



Performance Analysis of DSR Using Different Networks

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Abstract: *The Dynamic Source Routing protocol (DSR) is a simple and efficient routing protocol designed specifically for use in multi-hop wireless ad hoc networks of mobile nodes. DSR allows the network to be completely self-organizing and self-configuring, without the need for any existing network infrastructure or administration. The protocol is composed of the two mechanisms of Route Discovery and Route Maintenance, which work together to allow nodes to discover and maintain source routes to arbitrary destinations in the ad hoc network. . In this paper OPNET simulation tool is used for analysing the performance of DSR routing protocol .In this simulation scenario different networks are used to measure the performance of DSR routing protocol. The experimental study has Traffic sent and traffic received parameters. The simulation results of the research have practical reference value for further study*

Keywords- MANET; routing protocols; DSR

I. INTRODUCTION

Mobile Ad-hoc Network (MANET)

A Mobile Ad-hoc Network (MANET) [1] is a temporary wireless network composed of mobile nodes, in which an infrastructure is absent. Nodes in these networks utilize the same random access wireless channel, cooperating in a friendly manner to engaging themselves in multihop forwarding. The node in the network not only acts as hosts but also as routers that route data to/from other nodes in network. Generally there are two distinct approaches for enabling wireless mobile units to communicate with each other:

Infrastructure

Wireless mobile networks[2] have traditionally been based on the cellular concept and relied on good infrastructure support, in which mobile devices communicate with access points like base stations connected to the fixed network infrastructure. Typical examples of this kind of wireless networks are GSM, WLL, WLAN, etc.

Infrastructure less

In infrastructure less approach, the mobile wireless network is commonly known as a mobile ad hoc network (MANET). A MANET[2] is a collection of wireless nodes that can dynamically form a network to exchange information without using any pre-existing fixed network infrastructure. This is very important part of communication technology that supports truly pervasive computing, because in many contexts information exchange between mobile units cannot rely on any fixed network infrastructure, but on rapid configuration of wireless connections on the fly. Wireless ad hoc networks themselves are an independent, wide area of research and applications, instead of being only just a complement of the cellular system

The main features of MANET are listed some as below:

1. MANET can be formed without any pre-existing infrastructure.
2. It follows dynamic topology where nodes may join and leave the network at any time and the multi-hop routing may keep changing as nodes join and depart from the network. It does have very limited physical security, and thus increasing security is a major concern.
3. Every node in the MANET can assist in routing of packets in the network.
4. Limited Bandwidth & Limited Power.

TYPES OF ROUTING IN MANET:-

- Proactive routing protocols
- Reactive routing protocols
- Hybrid routing protocols

II. DYNAMIC SOURCE ROUTING PROTOCOL (DSR)

The Dynamic Source Routing protocol (DSR)[3,4] is a simple and efficient routing protocol designed specifically for use in multi-hop wireless ad hoc networks of mobile nodes. DSR allows the network to be completely self-organizing and

self-configuring, without the need for any existing network infrastructure or administration. As nodes in the network move or join or leave the network, and as wireless transmission conditions such as sources of interference change, all routing is automatically determined and maintained by the DSR routing protocol. Since the number or sequence of intermediate hops needed to reach any destination may change at any time, the resulting network topology may be quite rich and rapidly changing. The protocol is composed of the two main mechanisms of "Route Discovery" and "Route Maintenance", which work together to allow nodes to discover and maintain routes to arbitrary destinations in the ad hoc network.

Important Properties of the Protocol

The DSR protocol [8] is composed of two mechanisms that work together to allow the discovery and maintenance of source routes in the ad hoc network:

- **DSR Route Discovery**

When some node **S** originates a new packet destined to some other node **D**, it places in the header of the packet a *source route* giving the sequence of hops that the packet should follow on its way to **D**. Normally, **S** will obtain a suitable source route by searching its *Route Cache* [5] of routes previously learned, but if no route is found in its cache, it will initiate the Route Discovery [6] protocol to dynamically find a new route to **D**. In this case, **S** is called the *initiator* and **D** the *target* of the Route Discovery.

- **DSR Route Maintenance**

When the transmission of data started, it is the responsibility of the node that is transmitting data to confirm the next hop received the data along with source route. The node generates a route error message, if it does not receive any confirmation to the originator node. The originator node again performs new route discovery Process [7]

III. SIMULATION

In this paper the DSR is analysed on different networks with the help of OPNET MODELER 14.0. The OPNET SIMULATOR is used to analyse the parameters like traffic sent, traffic receive on 50.

SIMULATION ON DIFFERENT NETWORKS

3.1 DSR Protocol in WLAN

Total Traffic sent for DSR Protocol in WLAN network

Fig1 shows variation of data received in bytes per second and for DSR protocol. From fig 1 it has been concluded that maximum value of voice traffic sent is approx 18000 bits per second.

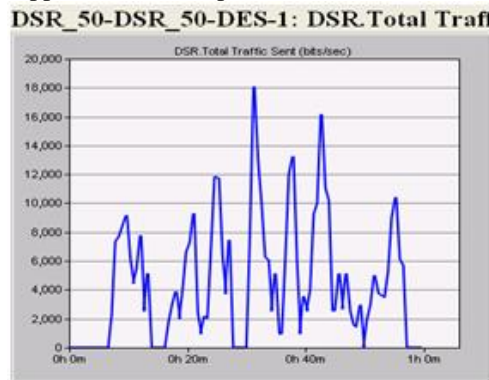


Fig1: Total Traffic sent for DSR Protocol in WLAN network

Total Traffic received for DSR Protocol in WLAN network

Fig 2 shows variation of data received in bytes per second and for DSR protocol. From fig it has been concluded that maximum value of voice traffic received is approx 19000 bits per second.

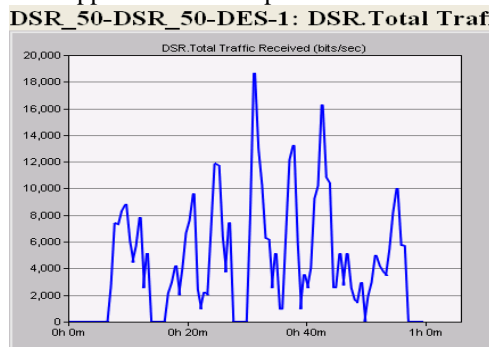


Fig2: Total Traffic received for DSR Protocol in WLAN network

3.2 DSR Protocol in MANET:-

Total Traffic sent for DSR Protocol in MANET network

Fig3 shows variation of data received in bytes per second and for DSR protocol. From fig it has been concluded that maximum value of data traffic sent is approx 21000 bits per second.

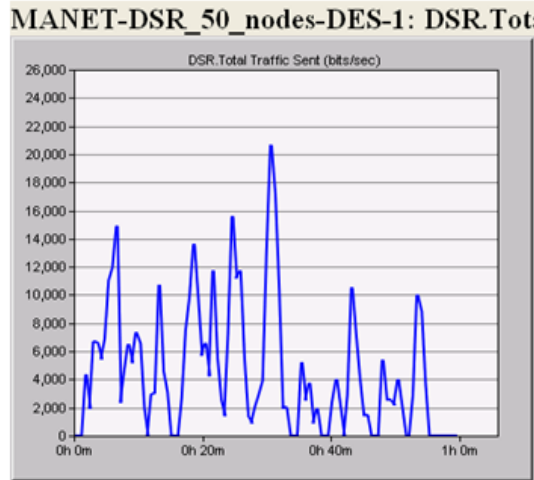


Fig.3: Total Traffic sent for DSR Protocol in MANET network

Total Traffic Received for DSR Protocol in MANET network

Fig.4 shows variation of data received in bytes per second and for DSR protocol. From fig it has been concluded that maximum value of data traffic sent is approx 21000 bits per second.

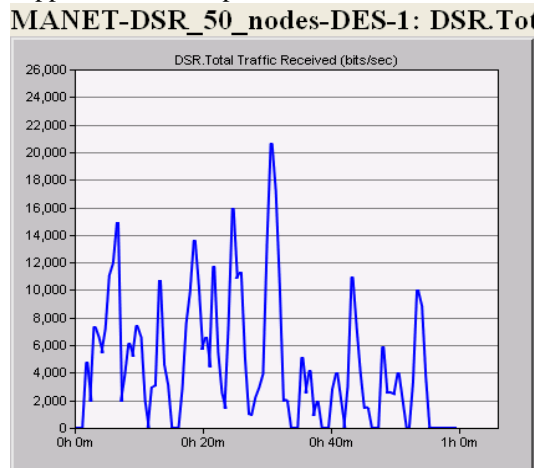


Fig.4: Total Traffic received for DSR Protocol in MANET network

IV. CONCLUSION

A Mobile Ad-hoc Network (MANET) is a temporary wireless network composed of mobile nodes, in which an infrastructure is absent. So in this paper we have two scenarios made up of 50 nodes which is simulated on opnet modeller 14.0. In this paper i have analysed DSR protocol on two different networks which is MANET and WLAN networks. as it is observed from the above results that DSR protocol performs best in MANET network as traffic sent is equal to traffic received whereas in WLAN networks traffic sent is less than traffic received. In WLAN networks, traffic received is more than traffic sent. so in the end ill conclude that performance of DSR is best in MANET as compared to WLAN networks

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