INTERNATIONAL JOURNAL OF ENGINEERING SCIENCES & MANAGEMENT

CONGESTION CONTROL POLICY IN NETWORK WITH MAC PROTOCOL OVER TCP BASED RELIABLE NETWORK

Sachin Upadhyay[1] and Parag Jain[2]
Computer Science Department, Oriental University, Indore, MP, India
HOD (IT), Oriental University, Indore, MP, India

ABSTRACT

As the network activity is growing evaluation of the performance in network is necessary we know that today network has lots of protocols and network management schemes but no one will provides best effort services with trusted communication. Since the Ad hoc network can be a WLAN because network will be open for entire internet so secure communication is also the important consideration with network layer. In this synopsis we aim to study Ethernet 802.11 with other Media Access Layer protocol on simulator GNS3 based on the network specification with TCP network connection. Here we will capture all the incoming data packet on one time TCP connection and then getting the result of Lost Packets, Received Packet, Delayed Packets and overall through put performance will be measured at MAC layer with the help of designed reliable network where we are not only evaluating performance but also rectifying the addressing scheme used for the delivery of data packet.

All the activity which we are managing by our proposed scheme is assure about the reliability aspects due to the connection oriented TCP services and the previous working of the MCA lower version protocol has been implemented as UDP connection-less services that cannot measure eve4ry thing to achieve reliability aspects so that comparative study of previous protocol with new is necessary that has been experimented and analyses by GNS3 network protocol analyzer that provides as graphical verification of resultant activity.

Key words: IEEE802.11, MAC Layer, GNS3, WLAN, Ad Hoc Network.

INTRODUCTION

IEEE has developed the project 802 for getting the media access and flow control. IEEE 802 has been designed for Wireless and Wire LAN with number of media accessing scheme Protocol has been designed for the maximum utilization of the available capacity of transmission media like CSMA/CD, CSMA/CA, ALOHA. Our Proposed communication policy has been designed for maintaining the network performance factor for any network. when we are working with MAC 802.11 it works well compare to other standards like 802.3 , 802.4,802.1 etc. with the possible considered communication system each LAN now are working with Video, Voice and Data packet where Video and Voice can be sanded with some different addressing while the Data Packet having some difference addressing.

*Corresponding Author
Email- ittech.net@gmail.com

Mode accordingly we have network Scheme that works as a intelligent decision maker that not only evaluating the performance but also directing the packet to right direction whenever required.

Project 802 organized by IEEE to set the communication standards that allows intercommunication in different systems developed by variety of manufacturers .Our proposed scheme has been implemented as a media access manager for all of system of any Network to make this achievement we need to design network that should co-ordinate with project 802 as a super intelligent machine with higher throughput and less delay time. In proposed model we are performing all the experimental operation on TCP connection so that all the associated organization who is like to work in confidential environment can also take the reliable communication at higher level. Where ever connection has been established by Transmission Control Protocol all the QoS Support services has been activated at the evolutionary model layer which can be achieved with the help of Ethernet 802.11

Int. J. of Engg. Sci. & Mgmt. (IJESM), Vol. 3, Issue 3: July-Sep.: 2013, 9-12

9

series instead of 802.3 or other remaining Ethernet because project 802 has been designed for MAC layer [13], all the 802 Ethernet protocols are working well at that position but when we go through the 802.11 protocol series what we find, simulator shows clearly that how much 802.11 Ethernet is best than other protocol for communication network system for data transmission with all the network specification factor has been covered with TCP oriented connection. As the technology growing all the government or private organizations who are working with in a confidential environment want to make very higher level of efficiency , Performance and Qos Services.

Research Objective:
we will capture all the incoming data packet on one time TCP connection and then getting the result of Lost Packets, Received Packet, Delayed Packets and overall through put performance will be measured at MAC layer with the help of designed reliable network where we are not only evaluating performance but also rectifying the addressing scheme used for the delivery of data packet

Proposed Algorithm:
MAC implementation with unreliable source is not well for all those organization who especially working for confidential data communication framework all the schemes define by the computer society for network point of view is providing the resulted contents with different connection scheme TCP is always there to provides the reliable source of information . Network performance always varies with the specification of connection protocols. Here we are presenting the TCP code to for reliable connection and MAC code implementation.

I have some code that uses Indy. Sockets. UDP Client to send messages to pcs on a LAN network using the TCP address and listening port (which I store in a database):

```
public static void SendMessage(Client pClient)
{
   TCPClient tcpClient = new TCPClient();
   TCPClient.Host = pClient.ServerIP;
   TCPClient.Port =
pClient.fListeningOnTCPPort;
   tcpClient.SendBuffer(pClient.RestartMessage);
}
```

---

able to send messages using the MAC address instead (also stored in database), is it possible to send a similar message using MAC address?

The MAC address of a live same-subnet TCP connection will almost certainly be in the ARP cache.On Linux, you could examine on GNS3 that how the ARP cache by looking in /proc/net/arp.

IP address	HW type	Flags	HW address	Mask	Device
10.0.0.32	0x1	0x2	00:1e:4f:f5: be: dc	*	eth0
10.10.10.1	0x1	0x2	00:1f:6c:3e:02:e3	*	eth0

After configuring all this setting we need to bind the communication channel with interface to get the data transmission result over to the simulator that shows graphical specification of both TCP and UDP.

Save this script to a file (e.g. /usr/local/bin/chanhop.sh) and run:
 # chmod 700 /usr/local/bin/chanhop.sh
As root, to make the script executable. Running the script with no arguments displays the following usage instructions:
chanhop.sh: Usage:
./chanhop.sh [-i|--interface] [-b|--band] [-d|--dwelltime]
-i or --interface specifies the interface name to hop
-b or --band specifies the bands to use for channel hopping, one of
 IEEE80211B   Channels 1-11 [default]
IEEE80211BINTL Channels 1-13
IEEE80211BJP   Channels 1-14
IEEE80211A   Channels 36-161
Use multiple -b arguments for multiple channels
-d or --dwelltime amount of time to spend on each channel [default .25 seconds]
e.x. ./chanhop.sh -i ath0 -b IEEE80211BINTL -b IEEE80211A -d .10 Exiting.
Starting Channel Hoping:
 # ./chanhop.sh -i ath0
 # ./chanhop.sh -i ath0 -b IEEE80211B -b IEEE80211A -d .10
Exiting.
Starting Channel Hoping:

Result Analysis
To make the communication in network environment we need to consider all the 802.11 protocol series if we will take each protocol individually we found that they have performed differently with QoS specification and normally without QoS Model they give the Following result that has been got in a global network environment if we analyzing the performance specification in an intranet area network we need to combine both TCP and 802.11 protocols parallel and then we need to analyze the performance of TCP and 802.11 protocols for an individual time session of TCP protocol with QoS specification.
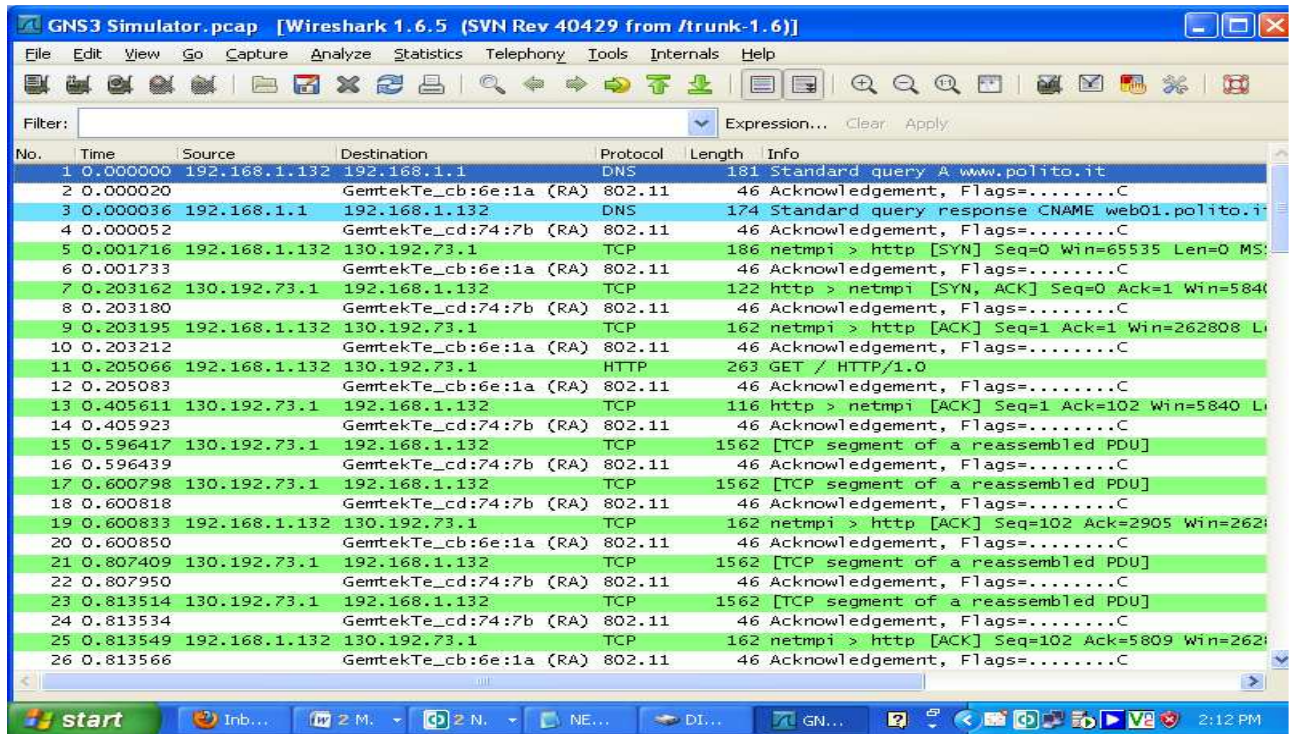
Int. J. of Engg. Sci. & Mgmt. (IJESM), Vol. 3, Issue 3: July-Sep.: 2013, 9-12

10

Figure 1: Performance Evaluation between Two IP'S of any Intranet Wireless Area Network over   TCP and 802.11 Standards.

The Simulator GNS3 simulates the actual performance with Throughput and Packet Delay specification assigned by QoS appraisal Model. In above intranet scenario we are considering Two IP addresses i.e. 192.168.1.132 and 130.192.73.1 both of the IP'S will be in communication through TCP whenever anyone ip will interact with other ip , QoS standards 802.11 will always there for providing services with defined QoS specification. The sequences of request promoting at sequential timer set and performing the acknowledgements after getting response shows that req1,req2,req3,req4……………reqN. Has been performing completely without interruption, here we call for the connection with time session 0.000000 to 0.813566 that evaluates all the request has been done without delay . It means Our proposed QoS model has been working properly without data loss and also providing efficiency specification for any limited communication area network all the devices are co-ordinate with each other in any network topology with such a wonderful mechanism, connection has been established by TCP protocol that support buffering at both end so that stream delivery services support audio, video and multimedia communication.

Conclusion:

QoS Model contains TCP and IEEE protocols therefore it expansive to implement but economical for all the private and government organization that provides reliable network for communication.
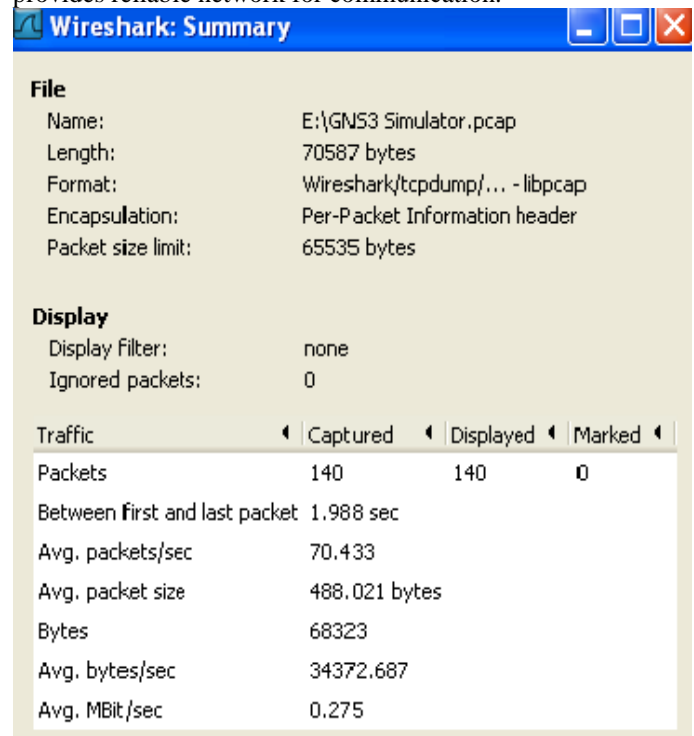
Data Packet Capturization Details

when TCP connection has been established between nodes for session 1.988 sec simulator captured 140 ,all the 140 packets has been acknowledged and display shows 140 i.e. no packet lost or ignored during whole session , all the packets has been captured in 1.9sec that is the best time case complexity for transmission of data in any intranet system. The QoS model is working successfully.

REFERENCES

D. Chiu and R. Jain. Analysis of the Increase/Decrease Algorithms for Congestion Avoidance in Computer Networks. Journal of Computer Networks and ISDN, 17(1), June 1989.

A. Lahanas and V. Tsaoussidis. Additive Increase Multiplicative Decrease - Fast Convergence (AIMD-FC). In Proc. Networks 2002, Atlanta, Georgia.

William Stallings, Data and computer communications, Prentice Hall, 2004.

John Nagle. Congestion control in ip/tcp internetworks. SIGCOMM Comput. Commune. Rev., 14(4):11–17, October 1984.

Van Jacobson. Congestion avoidance and control. In ACM SIGCOMM '88, pages 314–329, Stanford, CA, August 1988.

Saverio Mascolo, Claudio Casetti, Mario Gerla, M.Y. Sanadidi, and Ren Wang. Tcp westwood: Bandwidth estimation for enhanced transport over wireless links. In Mobi-Com '01: Proceedings of the 7th annual international conference on Mobile computing and networking, pages 287–297, New York, NY, USA, 2001. ACM Press.

Lisong Xu, Khaled Harfoush, and Injong Rhee. Binary increase congestion control (bic) for fast long-distance networks. In IEEE Infocom 2004,2004.

Fernando Paganini, Zhikui Wang, John C. Doyle,and Steven H. Low. Congestion control for high.performance, stability, and fairness in general networks. IEEE/ACM Trans. Netw., 13(1):43–56,February 2005.

Sally Floyd and Kevin Fall. Promoting the use of end-to-end congestion control in the internet. IEEE ACM Transactions on Networking, 7(4):458 472,1999.

D. Katabi, M. Handley, and C. Rohrs. Internet congestion control for future high bandwidth-delay product environments, 2002.

R. Stewart, Q. Xie, K. Morneault, C. Sharp, H. Schwarzbauer, T. Taylor, T. Rytina, M. Kalla, L. Zhang, and V. Paxson. Stream control transmission protocol, 2000.

E. Ferro and F. Potorti, "Bluetooth and Wi-Fi wireless protocols: A survey and a comparison," *IEEE Wireless Commun.*, vol. 12, no. 1, pp. 12-16, Feb. 2005.

X. Wang, Y. Ren, J. Zhao, Z. Guo, and R. Yao, "Comparison of IEEE 802.11e and IEEE 802.15.3 MAC," in *Proc. IEEE CAS Symp. Emerging Technologies: Mobile & Wireless Commun*, Shanghai, China, May, 2004, pp. 675-680.

Int. J. of Engg. Sci. & Mgmt. (IJESM), Vol. 3, Issue 3: July-Sep.: 2013, 9-12

12