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Anatomy on WI-FI

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Abstract: The paper presents a brief study about Wi-Fi analysis and its strength at various locations of our campus.We are living where world have become smaller with help of technology. When we talk about technology, prime importance is given to internet connectivity where its quality, reliability and its cost effectiveness plays a vital role in choosing the proper type of network. By keeping this perspective in mind this project was carried out giving us a glance overview of our campus connectivity by using tools like wifi analyzer, google maps and various topologies. The main motive of this project was to study the prominent internet access points in our campus and to verify dead zones and implement and suggest remedies in order to improve connectivity throughout the premises.

Keywords: data rate, quality, topology.

I. INTRODUCTION

We are living in the world of internet and it has become one of our essential needs. As we talk about internet , the things that come with it are wifi ,access points, speed, etc. So, our paper mainly focuses on Wi-fi (Wireless fidelity) an atomyi.e its study, analysis, and modes to improve its efficiency. There are many wi-fi analyzer tools available which provide detail description as well as statistics about wifi networks. During our survey ,we chose Insider 2.0 as our analyzing tool. A detail study regarding the wifi access points was done in our campus for nearly two weeks at different times of the day in order to get best values in all conditions. A Google map was plotted which shows exploded view of each building in the premises with their network strengths. By the results, we verified strong as well as weak(dead zones) in our campus. From this we proposed a remedy which is based upon the STAR TOPOLOGY CONCEPT which focusses on all round coverage of the campus , by providing net access points uniformly though out the premises.

II. BACKGROUND AND RELATED WORK

Wi-Fi was an outcome by a decision taken in 1985 by the Federal Communications Commission (FCC), America's telecoms regulator, to open several bands of wireless spectrum, allowing them to be used without the need for a government license.[1] The new standard was published in 1997, and engineers immediately began working on prototype equipment to comply with it. Two variants, called 802.11b (which operates in the

2.4GHz band) and 802.11a (which operates in the 5.8GHz band), were ratified in December 1999 and January 2000 respectively. 802.11b was first developed by the to great humans Richard van Nee of Lucent and

Mark Webster of Intersil (then Harris Semiconductor).[2]Wi-Fi also has a number of security features. To access the network, users must have a password for WPA2, also known as Wi-Fi Protected

Access (the 2 represents the fact that this feature is in its second generation). [3]

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SR.NO	SYMBOL	STRENGTH IN dB	QUALITY & DATA RATE
1.		ABOVE 85	POOR average 1Mbps
2.		75-85	FAIR average 4 to 8 mbps
3.		65-75	GOOD average 16-32 mbps
4.		BELOW 65	EXCELLENT average 54 mbps

III. WI-FI ANALYZER SELECTION

In order to carry out this project, various wifi analyzing tools and their characteristics were studied. They are as follows:

A. GFI Lan Guard

Used to scan both small and large networks. Information coming from up to 60,000 devices, running on Windows, Mac OS or Linux, will be available at a glance. [4]

B. Open NMS

OpenNMS is an open source network manager that provides an interface similar to that of inssider2.0 which has main feature like time analysis.

C. InSSIDer 2.0

It is a free wifi analyzing tools and also small in size.it provides information regarding 2.4 Ghzand 5GHz bands. It also plots time graph of the signal and also has GPS feature provided in it. Due to its user friendly interface and great qualities, we decided to chose insider 2.0 as our analyzing tool throughout our survey.[8]

IV. RESULT

Readings were taken at various locations of every building, so as to get a brief overview of strength at different positions. Following strengths were observed which are shown in a pictorial representation.

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LOCATIONS OF PROMINENT WI-FI ACCESS POINTS

SR. NO	LOCATION	OPERATOR	MODE	QUALITY
1.	BOAT CLUB	VIT CAMPUS	WIRELESS	EXCELLENT
2.	INTERNET LAB B-1	VIT CAMPUS	WIRED LAN	EXCELLENT
3.	READING HALL B-3	JIO	WIRELESS	EXCELLENT
4.	DESIGN LAB B-3	VIT CAMPUS	BOTH	EXCELLENT
5.	SHARAD ARENA	VIT CAMPUS	WIRELESS	GOOD
6.	FLOOR 2,3,4 B-1	VIT CAMPUS	WIRED LAN	GOOD

Fig.2 Table showing Wi-Fi access points

V. REMEDY PROPOSED

As per the information collected, we figured out that, the problem of dead zones or poor connectivity can be resolved by using concept of star topology.[9] It will have a router reflector combination by giving the premises an all-round accessibility. Not only this solution is restricted to our campus , but it can be implemented to any campus by optimizing their layout points of routers.

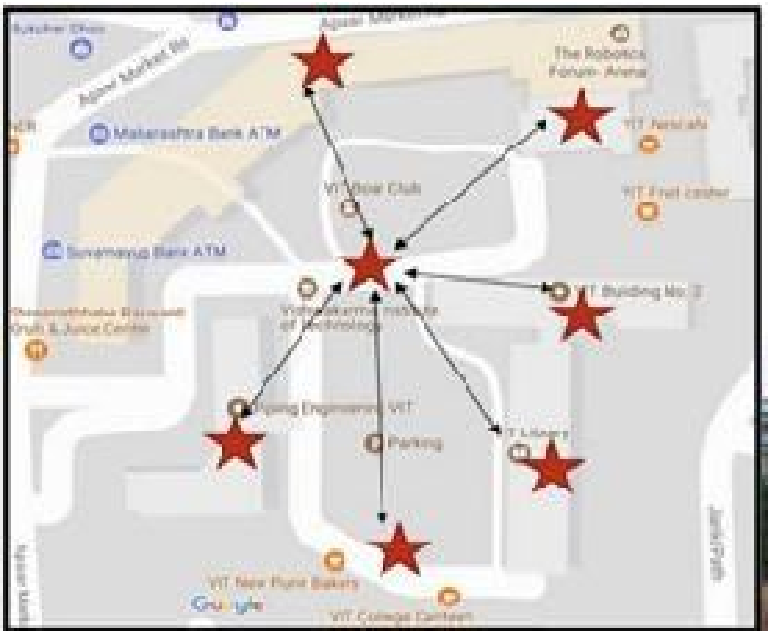


Fig. 3 Remedy- STAR TOPOLOGY

VI. FUTURE SCOPE

The star topology remedy can be further combined with directors so as to get better speed of internet access as it will direct the path for proper transmission. Wi-Fi boosters[10] can be also attached which will get triggered when speed of access points reaches below optimal level.

VII. CONCLUSION

A study regarding various access points and their strengths was carried out, and remedies to enhance the Wi-Fi accessibility were proposed. During this survey various wifi analyzing tools were also studied and their key features were identified. Also points in the campus were identified which have poor connectivity also known as dead zones and were taken for case study. A remedy bassed

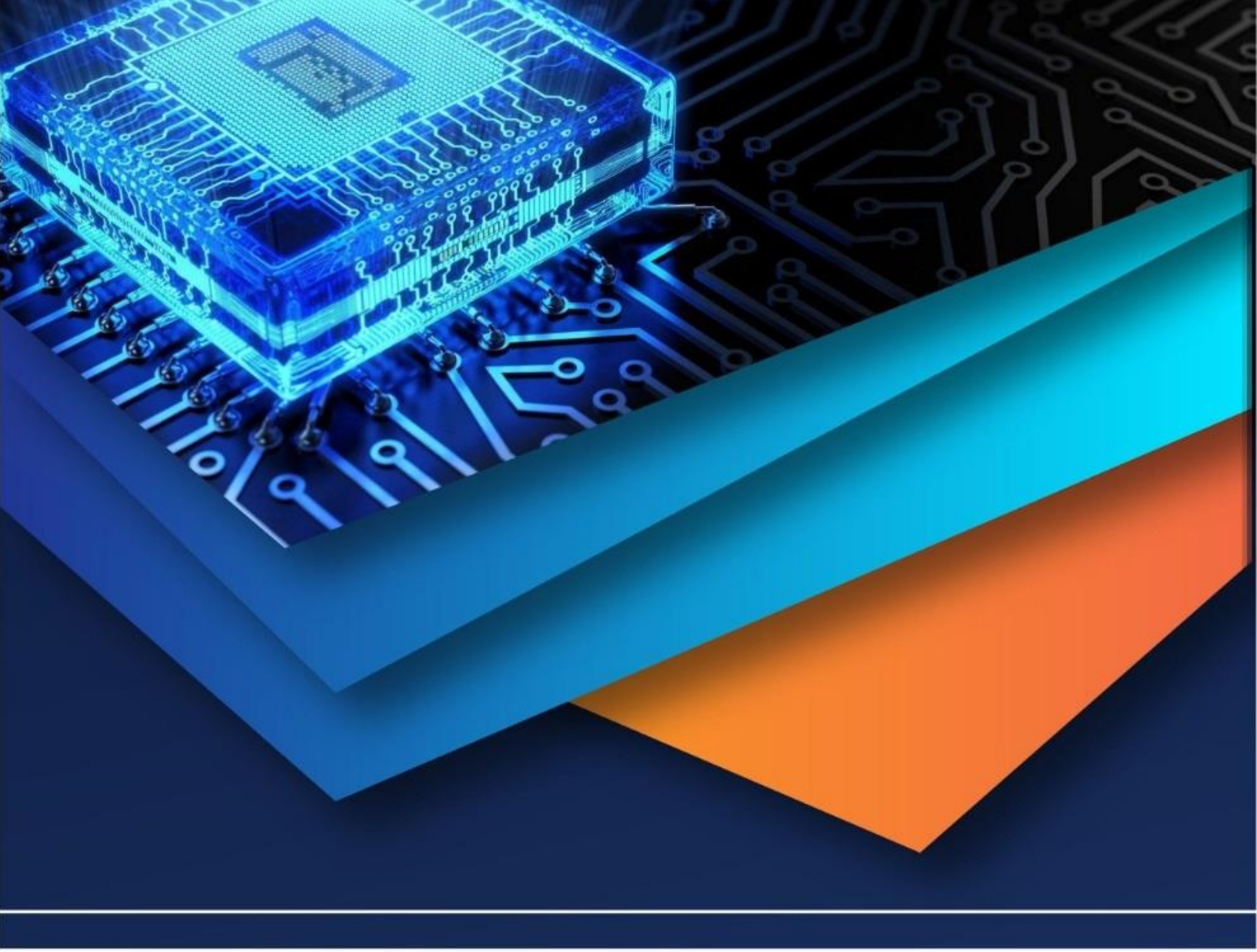
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upon STAR TOPOLOGY concept was proposed for improving connectivity. To enhance these spots, reflectors and Wi-Fi booster remedy was also taken into consideration.

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