

Performance Evaluation of Various Routing Protocols with Geographic Greedy Forwarding In Ad-Hoc Network

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Abstract–The wireless networks is most advanced in the field of networking. Ad-hoc is the new era in the of filed networking an Ad-hoc doesn't required support of any kind buy means of infrastructure or any administration to handle out the work. They have very limited range in which Ad-hoc work irrespective of their geographical situation .Mainly the work in two forms one is node as carrier and transmitter which is very complex in any case. They are not restricted to only one position the can move to other location as time pass. (MANET)in general is said to be wireless Ad-hoc network. They are called peer-to-peer, and self-constructing network. As topologies change rapidly the new term ology comes to play new technology almost Sideline the guidelines or connect them to the larger Internet space. These are suitable for various protocol such AODV, DSDV,AOMDV DSR and GREEDY which are available to use on this paper we going to compare Ad-hoc routing protocols. On the bases of Percentage out of order Delivery, End to End delay, jitter, throughput. In this paper

all assumption are carried out for comparative study for future research.

Keyword – MANET, AODV, DSDV, AOMDV, GREEDY, DSR, PDR,

1 Introduction

The wireless networking is most prominent now days which enable the one particular user to share the data and the services which may be regardless of their geographic position. Wireless networking is classified in two types: one is Infrastructure Networking and Infrastructure less (Ad-hoc) Networking infrastructure network is a network in which mainly is the collection physical things that can be anything like server or network components. They are mainly bunch of things which are moveable from one place to other place and they are only things which can think intelligently

Infrastructure less (Ad-hoc) Networks Wi-Fi networks are generally created by Wi-Fi routers while ad-hoc networks are usually short-lived networks created by a device. But it isn't always so simple. Mobile networking in which all nodes can be connected dynamically in the

arbitrary fashion their ranges are short in this each node acts as a self-router and transmit the data. Ad-hoc mode is also known as “peer-to-peer” mode. The Ad-hoc networks don’t require an admin access point. Devices on the wireless mode can connect to other in this mode services[1,2].

Geographic Greedy Forwarding

Geographic greedy is one out of several types of ad hoc routing protocols which are reactive, proactive geographic stateless routing the geographic is the simple routing protocol to be implemented on the NS2. It has various factors to be used first one is that no node in a network does not maintain any routing table. That we are going to keep neighbors list at the routing component but such information is available at logical link layer Geographic greedy forwarding one of the most simple to implement and as efficient to transmit the data. This is the reason why we are using the greedy in networking this makes it as a most promising selection in routing wireless. In this destination of particular node is selected by the forwarding the node through the selection of each intermediate node in a completely full filled distributed system. Then the packet has to be forwarded to make a hop by hop with its route. Geographic greedy has to face some challenges like holes are used to make sure that forwarding process should be blocked this type of node is called stuck node. It can be caused by jamming, power exhaustion and noise interference

The geographic greedy forwarding protocol can be implemented by five steps.

- 1.) On receiving a packet from the upper most layers, in the source node adds a header including the destination Identification and location.
- 2.) Source nodes send packet closer to their ally neighborhood which remain always close to them.
- 3.) After receiving packet from a neighborhood node forwards the packet if it has been already exists. Then it became destination.
- 4.) If there is no neighborhood closer than it is called local minimum simply drops the packet.
- 5.) When the packet is made through this entire step it finally reaches its destination then the geographic routing gets completed.

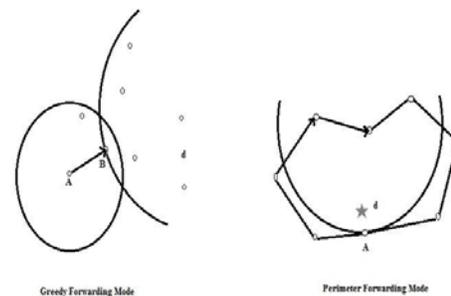


Fig 1: Greedy forwarding node

2 Installation and Compilation in NS2

The installation take place in LINUX operating system the steps are -:

1) First step is to unzip the ns.allinone-2.34.tar_1.gz folder after getting it done ns-allinone-2.34 is our folder.

2) Second step copying the folder ns.allinone-2.34.tar_1.gz, now it will give ns-allinone-2.34.tar_1.

3) Third step extract and make ns-allinone-2.34.tar_1.gz get ns-allinone-2.34.tar_1.

4) Go to ns-allinone-2.34 folder and ./install.

There are various steps to be performed

1) Open terminal and edit .bashrc file.

2) Add the TCL library, LD library path in .bashrc file .save this.

To run this in NS2 on windows platform it required.

Then type this command /user/local/ns-allinone-2.34/ns-2.34/directory again go to terminal and type this.

```
#.configure
```

```
# .make clean
```

```
# .make
```

```
# .make install
```

After completion of the installation part and recompilation, then this NS file is created.

```
#ns [<file>][<args>]
```

3Ad-hoc Routing Protocols for Wireless Network

Ad Hoc On-Demand Distance Vector Routing (AODV)

The AODV is active only when we want to discover routes .It has similarity to DSR which has same character which discovers route when they are on demand by user .AODV has very mechanism in which it maintain routing information in the routing table in which only one entry of packet is allowed for particular destination. But in DSR it allows multi point destination because of the cache which highly store the routing information in table. They are completely depended on the routing table's entry for the destination. When packets has source of information and route of destination known to then first they will send RREQ which means request then after that route will RREP replay to the packet for transmission[3-5].

Dynamic Source Routing (DSR)

The DSR is advance from of AODV in which it has the route cache, route maintenance. DSR is reactive and it's also to be known as bi-directional links. These nodes are used to be self-maintained without the need of administration. A hop which provide next pass to packet which is passed through source to get to the destination the source must tell the address of destination after this it pass the all route info to hop which is nothing but gateway, switch between the source to

destination. Cache memory where the previous destination is stored in order to fast moving if the similar address occur again. It has two operational mode one is “route discovery” and second one is “route maintains”[3-5].

Ad-hoc On-demand Multiple Distance Vector (AOMDV)

AOMDV is Ad-hoc multiple distance vector which is an advance version on AODV .In this all routers gives advertise to hop count to other , because of its property of route discovery it always try to find more and more multi paths between source and destination. When the route which fails to deliver the packets it search for new route to deliver that. Sudden routes are not formed only new routes are formed when all other not able to deliver the packet. One of the best efficient way to transfer of data

Greedy Routing on Ad-hoc

Greedy routing is a position based routing is routing principal that heavily really on the base of geographic position information. It can be used in wireless networks because of its greedy nature this protocol always look for shortest and best path irrespective of the conscious. In this routing protocol nodes are self-determine to tell their current position and so that of the source has the current information of destination. In this the packet which is carrying the info of destination should not come in

contact with network topology or route discovery.

4Factors for Performance Evaluation in Ad-Hoc network

Percentage out of order Delivery

In this the information which has to send to destination the rate of dropped information by the mean of external measure of connectionless routing of particular node to transport layer protocols such as TCP which prefer in-order delivery.

Measur ed	50 Nodes			
	AOD V	DSR	DSDV	Greedy
No. of packets Send	447	488	469	493
No. of packet receive	440	485	287	490
Packet deliver y ratio	98.45	99.37	61.23	99.49
Control Overhe ad	40598	8698	1880	41723
Delay	1.1726	40665 6	0.3380 76	0.29792 1
Jitter	0.0319 56	0.036 31	0.0253 3	0.04123 65
No .of packets droppe d	3451	5	242	3

Table 1: No. of Nodes 50

End to End Delay

Simple term to express delay is average time or actual time of a packet to reach its destination with respective time given to it but delay caused by various factor like search for route discovery by router, data packet in queue wait of its turn to get transmitted to final destination. The packet which made through the queue is counted or gets marked by the router. If the end to end delay is lesser in any protocol the efficiency of data packet delivery almost become high [5-7].

$$\text{End To End delay} = \frac{\sum \text{Arrival time} - \text{send time}}{\sum \text{Number of connection}}$$

Throughput

In general the throughput is measured by the productivity of a machine[6-7] .Total number of packet send in a particular period of time, basically we see check for the system performance, efficiency,rate of transfer from one node to another node at fixed time provided to it . By simple mean we can say that throughput is one of the main factor in the routing protocol which give us idea of bit rate/time for packet .It is measured in Kbps, Mbps, and Gbps.

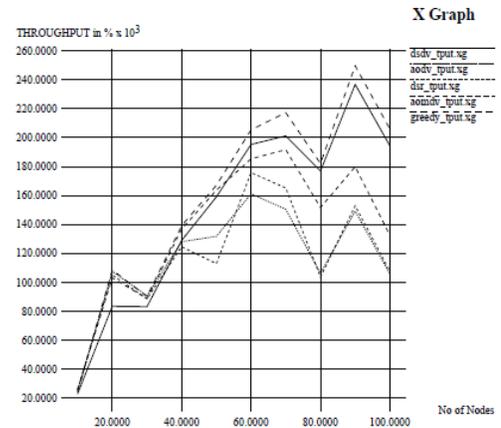


Fig: 2 Throughput vs. Number of nodes
Jitter

Jitter is one of the factors in wireless networks which make connection nervous all the time .Due to the various delays in reaching of packets in time, efficiency, congestion, hardware and more in that list but main factor is from. Sometime the jitter factor is high that packets are out of reach this causes the drop in packets.

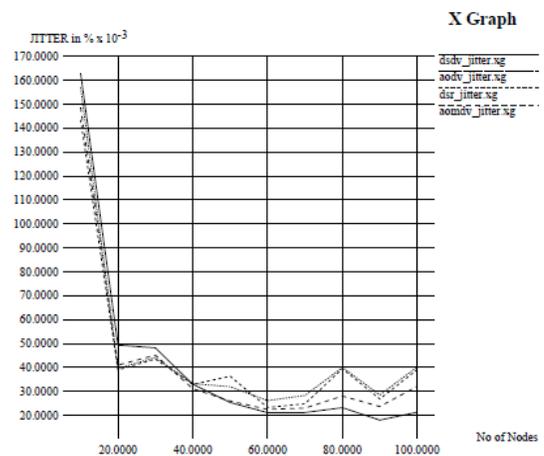


Fig 3: Jitter vs. Number of nodes

CONCLUSION

After evaluating all the factors of routing the AODV, DSDV, DSR, AOMDV and GREEDY on some cases like End to End delay, Throughput, jitter greedy always has showed up advanced improvement .Protocols other than this does not have a direct impact on the data routing performance.Data traffic in greedy is compare to be less so that packet deliveries always improving in many any case we see greedy always give better result in any case. In many cases the power efficiency is more likely get reduce as the data load or packet transfer is more, for that we make sure that routing protocols should have the power factor remains always high.

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