

# Encrypting and Decrypting Files with Public Key Infrastructure (3e)

Access Control and Identity Management, Third Edition - Lab 07

Student:

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Email:

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Time on Task:

3 hours, 54 minutes

Progress:

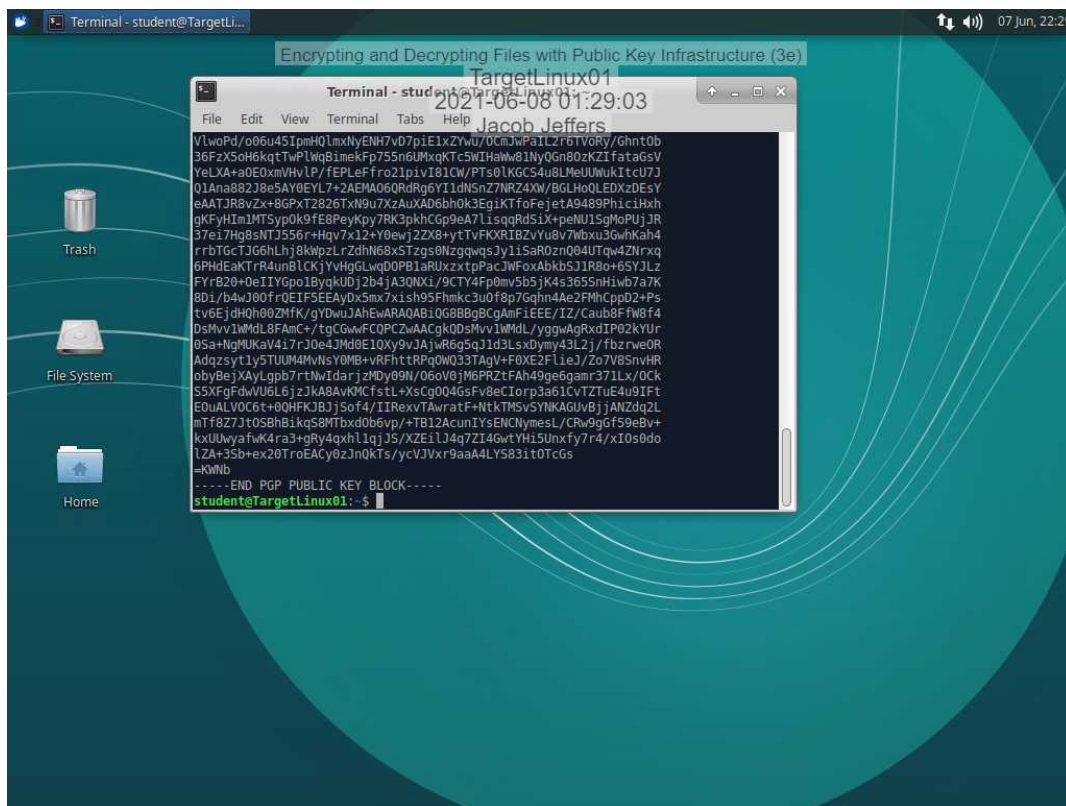
100%

Report Generated: Tuesday, June 8, 2021 at 2:35 AM

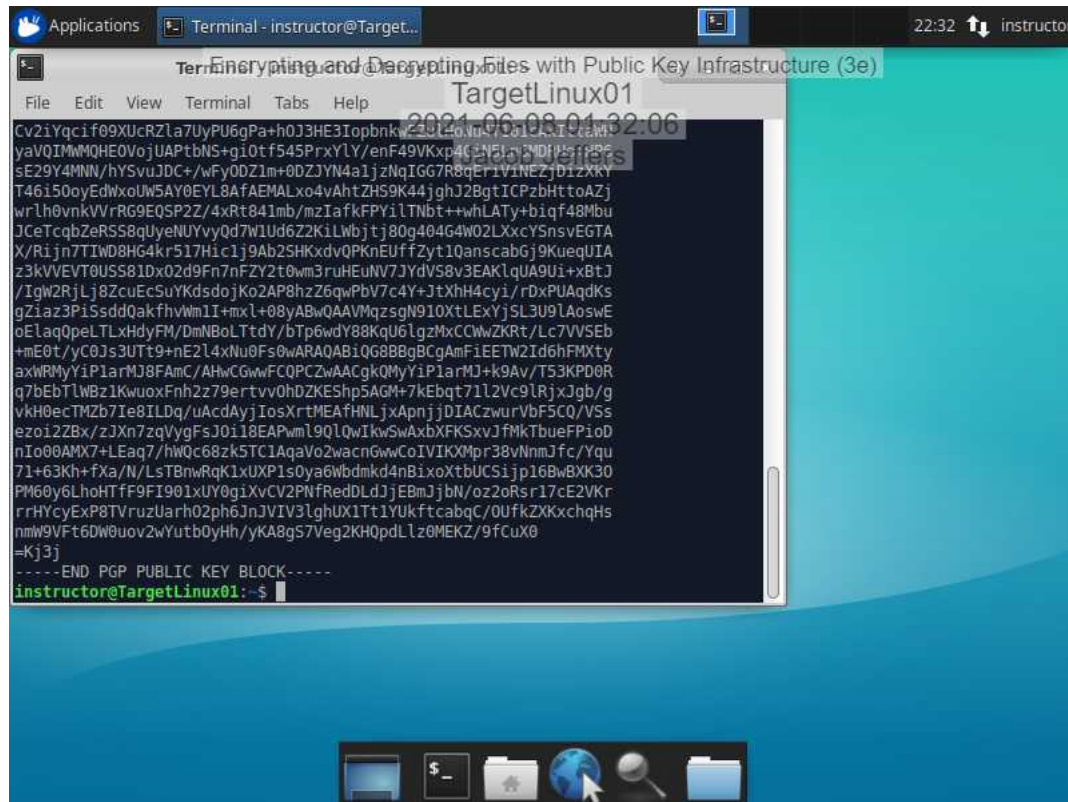
## Section 1: Hands-On Demonstration

### Part 1: Create Encryption Keys

11. Make a screen capture showing Nancy's public key.

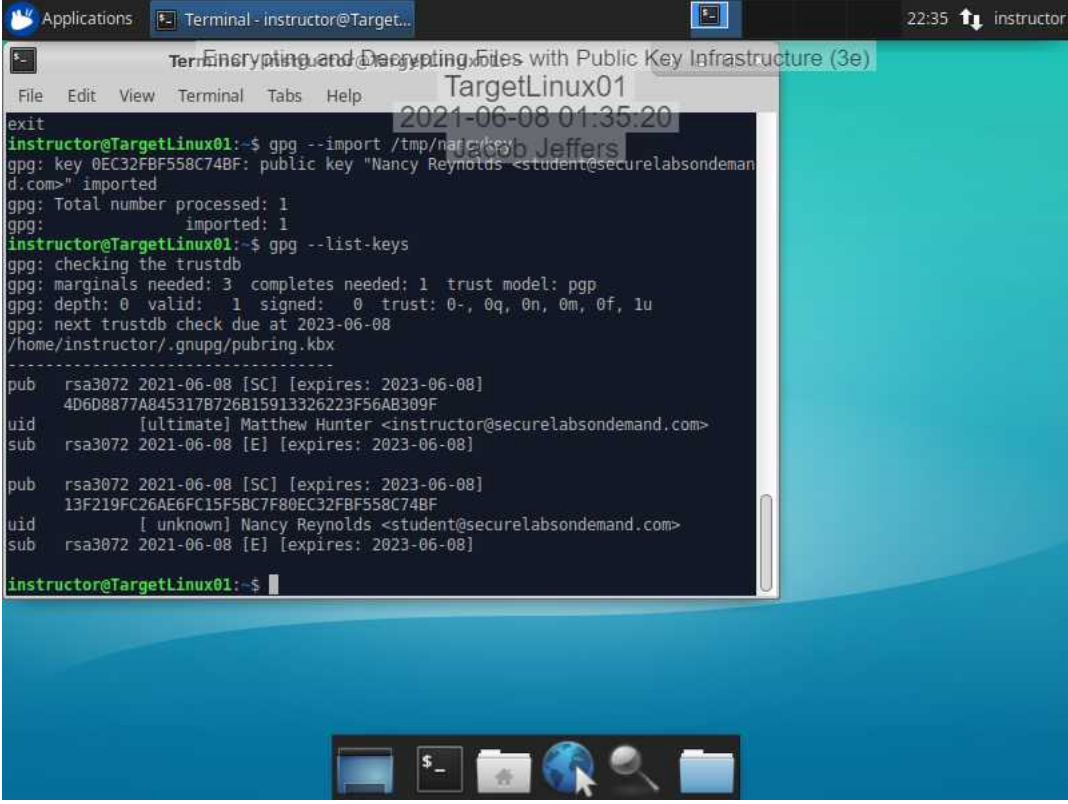


### 21. Make a screen capture showing Matthew's public key.



## Part 2: Encrypt a File

12. Make a screen capture showing the output of the `--list-keys` command.



The screenshot shows a terminal window titled "Terminal - instructor@TargetLinux01" with a menu bar (File, Edit, View, Terminal, Tabs, Help). The terminal output is as follows:

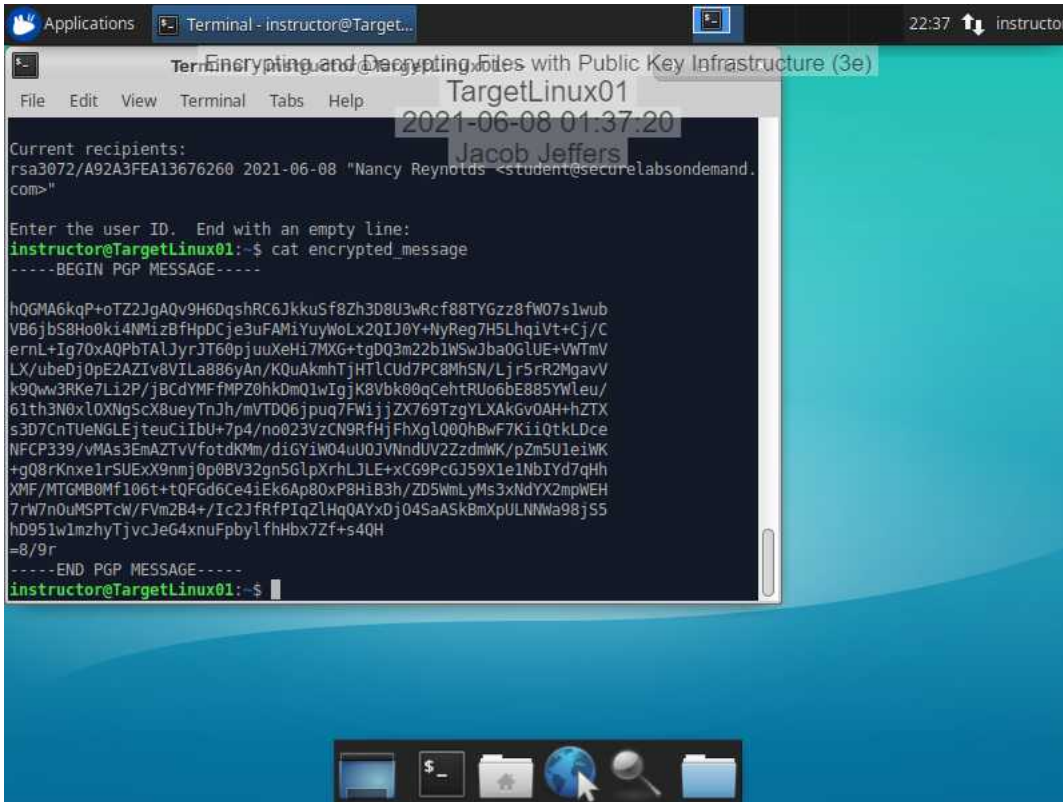
```
exit
instructor@TargetLinux01:~$ gpg --import /tmp/nat...
gpg: key 0EC32FBF558C74BF: public key "Nancy Reynolds <student@securelabsondemand.com>" imported
gpg: Total number processed: 1
gpg:      imported: 1
instructor@TargetLinux01:~$ gpg --list-keys
gpg: checking the trustdb
gpg: marginals needed: 3  completes needed: 1  trust model: pgp
gpg: depth: 0  valid: 1  signed: 0  trust: 0-, 0q, 0n, 0m, 0f, 1u
gpg: next trustdb check due at 2023-06-08
/home/instructor/.gnupg/pubring.kbx
-----
pub   rsa3072 2021-06-08 [SC] [expires: 2023-06-08]
      4D6D8877A845317B726B15913326223F56AB309F
uid           [ultimate] Matthew Hunter <instructor@securelabsondemand.com>
sub   rsa3072 2021-06-08 [E] [expires: 2023-06-08]

pub   rsa3072 2021-06-08 [SC] [expires: 2023-06-08]
      13F219FC26AE6FC15F58C7F80EC32FBF558C74BF
uid           [ unknown] Nancy Reynolds <student@securelabsondemand.com>
sub   rsa3072 2021-06-08 [E] [expires: 2023-06-08]

instructor@TargetLinux01:~$
```

The terminal window is overlaid on a desktop background with a blue gradient. A taskbar at the bottom contains icons for a terminal, file manager, and other applications. The system clock in the top right corner shows 22:35.

18. Make a screen capture showing the **encrypted message**.

A screenshot of a Linux desktop environment. The top panel shows the 'Applications' menu, a terminal window titled 'Terminal - instructor@Target...', and a clock showing '22:37' and the user 'instructor'. The terminal window is open, displaying a PGP message. The message header includes 'Current recipients: rsa3072/A92A3FEA13676260 2021-06-08 "Nancy Reynolds <student@securelabsondemand.com>"', '2021-06-08 01:37:20', and 'Jacob Jeffers'. The body of the message is a long block of base64-encoded text. The terminal prompt is 'instructor@TargetLinux01:~\$'.

```
Applications  Terminal - instructor@Target...  22:37  instructor

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TargetLinux01
2021-06-08 01:37:20
Jacob Jeffers

Current recipients:
rsa3072/A92A3FEA13676260 2021-06-08 "Nancy Reynolds <student@securelabsondemand.com>"

Enter the user ID. End with an empty line:
instructor@TargetLinux01:~$ cat encrypted_message
-----BEGIN PGP MESSAGE-----

h0GMA6kqP+oTZ2JgA0v9H6DqshRC6JkkuSf8Zh3D8U3wRcf88TYGzz8fw07s1wub
VB6jbS8Ho0ki4NMiz8BfHpDCje3uFAMiYuyWoLx2QIj0Y+NyReg7H5Lhq1Vt+Cj/C
ernL+Ig70xAQpBtAlJyrJT60pjuuXeHi7MXG+tgDQ3m22b1WSw3ba0G1UE+VWtmV
LX/ubeDjQpE2AZiv8VILa886yAn/KQuAknhTjHTLCud7PC8MhSN/Ljr5rR2MgavV
k9Qww3RKe7Li2P/jBCdYMFfMPZ0hkdMq1wIgjK8Vbk80qCehtRUo6bE885Ywleu/
61th3N0xLOXNg5cX8ueyTnJh/mVTDQ6jpuq7FWijjZX769TzgYLAkGv0AH+hZTX
s3D7CnTUEnglejteuCiIbU+7p4/no023VzCN9RfHjFhXglQ00hBwF7KiiQtkLDce
NFCP339/vMA53EmAZTvVfotdKMm/diGYiW04uU0JVNndUV2ZzdmWK/pZm5U1eiWK
+gQ8rKnxe1rSUEX9nmj0p0BV32gn5GlpXrhLJLE+xCg9PcG359X1e1NbIYd7qHh
XMF/MTGMB0Mf106t+tQFGd6Ce4iEk6Ap80xP8HiB3h/ZD5WmLyMs3xNdYX2mpWEH
7rW7n0uMSPTcW/FVm2B4+/Ic2JfRfPIqZLHqQAYxDj04SaAskBmXpULNNWa98jS5
hD951w1mzhyTjvcJeG4xnuFpbylfhHbx7Zf+s4QH
=8/9r
-----END PGP MESSAGE-----
instructor@TargetLinux01:~$
```

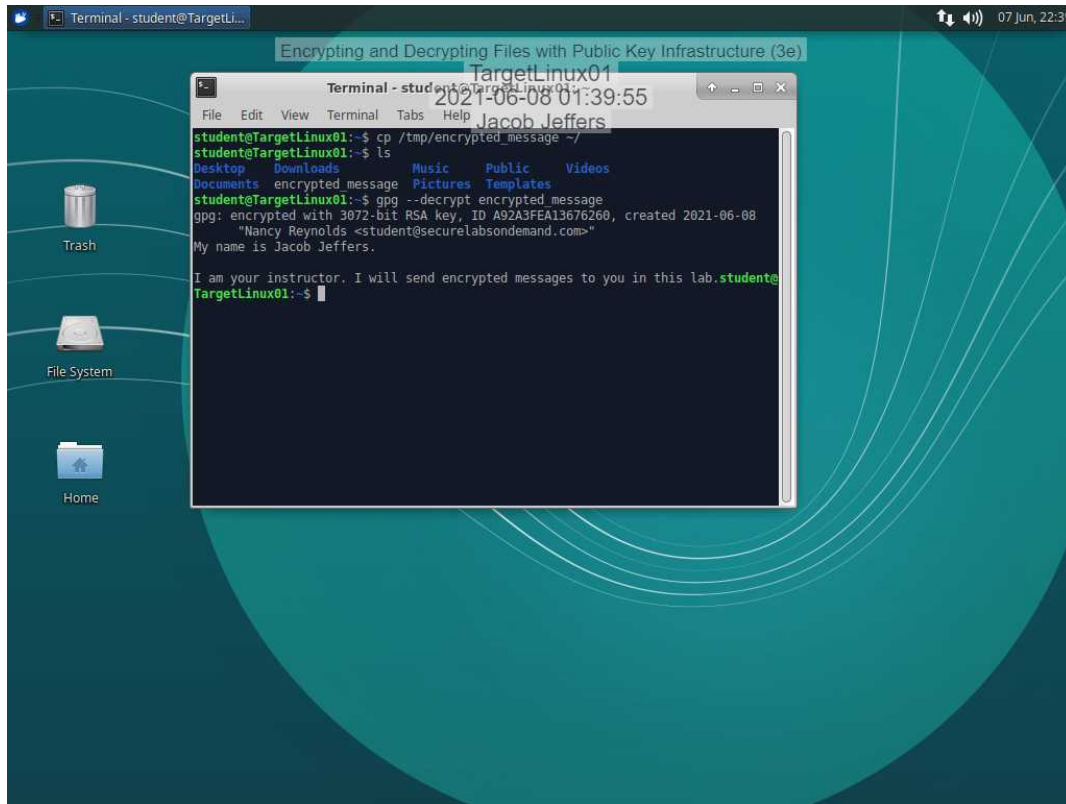
### Part 3: Decrypt a File

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## 3. Make a screen capture showing the **decrypted** message.



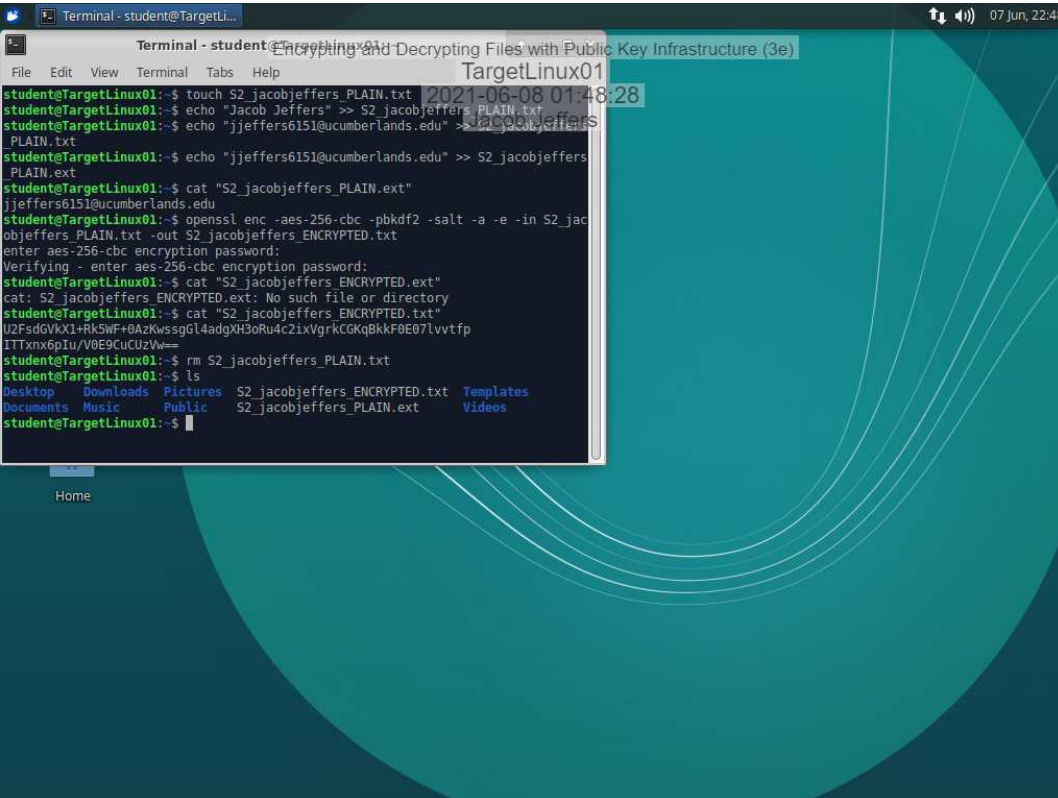
## Section 2: Applied Learning

### Part 1: Encrypt a File with Symmetric Encryption

10. In the Lab Report file, **document** the password you used to encrypt the file.

jackets

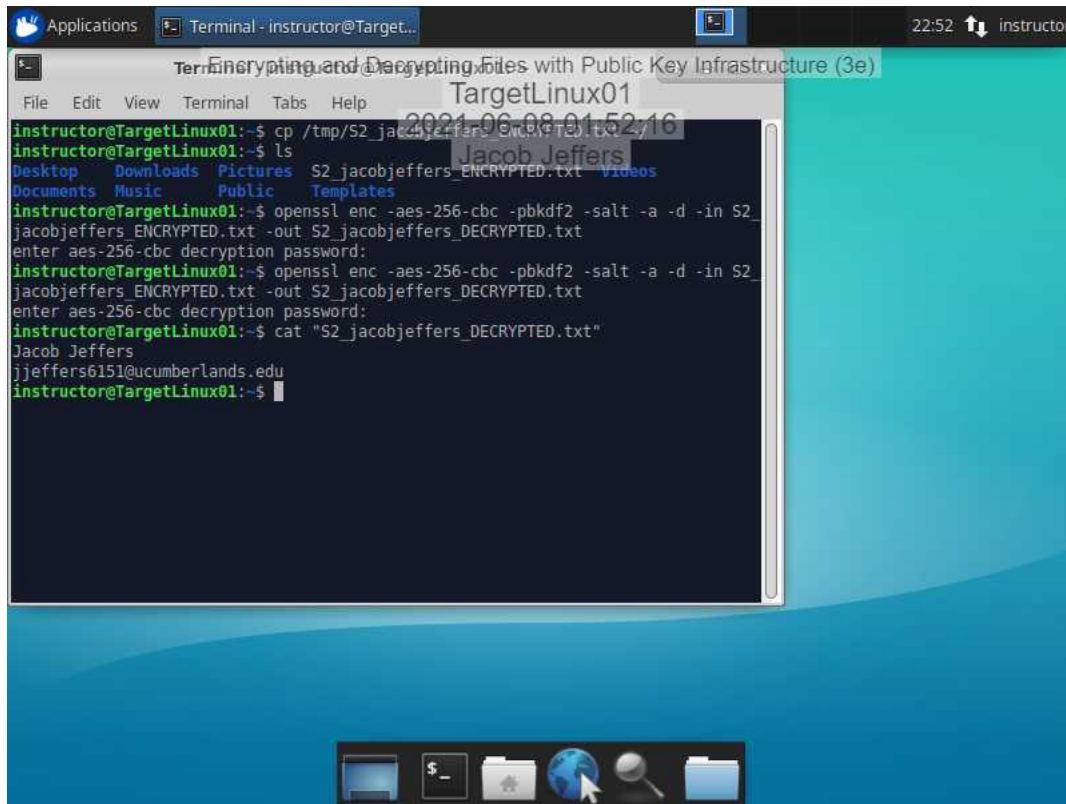
14. **Make a screen capture** showing the **output of the ls command**.



```
student@TargetLinux01:~$ touch S2_jacobjeffers_PLAIN.txt
student@TargetLinux01:~$ echo "Jacob Jeffers" >> S2_jacobjeffers_PLAIN.txt
student@TargetLinux01:~$ echo "jjeffers6151@cumberlands.edu" >> S2_jacobjeffers_PLAIN.txt
student@TargetLinux01:~$ cat S2_jacobjeffers_PLAIN.txt
Jacob Jeffers
jjeffers6151@cumberlands.edu
student@TargetLinux01:~$ openssl enc -aes-256-cbc -pbkdf2 -salt -a -e -in S2_jacobjeffers_PLAIN.txt -out S2_jacobjeffers_ENCRYPTED.txt
enter aes-256-cbc encryption password:
Verifying - enter aes-256-cbc encryption password:
student@TargetLinux01:~$ cat "S2_jacobjeffers_ENCRYPTED.txt"
cat: S2_jacobjeffers_ENCRYPTED.txt: No such file or directory
student@TargetLinux01:~$ cat "S2_jacobjeffers_ENCRYPTED.txt"
U2FsdGVkX1+RK5WF+0AzKwssgG14adgXH3oRu4c2ixVgrkCGKqBkKF0E07lvvtfp
ITTxnx6piu/V0E9CuCUzVw==
student@TargetLinux01:~$ rm S2_jacobjeffers_PLAIN.txt
student@TargetLinux01:~$ ls
Desktop  Downloads  Pictures  S2_jacobjeffers_ENCRYPTED.txt  Templates
Documents  Music      Public    S2_jacobjeffers_PLAIN.txt      Videos
```

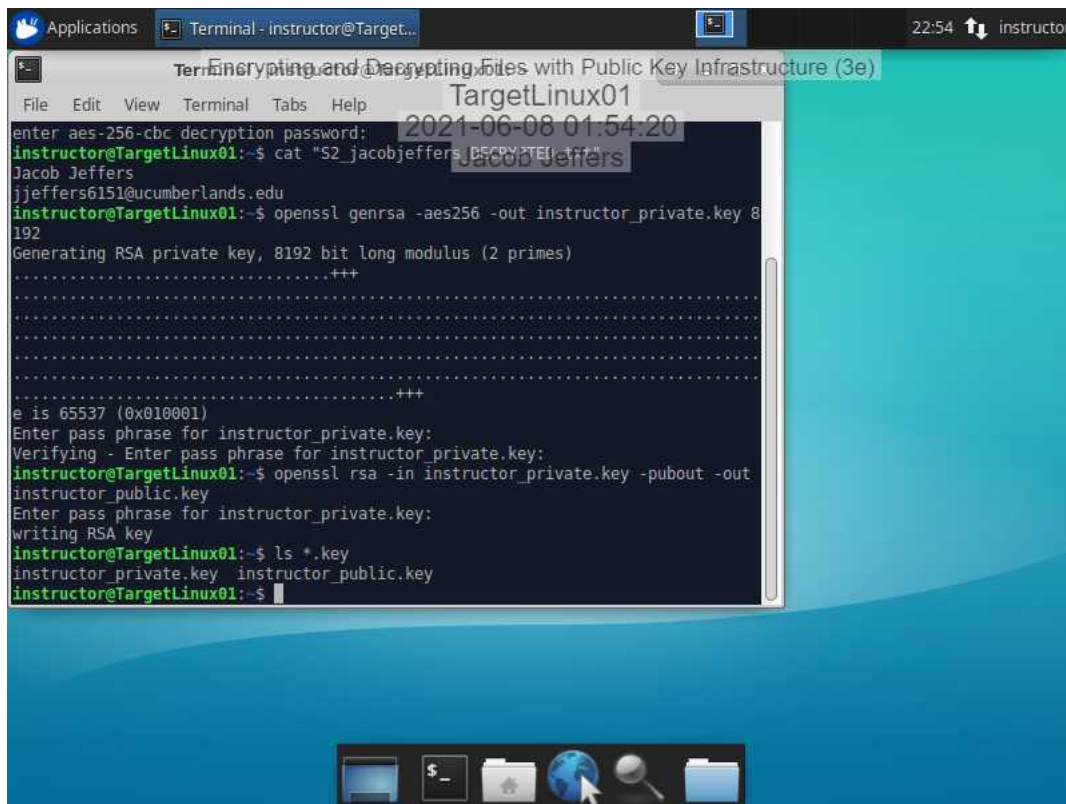


25. Make a screen capture showing the contents of the decrypted file.



## Part 2: Encrypt a File with Asymmetric Encryption

### 7. Make a screen capture showing the instructor's key pair files.





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20. **Make a screen capture** showing the encrypted contents of the **S2\_yourname\_newfile\_ENCRYPTED.txt** file.

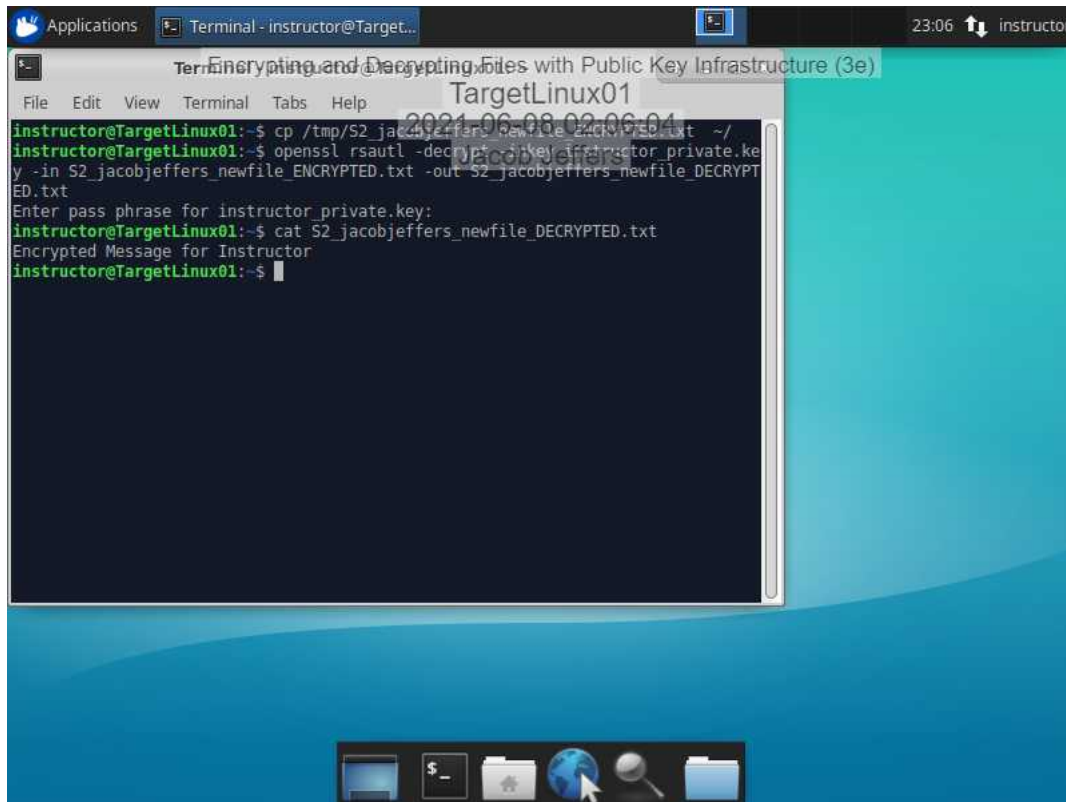
A screenshot of a terminal window titled "Terminal - student@TargetLinux01". The terminal shows a series of commands and their outputs. The first command is `cat "S2_jacobjefers.newfile.txt"`, which outputs "2021-06-08 02:01:27" and "Jacob, Jeffers". The second command is `openssl rsautl -encrypt -pubin -inkey s2jacobjefers.pem -in S2_jacobjefers.newfile.txt -out S2_jacobjefers.newfile.encrypted.txt`. The third command is `cat "S2_jacobjefers.newfile.encrypted.txt"`, which outputs a large block of hexadecimal data representing the encrypted file. The terminal window has a dark background with a teal-colored sidebar on the left containing a "Home" button. The top of the terminal window shows the title bar and a menu bar with options like "File", "Edit", "View", "Terminal", "Tabs", and "Help".

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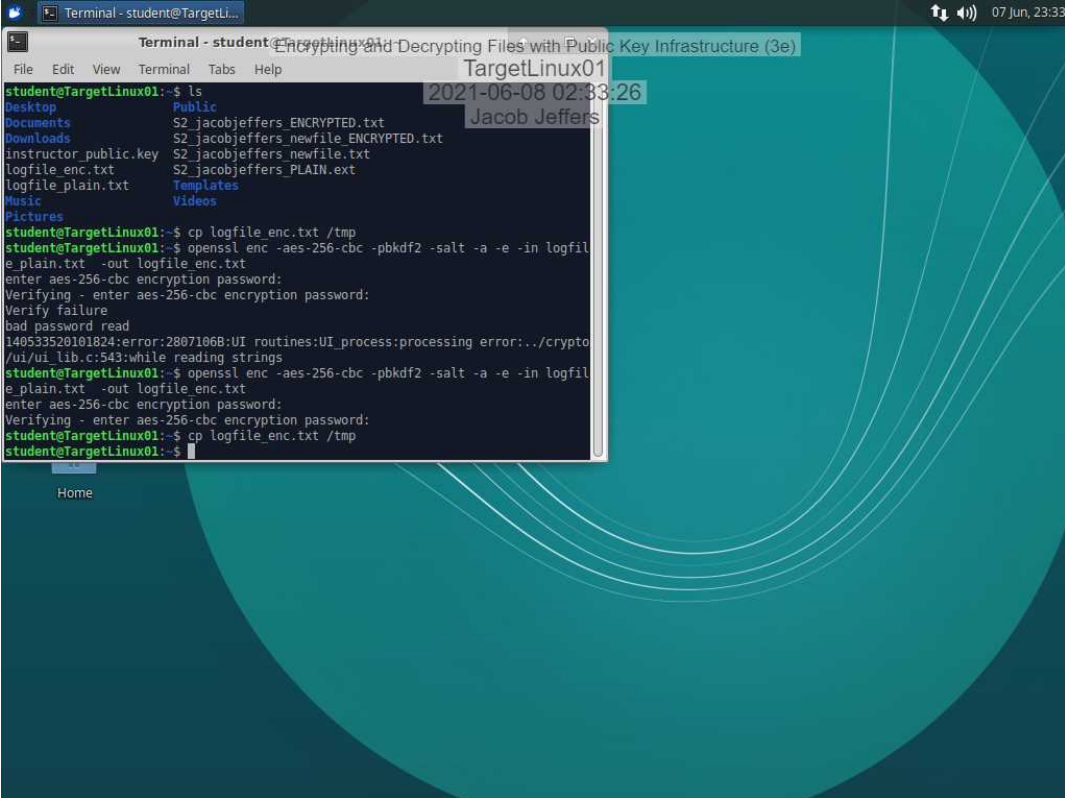
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30. **Make a screen capture** showing the **decrypted contents** of the **S2\_yourname\_newfile\_DECRYPTED.txt** file.



### Section 3: Challenge and Analysis

Make a screen capture showing the commands used to encrypt and copy the file.



The screenshot shows a terminal window titled "Terminal - student@TargetLinux01" with a menu bar (File, Edit, View, Terminal, Tabs, Help). The terminal output is as follows:

```
student@TargetLinux01:~$ ls
Desktop      Public
Documents    S2_jacobjeffers_ENCRYPTED.txt
Downloads    S2_jacobjeffers_newfile_ENCRYPTED.txt
instructor_public.key  S2_jacobjeffers_newfile.txt
logfile_enc.txt  S2_jacobjeffers_PLAIN.txt
logfile_plain.txt  Templates
Music          Videos
Pictures

student@TargetLinux01:~$ cp logfile_enc.txt /tmp
student@TargetLinux01:~$ openssl enc -aes-256-cbc -pbkdf2 -salt -a -e -in logfile_enc.txt -out logfile_enc.txt
enter aes-256-cbc encryption password:
Verifying - enter aes-256-cbc encryption password:
Verify failure
bad password read
149533520101824:error:28071068:UI routines:UI_process:processing error:../crypto/ui/ui_lib.c:543:while reading strings
student@TargetLinux01:~$ openssl enc -aes-256-cbc -pbkdf2 -salt -a -e -in logfile_enc.txt -out logfile_enc.txt
enter aes-256-cbc encryption password:
Verifying - enter aes-256-cbc encryption password:
student@TargetLinux01:~$ cp logfile_enc.txt /tmp
student@TargetLinux01:~$
```

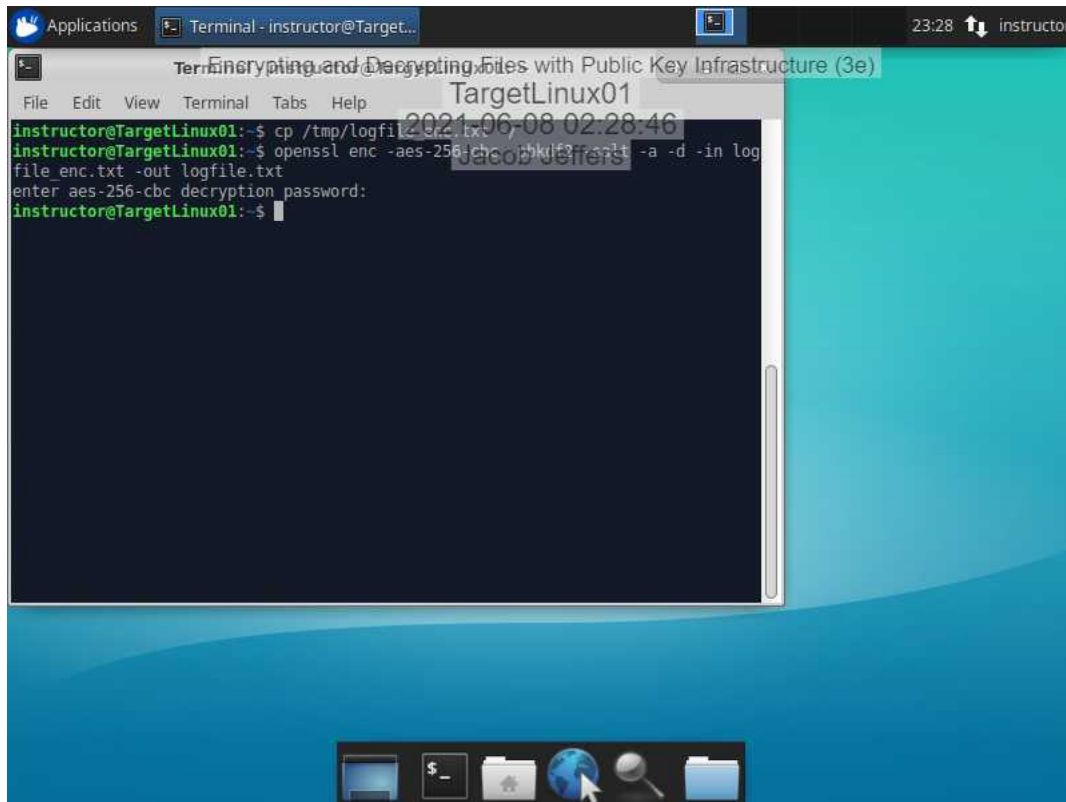
Overlaid on the terminal are three semi-transparent boxes containing the text: "TargetLinux01", "2021-06-08 02:33:26", and "Jacob Jeffers". The desktop background is a teal abstract design. A "Home" button is visible at the bottom left of the terminal window.

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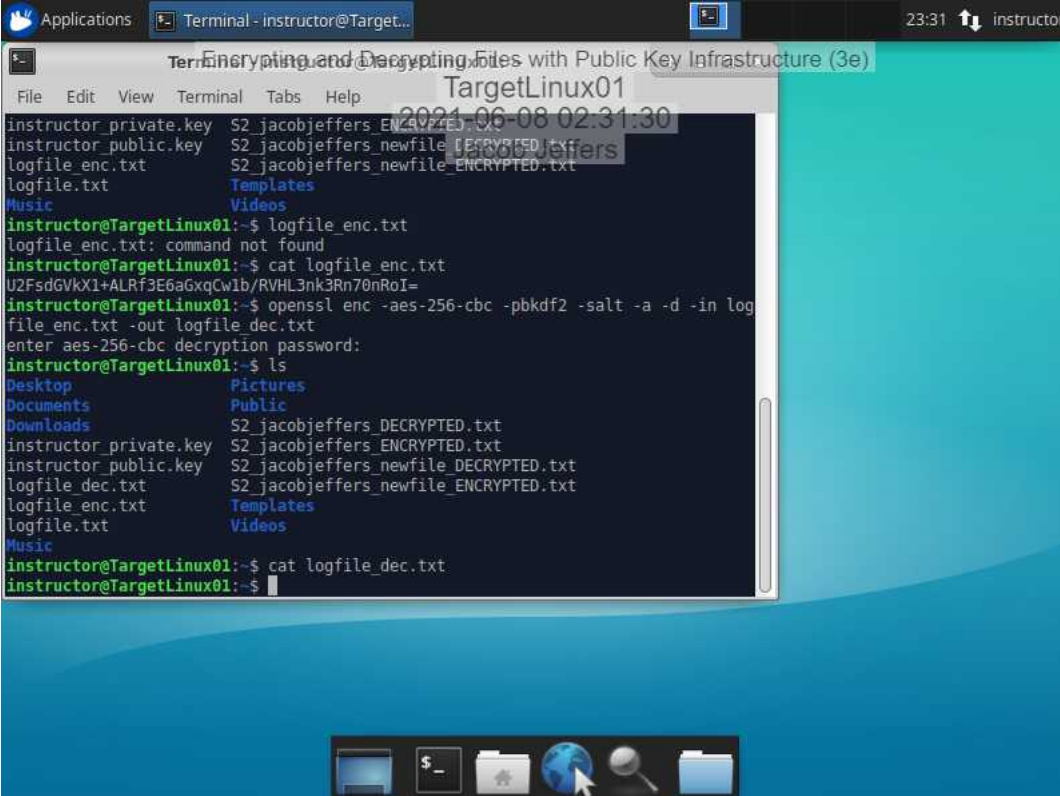
**Make a screen capture** showing the **commands** used to copy and decrypt the file.



## Encrypting and Decrypting Files with Public Key Infrastructure (3e)

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Make a screen capture showing the **decrypted file contents**.



The screenshot shows a Linux desktop environment with a terminal window open. The terminal title is "Terminal - instructor@Target...". The terminal output shows the following commands and results:

```
instructor.private.key S2_jacobjeffers_ENCRYPTED.txt
instructor_public.key S2_jacobjeffers_newfile_ENCRYPTED.txt
logfile_enc.txt S2_jacobjeffers_newfile_ENCRYPTED.txt
logfile.txt Templates
Music Videos
instructor@TargetLinux01:~$ logfile_enc.txt
logfile_enc.txt: command not found
instructor@TargetLinux01:~$ cat logfile_enc.txt
U2FsdGVkX1+ALRf3E6aGxqCw1b/RVHL3nk3Rn70nRoI=
instructor@TargetLinux01:~$ openssl enc -aes-256-cbc -pbkdf2 -salt -a -d -in log
file enc.txt -out logfile_dec.txt
enter aes-256-cbc decryption password:
instructor@TargetLinux01:~$ ls
Desktop Pictures
Documents Public
Downloads S2_jacobjeffers_DECRYPTED.txt
instructor.private.key S2_jacobjeffers_ENCRYPTED.txt
instructor_public.key S2_jacobjeffers_newfile_DECRYPTED.txt
logfile_dec.txt S2_jacobjeffers_newfile_ENCRYPTED.txt
logfile_enc.txt Templates
logfile.txt Videos
Music
instructor@TargetLinux01:~$ cat logfile_dec.txt
instructor@TargetLinux01:~$
```

The terminal window is titled "Terminal - instructor@Target..." and the desktop background is blue. The terminal output shows the decryption of a file using OpenSSL. The decrypted file contents are displayed in the terminal output.