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Channel Assignment and Performance Evaluation of AODV Algorithm in Wireless Mesh Networks

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Abstract:Adhoc Networks are those Networks which does not require complex configuration. Wireless mesh Networks are also a part of Adhoc Networks. Wireless Mesh Networks have capacity to support Internet Access at fewer expenses for mobile and as well as Stationary Networks. It involves multihopping techniques which involves routers in Wireless Mesh Networks. The main advantage here the geographical area can be increased without any disturbances in the existing Network. In this paper, we propose a Channel Assignment Method which reduces the congestion mechanism and tried to remove all the disadvantages in the earlier mechanism. With this concept, the main focus is given on reducing the packet drop when the network size is increased and maintain the same QoS parameters. As a result when the network size increases the same performances is expected and in turn covering more geographical areas.

Key words: DSR, AODV, Channel Assignment, GEAR,QoS.

I. INTRODUCTION

Wireless Communication is the fastest growing technology with many advantages and speed of communication is the highly appreciating part of Wireless Network. But Wireless networks have many issues like unclear coverage if geographical distance increases and congestion problems if more nodes are communicating at the same time resulting in a lower Quality of Signal and performance will gradually come down.

Wireless Mesh Networks can be solution to this problem as all the nodes are connected in a Mesh topology. Wireless Mesh Networks has Wireless Clients and Wireless Routers. Wireless Mesh Networks are capable of providing the Internet at less expense and it can use by both Wired and Wireless Clients and the speed is effectively maintained. Wireless Metropolitan Area Networks (WMN) can also address the same problem but it has demerits like mobility support and Handoff. The usage of Adhoc Routing Protocols in WMN will provide features like self-healing, optimize. But the achievable techniques in Wireless mesh Networks are Network traffic, Network Size and the congestion factor which reduces the QoS. This paper presents the work which results in lesser the congestion and expands the Network providing the same QoS even though more Mesh Clients and Mesh Routers gets added to the Network. Simulations are carried out in NS2 simulator version NS 2.29 to carry out our work and results are noted down.

II. RELATED WORK

In [1], AODV- CGA is been discussed but it has the demerit that when Network expands it takes more time to setup the transmission. As a result the time taken to deliver the Quality takes more time and if congestion is found then information will be lost. The Handoff factor is also a serious blow while the Network is expanding. The GEAR Protocol used fails to deal with scalability factor resulting in limited Wireless Routers and Clients. The MPR also reduces the number of packets to be re transmitted resulting in low quality.

III. AODV Protocol

AODV is a very much in demand protocol because it makes routes as and when it is required and it does not makes any routes in advance. So, this reduces the wastage of bandwidth. AODV results in route mechanism and maintaining that routes with the help of other protocols. AODV is responsible for sending the packets from source to destination and if destination is not available it will broadcast the packet so that all the clients may get the information regarding the destination part. When Network gets expanded the broadcasting mechanism is applied and the effort to reach the destination is also made. AODV may take help of other protocols like DSR which makes use of IP Source Routing.

IV. SIMULATION

The Simulation experiments are carried out in NS2 Simulator. The following parameters are considered in the Simulation like Simulation area, Simulation time, Transmission Range, Packet Size, Congestion factor, Mobility Models. The following tables describes in detail

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Simulator	NS2
Version	2.29
Simulation Area	1000 x 1000
Simulation Time	900s
Transmission Range	300 m
Packet Size	1024
Congestion factor	4
Mobility Models	Random Early Point

For performance evaluation of AODV protocol, 6 mesh routers are considered and 15 mesh clients are considered. Before the Simulation, the mesh routers are fixed at certain fixed points and while during simulations the mesh routers started to move and the client's interactivity changes as and when the network started to grow. The keen observation was carried out whenever the network expanded and the delivery of packets and quality of service was observed.

V. RESULTS AND DISCUSSIONS

The performance analysis was conducted by allocating the channel among different clients and performance evaluation of AODV was observed. The performance evaluation was conducted by increasing the number of clients and transmission load. The Packet Delivery when geographical area is increased is noted below.

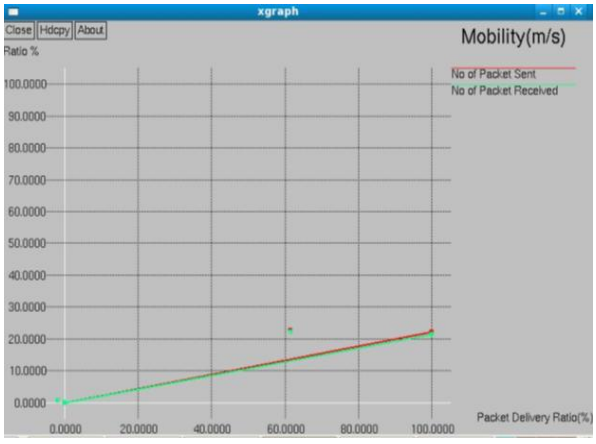

Fig 1. The number of packets send is almost equal to number of packets received when the geographical area is increased.

So, when the geographical area is increased the packet loss is reduced even though the different mesh clients are introduced. It gives clear evidence that more and more mesh clients can be added into the network and the packet loss is significantly reduced.

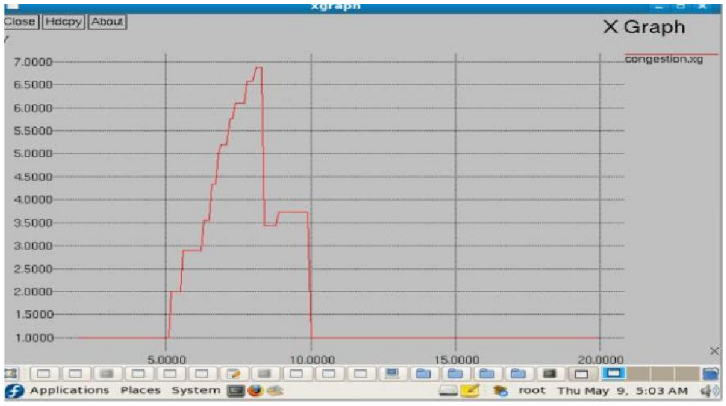

Fig 2 shows the speed of packets with the mesh network is constant. The overall congestion remains the same in smaller area and the larger area where more mesh clients and mesh routers are used.

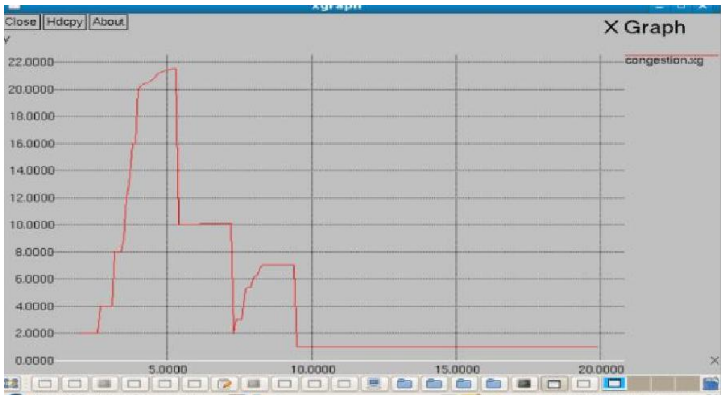

Fig 3 shows if we increase the packet size to 1024 bytes the congestion level remains the same for smaller network as well as larger network where more mesh clients and mesh routers are involved.

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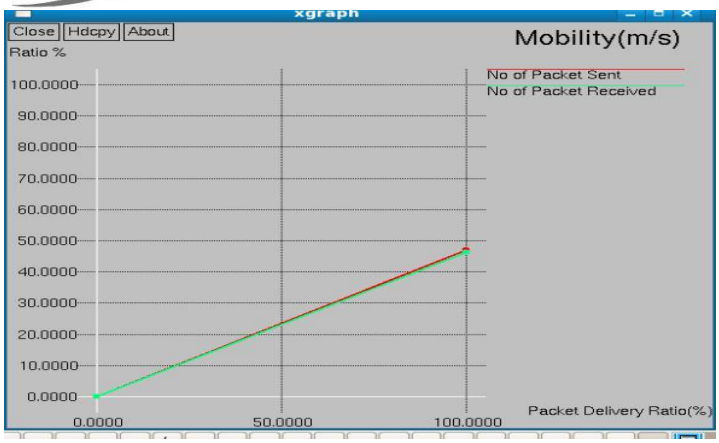

Fig 4 shows the Mobility and packet Delivery ratio when the Network has increased from less mesh clients to more mesh clients and more routers.

VI. CONCLUSION

The approach where Channel Assignment and Performance Evaluation deals significantly that AODV algorithm works efficiently when the no of nodes increases and geographical area gets increased. We have considered the various factors like packet drop, congestion factors in smaller networks and larger networks by increasing the nodes and the congestion remains almost the same for larger networks. The packet Delivery ratio across the larger Network also remains the same.

References:

i. *Provisioning of Deadline-Driven Requests With Flexible Transmission Rates in WDM MeshNetworks by Andrei, D.; Tornatore, M.; Batayneh, M.; Martel, C.U.; Mukherjee, B in 2010.*

ii. *Interference aware channel assignment in wireless mesh networks Authored by MassimilianoSlongo and TinkuRasheed in 2008*

iii. *B. Mukherjee, Optical WDM Networks. New York: Springer, 2006.*

iv. *B. Mukherjee, "Architecture, control, and management of opticalswitching networks," in Proc. IEEE/LEOS Photon.*

v. *Enhancing Performance of MAODV Routing Protocol for Wireless Mesh Network Using Integrated Multiple Metrics Technique (IMMT) Farhat Anwar1, Aisha Hassan Abdalla1, S. M. Sadakatul Bari1, Md. Akhtaruzzaman, MosharrofHussainMasud, JannatulNaeem, Md. Saiful Azad, Md. ArafaturRahman*

vi. *Asad Amir Pirzada, Marius Portmann and Jadwiga Indulska "Performance Comparison of Multi-Path AODV and DSR Protocols in Hybrid Mesh Networks"*

vii. *Wen Jin, "Wireless Mesh Networks structural Design on Modern Campus", published in 2009.*

viii. *"A smooth forwarding operation in WMN" by RaoGanapathy, Bim Haji Suaidi published in 2011.*

ix. *Routing Packets into Wireless Mesh Networks, Rainer Baumann, Simon Heimlicher, Vincent Lenders, Martin May*