# Identifying Efficient Frequency Standards of Wireless Network

**Priyanka B Karande, Rupali S Kumbhar, Priydarshanee A Pawale, Ajinkya. C. Bapat**

*Abstract: For encouraging wireless network contineous improvement is important. this is done by comparing related protocol and resulting the efficient protocol. this paper shows the overview of IEEE 802.15.4(x-bee),802.11(wifi),802.16(wimax) and carefully observed the comparision between them on the basis of Throughput,PDR,Delay and energy through simulation on NS2s. On the basis of observed results, this paper proved the Efficient Standards among xbee wifi & wimax.*

*Index Terms: Throughput, End to end delay, Power consumption, Packet delivery ratio, NS2*

## I. INTRODUCTION

Wireless network is a network that uses Wireless protocol for connecting network nodes. This implementation takes place at the Datalink level of the OSI model network structure.Personal Area Network (PAN) are systems are intended for short range communication between devices typically controlled by asingle person.some of these technology include standard such as Wifi,xbee, Wimax[1][2][3][10]

It is necessary to analyse to effective standard for its efficient use.for this paper uses a network simulator - 2(NS2)for simulation of different wireless standards. NS (network simulator) is a name for a series of discrete event network simulators ,specifically ns -1,ns-2,ns-3.all of them is free software publically available under GNU licensens for research & devlopment ,In this paper the comparative analysis between IEEE 802.15,802.11,802.16 has done[4][5][6].

### I. a IEEE 802.15.4-ZIG-BEE

Zigbee is an IEEE 802.15.4-based specification for suite of high-level communication protocols used to create personal area network with small, low power digital radios.The technology defined by the xbee specification is intended to be simpler and less expensive than other wireless personal area network (WPAN),such as Wifi.It is low power cosumption limit transmission distances to 10 to 100 m line-of-sight,depending on power output [1][3][8].

### I. b IEEE 802.11 Wi-Fi

WIFI is a technology for wireless local area networking with devices based on the IEEE standards 802.11.WIFI s a trademark of the WIFI alliances, which restricts the use of the term WIFI certified to products the successfully complete interoperability certification testing. Such an access point (hotspot) has a range of about 20 m (66feet) indoors and a greater range outdoors [9][2][10][11] sss.

### I. c IEEE 802.16 WIMAX

WIMAX is a family of wireless communication standard based on the IEEE 802.16, which provide multiple physical and media access control. WIMAX refers to interoperable implementations of the IEEE 802.16 family of wireless network standards ratified by the WIMAX Forum The rest of the paper is organised as follow in section II.methodology is described and simulation results are shown in section III. whereas conclusion in IV.

## II. METHODOLOGY

First of all installing the corresponding window i.e LINNUX (UBUNTU2.34).after that implementing the code regarding all program in ns-alliance. Further using terminal run the program related to the defining protocol. Which may be compare the particular parameters. The parameters such as Throughput, energy,(power consumption),end to end delay, and PDR(packet delivery ration) are measured. Whereasss three protocol are used to show the comparison on the basis of frequency 868MHz.As after comparing on the throughput point of view the efficient protocol is xbee. But as we considered the advanced technology and also the customer application point of view the other two are most efficient

Thus these all process are done by using network simulator 2 The detail operation of this paper is described in fig.1.

- After Creating Tcl file applying three protocol xbee, wifi, wimax to that and perform at frequency 868MHz and observed simulation an NAM file.
- Comparison of zigbee,wifi, wimax based on Throughput, considering frequency 868MHz.as shown in fig.2,3,4.
- Same for Delay Power Consumption and PDR is shown in fig5,6,7,8,9,10,11.

**Revised Version Manuscript Received on March 22, 2017.**
   **Priyanka B Karande,** Department of Electronics & Telecommunication of Engineering, Nanasaheb Mahadik College of Engineering, Peth (Maharashtra), India. E-mail: priyakarande10@gmail.com
   **Rupali S Kumbhar,** Department of Electronics & Telecommunication of Engineering, Nanasaheb Mahadik College of Engineering, Peth (Maharashtra), India. E-mail: rupask05@gmail.com
   **Priydarshanee A Pawale,** Department of Electronics & Telecommunication of Engineering, Nanasaheb Mahadik College of Engineering, Peth (Maharashtra), India. E-mail: priyapawale70@gmail.com
   **Ajinkya.C.Bapat,** Department of Electronics & Telecommunication of Engineering, Nanasaheb Mahadik College of Engineering, Peth (Maharashtra), India. E-mail: ajinkyabapat1@gmail.com
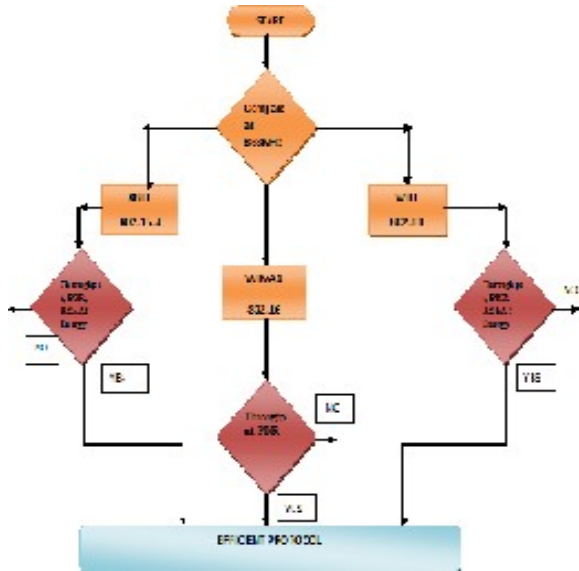
**Fig.1.1Flow of work**

## III. SIMULATION RESULT

After performing the operation as per the flow graph shown in the fig.1. using ns2,the following results were found
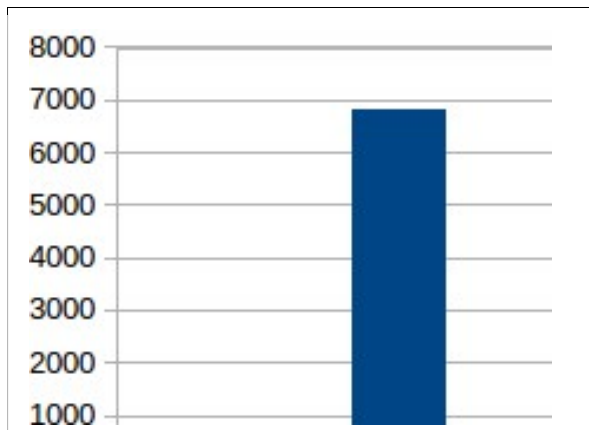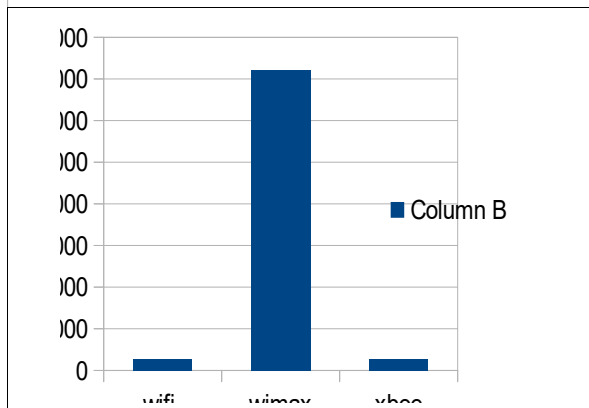


**Fig.2.Throughput of time interval 0.625**



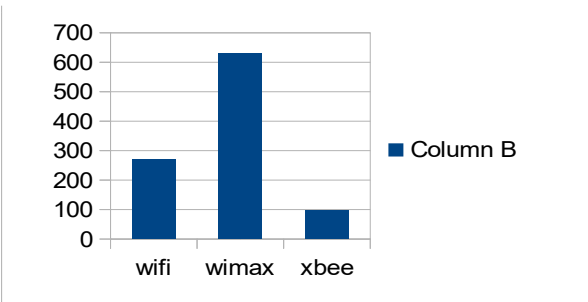**Fig.3.Throughput of time interval 0.25**
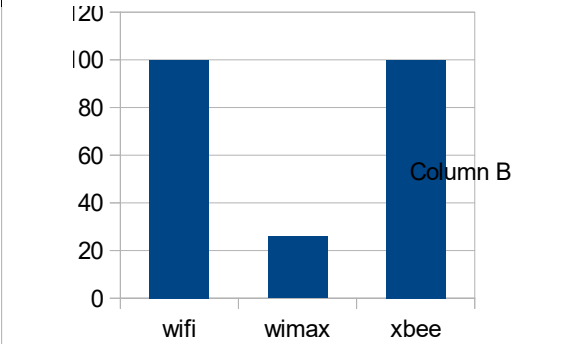


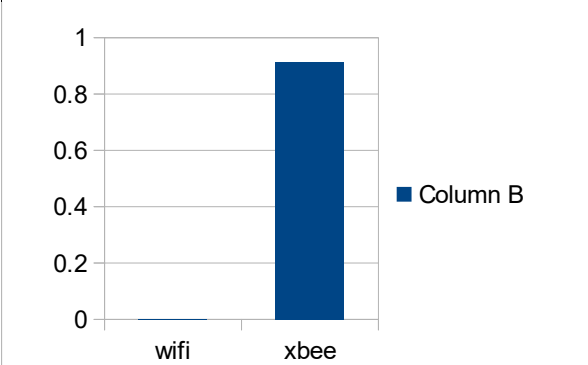**Fig.4.Throughput of time interval 0.125**



**Fig.5.PDR of time interval of 0.625**
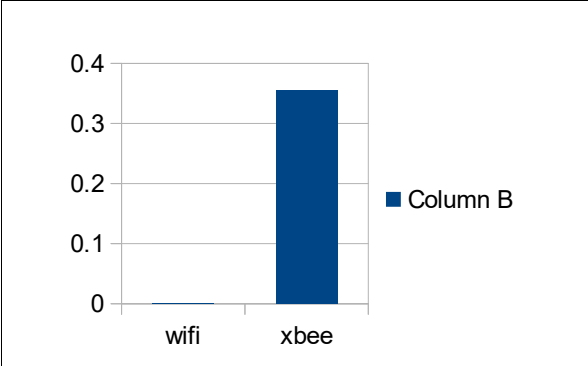


**Fig.6.end to end delay of time interval 0.45**
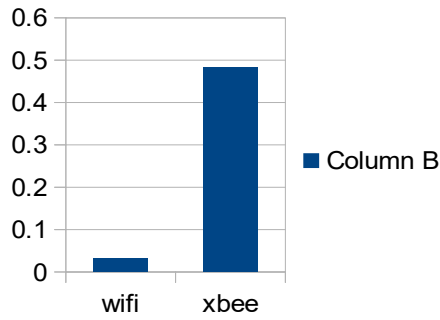


**Fig.7.end to end delay of time interval of 0.25**

**Fig.8.end to end delay of time interval of 0.125**



**Fig.9.energy of time interval 0.25**



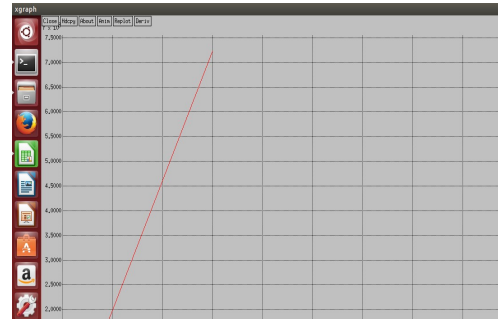**Fig.10.energy of time interval of 0.45**



**Fig .11.energy of time interval of 0.125**
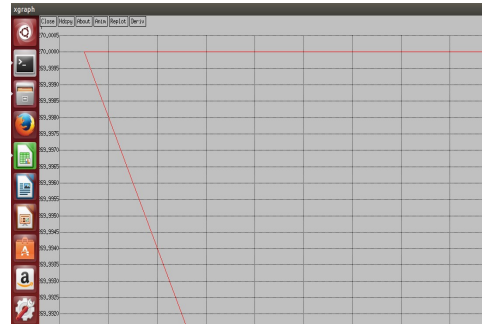


**Fig.12.Throughput of WIFI**



**Fig.13.Throughput of WIMAX**
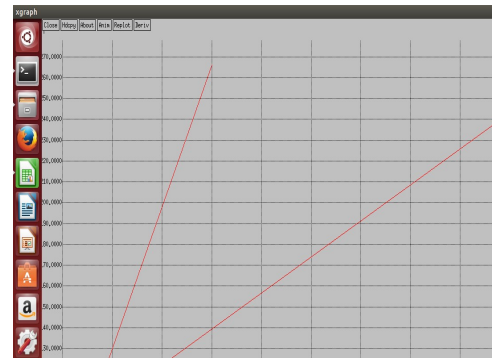


**Fig .14.Throughput of xbee**
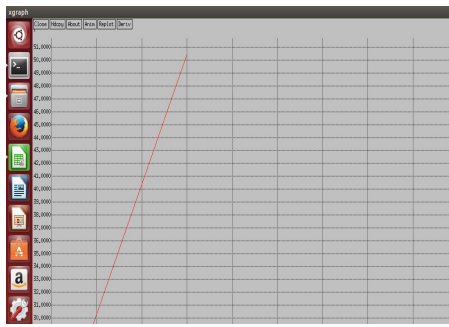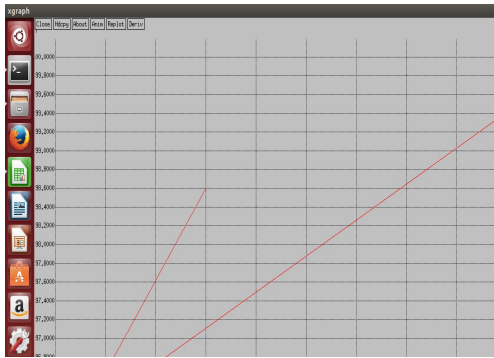


**Fig.15.PDR of WIFI**

**Fig.16.PDR of WIMAX**
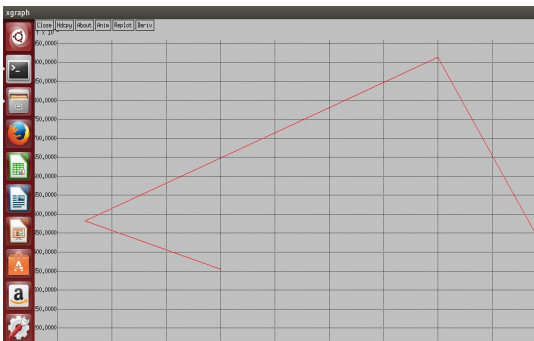


**Fig.17.PDR of XBEE**

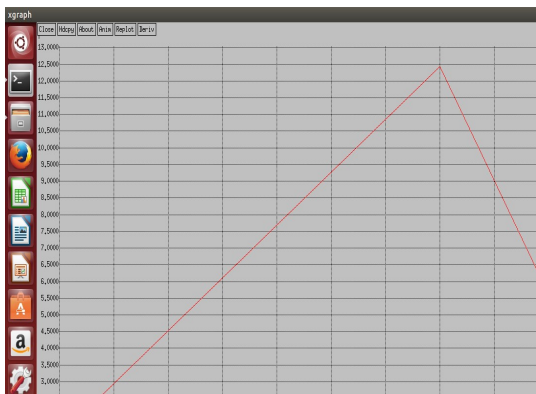

**Fig.18.end to end felay of wifissss**



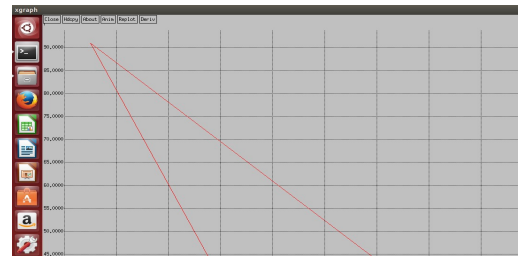**Fig.19.power consumption of wifi**



**Fig.20.power consumption of wimax**

## IV.    CONCLUSION

From all comparison and simulation result shown in.III., this paper practically concluding that zigbee having less throughput as compared to wifi&wimax. Whereas wimax has shown highest throughput which suggests WIMAX is most efficient protocol for long range communication.

### REFERENCES

1. Marina Petrova, Janne Riihij arvi,Petri Mahonen and Saverio Labella WTH Aachen University, Germany, "Performance Study of IEEE802.15.4 Using Measurements and Simulations"
2. "ZigBee Wireless Networking", Drew Gislason (via EETimes)IEEE P802.15.4/D18,"Draft Standard: Low Rate Wireless Personal"Area Networks, Feb. 2003.
3. Ms.Swati.V.Birje,Mr.Mahesh.S.Kumbhar,Mr.Raviraj.S.Patkar "Performance comparision of 802.11 and 802.15.4 based networks" International Journal of Advanced Research in Computer and Communication Engineering.
4. Introduction to wifi technology, retrieved on September 24, 2006 from www.wifitechnology.com
5. IEEE 802.16 and wimax;broadband wireless access for every one ,Intel Corporation 2003,http://www.intel.com/ebuisness/pdf/wireless/intel/802.16_wimax.pdf
6. A.Wiling,"An architecture for wireless extension of profibus,"in proc.IEEE Int.conf.Ind.Electron.(IECON'03) ,Ronoku,VA, Nov2003,
7. Chan,H.Anthony. "ssoverview of Wireless data network standards and there implementation issues."talk presented at the 12th ICT Cape Town(2005)
8. Morrow, R."Wireless network coexistence",McGraw-Hill:New York,NY(2004).
9. Conexaxant, single-chip WLAN Radio CX53111.New port beach,CA,2006.
10. E.Ferro and F.Potorti, "Bluetooth and Wifi wireless protocols:A survey and a comparision,"IEEE wireless communication ,vol.12,no.1,pp.12-16,feb2005
11. J.S.Lee, "performance evolution of IEEE 802.15.4 for low rate wireless sspersonal area network,"IEEE trans.consumer electron,vol.52.no.3,pp.742-749,august2006