

INCREASING THE PERFORMANCE OF MANET MULTIMEDIA COMMUNICATION USING THE MINING TECHNIQUE

T.Balasubramanian¹, D.Kavitha² and S.Senthilnathan³

^{1,2,3}Assistant Professor

^{1,2,3}Department of Computer Science and Applications

^{1,2,3}Sri Vidya Mandir Arts & Science College, Katteri, Uthangarai

Abstract: A mobile ad hoc network (MANET) is a continuously self-configuring, infrastructure-less network of mobile devices connected without wires. Recently, it has emerged the most significant area in mobile computing research field. Assuring the quality streaming of the multimedia communication is a difficult task in MANET, particularly when node mobility is present. The techniques introduced due to node mobility have not provided the proper solution for this task and leads to the frequent network partitioning of the mobile users. In this paper, a mining algorithm is proposed for increasing the streaming performance of multimedia communication. This Streaming Mining Algorithm (SMA) ensures the continuous availability of multimedia streaming services while minimizing the overhead. The work proposed provides the QoS in MANET for increasing the quality streaming of multimedia communication. The network-wide continuous streaming coverage is achieved by partition prediction and service replication on the streaming sources and assisted by distributed selection of streaming sources on regular mobile nodes and users. The proposed algorithm is validated by the results of performance evaluation.

Key words: QoS, MANET, Mining Technique.

1.INTRODUCTION

Providing QoS in MANET is a challenging issue in multimedia communication which needs higher bandwidth and reliable communication. Providing them is a difficult task due to the nature of the network. This paper focuses on to provide a reliable communication to the MANET through mining techniques which estimate the reliable and high bandwidth path for communication. The motivation behind this work is to create a model which can be used as a tool for providing effective QoS to multimedia communication in MANET. The aim of this paper is to frame a

Streaming Mining Algorithm which uses the mining technique to determine effective and optimal QoS. The objective of this work is to provide prioritized and customized services to the multimedia applications in MANET communication.

2.MANET CONCEPT

A mobile ad hoc network is a collection of wireless nodes that can dynamically be set up anywhere and anytime without using any pre-existing network infrastructure. It is an autonomous system in which mobile hosts connected by wireless links are free to move randomly and often act as routers at the same time. The traffic types in ad hoc networks are quite different from those in an infra structured wireless network, including:

1) *Peer-to-Peer*: Communication between two nodes which are within one hop. Network traffic (Bps) is usually consistent.

2) *Remote-to-Remote*: Communication between two nodes beyond a single hop but which maintain a stable route between them. This may be the result of several nodes staying within communication range of each other in a single area or possibly moving as a group. The traffic is similar to standard network traffic.

3) *Dynamic Traffic*: This occurs when nodes are dynamic and moving around. Routes must be reconstructed. This results in a poor connectivity and network activity in short bursts.

3. QoS SUPPORTING MODEL

Just like in wired networks, QoS protocols can be used to prioritize data within ad hoc networks in order to reserve better connections for high data rate

applications while still maintaining enough bandwidth for lower bit rate communication. The support of multimedia services will most likely be required within and throughout the MANET, for which different QoS classes (e.g. voice, video, audio, web, and data stream) are needed to facilitate the use of multimedia applications. In such a stochastic changing environment involving dynamic nodes, hidden terminals, and fluctuating link characteristics, supporting end-to-end QoS at different levels will be a great challenge that requires in-depth investigation [3]. An adaptive QoS must be implemented over the traditional plain resource reservation to support the multimedia services. Special emphasis should be put on achieving a new QoS model for MANETs by taking into account the ad hoc features of the target networks: dynamic node roles, data flow granularity, traffic profile, etc.

4. CHALLENGES IN MANET

Major challenges in MANET are due to the ad hoc nature of the node, dynamic topology and multi hop in nature. So streaming communication in this, need a reliable communication which needs to provide the guaranteed Quality of service (QoS). QoS refer to the capability of a network to provide better or optimal service to selected network traffic over various network technologies. QoS algorithms should focus on effective use of existing resources and applying the required level of service without reactively expanding or over provisioning their networks. Network parameters such as bandwidth, latency, packet loss, jitter and throughput are considered for QoS in MANET. It is difficult to support diverse applications with appropriate QoS in MANET because it is highly dynamic network due to varying topologies, traffic load conditions, less communication bandwidth and smaller processing power capacity than fixed networks. Factors such as varying wireless link capacity, propagation path loss, fading multi-user interference, power expended and topological changes become very important issues in mobile ad-hoc networks. MANET requires efficient distributed algorithms to determine the network organization, link scheduling and routing.

5. STREAMING MINING ALGORITHM (SMA)

In MANET we have to assess the capacity, propagation path loss, fading multi-user interference, power expended and topological changes traffic load conditions, communication bandwidth and processing power capacity before we provide a reliable communication. Various algorithms are developed to address data mining primitives which provide the solution using the K-means clustering, but streaming communication parameters are not considered. To

address this issues the concept of Streaming Mining Algorithm (SMA) is introduced. Let us formally define the operations of SMA. An algorithm is local assuming that a static network and data are available. For any network size, there are inputs such that the algorithm terminates with communication expended per peer not greater than a node and on the rest of the inputs the communication expended per node is on the order of network size. SMA is very attractive for large scale systems like MANET systems and sensor networks because of their scalability.

6. ALGORITHM

1. Select nodes randomly and provide the initial cluster for communication.
2. Assign a value to each node to the closest node.
3. Cluster the adjacent nodes.
4. Estimate the network size through prediction.
5. Assess the traffic load and communication bandwidth.
6. Estimate the path loss and power capacity.
7. Recalculate the positions of each node (the average of all data nodes assigned).
8. Repeat Steps 2 to 7 until the node does not change.

The assignment of points to the final node forms the clustering. The algorithm can adjust itself to changing network and dynamic data in MANET with simple mechanism to detect change in network/data. Any new node joining the network can join the ongoing clustering algorithm by syncing to the ongoing minimum iteration in its neighborhood. Change in data content of any peer just reassigns the cluster parameters in that peer and move on to the next iteration.

7. PERFORMANCE EVALUATION

In this section we evaluate the performance of the algorithm how it access the MANET environment and provide a quality of service to the multimedia communication in MANET. We use the path availability between any two arbitrary node 3 and 17. The result shows that in a connected network, a better path for data communication between source and destination can always be found.

The performance of the streaming mining algorithm would be best quantified by the deviation (or error) between the actual network topology and the network topology perceived by the individual nodes. We have defined various parameters to a topology deviation. As a concise definition for these parameters, we could say that if the average topology deviation for a particular system is communication efficiency, it signifies that, on an average, each node can conclusively pinpoint a

circular increases in communication efficiency within which a desired node would be located. Another parameter, which we have used to capture the celerity with which topology change and power conception information get infiltrated into the system, is percolation. Percolation is defined as the time required, for all the nodes in the system, to learn about the entry of a new node in the network. This is also a measure of the scalability of the system.

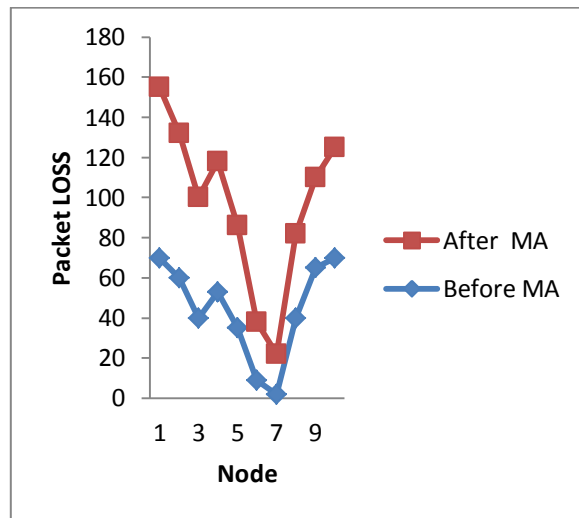


Figure.1: Performance Analysis Chart

8. CONCLUSION

In this paper, a method is proposed to increase the performance in MANET multimedia communication through a mining technique Streaming Mining Algorithm by providing the QoS for the quality streaming. The result had shown that it had obtained the expected results.

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