

Improving Performance and Avoiding Collision (Hidden node problem) in Adhoc Network by using RTR Based on Shortest Distance Method.

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Abstract-Ad hoc network or without infrastructure- **Ad hoc network** is a decentralized kind of network and temporary based network. It doesnot require any infrastructure for its network. There are two problems associated with the Ad hoc network- one is Hidden node problem and other one Exposed node problem. And there are number of techniques to remove hidden node problem like RTS/CTS handshake, MACA,MACAW, MACA-BI etc. But in this paper I am going to elaborate on how to improve performance of network by using RTR technique with shortest distance method.

Keywords- RTS/CTS, RTR, MACA, MACAW.

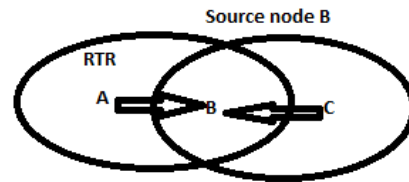


Fig 1 RTR packet send by node A and

C

I INTRODUCTION

Today the technologies used in various fields are at peak. And wireless network is playing important role in our day today life. Wireless network is generally of two types. Infrastructure based wireless network in which network rely on the pre-existing infrastructure like access points. It is mainly of three types LAN,MAN,WAN etc. Ad-hoc network or without fixed infrastructure is temporary based network which does not rely on the infrastructure that is it is decentralized kind of network. There are number of techniques used to remove Hidden Node problem in adhoc network and one of them is RTR technique which means ready to receive . Node that wants to receive data send RTR packet to the source node and source Node send data packet to that node. As a result hidden node problem is solved and also number of packets that are used in this technique are less as compared to other techniques.

Techniques To Remove Hidden Node Problem-

There are number of techniques to remove Hidden Node Problem like RTS/CTS, MACA,MACA-BI,MACA-W,CSMA,PAMAS,DBTMA.

II Problem Formulation-

To remove hidden node problem, RTS/CTS mechanism is used in which node that wants to communicate with other node send RTS (Request to send) to that node and RTS receiving send CTS (clear to send) to RTS sending node and all the nodes which are in its range .These CTS receiving nodes goes to waiting state for a time that is provided in CTS control packet i.e. CTS timer. But after that RTR technique is introduced in which node that wants to receive packet sends RTR to the data sending node i.e. Source node. As a result source node prepares a waiting queue based on shortest distance and send data to nodes according to shortest distance first.

Nodes	A	C	D	E
Distance	2	3.5	4	6

Fig 2 Distance from source node A

Send data first to
Node A due to
shortest distance

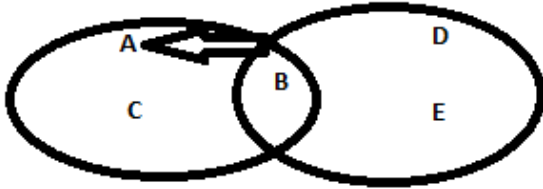


Fig 3 Showing source node sending data

Distance preference

Node Deployment

Total number nodes taken -50

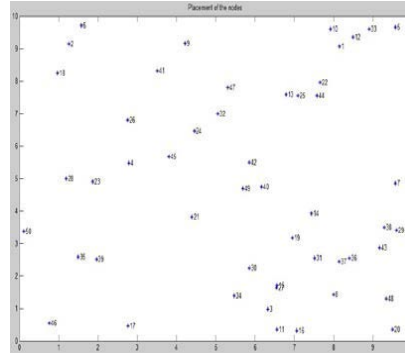


Fig 4 Deployment of nodes

III Methodology

Algorithm as follow- Step1 : Start

Step2: Receiver nodes send RTRs to source node.

Step3: Source Node receives RTRs and calculate distance by using any co-ordinates mathematical method

Step4: And source node calculate shortest distance from the all the RTR sending node.

Step5: And Source node send data to that receiving node which has shortest distance from it and a kind of waiting queue is prepared on the basis of shortest distance.

Step6: Send data

Step7: End

IV RESULT

Simulation Scenario-

Work on Matlab- Matlab is a numerical computing environment and programming language. Matlab allows easy matrix manipulation, plotting of function and data, implementation of algorithm, creation of user interfaces and interfacing with programs.

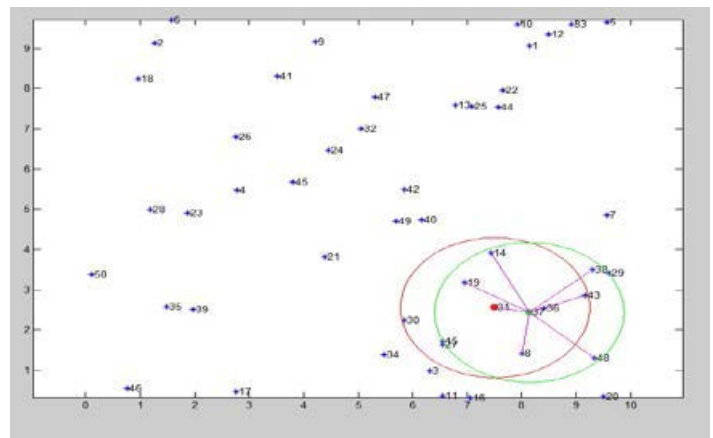


Fig 5 RTR (Ready to Receive)

Source node selected is 31 and all other node that are in its range start sending RtR packets to the source node indicated by red line . Source node 31 calculates distance from all other nodes and prepare a queue based upon the shortest distance from it . Here 37 node has the shortest from the source node 31 so 37 node recieves data first as indicated in fig 4 by green lines.

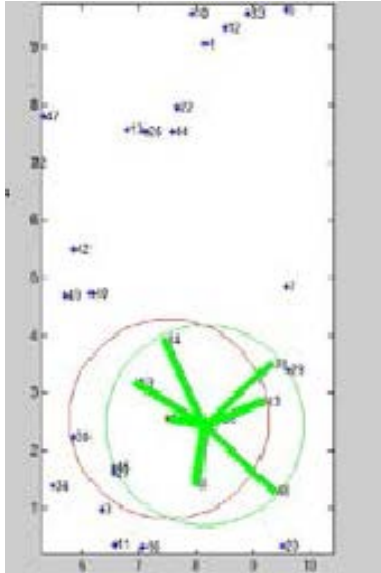


Fig 6 Nodes receiving data

As a result queue is prepared so node after 37 which has shortest distance as compared to other waiting node receives data first as a result hidden node problem is also get reduced as now nodes has to wait till communication is over and performance is also improved.

Results-

From the above scenario of communication between Node 31 and node 37, 19,14,38,29,43,36,48,8.

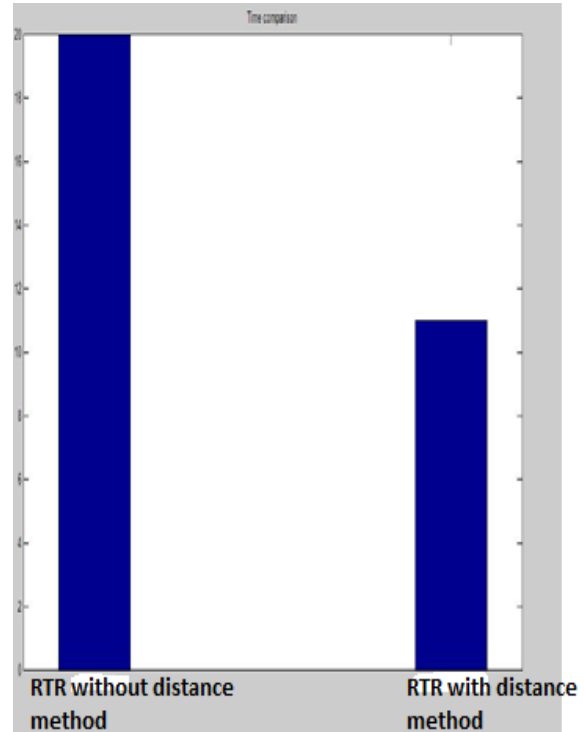


Fig 7 Time Comparison

With RTR having distance method time delay has also reduced as due to queue nodes send according to their distance and collision also get removed too. Fig5 presents time comparisons between two different techniques.

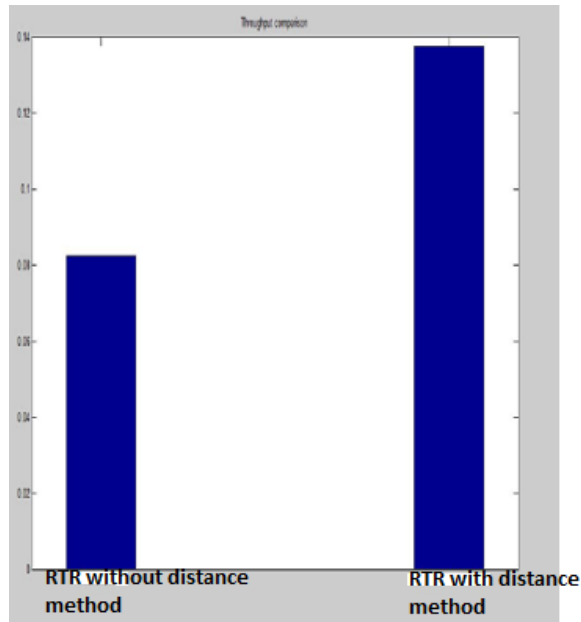


Fig 8 Throughput

V Conclusion- Various evaluation and Simulation results lead to following Conclusion-

Due to integration of RTR with distance technique performance of network has improved and also hidden node problem is removed.

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