



## Reputation Scheme on Dynamic Source Routing in Ad-Hoc Networks

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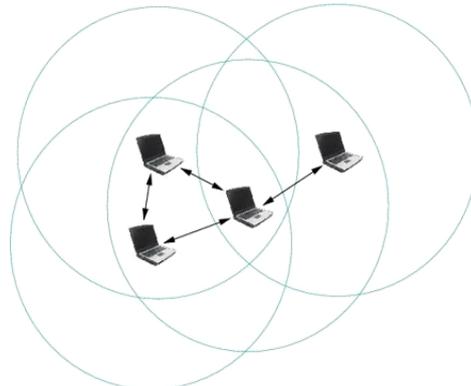
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**Abstract:** MANET (Mobile Ad-hoc network) is self-configuration wireless adhoc network of mobiles nodes. Every nodes has a router/switch connected by the wireless connection. Mobile adhoc networks are playing wide spread usage in the areas of military and other applications. But this mobile adhoc network not have any centralized authorities like an access point or a router. Thus routing has become big challenge to these type of networks. Mobile ad-hoc networks are disposed to a number of security threats. In ad hoc network, all nodes move freely and independently, so this topology is highly dynamic. Due to limited broadcast power of dynamic nodes, multi hops may be required to transmit data from one host to another host. Main challenges in MANET is battery constraints, Limited bandwidth, Dynamic topology, Routing Overhead, Hidden terminal problem, Packet losses due to transmission errors, Mobility induced route changes. DSR is one protocol used in MANET network. Main objective of review is to study various enhancement & proposed work given by different authors.

**Keywords:** – MANET, DSR, Ad hoc Network, Energy, Security

### I. INTRODUCTION

Mobile Ad-hoc network (MANET) is a self configuration wireless ad-hoc network of mobile nodes. Each nodes has a router or a switch connected by the wireless connection. The union of connections is in a random topology. The network can either function independently or connect to internet IPv-4 and IPv-6 or other protocols. Different routing protocols have been proposed as the origin of Manet. Dynamic Source Routing is the most famous routing protocol based on source routing. In adhoc network, all the nodes move freely and independently, so this topology is highly dynamic. Due to limited transmission power(TP) of the dynamic nodes, multi hops may be required to transmit data from one host to another host. The Mobile Adhoc network is a collection of wireless mobile hosts founding a temporary network without the help of any established infrastructure/centralized direction. Under these circumstances, routing is much more complex than static (unconventional) networks. An Ad Hoc network can be used in an area where infrastructures for mobile communication are not available due to high deployment costs or disaster destruction of infrastructure. Due to the lack of infrastructure and the limited transmission range of a node in a mobile ad hoc network, a node has to rely on neighbors nodes to route a packet to the destination node. In specific, all the network functions are based on the node co-operation. Currently, routing protocols for mobile ad-hoc networks, such as the Dynamic Source Routing (DSR) and the Ad-hoc On Demand Distance Vector Routing Protocol (AODV) are based on the assumption that all nodes will co-operate and without node co-operation, in a wireless ad-hoc network, no route can be established, no packet can be forwarded. The Dynamic Source Routing protocol (DSR) is a simple and well organised routing protocol designed specifically for use in multi-hop wireless ad hoc networks of mobile nodes.



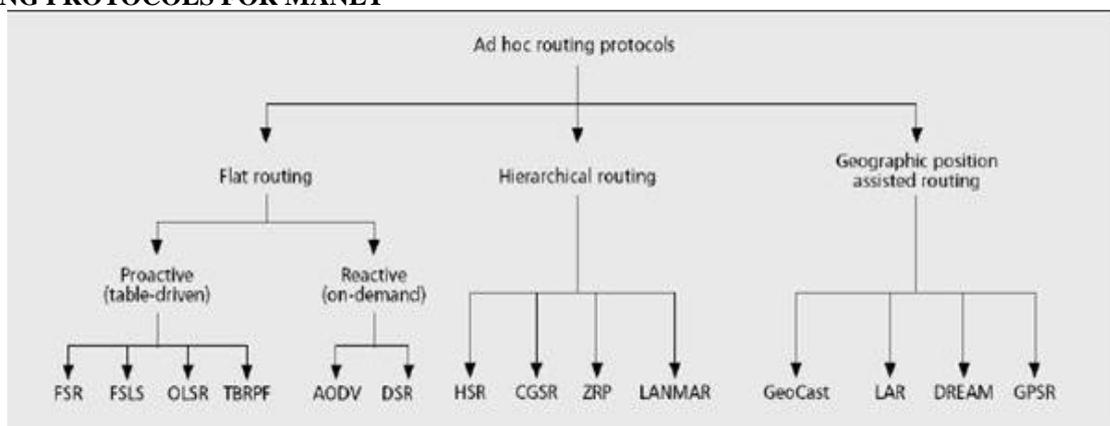
Ad-hoc network

Furthermore, nodes are free to move in any directions, and therefore will change its links to other devices regularly. The primary challenge in building a wireless ad hoc network is to equipping every device to continuously maintain the information required to properly route traffics. This means if the link breakages occur, the network has to stay operational by creating new routes.



Mobile Ad-hoc network

## ROUTING PROTOCOLS FOR MANET



**Classification of Routing Protocols:** The routing protocols can be classified into two parts : i. Table driven ii). Source initiated(on demand) while depending on the network structure, these are classified as flat routings, hierarchical routings and geographic position assisted routings. Flat routing covers both routings protocols based on routing strategy. The three adhoc routing protocols are used i.e AODV, DSDV and DSR. AODV and DSR is reactive (On demand) whereas DSDV is Proactive (Table driven) Routing protocol.

In designing of DSR, we sought to create a routing protocol that had very low overhead yet was able to react very quickly to changes in the network. The DSR protocol provides highly re-active services in order to help ensure successful delivery of data packets in-spite of node movement or other changes in network conditions.

The DSR protocol is composed of two main mechanism which work together to allow the discovery and maintenance of source routes in the adhoc network.

Route Discovery is the mechanism by which a node S wishing to send a packet to destination node E obtains source route to E. Route Discovery is used only when S attempts to send a packet to E and does not already know a route to E.

- Route Maintenance is the mechanism by which node S is able to detect, while using a source route to E, if the network topology has changed such that it can no longer use its route to E because a link along the route no longer works. As & when Route Maintenance show a source route is broken, S can attempt to use any other route it happens to know to E, it can invoke Route Discovery again to find a new route for subsequent packets to E. Route Maintenance for this route is used only when S is actually sending packets to E.

The operations of both Route Discovery and Route Maintenance in DSR are designed to allow unidirectional links and asymmetric routes to be supported.

## II. NEED OF ROUTING PROTOCOLS

To find an efficient route for an un-interrupted communication, many protocols are suggested keeping applications and type of networks in view. The main problem with ad-hoc networking is how to send a message from one node to another with no direct link. The node in the networks are moving randomly, and it is very challenging which nodes that are directly connected together. The topology of an ad-hoc network is constantly changing and it is very difficult for routing processes. As already discussed, there are two main approaches for routing process in ad hoc networks. The first approach is pro-active approach which is table driven and uses periodic protocol.

### III. MANET CHALLENGES

- a) Bandwidth capacity:- Wireless link continue to have significantly lessor capacity than infrastructures networks. In addition, the realized throughput of wireless communications after accounting for the effect of multiple access, noise and interferences conditions, etc., is often much lesser than a radio maximum transmission rate.
- b) Dynamic topology: Dynamic topology memberships may disturb the trust relationships among the nodes. The trust may also be disturbed , if some nodes are found as compromised node.
- c) Routing Overhead: In wireless ad-hoc networks, nodes often change their locations within network. So, some old routes are generated in the routing table which leads to un-necessary routing overhead.
- d) Unseen terminal problem: Unseen terminal problems refers to the accident of packets at a receiving node due to the concurrents transmissions of those nodes that are not within the direct transmissions range of the senders, but the same are within the transmission range of the receiver.
- e) Packet losses: Ad hoc wireless networks experiences a much higher packet loss due to factors such as increased accidents/interruption due to the presence of hidden terminals, presence of interference , unidirectional links, frequent path breaks due to flexibility of nodes.
- f) Mobility-induced route changes: The network topology in an ad hoc wireless network is highly dynamic due to the movement of nodes, hence an ongoing sessions suffers frequent paths breaks. This situation often leads to the frequent route change.
- g) Power constraints: Devices used in these networks have restrictions on the power source in order to maintain the size & portability and weight of the devices.
- h) Security : The wireless mobile ad-hoc nature of MANETs brings new security challenges to the network designs. As the wireless medium is weak to snooping and ad-hoc network functionality is established through node co-operation, mobile ad-hoc networks are basically exposed to numerous security attacks.

### IV. LITERATURE SURVEY

1. The author (Lakshmi P.S.) proposed the solution on the title “ Security & Energy efficiencies ”. Different networks(wireless) problems can be resolved for actual design & placement of the communication devices which work in MANET network situation. In this research paper, securities & energy efficient routing procedure(method) for MANET are measured, and analyzed & highlighting strengths and weaknesses.
2. The author (Md Shahid Akhter<sup>1</sup>, Vijay Prakash Singh<sup>2</sup>) developed solution on “ POWER SAVING DSR PROTOCOL FOR MANET ”. Mobile ad hoc network are playing important role in the world. MANET(adhoc) mainly depends basically on battery power so its lifetime should be improved. Every node in MANET(adhoc) must take dynamic participations (roles). In this research paper two improvements proposed by author in DSR protocol to increase the life time of MANET. The algorithm of DSR protocol is changed on the basis of startup energies of nodes. These both enhancements are done in DSR to save the energy of nodes so that they can function efficiently in less power situation also. There is very good improvements in the lifetime of MANET.
3. The author (Kavita Sharma) proposed solution of “Energy Efficient Power Aware Multipath DSR”. Multipurpose uses of MANET (Mobile Ad Hoc Networks) have attract everyone's attention and offer a lot of challenges to the researchers. Very often the minimum hop count leads to hipogh power consumption. This paper proposed solution on Energy efficient power aware with multipath dynamic source routing protocol by modifying one of the most popular routing protocols e.g. Dynamic Source Routing (DSR) protocol which is not at all concerned about power consumption. This Dynamic source routing-Power aware routing DSR-PSR uses the basic concept of traditional DSR through which it not only enhances the life time of the network but also increases the overall performance of the networks.
4. The author(J.-E. Garcia) proposed solution on “DSR-based Energy efficient Routing Algorithm for MANET”. MANET has no static infrastructure. Author apply the mechanism on Dynamic Source Routing (DSR) and propose a original DSR based energy efficient routing algorithm referred to as the Energy Dependent DSR. Author compare EDDSR algorithm with two of the most recent offers the (LEAR) and the Minimum Drain Rate (MDR) system. We show that EEDSR is the best approach to reduce and balance power consumption in a wide spectrum of scenarios.
5. The author(Palak., Nasib Singh Gill<sup>2</sup>) proposed solution on “Power Saving Intelligent Dynamic Source Routing (IDSR) in MANET”. The strange property of a MANET is that it is not having infrastructures. It is suffers from many restrictions , one of them is energy problem. This paper presents an optimizations of DSR to make it bright in terms of selection of routes so that the overall network lifetime can be increased. The performance of paper proposed protocol is validated using NS2 and found that author proposed protocol IDSR (Intelligent Dynamic Source Routing) outperforms traditional DSR.
6. The author ( Abdelwadood Mesleh ) proposed the solution on “AODV & DSR energy aware routing algorithms”. A method of the glomosim are used for simulation & to compare the performance of the four routing algorithms e.g. (AODV,/eAODV & DSR/eDSR) in terms of average energy consumptions average end delayed and average drop packets. Results reveal that eDSR is able to work best in terms of averaged energy consumption and averaged end to end delay over different mobility speeds.
7. The author (FeiWang, FurongWang, Benxiong Huang) proposed solution on “Reputation-Based Secure Route Protocol in MANET(Adhoc)”. The paper proposed On demand Secure Route (COSR), a novel secure source (NSS) route protocols, against self-centered behaviors. The COSR measures node reputation (MNR) and route reputation (RR) by contributions & Capability of Forwarding (CoF) and recommendation upon Dynamic Source Route (DSR)

and uses RR to balance load to avoid main points. Furthermore, COSR defines path collection algorithms by NR to enhance efficiency of protocol. At last, we verify COSR through this method. Results of this method show that COSR is secured and stabled.

8. The author (Gurwinder Singh and Chakshu Goel) recommended solution on “An enhancement over Dynamic Source Routing Protocol in Multi-hop Wireless MANET(Adhoc) Network”. Dynamic Source Routing protocol is powerful & simple routing protocol designed specifically for use in multi-hop wireless ad-hoc networks of mobile nodes. Author has compared and observed that recommended mechanism outperforms in different types. The simulation results also shows that the proposed mechanisms can stimulates nodes to cooperates with each other and improve the performance of DSR routing protocol.
9. The author (Sangheetaa Sukumran) proposed solution on” Reputation based DSR Protocol for Ad-hoc (MANET).” This paper proposed new reputations based routing protocol based on Dynamic Source Routing (DSR) and through simulation results proves that the proposed method performs well compared to normal DSR.
10. The. The author (Dr.A.Rajaram) proposed solutions on " Power Aware Routing for MANET Using On demand MPRP". Routing protocol helps in regular updating the routing tables with both the node routed list and their constant energy. Due to multi-path protocol, it shifts the route without further overhead loss & delay in transport of packets. Simulation result shows that PAAOMDV performs well compared to ad-hoc on-demand multipath distance vector (AOMDV) routing protocol even after introducing energy related fields in PAAOMDV.
11. The author proposed (Rachit Jain) solution on “Study and Performance Comparison of AODV & DSR on the basis of Path Loss Propagation Models “ In this paper, author present comparative study on the behavior of various routing protocols with path loss spread models various performances metrics used for this comparison such as packet delivery fraction, average jitters, throughput & average end. These type of studies would be helpful in choosing the correct protocols for any active operating environment.
12. The author (David B. Johnson) proposed solution on “DSR(Dynamic Source Routing) in Ad-Hoc Wireless Networks” as everybody is aware that an ad-hoc network is a collection of wireless mobile hosts starting a temporary network without the aid of any established infrastructure/centralized management This type of environment, it’s essential for one mobile host to obtain the aid of other hosts in forwarding a packet to its target, This paper presents a protocol for routing in Mobile Adhoc networks that uses the dynamic source routing. The protocol adjust fast routing changes when host movements are tedious. But requires a little or no overhead during periods in which hosts move in less often. The highest rates of host movements virtually overheads of different protocols are quite low, falling to just 1% of total data packets transmitted for moderate movement rates in a network of 24 mobile hosts.
13. The author (Gurwinder Singh) proposed the solution on “An Enhancement over Dynamic Source Routing Protocol in Multi-hop Wireless Ad-hoc Network” In this paper author evaluated the performance of DSR through detailed simulation and propose a new scheme that exploit the former behavior of mobile nodes and gathers ratings & process and combines this information and make it available upon request by changing variety of movement and communications design. Simulation results are shown to appraise the performance of the proposed scheme. In comparisons it is found that the proposed mechanism overtakes in different categories. The simulation results also indicates that the proposed mechanism can be stimulate nodes to cooperate with each other and improve the performance of DSR routing protocol.
14. The author(Jihye Kim) proposed solution on “Secure route discovery for dynamic source routing in MANETs “. The focus of this paper work is mainly on securing the route discovery process in Dynamic Source Routing. Goal is to discover a range of best crypto graphic techniques with varying flavors of securities , efficiencies and robust. The ariadne method while very good, assumes loose time synchronization among MANET (ad-hoc)nodes and does not offer rejection. If the former is not possible and latter is required, an alternative approach is also required. By using a secure route discovery protocol (SRDP) which allows the source to *securely* discover an authenticated route to the destination using either aggregated message authentication codes (MACs) . Several existing techniques are shown and their efficiency and security are compared and evaluated.
15. The author ( Boon Chong) proposed solution on “Route discovery optimization for DSR in MANET (Ad-hoc)”. This paper work is based on the idea of new route searching optimization based on unique query is proposed that result in as much as 30 % dropping in the number of query packets broadcast whenever a new route needs to be discovered. It achieves this by uni-casting the query packets along an existing route towards a destination neighbors nodes. The simulation results shows that a network with high degree of nodals mobility benefits most from this optimization.

## V. COMPARATIVE STUDY OF DYNAMIC SOURCE ROUTING PROTOCOL

AUTHOR & YEAR	BASED ON	FINDING
Md Shahid Akhter1, Vijay Prakash Singh2 in 2013	Novel energy aware multipath routing protocol based on DSR	The proposed protocol is mainly useful for enhancing the lifetime of MANET regardless of the quantity of data exchanged. In order to maximize the lifetime of a node, the selection of optimal path is based entirely on the initial energy of the node. This point is considered valid in the proposed protocol to increase the overall lifetime of MANET.

Kavita Sharma in 2014	Energy Efficient Power Aware Multipath Dynamic Source Routing (Power awareness)	The best optimal path is chosen The best path is chosen on the energy factor. DSR-PSR is being compared with DSR which do not consider energy during path discovery.  Proposed algorithm provides a significant increase in successful packet transmissions.
J.-E. Garcia, A. Kallel, K. Kyamakya, K. Jobmann,	Novel energy aware multipath routing protocol based on DSR	In this research, described a novel power-aware route discovery algorithm called Energy Dependent routing algorithm. Its main goal is to extend the average lifetime for each node while balancing the total energy consumption among all nodes in the network. EDDSR shows a similar behavior that MDR.
Palak in 2014	Power saving intelligent DSR	The residual energy of neighbor node is compared with average energy of path and according the node is disable. It reduce energy consumption.
Abdelwadood Mesleh in 2012	Energy-aware routing algorithms e-AODV and e-DSR routing algorithms	It compares their performance with the well-known AODV and DSR routing algorithms. This paper concludes that e-DSR is able to work best in terms of averaged energy consumption. It select better route and save energy.
FeiWang, FurongWang, Benxiong Huang in 2010	Reputation-Based Secure Route Protocol in MANET	Author present a reputation-based secure routing protocol, called COSR, for MANET. The COSR uses a novel reputation model to detect malicious and selfish nodes and make all nodes more cooperative.

## VI. CONCLUSION

After reviewing & study various proposed work and improvement in Manent (DSR), lot of enhancement has been done in this protocol. Different authors proposed various solutions i.e. EDDSR (Energy Dependent routing algorithm), main goal of this is to extend the average lifetime for each node while balance total energy. In the same way e-DSR has proposed able to work best in terms of average energy consumption. COSR is proposed to novel reputation model to detect malicious and selfish node and make all nodes more co-operative. In spite of lot of improvement and enhancement, still lot of improvement required to increase the efficiency of Manet network.

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