

# LIFI

## The Next Generation of Network Technology



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Our homes, offices and environments are ablaze with internet connections, with an always-on-internet service that has become invaluable in our lives. Younger generations cannot imagine a life without the internet, and we too have succumbed to its attraction and convenience, living digital lives that permeate across all spheres of our public and private interactions.

Our expectations of internet technology has gone from slow, telephone based modems of the past, to blistering internet speeds where we can download gigabytes of information in minutes rather than what used to take days just 20 years ago. Our work and play has become increasingly digital, having developed an insatiable appetite for digital content, online shopping, online streaming, online gaming, online working, which can be seen in the explosion of such platforms and collaborative technologies globally. This is only set to increase as more people of the world come online and internet speeds increase to keep pace with ever-greater demand.

The vehicle of modern internet access in our surroundings is predominantly WIFI (WIREless FIDELITY), a wireless technology based on radio waves that has proven to be a robust communication medium delivering fast connection speeds that is cost effective, which was introduced in the form we see it today, back in 1997. Since then, it has gone through numerous iterations just like any technology, to make it faster, more reliable and more secure as our needs have evolved.

Despite the fast WIFI speeds we have today, it is clear that greater speeds will be needed in the future, with WIFI having to evolve just as every other technology did. I see this technological evolution happening through LIFI (LIght FIDELITY), a technology that is set to revolutionize internet access and eventually replace WIFI at much greater speeds. The fastest possible WIFI speed with current technology is around 10 Gbps. This can be achieved by using the latest WIFI 6 standard and the use of multiple channels simultaneously. However,

actual speeds may be limited by various factors such as distance from the router, interference from other devices and network congestion.

LIFI on the other hand uses visible light and infrared spectrum to transmit data, which are 2600 times larger than the entire radio frequency spectrum. In real-life tests, LIFI has been shown to be able to deliver up to 100Gbps, with a lab tested maximum of over 224 Gbps. This is clearly a winner when it comes to provisioning faster internet speeds, with work underway to develop new communication standards to facilitate the interoperability of LIFI with WIFI.

LIFI clearly offers higher data rates, lower latency, better security, lower energy consumption and reduced interference than WIFI, enabling new applications in areas such as smart lighting, indoor positioning, vehicle communication, underwater communication and augmented reality.

One of the main challenges of LIFI is the need for line of sight between the transmitter and the receiver, which limits the coverage and mobility of the devices. However, this challenge is being overcome by using multiple light sources, relay nodes and hybrid LIFI/WIFI systems. Standardization and interoperability of LIFI devices is being discussed by industry leaders and other stakeholders which means this technology will start to become more common as issues are resolved.

LIFI has already been implemented in specific setups across the world in countries such as France, Scotland, Netherlands, India and others. Even the US army has deployed this in some of its bases due to the high level of security it provides when compared to WIFI.

I see, in the near future, that hybrid implementations of WIFI/LIFI will become commonplace as this technology becomes more mainstream, as protocols are standardized and interoperability issues are resolved, with device manufacturers coming onboard with cheaper LIFI networking equipment. This hybrid approach will allow the improvement of network performance by allowing WIFI networks to offload traffic to LIFI setups, which will eventually replace WIFI altogether.