ASSIGNMENT 12

AIM: Explore the GPG tool of linux to implement email security.

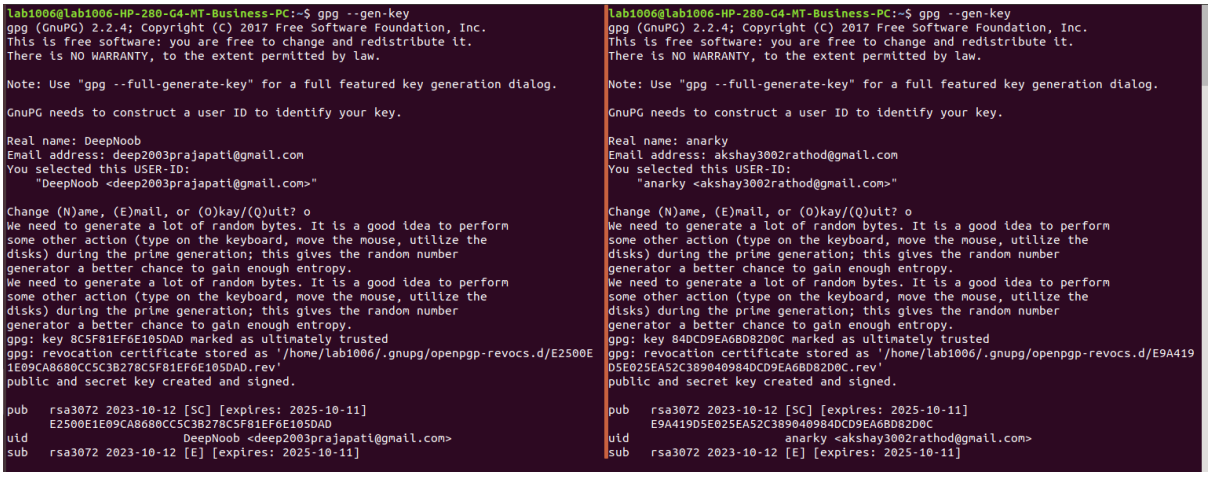
LO MAPPED: LO6

THEORY:

GPG is the OpenPGP part of the GNU Privacy Guard (GnuPG). It is a tool to provide digital encryption and signing services using the OpenPGP standard. gpg features complete key management and all the bells and whistles you would expect from a full OpenPGP implementation.

Step 1: Generate private key and public key pairs for sender and receiver using command

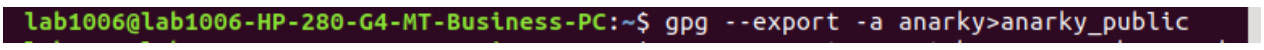
gpg --gen-key or gpg –full-generate-key **(repeat for sender and receiver)**



Step 2: Create a file containing sender’s public key which then can be sent to other users.

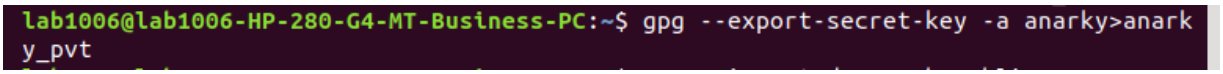
gpg --export -a username>filename (creates file in ascii format) **or** gpg --

output filename --armor --export user’s_email **(for sender)**



Step 3: Similarly create file containing sender’s private key. gpg --export-

secret-key -a username>filename **(for sender)**



Step 4: You can create a fingerprint of key using the command gpg --fingerprint receiver's_email **(for receiver)**

```
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg --export -a anarky>anarky_public
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg --export -a deepnoob>deepnoob_publi
c
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg --fingerprint deep2003prajapati@gma
il.com
gpg: checking the trustdb
gpg: marginals needed: 3  completes needed: 1  trust model: pgp
gpg: depth: 0  valid:   4  signed:   0  trust: 0-, 0q, 0n, 0m, 0f, 4u
gpg: next trustdb check due at 2025-10-05
pub   rsa3072 2023-10-12 [SC] [expires: 2025-10-11]
      E250 0E1E 09CA 8680 CC5C  3B27 8C5F 81EF 6E10 5DAD
uid           [ultimate] DeepNoob <deep2003prajapati@gmail.com>
```

Step 5: Sender needs to add in his public key ring, the public key of receiver **(for sender)**

gpg –import filename_containing_public_key_of_receiver

```
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg --import deepnoob_public
gpg: key 8C5F81EF6E105DAD: "DeepNoob <deep2003prajapati@gmail.com>" not changed
gpg: Total number processed: 1
gpg:               unchanged: 1
```

Step 6: Listing public keys in keyring gpg --list-key **(from public key rings of all users)** gpg --list-keys shachi_natu@yahoo.com **(from public key rings of specific users)**

```
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg --list-key
/home/lab1006/.gnupg/pubring.kbx
--------------------------------
```

Step 7: Sender can sign the public key of receiver using command

gpg --sign-key receiver_email

```
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg --sign-key deep2003prajapati@gmail.
com

sec  rsa3072/8C5F81EF6E105DAD
     created: 2023-10-12  expires: 2025-10-11  usage: SC
     trust: ultimate      validity: ultimate
ssb  rsa3072/24D67A3CC36F9241
     created: 2023-10-12  expires: 2025-10-11  usage: E
[ultimate] (1). DeepNoob <deep2003prajapati@gmail.com>


sec  rsa3072/8C5F81EF6E105DAD
     created: 2023-10-12  expires: 2025-10-11  usage: SC
     trust: ultimate      validity: ultimate
 Primary key fingerprint: E250 0E1E 09CA 8680 CC5C  3B27 8C5F 81EF 6E10 5DAD

     DeepNoob <deep2003prajapati@gmail.com>

This key is due to expire on 2025-10-11.
Are you sure that you want to sign this key with your
key "anarky <akshay3002rathod@gmail.com>" (84DCD9EA6BD82D0C)

Really sign? (y/N) y
```

When you sign the key, it means you verify that you trust the person is who they claim to be. This can help other people decide whether to trust that person too. If someone trusts you, and they see that you've signed this person's key, they may be more likely to trust their identity too.

Step 8: Encrypt the data to send. (create a file beforehand to be encrypted) gpg --encrypt -r receiver_email name_of_file **(only encrypt, .gpg file created)**

OR

gpg --encrypt --sign --armor -r receiver_email name_of_file

(encrypt and sign, ascii file created)

OR

gpg --encrypt --sign -r receiver_email name_of_file

(encrypt and sign, .gpg file created)

```
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg --encrypt -r deep2003prajapati@gmai
l.com anarky.gpg
gpg: checking the trustdb
gpg: marginals needed: 3  completes needed: 1  trust model: pgp
gpg: depth: 0  valid:   2  signed:   0  trust: 0-, 0q, 0n, 0m, 0f, 2u
gpg: next trustdb check due at 2025-10-11
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$
```

Step 9: Decrypt the file

gpg -o myfiledecrypted -d myfile.txt.gpg

```
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg -o myfiledecrypted -d anarky.gpg
gpg: no valid OpenPGP data found.
gpg: decrypt_message failed: Unknown system error
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg -o anarky -d anarky.gpg
gpg: no valid OpenPGP data found.
gpg: decrypt_message failed: Unknown system error
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg -o myfiledecrypted -d anarky.gpg.gp
g
gpg: encrypted with 3072-bit RSA key, ID 24D67A3CC36F9241, created 2023-10-12
      "DeepNoob <deep2003prajapati@gmail.com>"
File 'myfiledecrypted' exists. Overwrite? (y/N) n
Enter new filename: xsdjfexdtmy,l.';
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$ gpg -d -o anarky.gpg anarky.gpg.gpg
gpg: encrypted with 3072-bit RSA key, ID 24D67A3CC36F9241, created 2023-10-12
      "DeepNoob <deep2003prajapati@gmail.com>"
File 'anarky.gpg' exists. Overwrite? (y/N) y
lab1006@lab1006-HP-280-G4-MT-Business-PC:~$
```

CONCLUSION: In this assignment we have explored the GPG tool of linux and implemented email security.