Evaluation of Table Driven Protocols-DSDV & OLSR in MANET

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Abstract— Ad-hoc networks are wireless networks where nodes communicate with each other using multi-hop links. There is no stationary infrastructure or base station for communication. In the infrastructure network base stations are fixed. A MANET is a type of Ad-hoc network that can change locations and configure itself on the fly. Routing in Ad-hoc-networks has been a challenging task ever since the wireless networks came into existence. A number of protocols have been developed for accomplish this task. The objective of the proposed work is to study the Table driven(Proactive) Protocols- DSDV and OLSR protocol performance on the basis of Cumulative sum of no. of all generated packets, Throughput of dropping packets, Packet Size Vs. Average throughput of sending packets, Packet Size Vs. Average throughput of receiving packets, Throughput of receiving bits Vs. Maximal Simulation processing time. Output results are compared using network simulator-2(NS2) between DSDV and OLSR.

Keywords: Proactive, DSDV, OLSR, MPR, Throughput, Maximal Simulation Time

I. Introduction

DSDV protocol is proactive protocol and enhanced version of Bellman ford algorithm and DSDV keeps the simplicity of Bellman Ford algorithm, avoid looping problem and remain compatible in cases where a base station is available. And idea behind the DSDV is to modify the Bellman ford algorithm. DSDV adds two things to distance-vector routing.

– Sequence number; avoid loops
– Damping; hold advertisements for changes of short duration.

The tables are updated either using a "full dump" or an incremental update. A full dump send the full routing table to the neighbors and could span many packets whereas in an incremental update only those entries from the routing table are sent that has a metric change since the last update and it must fit in a packet. The route information broadcast by each node contain

– Its new Sequence Number
– Each route
– The Destination's address
– The number of hops required to reach the destination
– The Destination Sequence Number.

Each row of the update send is of the following form:

– <Destination IP address, Destination sequence number, Hop count>

In OLSR, only nodes, selected as such MPRs, are responsible for forwarding control traffic, intended for diffusion into the entire network. MPRs provide an efficient mechanism for flooding control traffic by reducing the number of transmissions required. OLSR minimizes the overhead from flooding of control traffic by using only selected nodes, called MPRs, to retransmit control messages. This technique significantly reduces the number of retransmissions required to flood a message to all nodes in the network. Secondly, OLSR requires only partial link state to be flooded in order to provide shortest path routes. The minimal set of link state information required is, that all nodes, selected as MPRs, must declare the links to their MPR selectors.

II. Simulated Information

Parameters	Value
Simulator	NS2
Channel Type	Channel/Wireless Channel
Radio-propagation model	Propagation/TwoRayGround
Network Interface Type MAC Type Interface Queue Type	Phy/WirelessPhy Mac/802.11 Queue/DropTail/PriQueue
Maximum packet in ifq	50
Link Layer Type	LL
Antenna Model Set val(nn) Set val(rp) Set Val(x)	Antenna/OmniAntenna 10/50 DSDV 500
Set val(y)	400
Set val(stop)	140

Fig. 1: Simulated Information of DSDV Protocol

Parameters	Value
Simulator	NS2
Channel Type	Channel/Wireless Channel
Radio-propagation model	Propagation/TwoRayGround
Network Interface Type	Phy/WirelessPhy
MAC Type	Mac/802.11
Interface Queue Type	Queue/DropTail/PriQueue
Maximum packet in ifq	50
Link Layer Type	LL
Antenna Model	Antenna/OmniAntenna
Set Val(nn)	10
Set Val(rp)	OLSR
Set Val(x)	500
Set Val(y)	400
Set Val(stop)	140
Set Val(seed)	0.0
Set Val(cbr-start)	30.0

Fig. 2: Simulated Information of OLSR Protocol

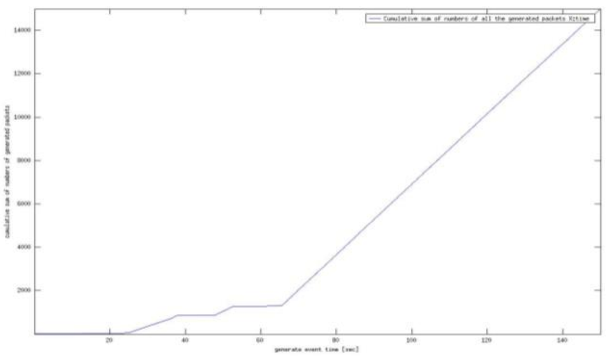
III. RESULTS

Comparison between DSDV & OLSR is made depending on these parameters:-

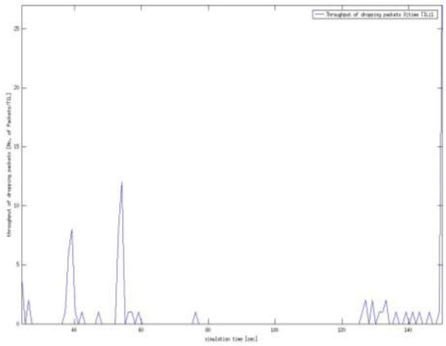
- Cumulative sum of no. of all generated packets.
- Throughput of dropping packets.
- Packet Size Vs. Average throughput of sending packets.
- Packet Size Vs. Average throughput of receiving packets.
- Throughput of receiving bits Vs. Maximal Simulation processing time.

A. DSDV Protocol Analysis

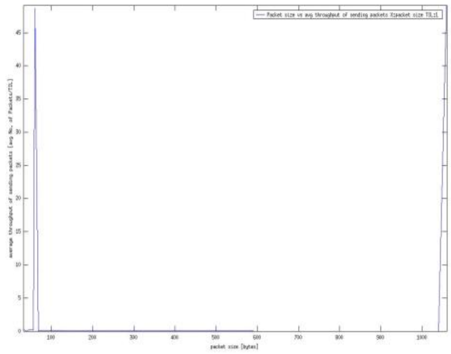
1) Cumulative Sum Of No. Of All Generated Packets



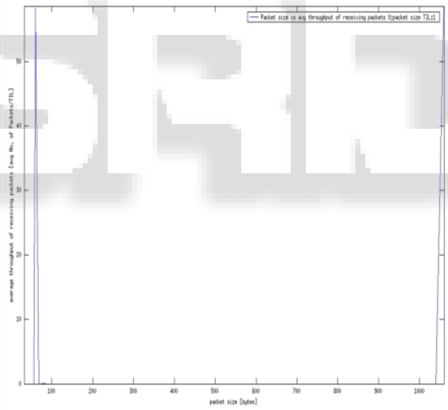
2) Throughput Of Dropping Packets



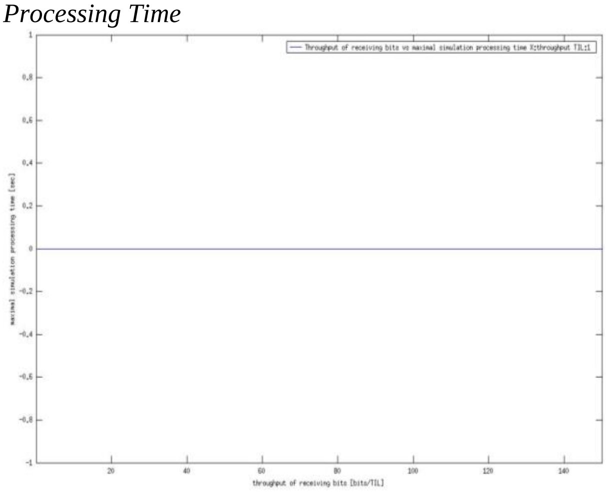
3) Packet Size Vs. Average Throughput Of Sending Packets.



4) Packet Size Vs. Average Throughput Of Receiving Packets.

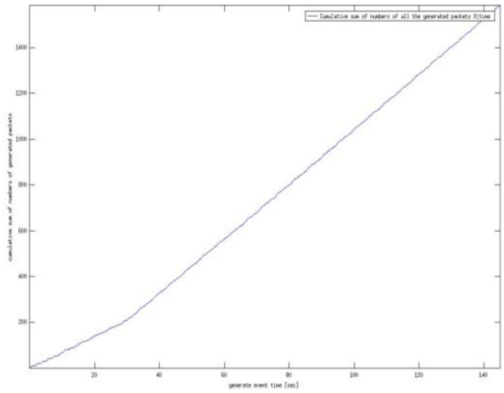


5) Throughput Of Receiving Bits Vs. Maximal Simulation Processing Time

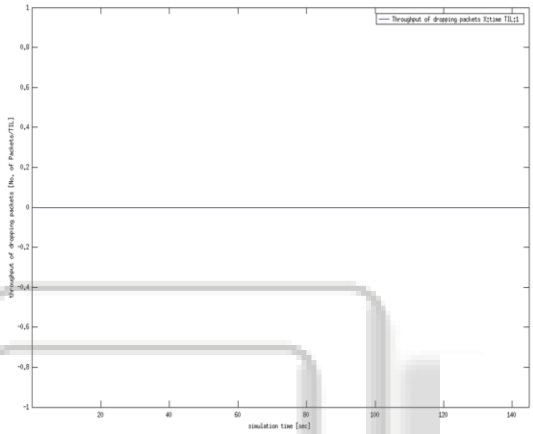


B. OLSR Protocol

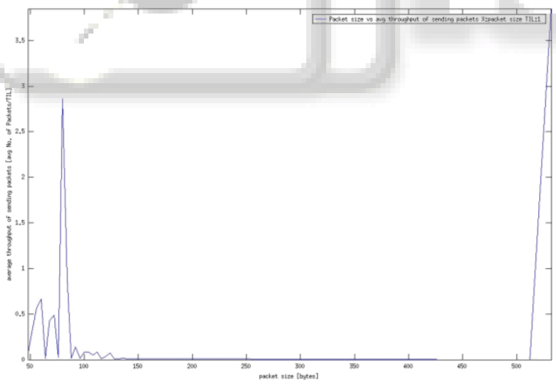
1) Cumulative Sum Of No. Of All Generated Packets



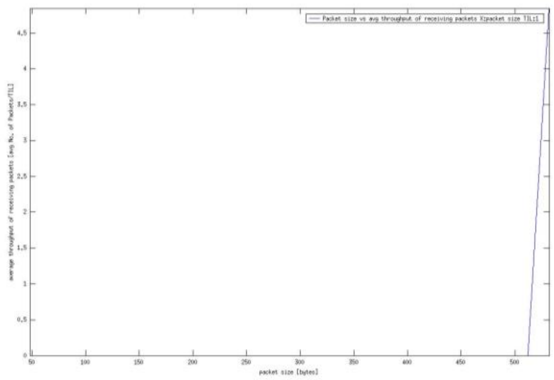
2) Throughput Of Dropping Packets



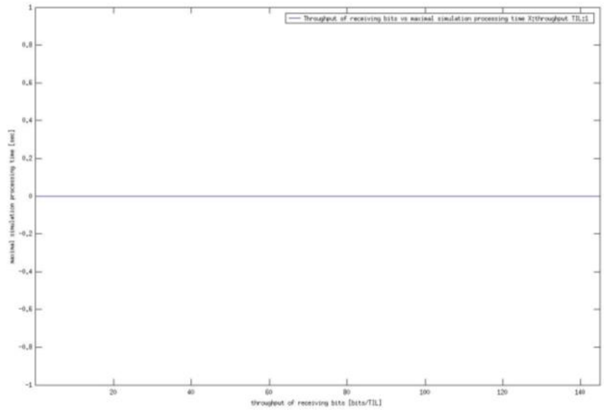
3) Packet Size Vs. Average Throughput Of Sending Packets.



4) Packet Size Vs. Average Throughput Of Receiving Packets.



5) Throughput Of Receiving Bits Vs. Maximal Simulation Processing Time



IV. CONCLUSION

In case of DSDV and OLSR if we calculate its performance in no. of bytes (Send bytes-Dropped bytes)/Send bytes*100 the value achieved is 99.3% in DSDV and 100% in OLSR when the number of nodes are 10 in the network. If the performance is calculated actual send packets given as

(No. Of generated packets-No. of dropped packets-No. of lost packets)/No. of generated packets*100 the value achieved is 99.11 % in DSDV and 100% in OLSR.

On the basis of above two formulas if values are calculated of DSDV under two different conditions when no. of mobile nodes are 10 and 50 in the network.99.4% DSDV when no. of nodes are 10 performance calculated on no. of bytes 99.25% when no. of mobile nodes are 50 in the network. 99.11 % in DSDV when no. of nodes are 10 performance calculated on no. of actual packets send and 99.05% when no. of mobile nodes are 50 in the network. This implies that DSDV works best in less stressful condition as compared to OLSR.

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