Identifying Efficient Frequency Standards of Wireless Network

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Abstract: For encouraging wireless network continuous 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 comparison 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 a singular person. Some of these technology include standard such as Wifi, xbee, Wimax. [1][2][3][10]

It is necessary to analyze 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 licenses for research & development. 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 consumption 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

Wi-Fi is a technology for wireless local area networking with devices based on the IEEE standards 802.11. Wi-Fi is 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 (66 feet) indoors and a greater range outdoors [9][2][10][11].

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 organized as follows in section II. methodology is described and simulation results are shown in section III, whereas conclusions in IV.

II. METHODOLOGY

First of all installing the corresponding window i.e LINUX (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. Whereas 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.

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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.1. Flow of work

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
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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.

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