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A SURVEY ON ROUTING PROTOCOLS FOR MANET

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Abstract- A Mobile Ad-Hoc Network (MANET) is a collection of wireless mobile nodes forming a temporary network without using any centralized access point, infrastructure, or centralized administration. Data transmission between two nodes in MANET's may be requires multiple hops as nodes transmission range is limited. Mobility of the different nodes makes the situation even more complicated. Multiple routing protocols especially for these conditions have been developed during the last few years, to find optimized routes from a source to some destination.

Ad-hoc network suffer from the lot of issues and congestion and security are the major issues of ongoing research, which leads to severe degradation of network throughput and increases the routing overheads. This survey gives a comprehensive overview of AODV (Ad-hoc On demand Distance Vector Routing) detailed comparison of different research on AODV has been presented. Open research direction is also discussed to serve as a starting point to future protocol design and evaluation.

Keywords- Confusion matrix, Data Mining, Decision tree, Neural Network, stacking ensemble, voted perceptron.

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Introduction

In AODV [1], the network [2] is silent until a connection is needed. At that point, the network node [3] that needs a connection broadcasts [4] a request for connection [5]. Other AODV nodes forward this message, and record the node that they heard it from, creating an explosion of temporary routes back to the needy node. When a node receives such a message and already has a route to the desired node, it sends a message backwards through a temporary route to the requesting node. The needy node then begins using the route that has the least number of hops through other nodes. Unused entries in the routing tables are recycled after a time.

When a link fails, a routing error is passed back to a transmitting node, and the process repeats.

Much of the complexity of the protocol is to lower the number of messages to conserve the capacity of the network. For example, each request for a route has a sequence number. Nodes use this sequence number so that they do not repeat route requests that they have already passed on. Another such feature is that the route requests have a "time to live" number that limits how many times they can be retransmitted. Another such feature is that if a route request fails, another route request may not be sent until twice as much time has passed as the timeout of the previous route request.

The advantage of AODV is that it creates no extra traffic for communication along existing links. Also, distance vector routing is simple, and doesn't require much memory or calculation. However AODV requires more time to establish a connection, and the initial communication to establish a route is heavier than some other approaches.

Technical Description

The AODV Routing protocol uses an on-demand approach for finding routes, that is, a route is established only when it is required by a source node for transmitting data packets. It employs destination sequence numbers to identify the most recent path. The major difference between AODV and Dynamic Source Routing (DSR) stems out from the fact that DSR uses source routing in which a data packet carries the complete path to be traversed. However, in AODV, the source node and the intermediate nodes store the next-hop information corresponding to each flow for data packet transmission. In an on-demand routing protocol, the source node floods the Route Request packet in the network when a route is not available for the desired destination. It may obtain multiple routes to different destinations from a single Route Request. The major difference between AODV and other on-demand routing protocols is that it uses a destination sequence number (DestSeqNum) to determine an up-to-date path to the destination. A node updates its path information only if the DestSeqNum of the current packet re-

ceived is greater than the last DestSeqNum stored at the node.

A RouteRequest carries the source identifier (SrcID), the destination identifier (DestID), the source sequence number (SrcSeqNum), the destination sequence number (DestSeqNum), the broadcast identifier (BcastID), and the time to live (TTL) field. DestSeqNum indicates the freshness of the route that is accepted by the source. When an intermediate node receives a RouteRequest, it either forwards it or prepares a RouteReply if it has a valid route to the destination. The validity of a route at the intermediate node is determined by comparing the sequence number at the intermediate node with the destination sequence number in the RouteRequest packet. If a RouteRequest is received multiple times, which is indicated by the BcastID-SrcID pair, the duplicate copies are discarded. All intermediate nodes having valid routes to the destination, or the destination node itself, are allowed to send RouteReply packets to the source. Every intermediate node, while forwarding a RouteRequest, enters the previous node address and its BcastID. A timer is used to delete this entry in case a RouteReply is not received before the timer expires. This helps in storing an active path at the intermediate node as AODV does not employ source routing of data packets. When a node receives a RouteReply packet, information about the previous node from which the packet was received is also stored in order to forward the data packet to this next node as the next hop toward the destination.

Advantages and Disadvantages

The main advantage of this protocol is having routes established on demand and that destination sequence numbers are applied for find the latest route to the destination. The connection setup delay is lower. One disadvantage of this protocol is that intermediate nodes can lead to inconsistent routes if the source sequence number is very old and the intermediate nodes have a higher but not the latest destination sequence number, thereby having stale entries. Also, multiple RouteReply packets in response to a single RouteRequest packet can lead to heavy control overhead. Another disadvantage of AODV is unnecessary bandwidth consumption due to periodic beaconing.

Literature Review

Enhanced Local Repair AODV (ELRAODV)

This Research has been contributed by *Jagpreet, et al.* [1] The enhance local repair AODV is based on the local repair Strategy where unicast mechanism has been introduce to improve the routing overhead by making mobile nodes aware of local connectivity. In the proposed Methodology it extended the HELLO packet to NHellow this extra information helps AODV to repair the route by unicast instead of broadcast. The outcome of this research ELRAODV performs better than classic AODV in term of the congestion and end to end delay But the drawback of this mechanism is that it cannot work when multiple link failure occurs means maximum protocol can work on the singular link failure. In future this proposed protocol can be tasted on scalability and energy performance measures.

The Improved AODV Protocol with lower Route Cost and Smaller Delay (PWAODV)

This Research has been contributed by Wang Ningning, et al. [2] In this piggyback mechanism and weighted neigbour stability algorithm is introduced. In this they were using piggyback mechanism by which Route cost can be reduced greatly.

Performance Enhancement in AODV with Accessibility Prediction

This Research has been contributed by Habib-ur Rehman, et al.[3]. The need for mobility awareness in Ad Hoc routing protocols is widely proclaimed in this paper a mechanism is introduced in which nodes are aware of its neighbor nodes. This information is utilized in routing operation like route request, route reply and route error operation. The outcome of this research it greatly reduce the routing overhead and MAC overheads.

AODV-AP can be further extended to have a numerical measure of the relative mobility. This value will reflect that how rapidly a destination is changing its position relative to a specific node. This value then can be used as a route cost or can be combined with other costing approaches to have a more comprehensive route cost metric.

GNDA: Detecting Good Neighbor Nodes in Ad Hoc Routing Protocol

This Research has been contributed by Nandkumar Kulkarni, et al. [4]. Good neighbor Detection nodes is research has been contributed on the Ad Hoc routing protocol AODV. AS we Know in the current generation wireless has great impact on the communication technologies and wide area network. Mobile Nodes has been connected via wireless link and mobility of wireless nodes has come into roll to play (means routes can be disconnected due to dynamic movement of nodes). So in the wireless and Ad Hoc Network route selection and topology combination is very difficult and challenging issue.

Networks are vulnerable to both internal and external attacks due to presence of the bad neighbor. GNDA use to analyze the Network to detect good node as well as the bad nodes by examining certain parameters like signal strength, flow capacity and relative position of nodes have been taken into account.

All information related with good neighbors is stored in routing table which improves performance of routing protocol in terms of good communication and stable route. Analytical results of proposed solution shows that it improves data throughput, improve overall performance of the network with in fixed and dynamic transmission range.

Performance Comparison of AODV, DSR and ZRP Routing Protocols In MANET'S

This Research has been contributed by Shaily Mittal, et al. [5]. This review paper has aim of compare various routing protocol and identify drawbacks of each one of them. In Mobile Ad Hoc network is the collection of various nodes were each of the node has role to play in communication mechanism where no centralized access point, infrastructure or centralized administration. Communication between different nodes needs no. of hopes of or nodes to play role as a intermediate node in the communication. This research shows comparison of different routing protocols like AODV, DSR and ZRP over different parameter like Average end to end delay, TTL based hop count and packet delivery ratio. Simulation has

been done on QualNet. In future research required to remove routing overheads of each one of them.

AODV-BR: Backup Routing in Ad Hoc Networks

This Research has been contributed by Sung-Ju Lee, et al. [6]. Routing protocols therefore play an important role in mobile multi hop network communications. Our algorithm establishes the 'mesh and multipaths without transmitting any extra control message. In this protocol we use the a new style of routing called “on-demand” routing has been proposed for Ad Hoc networks. Our scheme can be incorporated into any Ad Hoc on-demand unicast routing protocol to improve reliable packetdelivery in the face of node movements and route breaks. The mesh configuration provides multiple alternate routes and is constructed without yielding any extra overhead. We also learned that however, our scheme does not perform well under heavy traffic networks. We are currently investigating ways to make our protocol robust to traffic load.

A Simulation Based Study of On-Demand Routing Protocols for Ad Hoc Wireless Networks

This Research has been contributed by Azzedine Boukerche, et al. [7]. A routing protocol for Ad Hoc networks is executed on every host and is therefore subject to the limit of the resources at each mobile host.A good routing protocol should minimize the computing load on the host as well as the trafic overhead on the network. Therefore, a number of routing protocols have been proposed for Ad Hoc wireless networks. We study and compare the performance of the following three routing Protocols AODV, CBRP and DSR. We have presented an extensive simulation studies to compare three on-demand Ad Hoc routing protocols, DSR, AODV, and CBRP. using a variety of workload such mobility, load and size of the Ad Hoc networks. Our results indicate that the two source routing based protocols, DSR and CBRP, have very high throughputs while the the distance-vector based protocol, AODV, exhibits a very short end-to-end delay of data packets.

An Improvement On Ad-Hoc Wireless Network Routing Based On Aodv

This Research has been contributed by Neda Moghim, et al. [8]. In this paper we try to reduce AODV's routing load by preventing AODV from relying on route request flood more often in route discovery process. Simulation showed that the proposed way could reduce routing overhead and delay of routing in high load networks without any undesirable effects on throughput and delay of packets. Simulation showed that using source routes in route discovery process can reduce routing overhead and delay of routing in high number of connections and high speed of movement. Each MANET (Mobile Ad-hoc NETwork) node must be capable of acting as a router. These networks are intended for situations; when it is not economically mobile and Ad-hoc environments.

A Robust Routing Protocol For Wireless Mobile Ad-Hoc NetWorks

This Research has been contributed by Q. Wang, et al. [9].We propose a new scheme AODVRR (Ad Hoc On-demand Distance Vector Protocol with Redundant Routes) with improved robustness. Further improvements are obtained by adapting Route Expiry Timeout (RET) to mobility at the expense of slight increase in overhead. This paper aims to explore approaches to improve the robustness of exiting MANET routing protocols. WC develop a new scheme AODV-RR that builds multiple mutes for each Source destination pair and supplies immediate backup mute to salvage traffic flows at the point of link failures. Future work may need to introduce mechanisms to enable traffic discrimination in networks with traffic of different priorities and characteristics including normal data. Voice, video, and web interaction traffic etc.

Analysis of Two Ad Hoc Broadcasting Protocols

This Research has been contributed by Hao Zhang, et al. [10]. In this paper, we analyze two popular Ad Hoc broadcasting protocols in grid networks. The results show the relation between protocol efficiency and selection of the parameters. Ns-2 simulations have been used widely to compare the performance of these protocols in various situations. We are investigating the characteristics of *RE*, *SRB* and average latency when the whole network is asymptotically connected. We have also analyzed the average latency for two specific cases ($C = 2$ and $R–1\ 2 \le d \le R - 1$) in one-dimensional grid. A more complex problem is how to analyze these algorithms when nodes are randomly distributed in a unit-area disc. proved that for $\pi R2(n) = log(n)+c(n)\ n$ the network is asymptotically connected with probability one if and only if $c(n)\rightarrow\infty$.

A Performance Evaluate of Improved AODV-Based Power-Aware Routing Protocol in MANET

This Research has been contributed by Jin-Man Kim, et al. [11] Mobile Ad Hoc network has group of wireless node they are communication without a centralized mechanism in the network. There are various issue in mobile Ad Hoc network in one of them is energy. If network is divided in divided into more than two and one of the node has consume all the energy still not participated in the network. In the area of energy storage and increase network life time huge work has to be contributed. One improvement is to apply energy mean value algorithm which considerate node energy-aware. Outcome of the algorithm does have positive result in ns2.further research issue is to develop optimal model through applying various parameter in different environment.

AODV Multipath Extension Using Source Route Lists With Optimized Route Establishment

This Research has been contributed by Yusuke Sakurai, et al.[12] In on demand distance vector routing in MANET establish is single path for the communication. This paper introduce novel on-demand multipath routing protocol for MANET which combines metrics of delay, hop count and disjointness, each intermediate node deliberately selects multipath candidates while contributing to suppression of unnecessary routing packets. Due to extension of RREQ/RREP packet provide more efficient multipath routes. Outcome of this research has higher packet delivery ratio and lower routing packets. Further research issue is to improvement of the metric definition should be considered.

Performance Comparison of Routing Protocols For Mobile Ad Hoc Networks

This Research has been contributed by Vahid Nazari Talooki, et al. [13]. Ad hoc network are characterized by multi-hop wireless connectivity and frequently changing network topology which have

made there infrastructure less. In this research comparison of the AODV,DSR and TORA routing protocols with respect to a modified path optimality that we call as a weighted path optimality and analyses various factors average end-end delay and jilter etc.

A Distributed Intrusion Detection System For AODV

This Research has been contributed by Cao Minh Trang, et al.[14] An Ad Hoc network is the collection of mobile nodes communicating without a centralized infrastructure. MANET generally use a wireless radio communication channel. So they are open to various type of attack. In this research they presented a Distribution Intrusion Detection System to protect against some attack like DoS attack, Sequence No. Modification. Here IDS agent is use to detect the intruders without using any of the cryptographic algorithm. Outcome of this research performance of AODV is Improved in the presence of attack. Future direction of the research is look for the solution of other kinds of attack.

Throughput Enhancement in AODV Routing Using Mobility Awareness

This Research has been contributed by Dr. S.A. Hussain, et al.[15]. In MANET routes have recreated many time due to the mobility of the nodes. If a node in a mobile Ad Hoc network aware of the mobility of the neighbor nodes then highly mobile node is to avoided to become a part of routes, this will greatly reduce new path discovery towards the destination. A node in the network is aware to its neighbor by the help of inquiries and reply to inquiries. These inquiries are based on the hellow message. Outcome of this research is greatly reduce the new path discoveries and it increases the network throughput and performance.

Impact of Selfish Nodes on Route Discovery in Mobile Ad Hoc Networks

This Research has been contributed by Qi Zhang, et al. [16]. In this paper, we have introduced a routing approach based on selfish nodes for mobile Ad Hoc networks. In mobile ad-hoc network we show use of by classifies mobile nodes into selfish nodes and normal nodes. Selfish nodes always refuse to forward packets for others while normal nodes always forward packet.it solve the problem of cogestion. The disadvantage, in theory, is that we may miss the optimal route and suffer from a low deliveryrate because selfish nodes refuse to forward packets. Simulation results show that our approach out performs the AODV protocol indense networks since the approach assigns relatively low forwarding probability to selected nodes, thus leading to fewer rebroadcasts.

An Optimized AODV Protocol in Mobile Ad Hoc Network

This Research has been contributed by Zhao Qiang Zhu Hongbo, et al. [17]. In this paper, we propose a new scheme to improve AODV protocol by the concept of reliable distance. The Ad Hoc On Demand Distance Vector (AODV) protocol is an on-demand protocol specialized for mobile Ad Hoc network. Because of node's mobility and limited transmission range.

Trust Routing Protocol Based On Congestion Control In MANET

This Research has been contributed by Rahim Rashidi, et al. [18]. In this paper we have introduced routing protocols in MANET use cryptographic algorithms and trust. Routing protocols are based on trust, the paths are not done according to the security. The trust models have three main properties of the trust agent, reputation agent and combiner agent.

Since the congestion control agent is crucial in the trust protocols, this article presents a developed trust protocol based on congestion control. The congestion control section guarantees the stability of network and does the distribution of the load on the most highly trust nodes**.**

Simulations are carried out and the results show that the performance such as packet deliver ratio, average end-to-end delay, normalized routing overhead and number of RERR has been improved under conditions of increasing mobility and traffic load.

Research And Improvement Of AODV Protocol In Ad Hoc Network

This Research has been contributed by JIAO Wen-Cheng, et al. [19]. There are two processes in AODV protocol routing find and routing maintenance. AODV protocol uses the method of hop-by-hop routing to transmit packets. Wormhole attack is a special attack methodaimed at Ad Hoc network. Based on the analysis of AODV protocol and the attack conditions of wormhole attack, the process and algorithm aimed at wormhole attack are researched.

Enhancing the security of the AODV-S routing Protocol

This Research has been contributed by Prakash Veeraraghavan, et al. [20]. Security is the major issue in Ad Hoc network. Protocols of MANET do not offer protection against various type of attack. Thus they do not offer any immunity. AODV-s is the modified version of AODV protocol by immune to various type of attacks. It also provides solution of Dos attack when the hope count modified in it. Outcome of this research it successfully various type of attack which increases the network performance. In Future he would like to work on mobility prediction methods.

Modified Routing Algorithm for AODV in Constrained Conditions

This Research has been contributed by Prakash Veeraraghavan, et al. [21]. In MANET AODV exhibits abnormal behavior due to the high mobility of nodes in the network. The proposed work is aimed at performance improvement in internet connectivity by applying local congestion methods in routing protocols. Outcome of this research increases packet\ delivery ratio even in constrained condition in satisfactory level and also improvement of network load and end to end delay has achived.

Performance Comparison and Evaluation of AODV, OLSR, and SBR in Mobile Ad-Hoc Networks

This Research has been contributed by Alexander Klein, et al.[22]. In this paper various proactive routing protocols has been compared like SBR, AODV, and OLSR in various mobile scenarios with different traffic pattern. These protocols are compared on the basis of reliability and routing overhead. Outcome of this research shows SBR achieve high end to end reliability without frequent end to end route calculations. Future direction of research is to increase the reliability without increasing the routing overhead.

Implementation of Geocast-Enhanced AODVBIS Routing Rotocol In MANET

This Research has been contributed by *Chia-Ching Ooi*, et al.[23]. AODV-bis module is improved version AODV. Key issue of this research is featuring path accumulation. To enhance AODV-bis, location information is utilized during route discovery to limit forwarding Zone by e geocasting by only little modification of packet format. Outcome of this research is it greatly reduce the RREQ packet or it protect from reestablishing the path by RREQ.

Token Routing: A Power Efficient Method for Securing AODV Routing Protocol

This Research has been contributed by Leiyuan Li, et al. [24]. Token Routing Protocol is the security enhancement in the AODV Protocol. It uses hash chain algorithm to generate the token which is added with the data packet for authentication and to choose the correct for data packet to forward. Outcome of this research it reduces the energy consumption and routing packet delay by using hash algorithm instead of cryptographic algorithm. Therefore, TRP can be use to secure routing protocol in sensor and ad- hoc network.

An Enhanced Aodv for Mobile Ad Hoc Network

This Research has been contributed by HONG-PENG WANG**, et al.** [25]. Enhance AODV protocol, is the enhance version of AODV in which mobile nodes aware of the local connectivity to its neighbor in the network it achieved by the extension of the hello message but with the lower overhead. It also prevent unidirectional link in the network to some extent. Outcome of this research is to reduce route load in the network. The s security of the protocol is another direction for our future work.

Enhanced AODV Routing Protocol for Ad Hoc Networks

This Research has been contributed by Khushboo Agarwal, et al. [26]. EAODV is the next generation of AODV which offer quick adaption to dynamic link condition, low processing overhead and low network utilization. EAODV reduces hop count, latency time and enhance throughput, packet delivery ratio in MANET. It also maintains multiple routes towards the destination and also the shortest route. Future direction of research is cover the security aspect which is major issue of research in MANET.

An Improved Hierarchical AODV Routing Protocol for Hybrid Wireless Mesh Network

This Research has been contributed by Pei Tingrui, et al. [27]. In MANET routing is the main issue of the research. There are lot of routing protocol has been built but are not ideal or optimal and do not utilize the potential of wireless Mesh Networks. In this paper, we introduce an improved Hierarchical AODV routing protocol (IH-AODV), which have better scalability and performance in the network and also have less routing overhead for finding the alternate Paths when the route is lost. Outcome of this research IH-AODV scales well for large network and other metric are also better than AODV. Future direction of the research is to make protocol secure and energy efficient.

Enhanced AODV for Wireless Networks

This Research has been contributed by Sandeep Suman, et al.[28]. E-AODV is the extension of AODV in which two concepts are merge Blocking Expanding Ring Search (BERS) & routing packets as HELLOW packets techniques for the reduction of routing overhead. Outcome of this research is that E-AODV performs better than AODV. Future research issues are Route Reply packet is a unicast packet which can also be used as a HELLO packet by utilizing promiscuous mode of a wireless node and HELLO load can be further reduced by using DATA packets as HELLO packets.

The Enhanced Fault-Tolerant AODV Routing Protocol for Wireless Sensor Network

This Research has been contributed by Che-Aron, et al. [29]. Practical issues related with Wireless sensor Network's are reliability and availability. In this paper they works on the problem of reliability by enhancement fault tolerance AODV(ENFAT) which uses Backup Route Algorithm to create backup route for each and every node in the network. If a node gets failed to deliver the packet through the main route than it immediately uses the backup route to become a new route to reduce data packet drop and make the continuation to data packet to deliver. Outcome of this research is proposed technology satisfies the tradeoff between fault tolerance and low transmission delay. For future work, we plan to further evaluate our scheme by using more detailed and realistic channel models with fading and obstacles in the simulation.

Efficient Routing In Wireless Mesh Network by Enhanced AODV

This Research has been contributed by Muhammad Mehran Ajmal, et al. [30]. In this paper AODV is enhance by introducing a new hybrid routing metric. Outcome of the research shows selected path is more optimal then standard AODV with low packet loss ratio, load balanced path and with high bandwidth. In future we intend to refine formula that can be used to calculate the optimal path selection.

Optimized AODV Routing Protocol for Vehicular Ad Hoc Networks

This Research has been contributed by Baozhu Li all etc [31].To optimize the performance of AODV AODV_OBD routing protocol is presented. Outcome of AODV_OBD routing reduces the packet delay to a certain extent as compare to standard AODV. However, because there is no full consideration of packet delivery rate, the packet delivery rate curve of AODV_OBD protocol is not ideal.

RE-AODV: An Enhanced Routing algorithm for QoS Support in Wireless Ad-Hoc Sensor Networks

This Research has been contributed by M.Usha all etc [32].Wireless sensor network has two key issues Low Control Overhead and Power cost. In this paper RE-AODV is introduce which is the enhancement model of AODV for the reduction of routing overhead and to improve the efficiency this can be achieved by modifying the hello packet format. Outcome of this research routing overhead is decrease by 25% and end to end delay decreases by 11%. In future cover of the research is to cover energy related issues.

An Improved AODV Routing Protocol for VANETs

This Research has been contributed by Ben Ding, et al. [33].

Proposed Work to Decrease the Routing Overhead

AODV: Enhance local Repair AODV is Motivated by the issues identified in local Repair AODV which use to broadcast locally to repair the route. In ELRAODV route repair by unicast mechanism instead of broadcast. As shown in figure when red node down then instead of discarding the whole route or to find new route from the source, Node 1 start repairing same route to node 2 by finding the alternative of the broken node. As shown in the figure Node 1 sends unicast request to node 2 by LRREQ packet & Node 2 reply by RREP Packet.

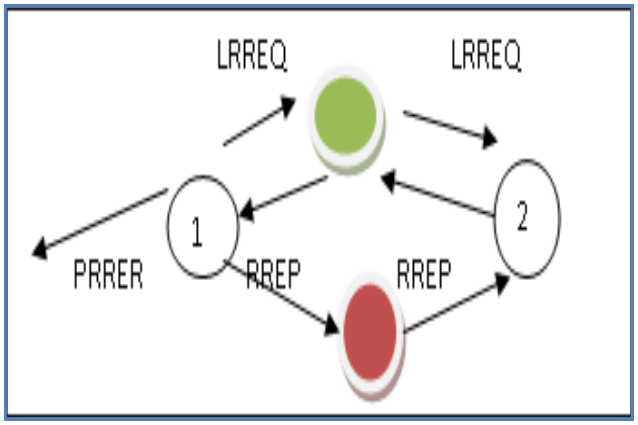

Fig. 1-

Extended Enhance AODV is modified version of ELRAODV. if the route is not repair by ELRAODV then it sends the route error message towards the source by the help of RRER Packet to report the route failure or link failure. In our proposed research instead of sending RRER packet it sends PRRER (priority route error packet) which is the extension of RRER packet to set the priority of the packet. if some packet waiting in the queue to forward the packet instead of forwarding these packet our packet is forward first. As shown in [Fig-1] if route is not repair by alternative green node or multiple link failure occurs then it sends PRRER packet to the source.

Expected outcome of this research is that congetion and routing overhead in the network will decrease. As we know source doesn't stop sending the data packet until gets the if route error packet (PRRER). If it gets this packet as soon as possible it stop sending data packets as packet as soon as possible which effects on network overhead and congetion in the network.

Conclusion and Future Research Direction

In this paper we have done survey of all the paper published in AODV In future we would like to improve this protocol by removing one of the drawbacks of AODV that is routing overhead by our proposed methodology and research work. As described in this paper, significant research has already been performed in the area of congestion and security. However a number of issues still remain unresolved or not completely addressed. Therefore, 4.1 Paragraph contain speculation on future research challenge.

To provides QoS up to satisfactory level when number of nodes increases in the network it usually decrease, Signal strength decreases due to increases of routing overhead in the network, to resolve the problem of energy or distribution of energy properly still an open question, and protection from various kind of routing attack in the network.

Additionally the proposed solution are in most cases not tested in real environment Therefore, future studies should rather be devoted to real implementation than just simulation. Only such an approach can ultimately verify a protocol's usefulness in future Ad-hoc network.

finally it should be kept in mind that is trade-off between signal strength, routing overhead, congestion, security and Quality of services etc. It is challenging issues to resolve all problems together. However list is still open due to continuous emerging new technology in Ad-hoc Network.

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