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A COMPREHENSIVE STUDY APPROACH OF (LI-FI) LIGHT FIDELITY

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ABSTRACT: -In the Current Scenarios, the rate of speed of internet is a major issues and most of them in business industries, educational institutions, several organizations, entrepreneurs is moving for getting right information at the right sequence and right place. This initialize speed internet connectivity, advanced technology and huge spectrum of channels. Present paper reflects the Future of Communication (LI-FI) which may affect all lives. Depending on the type of deployment and application, a benefit of Light fidelity is the ability of LED light bulbs to give both clarification and communication connectivity at the same time and seamlessly. Li-Fi has thousand times faster speed than Wi-Fi and ensures security as the visible light is unable to intrude through the walls, which implements a new criteria of wireless communication.

Keywords: - LI-FI, WI-FI ,Transmission, LED, D-Light (Data Light), Visible Light Communication

INTRODUCTION

Nowadays internet has become a major demand people are in search of Wi-Fi hot spots. This is the advanced scenario in day –today communication system which enables the need of LEDs, Light Emitting Diodes that provides in the transmission of data much faster and reliable than the data that can be transmitted through Wi-Fi. Li-Fi is a wireless communication system in which light is used as a carrier signal instead of traditional radio frequency as in Wi-Fi. Light fidelity which ensures the technology that implement light emitting diodes to transmit data wirelessly. Visible light communication (VLC) uses rapid pulses of light to transmit data wirelessly that cannot be find out by visible eye. This paper ensures on Light fidelity technology that overcome Wi-Fi technology and challenges for the new VLC technology.

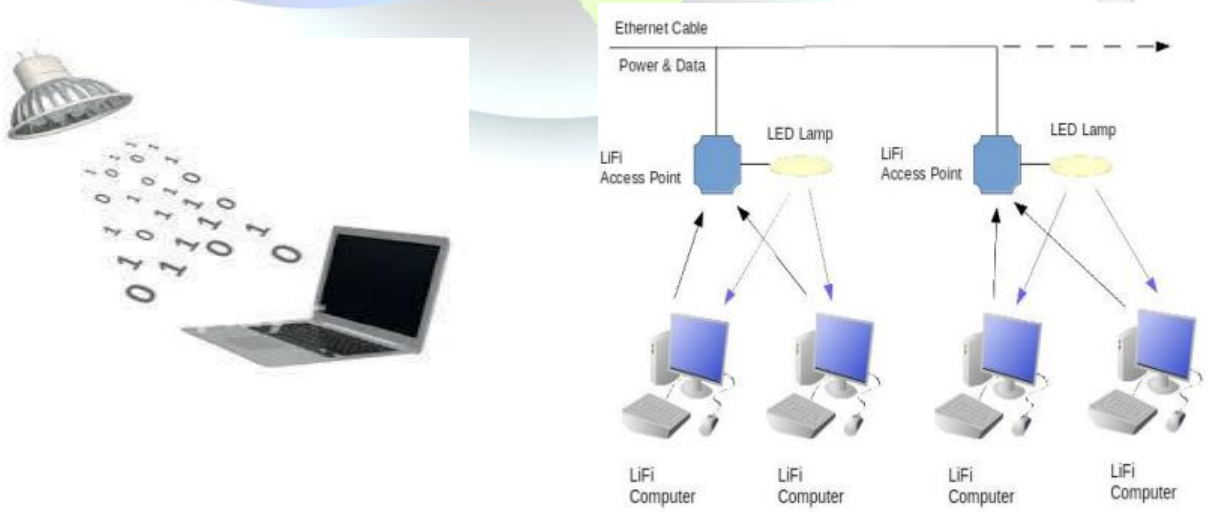

Fig. 1 OVERVIEW WITH LIFI-TECHNOLOGY

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1.DESIGN of Li-Fi

Li-Fi architecture consists of a number of LED bulbs or lamps including many wireless devices such as Mobile Phones, Laptops and PDA. The following factors should be taken into concern while designing Li-Fi:

- Presence of light.
- Line of sight (LOS).
- For better performance use fluorescent light and LED.
- Photo detector received data

WHY USE VISIBLE LIGHT COMMUNICATION

Fig. 2 DIFFERENT RAYS

- The Gamma rays cannot be used as they could be unsafe.
- X-rays has similar health issues.
- Ultraviolet light is fine for place without people, but otherwise unsafe for the human body.
- Infrared, due to eye safety regulation, can only be with low power.
- Radio waves penetrate through the walls so they arises security issues.

2. ADVANTAGES OF LI-FI

LiFi is a form of Visible Light Communications (or 'Visual' Light Communications), and part of the broader field of Optical Wireless Communications (OWC). Light fidelity implements light emitting diodes (LEDs) to deliver communicating network , mobile-capable, high-speed interface communication. Primary implementations of LiFi utilize stand-alone transceivers or LED light bulbs, controlled by a driver that turns the LED on and off, to transmit encoded data. An optical sensor is used to receive the data, which is then decoded.

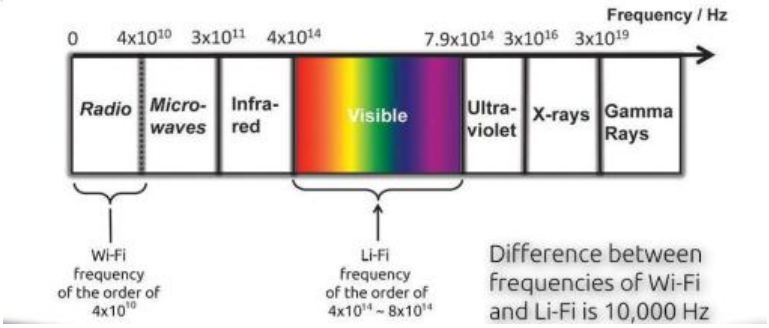

Fig. 3 LIFI-WIFI

Capacity:-The bandwidth of light is 1000 times wider than the bandwidth of radio waves. As the equipments are already available and the light sources are already installed so, it has got better capacity.

Efficiency:-LED light consumes less energy and are highly efficient.

Low cost :- As the cost of the LED is low and it consumes less electricity so the cost ids low.

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Availability:- As light sources are present everywhere so availability is not an issue. There are uncountable of light bulbs worldwide, they just need to be restore with LEDs for actual transmission of information.

Security:-As light waves cannot intrude through walls so, they cannot be intercepted or misused. They provide secure access.

Free band:-It makes use of free band that doesn't need any licensing.

High speed:-It provides theoretical speed of one giga byte per second.

3.APPLICATION & ADVANTAGES

Airways: We were facing the problem in communication media at the time of travelling in the airways, because the whole airways communications are executed on the basis of radio waves. We can overcome this drawback by using LI-FI technology as shown in below figure

Fig. 4 LIFI IN AIRCRAFT

Fill Green Data Processing:LI-FI not gives any side Reaction on any Function Independently like radio waves and other communication waves which Reaction on the birds, human bodies, etc.

Free From Frequency Reaction Issues :LI-FI is a visible light communication medium, so light fidelity don't need any sort of spectrum license i.e. for the license and communication we need not to pay any financial thing.

Enhance Power Plants: Power plants Preferred more speed and data system with communicate to enhance things like grid integrity, demand and (in nuclear plants) core temperature and Wi-Fi could not function properly in these region as these are more quick to detect the radio frequency like as in petrochemical plants. Light fidelity can work promptly in these sensitive scenarios and it also ensures to saves money.

Developing Communication Security: Light never intrude to the wall so in visible light communication, safe is greater than many other communication issues as shown in below

Fig. 5 COMMUNICATION SECURITY

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Multi User Communication*:* LI-FI maintains & enriches the needs to share different things at a one instance which enhance the network broadcasting .

Lightings Points Used as Hotspot: Any lighting emitting devices like car lights, ceiling lights, street lamps, etc. are carryout as a hotspot. It reflects that the various light initialize to spread internet using VLC which guide us to minimum cost architecture for a hotspot.

CONCLUSION:

With the current increase in the cellular networks, the latest technology of Light fidelity has maintain and proves to be a benchmark in communication systems. It uses the visible spectrum of light which is far excellent than the RF as it is regrettable to intrusion. With the use of LEDs the information can be transfer at very huge range with just the effortless turning on and off of the LEDs. This technology is not only free to use but also provides a safe and secure access.

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