A New approach for Data Allocation in Overlay Networks in Secure and Efficient Manner

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Abstract: **Routing is a process of sending dedicated packets from valid source to the valid destination through a device called as router. This routing periodically changes if there was any node failure or link failure occurred intermediately during data transmission. An overlay network is a computer network that is built on top of another network; Overlay routing is used for various network users for sending the data through network, by using this there is no need to change the standards of current routing scheme when there was any delay or loss during the data transfer. For this networking we required an overlay infrastructure. In order to build this network it requires huge maintenance cost for usage as well as deployment. This mainly gives rise for following optimization problem like: First we need to optimize the network by finding very minimal set of overlay nodes in order to satisfy the routing and there is no facility like monitoring and detecting the routing problems in the activities of communicating nodes between each other. In current overlay network failed in reducing the infrastructure of the nodes. We reduce the number of infrastructure nodes that need to be added in order to maintain a specific property in the overlay routing. The Border Gateway Protocol contain routing table contain list of known routers with address they can reach, and a cost metric associated with the path to each router, best available route is chosen. Here we using AS-level BGP routing is used for finding a minimal number of nodes and it determines the shortest path routing between the source and destination. We are using AES encryption for encrypting the data as well as we are reducing the minimal number of relay nodes during data transmission, hence we called the proposed routing protocol as hybrid routing protocol. There is an advantage with overlay network, no need to redesign the network, where we can reduce a lot of delay, packets loss and reduce maintenance cost. This infrastructure may be applicable in applications for better performance in efficient manner.**

Key words: - Routing, Overlay Network, Minimized the nodes, Advanced Encryption Standard (AES), Border Gateway Protocol.

I. INTRODUCTION

A network is a system of interconnected computers .A network is a system that connects all devices and computers and is used for communicating from one system to another system. There are two types of devices hardware and software like scanners, printers and cameras. This network can connect through a wired or wireless connection.
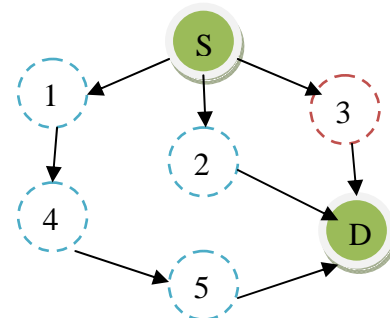

Fig. 1. Network

Communications:
Exchanging the information from one place to another, and this is the way to communicate with each other and also helpful to pass the information very accurately and efficiently. Through devices it is possible to communicate with each other. Or Through modems to pass the information.

Overlay Network:
It is a computer network that is established on top of another network. In this Network, the nodes are being connected as dynamically or logical links with each corresponds path through a physical links in the underlying network. Networks like Peer-to –peer network, client-server network.

Uses of overlay Network:

- These Networks are used in Telecommunication because of the availability of optical fiber telecommunication transport networks and IP Networks.

- Computer Networks is used for users to share the resources as well as communication purpose.

- This network established on top of the another network by this we can easily manage the data and we can send data to the particular user.
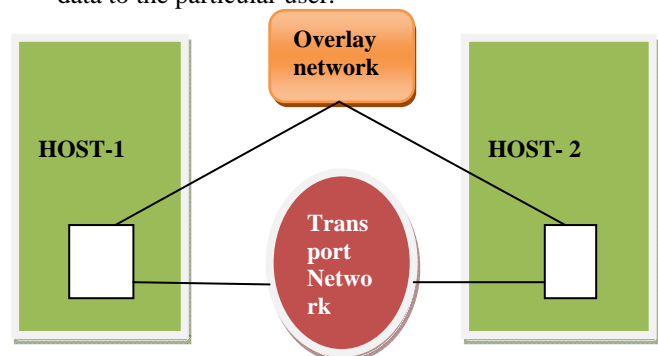

Fig. 2. Overlay Network

There are many aspects like:
- File Sharing
- Hardware Sharing
- Application Sharing
- User Communication

Advantages of Overlay Network:
Virtualization is performed at the network edge, while the remainder of the L2/L3 network remains unchanged and doesn't need any configuration change in order to support the virtualization of the network. The most common approach is to perform the encapsulation at the hypervisor switch, virtualization edge (NVE).
By this network, it is possible to communicate with each other and we can built on above local area networks and we can add an internet protocol headers to all packets.

II. BORDERGATEWAY PROTOCOL
BGP controls what BGP Routes are installed in the routers, for every routers it contain routing table. And it configures varies with each router and this protocol is be simple for communicating and as well as maintaining the network. Through this protocol there are two process for processing the data.
- All routes from BGP nodes are installed in the routing table.
- Transmit all routes from between BGP Nodes to all BGP Nodes.

BGP may be used for routing within an autonomous system. BGP is used to provide an interdomain routing system. BGP guarantees the exchange of loop-free routing information.BGP is a path vector protocol with the following properties.
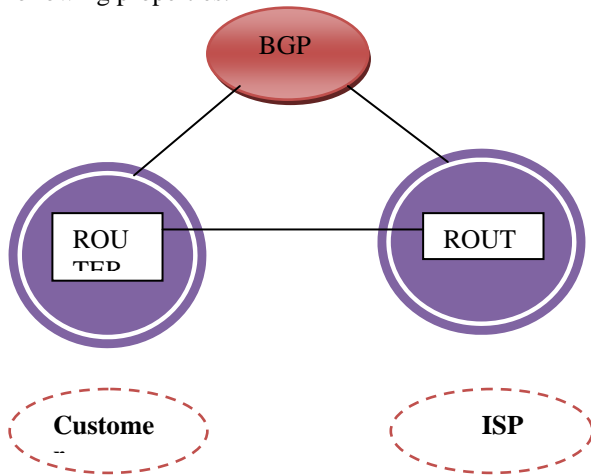

Fig. 3. BGP Protocol

III. EXISTING SYSTEM
- In normal overlay networks the data will not be stored in an encrypted manner.
- By using the current overlay routing the users failed in achieving data integrity in the form of viewing the data request in plain text only.

- There was no facility like monitoring and detecting the routing problems in the activities of communicating nodes between each other.
- In current overlay network failed in reducing the infrastructure of the nodes.
- If any node failed again we have to retransmit the Nodes from Source to Destination.

IV. PROPOSED SYSTEM
- We have to reduce the number of infrastructure nodes that need to be added in order to maintain a specific property in the overlay routing.
- No need to redesign the network.
- Finding a minimal number of nodes and it determines the shortest or smallest path routing between the source and destination.
- Improving routing properties between a single source node and a single destination, by this there will not be problem for routing, and finding the optimal number of nodes becomes trivial.
- Where we can reduce a lot of delay, packets loss and reduce maintenance cost.
- We are using AES encryption for encrypting the data as well as we are reducing the minimal number of relay nodes during data transmission and for securing data.
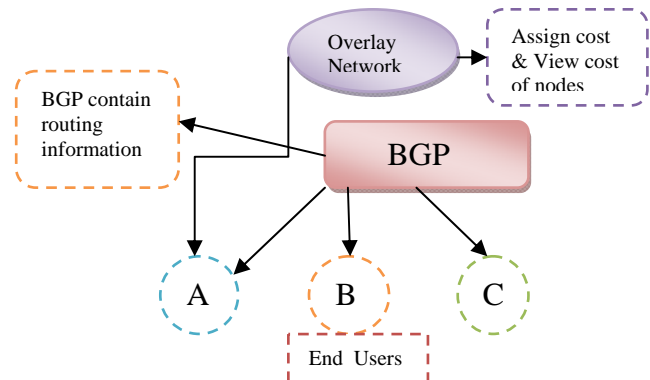

Fig. 4. Indicates about Modules

V. SYSTEM SPECIFICATION
Hardware Requirements:

System	:	Pentium IV 3.5 GHz.
Hard Disk	:	40 GB.
Floppy Drive	:	1.44 Mb.
Monitor	:	14' Colour Monitor.
Mouse	:	Optical Mouse.
Ram	:	1 GB.

Software Requirements:

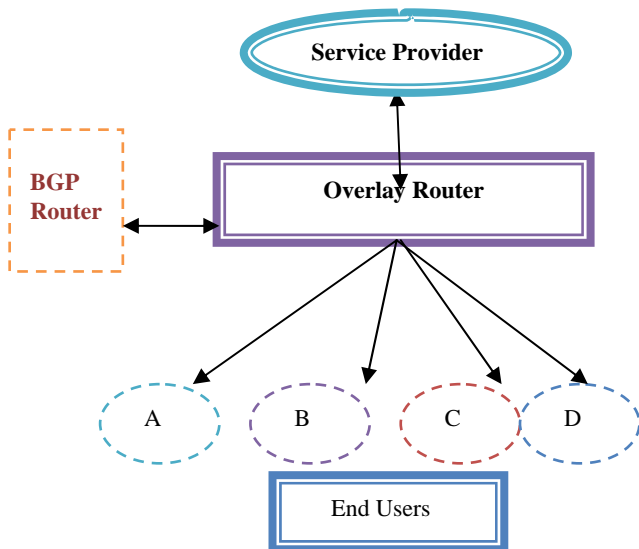|		
Operating system	:	WindowsXP,Windows Coding
Language	:	Java–AWT,Swings, Networking
Data Base	:	My Sql / MS Access.
Documentation	:	MS Office
IDE	:	Eclipse Galileo
Development Kit	:	JDK 1.6

Fig. 5. System Architecture

VI. MODULES

1) Service Provider
2) BGP Router
3) Overlay Router
4) End User

Service Provider:-
- In this module, the Service Provider calculates the shortest path from Source to Destination.
- The shortest-path routing over the Internet BGP-based router.
- The Service provider browses the required file and uploads their data files and delivered to the particular end user which is selected by user(A, B, C, D) and with their DIP (Destination IP) of End User.

BGP Router:-
- The BGP Router is responsible to route the nodes using BGP routing.
- By Finding a minimal number of relay node locations by this it can allow shortest -path routing between the source to destination
- BGP Router considers a one-to-many destination.

Overlay Router:-
- The Overlay Router is responsible to route the file to the specified destination.
- Finding a minimal path to the destination using overlay routing, one can perform routing via shortest paths.
- Nodes in the overlay network can be connected by dynamically or logical links, for each of which corresponds to a path, and through many physical links, in the underlying network.

End User (Destination):-
- In this module, the End user (Node A, Node B, Node C, Node D) is responsible to receive the file from the Service Provider.
- End User receives file from a single source to destination (Node A, Node B, Node C, Node D).
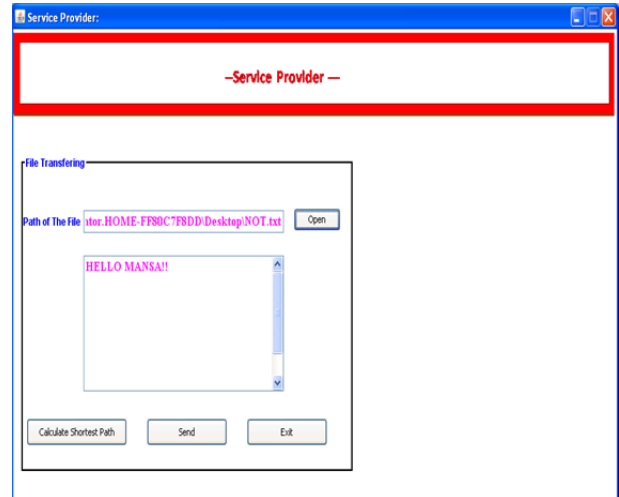
VII. RESULTS

Fig. 6. Service Provider

- Browse the File and upload the from specified directory.
- Calculate the Shortest path and enter the IP Address of router.
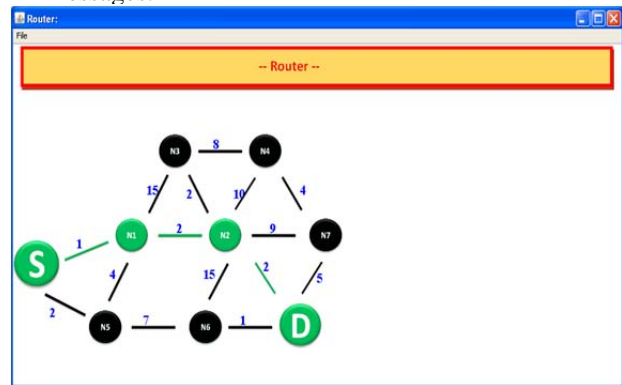- Select the Source and Destination Node for sending the messages.

Fig. 7. Router

- In this router, we assign the cost for nodes and View the cost of nodes.
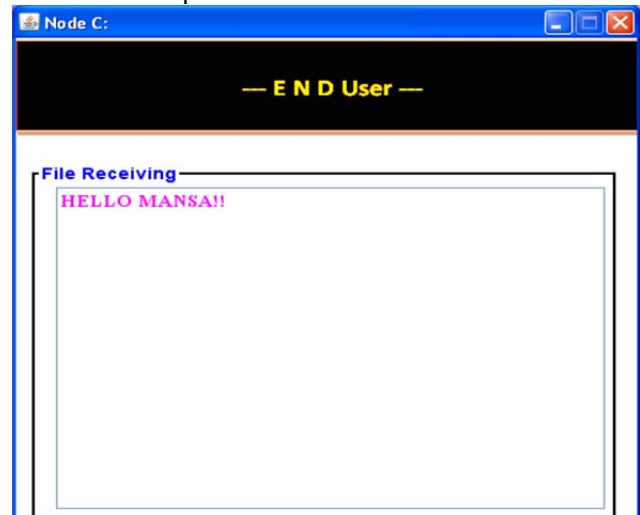- Send the data from source to destination according to the shortest path

Fig. 8. Nodes

- This is the window which is displayed the message and this node is considered as the destination.
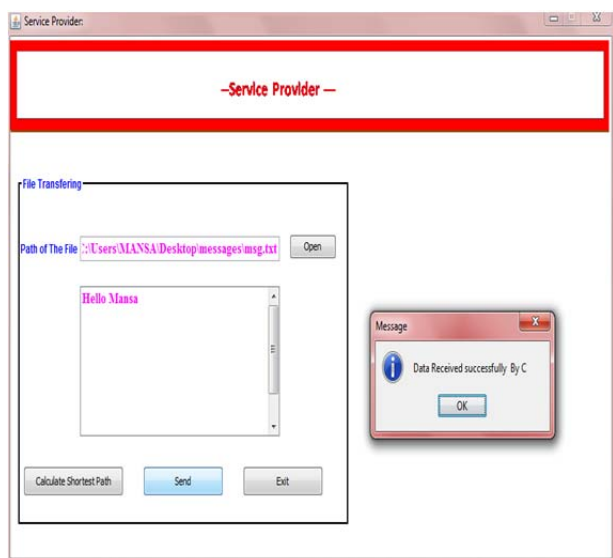- This is the Destination Window which displays the message.

Fig. 9. Data Received

After successful message is delivered to destination it displays the window.

CONCLUSION & FUTURE WORK

The goal of this paper was to reduce the number of infrastructure nodes that need to be added in order to maintain a specific property in the overlay routing. And no need to redesign the network, finding a minimal number of nodes and it determines the shortest path routing between the source and destination by this performance we can reduce the cost for using the overlay infrastructure. We use overlay routing to improve network performance. This infrastructure may be applicable in applications for better performance.

This work can be extended to the real time network which consists of more number of nodes. In this paper we choose only Text Documents.

In Future we will choose the Multimedia along with Text documents.

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