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# QoS Aware Video Transmission in Wireless Network: Successful and Failure Existing Technique

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***Abstract:*** ***Wireless technology has become one of the integral part of our daily life, it is the 21st century technology, emergency of wireless network have led the multimedia distribution very effectively. Moreover the video has been an eminent media for communications as well as for the entertainment purpose for past several decades. Due to improvisation in technologies people can communicate over face to face over the wireless network without any concern about the distance, hence the video transmission over the wireless network has become one of the interesting application in daily life. Moreover, it is very important to maintain good QoS (Quality of Service) such as effective bandwidth, routing protocols and other QoS parameters. In this paper, we have surveyed the extensive amount of research paper to understand the Quality of service, meanwhile we have extensively discussed the various existing methodology, which has helped in improvising the wireless network for video transmission. Moreover the main aim of this research work is to survey and address all the requirement along with challenges that occurs while designing the wireless network, also this survey unveils the recent development in optimization, algorithm, novel approach and the protocols for improvising the Quality of Service.***

***Keywords: Wireless network, Survey, QoS, Data Transmission, Video Transmission***

## I. INTRODUCTION

The collection of communication devices by media link is known as network. There are 2 different kinds of network known as (i) wired and (ii) wireless network [1], D.R. Boggs and B. Metcalfe were the two engineers who invented the wired network known as Ethernet. They began their research in 1972 and achieved their research work in 1980 within the IEEE standards (802.3). Networks that are wired are represented as data transfer at low-level and its utilization, they build the cables and cards via which transfer of the data is done from one device to another device. The word wired means that some hard component that has wires. Wired network represents that connection of devices using wires, modem or any other linking components. The transfer of the data from one location to another via wires. The types of wires are of optic fiber, copper, twisted pairs.

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In the connection using wire, internet is used from only single wire (one source), modem or any other linking components. The network that is wired also consists Ethernet within it. From very long time, Ethernet wire is utilized. The network that is wired normally does the data transmission up to 10 Mbps. Wired network also include Fast and Giga Ethernet. The speed of data transmission is 100 Mbps and 1000 Mbps for Fast and Giga Ethernet, respectively. CAT-5 and CAT-6 both wires utilized for Fast and Giga Ethernet [2].

### 1.1 Drawbacks of Wired network:

- It is not helpful for smartphones and mobile phones, as it needs some physical kind of connection to utilize the internet.
- One wired network is linked to only single device so it won't facilitate another device by one wire.
- Wires can be very soon damaged, thus the user must be very careful during connecting and managing the wire with the device and secure the wire from any waters and cuts.
- There is completely mess in the place where the wires are gathered.
- When more devices needs to be connected, Ethernet connection is required. Along with in requires more wires to link the devices, if it is done so, then it is very difficult to find which wire is for which device and it takes lot of time to maintain.
- If the network needs to be expanded, then we need more wires and that will be expensive and time consuming to establish a network. If we need to expand the network widely, then we must rewire all the devices and re-establish the network is wide.
- User cannot move independently.
- For openly public utilization, wired network is not recommended.
- Many wires required to link to certain port.
- Installation is difficult and sometimes costly also.

### 1.2 Physical limitations:

- The network range and distance among the devices
- Signal sharing
- Loads on network and usage of network
- Weak antennas
- Signals getting reflected back
- Limit of Spectrum channel
- Wireless signal restriction
- Signal polarization
- Loss of speed because of wireless overhead
- Less performance.

The network that are wireless was also well-known by IEEE in 1997 with 802 standard, 2 Mb was the first connection of the wireless network and during those time it was not so familiar and improvement to none but later with the evolution of new wireless networks, it became known throughout the world. This network points to the medium like infrared or electromagnetic wave over which transmission of the data happens. All the devices that are wireless include sensors and antennas in it [3]. The network that is wireless is dependent on the frequency without the utilization of any wires. It is accessible for everyone.

In the network that is wired, the area is limited for the user for utilizing the internet and to interact with other devices. However, because the area of wireless network is not limited for user and connectivity to be simple. However wired is not costly and is more reliable and bandwidth with more speed. However, wireless one is costly with low quality and bandwidth. Wireless network design needs little extra compared to one access point. In parallel, the wired connection has more complexity and problems in connecting the wires. With the help of wireless network several people can use the internet whereas in wired, extra user needs extra wire connection. There are many difficulties in networks that are connected using wires, which we will be discussing in deep in the wireless network that is used as a solution.Recently there is a huge traffic in the development of wireless. For example, based on the recent CISCO forecast, the amount of mobiles will increase from 9.3 billion in 2018 to 11.6 billion in 2021, consisting M2M connections of 3.3 billion. Likewise, rest of the wireless technologies like Wi-Fi along with 0.541 billion public hotspot by the year 2021 and LPWAN calculating for 31% of M-M devices by the year 2021. It will also be a huge raise in experience.

### 1.3 Advantage of wireless:

- Users can move independently with wireless network and have the access to the internet easily anywhere with their devices.
- Without any wired connect, data and files can be shared from one device to another.
- No wires are required, thus it is cost effective and time saving also.
- Can be easily connect to more than one devices.
- Useful and accessible very easily.
- It manages huge amount of users as it is unlimited to use and open source.
- With the help of wireless network, social media data becomes easy to transfer and access.
- It is considerable as the users can use from any nearby placed resources.
- It is useful to improve the productivity.
- In wireless network, user can connect easily, whereas in wired network, user needs their wire to connect.
- It is cost effective.
- Network protection becomes strong and better that the system cannot be easily attacked as they have the strongest password for both software and hardware.
- Anyways, it is less speed, but the user easily fulfills the need by getting the desired thing from web or internet.
- Safe and healthy.
- Wi-Fi is also cost effective.

### 1.4 Application:

- Wireless network can easily utilized in medical field without any problem. It is utilized for monitoring the patient remotely, dispensers application and biometric information of network that is wireless.
- Wireless technology can also be used during traveling with airlines.
- The wireless network can be utilized in businesses as everyone can contact each other easily, irrespective of which place they are and whatever they are doing. Due to which from small to large all type of business can be handled and earn huge profits.
- Wireless network can be utilized for communication the mobile phones. Using this technology, interconnection of devices and transferring of multi-media data can be done including all other things similar to wireless are in our control.
- It can also be utilized for communication through voice. The video calls and messages can be done using wireless network for two or more devices.
- In remote control also, wireless network can be utilized. There are several kind of applications of remote control system like TV, Air-condition, garage gate opener, so on.
- This technology can be utilized for both navigation system and for entertainment purpose also.

### 1.5 Types of wireless network connection:

#### *1.5.1 P2P wireless network:*

The communication having one hop is known as point-point network. In these networks, a device can interact with only one device at one time. It is same as one-one operation, where only single device can be paired with another single device. This kind of networks is not recommended for huge networks where performance and accuracy is the main problem. This this type of networks if one device malfunctions then whole network gets breakdown with respect to the configuration. This kind of networks are have the ring or tree topology. In figure 1.4, it represents the instance of point-point networks.

#### *1.5.2 P2M (Point to Multi-point):*

In this kind of network, single device can be connected to the many devices. One device manages the control of the remaining devices. If any device need to interact with another device then, it should send the information to the main device and the main device will send that information to another device. The performance of this network is dependent on the quality of connection among main device and rest all devices. This kind of network is utilized star topology for interact.

#### *1.5.3 M2M (Multi-point to Multi-point):*

In this type of networks every device can link with the remaining all devices. If one device needs to interact with another device, it has several options to transfer data to the device and it will opt the fastest and feasible path to interact with the targeted device. This kind of networks is utilizes mesh topology for interaction. These days, this kind of networks are gaining popularity for communication technologies. This kind of networks also known as W-LAN (IEEE-802.11) networks.

### 1.6 Types of WNS (Wireless Networks):

#### *1.6.1 WLANS (Wireless Local Area Networks):*

WLAN allow the user to operate in the local area such as library and university campus in order to form the network to internet, a temporal network are formed by considering the less number of users and it does not require any access point.

#### *1.6.2 WPAN (Wireless Personal Area Network):*

Current technologies of wireless networks are Bluetooth(Ieee 802.15) and IR(Infra-Red), these allows the personal device connectivity within the area of 30 feet, however the Infra Red needs the direct line site and the range is very less.

#### *1.6.3 WMAN (Wireless Metropolitan Area Networks):*

This type of wireless networks allows the multiple network connection in the metropolitan range such as various buildings in the city and it can be the alternative to laying fiber cabling.

#### *1.6.4 WWAN (Wireless Wide Area Network):*

This is one of the type of wireless network, which can maintain the large areas such as country, city and it is managed via the multiple satellite model through ISP. Moreover table 1 represents the types of the network, coverage area, standards and their application

**Table 1: various types of wireless network along with their standards, application and Range**

| Network Types | Coverage Area | standards | Applications |
|---|---|---|---|
| WPAN | Within the reach of person | IEEE 802.15, Bluetooth | Replacement of the cable for peripherals |
| WLAN | Within the campus or the building | Wi-Fi, IEE 802.16 | Extension of the wired networks |
| WMAN | Within the City | IEEE 802.16 | Home, Business |
| WWAN | World-Wide | Cellular 2G, 3G, 4G,LTE | Mobile |

### 1.7 QoS (Quality of Service):

Wireless network uses the electromagnetic waves for communicating the information between two points without any physical connection between these two, the data, which is being transferred, are superimposed on the radio carrier in such a way that it can be extracted in absolute way at the receiver end. Moreover, data moving through the wireless network, it involves three distinct elements network structure, data format and the radio signals. These elements are independent of the other given two. Moreover the wireless network offer support the multimedia services, wireless communication includes the huge range of services as such range of text, image, animation, graphics, video and audio etc. Moreover, these services makes the good demand for the bandwidth on the wireless networks. However the transmission of data requires the parameter like bit error rate, jitter, delay and bandwidth. QoS (Quality of Service) is one of the important factor, which is consider for the multimedia transmission. Quality of Service is defined as the network capability for providing the differentiated service to choose the network traffic over the network technologies, Quality of service refers to the one that manages the traffic of data to reduce packet loss, jitter and latency on the network. QoS manages and controls the network resources, through setting the priority for the particular type of data in the network [4]. Moreover the organizations achieves the QoS through various technique and tools, for few organization QoS is included in the SLA(Service Level Agreement) to guarantee the performance, Moreover the QoS has various characteristics given below.

1. It allows for establishing the SLA with the network users.
2. Gives the building blocks for the multimedia applicatios
3. It enables the visibility and control for the wireless network.
4. It also enables the network resource that needs to be shared in efficient manner and handling of critical applications
5. It supports the dedicated bandwidth for the users, controls the jitter,and shapes the traffic for smooth traffic flow, reducing the network congestion, setting of the traffic priorities.

#### *1.7.1 QoS parameters:*

*1.7.1.1 Bandwidth:*

Bandwidth is defined as the capacity of the wireless communication to transmit the maximum amount of the given data from one point to another through the computer network, it is expressed in the bits per seconds, megabits per second, gigabits per seconds, bandwidth can be either symmetrical or asymmetrical i.e. upload and download are not equal. By managing the bandwidth QoS can be optimized and priorities can be set for the task.

*1.7.1.2 Jitter:*

Jitter is playsone of the eminent role in providing the quality of service and it is described as the variance in the time delay. Moreover jitter takes place due to route change, timing drift and network congestion, more jitter may degrade the video or voice quality.

*1.7.1.3 Throughput:*

Throughput can be described as how fast the data transmission can take place through the given network, it plays crucial part in providing the better Quality of Service. Moreover, the higher throughput shows the better Quality of Service generated by the particular method. At first it looks the bandwidth and throughput as same, but the difference is bandwidth is the potential measurement of the particular link, whereas throughput is the absolute measurement of the link.

*1.7.1.4 Energy Efficiency:*

Energy is one of the important parameter as this directly depicts the cost and this makes one of the key criteria for designing the wireless network. Moreover, energy consumption of the network increase with the increase in the access point density.

Hence, it becomes very crucial for the researcher to design and develop a model such that the energy consumption should be as less as possible.

*1.7.1.5 Security:*

Security plays one of the major part in the data transmission of any form, security in the wireless networking is mostly based on the cryptographic technique as cryptography technique provides the various aspects of the security for data transmission, and these aspects are non-repudiation, authenticity, integrity and confidentiality.

Hence the researcher has to develop a methodology that can provide the end –to-end security.

In this research work we have surveyed the various existing methodologies for providing the better QoS (Quality of Service) especially in multimedia transmission.This particular research is organized in standard format of any work, Here first section starts with the network and the types of network, later we focus on the advantage of wireless network and application. Later of the same section, discuss the types of wireless network and importance of QoS in wireless network. Second section discuss the various methodologies in past which has been proposed for enhancing the Quality of service in data transmission. Later the same is given in the tabular column by including the shortcomings of these methodologies.

## II. LITERATURE SURVEY:

Latest research works on various types of networks consists [5] that aims on the issues of streaming medical video via 4G cellular networks and [6] that introduces a framework for sending and receiving medical multi-media on CR networks (Cognitive Radio). The most of the present work on MAC (Medium-Access-Control) protocols for WLANs has aimed on sending and receiving integrated voice and data traffic. The main issue for sending and receiving video traffic integrated with data and voice has gained attention in past few years. The authors introduces another method for representing the size of TXOP. In [7], TXOP is evaluated based on amount of MAC Service Data Units (MSDUs) in the present queue of every station. In [8], the researchers used a window whose real queue length measurements was already known to tune their prediction of TXOP. Anyways, both of these methods are not enough for busty video traffic. The purposes are: i) the present queue's size is not same as next video frame's queue size, cause to wrong prediction, and ii) history details does not give an adequate prediction based on the forthcoming behavior of the sources of video, mainly for small video sequences. In [9], for sending and receiving tele-medicine via WLANs, the researchers introduced a cross-layer design method. Anyways, their scheme does not include the transmitting of tele-medicine information and considers that the only traffic of the video transmitted within the network is video of tele-medicine. Their implementation also include a complex 3-layer method to guarantee bandwidth to telemedicine applications; In some condition with more than one type of telemedicine and regular traffic this method can be both leading the system to starvation of bandwidth and time-consuming. The research work in [10] assumes the usage of SVC (Scalable-Video-Coding) for enhanced scheduling for the applications of medical, and only utilizes AVC (Advanced-Video-Coding) for the dynamic signals. The researchers point out, anyways, that AVC gives good picture quality. The research aims on networks of cellular, also utilizes SVC. The plan of a token dependent scheduling method that practically removes collisions and thus raises channel usage, it was initially introduced in [11], for the sending of voice and information traffic in a completely connected WLAN where every nodes can listen each other. The main benefit of wireless network compared to network that are wired is that users can freely move around within the network along with their wireless components and are capable to use internet and get anything they need from internet. Users can transfer files from one device to another without any physical connection. The time and price for installation of wireless networks are fewer differentiated with the wired networks. Addition of these benefits the wireless networks are liable to many liabilities that are studied in the sub sessions. The requirement of security is important in any kind of networks. Administrators of the network particularly aim to stop spying attacks and the authentication needs. Many organizations have introduced many methods to secure the wireless networks from attackers. In [12], author introduced encrypting frames, which are mainly based on previous frames. In this technique, the algorithm minimizes the encryption overhead as the previous dependent frames are not encrypted. In [13], author introduced encrypting syntax elements depending on the dependency of inter frame among adjacent frames. In this technique, the algorithm aims to minimize error transmission because of encryption. In [14], author encrypted view changing object-associated data through motion syntaxes in stream of HEVC. Anyways, author's research protects the motion data, still frame-I data is visually not secure. Additionally, in all the above-mentioned researches, many selective encryption techniques have been implemented to minimize the encryption time price with manageable trade off over protection. And other main requirements like compliance of format and statistical size conservation were fulfilled.In [15], author introduced the H.264 encoder along with tunable parameters like QP (Quantization-Parameter) and RFN (Reference-Frame-Number) optimization for the wireless transmission of multi-media information. The sending of video packet through network with better quality video is gained by preserving the lowest processing delay and usage of energy at sensor nodes with a managed bit rate. Here, the frame-I are transferred without performing compression where B and P frames are coded in the part of encoding. In [16], author introduced a cross-layer scheduling to improve the network performance in both real and non-real-time traffic dependent LTE systems. In the reference frame, H.264 encoder is utilized along with motion compensation. The video quality is evaluated depending on the QoE metric represents that it fails in maximizing the network throughput. And also, only few information is compressed by the H.264 encoder and hence affect in loss of packet while maximizing the nodes within network. In [17], author introduces a video streaming method based on CV to minimize the traffic of video by removing the unwanted chunk request and overloads of content. Thus, for large content, CV will manage the average duration for content downloading request period.

For large content sending, the streaming source initially verifies whether CP has the average view time for content. Therefore, CP gives the value of playback time and terminal of user gives the average view depending on the introduced approach. After this operation, the CP and the terminal of the user begins to stream the video information to the user. Anyways, traffic of internet is maximized immediately; the approach requires some enhancements to manage with different applications. In [18], author introduced an EQBA (Energy-Quality-aware-Bandwidth-Aggregation) includes both delay and energy constrain for more than one path video sending in wireless networks.

In this, nodes of the sensors are categorized by the heterogeneous resources, which transmit information to mobile devices in flow type of single video. Later, a bandwidth aggregation technique that combines quality aware transmission, energy reduction and delay. Anyhow, the EQBA model fails in preserving the rate of encoding and the relationship among QoS metrics and energy of the mobile.

Energy is one of the issue that has become one of the eminent problem in the wireless network and energy consumption has been given the significance amount of research in the same. Moreover, with the critical demand of energy consumption in wireless network, the energy consumption is the tradeoff between the achieved performance and energy consumed. Moreover, wireless medium is open medium hence the big obstacle lies in achieving the performance. In past various methodologies have been proposed for video transmission. In [19] modulation of quasi quadrature is used for minimizing the energy consumption while transmitting the video, whereas in [20] proposed an algorithm for assigning the various FEC( forward error correction ) rates for the frames in the given Group of pictures and this algorithms helps in dropping the packet with the lower priority. [21] Usedthe wide research between the tradeoff among the energy consumption and the quality of the video and proposed a methodology which assigns the various AMC (Adaptive Modulation coding) to the various layers of video encoding. [22] Helps in maximizing the video quality subject to the energy constraint in the device to Device network through optimizing the FEC code rate and bit rate on the given paths between the provided nodes. The above few method does try to achieve the energy conservation however they failed to provide the require QoS.

Meanwhile we present the table for comparing the above discussed method, here it is divided into four column. First column indicates the paper, second column discuss the methodology and their shortcoming, third column suggest the main advantage of particular method and last column represents the shortcoming of particular method.

**Table 2: QOS comparison of various methodology along with their advantage and disadvantage.**

| Paper | Implementation | Advantage | Disadvantage |
|---|---|---|---|
| [7] | This research work segregates the video and voice traffic, here a scheduler is created which is capable of accessing the schedule of non-real time and real time to the particular medium with the distributed contention and centralized pooling respectively. | The main advantage is that flow of real time traffic is more deterministic and can be easily monitored | The biggest drawback of this method is bandwidth mechanism and efficient management. |
| [8] | In this paper FHCF referenced scheduling algorithm is presented it aims to fair for VBR flows and CBR flows, it uses the queue length estimation for tuning the mobile stations | FHCF provides good fairness while supporting bandwidth and delay requirements for a large range of network loads<br>This method provides the good amount of fairness by supporting the delay and bandwidth requirements for the huge network loads | It needs to include the robust and adaptive algorithm for error prone wireless channels |
| [9] | It proposed the methodology EDCA cross layer design which has the expert station that are connected to the particular WLAN access point, it is effective for examining the patient through the WLAN. | Cross layer design, approach delivers the traffic flows of the telemedicine application with the various priorities in order to assign the video along with the QoS. | This method fails to guarantee the priority access for the higher priority traffic while the significant load from the low prioritized user |
| [10] | This methodology implements QoS variants for more than one packets and flows belonging to the same category of service via wireless link that is not implemented in present methodology. In the variation, the necessity of each packets and flows to the out coming QoE is included and this research introduces policies for prioritizing data of medical videos in Wireless Networks respectively | This research also defines the development of introduced resolution into OMNeT++ simulator with the help of WLAN | Implementing refers to managing the policies in run-time for fulfilling the needs of each applications in an accessible way. And also, the present policies are to be evolved with high fine-grained prioritization including intra frame variants. |

| | | | |
|---|---|---|---|
| [11] | a new token dependent method to gain assured priority access to the traffic in real-time and simultaneously gain comparative variation (for channel capacity factor) to traffic of data in completely connected WLAN | This method offers assured priority access to traffic of voice and simultaneously offers quantitative and exact service variance for traffic of data that offers major flexibility and capability to the NSP (Network-Service-Provider) for service class maintenance. | When network is connected partially, it is more difficult and needs more investigation |
| [12] | This techniques has two factors: (i) MRR (Motion-Reference-Ratio) of MB is implemented to define the inter-frame dependency between the adjacent frames. MBs' MRRs are statistically analyzed, and MBs to be encoded are opted depending on the statistical outcomes; (ii) bit-sensitivity is implemented to show the degree of necessity of each bit in the bit-stream of compression for rebuilding the quality of video. The major bits for rebuilt video quality are opted to be encoded depending on the bit-sensitivity of H.264 bit-stream.<br>video quality areselected to be encrypted based on the bit-sensitivity ofH.264 bit stream. | The applicability and the effective of encoding are enhanced majorly | This method is very complex to be implemented in the real time scenario |
| 13 | This technique implements novel secure multimedia communication method based on WSN to improve quality of video transmission, use less energy and surely security. Because of energy and computing resource limitation, selective encryption and allocation of resources usually suitable to WSN for two conditions. (i) WSN has very limited resource of energy that needs maximum efficient communication energy by UEP-based distribution of WSN resources. (ii) Few encryption mainly minimizes computational load by only managing a small part of the position details in multimedia stream infrastructure. The details of magnitude is not useful while decryption without right position details in the bit stream. | Robustness is enhances compared to transmission error by reducing the overhead of encryption between video frames | Moreover the energy consumption is more with the increase in more number of nodes |
| 14 | Here, new methodology was implemented in encoding moving objects in HEVC (High-Efficiency-Video-Coding) media. Because of video encoding's requirement of high computational difficulty, selective encoding for moving objects in video was encoded. Vertical data of MVD (Motion-Vector-Difference) was been opted to be encoded with the help of AES technique. | The outcomes of implemented technique are better after analyzing the video's security level, encrypted video's quality, encryption technique's computational price and statistical analysis of encrypted and non-encrypted sequences of video on CPU. | More computation overhead and time delay makes it unsuitable for the real time application |
| 15 | Here, the architecture of real-time wireless multi-sensory smart surveillance system is implemented, along with all data streaming. A data center is implemented as repository of data storage and data processing and estimating unit. It estimates the future threats and alerts in real-time | In this technique, HEVC is better compared to H.264 for transmission of video streaming. Implementation of 3D monitoring technique is done, inter and intra-frame synchronization methods are used to analyze and deploy real-time multi-sensory streaming | PSNR value needs to be more for the content to be coded at the higher Bit Rate |

| | | | |
|---|---|---|---|
| 16 | Here, cross-layer design technique is implemented, which cooperatively enhances application, physical and MAC protocols of layers of wireless protocols. This technique gives effective distribution of wireless resources for various applications used by various clients to increase usage of network resources and expected QoS or QoE (Quality-of-Experience) | Proposed QoE-Oriented cross-layer framework leads to remarkable improvement in terms of user-perceived video quality and spectral efficiency as well as maintain fairness among nRT users. Future work may includes Comparing CLRA with the latest QOE-Driven scheme, the complexity analysis and optimization of the CLRA scheme | More number of packet loss and QOE model has to be define |
| 17 | Here, CVS (Categorized-based-Video-Streaming) technique was implemented for mitigation of traffic in data transmission services that is upgrade version of VPAS protocol. This technique divides the video file into n divisions based on playback time that are given with AVR (Average-View-Ratio) that is given by CPs or kept as values gained by empirical. After allocation of AVR, the client terminals transmits a block request to CP along with higher request period to minimize the amount of request messages. | CVS shows better result compared to existing YouTube streaming and VPAS for amount of block request, network traffic amount and ratio of network resources average waste factors. | Reliability and the feasibility of this research work still needs to be verified in CDS(Content Delivery system) |
| 18 | This paper proposes a method named as ELBA, here analytical model is proposed for delay constrained EQ (Energy Quality) tradeoff for the multipath transmission and later the BA (Bandwidth aggregation) framework is presented for quality aware packet distribution. | This method performs effectively over the other existing bandwidth aggregation for the energy utilization. | Improvisation is required in energy minimization and ABR streaming. |

## III. CONCLUSION

In this paper, we have surveyed the various existing QoS Oriented methodology for the data transmission in wireless network. Moreover, this research work analyzes the various QoS lackness of wireless network. Here we discuss the various QoS enhancement technique proposed for the wireless network. The above discussed QOS technique does improvise the data transmission more flexible and efficient, however still there are many research topics that needs to be discussed such as these technique needs to adapt the parameters for the traffic load, optimizing the trade-off among the fairness, priority and channel efficiency. Moreover these technique needs to be evaluated under the different scenario.

## REFERENCE:


1. Tim Zimmerman, Christian Canales, Bill Menezes “Magic Quadrant for the Wired and Wireless” 17 October 2017.
2. Kirsner, Scott. “The Legend of Bob Metcalfe,” Wired, 6.11 (November 1998), 182-186.
3. H. Huang, "Flexible Wireless Antenna Sensor: A Review," in *IEEE Sensors Journal*, vol. 13, no. 10, pp. 3865-3872, Oct. 2013.
4. Hua Zhu, Ming Li, I. Chlamtac and B. Prabhakaran, "A survey of quality of service in IEEE 802.11 networks," in *IEEE Wireless Communications*, vol. 11, no. 4, pp. 6-14, Aug. 2004.
5. I.U. Rehman , N.Y. Philip , M-QoE driven context, content and network aware medical video streaming based on fuzzy logic system over 4G and beyond small cells, in: Proc. of EUROCON, 2015 .
6. D. Ouattara, et al., A QoS-control framework for medical multimedia data transmission in CRN environment, in: Proc. of the IEEE Symposium on Com- puters and Communication (ISCC), 2014.
7. H. Zen, et al., Adaptive segregation-based MAC protocol for real-time multime- dia traffic in WLANs, in: Proc. of the IEEE ICON, 2007.
8. P. Ansel, et al., FHCF: a simple and efficient scheduling scheme for IEEE 802.11e wireless LAN, Mobile Netw. Appl. J. 11 (3) (2006).
9. E. Supriyanto , et al. , Cross layer design of wireless LAN for telemedicine appli- cation considering QoS provision, in: G. Graschew, T.A. Roelofs (Eds.), Advances in Telemedicine: Technologies, Enabling Factors and Scenarios, InTech Publish- ers, 2011.
10. Ojanperä, Tiia & Uitto, Mikko & Vehkaperä, Janne. (2014). QoE-based management of medical video transmission in wireless networks. IEEE/IFIP NOMS 2014 - IEEE/IFIP Network Operations and Management Symposium: Management in a Software Defined World. 1-6. 10.1109/NOMS.2014.6838405.
11. P. Wang and W. Zhuang, "A token-based scheduling scheme for WLANs supporting voice/data traffic and its performance analysis," in *IEEE Transactions on Wireless Communications*, vol. 7, no. 5, pp. 1708-1718, May 2008.
12. H. Shen, L. Zhuo, and Y. Zhao, “An efficient motion reference structure based selective encryption algorithm for h.264 videos,” IET Information Security, vol. 8, no. 3, pp. 199–206, May 2014
13. W. Wang, M. Hempel, D. Peng, H. Wang, H. Sharif, and H. H. Chen, “On energy efficient encryption for video streaming in wireless sensor networks,” IEEE Transactions on Multimedia, vol. 12, no. 5, pp. 417–426, Aug 2010.
14. H. H. Mohammed A. Saleh, Nooritawati Md Tahir, “Moving objects encryption of high efficiency video coding (hevc) using aes algorithm,” Journal of Telecommunication, Electronic and Computer Engineering, vol. 8, no. 3, pp. 31–36, 2016.
15. H. Hassan , M.N. Khan , S.O. Gilani , M. Jamil , H. Maqbool , A.W. Malik , I. Ah- mad , H. 264 encoder parameter optimization for encoded wireless multimedia transmissions, IEEE Access. 6 (2018) 22046–22053.
16. M. Nasimi, F. Hashim, A. Sali, R.K. Sahbudin, QoE-driven cross-layer downlink scheduling for heterogeneous traffics over 4G networks, Wirel. Personal Com- mun. 96 (3) (2017) 4755–4780.
17. T.K. Kim, J.H. Kwon, E.J. Kim, Categorization-based video streaming for traffic mitigation in content delivery services, Multimed. Tools Appl. 76 (23) (2017) 25495–25510.
18. J. Wu , B. Cheng , M. Wang , J. Chen , Energy-efficient bandwidth aggregation for delay-constrained video over heterogeneous wireless networks, IEEE J. Sel. Ar- eas Commun. 35 (1) (2017 Jan 1) 30–49.
19. S. Hu, K. Chitti, F. Rusek, and O. Edfors, “User assignment with distributed large intelligent surface (LIS) systems,” in IEEE WCNC, Barcelona, Spain, Apr. 2018, pp. 1–6.13

20. Q. Wu and R. Zhang, "Intelligent reflecting surface enhanced wireless network via joint active and passive beamforming," [Online] https://arxiv.org/abs/1810.03961, 2018.
21. Y. Han, W. Tang, S. Jin, C.-Kai Wen, and X. Ma, "Large intelligent surface-assisted wireless communication exploiting statistical CSI," [online] https://arxiv.org/abs/1812.05429, 2018.
22. L. Zhang, X. Chen, S. Liu, Q. Zhang, J. Zhao, J. Dai, G. Bai, X. Wan, Cheng Q, G. Castaldi, V. Galdi, and Tie Jun Cui, "Space-time-coding digital metasurfaces," Nat. Commun., vol. 9,, pp. 1–11, Oct. 2018.

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