

# 10G EPON COMMUNICATION USING IPsec AND RMM PROTOCOL

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**ABSTRACT:** Broadcasting is usually a high data rate application where it traditionally uses wireless medium. The transmission in these network declines throughput and consumes more time. It is overcome in passive optical wired networks which provides fast transmission and triple play services. A variety protocol is transmitted over a network in order to locate the protocol for better performance. The analyses of these protocol reveal that RMM provide improved throughput and drop tail.

**Keywords:** Drop tail, Reliable Multimedia Multicasting, Passive Optical Network

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## I. INTRODUCTION

The main purpose of wired network is transfer of data over a wire based communication technology. Wired network uses Ethernet cables for provide connection between PCs. Multi router are often used to connect all computer in larger network. Similarly, in smaller network computer are connected by a router. The problem of interference is reduced in wired network when compared with wireless network. The rate of delay is reduced and better authentication is provided in wired communication.

Multicasting transfers cluster of data to a destination from the sender or user which improves bandwidth and efficiency. Multicasting is not a connection oriented. When compared with unicast, multicasting doesn't contain any group address. In sub network, transmission and reception of multicast frames are relatively simple process.

Passive optical networks is used to provide service to multiple user from single address. It consist of unpowered optical splitter to activate single fiber to many optical end points. It reduces the usage of large fiber connection and equipment used in central station. There are various categories in passive optical networks such as BPON, EPON and GPON.

## II. RELATED WORK

### A. Overview of RMM protocol

Leader based protocol is extended as Reliable multimedia multicasting (RMM). The transmission of data between two networks is by using ready to send, clear to send, and acknowledgement frames. Among large number of receiver one is considered as leader. The receiver receives an RTS frame from the sender. In response to it, the receiver transmit CTS frame. After this frame, the sender starts the transmission of data to the leader receiver. Once the transmission is over, the receiver replies with an ACK frame. It denoted the successfully transmission of data frames. Negative ACK is given, if data transmission is interrupted or lost. Thus frequency retransmission is minimized by using an RMM protocol. RMM protocol consists of three frames namely P-frame, I-frame and B-frame.

### B. Overview of IPsec

Internet protocol security (IPsec) is mainly used to improve the security in the network. Authentication and encryption is done for each packets that are to be transmitted. It provides mutual authentication between to system and cryptographic security is to protect the communication. It operate in internet layer in most cases. It uses various protocol functions such as authentication header, encapsulating security and security association. The IP packet payload functions is alone encrypted in tunnel mode. Some of the cryptographic algorithm are triple DES and AES which improves confidentiality of data packets.

**C. Categories of Frame**

P frames is commonly known as the predictive frames. MPEG standard used this frames for compression of data. The individual frame picture are group together and played backed so that viewers can understand. It contain only the changed data in preceding frames. It follows I-frames and fully depends on I-frames.

B frames is also known as bi- direction frame .It is similar to the above one expect it function. It depends on both following and preceding frame in the system. It contain data that have been changing in preceding frame. Both P-frames and b-frames are called as delta frame.

I-frames are (intra coded frame) manage both P frame and B frame. The quality of data is more if I frame is more in number. It require more amount of space because it contain more amount of data. Whenever this frame is lost a severe impact occur on the network system. It is also known as key frame and contain digital content.

**III. SIMULATION RESULT**

The server consist of four sub server namely TCP, RMM, MAC and VMP. The server is mainly used to transmission of data to different user of the system. Initially, the protocol are registered in IPsec protocol. The IPsec protocol provides authentication to each user. Once authentication is done, transmission of data starts from sub server to user. The protocol satisfies different requirements of the user.

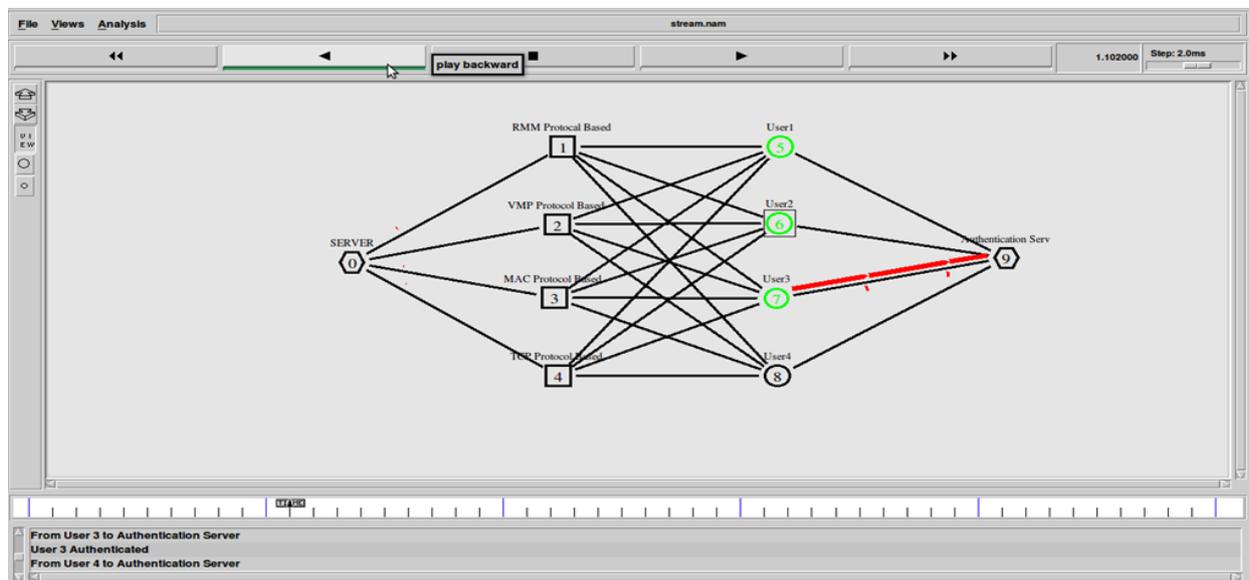


Fig 1: Flow Diagram

**A. RMM performance**

The rate of transmission varies for different type of protocols. Depending upon these variation graphs are obtained. The simulation result provides two type graph, they are throughput and delay. The graph below shows increased data rate to different user. RMM provide quality of service in real time. Red line indicates that rate of throughput is more in RMM.



Fig 2: Throughput graph

Figure 3 shows that delay is considerably reduced in RMM protocol. Because of this packet loss is reduced and security is improved. These show that quality of data transmission is improved to a larger extent.



Fig 3: Delay graph

#### IV. CONCLUSION

The efficient reliable multimedia multicast (RMM) mechanism with 10G EPON based network is compared with the video medium access control protocol is discussed. RMM efficiently deliver the video, audio, data upstream and downstream over a 10GE PON network traffic. To attain high data transmission and low bit error rate. RMM protocol function are compared. The comparative result provide data upstream and downstream traffic.

#### V. FUTURE WORK

For future improvements, we can implement quality of service (QoS) in 10GE PON network. In later, it will come up with better performance in throughput and improvising authentication

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