Efficient Forwarding Routing Scheme in Delay Tolerate Network

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Abstract: *Today one of the very popular networking is Delay Tolerant Network (DTN) where there is no proper end to end connection between source and destination. Means in Delay Tolerant Network (DTN) source to destination path does not exist. All message transfer using intermediates. In this, routing protocols use the mobility assisted, store-carry-forward paradigm which allows delivery among disconnected network components. This paper proposes to improve the forwarding performance of routing from a resource allocation and delivery performance. This paper analyzed Delivery forecast computation and analysis of different efficient scheme for improving forwarding technique.*

I Introduction

Delay Tolerant Network [1] is a wireless networks in which a fully connected path from source to destination does NOT exist. Means there is no end-to-end path from a source to destination [2].

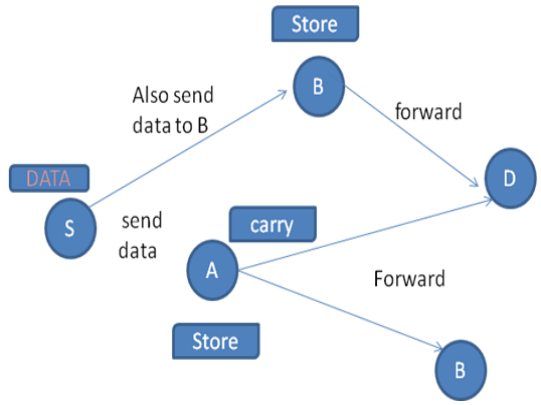

Figure :1 Data delivery in DTN

In fig show node S is source node and node D is destination. Node S sends message to B and A. both node store message. Then forward to next node. Means the connectivity of the network is maintained by nodes only when they come into the transmission ranges of each other. If a node has a message copy but it is not connected to another node, it stores the message until an appropriate communication opportunity arises [3].

1.1Key properties of DTN [4]:

- High Latency and Low Data Rate:
- Long Queuing Delay
- Disconnection

1.2 DTN Application [5]:

- Satellite communication
- Military networks
- Vehicular ad hoc networks
- Wildlife tracking

1.3 DTN Challenge [6]:

- Contact Schedules
- Contact Capacity
- Buffer Space
- Processing Power
- Energy

II Background

Many of the researchers have worked in various methods to improve routing protocol in delay tolerant network. Many of the researchers have worked in various methods to improve routing protocol in delay tolerant network. This section compiles and summarizes some important research documents which show all reduce overheads, better delivery ratio, increase the connectivity.

2.1 Universal scheme improving routing

X. Jiang et al. [7] had presented much better opportunities arise to minimize the communication cost without degrading the delivery ratio and latency. They proposed to improve most of the existing routing approaches based on the ‘‘probability to deliver’’ metrics. In this the developed there are *n* opportunities, E-Scheme lets the first K opportunities go by and accepts the opportunities which are better than all of the K ones. They demonstrate that $K=\frac{(n-1)}{e}$ or $K=\sqrt{\frac{(n-1)(n-2)}{e}}$ where *e* is the mathematical constant.DTN routing protocol can be either a single-copy or a multi-copy approach. However, in DTNs characterized by their lack of connectivity, single-copy approaches may cause low delivery ratios and lead to unbounded delivery delay. The basic operation of E-Scheme node A has a message to be sent to node E. At first, node A meets node B in and then encounters node C.But node A rejects these two opportunities and keeps the messages till a much better opportunity arises. Much better opportunities arise to minimize the communication cost without degrading the delivery ratio and latency. E-Scheme can reduce excess traffic and forward messages to the best relay with a high probability. E-Scheme could efficiently reduce the number of relays, making a remarkable decrease in the number of copies to be forwarded in the 2-copy scenario. But if the number of encounters is small, E-Scheme will not miss good forwarding opportunities. Total number of opportunities *n* depends on various parameters so it is difficult to analyze quantitatively.

2.2 Using extended information improving routing protocol performance

X. Chen et al. [8] had presented the contact of nodes is non predictable so that it can reflect the most flexible way of nodes movement. We know that the contact of nodes can be periodical, predictable and non predictable. Some existing schemes use utility functions to steer the routing in the right direction. They find that these schemes do not capture enough information of the network. Thus, they develop an extended information model that can capture more mobility information and use Weight and frequency function (WF), Regression functions, Linear Regression (LR), Weighted Linear Regression (WLR), Quadratic Regression (QUADR), Weighted Quadratic Regression (WQUADR), Polynomial Regression and Weighted Polynomial Regression for data processing. Experimental results from both simulator and real wireless trace data show that their routing algorithms based on the extended information model can increase the delivery ratio and reduce the delivery latency of routing compared with existing ones. Each node capture more mobility information and use Weight and frequency function (WF), Regression functions, Linear Regression (LR), Weighted Linear Regression (WLR), Quadratic Regression (QUADR), Weighted Quadratic Regression (WQUADR), Polynomial Regression and Weighted Polynomial Regression for data processing. Using extended information model can increase the delivery ratio and reduce the delivery latency of routing. In single-copy scheme get perfect result in terms of delivery ratio. In their simulator initially all nodes are randomly generated in a 100 m X 100 m area not more than. The transmission ranges are set small in their experiments.

2.3 Energy Efficient Network Method

E. Husni and A. Narendra et al. [9] had built the method for network power saving by suing delay tolerant network. To save power in the network, energy saving system will be used changing the link rate, Proxying, Energy efficiency specification. Changing link rate is an energy efficiency technique that works by downgrading the usual Network Interface Controller (NIC) link rate to a lower speed. Proxying is a technique for resting the user node to make it go into sleep mode without erasing its

presence in the network while still turning on other network components. This technique is generally carried out by manipulating the packet so that when the user node is in a sleep state, the packet is not wasted, and will remain in the network until later sent back to the user node when the user node was turned back on. In this scheme less power consumption than other components. Energy utilizations are able to increase or maintain the connectivity. In changing link rate there are is no available easy option for automatically changing the link rate, it will be done manually.

2.4 Balanced Routing

R. Xie et al. [10] had presented routing algorithm called ABC, which tries to make the best use of limited buffers of the nodes by balancing the buffer usage across the network. Trace-driven simulation results show that our algorithm performs well under a wide range of network configurations. In ABC Nodes in DTNS are always performing some kind of polymerization, like some node will continuously contact with each other for a relatively long time, and they will mainly choose the same nodes to deliver their data packets. In this situation, if all these nodes are using the same heuristic algorithm to find paths, they will be overlapped for most of it. And this will lead to the circumstance that some hot nodes' loads are too high to serve other nodes, and cause packet loss. ABC makes data generators broadcast node-load-information packets to affect other nodes' path selection. Supported by a special broadcast packet superposition and attenuation algorithm, ABC can let hot nodes which have high load be broadcast much further, and no critical nodes disappear rapidly. Using small additional communication overhead, ABC provides a big improvement of DTN networking communication. Figure show the example of ABC scheme. It actively offloads traffic from hot nodes to other nodes. One of the advantages this is the ideal algorithm Oracle. Most of time host nodes' loads are too high to serve other node.

III Methodology

Gathering information about history model like PROPHET my scheme first collects the information. All information is store in name just like Information_Summary. When node X send message to node Y then this algorithm introduces delivery predictability P(X,Y). In each meet, nodes exchange Information_Summary which contain delivery predictability information. Using this information they update internal delivery predictability vector and select the next node for forwarding message. The computation of delivery predictability has three parts. In First part whenever they meet update the metric. In Second part if they are not meet still they reduce the contact probability of two nodes X and Y. If node X often meet node Y, and node Y often meet node Z, then Y is a good forwarder for message for X to Z and vice versa. Based on this strategy transitivity will be computed.

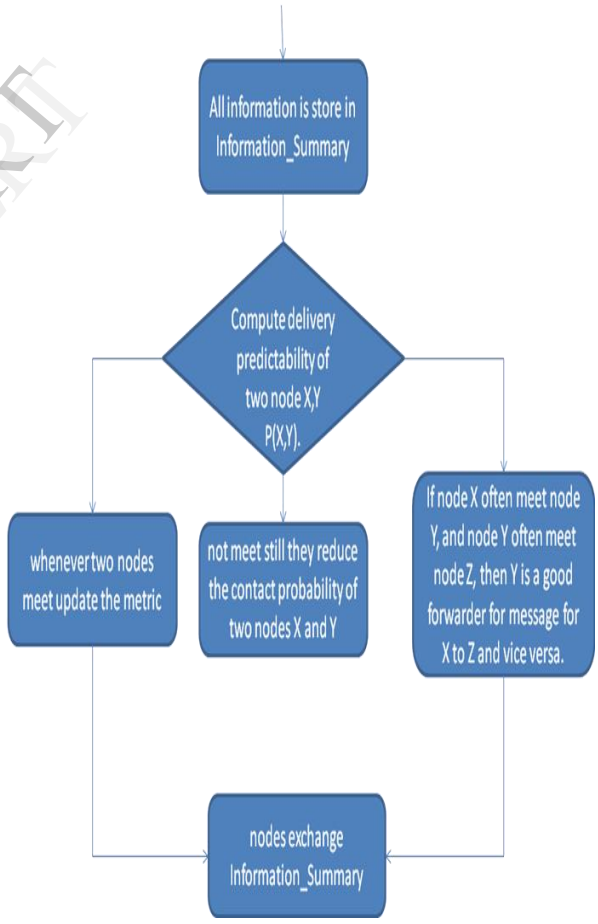

Figure 2: Flow of Delivery forecast computation

IV CONCLUSION

Using this routing scheme we conclude that they will increase the delivery ratio and reduce the delivery latency. This scheme divided in three parts so in first Delivery forecast Calculation will done, which is based on probability of two node. Then after second phase will computation delivery time of two nodes. In last node will transfer message to next node using result. So the performance will increase.

V FUTURE WORK

In future work this routing scheme will be implemented for none periodically. After this phase completed then minimum distance will be calculated then forwarding happen in last phase. Use the better technique for transfer information to another node using extended scheme which required less delay and fast transmission.

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