Reduces the Link Failure in AODV Routing Protocol Using Leader Election Algorithm

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Abstract:. In this paper modified the AODV routing protocol for the detection of link failure. The modified protocol is called secured efficient routing protocol (SEAODV). The SEAODV protocol based on two functions one is leader based function and one is message based function. The leader based function measure the distance of normal node and failure node. Our proposed algorithm is very efficient in compression in ADOV routing protocol. For the evaluation of performance our modified protocol tested in different network scenario tested through simulations for different distributions of nodes and failure and different connectivity models. Under all the evaluated scenarios, the technique demonstrates excellent detection probabilities.

Keywords: - MANET, AODV, Link prediction, leader election

I.Introduction

The mobility and dynamic infrastructure of ADHOC network gives the flexibility and fast installation process. But due to mobility and dynamic infrastructure the failure of communication path is big issue in MANET network. Now a day's various authors proposed an improved routing protocol for routing stability and reliable path for communication. The failure of link is serious issue and creates the delay of network traffic problem and decrease the performance of mobile adhoc network. For the reduction of link failure prediction various algorithm are used such as secured backup routing protocol. The secured backup routing protocol provides the concept of alternate routing path concept for the purpose of communication. The route repairing function always estimated the two path for the process of communication. In this paper used distributed algorithm called leader election algorithm. the leader election algorithm based on the concept of group communication. It gives on the discovery process for the establishment of path in ELECTION, the large number of control message exchanges, overburden the communication link due to broadcast nature of the protocol. Also, ELECTION is not fault tolerant. Furthermore, in context of SEFA [12], author used clock synchronization, which is also not a preferred approach for manets. The protocol, in , may violate safety requirement due to the existence of multiple leaders simultaneously if multiple nodes do not receive heartbeat message due to some reason. Moreover, they implemented ELECTION directly without addressing the cons of ELECTION. The protocol also assumes the FIFO channel that is extremely difficult to warrant. In [23], authors have implemented only SEFA in a logical hierarchy without providing any solution for frequent leader failure in the network. Nevertheless, protocols, in [] are fault tolerant. The protocol, in [25], is different from ELECTION is term of network partition handing; however, the contribution is marginal. Essentially, the authors have re-presented ELECTION in some different words without any enhancement except network merge handling. Section II discusses about leader election algorithm Section III proposed method. Section IV discusses simulation finally, concluded in section V.

II. Leader Election Algorithm

The leader election algorithm is distributed the mobile node and process for selection of coordination among of all group node in terms of synchronization.

The entire mobile node in the distribute group have their personal id. If the not send any message to neighbors node id location identify the path of communication.

Algorithm process for path

Begin

Step1: call election message ()

Step 2: for k:=1 to n-1

Call update election message

Send election message to all mobile node

Endfor

Step 3 create control message

Step 4 communicate all node

Here initialed three condition for the prediction of link failure

i. Node have imitated the election message before prediction
ii. Node have imitated the election message after failure
iii. Node not create message and rapier the path.

1st condition process

Begin

Create election message

Set n= current node

Set F=ture

Add node id

Return end

2nd condition

If (n=true)

Then if (fail N !N)

Then create new path

Endif

Else

Add another route

Endif

End

3rd condition

Leader= all node id

Change the control message

Connect the node

Return

End.

III. Proposed Methodology

In this section discuss the proposed method based on leader election technique for the prediction of link failure. The algorithm steps describe here.

Notations

1. $P_{S,D}$ = path between source to destination, In which proposed algorithm estimate whether the link detected failure present in path or not.
2. $S^i = P^i_{S,D}$ and $T^{i+2} = P^{i+2}{}_{S,D}$,Where T is a temporary target for temporary source S.
3. Set i = 0.
4. NS^r = represent neighbor node sequence number of S^i where r = 1,2,3,……
5. $l_{NS^r,T=}$ represent the number of hope in between NS^r &T

Algo(S^i,T^{i+2})

Step 1- if (S^i = D-1)
Then no link detected in whole path P_{SD}
Else goto step 2

Step 2- S^i broadcast "HELLO" message to all neighbor node(NS) except $P^{i+1}{}_{S,D}$.

Step 3- All NS reply to S^i regarding to "HELLO" message.

Step 4- Every NS find a route to T^{i+2}
$(NS^r, T) = l_{NS^r,T}$
and reply in term of hops to source s^i.

step5 ¥ NS £ (NS^r,T)

Where ($P^{i}{}_{NS}{}^{r}{}_{,T}$) = S where i = 1,2,3,……

Then discard $l_{NS}{}^{r}{}_{,T}$

Step6 source (S) select minimum $l_{NS}{}^{r}{}_{,T}$ among all $l_{NS}{}^{r}{}_{,T}$

Step7 If (minimum $l_{NS}{}^{r}{}_{,T}$ <= T)

Then i=i+1

Goto step 1

Else

Exit link detected

IV. Simulation Result

To investigate the effectiveness of the proposed scheme in link failure prediction and minimization of power consumption in mobile adhoc network, the simulation on a simplified topology was carried out using Network Simulator version (ns-2.34)

Parameter	value
Simulation duration	100 sec
Simulation area	1000*1000
Number of mobile node	25
Traffic type	Cbr(udp)
Packet rate	4 packet/sec
Host pause time	10sec

Table-I simulation parameter

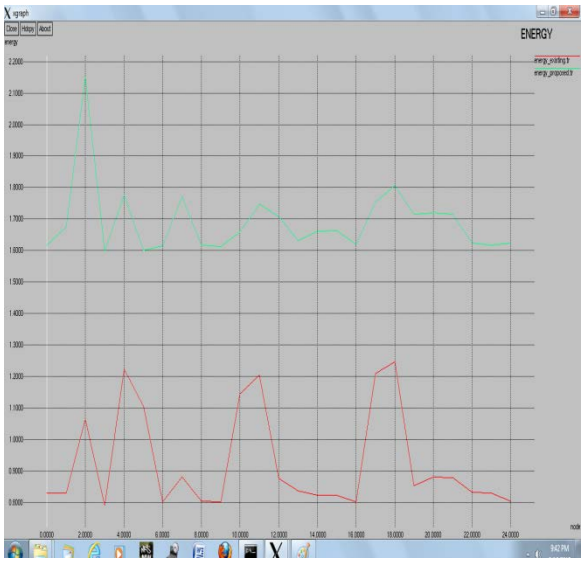

Figure 1 shows the power consumption of mobile node in given scenario of mobile node.

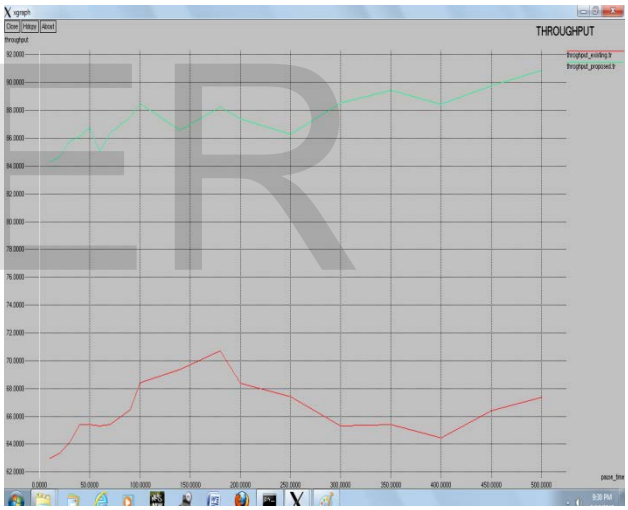

Figure 2 shows that throughput of packet send and received during failure mode.

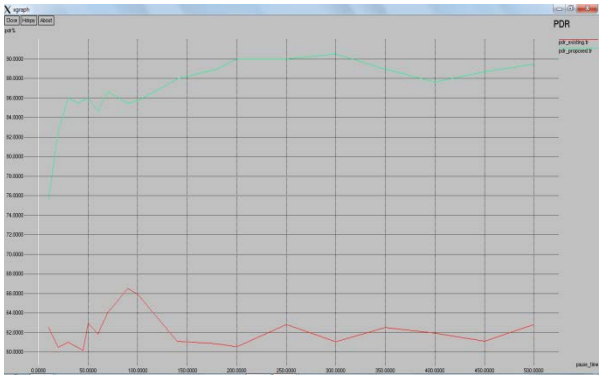

Figure 3 shows that packet transmits and received packet ratio during failure mode during communication of group node.

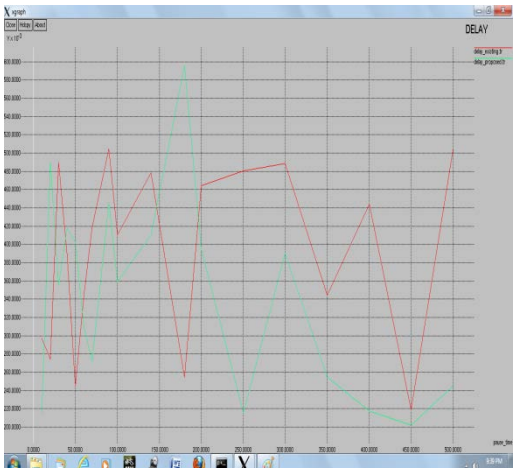

Figure 4shows that network life time of simulated node in given scenario.

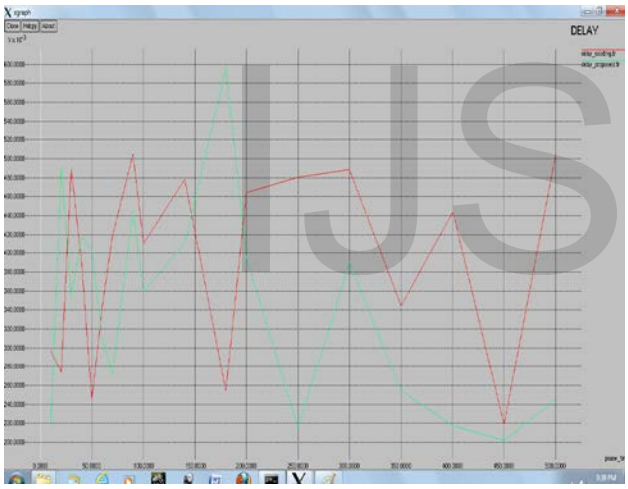

Figure 5.4shows that network life time of simulated node in given scenario of sleep node of power saving mode.

V. Conclusion & Future Scope

In this paper improved the AODV routing protocol for the link failure scenario. The link failure process decreases the performance of network in terms of delay of packet delivery for the communication. For the pervious algorithm used the concept of alternate path selection process. But the process of AODV routing protocol is on demand communication. So its not efficient technique for the prediction and repairing of failure of path. Here used leader election algorithm for the repairing and maintains of routing path. The leader election algorithm follows the concept of blocks message communication before the transmission. The proposed algorithm is very efficient in compression of secured backup routing protocol and AODV routing protocol. Our experimental result shows better performance instead of AODV routing protocol. In future minimized the limitation of election algorithm.

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