ENHANCED CONGESTION CONTROL METHOD TO ATTAIN QOS FOR REAL TIME APPLICATIONS IN MANET's

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Abstract— Many routing protocols for optimization of delay and energy that uses improved real time structures associating real time application has been established for Mobile Adhoc Network.Control of congestion is another main challenge while achieving the QoS particularly with the mobile station. This paper mainly focuses on control of congestion in real time and offer a traffic shaping mechanism in TCP/IP protocol suite of network model . In real time token bucket, the number of buffer size and bucket size depends on the output of the flow. Here the results illustrates that the proposed methods performs better in highly congested traffic scenario.

Index Terms— MANET , Throughput , QoS, Token Bucket

1 INTRODUCTION

The most promising issues in MANET that ocuu rduring real time data transmission is congestion control at the network devices such as routers which have limited buffer capacity to hold incoming packets and forward them towards their respective destinations[1].The token bucket is an algorithm used in packet switched computer networks and telecommunications networks. It can be used to check that data transmissions in the form of packets conform to define limits on bandwidth and burstiness. It can also be used as scheduling algorithm to determine the timing of transmissions that will complywith the limits set for the bandwidth and burstiness. I t is based on an analogy of a fixed capacity bucket into which tokens, normally representing a unit of bytes or a single packet of predetermined size, are added at a fixed rate. . A **mobile ad hoc network** (**MANET**), also known as adhoc wireless network, is a continuously self-configuring, infra-structure-less network connected wirelessly.Each device in a MANET is free to move independently in any direction, and will therefore change its links to other devices frequently. Each must forward traffic unrelated to its own use, and therefore be router. The primary challenge in building a MANET is equip-ping each device to continuously maintain the information required to properly route traffic.

Fig.1 Mobile Ad Hoc Network

2 LITERATURE SURVEY

MamataRath, Binod Kumar Pattanayak, study based on " Energy Competent Routing Protocol Design in MANET with Real time Application Provision". Adhoc on Demand Distance Vector (AODV)Routing protocol can overcome the networking issues efficiently, still power and delay efficiency has always been a tedious task in MANET due to the resource constrained nodes which are supplied with limited batterypower during the operation in the network. Here bat-tery power reduces delay in processing of packet and for-warding them to the next node during transmission. This causes overall end to end delay in the total transmission. Therefore many researches working for the design of robust and reliable protocols. This special network has the capability to function in resource constrained environment with good cooperation among the self-configured nodes.. Due to these special characteristics of the MANET, it is very important in current technology[2].

GhassanA.QasMarrogy, Dr.Emmanuel S. QasMarrogy, study based on comparision of "Performance Analysis of Real and Non-real Time Traffic under MANET " Technologies such as Voice, video, ftp, etc. have made imact on Mobile Adhoc Networks (MANET) . MANET is a

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infrastructurless network in which nodes changes their locations frequently, and they can configure the network automatically .Here the main focus of this paper is to study the impact of real time traffic (voice, video conference) and non-real time traffic (HTTP, FTP, Email) on the four routing protocols, Optimized Link State Routing (OLSR), Dynamic Source Routing (DSR), Ad-hoc On-demand Distance Vector (AODV), and Geographical Routing Protocol
(GRP) . Using the performance analysis with extensive simulation it is seen that OLSR protocol produces the highest throughput and the lowest delay compared to other protocols for non-real time and real time video traffic.

KhamisAlAlawi, Hussain Al-Aqrabi, proposed "Quality of Service Evaluation of VoIP over Wireless Networks".The services provided by Voice over IP (VoIP) is highly prioritised over other services and applications. Some factors with this real-
time service, such as delay and throughput which need to be addressed before delivering to the customer This paper
stimulates the performance of Voice-over IP (VoIP) in 802.11 wireless networks and elaborates on the evaluation of voice packet end-to-end delay and throughput. VoIP technology converts analog voice into digital datapackets that can be stored, searched, manipulated, copied, combined with other data, and distributed to virtually anydevice that connects to the IP network. This functionality made it possible to achieve maximum flexibility in the transport or transmission of voice that has been transformed into data[4].

Elizabeth M. Royer, Charles E. Perkins, proposed "An Implementation Study of the AODV Routing Protocol" . In this paper simulation was carried in variety of scenarios. Mobile wireless devices are rapidly gaining popularity due to recent improvements in the portability and power of these products.There is a growing need for communication protocols which allow users of these devices to communicate over wireless links[5].

3 Proposed Method

In the current work for controlling congestion we are using an Real time Token Bucket as an intermediate system between the sender and receiver. In the existing system there was no intermediate system between the sender and receiver. For example, if multiple nodes wants to communicate with the receiver at once, the receiver is unable to communicate with all the source nodes at once. The receiver can communicate with only one source node, because of this there will be a data loss, communication link breaks and no efficiency. To overcome this problem we are using proposed system.
In our proposed system there are 3 modules.

1)Node module which is responsible for generating packet and acquire token.
2)RTB System which is responsible for generating token and delivering to nodes and fetching data from nodes and storing into buffer and delivering data to destination using bucket size to destination.
3)Destination node which is responsible for receiving packets and storing accordingly.
Here inflow and outflow rates are configurable before starting system. Like communication between nodes and RTB data rate and RTB System to receiver system data rates. Nodes should check that before transmitting data, it has acquired a required no of packets or not. From RTB to receiver system standard data rates are set. Fixed rate flow refers to only 1set of buffer data transmitting at a time. It has to wait for next turn to send remaining packet. Here tokens are not required. In RTB node as to be acquire adequate tokens to transfer data. If node having adequate number of tokens than whole packet transferring from node to controller system without waiting. Here buffer will holds all the data from nodes. From buffer to bucket delivering to receiver will be FCFS basis. Using this token bucket system we can ensure that packets are delivering safely and providing QoS due to handling of congestion before transmitting data.

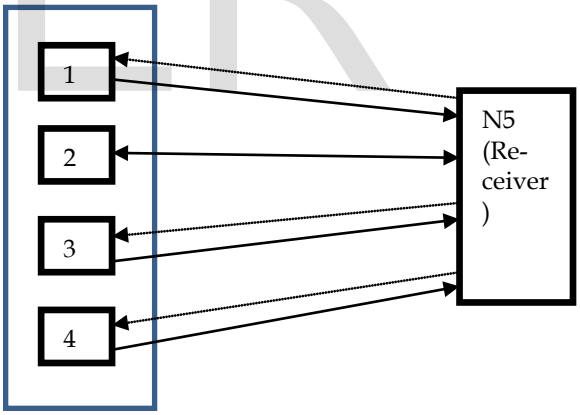

Fig.2 Existing System architecture

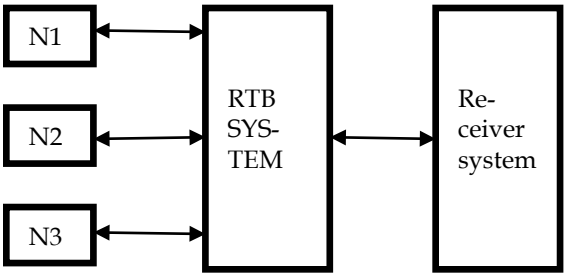

Fig.3 Proposed System architecture

Existing System	Proposed System
No Intermediate System is used	Intermediate System is used
There will be a connection loss	There will be no loss of connection
Data loss	Data will be transmitted without failure
In Existing system we are using Leaky bucket	In Proposed System we are using Real Time Token Bucket
No Efficiency	There is gain in Efficiency

4 EXPERIMENTAL SETUP

According to this paper we have written programs that will event functions of congestion control node, receiver system which are JAVA programs using Netbeans 9.X IDE and running on laptop under
Windows10 with 2GB RAM environment.For front end Swings/AWT API and for networking Sockets API are used

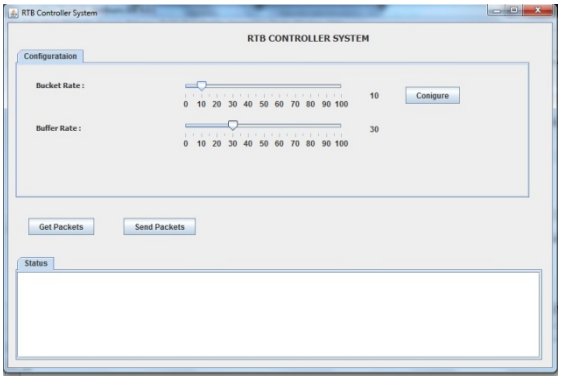

Fig.4 RTB controller system

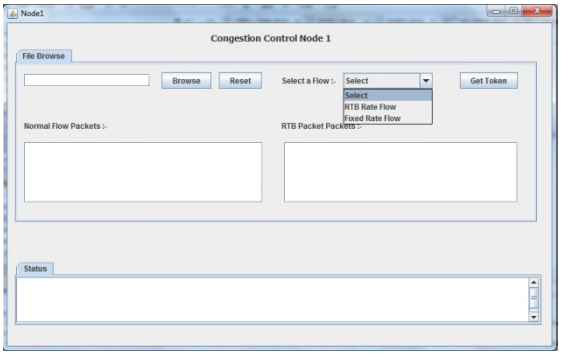

Fig.5 Selecting the flow snapshot

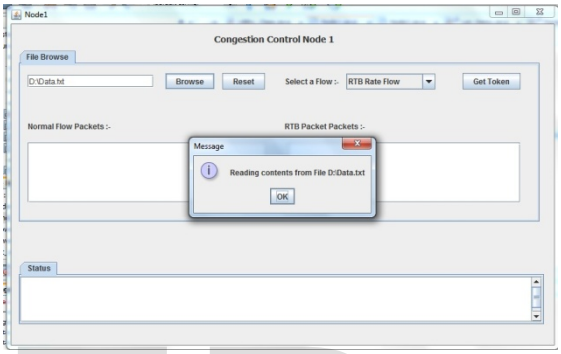

Fig.6 Reading from the file snapshot

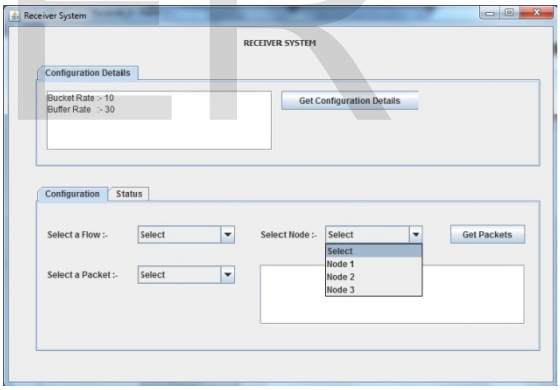

Fig.7 Receiver system snapshot

Algorithm between nodes and controller system

Step 1: Select type of data(RTB/Fixed).

Step 2: Generate a packet.

Step 3: Acquire a adequate number of tokens.

Step 4: Send the packet from node to the controller system.

Algorithm between controller system and server

Step 1: Server should update token value.

Step2: Transmit data between controller system to server system using bucket size.

Step 3: Received packets are stored accordingly.

5 Result

Token bucket traffic mechanism is used with basic concept of real time application during the packet transmission at the intermidiatenodes.In real time token bucket, the number of buffer size and bucket size depends on the output of the flow. Set the buffer size and bucket size.From node 1 to controller we use buffer size and from controller system to receiver system we use bucket size.Finally we get quality of service using real time token bucket.

6 Conclusion

This paper focuses on the main issue in real time transmission in Mobile Ad-hoc Network during the real time data transmission. It overcomes the queuing delay issues at the router interface during routing for inward and outbound traffic . Here we use improved method called real time token bucket which resolves the difficulty of congestion at the router interface. This mechanism achieves greater efficiency when embedded as multilayer communication based Qos architecture.

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