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Edge Node Detection For Better Data Transmission Under The Queuing Network Using Pipelining 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 its depended on opened queuing 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. In this work, we propose stack optimization based on Edge Node Detecting through Piping Queue (ENDPQ) for Secure Data Transmission in MANETs. Also, a novel approach using node duplication method and two hop neighbor discovery method using which the location of the node can be verified. The source node performs two-hop neighbor discovery to collect the neighbor 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.

Keywords- Piping, Traffic Analysis, Edge node, Neighbor Node, Queuing Network

I. INTRODUCTION

Manet is a promising innovation in giving Edge-Node Assisted Transmitting and network scope. Queuing network encourages the clients to work anyplace and whenever by associating with wireless switches. Manet conveys wireless connection for a large assortment of utilization. Although every one of the nodes has numerous associations with the neighbor nodes, for the situation that a particular node has an immediate association with every one of the nodes.

Routing in improvised mobile networks is enormous on account of the sizeable dominant topology. A MANET is a gathering of mobile nodes that powerfully frames a system without the guidance of a real strategy or framework network. 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.

Two hop neighbor disclosure is the path toward finding the neighbor and their neighbors. The source node sends the neighbor disclosure message, and the neighbor reestablishes a course of action of neighbors. By using this, the source node can get the neighbor of neighbors. The information about the neighbors and their neighbor could be utilized to perceive the principal area of the nodes.

The edge node is either moved to the remote node or assigned to the limit queue. A task from the remote node is comparably apportioned to the limit queue. Once an errand has been designated to the edge queue, it can't be exchanged for some other node. A task touching base at a node is either prepared by the node or is moved to some other node for handling utilizing the correspondence network.

Not under any condition like general nodes of MANET, there are two or three distinct nodes called harmful, which are all the more competent and has more transmission run. This greater transmission extent of adversaries gives the office to see the packet being transmitted by any node and at whatever call attention to node plays out a neighbor disclosure procedure the adversary in same manner answers that it is the most neighbor to the source by showing the fake area. While performing routing in the compact uniquely designated framework using area information, the opponent can choose an adjacent territory to the source code with the objective that it can appreciate all transmission of packets and can play out any strategy for framework peril.

Likewise, Manet is a domain which consolidates different assets and gives various directions to get to the edge node. When all is said in done, the considerable expense assets are sent to the network condition, and edge node specialist organization gives an arrangement of administrations to get to the assets. The information transmission does not know anything about the end client and in such an approximately

coupled condition, giving access to confinement is troublesome, and it is more arranged for different traffic.

II. RELATED WORKS

Mobile specially appointed network is a gathering of n nodes moving over a unit square. The unit square is separated into a similar size and is thought to be a torus with the goal that the opposed edges of the intersection match [1]. 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 [2], 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 [3-4]. Honestly, such node versatility delineates a distortion and may appear eccentric at first sight.

The FIFO queue turns into an unbounded queue and needs are not doled out. The high organized calls hold up in the long FIFO queue. At the point when the stay time exceeds, those coordinated calls are in the end dropped. Non-preemptive Priority Handoff conspire. In this plan, the voice handoff asks for is given higher need than information handoff request [5]. A voice handoff applications for is queued entry if there is no sit out of equipment channels. The information handoff requests for is queued on landing when it finds or less available channels.

The number of usable channels for information handoff clients. S is the aggregate number of directs in the network [6-7]. 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 [8-9], neither the limit nor the packet postponement will change, paying little respect to the real node versatility included [10].

The specially appointed network comprises various nodes that speak with each other using remote connections. Batteries generally fuel these nodes with restricted vitality [11-12]. To lessen vitality utilization and enhance network execution, nodes cooperatively decide a subdiagram of the last transmission chart to use as the correspondence topology [13]. The issue of determining a subdiagram is called topology control. Since the topology has the incredible impact on the execution and lifetime of the network, the developed topology ought to have various helpful properties. The call confirmation control methodologies for remote systems [14]

In this examination, the creator demonstrated that the average channel holding period for new calls and handoff calls are altogether unique [15-16]. Here, the customary one-dimensional Markov chain model may not be appropriate. A two dimensional Markov chain hypothesis must be connected [17]. It is attractive for the most extreme level of any node in the topology to be limited by some consistent. On the off chance that a few nodes have a too much large degree, they will pull in heaps of traffic stack stream and be quickly drawn out of vitality. Also, ordinary nodal degree ought not to be too extensive, since a topology with a little nodal degree will diminish the capacity and correspondence overhead to keep up neighborhood relations.

Symmetric topology necessitates that all connections ought to be bidirectional [18]. Since interchanges on deviated joins are confused as well as the exorbitant symmetry of the first topology is a necessary prerequisite of bunches of correspondence natives. They utilize progress likelihood grid and flag stream chart to get the normal new-call blocking likelihood [19], constrained end likelihood and the average holding up time of queued new/handoff calls.

They researched how the monitor channel plan and cradle arrangement plot influence the various leveled cell framework. They examined a progressive cell framework with limited queues for new and handoff calls [20]. The outcomes demonstrate that arrangement of buffering plan and monitor channel plan can adequately decrease the new-call blocking likelihood and constrained end likelihood in the various leveled cell framework.

III. MATERIALS AND METHODS

Edge Node Detecting through Piping Queue (ENDPQ) 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 are: ENDPQ 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 ENDPQ for calculation of potential queues. ENDPQ 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.

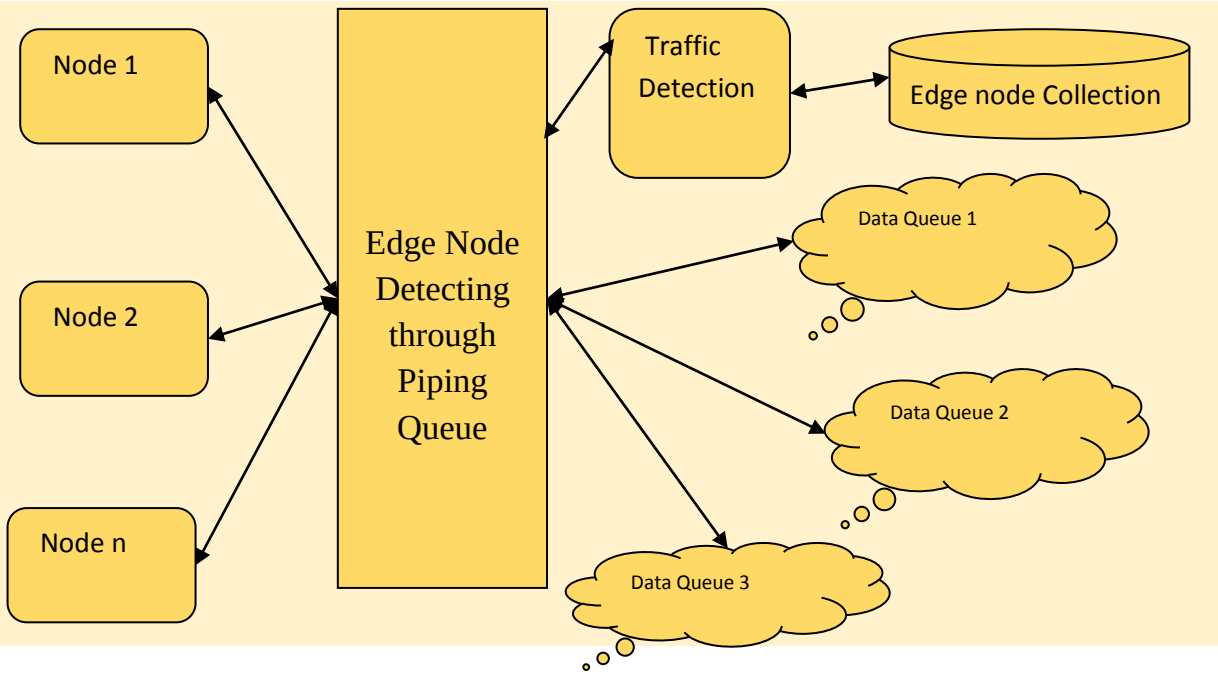

Figure 3.1 Workflow Diagram in Network

Above figure 3.1 shows the general flow can use various queues, there exists an exchange off between the level of additional limit surrendered to a growing into fault stream and the number of flows starved by making trouble stream. Even though ENDPQ utilizes different queues for putting the packets, packet reordering does not happen when packets are of comparative size. On the off chance that the packet sizes are different, reordering is conceivable yet confined inside one round of queue traversal. This can be avoided by buffering packets for one round to reestablish their request, before sending them into the connection. Then again, if switch sections the approaching packets into comparable measured cells, ENDPQ is connected to the phones and after that packets are reassembled before sending to the connection thus reordering does not happen for this situation.

III.I Node traffic Detection in Queuing Network:

Traffic of higher need flows must be identified to prevent automatic packet impacts. The steady streams are made to go through the incredible justification framework to detect traffic level. Packet Arrival Rate and Queuing Delay are taken as information factors and blockage degree as yield variable. There are conveying by delivering to them as participation capacity, and blockage extend is registered through the edge node recognition process. At the point when traffic goes is low, the nodes are maintained utilizing max-min guideline of ENDPQ scheme. Then again, streams that have traffic go medium and high are planned to use piping Queue method.

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 neighboring focused on the node.

For each reservation in the neighboring cell

{

On the off chance that the required Traffic is accessible.

Hold channels and return.

Else

Return Reservation disappointment

}

Stage 4: In the neighboring 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

User mobility networks are expanding which results in substantial traffic in mobile specially appointed networks. This portability requires quick information transmission to keep up the nature of associations.

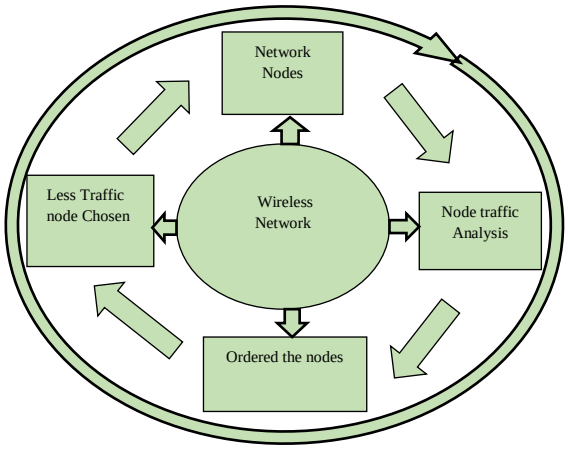

Figure 3.2 Traffic less node identification Model

The above figure 3.2 demonstrates the, how data transmission is done in less traffic node in the network. The Network supports different manage set, which contains a set of guidelines with node points of interest, for example, address, open/ own discovery, and the mark for each node of the network. It oversees trust node for different assets to give routing and integrity. 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 which is kept up by the network additionally that particular trust node completed to next stage for better data transmission.

III.II Edge node Based transmission in Network:

All in all, routing calculations are utilized to control the level of traffic in information transmission time. 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 isn't taken care of appropriately, at that point it prompts transportation and all things considered, no information can be conveyed. So we will relieve the right edge node better information transmission in the network. Essential ideas of queuing interface are to keep up the Quality of Service in lining models for keeping up QoS and different Active Queue Management procedures. In a system, the edge node information transmission require different kinds of activity with a specific end goal to keep the adaptable currents from starving and stable flow from the traffic.

Algorithm:

Input: Number of nodes Nn.

Output: Correct Edge node En.

Begin

For all nodes Ni from Nn

Discover transitional node In from Nn

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

End

For each transitional node

Network Distance of their first neighbor.

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

End

Recognize the node with Additional Nodes An.

An= $\int Dist(In) > Tr$

Expel Distance Node from En.

Repeat Edge Node.

Stop.

The Edge node approach computes the distance from their first neighbor and identifies the node with more range. Based on the distance, the method removes concern neighbor from the list.

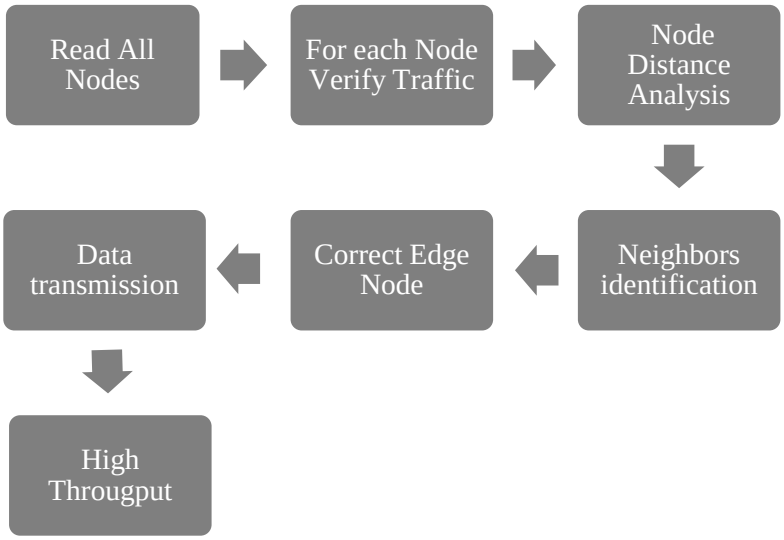

Figure 3.3 Edge node Detection Flow

Figure 3.3 shows the edge node detection data transmission process is the network. Each node has different behaviors in accessing the network data. Not all the node has the same reaction in obtaining the data. Each node accessing the data differently, and some of them access the data for a specific number of times, not more than that whereas the others would access the data separately. By maintaining and monitoring the behavior of the nodes, the problem of traffic can be handled. Piping is a simple estimate of the concept of a reproduction logical equivalent of the regions in network nodes. Edge node Based transmission in Network plays an essential role for queueing network. Managing path estimate is congested networks requires a clear understanding of the routing.

IV. RESULT AND DISCUSSION:

Ns2 is highly extensible. It not only supports most commonly used IP protocols but also allows the users to extend or implement their protocols. The latest ns2 version supports the four ad hoc routing protocols, including DSR and AODV. It also provides powerful trace functionalities, which are crucial in our thesis since various information needs to be logged for analysis. The full source code of ns2 can be downloaded and compiled for multiple platforms such as Windows, and Cygwin. The proposed Edge Node Detecting through Piping Queue (ENDPQ) algorithm is compared with existing Load Balancing based on Pipelining under the Queuing Network (LBPQN) and Directed Acyclic Graph (DAG) method. Also here given a brief simulation result is given below.

Table 4.1 Parameter Criteria

PARAMETERS	VALUE
Version	Ns-all-in-one 2.28
Area	1200m x 1200m
Broadcast Area	250 m
Transfer model	UDP
Data size	512 bytes

4.1 Packet Delivery Ratio

It is determined as the ratio of the number of the number of packets sent by the source to the packets received at the destination.

PDR = Σ Number of packets receive / Σ Number of packets sent *100

Table 4.2 Effect of the packet delivery ratio

Number of Nodes	DAG in %	LBPQN in %	ENDPQ in %
10	12	19	26
20	25	36	43
30	36	49	59
40	45	72	81
50	68	86	91

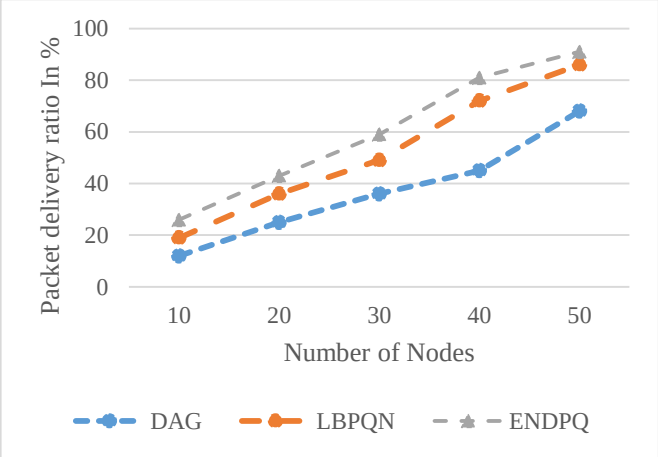

Figure 4.1 Effect of the rate of packet delivery ratio

In above Figure 4.1, Moreover, ENDPQ shows the highest packet delivery ratio when compared to others.

4.2 Routing Overhead

This metric represents the ratio of the amount of direction finding related control packet transmissions to some data communications.

Routing Overhead= Total number of control packets / Total number of data packet

Table 4.3 Effect of the Routing overhead

Number of Nodes	DAG in %	LBPQN in %	ENDPQ in %
10	26	16	13
20	46	32	26
30	66	55	48
40	83	76	65
50	94	90	86

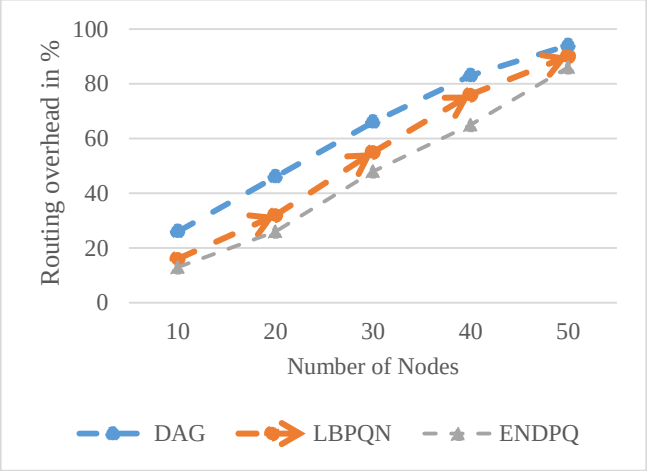

Figure 4.2 Effect of the Routing overhead

In the above illustration 4.2, Moreover, ENDPQ has shown the lowest routing overhead cost when compared with others.

4.3 End to End Delay

The time is taken by the data packet to reach from source to destination node.

End to End Delay=Arrival time – Sent time / Total number of connections

Average End to End Delay= Total End to End Delay / Total number of packets received.

Table 4.4 Effect of the End to End Delay

Number of Nodes	DAG in %	LBPQN in %	ENDPQ in %
10	19	16	12
20	29	23	19
30	49	42	34
40	67	55	42
50	82	77	65

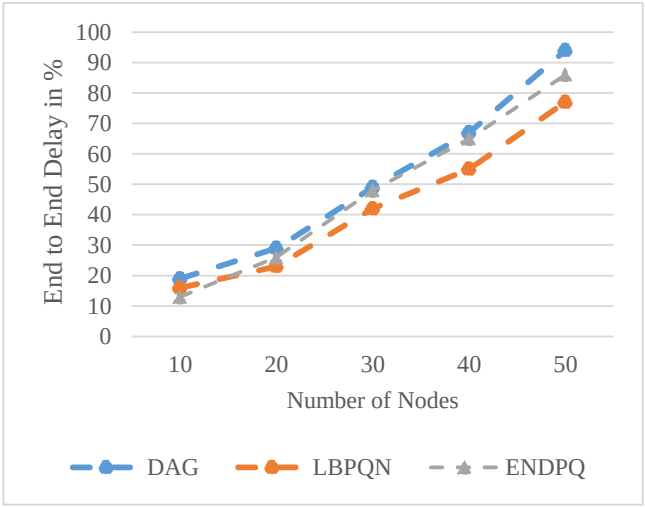

Figure 4.3 Effect of the End to End Delay

In the above figure 4.3, show that ENDPQ proves a minimum end to end delay rather than the others.

4.4 Throughput

It is defined as the total amount of data, that the destination receives them from the source which is divided by the time it takes for the destination to get the final packet.

Throughput= Total number of transferred packets / Time taken

Table 4.5 Effect of the Throughput

Number of Nodes	DAG in Packets	LBPQN in Packets	ENDPQ in Packets
10	11589	12698	13458
20	12589	13657	14582
30	13968	13974	14754
40	14874	14985	15685
50	14980	15120	15987

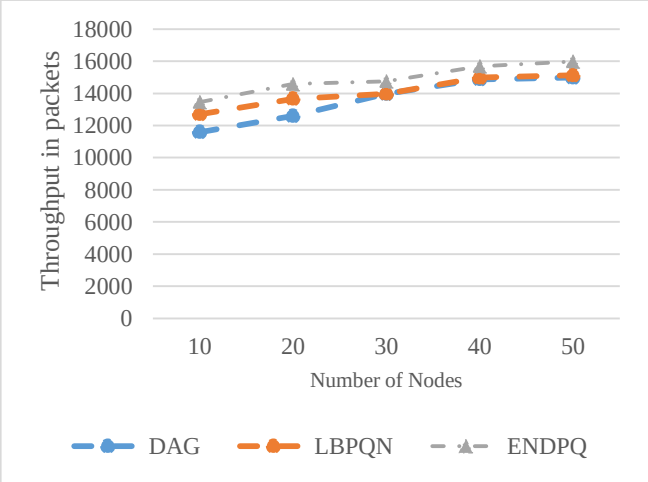

Figure 4.4 Effect of the Throughput

The results are captured in the above Figure.4.4 is ENDPQ experimental result shows that it is higher throughput compared with others.

V. CONCLUSION

We proposed an Edge Node Detecting through Piping Queue (ENDPQ) calculation with node duplication technique to perform secure correspondence based edge node information transmission. The proposed design gathers the arrangement of neighbors and their neighbors which have the area data of the neighbor found. Utilizing the complex stream elements of the two-hop neighbors, we process the edge node to distinguish the nearness of nodes in the whole neighbor list which demonstrates the nearness of adversary around the source node. The method performs course revelation with the distinguished edge node, and by accepting the demand, the neighbors perform course disclosure and abstains from sending the request to the assigned phony node or opponent node. The proposed strategy enhance the conveyance proportion up to 91% and diminishes the deferral additionally in the network.

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