**ADVANCEMENT IN NETWORK USING OPTICAL FIBER**

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***ABSTRACT*:** Wireless technology has bloomed to a great extent that it requires wireless technology to transmit a lot of data every day. Nowadays, wireless communications have become important in communication process. The main way to transmit wireless data is by using electromagnetic waves i.e., radio waves. However, radio waves can support less bandwidth because of compact spectrum availability and intrusion. Solution to this is data transmission using Visible Light Communication (VLC). Wi-Fi deals with wireless coverage within premises, whereas Li-Fi is perfect for high compactness wireless data coverage in defined area and for mitigating radio interference issues. In Li-Fi basically we focus to transmitting data between two terminals using LED’s. Li-Fi is a transmission of data through illumination, in which data can be sent through a LED light bulb that varies in intensity faster than human eye can follow. Lifi also supports encryption The light which we are using in our daily life is can also be used for communication by illumination. Transmission of numbers, symbols, alphabets through LiFi technology are done. This method can also be extended to transmit image or audio. Using visible light for data transmission including many advantages and eliminates the disadvantages of transmission of data through electromagnetic waves.

***Keywords***: *LiFI, Wifi, Ethernet, Wireless Communication, Light dependent resistor(LDR)*

**I.INTRODUCTION**

Optical networking technology has been advancing swiftly for some decades now. The high bandwidth and low attenuation features of fiber optics has made it the major element of telecommunication infrastructure. To achieve the ever-growing demand of data in telecommunication industry, researchers have explored various networking technologies in optical domain as well as advanced equipment and programmability, boosting transmission up to gigabit and beyond. Optical communication is a wide and vase research field and swiftly changing research domain,

where researchers around the globe and different expertise from different fields such as electronics,

communications, photonics, signal processing have provided their contribution side by side to meet

the ever-increasing demands for higher capacity, lowering energy consumption and it is cost in system

design to grant novel applications and emerging in new technologies in Optical domain. The fig 1

shows the optical network topology having an Add Drop Mux (ADM), in which two high speed

signals are terminated and the low-speed signals they contain are removed.

**II.LITERATURE SURVEY**

Wang Guohui, Andersen David G, Kaminsky Michael, [1] Wireless technology has bloomed to a great extent that it requires wireless technology to transmit a lot of data every day. Nowadays, wireless communications have become important in communication process. There has been a huge research to move to all-optical network to increase scalability and operational flexibility. The introduction of Wavelength-selective-switch (WSS) is suitable for 80 -wavelength systems. The utilization of optical technologies based on Liquid Crystal on-Silicon(LCOS) array supports up to 1 GHz very fine spectrum and hence allow wavelength selective switchesand Fast ROADMs to select wide-range of add-drop spectral shapes an make it more flexible.

Rafael Sánchez, José Alberto Hernández, Julio Montalvo García, and David Larrabeiti,et al. [2] Optical packet switching (OPS) has been proposed to curb this power drain, by leveragingoptics’ lower energy cost per bit transmitted and requiring fewer optical-to-electronic (O-E) conversions. OPS has a long research history, but no widespread deployments: it doesn’t allow, as yet,plug-and-play replacement of electronic switches. In particular, optics has no scalable method of buffering packets (without which the switch is vulnerable to contention); or decoding and processing heir headers (to decide where to send them); and both issues are exacerbated by asynchronous arrival of packets. Doubts have thus been expressed as to whether OPS actually can help with this excessiveenergy consumption

K. Y. Cho, U. H. Hong,S. P. Jung,Y. Takushima, A. Agata, T. Sano,Y. Horiuchi,M. Suzuki,and Y. C. Chung.[3] In the above proposed paper Optics can also be used for on-chip communications to achieve space, power and spectrally efficiency. Previously, OEO technology faces several issues like area,efficiency, power consumption and also in reliability due to assembly of discrete components. However, Infinera Corporation brought core Optical back-haul network technologies using PIC based Technology for execution of OEO Vision. PIC based technology is able to miniaturize and integrate several numbers of WDM technologies monolithically on a chip in the year 2005. The applications of MEMS with PIC technology might be able to build more efficient and scalable optical system to correct the switching at several network elements. One of these technologies which gives the replacement of fixed transponder is tunable transponder.

Bimlendu Shahi, Divya Jha, Dr. Dushyanth N D, and

Dr. Suresh D.et al.[4] Optical networking technology has been advancing swiftly for some decades now. The high bandwidth and low attenuation features of fiber optics has made it the major element of telecommunication infrastructure. To achieve the ever-growing demand of data in telecommunication

industry, researchers have explored various networking technologies in optical domain as well as

advanced equipment and programmability, boosting transmission up to gigabit and beyond. This paper

reviews various optical communication technologies, recent advances in optical network, it’s role in

telecommunication industry and its challenges.

applications, features and comparison with existing technologies like Wi-Fi etc. Wi-Fi is of major use for general wireless coverage within building, whereas Li-Fi is ideal for high density wireless data coverage in confined area and especially useful for applications in areas where radio interference issues are of concern, so the two technologies can be considered co

## **III.REVIEW**

**A.** **Recent Advancements**

In recent years, we have seen the development of more proficient optical transport capabilities

conveyed by the optical equipment and its framework providers as ultra-fast optical and server to

explore systems extended internationally. This advancement has been achieved by the always

quickening improvement of fast interconnects and optical transceivers for data-center servers.

Recent advances in optical communication increment the limits of correspondence framework as well

as enhance the framework dynamicity and survivability. Different new and upcoming advanced

technologies are created to build the data transmission of individual wavelength channels and the

quantity of wavelengths transmitted per fiber. Different new and upcoming optical technologies have

additionally been produced to strengthen different developing applications, including new and

upcoming, on-request and high demand data rate applications, in an adaptable, power efficient and

cost-efficient way.

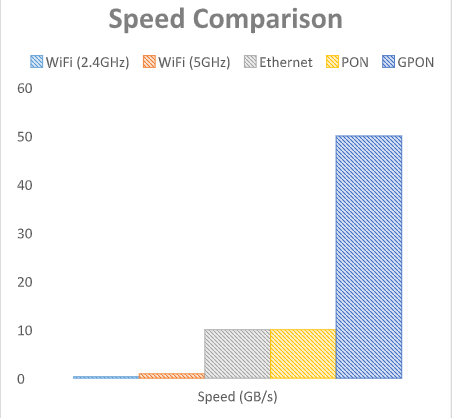
The applications of different electronic layers, extensive limit per channel, adaptable

wavelength (frequency) allocation, and quick optical switching and equipment handling can bring

the innovative advancement in the optical networking technologies. Recently, different vendors

around the globe are able to make possible by carrying huge bundles of Internet packet data and

Ethernet frames or SONET/SDH frame over single fiber using wavelength division multiplexing

. 

There are various PON technologies which are capable of supporting data rates more than 10

GB/s such as TDM, Colorless WDM, Optical OFDM, CDM, Hybrid PON. And the most used is the

GPON offering up 50 GB/s(for example BSNL Fiber.)

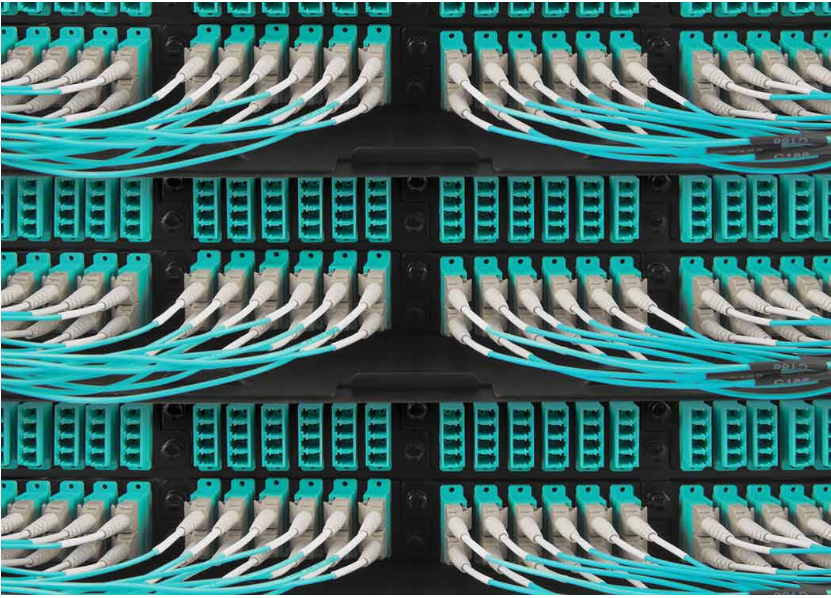
Optics can also be used for on-chip communications to achieve space, power and spectrally

efficiency.

Tunable transponder can be tuned to any of the available wavelengths by receiving or

generating only single wavelength at a system.

**B.** **Role of Optical Network Technologies in Telecommunication**

Optical transport technologies allow to deliver bandwidth that meets the needs of large enterprises, cloud operators, and internet content providers. They give network capacity, efficiency, and flexibility which supports services that can be deployed and reconfigured on demand Due to its capability to deliver more wavelength capacity and wavelengths per fiber in optics, telecommunication industry is able to deliver the services upto Gbps and more for each user end. 

## **IV.CONCLUSION AND FUTURE WORK**

At some point, all the Customer Service Providers around the globe are upgrading their bandwidth capability to grant the non-stoppable growing demand for voice call, on demand video services and also cloud-based services over two copper using DSL applications. CSP are able to provide these services effectively due to low-attenuation and ultra-bandwidth capability at back-haul network through convergence switch. CSP over the metro convergence need to maintain low TCO i.e. total cost of ownership over single unified billing and management system for all services granted to end-user. Different technologies, advanced hardware and chips with programmability and software development have contributed to the advancement of Optical Networking in terms of capacity, speed,

scalability and security. However, demand for high-speed communication is ever increasing which has

led the researchers to explore further possibilities to fulfill the traffic demand.

This paper reviewed different optical networking technologies, recent advances in optical

networks and some of their challenges. Use of different optical networking technologies based on the

cost, demand and availability of resources can prove to be beneficial. With the development of

network that can accommodate ever increasing traffic demand and its wide deployment, it increases

the number of network elements, which gives rise to the challenge of managing the network. Along

with the advancement in technologies, enhancement in management and control plane can make the

upcoming new technologies feasible

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