fromiso=/dev/sda1/$is
        initrd (loop)/live/initrd.img

}
```

```

menuentry 'Gentoo Linux Live' --class os --class gnu-linux --class gnu --
    set isofile="/live/archlinux-2023.11.01-x86_64.iso"

    insmod ext2
    insmod loopback
    insmod iso9660
        loopback loop (hd0,msdos1)$isofile
        search --no-floppy --fs-uuid --set=root 3b87d941-8ee7-43
        linux (loop)/live/vmlinuz boot=live fromiso=/dev/sda1/$is
        initrd (loop)/live/initrd.img
    }

```

8. Then update your GRUB menu again, reboot your computer, and choose your preferred Linux distribution ISO from the GRUB menu.

```
$ sudo update-grub
```

9. If you don't have enough free space on your **root** partition, to host other Linux ISO files you can [add another hard disk](#) and move all your Linux distribution ISO files there. After you create a partition and add a file system mount it on the **/mnt** path to make it available.

```
$ sudo mount /dev/sdb1 /mnt
```

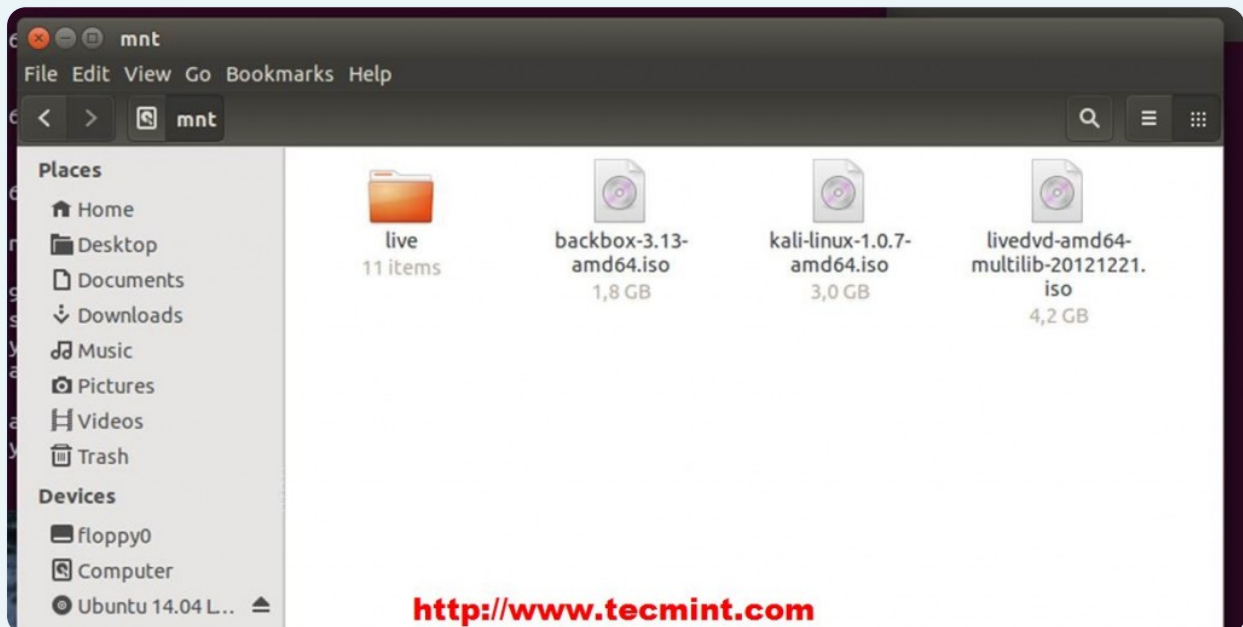
10. Then move all ISO on the new hard disk and grab its UUID using the **blkid** command.

```
$ sudo blkid
```

```
/dev/sda6: UUID="9481b298-6ed2-4fc9-9355-5f3ac0e7da80" TYPE="swap"  
/dev/sdb1: UUID="4ae0d3c8-ec8a-4a10-aa35-dd7ee640cc33" TYPE="ext4"  
/dev/sr0: LABEL="Ubuntu 14.04 LTS amd64" TYPE="iso9660"  
caezsar@ubuntu-desktop:~$
```

<http://www.tecmint.com>

Move ISO Images and Verify UUID



Verify All ISO Images

11. Again open and edit `/etc/grub.d/40_custom` grub file and add other Linux Live ISO distribution images to the **GRUB2** menu using the same procedure but pay attention to every distribution Live Kernel booting parameters which can be inspected by mounting the ISO image using **mount -o loop** option or consult distribution Wiki pages.