

# ???????-Encrypt

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[illegible]

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- GPG ?????
  - [Linux: HowTo Encrypt And Decrypt Files With A Password](#)
  - [How to easily encrypt a file with GPG on Linux](#)

- [Encrypting and decrypting files with password in Linux](#)
- [????](#)
- [Linux: HowTo Encrypt And Decrypt Files With A Password](#)
- [7 Tools to Encrypt/Decrypt and Password Protect Files in Linux](#)
- LUKS
- [Implementing corporate laptop encryption using LUKS](#)
- [How to unlock LUKS using Dropbear SSH keys remotely in Linux - nixCraft \(cyberciti.biz\)](#)

# ???????? - Cryptsetup

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??????? USB????????????????????????????????

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```
sudo apt install cryptsetup
```

???????????????????? /dev/sdb??? GParted ????????? /dev/sdb1????  
ext4??

```
sudo cryptsetup --verbose --verify-passphrase luksFormat /dev/sdb1
```

“ ?????????????? ?? YES?  
????????????

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- ?????????????????????
- ?????????????????????? /dev/mapper/<input-name>

```
sudo cryptsetup luksOpen /dev/sdb1 sdb1  
sudo fdisk -l  
sudo mkfs.ext4 /dev/mapper/sdb1  
sudo tune2fs -m 0 /dev/mapper/sdb1
```

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```
sudo e2label /dev/mapper/sdb1 MyCCWallet
```

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```
sudo mkdir /mnt/encrypted
sudo mount /dev/mapper/sdb1 /mnt/encrypted
sudo touch /mnt/encrypted/test.txt
```

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```
sudo umount /dev/mapper/sdb1
sudo cryptsetup luksClose sdb1
```

## Linux Mint ????

???????????????? Linux Mint ???

[ask\\_password.png](#) ask for password before opening

## Optional: ????

How to find and verify which Luks slot a passphrase is in on Linux

```
# Do not activate device, just check
sudo cryptsetup --verbose open --test-passphrase /dev/vda3

Enter passphrase for /dev/vda3:
Key slot 0 unlocked.
Command successful.
```

## Learning Cryptsetup

- [How to change LUKS disk encryption passphrase in Linux](#)
- [Create an encrypted file vault on Linux](#)

# Learning

## GPG

- [Using GPG to Encrypt and Decrypt Files on Linux \[Hands-on for Beginners\]](#)

## LUKS

- [How to unlock LUKS using Dropbear SSH keys remotely in Linux - nixCraft \(cyberciti.biz\)](#)
- [Linux Hard Disk Encryption With LUKS \[cryptsetup command \] - nixCraft \(cyberciti.biz\)](#)

# OpenSSL

Create Example Reference File, let us create a 1GB large text file using the fallocation command:

```
fallocate -l 1024M test.txt  
echo "LinuxShellTips tutorial on encrypting a large file with OpenSSL in Linux" >> test.txt  
cat test.txt
```

## Encrypt File with Password (?????)

```
openssl enc -aes-256-cbc -pbkdf2 -p -in test.txt -out test.txt.enc
```

- enc executes the symmetric key encryption process.
- -aes-256-cbc specifies the use of 256 bits cryptographic key.
- -pbkdf2 is the default algorithm being used.
- -p prints used salt, key, and IV.
- -in points to the input file.
- -out points to the output file.

To decrypt the file, run:

```
openssl aes-256-cbc -d -pbkdf2 -in test.txt.enc -out sample_decrypted.txt
```

“ You will be required to enter the encryption password you generated earlier.

## Encrypt File with Key (?????)

```
# generate a key file  
openssl rand 256 > symmetric_keyfile.key  
# use the keyfile to encrypt our file  
openssl enc -in test.txt -out test.txt.enc -e -aes-256-cbc -pbkdf2 -k symmetric_keyfile.key
```

To decrypt the file, run:

```
openssl enc -in test.txt.enc -out draft_decrypted.txt -d -aes-256-cbc -pbkdf2 -k symmetric_keyfile.key
```



# ?????? (Asymmetric Encryption)

?????????????????????????????: data too large for key size.

```
dnyce@LinuxShellTips:~/LinuxShellTips_Files$ openssl rsautl -encrypt -inkey my_public_key.pem -pubin -in symmetric_keyfile.key -out symmetric_keyfile.key.enc
RSA operation error
140330343245120:error:0406D06E:rsa routines:RSA_padding_add_PKCS1_type_2:data too large for key size:../crypto/rsa/rsa_pk1.c:124:
dnyce@LinuxShellTips:~/LinuxShellTips_Files$ ls -l symmetric_keyfile.key
-rw-rw-r-- 1 dnyce dnyce 256 Cam  5 14:18 symmetric_keyfile.key
dnyce@LinuxShellTips:~/LinuxShellTips_Files$ openssl rsautl -encrypt -inkey my_public_key.pem -pubin -in test.txt -out test.txt.enc
RSA operation error
140589405889856:error:0406D06E:rsa routines:RSA_padding_add_PKCS1_type_2:data too large for key size:../crypto/rsa/rsa_pk1.c:124:
dnyce@LinuxShellTips:~/LinuxShellTips_Files$
```

“ TIP:  
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## Hashing

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```
# For file
openssl dgst -sha256 my.file

# For string
echo -n "HelloWorld" | openssl dgst -sha256
```

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- [OpenSSL ??????????????????????](#)