International Journal of Research
Available at https://edupediapublications.org/journals
p-ISSN: 2348-6848
e-ISSN: 2348-795X
Volume 04 Issue 02
February 2017

Simulation analysis of Wifi and Wimax using AODV

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ABSTRACT

Wireless mesh network is a connection oriented network. It is also called as Adhoc network. WMN consist of mesh clients, Routers & Gateways. In WMN the packet loss will be the most common problem due to congestion occur. When each time the protocol chooses the same path. In "Congestion Reduction In Wireless Mesh Networks" these paper they use the protocol AODV in wifi network but the problems like Delay, Packet loss is more. In our "Simulation Of Wireless Mesh Network For Congestion Reduction" paper we are simulating the AODV protocol in WiMAX networks.

In this paper we are comparing the results of AODV in wifi & AODV in WiMAX. By using these AODV protocol in WiMAX the throughput is increases & Packet loss, Delay will decreases & we will get the better results.

Keywords—Congestion, Routing, Wireless Mesh Networks, AODV, DSDV

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1. INTRODUCTION

WMN is a network in which nodes are interconnected to each other. In this, If one of the node is failure throughout the network then also the complete performance of the network should be maintain through the simulation time. WMN consist of different networks such as INTERNET, IEEE802.11, IEEE802.15, IEEE802.16etc.

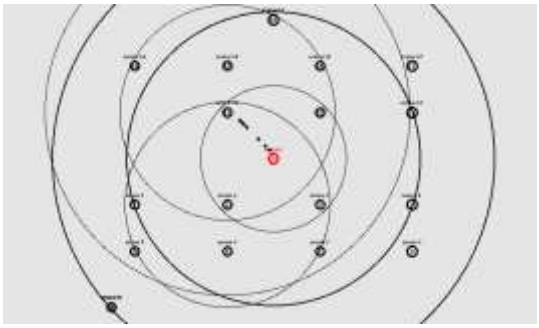

Figure 1: Simulation of WMN.

2. WiFi

WiFi is wireless fidelity and IEEE standard of WiFi is 802.11. WiFi officially launched in 1997. Hence, much research has been already done in WiFi technology. Speed of WiFi is 54 Mbps and it is wireless LAN. Frequency of WiFi is 2.4 GHz. And range of WIFI is very less i.e. 100m. In WiFi network FTP(File Transfer Protocol) protocol is used.

3.WiMAX

WiMAX means Worldwide Interoperability For Microwave Access. IEEE standard of WiMAX is 802.16. WiMAX launched in 2004. That's why very few research in WiMAX technology. WiMAX is wireless broadband network. The range of WiMAX is in Gbps. The frequency of WiMAX is 2GHz to 11GHz so that we can cover maximum area and the best example is Mobile Communication. Whenever people travelling they get stable network. The range of WiMAX is upto 50kms, line of sight. In WiMAX network OFDMA(Orthogonal Frequency Division Multiple Access) protocol is used.

4. ADHOC ON DEMAND DISTANCE VECTOR ROUTING PROTOCOL(AODV)

Ad-Hoc On Demand Distance Vector is a routing protocol design for wireless networks. This will be create the routes on demand i.e. establish the routes to the destination only on demand. It will support unicasting as well as multicasting routing. It creates routes on demand that's why it causes the power or it required less power. It sets the availability according to the connection. This AODV protocol is executed by increasing the nodes and the size of the packets due to this the throughput of the network is increases and the packet delivery is more in this protocol

5. RELATED WORK

In[1], "Simulation Of Wireless Mesh Network For Congestion Reduction" give the best results using wimax technology to reduced the congestion. We are comparing the results of

AODV & DSDV. The best results comes in AODV protocol. We reduced packet loss & delay. We are using AODV & DSDV protocols over that throughput, packet delivery of the protocol AODV is moreover DSDV and finally we are also comparing the graph of delay & throughput of AODV &DSDV protocols.

In [2], In this paper a congestion control scheme based on AODV routing protocol. The simulation results for AODV performs much better and improves network performance and show the increasing throughput and decreasing end to end delay. Congestion is decreased by applying the techniques of buffer in a modulated way. Wireless mesh network has immerged as a growing area of research for controlling the congestion.

In [3], A survey on congestion control in mobile Adhoc network give an overview of the present methods. In mobile Adhoc network different types of mechanism have been proposed to overcome the congestion control. In this paper, to discuss and compared different congestion control mechanism. In MANET each node act as a router, which helps to deliver packets from source to destination. In any congestion control algorithm the main objective is to balance the traffic to increase throughput of the network. It maximizes node transfer, packet delivery ratio and minimizes traffic congestion, end to end packet delay and network performance has been improved.

In[4], AODV based congestion control protocols discusses congestion control protocols in mobile Adhoc network. AODV was designed for networks with ten thousand of mobile nodes, it creates routes on demand. The performance is unicasting as well as multicasting. Since, it has no congestion control mechanism, the protocols based on AODV, EDAODV, AODV-I and CRP are discussed. AODV is a routing protocol and it works in three division route discovery , forward path set up and maintenance of route.

In[5], In this paper , we have proposed an efficient multichannel allocation and congestion control technique for WMN. Our proposed algorithm is simple to implement. It also assigns the channels so that the congestion is avoided and co-channel interference levels with same channel are reduced. We evaluate high throughput and channel utilization along with reduce latency which can be implemented in Adhoc network. In NS2 the efficient channel allocation and congestion control for WMN was implemented.

In[6], In this paper, the data is differentiated as high priority (HP) and low priority (LP) to make the delivery fast. It presents an overview over congestion aware routing and propose a new protocol to avoid loss of low priority packets is in a congestion aware routing. The main objectives is to derive a new congestion aware routing protocol for congestion control in wireless sensor networks to avoid loss of packets. We proposed new mechanism that achieves the packet delivery of the HP and LP by predicting the congestion in the wireless sensor networks.

In[7], In this paper, We propose agent based congestion control technique for Mobile Adhoc Network (MANETS). The congestion control scheme which includes routing algorithm and flow control at network layer is proposed. In this scheme, neighbors of source node are made mobile agents which collects and distribute the information about the network congestion. The performance technique with hope by hope algorithm. By simulation results, we have shown that it attains high delivery ratio and throughput with decrease in delay when compared with existing technique.

6. PROPOSED ALGORITHM

6.1. Simulation of AODV protocol in WiFi

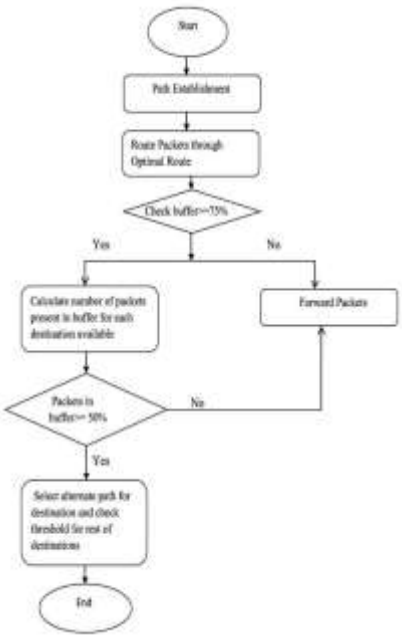

Figure 2: Flow Chart.[2]

Step 1: Consider multiple source destination pairs sending and receiving data at the same time.

Step 2: The route is established by broadcasting RREQ messages to all the neighbouring nodes and the node having path to destination responds to RREQ by sending RREP back using unicasting to source node via intermediate nodes creating a path from source to destination.

Step 3: Route Packets and Check buffer availability at each intermediate node whether it is greater than or equal to a threshold value.

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Step 4: If buffer space crosses a certain threshold value we will check for the second condition i.e. check number of packets in the buffer for particular destination.
Step 5: If the number of packets in the buffer for a particular destination is equal to or more than a certain threshold, consider an alternate path for transmission.
Step 6: Else forward packets through the same route.
Step 7: Repeat step 3 to 6 until all the destinations for which packets are available are covered.

6.2. Algorithm for simulation of AODV protocol in Wi-MAX

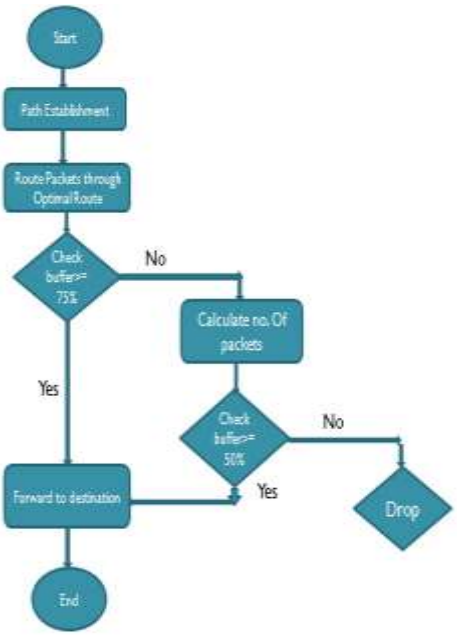

Figure 3: Flow Chart.[1]

Step 1: Consider multiple source destination pairs sending and receiving data at the same time.

Step 2: When sending the packets first check the buffer size. If buffer size is greater than or equal to 75% then packet delivered to destination.

Step 3: If buffer size is less than 75% then check buffer size is at least 50% or greater.

Step 4:If so, then packets are delivered to destination.

Step 5:Else,considering them to be garbage value, they're dropped.

The diagrammatic flow chart of algorithm is given in figure 1.

7. PERFORMANCE METRICES

1.Throughput: No. of packets successfully transmitted per second. It is measured in kbps. If the value of throughput increases then the performance of the network will also increases.

2.End to End Delay: Delay is the time required to send packet from source to destination. It is measured in seconds. If End to End Delay is minimized then performance of the network is increases.

8. SIMULATION RESULTS

This section represents the simulation results of two protocols evaluated by comparing two different metrics to get an idea of the network and to measure performance of the network.

8.1.GRAPHICAL REPRESENTATION

1. Throughput: The graph represents the throughput analysis with respect to number of nodes in AODV routing protocol. It is clear from the graph that the throughput of the Modified AODV is increasing as compared to the earlier AODV protocol. The proposed system gives better results in case of throughput hence increases the performance of the network.

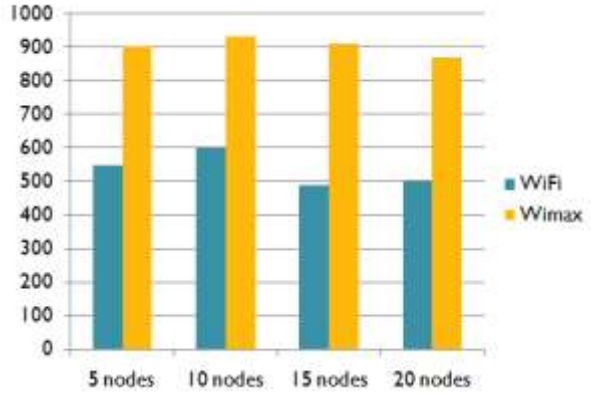

Figure 4: Throughput with respect to number of nodes

2. End to End Delay: The graph represents the End to End delay analysis with respect to number of nodes. The graph represents the decrease in end to end delay in modified AODV when compared with the earlier AODV protocol. The decrease in end to end delay clearly shows that the proposed system reduces the congestion problem and enhances the performance of the network.

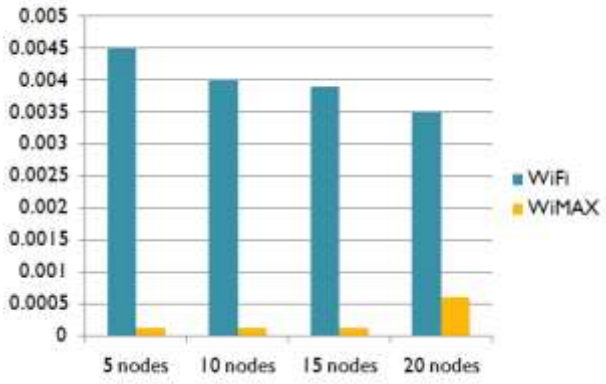

Figure 5: End to End delay with respect to number of nodes

9. CONCLUSION

In these paper we compare the results of AODV in wifi & AODV in wimax network and we conclude that AODV in wimax is better than AODV in wifi. Because range of wimax is more than wifi it covers large area & required less number of nodes so that's why AODV in wimax gives better results than AODV in wifi.

10. ACKNOWLEDGMENTS

I would like to thank my guide Prof. J.S.Gawai for her invaluable guidance throughout the course of this Research work. I am very grateful to her for her insightful and detailed comments and suggestions, which have helped me to improve my perceptive to complete my work entitled "Simulation of Wireless Mesh Networks using network simulator for Congestion Reduction". My signs of gratitude go out to my family and my friends, who had encouraged & inspired me with their blessings and consistent coordination. My acknowledgements would not be complete without expressing my personal belief in and gratitude towards God, our creator. None of this would have been possible without His blessings.

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