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ANALYSIS OF SCHEDULING ALGORITHMIN WiMAX NETWORK : A SURVEY

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ABSTRACT-Wimax abbreviated as worldwide interoperability for microwave access. It is new pattern of the remote innovation. It incorporates a few (QoS) nature of administration systems at (MAC) media access control level for provisioning a superior support of sound, video, information and so on. To give nature of administrations to meet the requesting pattern, there has been part of examination in the field of QoS planning strategies. In this area, a brief synopsis of current work in this field is displayed.

I. INTRODUCTION

WiMAX network is abbreviated as worldwide interoperability for microwave access. It has turned out to be exceptionally renowned in the realm of correspondences and PC systems. This innovation as the capacity to give broadband remote get to and give a superior and less expensive answer for correspondence administrations when contrasted with the current benchmarks and technologies[1].

It means to give remote broadband administrations in the size of the metropolitan zone system (MAN). It depends on IEEE 802.16 standard . This innovation has an objective scope of up to 31 miles and an objective information exchange rate surpassing 100 Mbps . Wimax bolsters different media applications like VoIP, voice gathering and web gaming. The IEEE 802.16 innovation (WiMAX) is a superior distinct option for 3G or remote LAN systems for giving network by radio hubs due to its high information rates, minimal effort of arrangement and expansive scope region and simple to utilize [2].

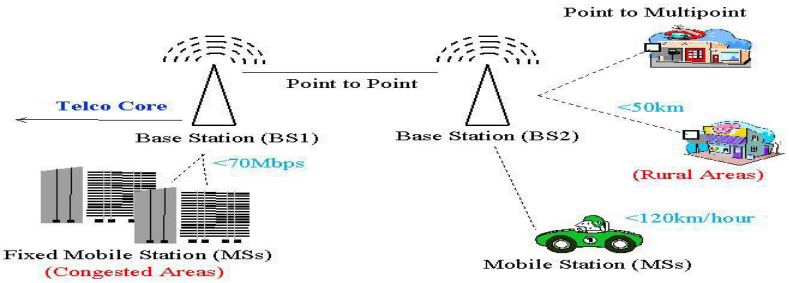

FIG 1. WiMAX SCENARIOS

A. WiMAX NETWORK DESIGN

The Wimax system is a mix of base station (BS) and supporter station (SS) [2].The bundles are exchanged from source hub to destination hub in the wake of taking after different adjustment, directing and planning system.

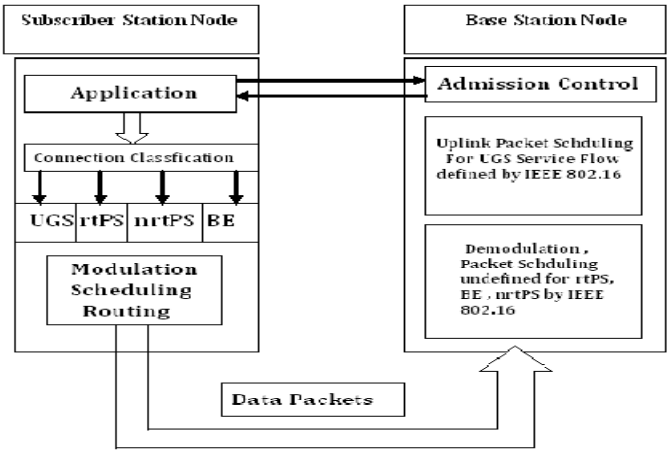

FIG 2. WiMAX NETWORK DESIGN

B. CHARACTERISTICS OF WiMAX NETWORK

There are eight key characteristic of WiMAX networks that differentiates it from other metropolitan area wireless access technologies are [3] :

1. Its uses Orthogonal Frequency Division Multiple Access (OFDMA).
2. Scalable use of any spectrum width(varying from 1.25 MHz to 28 MHz),
3. Time and FrequencyDivision Duplexing (TDD and FDD),
4. Advanced antenna techniques such as beam forming,
5. Multiple Input Multiple Output (MIMO), Per subscriber adaptive modulation,
6. Advanced coding techniques such as space-time coding andturbo coding,
7. Strong security
8. Multiple QoS classes

II. QUALITY OF SERVICES (QoS)

The term Quality of service alludes to the likelihood of the telecom system meeting a given movement contract. In the zone of systems administration it is termed as the likelihood of a bundle going between two focuses in the system. QoS is likewise termed as the capacity of system component (e.g. an application, host or switch) having some level of certification that its activity and administration prerequisites would be fulfilled [2]..

It is a measure of the dependable and predictable of a system is, there are number of parameters that can be utilized to quantify the level of execution in a specific system such as Wimax. These incorporate throughput, parcel delay, jitter, rate of bundles lost and so on. The essential objective of better QoS is to give need including better throughput, jitter and dormancy and enhanced misfortune attributes. .

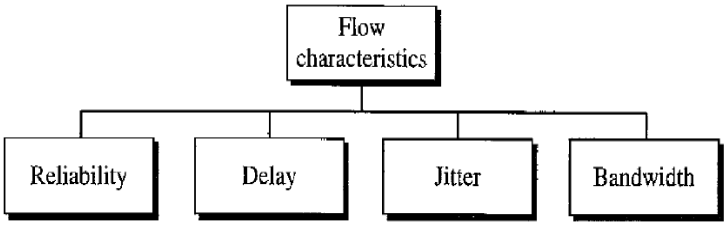

FIG 3. QoS FLOW CHARACTERISTICS

A) QOS CLASS IN WiMAX

QoS category	Applications	QoS specifications
UGS Unsolicited Grand Service	VoIP	Maximum Sustained Rate Maximum latency Tolerance Jitter tolerance
rtPS Real-Time Packet Service	Streaming Audio or Video	Minimum reserved rate Maximum sustained rate Maximum latency tolerance Traffic priority
ErtPS Extended Real-Time Packet Service	Voice with Acitity Detection (VoIP)	Minimum reserved rate Maximum sustained rate Maximum latency tolerance Jitter tolerance Traffic priority
nrtPS Non Real-Time Packet Service	File Transfer Protocol (FTP)	Minimum reserved rate Maximum sustained rate Traffic priority
BE Best-Effort Service	Data transfer, Web Browsing, etc...	Maximum sustained rate Traffic priority

FIG 4. QoS CATEGORY CLASSIFICATION

QoS category are the classes that the base station in a network should be able to support a wide variety of applications those category includes [4] :

- **Unsolicited Grant Service (UGS)**: It under spins study Bit Rate (CBR) such as voice applications.
- **Real-Time Polling Service (rtPS):** This bolster ongoing information streams that contain variable size information parcels, which are issued at intermittent interims, for example, MPEG video..
- **Extended Real-Time Polling Service (ertPS):**It is material with constant applications that require information rate and defer certifications like VoIP with hush concealment.
- **Non-Real-Time Polling Service (nrtPS):** This backings delay tolerant information streams that contains variable-size information parcels, that require a base information rate.
- **Best Effort (BE):** backings information streams that needn't bother with any QoS ensures like HTTP.

III. PROBLEM STATEMENT

In WiMAX, there arenumerous issues that should be thought, for example, the level of Quality of Service (QoS), transfer speed designation and transmission rate restrictions. It is troublesome assignment to pick a suitable planning procedure that backings diverse QoS prerequisites for various endorser stations. We pointed this issue and proposed another planning system.

IV. SCHEDULING ALGORITHMS FOR WiMAX

Planning calculations is in charge of conveying assets among all clients in the system, and furnish with a higher QoS. Clients ask for various classes of administration that might have diverse necessities, for example, data transfer capacity, throughput, jitter and so on so the principle point of any booking calculation is to amplify the system use and accomplish reasonableness among all users.[4]

A) STRICT PRIORITY (SP)

In this system bundles are spoken to by the scheduler relying upon the QoS class and after that they are doled out into various need lines, these lines are served by need from the most noteworthy to the least in which this component might causes some need QoS classes .

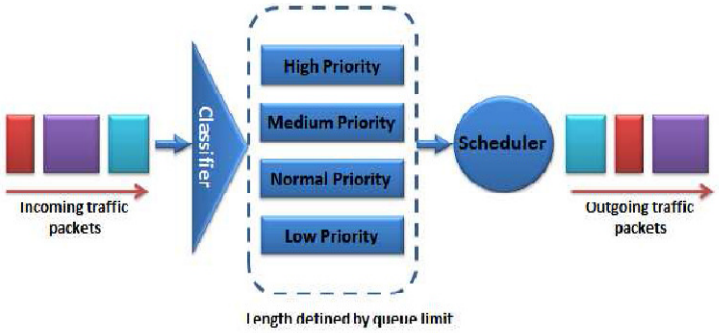

FIG 5. STRICT PRIORITY SCHEDULING

B) ROUND ROBIN TECHNIQUE (RR)

The system of round robin scheduler works in the strategy for rounds by serving the primary bundle in every need line in arrangement as per their priority till all lines are served and afterward it restarts over to the second parcel in each queue.[4]

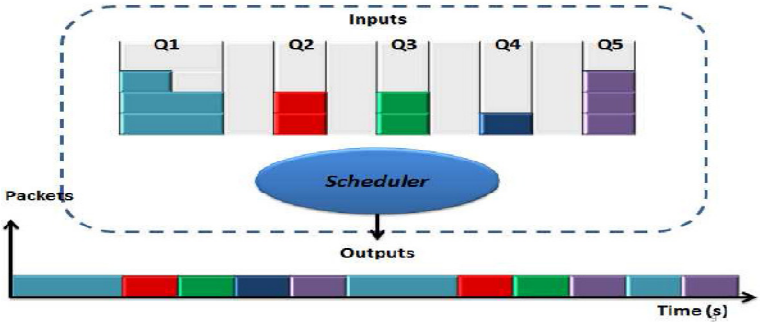

FIG 6. ROUND ROBIN SCHEDULING

C) WEIGHTED ROUND ROBIN (WRR)

In WRR technique, packets are classified into different service classes and then assigned to aqueue that can be allotted with a different percentage of bandwidth and served based on Round Robinorder . This algorithm address the problem of starvation by guaranting thatall service classes have the ability to access at least some amount of networkbandwidth.

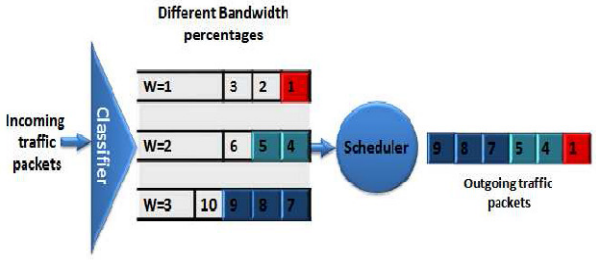

FIG 7. WRR TECHNIQUE

D) WEIGHTED FAIR QUEUING(WFQ)

In this method every stream are doled out with various weight to various data transmission rate in an approach to keep an impact of the transfer speed by a few streams giving a reasonable booking to various streams supporting variable-length parcels by hypothetical methodology of the summed up processor sharing (GPS) framework that figures and doles out a completion time to every bundle.

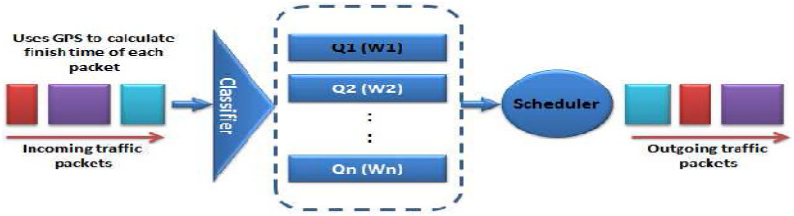

FIG 7. WFQ TECHNIQUE

V. LITERATURE SURVEY

There has been a quick development in remote innovation as of late. Alongside that the interest for remote information administrations and media applications has been expanded. To give a superior administration to take care of the developing demand, there has been parcel of exploration in the field of QoS. As the IEEE 802.16 standard is rising . QoS issues have been tended to by a significant number of the papers. In this segment, a brief rundown of current work in this field is displayed.

In [7], This work assesses the usage of different sorts of booking calculations in WiMAX system, for example, Round Robin (RR), Self-Strict-Priority (SP), Weighted-Fair Queuing (WFQ) and Weighted-Round Robin (WRR). In this study Qual Net 5.0 test system assessment variant are utilized to assess these calculations and to decide the most proficient one among them.

This [6] clarifies fundamental systems for giving QoS in parcel systems. They discuss control way systems that are helpful to permit the clients and system to concede to administration definition and information way components which empower in provisioning separated administration. These ideas have been adjusted in giving the QoS support.

This[5] paper proposed a structure of cross-layer QoS support in the IEEE 802.16 systems. Two novel components are proposed in the structure for QoS execution change.

In [8] creator presented portable WiMAX framework unquestionably has a higher framework limit and a more convoluted component to give a superior nature of administration (QoS) than prior remote frameworks, for example, code-division various access (CDMA) or the all inclusive portable information transfers framework (UMTS).

Here[9] present a general structure of a cross-layer system driven arrangement, and portrays the late advances in system demonstrating, QoS mapping, and QoS adjustment in term of giving end-to-end QoS to video conveyance over remote web.

VI. OBJECTIVE

- Surveying recent trends of existing schedulingalgorithms in WiMAX.
- Providing opportunistic scheduling by takingchannel conditions into account.
- Fulfilling the delay requirements of WiMAX 802.16e network applications using the end-to-enddelay of network by ascalable network tomographytool that estimates the delay of paths between base station anddestination addresses.

VII. METHODOLOGY

In the proposed work reenactment environment for 802.16e WiMAX systems will be made in light of which the QoS provisioning will be demonstrated. The throughput jitter bundle misfortune and debasement elements will be considered in displaying the 802.16e channels. Booking is performed at the Base Station (BS) and Subscriber station (SS).

The strategies that as of now exist clarifies booking systems at the supporter station or base station. Little endeavors have been embraced to fuse communication in the middle of BS and SS to accommodate better data transfer capacity allotment methods to the endorsers ensuring Quality of Service (QoS). In proposed work, we investigate Evolutionary Computing methods for planning at the BS and SS joining a synchronization circle called "Sync Loop" Here the UL(upper connection) map contains information regarding the UL outlines furthermore contains data about the transfer speed, recurrence distribution subtle elements.

A sync circle is presented between the BS and the SS to stick to the UL Maps transmitted and the QoS parameters. In view of the sync data got by the SS the BS could change the UL Maps guaranteeing upgraded QoS. The adaptability and its consequences for the proposed scheduler will likewise be firmly considered.

"**Sync Loop**" Here the UL(upper link) map contains data with respect to the UL frames and also contains information about the bandwidth, frequency allocation details.

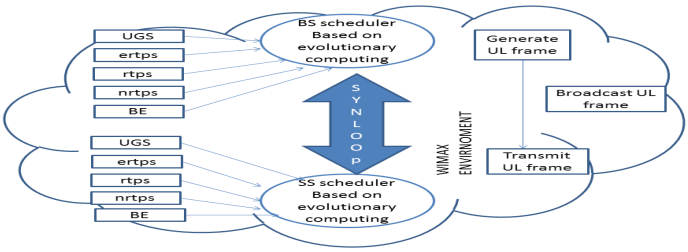

FIG 8. EVOLUTIONARY SCHEDULING BASED SCHEDULER FOR WiMAX NETWORK

VIII. POSSIBLE OUTCOMES

The conceivable result of the work embraced is to give QoS to all the administration classes characterized in the IEEE 802.16e standard for WiMAX systems. Better QoS can be demonstrated in light of the system parameters like opening achievement ratios,,network throughput, lessened parcel disappointments, administration due dates for fluctuated client situations and differed ecological conditions. The deferral bound, channel state data and administration debasement are critical outline calculates that ought to The delay bound,

channel state information and service degradation are significant design factors that should also be considered by the scheduler. The proposed work attempts to prove the scheduling efficiency against the existing scheduling models.

IX.Conclusion

Fulfilling the delay requirements of WiMAX 802.16e network applications using the end-to-enddelay of network by a scalable network tomography tool that estimates the delay of paths between BS and destination addresses.

REFERENCES

[1] Elechi onykachdi o and EZE Eliar C "Improved QoS for WiMAX networks : A Survey (2013)
[2] Vikram Mehta ,Dr Neena gupta "performance analysis of QoS parameters for WiMAX network International journal of engineering and innovative technology (2012).
[3] Rajjain fellow IEEE and Abdul Karim Tamminia "Scheduling in IEEE 802.16 E mobile Wimax networks :key issues and a survey"(2013)
[4] AlaZ Howaide,Ahmed S Doulat yaser M. khamayesh "performance evalution of different scheduling algorithm in WiMAX"(2014)
[5] An Algorithm for Burst Mapping with StrictQoS Requirements in IEEE 802.16e Mobile WiMAX Networks by Chakchai So-In Department of Computer Science & Engineering, Washington University in St. Louis St. Louis, MO 63130 USA cs5@cse.wustl.edu(2010).
[6] R. Guerin and V. Peris, "Quality of Service in packet networks: Basic mechanisms and directions", Computer Networks, Vol. 31, No. 3, pp.169 –189, February 1999
[7] Comparative Study of Scheduling Algorithms in WiMAX. Arhaif, Mohammed Sabri. 2, s.l. :International Journal of Scientific & Engineering Research, 2011, Vol. 2. ISSN 2229-5518
[8] Surveying best suitable scheduling algorithm for WIMAX- WI-FI Integrated Heterogeneous Network.Poulomi Das, Siladitya Sen, Arindam Banerjee(2013).
[9] Comparative Assessments for Different WiMAX Scheduling Algorithms. Ahmed H. Rashwan,Hesham M.ElBadawy, Hazem H. Ali. San Francisco, USA : World Congress on Engineering and Computer Science, 2009, Vol. 1. ISBN:978-988-17012-6-8