Performance Analysis Of Dynamic Source Routing In MANET

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Abstract: **This research paper comprises performance in terms of utility of dynamic source routing in MANET.MANET is a mobile ad-hoc network which is a collection of wireless mobile nodes(forming temporary network without the use of any pre-existing network).such network needs no rationalize control organ and is perfectly suited to many application, disaster, sensor network. MANET comprises many routing protocols like DSDV,GSR,AODV,DSR. Dynamic source routing protocol is a simple and efficient routing protocol designed specifically for use in multichip wireless ad-hoc network of mobile nodes. This paper basically presents a protocol DSR which adapts quickly to routing changes and depicts more optimum performance of DSR in MANET. Using simulation study it is shown that how DSR's performance has been enhanced in MANET.**

Keyword: **MANET, DSR, RREQ, RREP.**

I. INTRODUCTION

A Mobile ad-hoc network is formed by a group of mobile host without any backbone. To start a communication all the host in group, co-operate among themselves to forward the packet on behave of each other. Number of protocols have been designed and many of them are under development.DSR among all is one of popular routing protocol mobile ad-hoc network .since most of the algorithm are designed for one source to multiple destination i.e. uncasing we are considering just opposite condition that is multiple source and one destination and results of the emulation will show the aggrandized performance of DSR.A Mobile ad-hoc network (MANET)[1]is a kind of wireless ad-hoc network and is self configuring network of mobile routers and associated most connected by wireless links the union of which form an arbitrary topology[1]. Along with the development of ad-hoc network the size of network also become abundant and thus require assuring to deal large ad-hoc networks efficiently. The structure of network changes dynamically due to mobility of nodes [2].the nodes in the network not only acts as a host but also as router that route data to/forms other nodes in network. Each device in a MANET is free to move independently in any direction and will therefore changes its links to other devices frequently[3]. Routing protocol used in ad-hoc network must automatically adjust to environments that can vary between extremes of high mobility with low bandwidth and vice versa. Much protocol had been designed under the three main classifications of protocols for MANET.

ROUTING PROTOCOL

- TABLE DRIVEN PROACTIVE ROUTING PROTOCOL
  - ➔ OLSR
  - ➔ DSDV
  - ➔ WRP
- ON DEMAND DRIVEN ROUTING PROTOCOL
  - ➔ AODV
  - ➔ DSR
  - ➔ TORA
- HYBRID ROUTING PROTOCOL
  - ➔ ERP

In the proactive protocol, each node has routing table and is updated periodically even when the nodes do not need to forward any message.[6]

In reactive protocol, the routes are calculated only when required. i,e when a source wants to send an information to same destination it calls on route discover mechanisms to find the best path route to the destination.[7].

The hybrid protocol try to use a combination of both the concept in order to improvement [3].

II. DYNAMIC SOURCE ROUTING

These protocols find the route on demand by flooding the network with route request packets. The main characteristics of this protocol are –
- ➢ Path finding process only on demand
- ➢ Information exchange only when required
- ➢ For route establishment the network is flooded with request and replies.

WORKING OF DSR:
- ROUTE DICOVERY
- ROUTE MAINTANANCE

III. ROUTE DISCOVERY

When a node sends a packets to destination, firstly it looks at its route cashes the route previously named ,if no route is found in its cashes then the nodes begin the route discovery process with route request packet(RREQ) broadcast.

This packet includes the destination address. The source and the identification number(request id).each node receiving the RREQ, looks for the destination in its cashed, if it does not know the route to the destination, it adds its address to the route record in the RREQ and propagates it as a local broadcast packet.
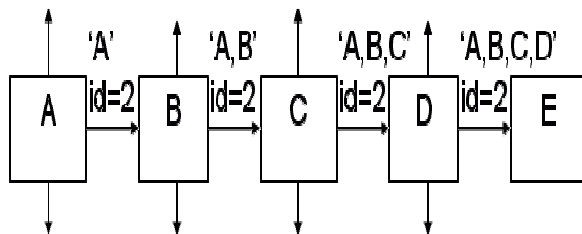
DIAGRAM:

Fig1: route discovery

A route reply (RREP) is sent when the RREQ reaches its destination, it has the route record. If the node that generates the route reply is destination, then it copies the route record sent in RREQ. if the node that generates the route reply (RREP)is an intermediate node then it add to the route record sent the route to destination stored by it.

IV. ROUTE MAINTAINANCE

The maintained of the route is to check the operation of route and to report any routing error to the source. This check is made between consecutive nodes. When there is a problem in transmission found in link level, the route error(RERR)packets are sent by the nodes. The route error has the address of both nodes in which the link failed [7].
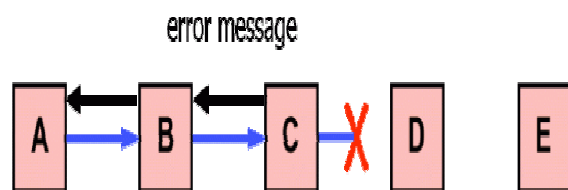

Fig: route maintained

V. PERFORMANCE ANALYSIS OF DSR/COGITATION OF DSR

By considering multisource to single destination in ad-hoc networks cogitation of DSR will be accomplished.The two sources D1 and D2 are suppose to transmit their packet in gap by milliseconds to single destination R1.now D1 starts its process millisecond before D2 and find out the best path P1 to transmit the packet. after milliseconds D2 also find out the best path P1 for transmitting the packet to R1 but which

is already occupied. Hence D2 opt the second best path which is less efficient then to P1.after certain period of time path P1 is free as D1 finished the transmission. now D2 will never turn up to path P1 until and unless any error occurred or any network failure occurs.

So to achieve an optimum performance from DSR in case of multiple source and shared path, a mode of operation will describe.

As D1 has completed its task and about leave the path P1 unused it will send a route reply(RREP)like an acknowledgement. This route reply will acts as an interrupts for another source D2.

Again at D2 the new metric will found with best one path and if P1>>P2.so now D2 will switch to P1 gradually. As D2 changes the path and switch to P1so we can say the packet delay will reduces and also throughput will improves.
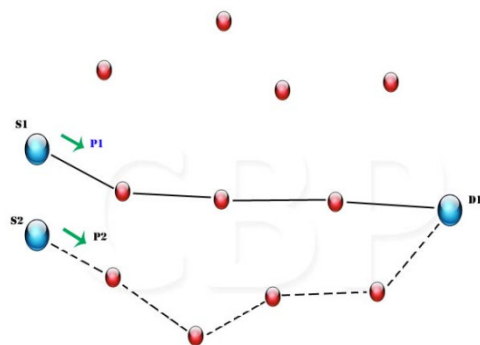

Fig 2: multiple source and common best path

VI. SIMULATION

What simulation exactly means ? actually it is a imitation of the operation of real world process or system overtime.

Methodology is based on network simulator but before network simulator. What does simulation technique means? it is a technique where a programme models the behaviour of network either by calculating the interaction between the different network entities, using mathematical formulas or actually capturing and playing back observation from a production network[3].

Network simulator is a piece of s/w or h/w the predicts thru behaviour of network without an actual network being present. a network simulator is a s/w programme that imitates the working of computer network.

> Simulation tool:

Network simulator-2 is composed of two parts : a) TCL code b) c++ code

TCL Code: it is used to communicate with simulator and permits to define different simulation parameter

C++ Code: it is a main part of project as it basically defines how the simulator have to work.

Why NS-2?

Ns-2 is chosen as simulation tool among other due to the following reason

* ❖ As it easily produces network environment for ad-hoc network.
* ❖ Wireless channel module.
* ❖ Routing along multiple path.
* ❖ Mobile host for wireless cellular network.

> Simulation environment:

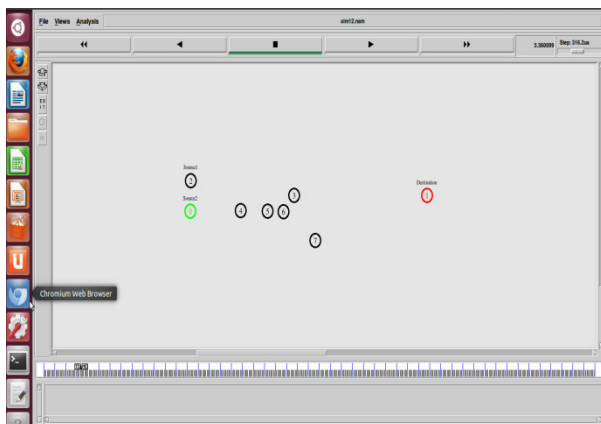| Routing protocol	Dsr
Mac type	802.11
Transmission range	450m
Simulation time	100
Topology size	1500x1500
Number of nodes	8
Traffic type	CBR
Packet size	512 bytes
CBR rate	600kbps
Queue length	50

VII. SIMULATION RESULT

Fig 3 : screenshots of nodes position

Fig 4 : screen shots of both the sources sending according to DSR

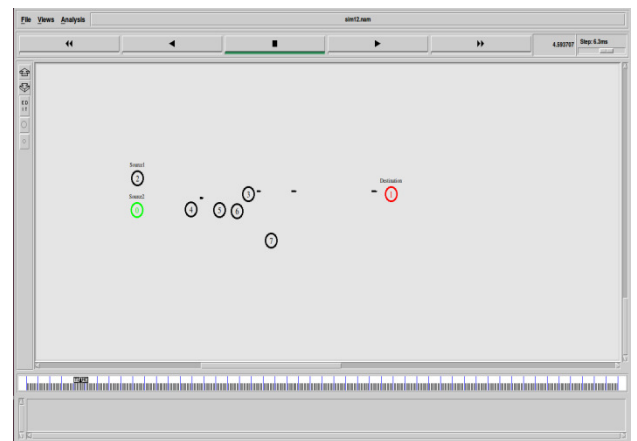Fig 5 : screen shots of both the sources sending according to DSR

Fig 6 : screen shots of both the sources sending according to DSR

VIII.   CONCLUSION

This paper concludes the analysis of dynamic source routing in mobile ad- hoc network. By using network simulator-2 with the specified environments the performance of dynamic source routing is enhanced i.e. multiple source and single destination. Though the throughput remains same. In future research throughput can also be enhanced to increase efficiency of dynamic source routing in manet.

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