Data Security using Tree Traversal

L. Eswara Chandra Vidya Sagar[1]

[1] K L University

Abstract

We all know that presently in 21st century one of the most emerging problem is Data Security. There is no guarantee that the data we have sent may be hacked by any Hacker or the data we have sent may reach correctly to the receiver or not. So many data security techniques have been emerged from past 2 to 3 years. But still we need a best technique to protect the data from third parties.Cryptography is an art of scrambling the data in order to provide security and confidentiality. Cryptography is being used in order for the securely transmission of the data. This paper provides a new idea for Data encryption and decryption in order to provide security for data.

Index terms— cryptography, encryption, decryption, hacker.

1 Introduction

ryptography is an art of hiding information. A lot of research has been done in the field of cryptography. There are various encryption algorithms used for secure data transmission. For example like security using Random number generator using chipper text and by using symmetric and asymmetric keys.

But still a new algorithms are emerging because still we require a better technique for data encryption and decryption. Better technique in a sense stronger the security. For a strong security so many persons are using two encryption algorithms at encryption side. But it takes long time for decryption.

Our technique Data security using Tree traversal overcomes the problem of week security because it is more difficult to decrypt the information by any unauthorized user.

In this mechanism we are using one of the important part of Data Structures that is Trees. Now let us discuss the topics required to be known in Data Structures to understand this paper.

Tree is a widely used abstract data type (ADT) or data structure implementing this ADT that simulates a hierarchical tree structure, with a root value and subtrees of children, represented as a set of linked nodes.

For example your family can also be represented in tree like your grandfather will be root your grandfather children's are nodes to your grandfather and your are node to your father like this a family can be represented in the form of a tree.

Author: Student K. L.University Vijayawada, India. e-mail: lingamsagar@gmail.com Tree traversal (also called tree search) could be a sort of graph traversal and refers to the method of visiting (examining and/or updating) every node in an exceedingly tree system, precisely once, in an exceedingly systematic method. Such traversals area unit classified by the order within which the nodes area unit visited.

There are mainly three types of tree traversals they are INORDER, PREORDER, POSTORDER. Order of visiting nodes by In-order is "Left Root Right" by Preorder is" Root Left Right" by Post-order is "Left Right Root" . These traversals are clearly represented in below diagram.

2 Our Proposed idea

The Idea we are going to propose is mainly divided into two types one is mechanism followed at sender for encryption and another mechanism followed The steps to be followed during encryption is explained in below flow chart Arrange the text in the nodes in the form of BFS mechanism after arranging the text we will get an

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trees structure then apply the in-order and either pre-order or post-order on the arranged tree. Send the traversal outcomes to the receiver then receiver apply the decryption mechanism. This is explained with an example let us consider a text as "Hello World this is the new encryption technique" and node size as "7" means each node can hold 7 character including spaces provided in the text. Tree formed contains 7 nodes since when we divide length on the above string with node size we will get output as 7 i:e No. of Nodes=Abs ((length of string (49)/Node size (7)).

3   Figure 4 : Example for encryption

Pre-order and post-order is shown in the above diagram now apply in-order traversal to the above then send the in-order and pre-order traversal data to receiver. Receiver can decrypt only when he had inorder and either pre-order or post-order data otherwise no one can decrypt it. The steps to be followed at reception end by the desired receiver are First receiver have to receive both the in-order and either pre-order or post-order data. After that construct a tree with max 2 child for each node. After forming the tree apply the mechanism of BFS (Berth First Search). Detailed information about BFS can be available in Internet. When you apply the BFS for the tree formed from the received traversal data the receiver will get the original data send by the sender.

In this way the reception procedure follows the above procedure is explained with an example in below section along with required flow chart. 3

Take the sample example that is taken at sender side or for encryption. i:e "Hello World this is the new encryption technique". So receiver receives in-order and post-order for the above text.

In-order Data: "he neworld th encrypt Hello W ion tec is is t nique" Post-order Data: "he new encrypt orld th ion techniqueis is t Hellow ". After receiving the data construct a binary tree with the help of in-order and post -order data received after that apply the BFS you will get the required data.

Constructing a tree based on the traversal data is explained in this section. Before constructing we need to know is that for in-order the visiting of node sequence is left, root, right and for pre-order is root, left, right for post-order is left, right, root. First take the 7 characters from the received post-order data and match the position of selected data in in-order and keep it as root node for the tree that is to be constructed from the root node the left side text is left tree and right side text is right tree.

Follow the procedure till you reach the last node of a tree.

In this way a tree is constructed after constructing apply BFS. ? Developing of algorithm for this mechanism is somewhat complex.

III.

4   Conclusion

According to me this the best encryption and decryption techniques using tree traversal mechanism which provides high end security to the data and the development of the mechanism is explained in this paper completely.   [1] [2]
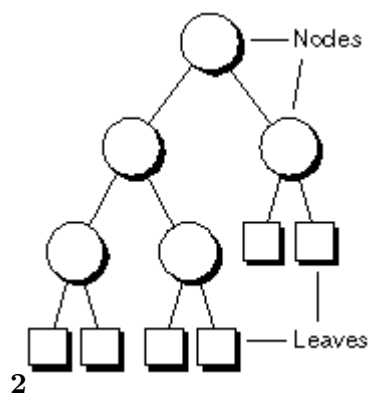

Figure 1: Figure 1 :

Figure 2: Figure 2 :
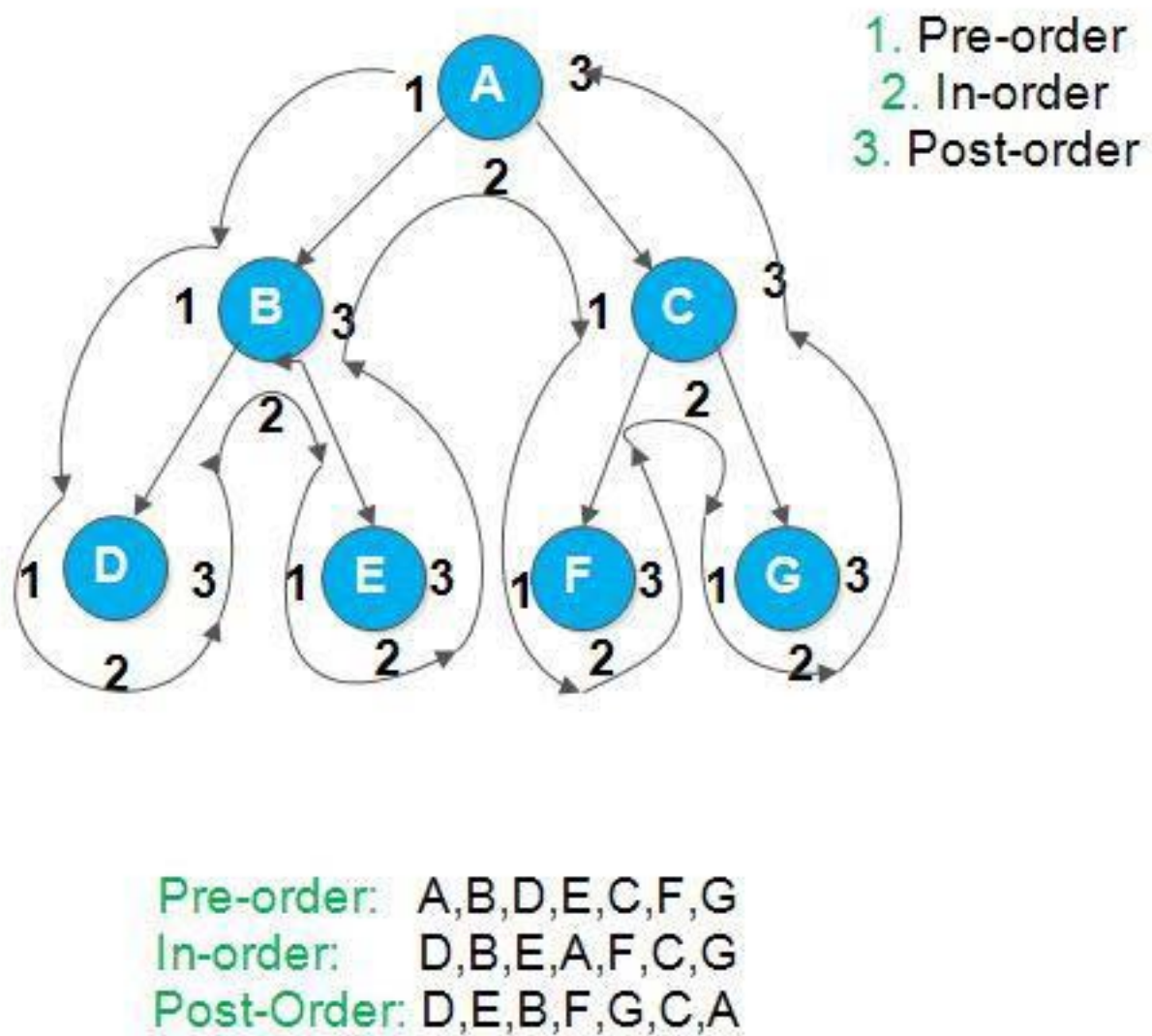
Figure 3: C

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Figure 4: Figure 3 :

Hello world this is the new encryption technique
Size of node is 7

1   Hello w   3

2

1   orld th   3

2

1   is is t   3

2

1   he new   3

2

1   encrypt   3

2

1   ion tec   3

2

1   nique   3

2

Pre-Order: Hello world thhe new encryptis is tion tecnique
Post-Order: he new encrypt orld th ion tecniqueis is tHellow
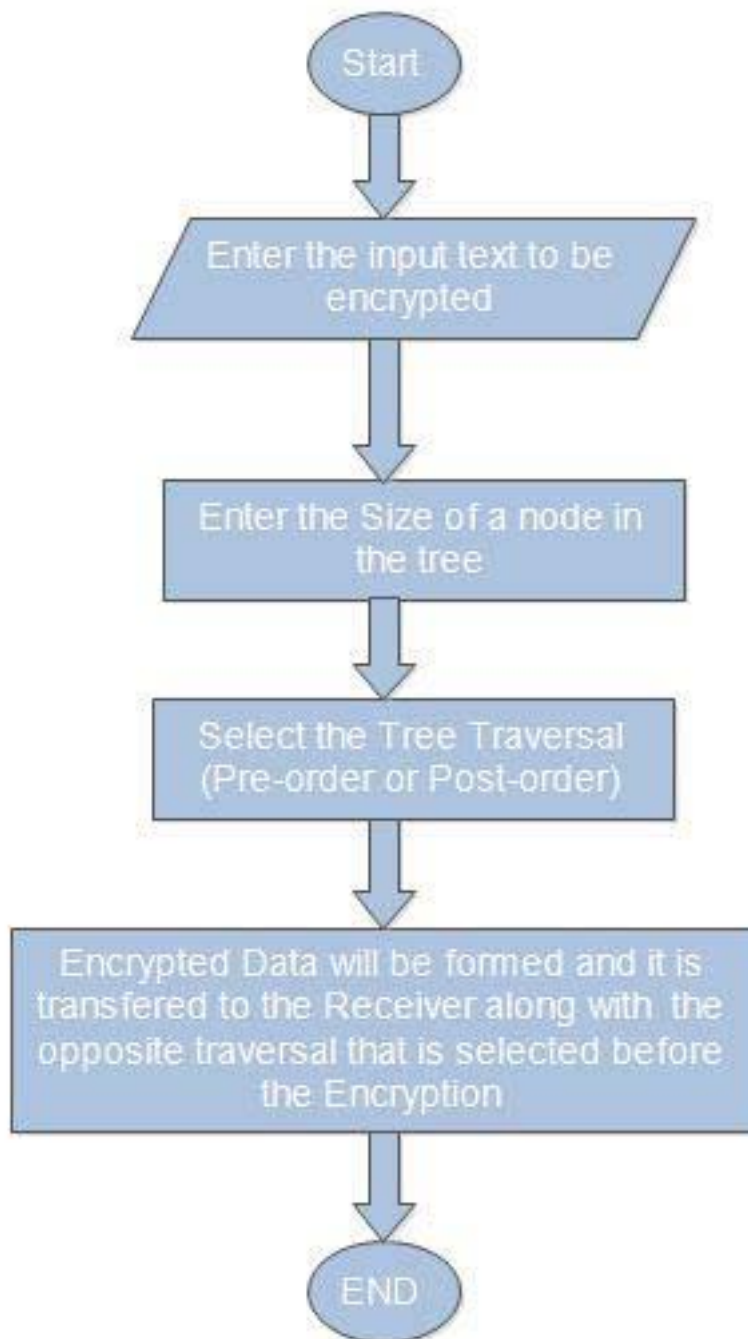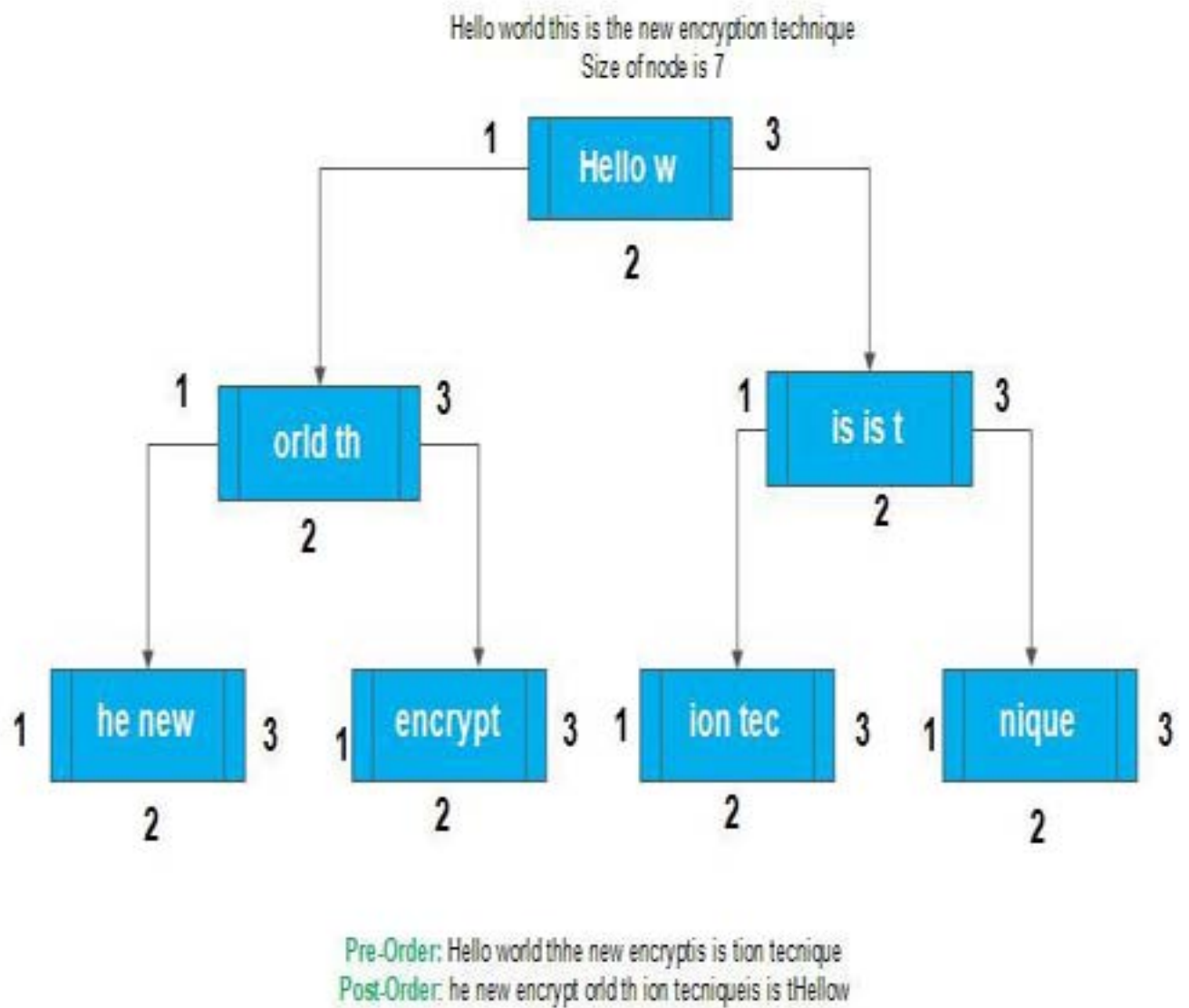
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Figure 5: GlobalCFigure 5 :

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Figure 6: Figure 6 :

4 CONCLUSION
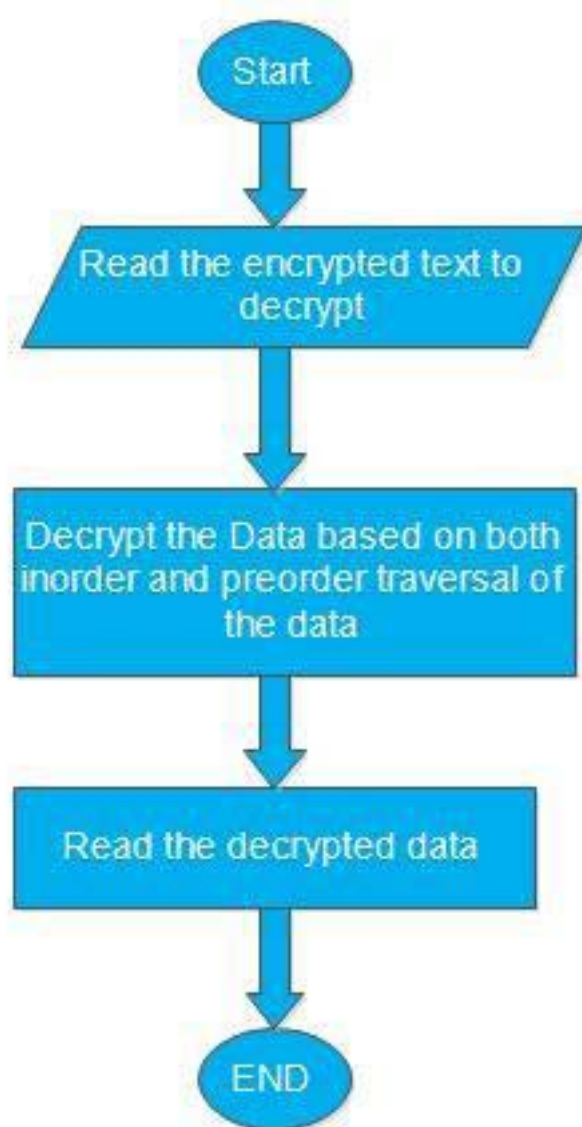
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