

# INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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**A SURVEY ON TRUSTBASED SECURE AODV IN MANET: A LITERATURE REVIEW****V.VALLINAYAGI****HEAD****DEPARTMENT OF COMPUTER SCIENCE****SRI SARADA COLLEGE FOR WOMEN****TIRUNELVELI****ABSTRACT**

A mobile Adhoc network is a collection of wireless mobile nodes forming a temporary network without using any centralized access points, infrastructure or centralized Administration. Data transmission between the two nodes in Manet may require multiple hops as Nodes transmission range is limited. Mobility of the different nodes makes the situation even more Complicated. These nodes are often vulnerable to failure thus making mobile adhoc networks Open to threats and attacks. Routing is always the most significant part for any network. One way is to transplant ordinary mechanisms in common networks with some improvement While the other way is to find some other factors such as trust to achieve the objective. This paper gives you a survey on trust in manet.

**KEYWORDS**

aodv, manet, network, trustbased, simulation, routing.

**1. INTRODUCTION**

In Aodv the network is silent until connection is needed. At that point the network node that needs a connection broadcasts a request for connection. 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 message and already has a route to the needy node. it sends a message backwards through a temporary route to a 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 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 message to conserve the capacity of the network. For example, each request for a route has sequence number nodes use this sequence numbers so they do not repeat route request that they have already passed on. Another such feature is that if a route request has time to live number that limits how many times they can transmitted. Another such feature is that if a route request fails another route request may not be send 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 vectors routing is simple and does not require much memory to calculation. However, AODV requires more time to establish a connection and the initial communication a to establish a connector and the initial communication to establish a route is heavier than some other approaches.

**2. WHAT IS TRUST?**

As an important concept in network security, trust is interpreted as a set of relations among agents participating in the network activities. These relations are founded on the proof generated by the prior interactions of entities in a protocol. As a general rule if these interactions have been true to the protocol, then trust will accumulate between these entities. Trust has also been defined as the degree of belief about the behavior of other entities (or agents). Establishing trust relationships among participating nodes is vital to facilitate collaborative optimization of system metrics. Trust and security are two tightly interdependent concepts that cannot be desegregated. For example, cryptography is a means to implement security but it is highly dependent on trusted key exchange. Similarly, trusted key exchange cannot take place without requisite security services in place. It is because of this inter-reliance that both these terms are used interchangeably when Defining a secure system.

**2.1 PROPERTIES OF TRUST**

In the context of a social network viewpoint, there are three main properties of trust: transitivity, asymmetry, and personalization. Firstly, trust is not perfectly transitive in a mathematical sense i.e., if A trusts B, and B trusts C, it does not guarantee that A trusts C. Secondly, trust is not essentially symmetric which means that it is not identical in both directions. A classic case of asymmetry of trust can be observed in the relations between supervisors and employees. Thirdly, trust is Intrinsically an individual outlook. For example, a particular entity will be contrarily evaluated by two people.

**2.2 CHARACTERISTICS OF TRUST IN MANETS**

In MANETs, the theory of trust is to be defined with caution because of the distinctive features of MANETs and the intrinsic fickleness of the wireless medium. The main characteristics of trust in MANETs are given below:

1. The existence of a trusted third party (such as a trusted centralized certification authority) cannot be assumed. Therefore, a decision method to determine trust against an entity should be wholly distributed.
2. Trust should be gauged without too much computation and communication load in a very customizable manner, while also capturing the complexities of the trust relationship.
3. A trust decision framework should not work under the assumption that all nodes are cooperative for MANETs. In an environment that is restricted of resources, selfishness is prone to be rampant over collaboration. For example, to save battery life or computational power.
4. Trust is not static, it is dynamic.
5. Trust is subjective.
6. Trust is not inevitably transitive. The fact that A trusts B and B trusts C does not mean that A trusts C.
7. Trust is asymmetric and not essentially reciprocal.
8. Trust is dependent on context. A could trust B as a wine expert but not as a car fixer. Likewise, in MANETs, if a specific task entails high computational power, a node with high computational power is considered as trusted; while a node that has low computational power but is not malicious (i.e., honest) is distrusted.

**2.3 SECURITY FLAWS OF AODV**

Malicious nodes can perform many attacks just by not following AODV rules since AODV has no security mechanisms.

A malicious node M can carry out the following attacks (among many others) against AODV:

1. Impersonate a node S by forging a RREQ with its address as the originator address.
2. When forwarding a RREQ generated by S to discover a route to D, decrease the hop count field to increase the chances of being in the route path between S and D so it can evaluate the communication between them. A variation of this is to increment the destination sequence number to make the other nodes assume that this is a 'fresher' route.
3. Impersonate a node D by forging a RREP with its address as a destination address.
4. Impersonate a node by forging a RREP that claims that the node is the destination and, to add to the impact of the attack, claims to be a network leader of the subnet SN with a big sequence number and send it to its neighbors. Thus it will become (at least locally) a black hole for the whole subnet SN.
5. By not forward certain RREQs and RREPs selectively, not responding to certain RREPs and not forwarding certain data messages. This kind of attack is particularly hard to even detect because transmission errors have similar effect.



6. Forge an RERR message by pretending it as the node S and sending it to its neighbor D. The RERR message has a very high destination sequence number dsn for one of the remote destinations (U). This might cause D to update the destination sequence number corresponding to U with the value dsn and, therefore, future route discoveries performed by D to take a route to U will fail (because U's destination sequence number will be much smaller than the one stored in D's routing table).
7. In accordance with the existing AODV draft, the originator of a RREQ can put a much bigger destination sequence number than the actual one. Additionally, sequence numbers wraparound when arriving at the maximum permissible field size value. This facilitates a very easy attack in where an attacker is able to set the sequence number of a node to any desired value by just sending Two RREQ messages to the node.

### 3. LITERATURE REVIEW

#### TRUST BASED SECURE AODV IN MANET

The performance of Adhoc on demand vector protocols has been modified by including the source route accumulation feature. The node may assist and trust each other in forwarding packets from one node to other. However, this implied trust relationship can be threatened by malicious nodes that may modify or disrupt the orderly exchange of packets. Trusted on this trust model we design trusted routing protocols using trusted frameworks and intrusion detection system. We extend the routing table and routing messages of AODV with trust information which can be updated directly through monitoring in the neighbourhood, so the computation is reduced and trustworthiness of the routing procedure can be guaranteed as well. Through simulation we can see that the bad nodes are clearly separated from the good nodes. The performance of AODV and TAODV under different environments were achieved.

#### ST-AODV QOS ASSERTION MANET ROUTING BASED ON THE TRUSTED AODV

In this paper a trusted ST\_AODV protocol is proposed that identifies the nodes that drops packets during data transmission. Trust value for each node is calculated to spot the untrustworthy nodes in the path during routing. A node is declared as a trustworthy node if its trust value is greater than the threshold value thus resulting in the trust worthy manet routing. This scheme has a good development on Qos parameter like pdr and delay also has provided trustworthy routing.

#### TRUSTED ON DEMAND ROUTING PROTOCOLS BASED ON AGENTS FOR MOBILE ADHOC NETWORKS

In this paper a new protocol based on self-monitoring and following the dynamic source routing algorithm is presented. THEREFORE, security is more important Trust routing protocols are one means security. ATDSR depends on self-monitoring of each node to find out its trust value. The advantages of ATDSR Are examined and it is compared with other techniques.

#### TRUST BASED ROUTING USING DOMINATING SET APPROACH IN WIRELESS ADHOC NETWORK

Some protocols are designed from scratch so as to incorporate security solution and some are designed to provide security measures into the existing protocols. Some protocols require each node to have high memory capacity as they store large tables using for stored security information. A new trust based routing protocols is proposed which overcome the above mentioned limitation.

#### AN ENHANCEMENT SCENARIO OF ROUTING PROTOCOLS SCHEME USING TAODV PROTOCOL AND FUZZY LOGIC

This paper has highlighted, the effect of malicious nodes on Performance of Ad-hoc networks is presented and importance of using trust levels to improve the reliability and performance Ad-hoc networks. Evaluating trust levels between nodes of Ad-hoc networks poses a big challenge due to the lack of infrastructure in Ad-hoc networks. To overcome this limitation a new approach based on fuzzy trust algorithm is proposed to facilitate the evaluation of trust levels between nodes of Ad-hoc networks. Simulation and experimental results collected after applying the TAODV approach show significant improvements in the performance and the reliability and Reduce the Packet dropped rate with reference to Time. Ad-hoc networks in the presence of malicious nodes. However, a number of further investigation could be conducted to extend this approach. User make many trust-based decisions on a Sub conscious level.

#### TRIUMF: TRUST-BASED ROUTINE PROTOCOL WITH CONTROLLED DEGREE OF SELFISHNESS FOR SECURING MANET AGAINST PACKET DROPPING ATTACK

In this paper we proposed a general solution to packet dropping misbehaviour in mobile ad hoc networks. The solution allows monitoring, detecting, and isolating of the droppers in short time without using promiscuous listening, and can differentiate between selfish and malicious nodes. In our trust routing protocol, nodes can cooperate together to perform trusted routing behaviours according to the trust relationship among them; to route around the misbehaving node. With the trust value threshold, nodes can flexibly decide whether its neighbour is a malicious node or not according to the value of certainty factor. In the future we will simulate the proposed trust routing protocol to show the results and effectiveness of our solutions, and compare it with existing trust based routing protocols like TAODV, TWOACK, and TDSR protocols. A detailed simulation evaluation will be conducted in terms of Routing Packet Overhead, Security Analysis, Mean Time to detect dropper node, Overall Network Throughput, and Average Latency. Also we will study the situation when there is more than one malicious node in the route from the source and destination, with asymmetry of communication link in both directions.

#### TRUST BASED ROUTING ALGORITHMS FOR MOBILE AD-HOC NETWORK

Mobile Ad-hoc networks (MANETs) has many challenges due to its dynamic nature. Some of the major challenges are number of malicious nodes detected, number of hops, route discovery time and packet loss.

Routing algorithms namely DMR, TMR and MTMR have their own way in order to establish the trust and transmit packet securely. But message trust based multipath routing protocol proved to be best in terms of number of malicious nodes detected, number of hops, to discovery time and packet loss.

In future we plan to implement the secure routing protocols such as the ARIADNE and ARAN and compare them with the trust based routing protocols. The system handles only text as message for data packets. In future it can be enhanced to include multimedia packets.

#### RESEARCH AND IMPROVEMENT OF AODV PROTOCOL IN AD-HOC NETWORK

This research has been contributed by JIAO Wen-Cheng, et al.. 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 method aimed 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.. Security is the major issue in Ad-hoc network. Protocols of MANET do not offer protection against various type of attack. Thus the do not offer any immunity. AODV-s is the modified version of AODV protocol by immune to various type of attacks. It also provides solutions 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. In MANET AODV exhibits abnormal behaviour 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 conditions in satisfactory level and also improvement of network load and end to end delay has achieved.

#### PERFORMANCE COMPARISON AND EVALUATION OF AODV, OLSR, AND SBR IN MOBILE AD-HOC NETWORKS

This Research has been contributed by Alexander Klein, et al. In this paper various proactive routing protocols has been compared like SBR, AODV, and OLSR in various mobile scenarios with different traffic pattern.

This protocols are compared on the basis of reliability and routing overhead. Outcome of this research source SBR achieve high end to end reliability without frequent end to end route calculations. Future directions of research is to increase the reliability without increasing the routing overhead.

#### PROPOSED WORK TO DECREASE THE ROUTING OVERHEAD

AODV enhanced local repair is Motivated by the issues identified in local repair. Aodv which uses to broadcast locally to repair the route. In trusted Aodv route repair by unicast mechanism instead of broad cast. Trusted route aodv is modified by sending route error message towards the source by the help of RREP to report the route failure.

So that routing congestion will decrease and propagation delay will reduce. We know that until it sends the route packet it never stops the data sending. If it has a trust worthy node and pick by the route, then it leads to decrease the congestion and delay.

## CONCLUSION

In this paper we have done survey of all the paper published in AODV in futures 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.

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

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