Department of Information Technology

Academic Year: 2022-23 **Semester: V**
Class / Branch: TE IT
Subject: Security Lab (SL)
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EXPERIMENT NO. 11

Aim: To study symmetric and asymmetric encryption methods using Cryptool.

Theory :

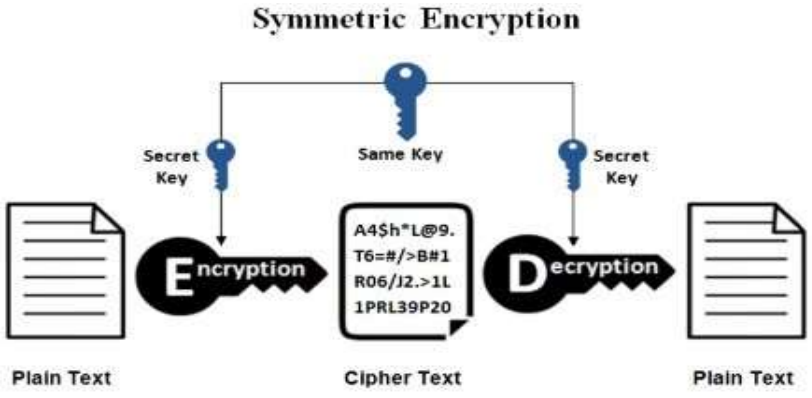
What is Cryptool?

- A freeware program with graphical user interface (GUI).
- A tool for applying and analyzing cryptographic algorithms.
- With extensive online help, it's understandable without deep crypto knowledge.
- Contains nearly all state-of-the-art crypto algorithms.
- "Playful" introduction to modern and classical cryptography.
- Not a "hacker" tool.

Cryptography is a method of using advanced mathematical principles in storing and transmitting data in a particular form so that only those whom it is intended can read and process it. Encryption is a key concept in cryptography – It is a process whereby a message is encoded in a format that cannot be read or understood by an eavesdropper.

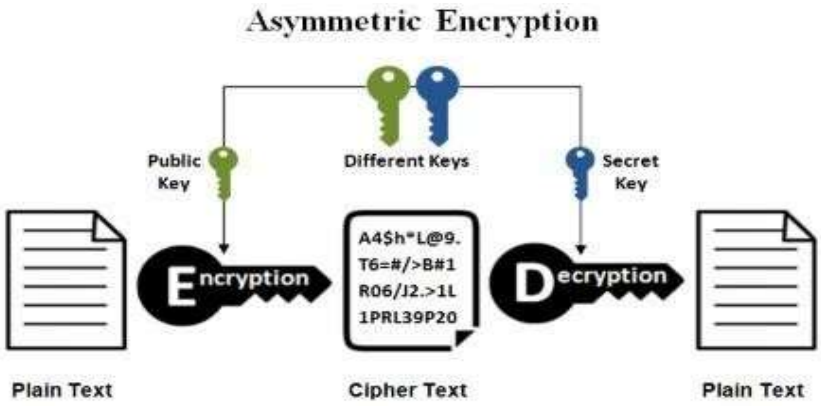
CrypTool is a free Windows program for cryptography and cryptanalysis. On Linux Platform JCrypTool can be used.

The current version of CrypTool offers among other things:
Visualization of several algorithms (Caesar, Enigma, RSA, Diffie-Hellman, digital signatures, AES, etc.) Cryptanalysis of several algorithms (Vigenère, RSA, AES, etc.)



Blowfish, AES, RC4, DES, RC5, and RC6 are examples of symmetric encryption. The most widely used symmetric algorithm is AES-128, AES-192, and AES-256.

The main disadvantage of the symmetric key encryption is that all parties involved have to exchange the key used to encrypt the data before they can decrypt it.



Asymmetrical encryption is also known as public key cryptography, which is a relatively new method, compared to symmetric encryption. Asymmetric encryption uses two keys to encrypt a plain text. Secret keys are exchanged over the Internet or a large network. Itensures that malicious persons do not misuse the keys. It is important to note that anyone with a secret key can decrypt the message and this is why asymmetrical encryption uses two related keys to boosting security.
A public key is made freely available to anyone who might want to send you a message. The second private key is kept a secret so that you can only know.

Asymmetric encryption is mostly used in day-to-day communication channels, especially over the Internet. Popular asymmetric key encryption algorithm includes EIGamal, RSA, DSA, Elliptic curve techniques

Conclusion : Thus we have implemented and studied various symmetric and asymmetric algorithms like DES, AES, RSA, etc using CrypTool.