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Scheduler Throughput of downlink LTE-MAC

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Abstract: Long Term Evaluation (LTE), which is called, has 4th Generation in mobile communication. As with the survey, we know that the speed of LTE system is very good enough in uplink and downlink of scheduler. In LTE network uses FDMA for uplink and OFDM for the downlink. With the previous work of algorithm for scheduler gives throughput calculation according to the 3GPP i.e. 3rd Generation Partnership Project. By MATLAB tool graph of throughput is calculated for Resource Block.

Keywords: LTE, MAC, Structure of LTE Frame, TTI etc.

I. INTRODUCTION

Mobile Systems are using LTE network to have better service in the environment. The 3GPP is the rules making body that shows the 3G UTRA and GSM systems. LTE as portrayed by the 3GPP. LTE hopes to make another radio-access development which will give high data rates, a low absence of movement and a more unmistakable spooky profitability.LTE grants transmission limit running from 1.4 MHz up to 20 MHz, where the latter is used to finish the most raised LTE data rate. Besides, LTE works in both Frequency Division Duplex (FDD) and Time Division Duplex (TDD). Orthogonal Frequency Division Multiplexing (OFDM) has been gotten as the downlink transmission arrangement for the 3GPP LTE. A downlink is a transmission from the BS (Base station) to MS (mobile station). OFDM isolates the transmitted high stream signal into different sub-streams signal and sends these over an extensive variety of sub-channels.
Here Mobile station related to User Equipment (UE) and Base Station is describes to EnodeB of LTE system.

A.MAC Layer:
Long term Evaluation – Medium Access Controli.e.LTE-MAC, E- UTRA characterizes two MAC elements; one in the UE and one in the E-UTRAN. MAC layer is the most reduced sublayer in the Layer 2 of the LTE radio stack. The association with the physical layer which dwells underneath the MAC is through transport channels, and the association with the RLC layer which lives above is through Logical channels. Radio Resource Protocol is in control of the arrangement of MAC that implies RRC chooses how MAC will act. For instance RRC advises MAC to design a particular PDU size. The MAC layer in this way performs multiplexing and DE multiplexing between logical channels and transport channels: the MAC layer in the transmitting side develops MAC PDUs, known as Transport Blocks (TBs), from MAC SDUs got through upside logical channels, and the MAC layer in the getting side recoups MAC SDUs from MAC PDUs got through transport channels. LTE-MAC Functions:

Handling between logical channels of one UE; Reporting of Information from scheduler; Transport Block Formation, Prioritization of Logical Channels etc.

II. SCHEDULER IN LTE

Typically scheduler implies, it plans the no. of UE's in the Resource Blocks of frame structure. Structure is comprised of Frequency and time as scheduling in downlink uses OFDM method. It has collected much thought starting late and has been gotten as the downlink transmission arrangement for the 3GPP LTE. OFDM is a multicarrier transmission arrangement since it parts up the transmitted high bits signal into different sub-streams and sends these over a high bandwidth. Each subcarrier is balanced utilizing distinctive levels like QPSK, QAM, 64QAM regulation and an OFDM is obtained by including the modulated subcarrier signals

A. Time Domain frame of LTE:
Here just displays the structure of 2 subframes in time. Term of time for a frame i.e. one radio frame is equal to 10ms. That implies 100 frames/second. No. of subframe present in one frame structure is 10. This is means 1ms is equivalent to 1 subframe. No. of slots in one subframe is 2 so that makes 20 slots inside one frame. This implies 0.5ms is equivalent to 1 slot.

B. Frequency Domain frame of LTE:

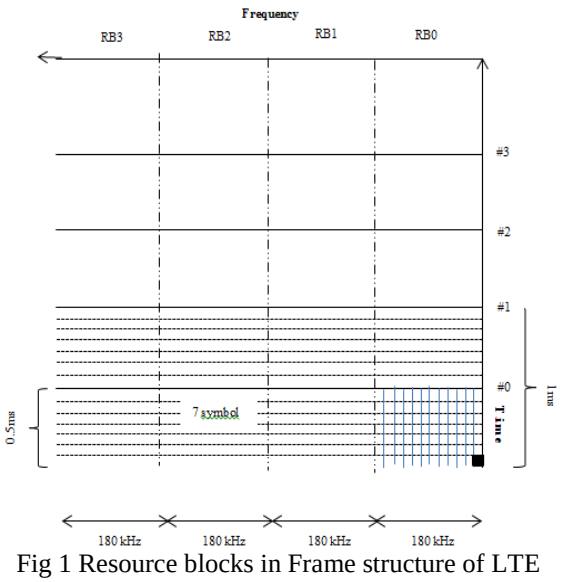

Fig 1 Resource blocks in Frame structure of LTE

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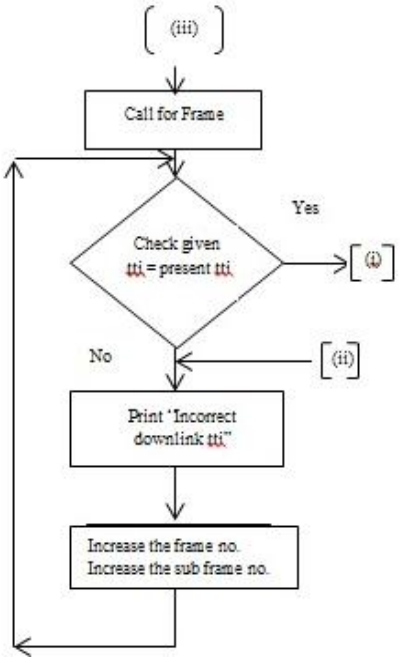
In this there are 12 subcarriers where each of 15 KHz said to be Resource Element (RE), in fig (a) the dark tab is RE, which takes after 180 KHz in every Resource Block, i.e.is secured by 12 Subcarriers and 7 symbols. Resource Element will be secured by 1 sub carrier and 1 symbol. At that point it implies in 1 slot or 1 RB there are 84 RE's.

III. ALGORITHM IN LTE

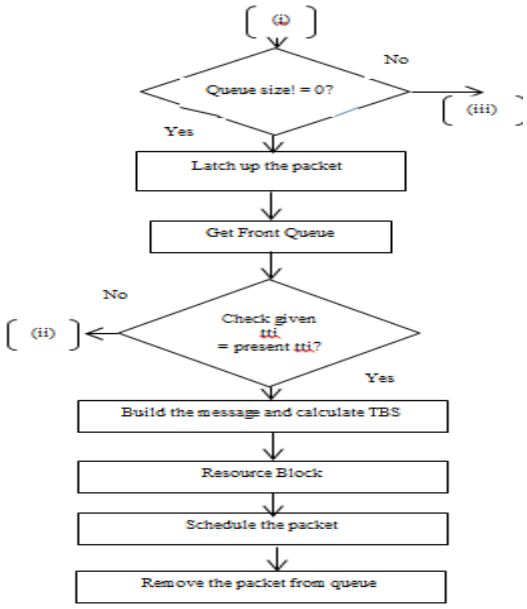
Here it is algorithm of scheduler in Long Term Evaluation (LTE) of Medium Access Control (MAC) comprise of two flowcharts to plan the packets i.e.

a) Calling Frame:
Transmission Time Interval (TTI) with allocated packets will reach the scheduler. Frame structure must be called. Scheduling happens when new information is to be sent. Comparison of given TTI and present TTI of the packet. When present TTI and given TTI are not same will go to step5, or else if both of them are same then go to Execution Scheduling algorithm. As the TTI's are not same, first increment in the sub frames number. When it scopes to the most extreme of the sub frame number then build the frame number by 1.The above execution to be done persistently until the given TTI is made equivalent to the present TTI.



b) Execution Algorithm:
Check for the nearness Queue. Take the front one and process, keeping other in line. Check again for the given TTI is equivalent to present TTI. If the Allocated TTI and Current TTI are equivalent then Pack the message and determine the Transport Block Size (TBS) or else generally go to calling frame calculation Resource Block position.

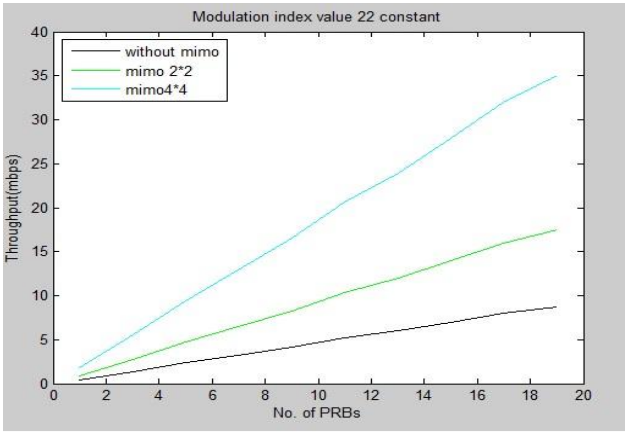
Determine number of Downlink Control Information (DCI's). Schedule the packet. Take off packet from line which is planned.



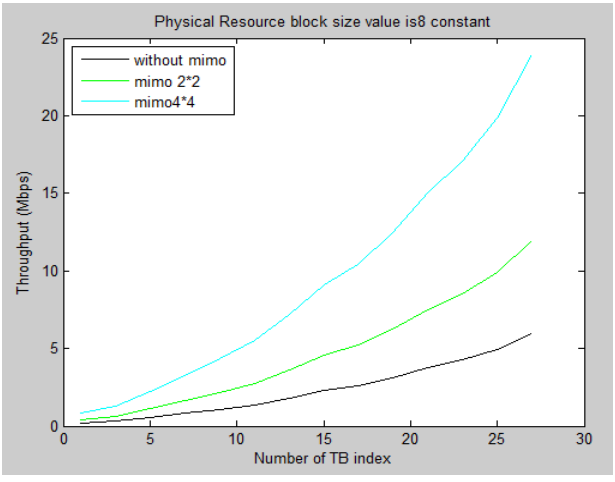
IV. RESULTS & SIMULATION

Calculation of throughput is done by assigning Resource Block and Modulation Index value according to 3GPP.
Simulation:

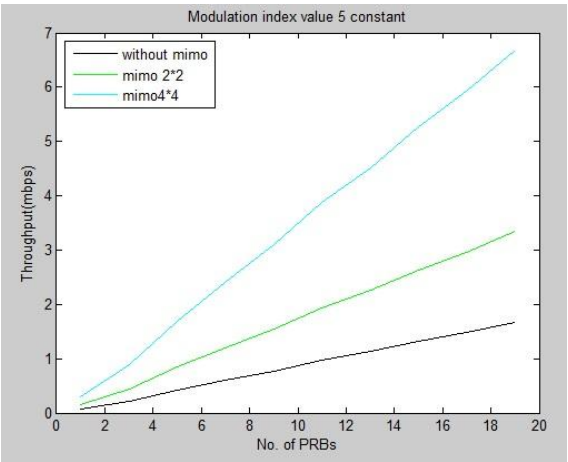
a) Modulation Index value 22



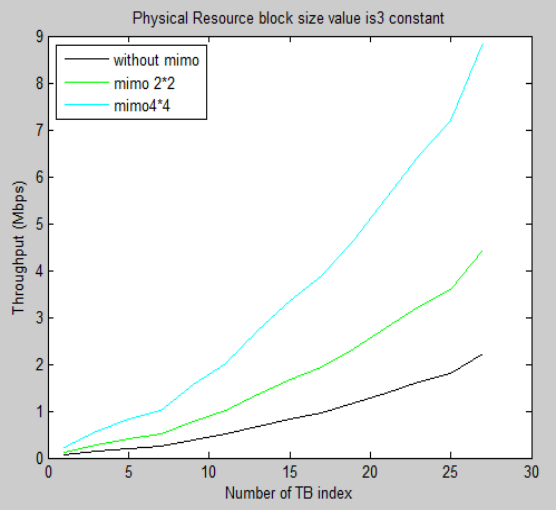
b) Resource Block value 8



c) For Modulation Index 5



d) For Resource Block 3



The result has given idea of throughput vs different values of modulation index value and number of resource blocks in physical is used.

V. CONCLUSION

From the algorithm it is able to calculate throughput for Modulation Index value keeping constant and varying the number of resource blocks for without MIMO ,2*2 MIMO and4*4 MIMO and again it is checked for the variation of throughput by keeping resource block constant and varying the modulation index. Modulation index value depends on the channel quality and even it resembles for modulation scheme that has to be taken.

REFERENCES

[1]. Third Generation Partnership Project (3GPP), 3GPP TS 36.213 V9.2.0
[2]. Ronak D. Trivedi, M. C. Patel. "Comparison of Different Scheduling Algorithm for LTE" International Journal of Emerging Technology and Advanced Engineering ISSN 2250-2459, ISO 9001:2008 Certified Journal, Volume 4, Issue 5, May 2014.
[3]. Christopher McGuire and Jeonghwa Lee "Comparisons of Improved Round Robin Algorithms", Proceedings of the World Congress on Engineering and Computer Science 2014 Vol I WCECS 2014, 22-24 October, 2014.
[4]. Mohammad T. Kawser, Hasib M. A. B. Farid, Abduhu R. Hasin, Adil M. J. Sadik, and Ibrahim K. Razu "Performance Comparison between Round Robin and Proportional Fair Scheduling Methods for LTE" International Journal of Information and Electronics Engineering, Vol. 2, No. 5, September 2012.
[5] Vallari Sharma , Prof. P.K Chopra "A Survey on LTE Downlink Packet Scheduling" International Journal of Advanced Research in Computer and Communication Engineering Vol. 3, Issue 9, September 2014.
[6]. Ramprasad Subramanian, Pantha Ghosal, Shouman Barua, Shiqi Xing, Sinhlam Cong, Haider Al Kim and Kumbesan Sandrasegaran "Survey of LTE Downlink Schedulers Algorithms in open access simulation tools NS-3 AND LTE-SIM" International Journal of Wireless & Mobile Networks (IJWMN) Vol. 7, No. 2, April 2015