

A Review on Quality of Services Scheduling Algorithms in WiMAX

Supriya Sharma

M.Tech (ECE)

YIET, Yamunanagar

sharma.sp.89@gmail.com

Sunil Panjeta

A.P. (ECE)

YIET, Yamunanagar

panjetasunil@gmail.com

Abstract— With the expanding interest of wireless access to the system the interest for good quality system has likewise expanded. This interest is expanded by the data transmission or bandwidth escalated applications like audio, video. So this expanded interest for good quality network, has further expanded the interest of outlining scheduling algorithm which gives high throughput and minimum delay and load. In this work, a comparative study of various scheduling algorithms, for example, First-In-First-Out (FIFO), Priority queue (PQ), Weight Fair Queuing (WFQ), Round Robin (RR), Deficit Round Robin (DRR), Modified Deficit Round Robin (MDRR), was done. The outcomes demonstrated that proper determination of scheduling algorithms can enhance the required quality of service for various activity sorts of users. The best scheduling algorithms in this assessment is resolved based on the base jitter, throughput and most extreme got activity for every servicing class and particular Application.

Keywords—WiMAX, IEEE 802.16, Quality of Service, Scheduler.

I. INTRODUCTION

WiMAX is short type of Worldwide Interoperability for Microwave Access. This innovation gives access to

broadband remote information in long separations. This innovation depends on Electronics and Electrical Engineers Association standard (IEEE802.16) giving essential web convention connection to the client. Distinctive sorts of IP protocols based applications are expanded significantly as of late. Different sight and sound applications with email applications, document transmission and web program are getting to be well known progressively. These applications send enormous voice and picture streams with transfer speed prerequisites and different postponements what's more, this prompts heterogeneous movement load in the system. Any application needs a particular kind of administrations quality. IEEE 802.16 is intended to accomplish a few objectives as simple advancement and foundation, high information rate, amplified secured region and wide frequency spectrum. This standard can give the nature of administration to all different sorts of uses including ongoing activity in light of the sort of stream. In spite of the way that different planning calculations are introduced for WiMAX networks, there is no comprehensive study to provide integrated software to compare these algorithms or calculations. The present study expected to make a complete view of relative execution of algorithms and scheduling arranges and utilizing the outcomes to consider its shortage in productive models outline. The previous study concentrated on usage of test calculations for uplink and downlink activity by OPNET. Likewise, it attempted to

assess the calculations by activity models that are planned particularly for WiMAX to show different applications supported in this innovation. The present study demonstrated that none of the current calculations or algorithms have required ability to create an efficient, strong and fair scheduler to support all WiMAX classes.

This paper is sorted out as takes after: In Section 2, begin with some related work. In Section 3 depict the quality of services and Section 4 its segments and appropriate adjusting classes with scheduling algorithms. In Section 5, finally concludes the discussion and comparative study of QoS scheduling algorithms in WiMAX.

II. LITERATURE REVIEW

Transmission of multicast activity, (for example, video, information and voice administrations over World Wide Interoperability for Micro Wave Access "WiMAX" expects to make multicast movement accessible to clients anyplace, at whatever time and on any gadget. The real difficulties of transmitting remote movement over WiMAX system through tradition multicast plans are throughput vacillation (Variations) among the endorsers inside the system scope, unreasonable conveyance of system assets, delay, delay jitter and bundle drop since they are set in various areas from the Base Station. These inefficiencies are as a consequence of various blurring and way misfortunes in time-fluctuating remote channel experience by the Subscribers. Booking calculations are chiefly in charge of use of accessible assets that are acquired in the system keeping in mind the end goal to guarantee the craving nature of administration, among those planning calculations are Round Robin, Max Rate, first in first out, Maximum Throughput, relative reasonableness and weighted reasonable lining and so on. This paper overviews different planning calculations for expansion of system throughput, reasonable dissemination of asset, minimize bundle misfortune and postponement in WiMAX. Exhibitions and impediments of a portion of the past works

are distinguished. At last, future examination headings to enhance a portion of the watched inefficiencies are talked about [2]. According to Radhia Khdir proposes a new scheduling algorithm for IEEE802.16 Broadband remote Metropolitan Area Systems in TDD mode. The proposed calculation concentrates on a proficient system to serve high need movement in congested systems. A point by point reproduction study is done for the proposed booking calculation and its execution has been contrasted and some referred to calculations, for example, Proportional Reasonableness (PF), Adaptive Proportional Fairness (APF) and Round Robin (RR) [3]. The two level scheduling (TLS) in [4] is introduced to support the administrations quality and reasonableness in downlink activity of WiMAX. The study expressed that it's proposed calculation achieved better after effects of WRR and RR calculations. The study [5] directed a far reaching investigation of booking calculations productivity in point-to multipoint WiMAX taking into account OFDM. A few calculations are explored than can bolster different administration classes, ensuring the nature of administrations and decency among adjusting classes and transmission capacity application.

III. QUALITY OF SERVICES

For the most part, there are two thorough meanings of administrations quality [7]:

A) *User-Based Services Quality*

It is far reaching impact of administrations proficiency deciding the fulfilment of a client or user of services or administrations.

B) *Network- Based Services Quality*

The exhibitions giving the chiefs controllability system joined of data transfer capacity or bandwidth, delay, jitter and packet loss to display a system administration (Voice Over Internet Protocol).

IV. SCHEDULER

Scheduler is the main component layer MAC and it guarantees quality of services for some types of services. This segment can be sorted out as lines in booking calculations. Booking lines are utilized to group assets in adjusting classes characterized in IEEE 802.16. The assets are diverse as far as transmission sort.

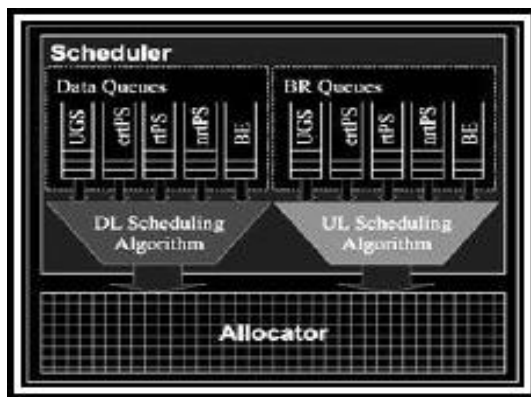


Figure 1: Scheduler Algorithm.

In DL transmission, scheduler acts in the clients information lines and in UL transmission, it is for the lines requiring MS transmission capacity. As is appeared in Figure 1 [6], booking calculation can be composed in view of DL furthermore, UL transmission and find about their essential part in enhancing nature of administrations in WiMAX. The priority of the quality of services and designing scheduling in WiMAX. IEEE 802.16 standard includes the quality of services instrument in media access control layer architecture (MAC). This standard defines the service flow providing the IP-based services quality. MAC layer is responsible for bandwidth scheduling for various users in accordance to the necessities and quality of services genius documents [6]. The standard supports wide range of applications. It is possible; they require distinctive levels of quality of services. IEEE 802.16 standard in accordance to these applications define five overhauling stream classes including: UGS, ertPS, rtPS, nrtPS and BE. Later, these classes and assigning them to scheduling

algorithms are clarified. UGS and ertPS service-providing classes have similar real-time requirements as the minimum jitter. For example, VoIP transmissions without silence suppression are good for UGS service and VoIP transmissions with quite suppression are good for ertPS service. Thus, we can use similar scheduling factor for both servicing classes. rtPS servicing class has particular quality of services requirements as low delay and high throughput for applications. For example, in video transmission, scheduling factor is defined separately. nrtPS and BE service classes have no or lowest guarantee of quality of services requirements like the minimum reserved traffic rate. Thus, two servicing classes can apply comparative scheduling algorithm. Various applications with different priorities are classified by scheduler in accordance with their quality of services class in the designed network as $UGS < rtPS < nrtPS < BE$.

V. CONCLUSION

In this paper, the comparison of different scheduling algorithms in WiMAX network such as First-In-First-Out (FIFO), Priority queue (PQ), Weight Fair Queuing (WFQ), Round Robin (RR), Deficit Round Robin (DRR), Modified Deficit Round Robin (MDRR), has been carried. Additionally, the execution of every scheduler is looked at in different classes of QoS by different movement as voice, video conferencing, document transmission and web browsing. The present study showed that none of the current algorithms had the capability to create an efficient, faire and strong scheduler to support all WiMAX classes. The analysis and conclusion of the study can be used to perceive the weaknesses and strengths of current scheduling algorithms and the design of efficient scheduling algorithms considering all or some of the weaknesses. For further, it is proposed to use simulation to investigate the efficiency of scheduling algorithm aware of delay sensitive algorithm and channel as EDF in WiMAX networks to specify their effect on various applications.

REFERENCES

- [1] Ali Heidari Khoei, Ghasem Mirjalily and Mehdi Agha Sarram, "Improving the Quality of Services by Scheduling Algorithms in Wimax Networks." Published in Indian Journal Science Research, Volume 7, Issue 1, Pages 1174-1184, 2014.
- [2] Aliu, A D Usman, S M Saini, "A Review on Scheduling Algorithms for Multicast Services over WiMAX Networks." Published in International Journal of Scientific & Engineering Research, Volume 6, Issue 6, Pages 1584-1590, June-2015.
- [3] Radhia Khdir, Kais Mnif, and Lotfi Kamoun, "Performance Evaluation of Scheduling Algorithm for Wimax Networks." Published in Journal of Advances in Computer Networks, Vol. 1, No. 1, March 2013.
- [4] Roy J, Vaidehi V, and Sricharan M S, " QoS Quaranteed Integration Methodology for a WLAN-WiMAX Heterogeneous Network," Published in Computers and Electrical Engineering, Volume 37, Issue 3, Page 261-274, 2011.
- [5] Kaur H, and Singh G, "Implementation and evaluation of scheduling algorithms in Point-to-Multipoint mode in WiMAX networks," Published in International Journal of Computer Science and Telecommunications, Volume 2, Issue 3, Page 540-546, 2011.
- [6] Both, Cristiano Bonato, "A new cross-layer adaptive architecture to Quarantee Quality of Service in WiMAX networks," 2011.
- [7] So-In, C., Jain, R., and Tamimi, A. K., "Scheduling in IEEE 802.16e mobile WiMAX networks: Key issues and a survey", Published in IEEE Journal on Selected Areas in Communications, Volume 27, Issue 2, Page 156-171, 2009.
- [8] Andreadis, A., Rizzuto, S., and Zambon, R, "A WiMAX simulation module for investigating QoS during horizontal handovers", Published in Simulation Modeling Practice and Theory Journal, Volume 29, Issue 1, Page 52-65, 2012.
- [9] Roy, J., Vaidehi, V., and Sricharan, M. S., "QoS quaranteed integration methodology for a WLAN-WiMAX heterogeneous network", Published in Computers and Electrical Engineering, Volume 37, Issue 3, Page 261-274, 2011.
- [10] Nie, W., Wang, H., and Park, J., "Packet scheduling with QoS and fairness for downlink traffic in WiMAX networks", Published in Journal of Information Processing Systems Volume 7, Issue 2, 2011.
- [11] Ali, N. A., Dhrona, P., and Hassanein, H., "A performance study of uplink scheduling algorithms in Point-to-multiPoint WiMAX networks", Published in Computer Communications, Volume 32, 2008.