**DESIGN AND IMPLEMENTATION OF LOCAL AREA NETWORK USING** **FIBER OPTIC CABLE**

**Submitted by: Amol Makade1, Roshan Karanjekar2, Shruti Bansod3,**

 **Ritika Kharwade4, Mrs. J. S. Gawai5**

**ABSTRACT**

Data transfer is the need of the hour. Surely people can use internet for this. But presently it would be time consuming. One can implement data transfer using wireless medium. But then it will be a costly affair. The need, therefore, is felt for fiber optic communication which is cheaper and more suitable for the task. It is cheaper than wireless medium and is prone to lesser loss as compared to wireless medium. Fiber optics has their own advantages; larger bandwidth, high speeds, only to name a few. Therefore, we need to use optic fibers for the internet and LANs.

**INTRODUCTION**

* **LOCAL AREA NETWORK**

 A local area network is a datacommunication network, typically a packet communicationnetwork, limited in geographic scope. Alocalarea network generally provides high-bandwidth communicationover in expensive transmission media.

 Local area network is composed of three basic hardware elements: atransmission medium,often twisted pair, coaxial cable, orfiber optics; a mechanism for controlof transmission over themedium; and an interfaceto the network for the host computers or other devices-the nodesof the network-that areconnected to the network.

* **OPTICAL FIBER**

A fiber optic cable is a cylindrical pipe. It may be made out of glass or plastic or a combination of glass and plastic. Basically, a fiber optic cable is composed of two concentric layers termed the core

and the cladding.The core and cladding have different indices of refraction with the core having n1 and the cladding n2. Light is piped through the core. A fiber optic cable has an additional coating around the cladding called the jacket.

**IMPLEMENTATION OF FIBER OPTIC LAN**

Optical Transrece-iver

Level converter

Serial port

Optical Transrece-iver

Level converter

Serial port

**FIG 1. BLOCK DIAGRAM**

The serial port transmits a '1' as -3 to -25 volts and a 'o' as +3 to +25 volts where as a parallel port transmits a 0 as 0v and a 1 as 5v. Level converter convert these RS232 compatible levels of +9v or -9v to 0/5 volt TTL levels. The output of Level converter drives the pnp transistor through a bias resistor of 1 k Ω, to switch on laser diode / photo diode and also visible LEDs. Here the laser diode / photo diode acts as transmitter / receiver. The transmitter converts electronic pulses into light pulse and receiver converts light pulses into electronic pulses.

APPLICATIONS

* HIGH-RESOLUTION IMAGING:

 The transmitter converts electronic pulses into light pulse and receiver converts light pulses into electronic pulses.

* DISTANCE LEARNING :

 Distance learning involves video/audio links that connect a teacher in one classroom to students in other classrooms.

* TELECONFERENCING:

 Similar to distance learning, teleconferencing employs fiber optic systems to connect municipalities and other government units by both video and audio.

* BROADBAND CATV TRANSPORT:

 Use of fiber optics in CATV network results from an increased consumer demand for new services, speed, bandwidth and cost containment.

* BROADCAST:

 As the broadcast industry moves to digitized video and HDTV or enhanced NTSC (National television standards committee), the use of fiber optic technology becomes inevitable.

**CONCLUSION**

 Optical fiber communication system is some applications to alternative types of communications systems such as coaxial cables and terrestrial microwave system. The Conventional LAN cables can be replaced by fiber optic cables which can provide much higher speeds and also larger information carrying capacity. Thus we can get a fast and efficient data transfer using fiber optic cable.