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Abstract: This paper proposed a novel cryptographic method for enhancing the security while transmission of image. Image which covers highest percentage of multimedia data, its protection is at most important. In image encryption methodologies, the pixels of original images are either manipulated or information is laid inside the image using the image as a cover to protect the data from undesired receivers. Scope of the project is to ponder on different ways of securing image data. Being a part of this digital world security becomes the most toughest and important things to handle. On the other hand hacking is also a growing domain which is used to track out a lot of information to solve a lot of digital criminal issues. DNA (Deoxy Ribonucleic acid) molecules, having the capacity to store, process and transmit information, inspires the idea of DNA cryptography. This combination of the chemical characteristics of biological DNA sequences and classical cryptography ensures the non-vulnerable transmission of data. In this paper review has been made about the present state of art of DNA cryptography. Keywords: Cryptography, DNA Cryptography, Cloud Security, User level security, Strong Key Generation, Data Encryption, Data Decryption. I. INTRODUCTION Cryptography is a method of protecting data, information and communications with the use of codes/images, so that only those who designed it and for whom the information is intended can read and process it. Encryption is one of the most formidable ways to keep our information safe between two endpoints. It makes data unread-able, so even it ends up getting in wrong hands it is mostly useless. The methodologies of encryption in which components of DNA are used to hide plain text from unauthorized users in the network come under the study of DNA cryptography .In DNA cryptography, the 4 chemical bases of DNA namely adenine [A], guanine [G], cytosine [C], and thymine [T] has so far majorly been used in addition to algorithms of cryptography. Considering 'ATGC' to be a code we can have 24 combinations of it like 'TACG', 'TGCA' etc. (4! = 24).Although among the 24 combinations only 8 are possible in a real life occasion as 'T' can combine only with 'A' and 'G' combines only with 'C' following the properties of DNA . But, here we shall use all the 24 combinations to encrypt our data. This will increase the complexity of detecting patterns in the encrypted text. In the study of cryptography, an image which contains information is converted to an unreadable or unrecognizable form by using algorithms. The image also has the capacity of carrying information. This field is gaining much popularity as image can carry vital information with them. Image encryption enables passing of data and information over unsecured networks like the internet. Without the correct key, the correct decryption to retrieve the original is a major challenge to high-end super computers. Image encryption plays a vital role in securing the transmission of images of military, healthcare, important government document images and other private images. Security services comprises of confidentiality, authentication and data integrity, and digital signature. In case, a person "A" wants to send a message to another person "B", secretly they need to follow the above said security service mechanisms. In confidentiality the data security is provided using symmetric or asymmetric method in two different ways such as block cipher and stream cipher. Symmetric method uses a single key {K} for both encryption and decryption, whereas in asymmetric method uses a pair of keys {KU, KR} for encryption and decryption process separately. Fig.1.Introduction to Cryptography (Ref. Geeks to Geeks) II. CHALLENGES IN TRADITIONAL CRYPTOGRAPHY Modern computers store data using a binary format. The size of the keys used in recent cryptographic applications is too big. It is very much difficult to crack a key when a billion calculations perform at a second as the combination to crack the key is larger and takes more time. Quantum computation is a new phenomenon which stores data using quantum bits. This performs calculations faster and hence the codes which take more time to break can be cracked speedily. Some of the challenges of traditional cryptographic methods are in which infrastructure it is executed, key size, and the quality of the algorithm. Recent days cloud computing and all other networking applications need information security for protecting the data and user validation. User validation validates the user and authenticates them after validity. As traditional encryption algorithm has severe security problems. The field of information security give importance to the new way of protecting the

algorithm has severe security problems. The field of information security give importance to the new way of protecting the data. The main objective of DNA cryptography is to provide confidentiality when the persons send data over a network III. DNA CRYPTOGRAPHY DNA Cryptography is a combination of modern biotechnology and cryptology. DNA Cryptography can be defined as hiding information with the use of DNA Sequence. DNA Cryptography is one of the rapidly evolving technologies in present world. Adelman was the one showed the world how it can be used to solve complex problems like directed Hamilton path problem (for ex. Travelling Salesman problem).It makes it possible to break the unbreakable algorithms. This is because DNA computing in terms of codes offers more speed, minimal storage and power requirements. DNA stores memory at a density of about 1 bit/nm3 whereas conventional storage media requires 1012 nm 3 /bit. DNA computing does not require any power while the computation is taking place. The Surprising part is that one gram of DNA contains 1021 DNA bases which is equivalent to 108 TB of data and hence we can store all the data in the world in a few milligrams. To encode data in a DNA strand this is made up of 4 nitrogenous bases namely: Adenine[A]Thymine[T] Cytosine[C] Guanine[G] The easiest way to encode is to represent these 4 units as four figures: A (0) –00 T (1) –01 C (2)–10 G(3)–11

Sources	Similarity
What is cryptography? - Definition from WhatIs.com cryptography is a method of protecting information and communications through the use of codes, so that only those for whom the information is intended can read and process it. the prefix "crypt-" means "hidden" or "vault" -- and the suffix "-graphy" stands for "writing." https://searchsecurity.techtarget.com/definition/cryptography	10%
DNA Cryptography - GeeksforGeeks surprisingly, one gram of dna contains 1021 dna bases which is equivalent to 108 tb of data. hence can store all the data in the world in a fewdna cryptography can be defined as a hiding data in terms of dna sequence. just like the rsa and des algorithms, in dna cryptology user have dna... https://www.geeksforgeeks.org/dna-cryptography/	3%
CTFtime.org / riftCTF / crypto 0x0003 / Writeup the first 4 characters of the string we were given are gatc. therefore, we tried to solve using these mappings: t(0) – 00 | g(1) – 01 | c(2) – 10 | a(3) – 11.repeating the steps as before, we know that ctag maps to r which maps to 01110010. we figure out that the mappings for each character are: a... https://ctftime.org/writeup/19105	3%