How to encrypt a USB Drive on Linux Operating System?

How to encrypt a USB Drive and mount it to the filesystem on Linux Ubuntu OS?

Published by Amritpal Singh on March 24, 2018 with 3 Comment

Categories: Tutorials

In this tutorial, you will learn to encrypt an external USB Drive and how you can mount it on your filesystem. In summary, you will setup a blank USB Drive to be an encrypted drive and you will learn to map it on your system and perform writing and reading files operations on the USB. We will be using LUKS (Linux Unified Key Setup) which is the default encryption mode on cryptsetup package. LUKS is the standard for Linux hard disk encryption.

Why encrypt your data?

Mainly encryption is used to keep secrecy and privacy.

1. Use the fdisk command to find the device name for your USB Drive:

```
sudo fdisk -l
```

The above command lists all partition tables for the specified devices connected on your system. In my case I connected an external 8GB USB Drive on my computer and it showed up as device name /dev/sdb.

2. OPTIONAL: Use the shred command to overwrite random data by 1s and 0s several times on the USB Drive:

```
sudo shred -v -n 1 /dev/sdb
```

This way you start off having random data on your USB Drive to begin with.

3. Install cryptsetup package on your system:

```
sudo apt-get install cryptsetup
```

You may already have it installed by default on your Ubuntu OS.

4. Set up a new dm-crypt device in LUKS encryption mode:

```
sudo cryptsetup luksFormat /dev/sdb
```

You will need you enter the passphrase for your encrypted usb.

5. Open the device and setup mapping with name provided (e.g. USBDrive in this example):

```
sudo cryptsetup luksOpen /dev/sdb USBDrive
```

Provide the passphrase you had earlier setup in step 4.

6. Verify the new virtual block device mapper:

```
ls -arlt /dev/mapper | tail
```

7. Run ext4 filesystem directly on that device:

```
sudo mkfs -t ext4 /dev/mapper/USBDrive
```

8. Mount the device your filesystem:

```
sudo mount /dev/mapper/USBDrive /USBDrive
```

9. Verify the the mapper is properly mounted using the df command:

```
df -h /USBDrive/
```

Suggestions

What to consider before securely deploying your web application on a linux server?

List of Top Linux Magazines

Intel Compute Stick USB 3.0 Gigabit Ethernet Adapter Setup

How to find version all of the packages installed in node_modules directory?

Docker Container Networking - Exposing Ports

Linux Commands

Cat Traceroute Date

Services

Linux Commands

Have a question? Contact Us

About

10. Success, at this point you can use the filesystem as you normally would, you have an encrypted USB Drive in your hand now.

Additional Notes:

Use the following two commands on every reboot to mount and unmount a drive:

Mounting:

```
sudo cryptsetup luksOpen /dev/sdb USBDrive
```

Provide your pass phrase:

```
sudo mount /dev/mapper/USBDrive /USBDrive
```

Unmounting:

```
sudo umount /USBDrive
sudo cryptsetup luksClose USBDrive
```

Resources:

1. http://www.markus-gattol.name/ws/dm-crypt_luks.html

Share it!

3 Responses

Name

Required

Email

Required

Response

Comment must be at least 5 characters and at most 250 characters!

Write Response

Raphaël

April 29, 2021

Thanks for the post, just a few remarks : For step 1, it is also possible to have a look at kernel logs right after plugging the device (or use "dmesg -w" then you plug the device in) For step 2, also possible with dd if=/dev/urandom of=/dev/sda bs=4K status=progress (although a bit longer) Before step 3 it might be worth having a look at the partition table (e.g. with fdisk /dev/sda) as there is no point in keeping a FAT32 primary partition for a USB key that you will not be able to open on Windows anyway (some websites even advise using NTFS formatting for GNU/Linux which does not make any more sense in my opinion)

ewalt

July 20, 2020

Scott, it doesn't look like '/USBDrive' exits on your root filesystem. Try 'sudo mkdir /USBDrive && chown <NONROOT_USER> /USBDrive' might fix your problem. Of course replace '<NONROOT_USER>' with the account name used to login on boot.

Scott

June 11, 2020

Thanks for the post, I'm a newbie and wanted to create an encrypted usb for some files. I followed the above and once I get to: sudo cryptsetup luksOpen /dev/sdb USBDrive Provide your pass phrase: sudo mount /dev/mapper/USBDrive /USBDrive I get; mount: /USBDrive: mount point does not exist. and; can't find in /etc/fstab I tried creating a mountpoint /media but no luck.