

# Communication over lifi

## What is lifi?

Li-Fi (Light Fidelity) facilitates the wireless method of data transmission through Visible Light Communication (VLC) technology

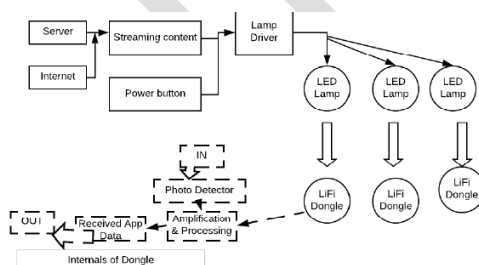
Li-Fi is a Visible Light Communications system transmitting wireless internet communications at very high speeds. The technology makes a LED light bulb emit pulses of light that are undetectable to the human eye and within those emitted pulses, data can travel to and from receivers. Then, the receivers collect information and interpret the transmitted data. This is conceptually similar to decoding Morse code but at a much faster rate – millions of times a second. Li-Fi transmission speeds can go over 100 Gbps, 14 times faster than Wi-Fi, also known as the world's fastest Wi-Fi.

Note:

It has more security than radio waves.as we can decrypt the radio waves various hardware like rtl-sdr, hackerphone, flipper zero etc. but lifi cannot be hacked. even we can transmit data

Over lifi technology. and it is very fast comparatively than any other medium. it can be used in mobile communication networks for safer and speed transmission of data over light. it eco friendly no birds can be harmed by lifi technology.

## How it works?



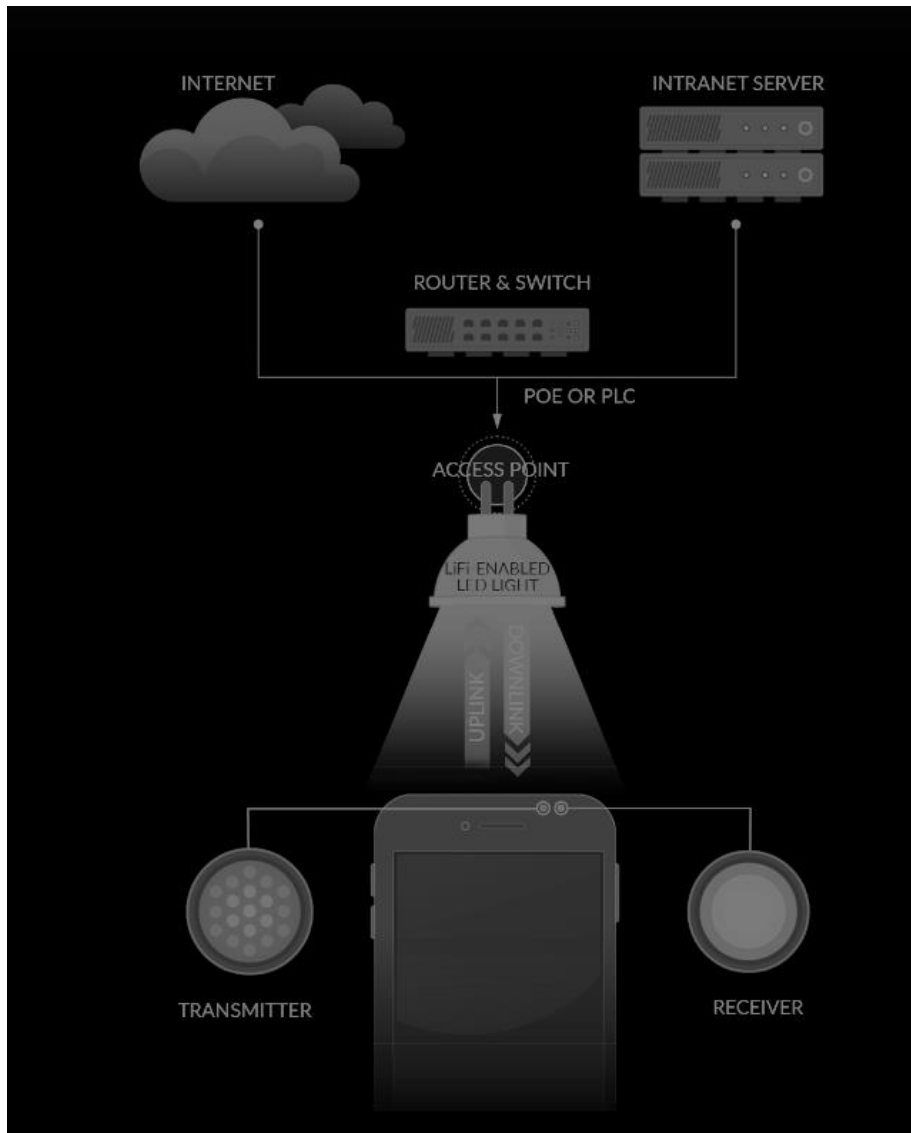
Initially a data is transmitted over internet to lamp drivers that are fixed on a tower or any lab

The lamp drivers are connected to the lifi enabled led lamps

On the other side lifi dongles are fixed and the light signals are amplified&processed using some photo detectors.and data are recived over the phone.

The transmitter signal have some flickering of light(that's hard to notice by our naked eyes)

That can be converted into electrical signal by the receiver.the recived signal can be back into its equivalent binary data

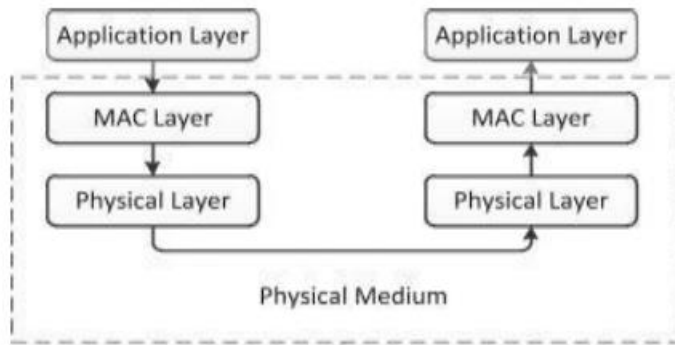


Or tansmit using POE(power over ethernet) to access point where lifi enabled photon(light) is used and photosensitive detectors demodulates the light frequency signal and convert back into an electronic data stream.it uses bi directional wireless-communication

### Architecture of lifi:

according to ieee 802.15.7 protocol defines 3types of layer namely

MAC layer application and physical layer.it is slight different from osi layer.



### Advantages of LiFi

The advantages of LiFi are mentioned below:

1. Speed: LiFi can transmit data at the rate of 10 Gbit/s. This is almost 250 times faster than any other high speed broadband connection.
2. High-density coverage: LiFi is more ideal for a high density coverage. WiFi is more ideal for common purposes.
3. Secure: LiFi is more assured and dependable than WiFi. Light cannot pass through opaque objects hence it can be easily blocked by many surrounding objects.
4. Cost: LiFi technology is free.
5. Larger Spectrum: There are no restrictions to the capacity of LiFi. Visible light spectrum is about 10,000 times larger than RF spectrum.

### Challenges of LiFi

1. The modulation in LiFi is a challenge when the light illumination is low.
2. LiFi cannot provide an Internet connection when there is no light source. This may cause limitations for locations and situations where LiFi may be necessary.
3. Light cannot pass through physical barriers. This may cause certain limitations.
4. The major drawback of LiFi is it can be used only within the small area as it cannot penetrate through walls.