EFFECT OF EDGE NODE DETECTION APPROACH USING PIPELINING BASED QUEUEING NETWORK IN MOBILE AD HOC NETWORK

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ABSTRACT

Mobile Ad hoc Networks (MANETs) is an autonomous system of mobile nodes connected by wireless links; the mobile nodes are available to run in any direction. MANETs are usually formed without any significant infrastructure also it is depending on open queueing network. As a result, they are almost exposed to the traffic observer that target damage, who try to block the data packets by compromising nodes and trace the data transmission direction. Therefore, detecting the edge node is an essential part in MANETs. It is easy to observe a node that induces edge node activity in other nodes, but very difficult to identify a node which is passively observing and misusing network data. A MANET is a gathering of mobile nodes that powerfully frames a system without the guidance of a real strategy or framework network. MANET is a promising innovation in giving Edge-Node Assisted Transmitting and network scope. MANET is a domain which consolidates different assets and gives various directions to get to the edge node and edge node organization gives an arrangement of administrations to get to the assets for different traffic. In this approach, stack optimization based on Edge Node Detecting Using Pipelining (ENDUP) Queue for Secure Data Transmission in MANETs. In this paper, the performance of the existing algorithms like Directed Acyclic Graph (DAG), Queueing Network Based Traffic Flow Estimation (QNTFE) and Load Balancing Based Route Optimization (LBRO), are compared with that of the proposed ENDUP. So, the ENDUP performs highest throughput and generate effective outcomes in Mobile Ad Hoc Network.

Keywords: *Queueing Network Based Edge Node Detecting Using Pipelining (ENDUP), Directed Acyclic Graph (DAG), Queueing Network Based Traffic Flow Estimation(QNTFE), Load Balancing Based Route Optimization(LBRO) and Mobile Ad Hoc Network.*

I. INTRODUCTION

Mobile Ad Hoc network (MANET), in some cases called a mobile work network, is a self- arranging network of mobile devices associated with wireless connections. A Mobile Ad Hoc Network (MANET) is gathering of wireless mobile terminals that can powerfully frame an impermanent network with no guidance from the settled framework or produced together with an organization.

Queueing network encourages the clients to work any place and whenever by associating with wireless switches. MANET conveys wireless connection for a large assortment of utilization. By and large, these mobile nodes meet up for a timeframe with a specific end goal to trade data. The nodes keep on moving while at the same time trading data and henceforth, the network must have the capacity to set up courses among themselves without outside help.

The edge node approach based data transmission, At the point when many user share nodes, it is fundamental to decrease the transmission rate of every sender with a specific end goal to mitigate the condition of traffic. Packets that go into the traffic network are permanently disposed of, and this automatic packet drop influences the network executives. The network assets are spent both arranged of packets and by retransmitted packets. In this manner, traffic decreases network throughput. At the point when the state of blockage is not taken care of appropriately, at that point it prompt transportation and all things considered, no information can be conveyed. So, we will relieve the right edge node better transmission in the network.

In light of the measures, the proposed algorithm Edge Node Detecting Using Pipelining (ENDUP) is separated into four stages. The initial step depicts the way to go through the incredible justification framework to detect traffic level. The second step is to decrease the transmission rate of every sender with a specific end goal to mitigate the condition of traffic. The third step computes the distance from their first neighbour and identifies the node with more range. The final stage, the route optimization is performed based on the computed value of the edge node detection based data transfer in network.

II. LITERATURE REVIEWS

Ahammed & Banu R et. al., (2010), discussed the framework for prediction algorithm of the direction of nodes based on the information of current network status. Thus, the time is believed to be opened, and every node moves as indicated by a similar versatility demonstrate after some time. Here, an essential yet broadly considered node versatility, portability is embraced toward the start of each scheduled opening, every node picks another phone autonomously and indistinguishably conveyed among all cells and remains in the battery for the entire availability. Such node versatility delineates a distortion and may appear eccentric at first sight.

Dhamodharavadhani, S et. al., (2016), discussed a node checks its current neighbours at every time to increase by one the associability value of the nodes from the previous period. Associatively value is reset to zero when a neighbour moves away. The neighbour is detected for the first time when the associativity value is set to one. The node with the highest associativity is the cluster formation phase which is chosen as a cluster head. The node with the highest degree is chosen when it has more than one high associativity value. The overlapping is produced in this algorithm remains stable over a long period.

Li & Wang H et. al., (2002), suggested the essential guidelines in an Ad Hoc network for their operations. A beginning voice or starting information call is hindered on landing if it finds less available channels. In any case, it encourages us incredibly in understanding sharp correspondences, since the network topology significantly develops under such node versatility, making an exceptionally powerful MANET, leaving no steady connections for transmission. Also, it has been demonstrated that, as long as the channel state and the average speed of nodes remain steady, neither the limit nor the packet postponement will change, paying little respect to the real node versatility included.

Priyanka Goyal, Vinti Parmar & Rahul Rish (2011), discussed a load adjusted routing path is picked among every possible path based on weight esteem processed for each path. On a reasonable path, the higher the weight esteem, the higher is its appropriateness for movement dispersal. The pipeline of reconfiguration is an answer for the sheltered and achievable utilization of reconfiguration demands.

Shanthkumar Birada & Sushma B Malipatil (2015), discussed bandwidth, battery life, heterogeneous nodes mean, all/few nodes are having a variety of functionality This novel approach, tweak such scenarios, discharging the energy of different node which is a valuable resource as retiring or invalidating a node, hence such node may not be a part of genuine communication.

III. EDGE NODE DETECTION USING PIPELINING

Stack optimization based on Edge Node Detecting Using Pipelining (ENDUP) Queue for Secure Data Transmission in MANETs. Also, a novel approach using node duplication method and two hop neighbour discovery method using which the location of the node can be verified. The source node performs two-hop neighbour discovery to collect the neighbour nodes and perform node duplication method to ascertain the location of the node being selected to route the packet. The proposed plan reduces the overhead introduced by verification procedure and increases the network performance.

ENDUP strategy enables a flow to utilize many queues. It uses various mixture abilities to decide an arrangement of FIFO queues for flow and serves all queues in the round robin arrange. The means associated with Edge Node Detecting through Piping Queue method (ENDUP) decides an arrangement of FIFO queues for a flow utilizing various mixture capacities. At the point when a packet arrives, all hash capacities are connected to the packet header by ENDUP for calculation of potential queues. ENDUP puts the packet into the queue with the data transmission benefit. On the off chance that the queue related with a stream develops huge, at that point the stream utilizes another of its queues and consequently sidesteps the traffic.

Node Traffic Detection in Queueing Network

Algorithm:

Stage 1: Start
Stage 2: For each new call node in the network,
Call portability forecast technique for the new call
Stage 3: Based on the returned an incentive from versatility forecast technique,
Direct is held in the neighbouring focused on the node.
For each reservation in the neighbouring cell
{
On the off chance that the required Traffic is accessible.
Hold channels and return.
Else
Return Reservation disappointment
}
Stage 4: In the neighbouring cells after handoff inception
If n(C) = Handoff
{
In the event that Reservation (n(C)) is True
Acknowledge
Else
{
If accessible monitor channel is valid
{
If Available traffic > Br
Acknowledge
}
Else
{
On the off chance that accessible free node > Br
Acknowledge
Else

Queue (n(C))
}
}
}
Stage 5: Stop

The above algorithm demonstrates how data transmission is done in less traffic node in the network. The node analysis provision utilizes piping to register the mark of the network user taking care of the specific elements of the node. The node can get to any order just by entering individually trust node and trust node completed to next stage for better data transmission.

Edge Node Based Transmission in Network

Algorithm:

Input: Number of nodes Nn.
Output: Correct Edge node En.
Begin

For all nodes Ni from Nn
Discover transitional node In from Nn

$$\text{In} = \int_{i=1}^{siz(Nodes)} \sum Nn \in \sum_{j=1}^{size} NodeID$$

End
For each transitional node
Network Distance of their first neighbour

$$\text{Separation} \int_{i=1}^{siz(Nn)} Dist(Intial\ node\ -\ In)$$

End
Recognize the node with Additional Nodes An.

$$\text{An} = \int Dis(In) > Tr$$

Expel Distance Node from En.
Repeat Edge Node.
Stop.

The above algorithm computes the distance from their first neighbour and identifies the node with more range. Based on the distance, the method removes concern neighbour from the list and the next section describes the performance evaluation of the proposed work.

IV. PERFORMANCE EVALUATION

The experimental result uses the network simulator NS 2. NS 2 is highly extensible. It is not only supports most commonly used IP protocols but also allows the users to extend or implement their protocols. The latest NS 2 version supports the four ad hoc routing protocols, including DSR and AODV. It also provides powerful trace functionalities, which are crucial in our work since various information need to be logged for analysis. The planned ENDUP algorithm is simulated and the presentation of the protocol is appraised. The network throughput, regular end-to-end delay and the procedure overhead on the network studied, and the results are obtainable in this section. These parameters are associated with the existing Directed Acyclic Graph (DAG), Queueing Network Based Traffic Flow Estimation (QNTFE), Load Balancing Based Route Optimization (LBRO). Its detailed simulation result is given below.

Packet Delivery Ratio Impact

It is used to survey idea through the framework. It represents extent among all packets in the network. In source to destination how many packets will be sent in particular time, it is called delivery ratio.

PDR = Packets received/Produced parcels * 100

Table 1 Comparative Table for Delivery Ratio

No. of. Nodes	DAG in %	QNTFE in%	LBRO in %	ENDUP in%
10	12	19	22	28
20	25	35	39	42
30	35	42	49	53
40	45	55	65	71
50	56	62	79	85

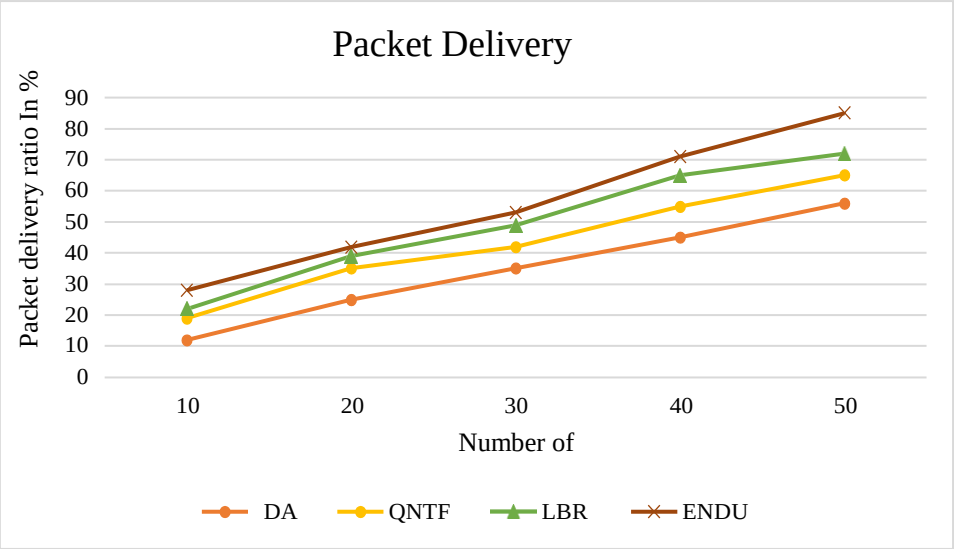

Fig.1 Pocket Delivery Ratio of Different Methods

Figure 1 shows the performance of Packet delivery ratio of different algorithms, and it indicates that the proposed method has higher packet delivery ratio than the others.

Examination of End- End Delay

End to end delay is nothing but between the times to take from one packet to another packet in a network. That is time to take all kind of parameters in data transmission.

Table 2 exhibits the end-end delay of the planned framework.

Table 2 End to End Delay

The Rate of Sending Packets/sec	DAG in ms	QNTFE in ms	LBRO in ms	ENDUP in ms
10	4.985	2.354	2.125	2.023
20	6.578	5.365	4.658	3.658
30	8.245	7.154	6.887	5.874
40	9.154	8.258	7.652	6.584
50	12.154	10.695	9.654	8.985

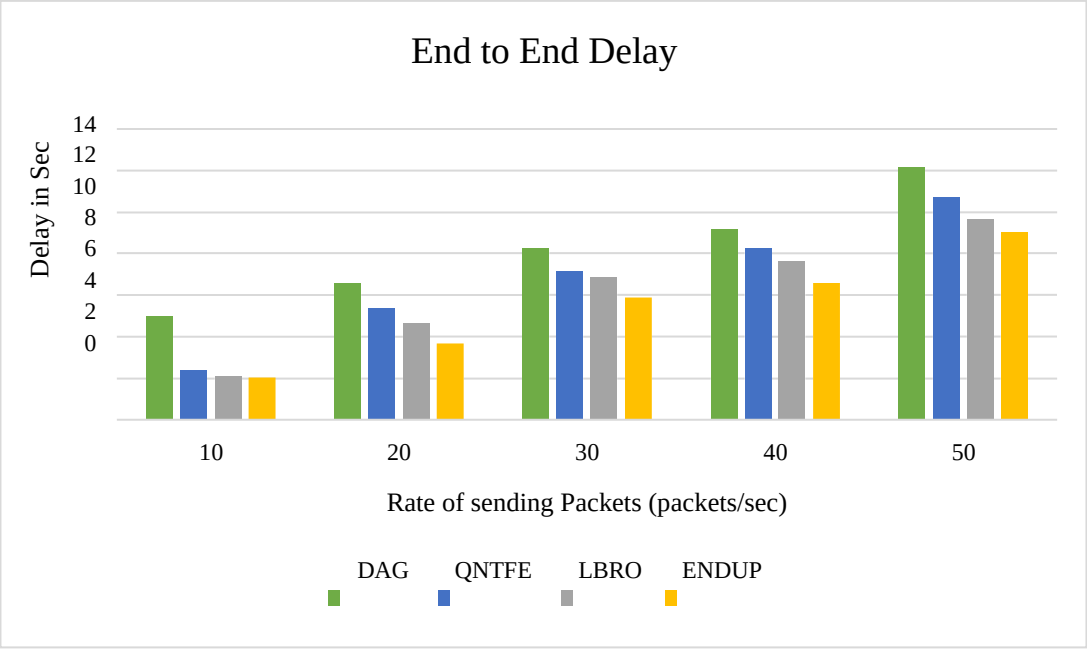

Fig.2 End to End Delay Ratio

Figure 2 exhibits the End to End delay of the prearranged schemes with the present structures and understood planned ENDUP consumes less ratio of the packet transmission.

Throughput Ratio

Sometimes called overall network performance is named as throughput ratio, it is consider all the QoS parameter to conclude the result in the network.

Table 3 demonstrates the throughput proportion of the suggested framework in the network.

Table 3 Analysis Table

No.of. Nodes	DAG in %	QNTFE in %	LBRO in %	ENDUP in %
10	19	22	29	32
20	25	45	52	68
30	39	59	69	75
40	49	61	78	82
50	62	82	91	93

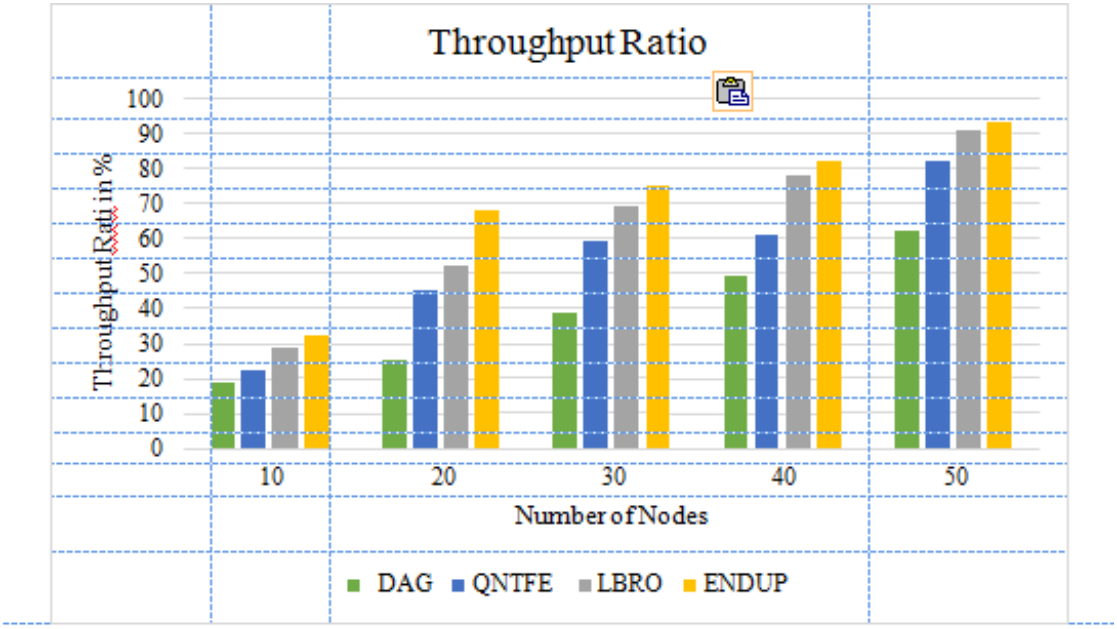

Fig.3 Throughput Ratio Analysis

Figure 3 demonstrates the overall performance throughput ratio of various methods, and it is clear that the proposed plan achieved highest throughput than the other methods.

V. CONCLUSION

In this paper, the performance of the existing algorithms like Directed Acyclic Graph (DAG), Queueing Network Based Traffic Flow Estimation (QNTFE) and Load Balancing Based Route Optimization (LBRO) are compared with that of the proposed ENDUP. The proposed ENDUP calculation with node duplication technique to perform secure correspondence based edge node transmission and gathers the arrangement of neighbours, their neighbours which have the area data of the neighbour found. Utilizing the complex stream elements of the two-hop neighbours, we process the edge node to distinguish the nearness of nodes in the whole neighbour list which demonstrates the nearness of adversary around the source node. Also, this method performs course revelation with the distinguished edge node, and by accepting the demand, the neighbours perform disclosure and abstains from sending the request to the assigned or opponent node. The proposed plan has highest throughput than the others and diminishes the deferral additionally in the network.

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