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Enhanced Features of Neighbor Aware Multicast Routing Protocol

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Abstract: Multicast routing protocol play an important role in adhoc wireless networks to provide this communication. It is always advantageous to use multicast rather than unicast especially in the adhocenvironment. In this paper, we propose an enhancement of Neighbor Aware Multicast Routing Protocol, which is tree based, hybrid multicast routing protocol for adhocnetworks. Tree based routingprotocol ensures the robustness. Robustness is one of the issues in designing a multicast routing protocol. The improvement can be helpful to increase the limits the population of forwarding nodes by using trusted dominant pruning method. For route creation the protocol uses neighboring information and trusted dominant pruning approach uses for route maintenance.

Keyword: Multicast,Adhoc network, trusted dominant pruning, robustness and routing.

I. INTRODUCTION

An adhoc wireless network consists of a set of mobile nodes that are connected by wireless links. The network topology in such a network may keep changing randomly. Routing protocols that find a path to be followed by data packets from a source node to a destination node used in the traditional wired network cannot be directly applied in adhoc wireless network due to their highly dynamic topology; absence established infrastructure for centralized administration. A variety of routing protocols for adhoc wireless network have been proposed in the recent past.

A routing protocol for adhoc wireless network must be fully distributed as centralized routing involves high control overhead and not scalable. Distributed routing is more fault tolerant than centralized routing, which involves the risk of single point of failure.It must cover the optimal routes once the network topology becomes stable.Every node in the network should try to store information regarding the stable local topology only.

Adhoc wireless networks is a infrastructure less multihop wireless network links,shared radio channel and distributed routing..Main aim of routing is to find paths with minimum overhead and also quick reconfiguration of broken paths.

The responsibilities of a routing protocol include exchanging the route information, finding a feasible path to a destination based criteria such as hop length minimum power required, lifetime of the wireless link gathering information about the path breaks, mending the broken

paths expending minimum processing power and bandwidth and utilizing minimum bandwidth.

Many routing protocols have been proposed for adhocnetworks.They can be broadly classified into three major categories named proactive routing protocols , reactive routing protocols and hybrid routing protocols.Hybrid routing protocol is combination of both reactive and proactive.Tree Structure is better in terms of packet transmission.

The main contribution of our work is enhancement of one solutions ,the so called trusted dominant pruning which takes into consideration the hostility of environment.Our proposed protocol isNeighbor – Aware Multicast Routing Protocol (NAMP). This is a tree based hybrid routing protocol utilize neighborhood information to route in the network maintained by request and reply message. If the receiver is not within the range, it searches the receiver byusing dominant pruning flooding method. NAMP consist of the tree structure i) Multicast Tree Creation ii) Multicast Tree Maintenance iii) Joining and Leaving of nodes from the multicast group. To create a multicast tree source, node

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sends a flood request packet to the destination with data payload.During the process of forwarding the packets, each node selects a forwarder and creates a secondary forwarder list (SFL). It contains the information about the nodes that were primarily considered as possible forwarders. Each intermediate node that use the chosen forwarder to forward the packet, but keeps the knowledge about other possible forwarders in SFL. SFL issued for repairing any broken route in the network. Link failure recovery is one of the greatest advantages of NAMP.

II.LITERATURE SURVEY

1.Alsakib, Pathon, Muhammad Monowar, Muhammad Alam, Choonghung "Neighbor aware multicast routing protocol for mobile Ad hoc network". The international Arab Journals of information technology vol.5, No.1. Jan. 2008.NAMP and trusted dominant pruning flooding method was used in research to avoid misbehaving node becoming a member of the conducted dominant set and combined with security protocol for reliable data delivery to overcome the existing problem

2.Kayi Lee Hyang-Won Lee and Eytan Modiano "Reliability in Layered Networks with Random Link Failures". Tree based hybrid protocol was used in his research instead of any algorithm to recover the link failure. It utilizes the neighborhood information. The roots in the network maintained by networks and reply messages. This concept is referred has a neighbor aware multicast routing protocol.

3.Ashikurrahman,PawelGburzynski and BozenaKaminska "Enhanced Dominant Pruning –Based Broadcasting in Untrusted Adhoc Wireless Networks"proposes trust based dominant pruning method for enhancements,scenario generation its ensures the impact of misbehaving nodes by retaining is worse.Traffic generation is used for well behaved nodes generate broadcast packed at regular intervals.Performance metrics aspects is Reachability,Redundancy and Delay.There are two way measures of reachability and potentially interesting one is coverage and another one is redundancy.Finally the delay metric is exprtessed as broadcast latency.

III. METHODS

The proposed trust based dominant pruning method is trust rating as measured by the nodes neighbor into the rank.
Consider the operation of a selected node **S**. Initially, for the lack of knowledge, **S**assigns the default trust rating of 1 to all the nodes in its neighborhood. This rating gets updated as prescribed below. The node maintains a pair of counters labeled**sui** (success count) and**fai**(failure count) for every one-hop neighbor**nei.**

Having transmitted a packet **p,S**keeps its signature in a queue and starts a timer for **δ** seconds. The signature of **p**contains a copy of the forward set **Fs**included in the packet header,as well as a sufficient amount of information to let the node recognize the same packet **p,** if received back. Within the **δ**- second interval **S**expects to receive back all the copies of **p**that will be rebroadcast by its neighbors. Having received such a copy from neighbor**wi, S**increments **sui.** If the timer goes off and some neighbors from **Fs**have not rebroadcast **p, S**will increment their **fai**counters. Note that **S**can also assess the integrity of the rebroadcast packets, Every **δ**- seconds the neighbourraterdaemon wakes up and calculates the current trust rating **Ti**for every neighborwifor which **sui + fai≠0;Ti= sci/(sci+ fci).**

Then, the average trust rating $\mathbf{Ti}^{\alpha}$of wiis updated as: $\mathbf{Ti}^{\alpha}= \alpha \times \mathbf{Ti}^{\alpha}+(1-\alpha)\times \mathbf{Ti,}$ where **α**is between0 and 1. Finally, both **sui**and **fai**are reset to zero, and thedeamon goes to sleep for another interval of **δ**- second.One more attribute associated with a neighbor**wi**is itsrelevance $\mathbf{Ri}^{u}$, which indicates how important **wi**is for relayingpackets received by **S**from **u**to **S's** two-hop neighbors.The relevance is calculated separately for every node u deliveringa packet to be rebroadcast by **S**as:$\mathbf{Ri= |Si|/wj\in B(u,v)|Sj|}$where $\mathbf{Si = N(wi) \cap Us}$. Similar to the trust rating **Ti, Ri**is also a fractional number between 0 and 1. Unlike trust rating, the relevance depends on the previous-hop (delivering) neighbor. Next With two simultaneous factors, the situation becomes more complicated because tuples $\mathbf{(Ti,Ri) \in R}^{2}$are not explicitly ordered.

Thus we suggest the following way of transforming theminto ranks: **(T,R)** represents a higher rank than **(T',R')** ifany of the following two conditions holds:

1) T >T'+ρ,
2) $\mathbf{|T - T'| \leq \rho \wedge R > R}$, where ρ >0 is typically small. This kind of ranking assigns a higher priority to the node's trustworthiness than to its relevance.

1. Fs= 0, Z = 0.
2. For each node wi∈B(u, s) do
3. Create the set S'isuch that S'i= N(wi) ∩ U.
4. Let K = {S1, S2, ..., Sn}.
5. For each node wi∈B(u, s) do
6. E(wi) == |S'i|/wj∈B(u,s)|S'j| .
7. Suppose, the trust ratings of nodes in B(u, s) are:
8. r(w1), r(w2), ...
9. Find a node whhaving highest trust rating in B(u, s).
10. Find the set of nodes, N = {w1, w2, ...}such that,
11. |r(wh) − r(wi)| < ρ, for wi∈N
12. Let wkis the node with highest relevance in N.
13. Fs= Fs∪ {wk}, Z = Z ∪S'k.
14. B(u, s) = B(u, s) − {wk}.
15. For each node S'i∈K do
16. S'i= S'i− S'k
17. K = K − {S'k}
18. If Z = U or Z is unchanged then exit;
19. Otherwise go to step 5.

In the trust-based dominant pruning algorithmeach iteration, **S**selects the most trustworthy neighbor**wh**and identifies all neighbors falling within the uncertainty region of **wh** (parameterized by ρ). Then, the most relevant node **wk**is selected from that region and added to **Fs;** also, all the twohopneighbors covered by it are added to **Z**that is removed from **Us.** The iterations continue until all nodes in **U**have been covered.

IV. CONCLUSION

We have presented enhancement of Neighbor Aware Multicast Routing Protocol.Improving the broadcast coverage of an adhoc wireless networks under condition of misbehaving nodes.Trust based dominant pruning method is outperforming compare with other dominant pruning methods.Trust based dominant pruning is redundant more,latency high and better coverage.

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BIOGRAPHIES

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