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Selfishness Detection System and Improve Data Transmission of MANET's

Bhalkar Yugandhara[1], Chaskar Ujwala,[2]Chaudhari Vanashri[3], GirigosaviChandrashekhar[4]

[1 2 3 4]*(Comp Dept* &DYPCOE,,Talegaon, *Pune University,India,)*

Abstract: MANET's are take lot of importance due to the popularity of mobile devices .MANET's is a continuously self-configuring , infrastructure-less network of mobile devices connected without wires. Each device in MANET's is free to move independently in any direction and will therefore changes its links to other devices frequently .In this network each and every mobile devices act as a router and communicate with each other. In MANET's there are many mobile devices which act as selfish, they not share its own memory for the other mobile devices and not consume their own services like battery and memory storage to transmitting data to other. Hence the mobility and resource constraints of mobile nodes may lead to network partitioning or performance degradation. Several data replication algorithms have been proposed to minimize performance degradation but this not efficient algorithm for data accessibility .In this paper , a new mechanism that improve the data transmission over MANET's by using the replica allocation algorithm for selfish node and finding the efficient path for data transmission by developing the path finding algorithm. Including calculate Degree of selfishness in allocating replicas will considerably reduce communication cost and produce high data communication.

Index Terms --- MANET's, selfish devices, router, replica allocation ,path detection.

I. INTRODUCTION

A Mobile Ad-hoc Network is an autonomous collection of mobile users that communicate over relatively bandwidth constraint wireless links that can change locations and configure itself on the fly. Because MANETS are mobile, they use wireless connections to connect to various mobile devices .Each device in a MANET's free to move independently in any direction and link to other devices frequently .Each must forward traffic unrelated to its own use and therefore be a router. This can be a standard Bluetooth connection, Wi-Fi connection or another medium, such as a cellular or satellite transmission. Some MANETs are restricted to a particular area of wireless devices , while others may be connected to the Internet. MANET's do not rely on extraneous fixed infrastructure and can be installed without base station and particular routers. This makes the nodes as ideal candidate nodes for rescue and emergency operations. The nodes in these networks have limitations in battery power and bandwidth, and each node needs the assistance from other nodes to forward their packets. The selfish nodes are reluctant to spend

their resources such as battery power, memory and time for others but they are not horror nodes.

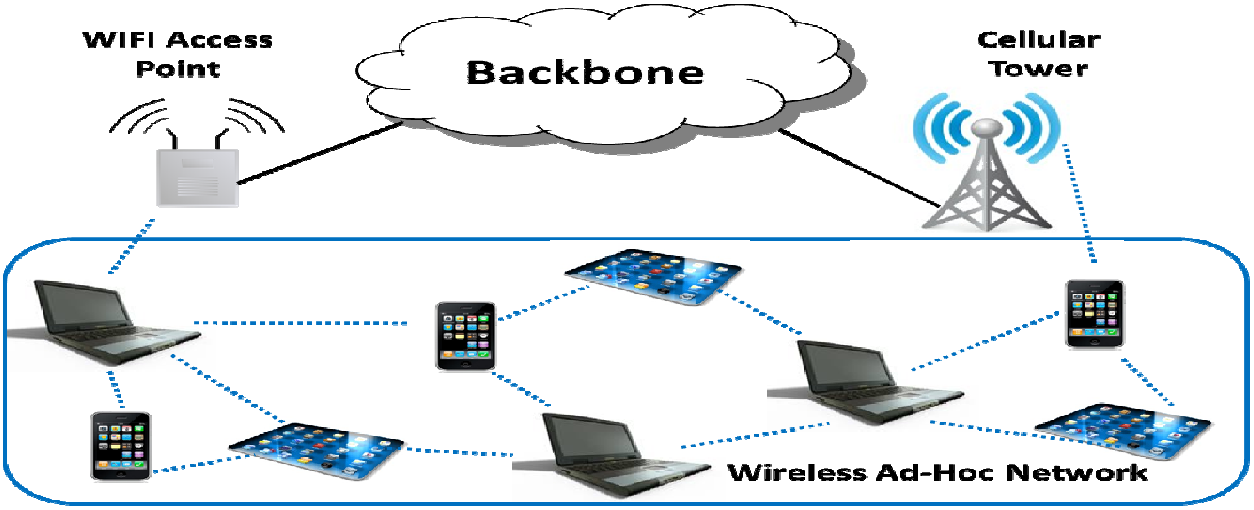

FIG.1

The problem is difficult when with the passage of time the nodes have little residual power and for their own purpose they want to conserve it. Thus in MANET environment there is a strong chance to a node to become selfish. A mobile node may be able to communicate with other nodes far away with the combination of intermediate nodes, transforming the packets to the destination. In this multi hop communication, each mobile node performs as both host and router. Routing protocols of ad hoc network such as DSR. Selfish replica allocation is a another notation refers to a mobile node's non cooperative act, means the node refuses to participate fully in sharing its memory space with other mobile nodes in the network. It considers replica allocation techniques with the developed selfish node detection method.

They are based on the concept of a SCF-tree and its goal is to achieve high data transmission with minimum communication cost in the presence of selfish nodes. The SCF-tree is divine by human friendship handling in the world. This paper, a model to detect and prevent selfish nodes that decline to cooperate but at the same time still utilize the network for their own benefits. Actually this model is also helped to find any misbehaving node attack in ad hoc network but in this paper the focus on replica allocation with the presence of selfish nodes.

- Characteristics of MANET's:

- In MANET's, each node act as both host and router. That is its is autonomous behavior.
- The reliability, efficiency, stability and capacity of wireless links are often inferior when compare with wire links.
- There is no central administration and fixed infrastructure.
- The nodes can join anytime and host configuration centralized firewall is absence here.

II. RELATED WORK

This deals with the replica allocation methods in MANET environment having selfish nodes which influence the performance of data transmission. Minimizing the effects of selfish nodes will be important to increase the data transmission between the nodes. The replica allocation techniques such as Static Access Frequency, Dynamic Access Frequency and Neighborhood , and Dynamic Connectivity-based Grouping failed to consider the selfish nodes, Hence improvements have to be made in replica allocation techniques that consider selfish replica allocation. The friendship manner replication has to be done in relocation period produce the new technique called SCF-tree based replica allocation . Various techniques have been proposed to handle the problem of selfish behavior from the

network perspective. As described in, techniques handling selfish nodes can be classified into three classes, they are following,

- Reputation-Based Techniques: Each node observes the behaviors of others and uses the acquired information for routing.
- Credit-Payment Techniques: Each node gives a credit to others, as a reward for data forwarding. The acquired credit is then used to send data to others.
- Game Theory-Based Techniques: It assumes that all rational nodes can determine their own optimal strategies to maximize their profit. The game theory-based techniques want to find the Nash Equilibrium point to maximize system performance.

- All these techniques focused on packet transmition in between the selfish nodes. The work introduced several trust models and trust management schemes in a MANET that can help mitigate selfishness in a MANET. Although the work introduces several schemes for the detection of selfish nodes, the work also focuses on the selfish behavior from the network perspective, such as dropping or refusing to forward packets. However, we need to consider the partial selfish behaviors into account in the selfish replica allocation problem. In the pioneering work , some effective replica allocation techniques are suggested, those are following,
- **Static Access Frequency (SAF) Method**: In SAF method, the nodes allocate replica of data items according to the access frequencies of that data items. Mobile nodes with the same access frequencies to data items allocate the same replica. A mobile node can access data items held by other connected mobile hosts, and it is more possible to share different kinds of replica among them. The SAF method causes low data accessibility when many mobile hosts have the similar access characteristics hence some of the data items to be duplicated in many nodes.

Dynamic Connectivity Based Grouping Method (DCG): The DCG method shares replicas in larger groups of mobile hosts than DAFN. At every relocation period, each mobile host broadcasts its host identifier. After all mobile hosts complete the broadcasts; every host knows the connected mobile hosts and the network topology from the received host identifiers. In each set of mobile hosts connected to each other, the mobile host with the lowest host identifier suffix executes an algorithm to find bi-connected components with the network topology known by received messages. Even if a mobile host belongs to more than one bi-connected component, it can only belong to one group in which the corresponding bi-connected component was found first. By grouping mobile hosts as bi-connected components, the group is not divided even if one mobile host disappears from the network or one link is disconnected in the groups. Thus, it is assumed that the group has high stability affected, unless they were in sleep mode and also if the selected routes are via specific host, the battery of this host will be exhausted quickly. If both of them are replicas, the host whose access frequency value to the data item is lower than the other one changes the replica to another replica. When changing the replica, among data items whose replicas are not allocated at either of the two hosts, a new data item replicated is selected where the access frequency value to this item is the highest among the possible items. This eliminates replica duplication among neighboring hosts. The above procedure is executed every relocation period. Overhead and traffic is much higher than SAF.

- **Node Behavior Model**
  - The nodes are no selfish nodes. The nodes hold replicas allocated by other nodes within the limits of their memory space.
  - The nodes are fully selfish nodes. The nodes do not hold replicas allocated by other nodes, but allocate replicas to other nodes for their accessibility.
  - The nodes are partially selfish nodes. The nodes use their memory space partially for allocated replicas by other nodes. Their memory space may be divided logically into two parts: selfish and public area. These nodes allocate replicas to other nodes for their accessibility. The detection of the type-3 nodes is complex, because they are not always selfish.

System Model To focus on the selfish replica allocation, it will not consider selfishness in data forwarding throughout this paper. Each node in a MANET has a unique identifier. All nodes that are placed in a MANET are

denoted by N= {N1,N2,…Nm}, where m is the total number of nodes. All data items are of equal size, and each data item is held by a particular node as its original node. Each data item has a unique identifier, and the set of all data items is denoted by D= {D1, D2,…Dn} where n is the total number of data items. Each node Ni has its own access frequency to data item. The access frequency does not change. Each node moves freely within the maximum speed.
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III PROPOSED SYSTEM

For solve the above problem, selfishness detection and replica allocation techniques are developed. In this invention each node goes through three stages: 1) efficient path finding, 2) detecting selfishness, and 3) replica allocation based on SCF+ trees.

4.1. Efficient Path Finding: Initially all nodes collecting the data about neighbor nodes. The network monitors having the detailed information of neighbor nodes such as Routing table. It provides the connection information to Route manager. The AODV Routing protocol and Dynamic Source Routing (DSR) both techniques are used to find paths from source node to destination node for transmitting packets. All possible paths are found by these techniques in network but packet transmission done through only shortest path in a network. Route request (RREQ) and route reply (RREP) are forwarded in between nodes to communicate. Intermediate nodes also used RREQ RREP to communicate with source and destination nodes.

4.2. Detecting Selfishness: Packet transmission route from S node to D node, which route is shortest among all possible routes. If any node behaves like selfish node, then it is not ready to transmit packets to other node. This cause may fail the communication. So in network selfish node detection is needed for efficient communication by applying "degree of selfishness" formula for each node. We borrow the notion of credit risk from economics to effectively measure the "degree of selfishness.A node wants to know if another node is believable, in the sense that a replica can be paid back, or served upon request to share a memory space in a MANET.

4.3. Replica Allocation: The SCF-tree based replica allocation techniques are inspired by human friendship management in the real world, where each person makes his/her own friends forming a web and manages friendship by himself/herself. He/she does not have to discuss these with others to maintain the friendship. The decision is solely at his/her discretion. After building the SCF-tree, a node allocates replica at every relocation period.

IV. BASIC REQUIREMENTS

- Functional Requirement

This paper mainly deals with eliminating selfishness over manet and make reliable transmission between pure nodes. The Different nodes are presented in network. In those source and destination nodes are needed to connect with each other through packet sending. Initially the shortest paths are finding in between the source and destination nodes. Particular shortest path was founded. Through that shortest path, source node sends packets to the destination node. If the transmissions are done perfectly then the network graph shows linear transmission lines. If any breaks found in transmission lines, it is the signal of occurring selfish nodes. That selfish node are extracted when path founding among all nodes. Network simulation is performed to found selfish nodes. If any path contains selfish node, through that path packets are not transmitted. Then the network founds replica allocation and another route or path from source to destination node. which is also one of the shortest path

- Non functional requirements
  - Performance Requirements:

  Here performance is concern with our controller is middleware between sender and receiver. Performance is mainly affected by all processing done by SCF+ tree is how fast it detect the selfishness over current network and find shortest path between sender and receiver.Thus , performance requirement is that how fast Algorithm technique find the node behavior to and make feasible route and choose the optimum path for packet transmission between host
  - Safety Requirements:

In system the safety should be taken when the when any device or node comes into the network , so we need to determine the behavior of the node for allocate to that node in particular class where it actually belongs.

- Security Requirements :

In MANET security plays small role. Because it is dynamic network and no centralized network for authentication so any one can enter and leave from particular Manet.

V WORKING CONCEPT

Various nodes, in those source and destination nodes are needed to connect with each other through packet transmission. Initially the shortest paths are finding in between the source and destination nodes. Particular shortest path was founded. Through that shortest path, source node sends packets to the destination node. If the transmissions are done perfectly then the network graph shows linear transmission lines. If any breaks found in transmission lines, it is the signal of occurring selfish nodes. That selfish node are extracted when path founding among all nodes. Network simulation is performed to found selfish nodes. If any path contains selfish node, through that path packets are not transmitted. Then the network founds replica allocation and another route or path from source to destination node. which is also one of the shortest path. The related work introduces the cooperative caching-based data access methods, including Cache Path, Cache Data, and Hybrid. Differing from all the above-mentioned replica allocation or caching techniques, we consider selfish nodes in a MANET. The work proposes Conquer, a broker-based economic incentive model for mobile peer-to-peer networks. Although the work considers free riders to host data in mobile peer-to-peer networks, it assumes that all peers are trusted and they do not cheat. some strategies for handling selfish behavior have been proposed In the research field of distributed databases. However, these works cannot be directly applied to a MANET, since they did not consider the constraints such as the bandwidth limitation for the detection of selfish nodes and system failures due to frequent node disconnections of a MANET.

VI TECHNICAL SPECIFICATION

6.1 ADVANTAGE

- Path is generated within minimum amount of time that as also shortest path for packet transmission.
- Low power components routers can share their resources like memory and data to contribute in manet structure called non selfish node (pure node).
- Provide reliable data transmission for every devices those are belongs to that particular environment.
- SCF+ algorithm provides the maximum possible feasible route and choose optimum out of them.
- Speed of packet transmission is increased because there is presence of linear path between sender and receiver.
- Our technique is scalable, adding new node in environment won't affect the already existing modules used in the system and can be added very easily if added modules(nodes) detect as a selfish then remove that from any path.
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6.2 DISADVANTAGE

- When we detect selfishness then we fire alarm but some time nodes are leave un-necessarily at that time selfish alarm also raised.
- There is no centralized network so authentication can not proceed.

6.3 APPLICATION

- In mobile Network :

- This technique will help the mobile devices to increase the rate of packet transmission. Because of this there is guaranty of packet delivery to any host those are present in network.

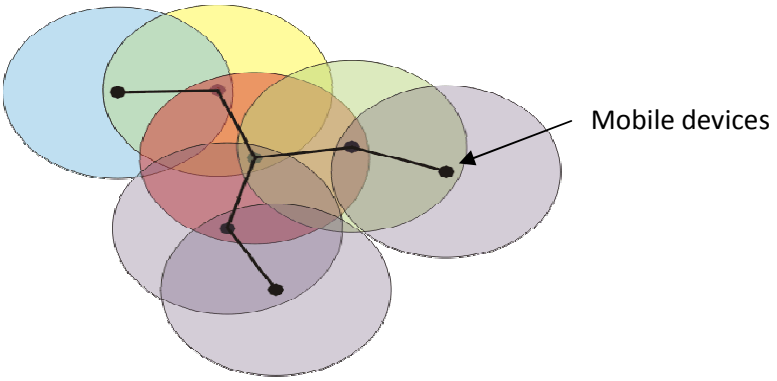

Fig 2. Transmission path between mobile nodes.

- In infrastructure network we can provide better service to client for sharing devices. This will help to share memory and data efficiently between client so one can gat better serviceability with other one.
- Education environment:
  - In large universities there is thousands of student .So college provide the Wi-Fi or any other internet service for student. Some student not shares their resources .hence using this technique we can detect selfish devices and make proper communication between pure nodes.

VII CONCLUSION

The selfish node replica allocation could reduce the overall data transmission in a MANET. The proposed techniques are inspired by the real-world reflection from economics in terms of credit risk and in human friendship management in terms of selecting friends completely at its own discretion. The applied notion of credit risk and the collaborative monitoring method to detect selfish nodes outperforms the existing detection methods and very node in a MANET calculates credit risk information on other connected nodes individually to measure the degree of selfishness. The collaborative monitoring method is used to reduce the detection time & cost of the each node. Since existing replica allocation techniques failed to consider selfish nodes and also proposed novel replica allocation techniques. The research is currently going on the impact of different mobility patterns. The proposed technique reduces communication cost, and query delay, to reduce the detection time of the selfish nodes for improvement of the data transmission or communication through Manet.

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