Priority Scheme: Routing in TMHF for Epidemic Routing Protocol

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Abstract— In this paper, we are proposing priority scheme with respect to TMHF that optimises the DTN epidemic routing protocol **.**This policy increases the possibility of delivery of message to destination and reduces overhead .The aim was to effectively utilize the network resources by giving priority to message which has the highest priority of hop count will be delivered first.

General Term

Algorithm, Routing Scheme, Intermediary Router

Key words: DTN, Hop Count, Nodes, Priority Scheduling, Queue, Store & Forward Network, TMHF,

1. INTRODUCTION

Store & Forward routing emphasizes for message which is traversing a path with multiple nodes, each intermediary node(like router) forwards the messages to next node when intermediary node receive the message, store and forward routing uses delay tolerant networks (DTN). DTN long as variable transmission delay for several hours to days because of limited bandwidth, limited resource varying connectivity, frequently changing behaviour, node mobility and long delay routing procedure in DTN is more challenging.

Delay tolerant networks (DTN) permits the transmission of data by means of intermittently connected nodes.DTN as any node [2][3][6][9] put forward as work by via store carry forward paradigm where every node act as a hop in the network and store the message in the buffer ,carries the message while moving and forward when it encounters with another node.

The forwarding of message in store and forward routing scheme can be done in usually two ways: single path, multi path. In single path routing scheme only one copy of message exists in the network, which is forwarded to the next and from that intermediary node it is directly forwarded to the destination node where as in multi path, the message uses a multi copy scheme more than one copy of same message are forwarded to multiple path through the use of epidemic router. Sometimes the new emerging technologies like cloud computing from where the user access the desired information, deriving the required information usually occurs extensive delays, and some time intermediary router cannot be able to exchange all message from its forwarding queue so sometime the sequence at which message should be transmitted or forwarded first, in that message queue when message in large amount is received from the previous node than message are being stored in buffer space using buffer space management policies and then forwarded to the required destination node using forwarding schemes and hence we can optimized the performance of routing protocols.

In this paper we have proposed the forwarding strategies TMHF with forwarding queue priority to reduce the delay time and obtain better performance of DTN networking and reduce the transmission time.

2. FORWARDING STRATEGIES

2.1 RANDOM QUEUE STRATEGY

In this strategy any message is being randomly selected for transmission and then forwarded to its destination node.

2.2 FIFO STRATEGY

In FIFO (first in first out) all the messages in any of the network are arranged according to the arrival time and the message which has the oldest arrival time, that message will be transmitted first.

2.3 PRIORITY STRATEGY

In priority strategy all the message in the network are assigned with the priorities, the message which has the lower priority in that queue is being transmitted first to the destination node.

3. EXISTING BUFFER MANAGEMENT POLICIES

3.1 DROP LAST: RECENTLY RECEIVED

The message with the long stay time in the buffer will be dropped. The idea is that the packet that was been in buffer for long time has less probability to be pass to other node.

3.2 DROP RANDOM

Drop the message in random number.

3.3 T- DROP

Drop the message having size lie between threshold values.

3.4 MEAN DROP

Drop the message having size less than the mean value of buffered message.

3.5 DROP OLDEST

The message with the shorted remaining life time (TTL) in network is dropped. The idea of dropping such a packet is that if packet is small, it has been in network for long time and this has high probability to be already delivered.

4. EPIDEMIC ROUTING

In epidemic routing message are diffused on nodes called carriers when carrier node while moving comes in contact other node it performs the pair wise exchange of message continues on all encountered nodes which increases delivery of message via multiple path. The epidemic routing protocol more robust but it consumes high volume of network resources such as buffer space, bandwidth and energy.

5. METRICES

5.1 DELIVERY PROBABILITY

It is the ratio of message received over message, send high probability means that more messages are deliver to the destination.

5.2 HOP COUNT AVERAGE

It is the mean hops which a message takes to reach its destination.

5.3 OVERLOAD RATIO

It is the negation of number of message relayed to number of message delivered. Low value of overload means less processing required delivering the relayed. This algorithm is to minimize the value of overload.

Figure: 4.1 EPIDEMIC ROUTING

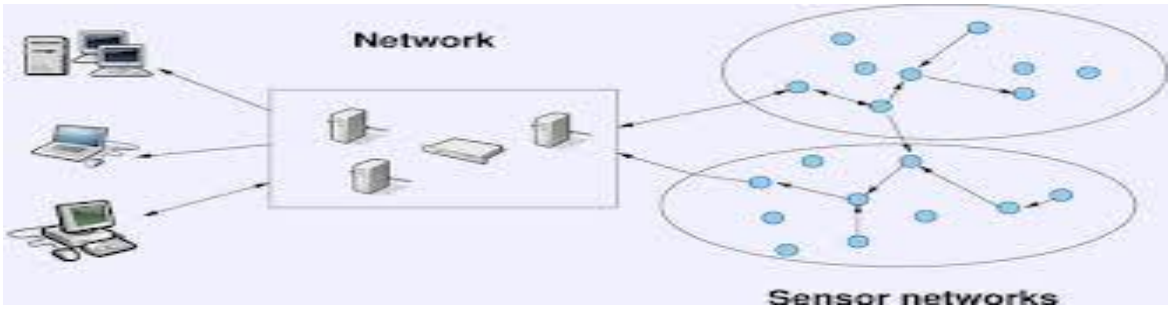

Table: 5.1

NODE	MSG ID	HOPCOUNT	ARR TIME	DES	PRIORITY
A	m4	12	14	B	3
	m2	10	16	C	6
	m1	3	4	C	5
B	m5	3	20	D	9
	m43	3	24	C	1

6. ANALYSIS

Traditional packet forwarding and dropping policies are widely used in delay tolerant networks. This paper provides complete review of forwarding message with the help priority queue and both result in TMHF (transmit maximum hop first). Hence if A and B are two connected mobile nodes m, A represent the message at A having the arrival time {12,10,3} and B represent the message buffered at B with arrival time {3,3} similarly the destination of message stored at A (m2, m4, m1) and at B (m5, m43).

STEP1. MESSAGE TRANSMISSION A-B USING PRIORITY

The exchange of message using priority scheme under epidemic routing protocol represent the queue of message at node A before transmission when A transmits the message then message-id A will be transmitted first to destination point 'B' as it has the lowest priority similarly then the m2 node will transmit first. But in the case when 'A' is being transmitting the message, certainly B's Node m43 came with the lowest priority among all the nodes, than A has to be get pre-empt and condition arise that new B should forward the message this cause more delay reduce bandwidth, reduce response time in network and such tolerance in the network occurs and caused the network to be delay tolerant network. To improve such delays in epidemic routing TMHF scheme is being used, which stands (transmit maximum hop first) like in this we can distinguish m4 m2 were forwarded from A to B the destination of both message is B.

Table: 5.2 TMHF TABLE AFTER TRANSMISSION

NODE	MESSAGE	DESTINATION
A-B	m4,m2	A
B-A	m43	B

7. ALGORITHM

STEP 1- Get message from the sending mode to the intermediary router in list.

STEP 2- Order and place the message according to the maximum hop count. In descending order and prepare list according to maximum hop count of message.

STEP 3- Transmit the message to destination node.

STEP 4- END.

8. CONCLUSION

In this paper we have proposed a forwarding strategy called TMHF that optimizes the DTN epidemic routing protocol. This policy reduces delay time and fast delivery rate as compared to priority scheme where the Lower priority message are being send first but sometime due to coming of higher priority in queue, delay occurs in the network. Hence TMHF utilizes network resources by giving priority to messages having higher value of hop count.

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