**Module 20: Cryptography**

**Cryptography:**

* the practice and study of techniques for securing communication by converting plain text into ciphertext, ensuring that only intended recipients can read the information.
* Process of converting data from one form to another.
* Mechanism of Transferring human readable form to human unreadable form.
* Also, plain text to cipher text and vice-versa.

**Types of Cryptography:**

* Encryption
* Decryption
* Hashing

1. Encryption**:** plain text /information is converted to ciphertext
2. Decryption: ciphertext is converted to plain text /information
3. Hashing : it is one way encryption algorithm, plain text /information is converted to ciphertext but not decrypt

**Hashing:**

* It is one way encryption algorithm.
* It is mainly used for checking integrity.
* Integrity checking types: Credential Integrity , Data Integrity
* Credential Integrity , Data Integrity is for validation / Verification.
* **Checking Integrity of File (checking hash value)**

-tool: Hashcalc Tool

- Operating System: window 11

**Steps:**

* Goto backup drive > ceh tools > module 20: cryptography > md5 and md6 hash calculator > Hash calc tool > install tool
* Create a file in desktop > rename it as “secret.txt” and insert “my credentials Pa$$w0rd1” into secret.txt > save
* Copy file secret.txt and paste it in same location > rename it as “secret-backup.txt”
* Open hash calculator in 2 window > browse file and calculate hash value
* Compare and check the value for checking file integrity
* **Checking Integrity of File (checking hash value) using md5 Calculator tool:**
* Goto backup drive > ceh tools > module 20: cryptography > md5 and md6 hash calculator > md5 calculator tool
* Goto files tab > add both files > select one file > calculate hash > copy current md5 value > remove files > select another file > copy hash value > compare
* Check the integrity of file.
* **Checking Integrity of File (checking hash value) using HashMyFiletool:**
* Goto backup drive > ceh tools > module 20: cryptography > md5 and md6 hash calculator > open Hashmyfile tool
* Add files > if the hash value matches then it will display same colour else it will display different colour.
* **Encryption:**
* Encryption is a form of data security in which information is converted to ciphertext**.**
* **Encryption Algorithms:**
* DES: Data Encryption Standard.
* 3DES: 3 times data encryption
* AES: Advance encryption standard.

(AES is more secured than other algorithms)

* **File Encryption tool:**
* Advance Encryption Package

* **Text Encryption tools:**
* BC Text encoder
* Crypto forge
* **Disk Encryption tools:**
* veraCrypt
* Bit Locker