

# Cryptography of File With Morse Language And Key Generation Using Zigzag Pattern

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**Abstract-** Cloud computing provides us cheaper, faster, flexible and efficient and user-friendly environment. Storing data on cloud provides multiple benefits to both service-provider and customer using it. The security of cloud has been a challenging issue because user has trust issues for storing data on cloud. For increasing security, the recommended approach is to combine two or more methods processes like the DNA sequences used with Morse code and zigzag pattern, for encoding scheme. Use of Morse code and Zigzag pattern makes the attacker much harder to steal original data. Furthermore, the proposed scheme is implemented to achieve higher accuracy of encryption and decryption in security of data and it's verified. Earlier while encryption and decryption only simple keys i.e. public key or private key was used for the same but main drawback was safety of the file which was not gained by the keys which are in normal language. This can be overcome by using combination of 2 or more algorithms which can generate 2 types of keys i.e. private and Morse which will be in cipher text (Morse language) and not normal language. Thus, ensuring security at next level. In this proposed scheme we will implement the combination of Morse code language and Zigzag Pattern.

**Keywords-** Morse code, DNA sequences, Cloud Computing, Morse Pattern, Zigzag Pattern, Data Block Security, Encryption, Decryption, Key Rotation.

## I. INTRODUCTION

The whole world of wireless communications, as we know it today, when Guglielmo Marconi transmitted the Morse code for over a distance of 3 kms by electromagnetic waves. From this time, wireless communications have rapidly grown up into a key element of modern society. Electronics devices can exchange information over network by using Wi-Fi. In cloud computing services are ballooning and its multifarious edge makes all the IT industry to migrate from old service model to new on-demand self-service model. Despite its growing popularity and increasing demand, cloud computing faces security challenges. The security issues are handled by combining cryptography with DNA computing. The DNA cryptographic techniques help the cloud user and

provider to protect their sensitive information from unknown access. Cloud computing has huge security risks as it deals with sensitive information.

## Objective

To achieve high-level security for transmitting (file, data) from one source to another using Morse code and Zigzag Pattern and to store the normal data i.e. Aa-Zz, 0-9, special characters in the form of Morse code. Where each letter/alphabet is represented by combination made up of four dots and/or dash.

## II. MORSE CODE

Morse code is the earliest method used in Radio Telegraphy communications, a language which is in form of dot(.) and dash (-). Now a days storing and exchange of data in cloud computing has become the necessity of modern working pattern in IT industries.To increase security and confidentiality of data over cloud environment different schemes are used but still the intruder tries much harder to steal original data. The proposed scheme is implemented by merging two or more methods to achieve high security in encryption and decryption of data which is verified.

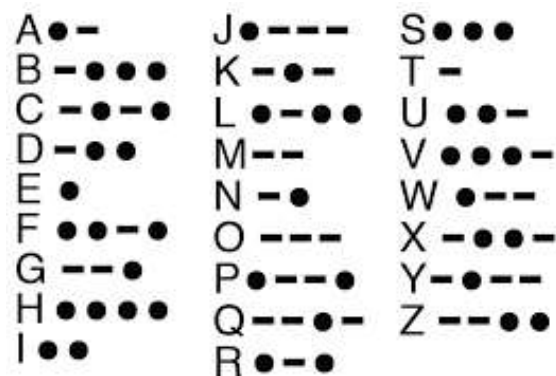


Fig. 1.1 Morse Code

## A. DNA COMPUTING

DNA computing was formed by the year 1914 by scientist AldemanDirect Hamiltonian path problem was solved successfully by using DNA computing. it is basically using DNA, biochemistry, and molecular biology, with computer. DNA follows its basic structure which has following nucleoids Adenine (A), Thymine (T), Cytosine (C), and Guanine (G). This A, T, C, G is used further in cryptography for different binary combinations which is called as DNA based cryptography

Binary Sequence		Nucleotide
0	0	A
0	1	T
1	0	C
1	1	G

Fig. 1.2 DNA table

**B. Zig-zag pattern:**

This pattern is used along a matrix structure where elements are arranged in form of matrix and accessed in zig-zag way. There are several zigzag pattern like horizontal zig-zag pattern, vertical zigzag pattern, parallel zig-zag pattern. In this proposed algorithm parallel zig-zag pattern is used.

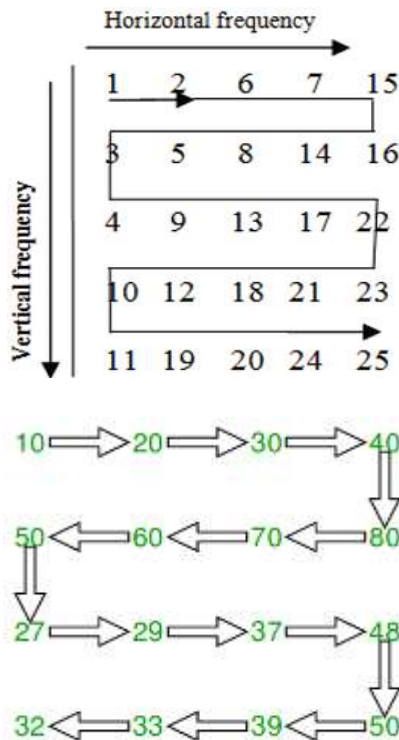
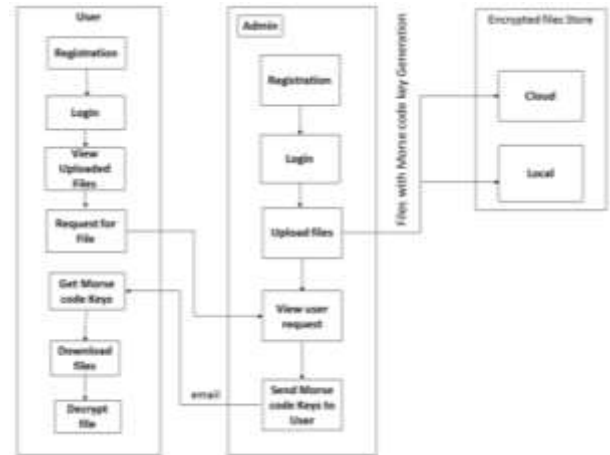


fig. 1.3 Zig-Zag Pattern

**III. SYSTEM ARCHITECTURE**



As proposed in our system using Morse Codewe could encrypt and decrypt the files to enhance security.Only Admin has the authority to upload files. Whenever admin uploads file it gets encrypted into Morse language. After encryption files are get stored on cloud as well as local storage of admin. User can only view these uploaded files .whenever he needs any file he request it to admin. Admin can then view his request .As files are encrypted each file will have its unique keys .Here keys used are of 2 types .these Keys can be used to authenticate different users so that file can only be shared with the right user only the 2 types of keys are Morse key and private key. Both Keys are generated using algorithm which consists of DNA pattern and Zig-Zag pattern.

**The Algorithm is as follow:**

1. Generate random number of specified digit
- 2.Convert number into its Binary
- 3.Using the A, T, G, C of DNA each pair of binaries is converted into DNA based code
- 4.DNA code arranged in matrix form is shuffled using parallel zig-zag pattern
- 5.finally the obtained code is concerted to Morse code which is our key

**Example:**

- Step1:** Let us assume that the plaintext is “ABC123”.
- Step2:** The plaintext is converted to binary data, the binary representation of the hexadecimal value ABC123 is 101010111100000100100011
- Step3:** The DNA sequence is obtained from binary form of encoded data. (Splitting in two’s) is  
C C C G G A A T A C A G
- Step4:** The transformed DNA sequence is converted into Morse pattern to encode the data to the next level.

Step5: The Morse sequence is converted into Zigzag pattern shown below

#### IV. APPLICATION

Using the above proposed system, the system can be used at different application like investigating services. This service involves a detective and client who hires this detective or investigating officer. All the files required by the clients are uploaded only by the investigating officer. So whenever client needs that investigated information he can login through his account and view the uploaded files and also request them to be downloaded. DNA and Zig-zag pattern is used to generate key. Keys are sent to client via mail. When user wants to download those files, When client enters correct Morse keys and private key, he can download that file which he has requested.

#### V. CONCLUSION

Transmitting and storage of files over the cloud securely using encryption, decryption technique which will help to converting simple plain readable textfile to cipher text file i.e Morse Code, Morse Code also provide a higher security so that essential information cannot be understood by any other person. Time required to encrypt and decrypt the data is less This system can be used at-

Internet payment systems, Business transactions  
E-commerce, Chatting, Image Processing.

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