A Comparative Analysis of DSDV and DSR in Different Scenario of Mobile Ad Hoc Network

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Abstract

An ad-Hoc network permits transportable devices to determine communication freelance of a central infrastructure. However, the actual fact that there's no central Infrastructure which the devices will move randomly offers rise to varied reasonably issues, like routing and security. during this paper the matter of routing is taken in this paper addresses problems bearing on two completely different routing protocols Destination Sequenced Distance vector (DSDV) and Dynamic source Routing (DSR) protocols, that are used for economical routing underneath completely different eventualities in Mobile Ad-hoc Network (MANET), that plays a crucial role in places where wired network are neither out there nor economical to deploy. objective of paper to implement the two routing protocols using Network Simulators and run it for various range of nodes. Then compared the two routing protocols for various network parameters and studied the economical protocol underneath a selected situation on the premise of two metrics. Packet delivery ratio, Routing load, end to end delay and coverage area.

Keywords: DSR, DSDV, Routing load, Connectivity, Packet Delivery

I. Introduction

Wireless cellular systems are in use since Nineteen Eighties. Wireless systems operate with the help of a centralized supporting structure like an access purpose. These access points assist the wireless users to stay connected with the wireless system, once they roam from one place to the opposite. The presence of a set supporting structure limits the adaptability of wireless systems. In numerous words, the technology cannot work effectively in places where there's no mounted infrastructure. Future generation wireless systems would force Straightforward and fast deployment of wireless networks [1]. This fast network deployment isn't Attainable with the present structure of current wireless systems.

Recent advancements like Bluetooth introduced a brand new form of wireless systems called mobile ad-hoc networks. The popular IEEE 802.11 "WI-FI" protocol is capable of providing ad-hoc network facilities at low level, when no access purpose is obtainable. But during this case, the nodes are restricted to send and receive data however don't route something across the network. Mobile ad-hoc networks will operate in a very standalone fashion or might probably be connected to a bigger network like the net.

II. The Protocol Stacks

The protocol stack for mobile ad hoc networks is described. This offers a comprehensive image of, and helps to rose perceive mobile accidental networks. Figure 1, shows the protocol stack that consists of 5 layers: physical layer, information link layer, network layer, transport layer and application layer. It's similarities to the TCP/IP protocol suite. As is seen the OSI layers for session, presentation and application are merged into one section, the applying layer. It's a layered framework for the look of network systems that enables for communication across all sorts of pc systems. In the middle of the figure, the TCP/IP suite is illustrated. As a result of it absolutely was designed before the OSI model, the layers within the TCP/IP suite don't correspond specifically to the OSI layers. The lower four layers are the same however the fifth layer in the TCP/IP suite (the application layer) is appreciate the combined session, presentation and application layers of the OSI model.

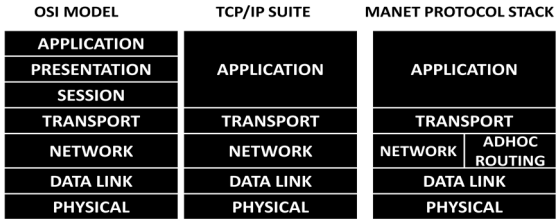

Figure 1: Model

On the correct, the MANET protocol stack -which is analogous to the TCP/IP suite -is shown. The most distinction between these 2 protocols stacks lies within the network layer. Mobile nodes (which are each hosts and routers) use a commercial hoc routing protocol to route packets. Within the physical and information link layer, mobile nodes run protocols that are designed for wireless channels. Some choices are the IEEE normal for wireless LANs, IEEE 802.11, the ETSI normal for a high-speed wireless LAN, HIPERLAN 2, and eventually an trade approach toward wireless personal space networks, i.e. wireless LANs at a fair smaller vary, Bluetooth. In simulation tool employed in this project, the quality IEEE 802.11 is employed in these layers. This paper focuses on accidental routing that is handled by the network layer. The network layer is split into 2 parts: Network and accidental Routing. The protocol employed in the network half is net Protocol (IP) and therefore the protocols which may be employed in the accidental routing half are Destination Sequenced Distance Vector (DSDV), or Dynamic source Routing (DSR).In this paper we are using the proactive gateway discovery and reactive gateway discovery**.**

III. DSDV

This protocol relies on classical Bellman-Ford routing algorithm designed for MANETS. Every node maintains an inventory of all destinations and range of hops to every destination. Every entry is marked with a sequence range[1]. It uses full dump or incremental update to scale back network traffic generated by rout updates. The printed of route updates is delayed by settling time. The sole improvement created here is avoidance of routing loops during a mobile network of routers. With this improvement, routing data will perpetually be readily obtainable, despite whether or not the supply node needs the knowledge or not. DSDV solve the matter of routing loops and count to infinity by associating every route entry with a sequence range indicating its freshness. In DSDV, a sequence range is linked to a destination node, and typically is originated by that node (the owner). The sole case that a non-owner node updates a sequence range of a route is when it detects a link break on that route. An owner node perpetually uses even-numbers as sequence numbers, and a non-owner node perpetually uses odd-numbers. With the addition of sequence numbers, routes

For a similar destination are selected primarily based on the subsequent rules:

A. A route with a more modern sequence range is preferred.
B. Within the case that 2 routes have a same sequence number, the one with an improved price metric is most well-liked [2]. The list that is maintained is termed routing table. The routing table contains the following:

   a) All obtainable destinations' IP address
   b) Next hop IP address
   c) Range of hops to succeed in the destination
   d) Sequence range assigned by the destination node
   e) Install time

The sequence range is employed to differentiate stale routes from new ones and therefore avoid the formation of loops. The stations periodically transmit their routing tables to their immediate neighbors. A station additionally transmits its routing table if a major amendment has occurred in its table from the last update sent. So, the update is each time-driven and event-driven.

IV. DSV

The Dynamic source Routing protocol (DSR) could be an easy and economical routing protocol designed specifically to be used in multi-hop wireless accidental networks of mobile nodes. DSR permits the network to be utterly self-organizing and self-configuring, while not the necessity for any existing network infrastructure or administration. Dynamic supply Routing, DSR, could be a reactive routing protocol that uses supply routing to send packets. It uses supply routing which suggests that the supply should understand the entire hop sequence to the destination. Each node maintains a route cache, where all routes it is aware of are stored. The route discovery method is initiated providing the specified route can't be found within the route cache.

A. Route Maintenance

Route Maintenance is employed to handle route breaks. When a node encounters a fatal transmission drawback at its information link layer, it removes the route from its route cache and

generates a route error message. The route error message is shipped to every node that has sent a packet routed over the broken link. When a node receives a route error message, it removes the hop in error from its route cache. Acknowledgment messages are used to verify the right operation of the route links. In wireless networks acknowledgments are usually provided as e.g. an existing commonplace a part of the MAC protocol in use, like the link-layer acknowledgment frame outlined by IEEE 802.11[3]. If a built- in acknowledgment mechanism isn't on the market, the node transmitting the message will explicitly request a DSR-specific software acknowledgment to be come by consecutive node along the route.

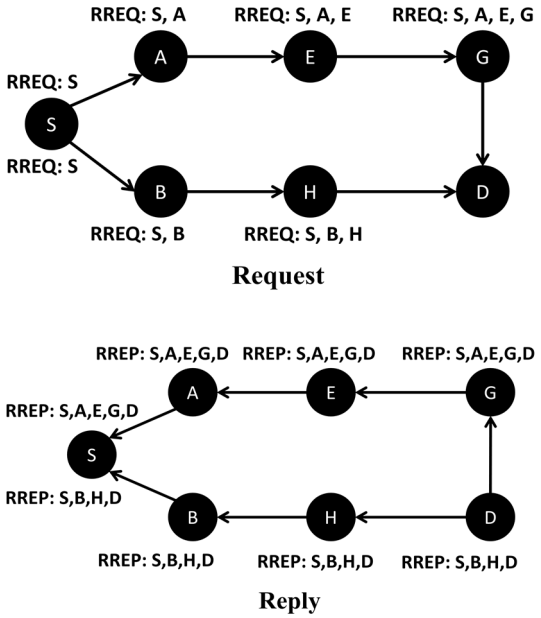

Figure 2: Route Maintenance

V. Simulation of DSDV and DSR

Aim of the paper is to implement DSDV and DSR routing protocol for ten nodes sending brackets with random speed. 1st the cbr files and situation files are generated and then using dsdv protocol simulation is completed which supplies the nam file and trace file[4]. Then another nam and Trace files are created dsr protocol. The following figures are the execution of the nam files instances created. For every execution of a similar program completely different nam files are created and that we will read the output on the network simulator[1].

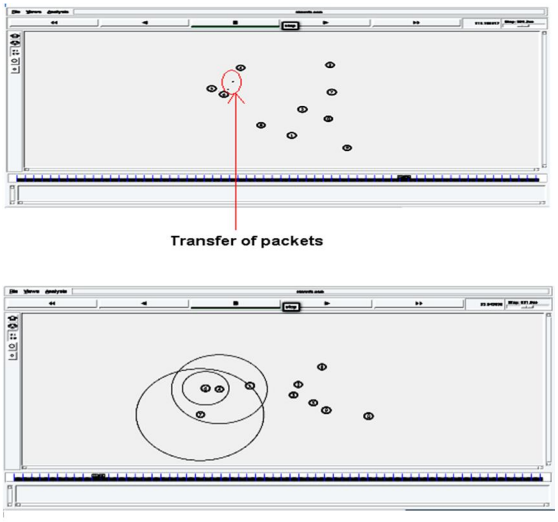

Figure 3: Dropping of packets

VI. Communication Model

In the scenario used in this study, seven mobile nodes communicate with one of two fixed nodes (hosts) located on the Internet through a gateway. As the goal of the simulations is to compare the different approaches for gateway discovery, the 28 traffic source was chosen to be a constant bit rate (CBR) source. Each source mobile node generates packets every 0.3 seconds in this study. And using the traffic time will be constrant routing protocol is dsdv and dsr.and mac layer protocol 802.11

Table 1: Parameter Values

Parameters	Values
Transmission Range	250 m/s
Topology Size	800*500 m
Traffic Time	Constraint
Routing Protocol	DSDV, DSR
MAC Layer	802.11

VII. RESULTS

When increase the area the no of packets dropped by intermediate nodes results is higher. Due to which we have to retransmit the dropped packets of course which will take more time.

A. Packet Delivery Ratio

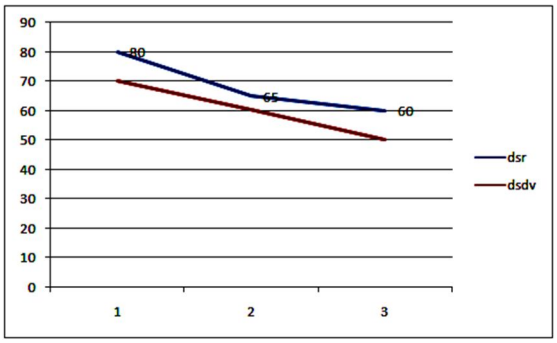

Figure 4: Packet delivery ratio with Coverage Area (800*500)

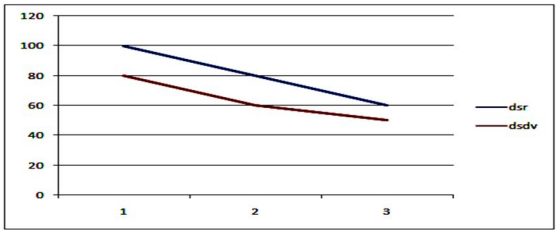

Figure 5: Packet delivery ratio with Coverage area (400*250)

B. Delay

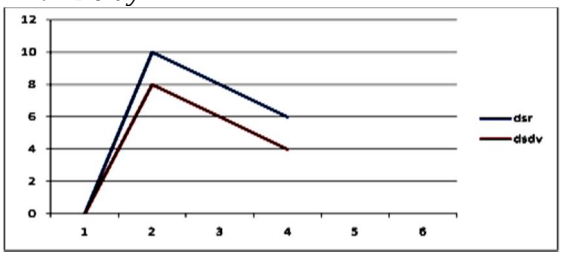

Figure 6: Delay with Coverage area (400*250)

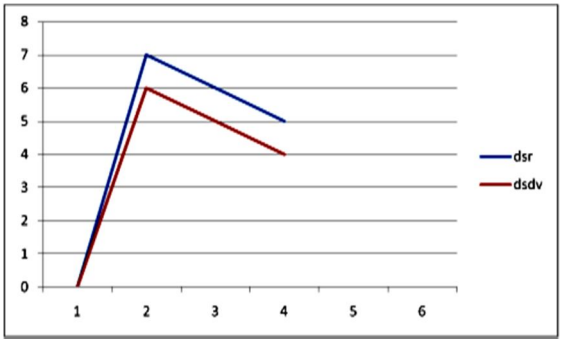

Figure 7: Delay with Coverage Area (800*500)

VIII. CONCLUSIN

In this paper implemented the Destination Sequenced Distance Vector and Dynamic source Routing protocols in Tool command language and integrated the module within the ns-2 Simulator. The performance of the protocols was measured with respect to metrics like Packet delivery ratio, coverage space. In this paper created the performance comparison of the protocols. Simulations were disbursed with identical topologies and running completely different protocols on the mobile node. The results of the simulation indicate that performance of the DSR protocol is superior to straightforward DSDV. It's conjointly observed that the performance is best particularly when the pause time is low. For higher pause time though DSR is best for many cases however their delivery ratio remains near one

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