

# Load Balancing For Hybrid LIFI And WIFI Networks

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## ABSTRACT

The number of nodes in the world is rapidly increasing as the day-to-day communications are entirely depending on the wireless medium. This leads to the main issue of load balancing in the network. To combat this issue, mixture of LIFI and WIFI organizations are mainly emerging criteria in the wireless world. This is called hybrid LIFI and WIFI Networks which improves the framework limit of indoor remote communications. In this task, a joint advancement issue is formed, to decide an organization level determination for every client over a time of time. The proposed approach can improve framework throughput and accomplishing extremely low computational complexity. Burden adjusting turns into a difficult issue because of a total cover between the inclusion spaces of LIFI and WIFI. Shortest path algorithm and hybrid WIFI and LIFI algorithm, is formulated to determine a network-level selection for each user. The proposed approach can improve framework throughput and furthermore to stay away from the information traffic problem. Hybrid LIFI and WIFI organizations (HLWNets) are as of late proposed to improve the framework limit of indoor remote interchanges.

Keywords: Hybrid LIFI and WIFI Networks, Shortest path algorithm, load balancing algorithm.

## 1. INTRODUCTION

The term remote correspondence was presented in the nineteenth century and remote correspondence innovation has created over the resulting years. It is perhaps the main modes of transmission of data from one gadget to different gadgets. In this innovation, the data can be communicated through the air without requiring any link or wires[2]. In the current days, remote correspondence framework has become a fundamental piece of different sorts of remote specialized devices, that grants client to convey even from far off worked zones. There are numerous gadgets utilized for remote correspondence like mobiles. Cordless phones, zigbee wireless innovation, GPS, WI-FI, satellite TV and remote PC parts. Current remote telephones incorporate 3G and 4G organizations, Bluetooth and WI-FI innovations [1]. Versatile information traffic increment between 2016 and 2021 reaching 48.3 hexa bytes each month before the finish of 2021. an indoor remote organization will represent over 80%. This will make a weight on existing WIFI, due its restricted data transfer capacity and thick business. To conquer these issues proposed to consolidate WIFI and LIFI [7]. This is known as hybrid LIFI and WIFI organizations [3]. There are numerous benefits in LIFI over WIFI. LIFI implies light devotion it sends and gets the data through light [6]. LIFI is quick transmission of information and quick web association around multiple times quicker than speeds reachable by WIFI. to stay away from load adjusting issues we join LIFI and WIFI [10][23]. Load adjusting is the way toward appropriating network traffic across different servers, this guarantees no single worker bear, too much interest by spreading the work equally by improve application [11].

## 2. METHODOLOGY

### 2.1 SHORTEST PATH ALGORITHM

For significant distance remote correspondence information sends from source to objective as parcel. Here in this calculation tracking down the most limited way between the sources to objective [4].

#### STEPS

1. Introduce the distance as per the calculation
2. Pick first node and figure distance to neighbouring node
3. Pick the following node with negligible distance
4. Rehash adjoining node distance estimation and track down the most limited way.[8]

### 2.2 HYBRID LIFI AND WIFI LOAD BALANCING ALGORITHM

This calculation looks for lightest worker in the organization and hence assigns Proper burden on it .This method conquers the heterogeneity versatile to dynamic Climate amazing in open minded and has a decent adaptability consequently help in improve the presentation of the framework.[5]

## 3. PROPOSED SYSTEM

In proposed system, there are 3 sorts of organization access, i) LIFI only, ii) WIFI only, LIFI or WIFI.

During the transmission of information through WIFI is feasible, only when impedance happen in that way. In the proposed work WIFI switches over to LIFI during obstruction and make the information transmission without any problem [9]. In WIFI networks, it arrives at the edge level it switches over to LIFI [10]. In proposed system, there are 3 kinds of association access, LIFI only, WIFI only, LIFI or WIFI during the transmission of data through WIFI there is practical for impedance occur in that manner[13]. In the proposed work WIFI is switch over to LIFI during impediment and make the data transmission with no issue [14]. In WIFI networks it shows up at the edge level it switch over to LIFI[15].

### 3.1 NETWORK MODEL

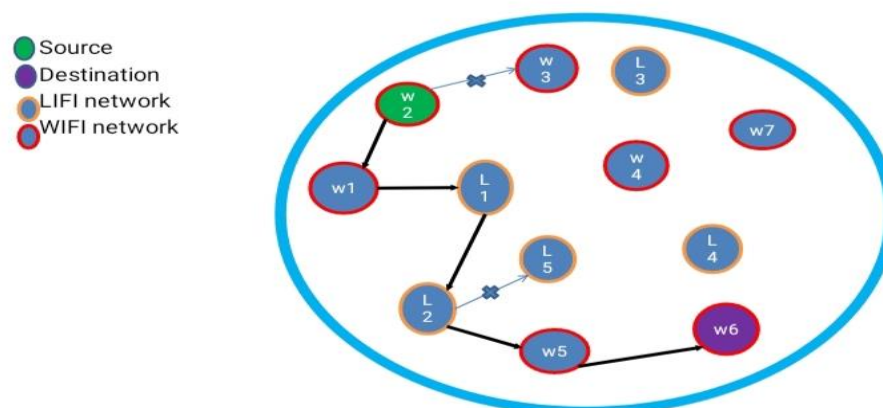


Fig1. Network Model

This figure1 shows Hybrid LIFI WIFI network model is contains combination of two types of networks such LIFI and WIFI.WIFI is higher area coverage network and LIFI is high speed network [16]. When interference occurs in WIFI network LIFI network will combine and reaches the destination [17]. It is used to determine a network level selection for each over a period of time.

3.2 FLOW CHART

Fig.2 shows the work flow of information from source to destination. This flowchart clearly explains the selection of network for transmission without affecting the load and the traffic.

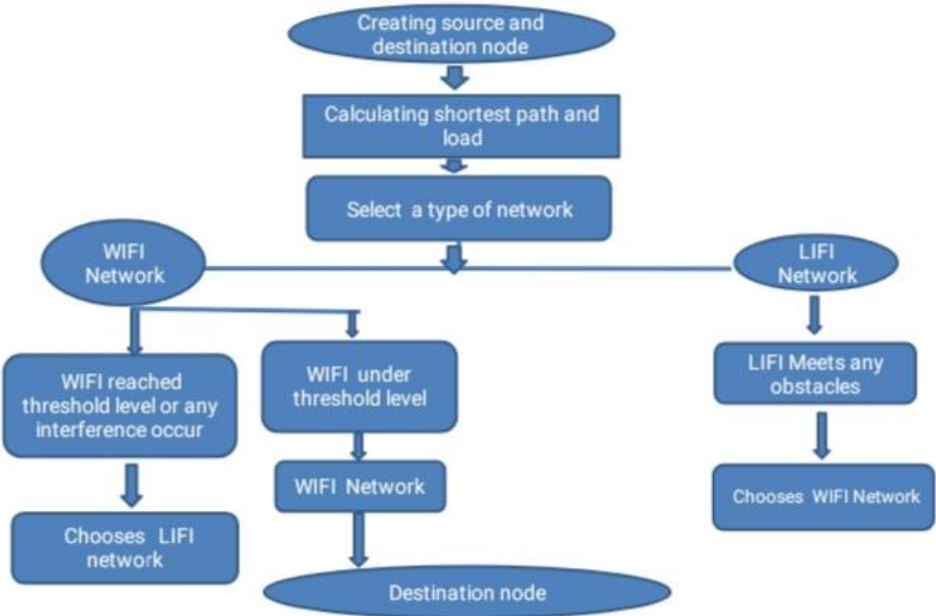


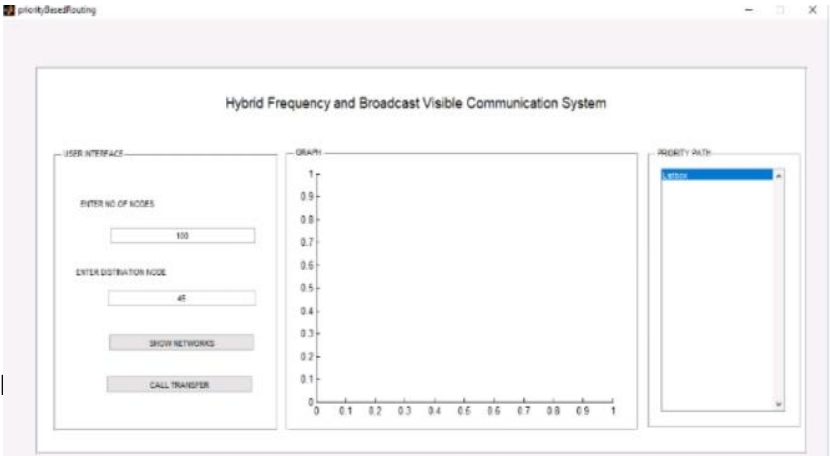
Fig2. Flow Chart

In this process it creates the source node and destination node, and calculating the distance and load based on algorithm .There are two type of networks such as LIFI and WIFI network .when it select WIFI network it has two conditions when WIFI reached the threshold level or any interference the WIFI network chooses the LIFI network [12] .when the WIFI under threshold level it chooses WIFI and reaches the destination node. The LIFI node meets any light path blockage it chooses the WIFI network.

4. RESULTS AND DISCUSSIONS

4.1 NODE ALLOCATION

The First Step of the process is node allocation, enter number of nodes and destination.it allocates the node based on the network availability and shortest path algorithm.



**Fig 3. Node Allocation**

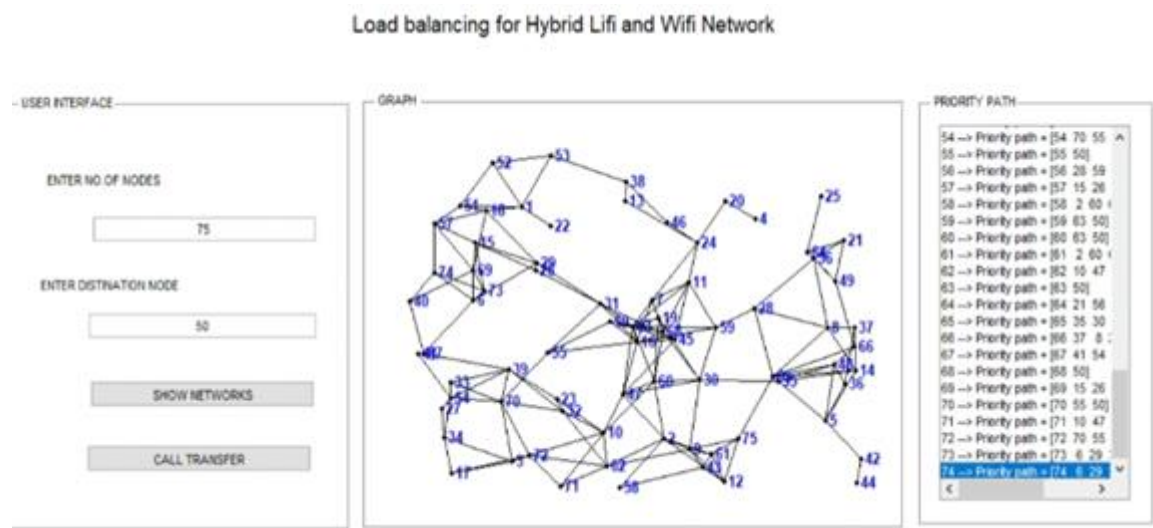
This figure 3 shows node allocation it means it creates the source node and destination node. First enter number of the nodes and run the select network. Number of node is 75 and destination node is 50.then it find priority path.

4.2 PRIORITY PATH SELECTION

The second step of the process is priority path selection. It finds the shortest path for source and destination. It uses hybrid load balancing LIFI and WIFI algorithm. First it Initializes distances according to the algorithm. Pick first node and calculate distances to adjacent nodes [20][25]. Pick next node with minimal distance, repeat adjacent node distance calculations. Final result of shortest-path tree.

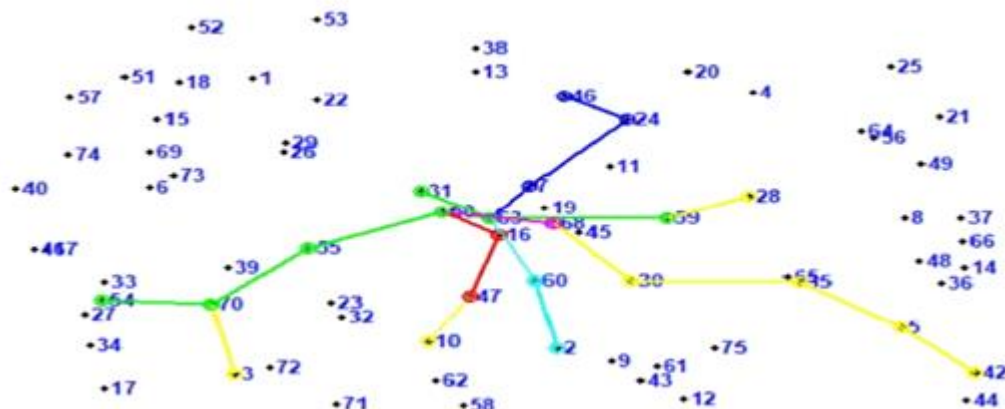
This Figure 4.2 shows priority path selection based on shortest path algorithm. For long distance wireless communication data send from source to destination in he form of packet.it shows priority path for all source node.

4.3 OUTPUT OF HLWNETWORKS



**Fig4. Priority Path Selection**

This is the output of the load balancing for hybrid LIFI and WIFI networks. Here dark line represents LIFI networks and other colour represents WIFI networks.in this project throughput is increased and delay is reduced.

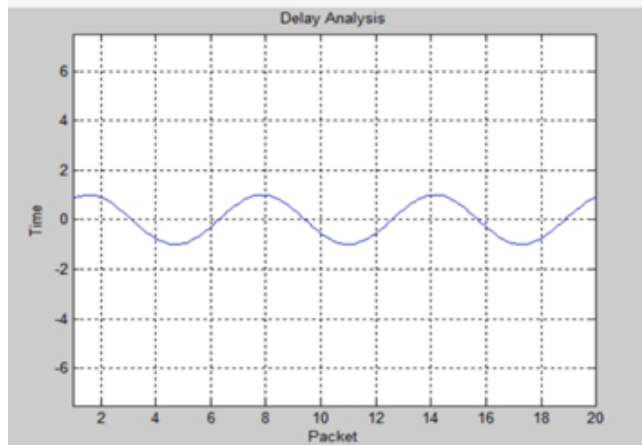


**Fig5. Output of the HLWN**

The figure 5 shows the output of HLWN by using shortest path and hybrid LIFI and WIFI algorithm. When WIFI reached threshold level it switches over to LIFI. When LIFI meets any obstacles, it switches over to WIFI network. It transfers the data without any interference [21]. 50<sup>th</sup> node is the destination node and 54<sup>th</sup> node is source node when interference occurs in 70<sup>th</sup> is the WIFI node it switches over to 3 LIFI nodes.

#### 4.4 DELAY ANALYSIS

This is the delay analysis of proposed system, the graph is drawn between packet and time. The delay of proposed system is reduced than existing system. It takes lesser time than other systems.

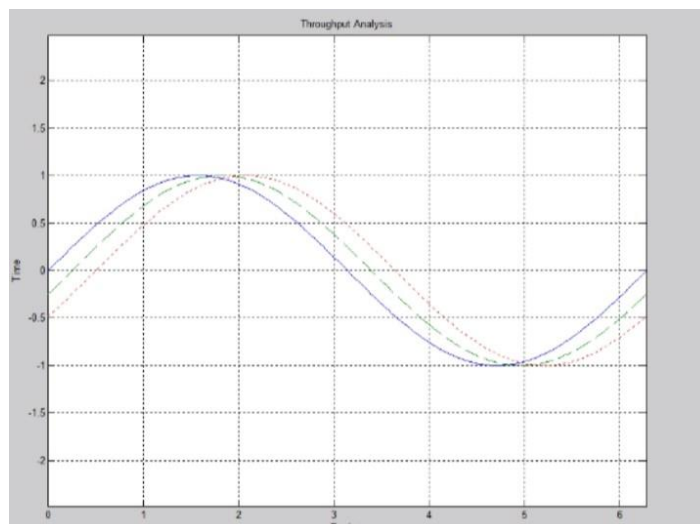


**Fig 6 Delay Analysis**

Figure 6 shows delay analysis of HLW networks by using shortest path and hybrid LIFI and WIFI algorithm [22]. The waveform represents decreases in delay. It reduces the amount of time taking longer than expected time.

#### 4.5 THROUGHPUT ANALYSIS

This is the throughput analysis of the proposed system; this graph is drawn between packet and time. Packet takes lesser time than other and without any interference so it increases the throughput.



**Fig7. Throughput Analysis**

The figure 7 Shows Throughput analysis Of HLW networks. Throughput is the actual amount of data that can be successfully delivered over a communication channel. The throughput increased than existing system. The graph represents increases in the throughput.

## 5. CONCLUSION & FUTURE SCOPE

In the rapid increase of the communication nodes in the network. The demand of increase of the population of network makes demand in the spectrum allocation of the network in the transmission. The technique employed in this paper is an appreciable way for managing the load traffic in the network. Load balancing will help in making the network in a comfortable way so that spectrum is allocated in an efficient way by choosing the appropriate network with respect to obstacles. The throughput is achieved in the accepting way and delay has been reduced in the 50% in case of delay.

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