

# Weighted Cluster based Malicious Node Detection Technique for MANET

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**Abstract**— ad-hoc network is infrastructure less self-configure network in which no two devices know their location or locality any new node enters or exit from network easily. That's a big issue of security there are lots of work done regarding in this field but all have few issues so overcome these problem we proposed a weighted cluster based intrusion detection system to secure our network.

**Key words:** MANET, MAC, CF, CM, CH

## I. INTRODUCTION

Unlike the conventional network, a different peculiarity of MANETs is the open community atmosphere the place nodes can join and go away the network freely. Thus, the wirelessly and dynamic natures of MANETs expose them extra liable to bigger than a few types of safety assaults than the wired networks. In a MANET, nodal within their wirelessly transmitter can communicate with all node instantly while nodes outdoor the range have to rely on some other nodes to relay messages. When a multi hop scenario arises, the packets transfers via the source multitude are relayed via many middle hosts earlier reaching the receiver host. The success of communiqué dependent on the other nodes cooperation. Each of the nodes has a wireless interface to communicate with every node. These networks are completely distributed, and can work at any place without the assistance of any fixed infrastructure for example sink stations or access points. Device in MANET should be capable to detect the existence of another device and execute required set up to facilitate communiqué and service and sharing of data. Ad hoc networking agrees the devices to keep connections to the network as well as simply joining and eliminating devices to and from the n/w. Cause to mobility node, the network topology may alteration sharply and unpredictably over time. The n/w is decentralized, where network association and message supply must be executed via the nodes themselves. Message routing is a problematic in a de-centralize atmosphere where the topology mutate. Though the shortest path from a transmitter to a receiver dependent on a given cost function in a static network is commonly the optimal technique, this idea is problematic to expand in MANET. The collection of usage for MANETs is range from big- scale, mobility, greatly dynamic n/w, to minor, diverse, static networks which are helpless via power sender. MANET is more vulnerable than wired n/w cause to mobility nodal, threats from conciliate nodes inboard the network, dynamic topology, scalability, fixed physical security and scarcity of centralized management. Because of these vulnerabilities, MANET is more prone to malicious attacks. A MANET is a mostly liberal of promises and hastily increasing technology that is dependent on a self-organized and hastily protrude network. Cause to its great characteristics, MANET attracts dissimilar actual atmosphere usage regions where the networks topology alterations very hastily. In several

scholars are trying to eliminate main infirmity of MANET for instance battery power, computational power, and security and limited bandwidth [1].

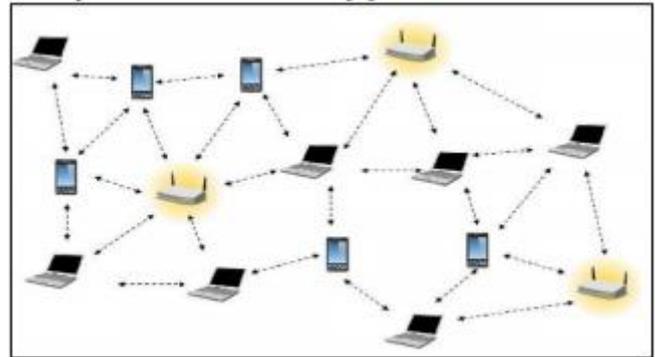


Fig. 1: Mobile Ad Hoc Network (MANET)

## II. CLUSTERING IN MANET

A well-turned methodology for dealing with the maintenance of MANET is thru separating the n/w into clusters. In this manner the network be administrable. It may be apparent although which a clustering method is not a routing protocol. Clustering is a scheme that aggregates nodes into collection. These collections are comprised thru the n/w and they are called as clusters. A cluster is mainly a subgroup of nodes of the n/w which satisfies a few properties. Clusters are similar to cells in a cellular network. Yet, the cluster association of an ad hoc network can't be achieved offline as in limited networks.

Clustering existing many benefits for the middle access layer and the network layer in MANET. The implementation of clustering patterns agrees a better recital of the protocols for the Medium Access Control (MAC) layer thru improving throughput, scalability and power consumption and spatial reuse. On the another side, clustering aid improve routing at the network layer thru decreasing the size of the routing tables and thru lessening transmission overhead cause to the modernize of routing tables later topological alterations arise. Clustering aid aggregate topology info since the no. of nodes of a cluster is lesser than the no. of nodes of the complete n/w. Therefore, all nodes only requirements to save a segments of the whole n/w routing info.

The objective of a clustering algorithm is to maintain and produce a linked cluster. In most clustering methods nodes are elected to play dissimilar roles according to a few criteria [2].

*A. Clustering offers many benefits when it is utilized with MANET*

- 1) It enhances system capability thru spatial reusing accessible resources. If two clusters are not neighboring clusters and they are not overlapped then they can use same set of frequency.

- 2) Border nodes and Cluster Head form a virtual backbone for routing amid nearest clusters. So spreading and generation of routing info is lessened to this collection of nodes.
- 3) Useful resource allocation can also be accomplished.
- 4) In cluster when mobile nodes travel to other cluster, only nodes present at that cluster need to update the information. So info saved thru each node is reduced, thus overhead of storing information is decrees.
- 5) Reduction of control packet in routing.

#### B. Demerits of the clustering in MANET

- 1) When any mobility node expires or node travels to other Cluster it reasons the re-clustering sometimes. It's known as the ripple effect of re-clustering.
- 2) Clustering is separated into two levels, Cluster Maintenance (CM) and Cluster Formation (CF). During CF each nodes are mobility nodes so routing strategies may be frequently altered that will decrees the presentation of the grid [3].

### III. LITERATURE SURVEY

In this paper an important clustering technique exploiting Multi-Layer perceptron NN to select CH. The CH is selected using mobility and residual energy as the attributes and is proved to be highly efficient as compared with the earlier methods [4].

In this paper, a Balanced Clustering in MANET Using Extended and Weekly Connected Dominated Sets that are applicable to cluster based MANETs to address this problem. Current protocols which exploit these devices to recover performance in terms of energy consumption and throughput, inter-packet delay variation Balanced cluster set making and delay and packet are overcome by proposed algorithm also network lifetime is prolonged by sustaining the energy level of nodes by Weakly and Extended Joined Dominating group. Balanced clustering averts info collisions. Previously single hop communication was possible but with the help of proposed algorithm two-hop communication is also made possible. Therefore the link becomes asynchronous so that which enables multiple transactions at a time, multiple transmissions is possible with limited no. of clusters called balanced clustering [5].

In this paper, first we introduce various approaches for clustering focus on different performance metrics. Then, we show few clustering patterns for instance Energy efficient clustering, Connectivity- depend clustering, Weighted depend clustering and Mobility-depend clustering. Lastly, a Fuzzy based approach for improving the reliability of cluster nodes in MANETs. We consider as reliability parameter the PL. By selecting nodes with small PL rate, the nodes are more reliable and the system performance is improved [6].

This paper studies the effect of correlated mobility on the throughput and delay performance of MANETs under information-centric environments, where the major anxiety of nodes is to retrieve contents stored by other nodes. depend on the degree of correlation among nodes, we consider two network regimes, i.e, cluster-dense regime and the cluster-sparse regime [7].

The new IWCA share the feature of self-adaptability of WCA and is capable to adjust corresponding

parameters according to different network characteristics, so it has a stable grouped cluster, which may results in more effectiveness and solidity of grouping and reduce network node communicuéd overhead and routing computational complexity. As a outcome, a stable and efficient clustering topology by fast convergence of the n/w will be achieved. Simulation results have illustrated that IWCA algorithm is superior to WCA algorism in words of performance and stability [8].

In this paper, A routing manner dependent on the P2P overlay network and autonomous clustering to rise the packet delivery ratio in case of the low node density. The autonomous clustering is a scheme to divide the n/w into several clusters and manage all nodes in the network. In each cluster, one cluster head that manages the cluster is selected. When the packets can't be promoted in the MANET layer, they are forwarded through cellular connections of the CH in the P2P overlay network. Evaluate the define method through simulation experiments and confirm the effects of the define pattern in the data packet delivery ratio [9].

In This paper the optimal election of CH is exploit to Ant Colony Optimization (ACO) manner. This algorithm optimizes communicuéd node span-time, and mobility and workload. The cluster structure is optimized thru the defined possibility function for clusters. The possibility function is calculated thru exploiting the parameters e.g energy drain rate and mobility element and residual energy. Node which has the extreme value for the probability function will elect like a CH. The overall communicuéd workload is calculated time to time. If its value is higher, then CH is reassigned. The benefit of this algorithm is which it can improve balance the energy consumption of the nodes and growth the stability of the node. Experiment outcomes illustrate that our future work results in more energy efficient and stabilized clusters [10].

In this work, a clustering methodology which decreases the delay of the n/w and increase the throughput exploiting the cost depend analysis. It also runs a re-clustering algorithm time- to-time where a novel cluster is formed and aid in managing the scalable n/w. Algorithms for clustering can be accomplished at routing stage or at higher levels. Dynamic clusters Formation helps in slenderizing overhead of node convolution and Power exploitation and a info packet. Cost depend Scalable Clustering is mainly exploited to minimalize network overhead [11].

### IV. PROBLEM STATEMENT

Mobile ad-hoc network is one of the most interesting field of research where lots of work done regarding security. Existing work have some issues to handle attacks like In existing IDS all attack identify but it's not identify flooding attack or passive attack so for improving our result we propose a technique which is based on weighted clustering.

### V. PROPOSE WORK

Recent interactions of the node with its neighbor. Some of the trust evaluation metrics are the type of data forwarded, data delivery rate, recommendation by CH, block list value and Number of packets forwarded, dropped, misrouted and

falsely injected [7] [8].The trust value can be calculated in two ways. They are Direct and Indirect (Recommendation) trust evaluation techniques. In our proposed paper direct trust evaluation is used because it will provide firsthand information and at the same time transmission overheads are reduced. After finding the trust value of one particular node and that value will be compared with predefined threshold (minimum and maximum)values. If the value lie in between minimum and maximum threshold value then the node announced as trusted otherwise distrusted and isolated from network activities. In our proposed work we enhance the trust approach and for flooding attack we improve algorithm where we also decide the thresh hold value for generate RREQ if RREP not receive particular threshold value than we declare this node as malicious

A. Algorithm

- 1) Step1: start network
- 2) Step2: create cluster on the basis of connectivity
- 3) Step3: if(node have higher connectivity){  
    Become cluster head} Else  
    Cluster normal node
- 4) Step4: if(drop>threshold){  
    Trust--}  
    Else  
    Trust++
- 5) Step5: If(forward<threshold){  
    Ftrust--}  
    Else  
    Ftrust++
- 6) Step6: if(trust<trustvalue && ftrust<trustvalue){  
    Broadcast malicious node}
- 7) Step7: exit.

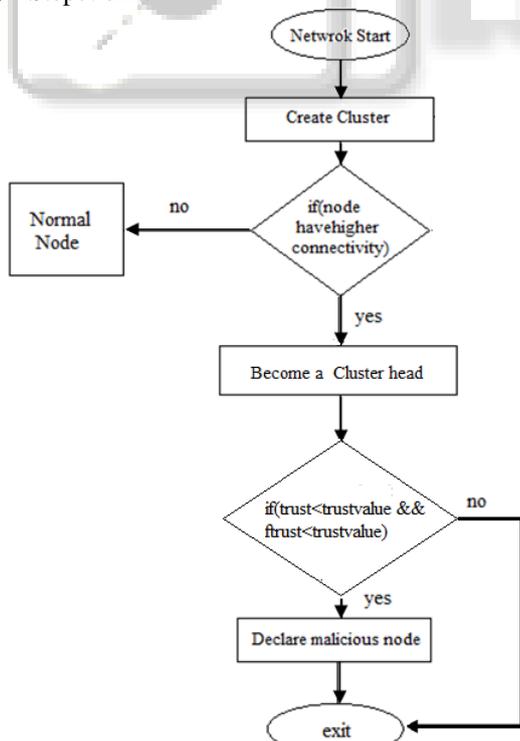


Fig. 2: Flow graph

VI. RESULT AND SIMULATION

Proposed work implemented on NS-2.35

Tool	Ns-2.35
Protocol	AODV weighted
Number of nodes	100
Simulation time	100ms
X	1000
Y	1000
Propagation	TwoRay
Antenna	omnidirectional

Table 1:

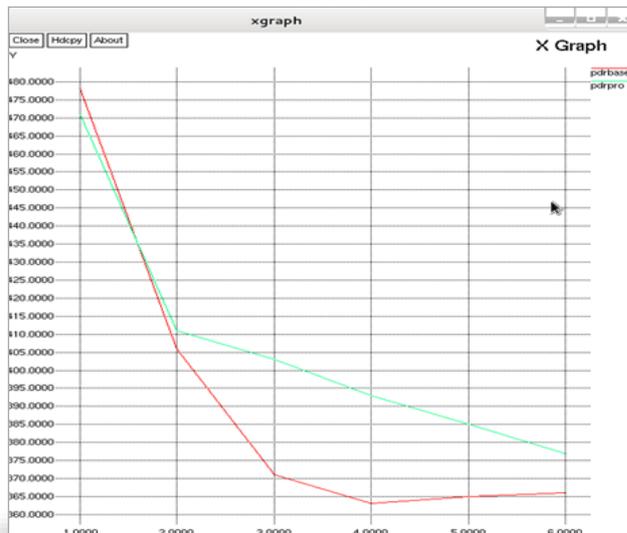


Fig. 2: Packet delivery ratio

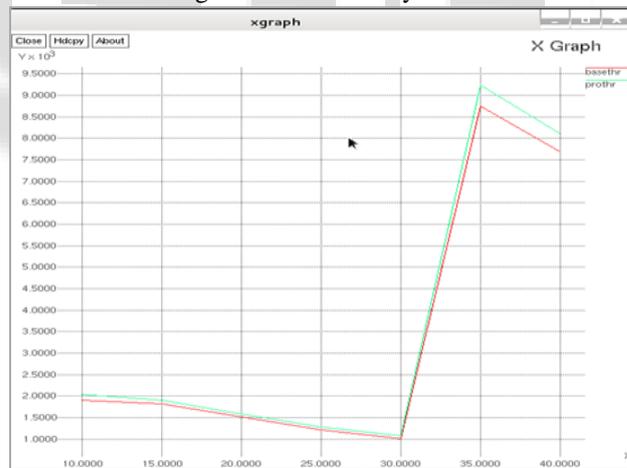


Fig. 3: Throughput

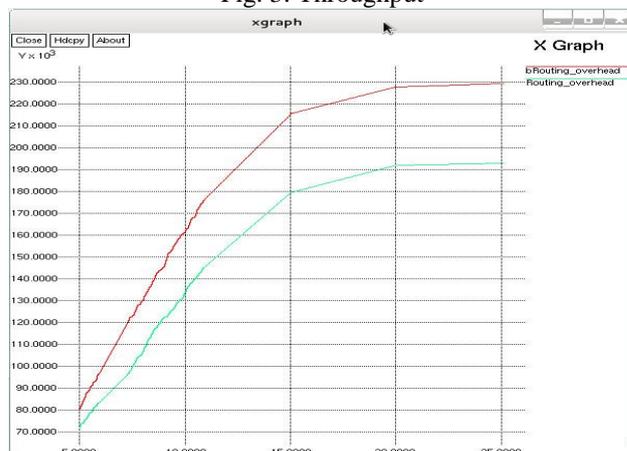


Fig. 4: Routing Over head

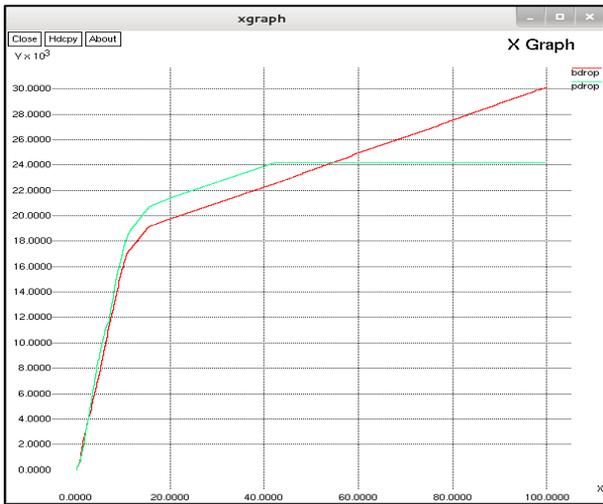


Fig. 5: Drop Packet

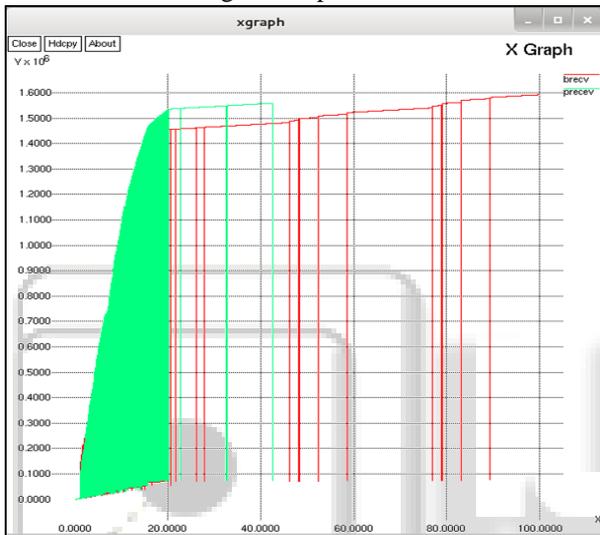


Fig. 6: Receive packet

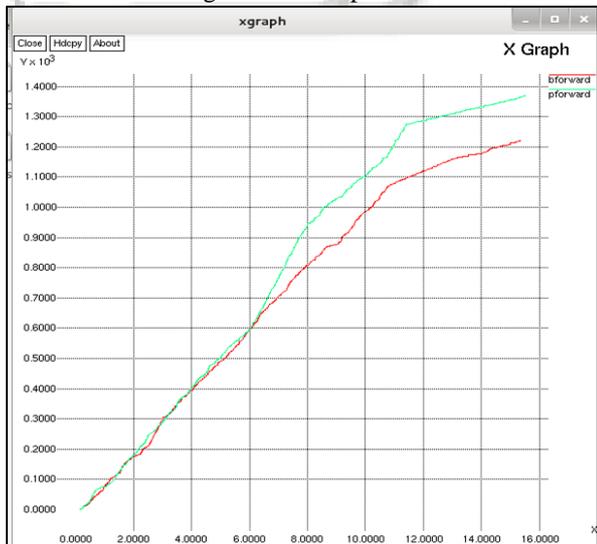


Fig. 7: Forward packet

## VII. CONCLUSION

Existence of attacks in network degrades the performance so that finding and preventing the malicious node is one of the most crucial task. By using this proposed technique we improve and secure our network in future we apply new cluster based crypto technique.

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