ISSN(Online): 2320-9801
ISSN (Print): 2320-9798

International Journal of Innovative Research in Computer and Communication Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 3, Issue 4, April 2014

Wireless- Media Oriented Data Rate Selection using WLANS

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ABSTRACT: Typically the WLANs treats for transmitting the multimedia flow, while multimedia data transmitting error messages will be sent. These will be removed with some control mechanism for continuous video flow, which are error free and having delay sensitivity. Multimedia applications which have significant performance to improve the cross layer awareness. In this we are mainly concentrating on optimizations of real time multimedia transmission over the WLANS. To solve this we propose a method which is very simple and very efficient cross layer mechanism for the selection of the transmission channel which is a wireless. This leads to propose an algorithm called Wireless –MORS. It mainly targets on the loos tolerance applications of VoD which does not require fully reliable transmission. This can be evaluated in real time using NS-2 simulator and the experimental analysis is shown and analyze the video quality with FGS video encoder. So the transmission through the wireless channel has been evaluated with Wireless-MORS and it is compared with other classical methods. A gradual increase in the video quality is maintained throughout the transmission and reached high throughput latency and jitter.

KEYWORDS: Wireless, WIVAN, FGS, NS-2

I.INTRODUCTION

The usage of real-time voice, audio, video signals and based applications created an interest in transmission issues can be solved using MANETS. Mainly most of the topologies of the MANETS will change because of the movements of the nodes based on their powerlevel and routing path from source to destination. So by this physical layer will affect more the operation of higher level layers. So the cross layered design will give various significant challenges w.r.t. the wired and wireless networks. For this many protocols have been implemented and proposed [1],[2]. These mostly interact with the application, transportation & network layers. Therefore the classical OSI approach of providing a physical layer as reliable as possible

So in this paper we focus by optimization of real time multimedia transmission through the MANETS. In this we propose a simple efficient cross layer protocol which can easily and dynamically adjust the transmission mode i.e., the physical modulation [3], rate and possibility for the FE correction. So for this we are proposing an algorithm called W-MORS algorithm (Wireless Media oriented rate selection algorithm). To transfer applications like file or mail or like several multimedia such as audio and video conference or VOD can tolerate some packet loss. W-MORS includes the intrinsic characteristics by varying conditions of the channel based on the application. For the transmission of the data with high rate, so the selected transmissions mode may varies depend on the time and on Bit error rate tolerance and the SNR of the signal at the receiver side. Finally we evaluate the quality of the transmitted video signals over the wireless media using W-MORS algorithm and compares with the original signals of the video.

II.RELATED WORK

The project from Europe well known as Mobile man European project proposes and introduces [4] layered architecture in which various protocols used for different layers can co-operate with the network to share the status of the network. The cross layered approach addresses and energy management and QoS issues should be solved. The CLA using the MAC layer reservation which can controls the packets and data transfer through the physical layer [5]. This type of mechanisms will improve the network throughput gradually for MANETS. The various mechanisms are included in the transmission strategy of the MAC layer.

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A set of end to end application layer some similar techniques are used for the video streaming over wireless mediaas proposed [6]. The ASRC [7] mechanism will be implemented to set the source rate based on the channel conditions and the transport buffer occupancy – delay constraints. So for the efficient transmission rate of data the combination of this forms a hybrid ARQ error control schemes. The equipment we are using should maintain standardized efforts to integrate various architecture. For this we have to consider the physical, MAC and other higher end layers for the co-design.

III.WIRELESS MORS ALGORITHM

In real-time multimedia applications can be characterized with their tolerance and some BER. So in this scheme. These errors can be ignored or neglected at the receiver side and the sender/ transmitter can be able to show the particular loss tolerance which the receiver uses both conditions. In this the transmitter includes the low tolerance information to allow the receiver to select the best mode and in which the low tolerance header also included. To the sender the selected data rate then transmitted along with the packet size and sends the data packets. If the data packets receives at the receiver side then if the receiver decodes the PLCP header and it has to identify the BER tolerance for the encoded payload. So while transmitting the data from sender to receiver then we have to consider both SNR and LT information and the fixed threshold are modified.

For generally to decode we use FEC Viterbi decoding at the receiver side. For the selection of wireless channel we use AWGN channel model. The below fig:1 shows the how the SNR threshold depend on the media. In this we can compute the minimum SNR and can tolerate the some bit errors based on the application. The receiver can select the highest rate for the transmission of the data w.r.t. the SNR. The threshold values will be pre-computed for various low tolerance values at the receiver side.

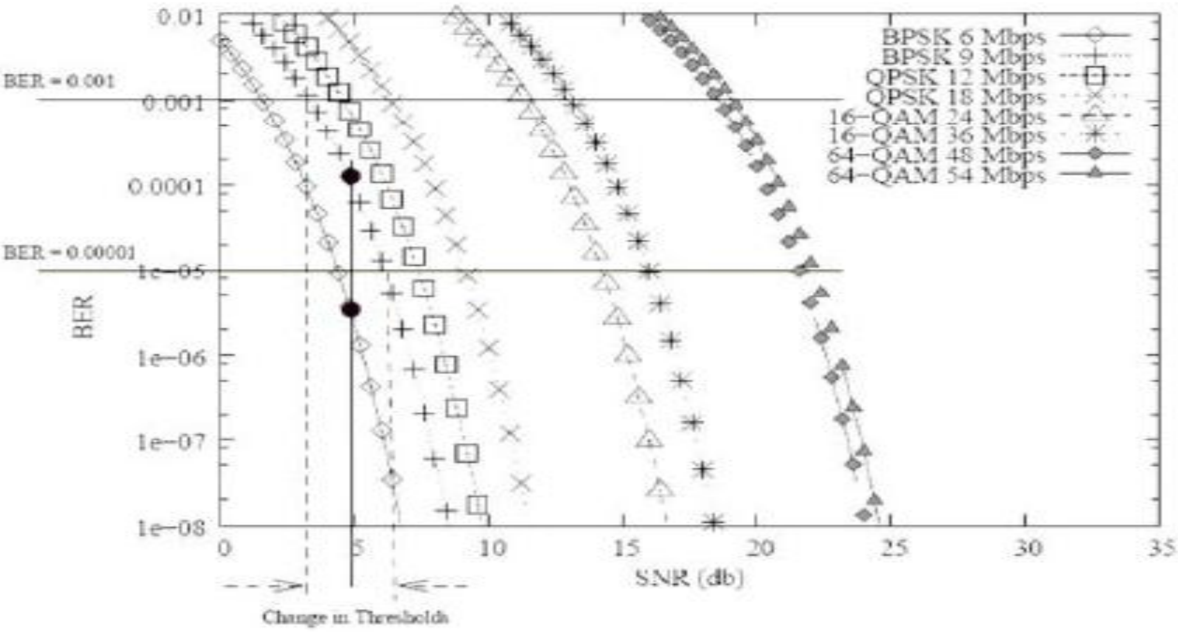

Fig: 1. Change in threshold of SNR w.r.t. different LTs.

IV.IMPLEMENTATION OF W-MORS

In this we propose an algorithm called Wireless MORS algorithm which will leads to help the EDCA protocol [8]. The feature of this protocol has been defined by the IEEE 802.11e which supports the Quality of service in WLANs [9] in which each QSTA (QoS Enhanced station) consists of 4 queues which assures the support of 8 users. The fig 2: shows the QoS control filed is added to the MAC header which is in the MAC layer. Table 1 shows the media oriented mechanism with two possible bits which can be defined in connection setup process. Low tolerance can be setup send to the receiver by adding 8 bits to the RTS data packet which is shown in fig 3.

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Bits 0-3	Bit 4	Bit 5	Bits 6-7	Bits 8-15
Traffic ID	*Schedule Pending*	*Ack Policy*	*Reserved*	*TXOP duration*

Fig 2: Control Field length with QoS in WLANS

Bit 6-7	Application Sensitivity
00	No tolerance in payload
01	Low loss tolerance in payload
10	Medium loss tolerance in payload
11	High loss tolerance in payload

Table 1: Classification of the LT

It is crucial to know whether the corrupted payload reach the receiver application layer and to make our mechanism operational. At the MAC layer we have to consider the CRC will have no more cover and payload but it consists of IP, UDP and RTP headers and then checksum should be disabled in the UDP [10]. These are shown in the below fig 4.

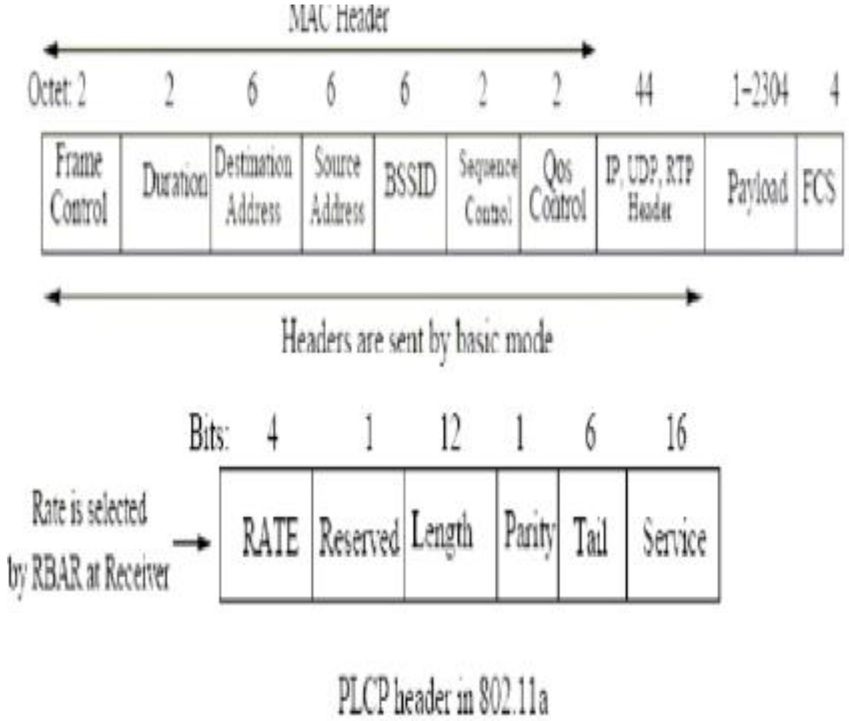

Fig:4 . Header frame formats for proposed concept W-MORS

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V.REAL TIME EXPERIMENTAL ANALYSIS

The simulation is done by using the NS2 simulator environment [11] which can be used how the data is processing and transmitting will be done from source to destination part [12]. Using our protocol the perceived signal can be evaluated its quality. So the throughput performance of the W-MORS when the bit error rate is equals to 10^{-3} which is a acceptable assumption. The fig 5, shows the interlinking of the two wireless stations vs the distance between the media and the wireless media. In our simulation study we selected five efficient transmission modes out of eight different ways [11]

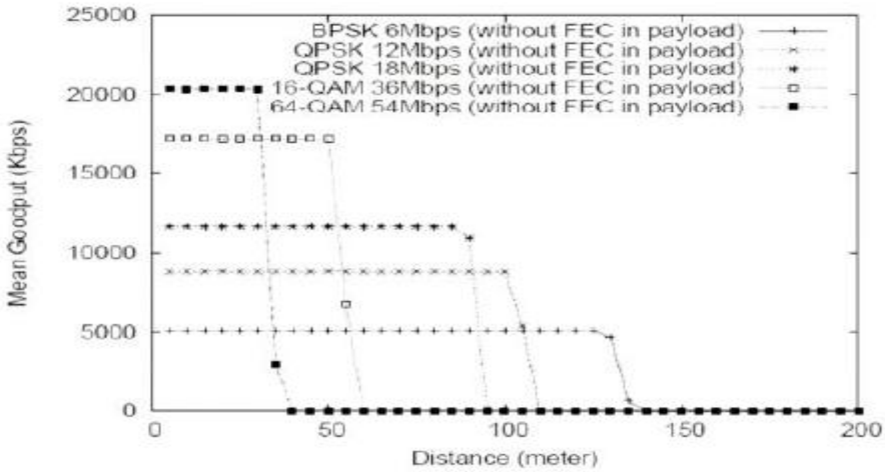

Fig 5: Media oriented with 10^{-3} bit errors

In the fig:6 the extra bandwidth to the overhead for the modified frame format and which is caused by having to send the MAC header at the basic mode and additional 8 bits are added to the RTS packets.

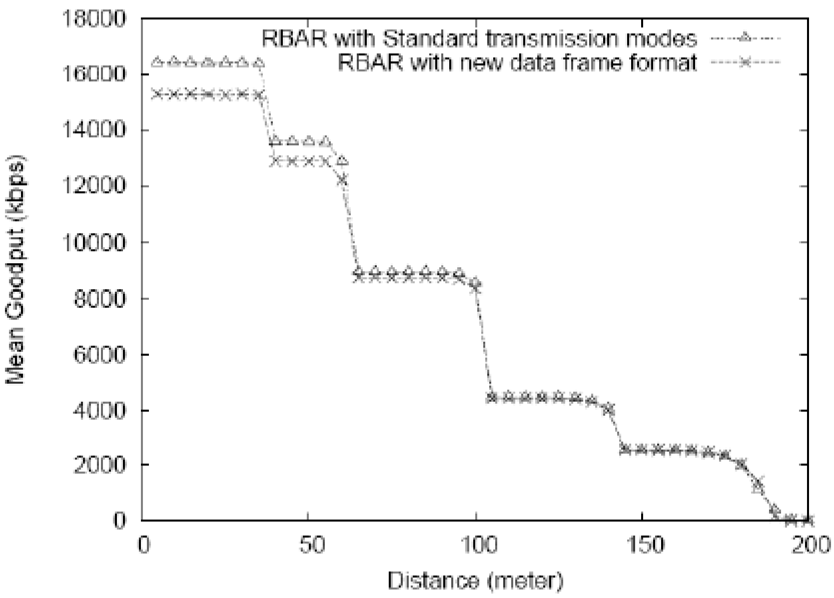

Fig: 6. Modified frame format for the OVERHEAD.

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The number of routing overhead packets initiated with the DSR, which has been set with the MANETS according to the different speed mean of the nodes which is shown in the below fig:7. So to evaluate this overhead we have to consider the all DSR routing packets before sending to the receiver.

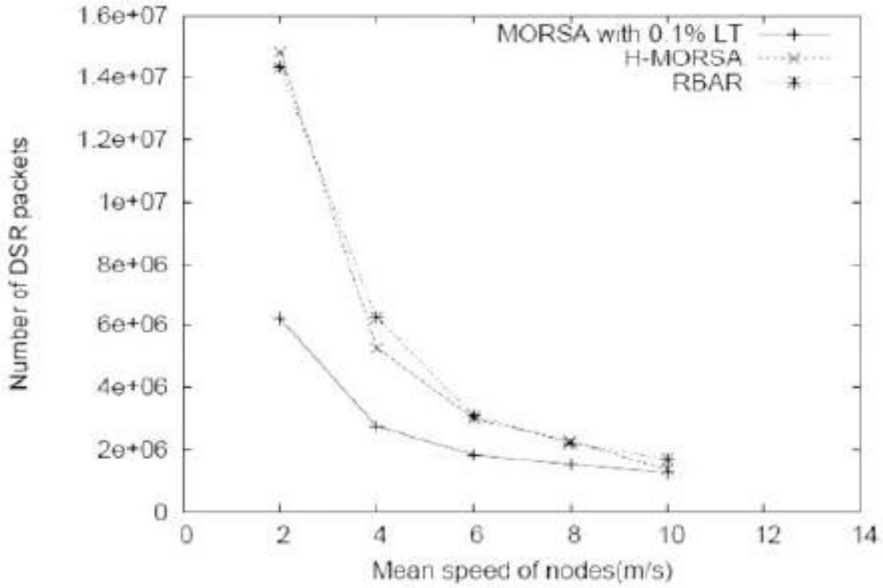

Fig: 7. Multihop network with DSR routing overhead.

1. Analysis of Video of Quality

The significant improvement in the performance and the throughput when considered the loss of the data to the selected transmission mode. In the previous results we observe that media oriented mechanism which can be justified by the evaluation of the video quality obtained at the receiver. In generally the wireless channels are divided into two type's memory less model and model with memory. Model with memory with a classical method is used by MARKOV Chain, in this the probability of the bit error rate will depend on the model we use [13].

In this we estimate the length and position of the error bits at the output of the decoder well known as Viterbi decoder [14]. It is difficult to estimate the classical techniques with this method. Then we use error event cost distribution which is of errorless periods to drive this model.

In this proposed model we have video encoder which has concept of fine grain scalability allowed for the dynamic rate adaption by which the bandwidth and capability of the receiver changes. The below fig: 8 shows the WAVIX video encodes and its structure. The arithmetic codes are widely used in the coding devices which have high compression efficiency with very low sensitive and high error bits. The bit stream generated by the video decoder will be split into texture and motion vectors. Again the bit stream is divided into header and coded entropy data.

The Multimedia transmission through the wireless channel we evaluate video of the bit stream quality at the receiver section. This WAVIX video encoder will be configured to encode the data which consists of 300 CIF video frames in a given image. So the activation of the WAVIX error resilience which corresponds wit adding of RS block code for the header protection and will add the security to the image. In the we accept the packets without any corrupted bits. The application layer will not be employed to the standard transmission mechanism.

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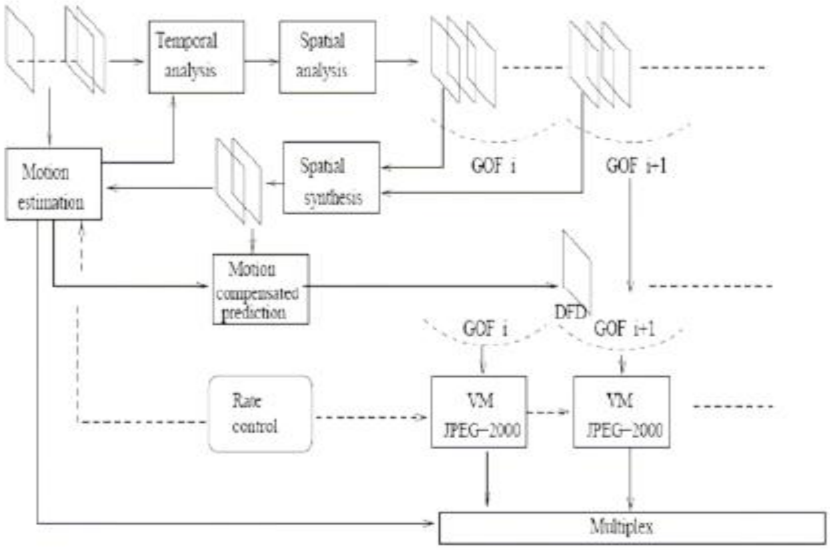

Fig 8: Video encoder WAVIX structure

VI.CONCLUSION

A novel cross layer mechanism in MANENTS has been proposed in this paper. In this we discussed about the selection of the best transmission media/ mode to transmit the data which have some specific characteristics of the application. So the working of this application is very easy to implement in the real time devices which can uses the information from the physical channel and which has less loss of tolerance requirements based on the application to select the minimum physical rate, FEC transmission mode/media and modulation. We have proposed a new technique for the selection of better transmission mode which cannot use the physical level FEC and which can easily increase the throughput of the application. So these are executed using a simulating tool called Network Simulator which can shows the mechanism of Adhoc networks through which can achieve 4Mbps throughput using MANETS. The experimental analysis will say the significant improvements in the throughput, latency and jitter rate. The gain obtained from this can be evaluated with the help of WAVIX video encoder which assures the bit error rate equals to 10^{-3} with <5% FEC overhead.

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