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EFFECTIVE GI-FI WIRELESS TECHNOLOGY

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Abstract: - Gi-Fi or Gigabit Wireless is the first transceiver integrated on a single chip that operates at 60GHz on CMOS process. Gi-Fi is a wireless transmission system is ten times faster than Wi-Fi and its chip delivers short-range multi-gigabit data transfer in an indoor environment. It allows wireless transfer of audio and video data up to 5 gigabits per second, low power consumption usually within a range of 10 meters. This technology providing low-cost and high broadband access with very high speed large files exchange within seconds.

Keywords – Wi-Fi: Wireless Technology, Gi-Fi: Gigabit wireless, Bluetooth Technology and CMOS

1. INTRODUCTION

It leads to introduction of Gi-Fi technology it offers some advantages over Wi-Fi, a similar wireless technology. In that it offers faster information rate in Gbps, less power consumption and low cost for short range transmissions. Gi-Fi which is developed on a integrated wireless transceiver chip. In which a small antenna used and both transmitter- receiver integrated on a single chip which is fabricated using the complementary metal oxide semiconductor (CMOS) process. Because of Gi-Fi transfer of large videos, files will be within seconds. Gigabit Wireless is the world's first transceiver integrated on a single chip which operates at 60GHz on the CMOS process. Wireless transfer of large files, audio and video data upto 5 gigabits per second is possible with this chip. The cost of wireless transfer rate is one-tenth and it provides ten times faster speed within a range of 10 meters. It uses a 5mm square chip and a 1mm wide antenna burning less than 2m watts of power to transmit data wirelessly over short distances, similar to Bluetooth. Gi-Fi technology provide various different features like High speed of data transfer, Low power consumption, High security, Cost effective, Small size, Quick deployment, Highly portable and high mobility .

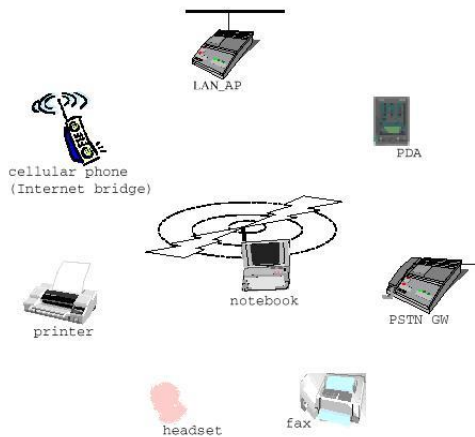


Fig: 1 GI-FI TECHNOLOGY

2. ARCHITECTURE

The main and important component of a Gi-Fi system is its subscriber station which is available to several access points. It supports standard of IEEE 802.15.3C which uses small antenna at the subscriber station. For the communication among different computer devices which includes telephones and PDA, it supports 17millimetre-wave wireless PAN network. In this network, the antenna is mounted on the roof and it supports Line Of Sight (LOS) operation.

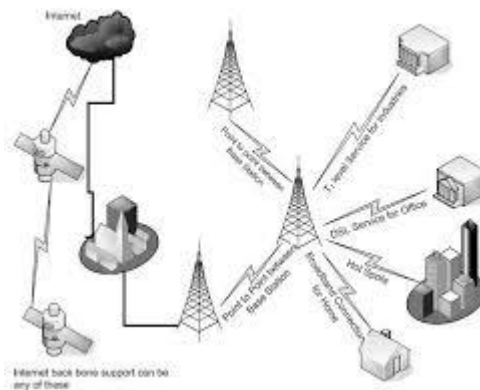


Fig:2 Architecture of GI-FI Technology

3. Disadvantages of Bluetooth and Wi-Fi

Characteristic	Bluetooth	Wi-Fi
Frequency	2.4 GHz	2.4 GHz
Range	10 meters	100 meters
Primary application	WPAN: cable replacement	WLAN: Ethernet
Data transfer rate	800 Kbps	11 Mbps
Power consumption	Low	Medium
Primary devices	Mobile phones, PDAs, consumer electronics, office and industrial automation devices	Notebook computers, desktop computers, servers
Primary users	Traveling employees; electronics consumers; office and industrial workers	Corporate campus users
Usage location	Anywhere at least two Bluetooth devices exist — ideal for roaming outside buildings	Within range of WLAN infrastructure, usually inside a building
Development start date	1998	1990
Specifications authority	Bluetooth SIG	IEEE, WECA

Fig 3 Disadvantages of Bluetooth and Wi-Fi

From the above table can conclude that the bit rate of Bluetooth is 800Kbps and Gi-Fi has 11Mbps. Both are having power consumptions 5mw and 10mw. They have lower frequency of operation 2.4GHz. For transferring

large amount of videos, audios and data files take hours of time. So higher data transfer rate at lower power consumption. Gi-Fi or gigabit wireless is the world's first transceiver integrated on a single chip that operates at 60GHz on the CMOS process. It allow wireless transfer of audio and video data at up to 5 gigabits per second, ten times the current maximum wireless transfer rate at one-tenth the cost. NICTA researchers have chosen to develop this technology in the 57-64GHz unlicensed frequency band as the millimeter-wave range of the spectrum makes possible high component on-chip integration as well as allowing for the integration of very small high gain arrays. The available 7GHz of spectrum results in very high data rates, up to 5 gigabits per second to users within an indoor environment, usually within a range of 10 meters.

4. FEATURES OF GI-FI

- **High Security:** It provides link level and service level security, where these features are optional. Point-to-point wireless systems operating at 60 GHz have been used for many years by the intelligence community for high security communications and by the military for satellite-to satellite communications.

- **High speed data transfer:** The main invention of Gi-Fi is to provide higher bit rate. Because of this high speed data transfer can transfer large video, audio, data files within seconds. The name itself indicates data transfer rate is in Giga bits per second it is 10 times faster than the present data transfer rate. The speed of Gi-Fi is 5 Gbps. An entire High-Definition (HD) movie can transmitted to a mobile phone in a few seconds and the phone upload the movie to a home computer or screen at the same speed.

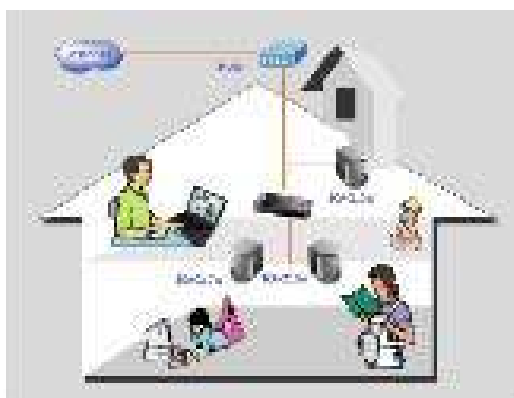
- **Small Size:** The chip just 5mm per side has a tiny 1mm antenna and uses the 60GHz millimeter-wave spectrum.

- **Low Power Consumption:** This is the best feature because although the large amount of information is transferred, it utilizes milliwatts of power only. Generally in present technologies it takes 10mwatt power, which is very high but this technology consumes only 2mwatt power for data transfer of gigabits of information.

- **Cost-effective:** Gi-Fi is based on an open international standard due to which the use of low-cost, mass-produced chipsets will bring down the cost automatically. This also results in integrated wireless transceiver chip which transfers data at high speed and low power at low price of \$10 only which is very less as compared to present systems. As time will pass and development increases the price of Gi-Fi will be decreased.

5. APPLIANCES

5.1 House Hold Appliances:



(Fig5.1 – Household Applications)

Consumers could typically download a high definition movie from a kiosk in a matter of seconds to music player or smart phone and having got home could play it on a home theatre system or store it on a home server for future viewing, again within a few seconds, high speed internet access, streaming content download (video on demand, HDTV, home theater, etc.), real time streaming and wireless data bus for cable replacement.

5.2 Office Appliances:

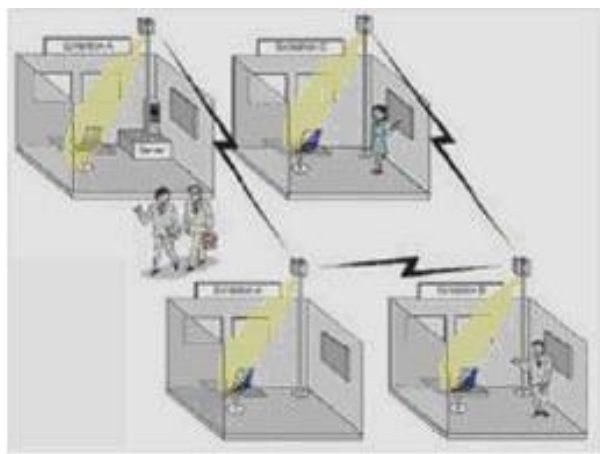


Fig.5.2 – Office Appliances

As it transfers data at high speeds which made work very easy, it also provides high quality of information from internet.

5.3 Video information transfer:

By using present technologies video swapping takes hours of time, whereas by this we can transfer at a speed of Gbps.



(Fig5.3. – Information Transfer)

Data transfer rate is same for transfer of information from a PC to a cell or a cell to a PC. It can enable wireless monitors, the efficient transfer of data from digital camcorders, wireless printing of digital pictures from a camera without the need for an intervening personal computer and the transfer of files among cell phone handsets and other handheld devices like personal digital audio and video players.

6. CONCLUSIONS

In this paper, the comparison is performed between Gi-Fi, Bluetooth and Wi-Fi technologies shows that these features along with some other benefits make it suitable to replace the existing wireless technologies. Gi-Fi offers High speed of data transfer, Low power consumption, High security, Cost effective, Quick deployment, Small size, Highly portable, high mobility etc.for short range transmissions as compare to current technology. Gi-Fi can be used in many devices such as media access control, Smartphone's, wireless PAN network. high cost of infrastructure have not yet possible for wi-fi to become a power network, then towards this problem the better technology despite the advantages of rate present technologies led to the introduction of new Gi-Fi. It removes cables that for many years ruled over the world and provides high speed data transfer rate.

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