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A Study on Issues of Ad Hoc Wireless Networks Using Bluetooth Technology

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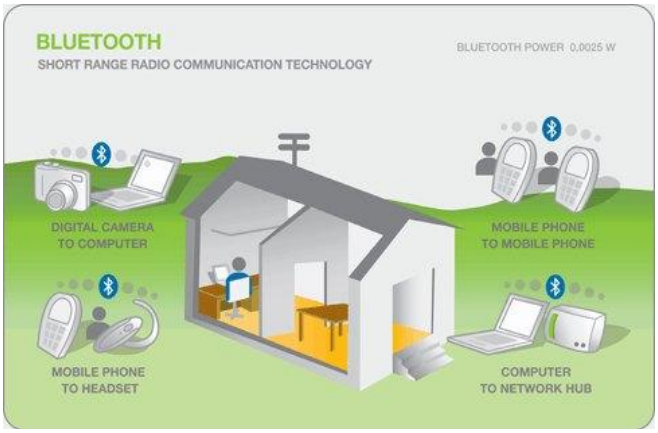
Abstract: This paper states an introduction on ad hoc wireless network to share ideas among one another. This paper concentrates on how Bluetooth technology is used in ad hoc networks. This paper brief an overview of Bluetooth technology, its working principle, architecture, issues and challenges when used in ad hoc wireless networks. Places where communication signals become weak and mobile phones are used, Bluetooth is proved to better for communication. More over most of the people are using smart phones with Android operating systems. Thus, Bluetooth is used purposely to communicate with a Bluetooth device outside the range of the Source device. To implement this ad hoc network acts as a translator between the source and thedestination Bluetooth device.

Keywords: *Ad hoc Networks, Bluetooth, Technology, Mobile, Piconets*

I. INTRODUCTION

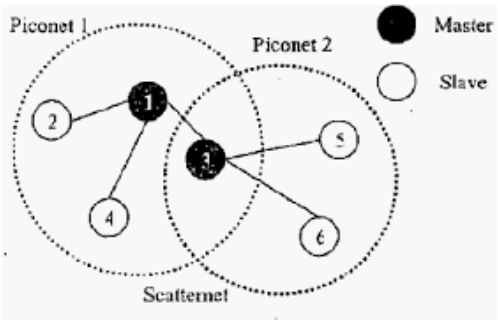
A Bluetooth is a technology which links devices together over a particular distance. It is a technology for transferring data to small distances the radio waves range from 2.4 to 2.485 GHz .



Ad hoc network does not workon the previous infrastructure, like routers in wired networks in managed connectionless networks.Ad-hoc networks can be created using various wirelesseshousehold name in the ad-hoc networking field for various advantages it offers over competing technologies. The main reason BT is very popular for ad-hoc networks is that BT offers automatic network configuration, authentication and service identification hence making set up of ad-hoc network is easier for the first level user, who is not much familiar with networking protocols and router configuration**.**

II. WORKING OF BLUETOOTH

A Bluetooth works with the use of radio waves instead of wires to link with mobile phone, Computer, or smartphone. Bluetooth is a short-range communications technology found in thousands of devices we use daily – like headsets, smartphones, laptops and portable speakers. Bluetooth transmits and receives radio waves in about 79 various frequencies centered on 2.45 GHz, apart from radio, television, and mobiles, and reserved for use by industrial, scientific, and medical fields. Electrical power is not used and, hence they don't travel long distance, they are more secure than wireless networks which work longer distances, such as Wi-Fi. Bluetooth devices are implicitly detect and connect to each other and up to eight of them can be connected and communicate at any one time. They don't interfere with each other since each pair of devices uses a different one among available channels. Any two devices want to communicate they pick a channel randomly and, if that's already taken, they randomly switch to one of the others channel this is called spread-spectrum frequency hopping. To decrease the problem of overlapping from other electrical devices and to improve security pairs of devices constantly change the frequency they're using per second. Whenever a group of two or more devices are sharing information, they form a ad-hoc mini network called a piconet. Any devices can join or leave an existing piconet at any time. One node called as the master acts as the overall controller of the network, while the others act as slaves and obey its commands. Two or more piconets can also join up and transfer information forming a scatternet.



A Two or more connected Pico nets form a scatter net. To connect piconets they must need a common node. A node may be a slave in one and a master in another.. The Bluetooth protocol stack contains 5 layers. The radio and baseband layers say the physical implementation of BT. It works on the 2.4GHz frequency. This uses frequency hopping spread spectrum for information sharing with 1600 hops per second. Every channel is occupied for 0.625ms, called a slot and the slots are number sequentially. The master in the piconet calculates the frequency hopping sequence and it is the work of the master's address. Bluetooth use TDMA (Time Division MultipleAccess).

Merits of Bluetooth

- It is cheaper.
- It is easy to install
- It is convenient to connect two separate devices

- It is connectionless.
- It is easy to use if the device is installed within it

Demerits of Bluetooth

- It can be hacked by hackers.
- If installed on a mobile phone it will be prone to receive cell phone viruses
- It allows only short range communication among devices
- It can link or join only two devices at once.
- It can lose connection due to certain conditions

III. FUTURE OF BLUETOOTH

The future of Bluetooth is very powerful, with initiatives are going on for higher throughput, more ubiquitous usage and connections with Wi-Fi and Ultra Wideband (UWB) broadcast technology. Operating systems such as the Mac OS and Windows continue to have support for Bluetooth. The SIG partners of BT are operating on enabling Bluetooth information points, in order to enable advertising models based among users getting information from 'information points', rather than having to 'put' information out.Other features like Bluetooth in cars automatic configuration of piconets and quality of service improvements, for instance enabling audio and video data to be shared at a higher quality. The range of Bluetooth Smart will increase up to 4 times, better from its current limit of about 330 feet, which will make it easier for devices in homes to pair and transfer data with devices that are farther away. A cent percentage increase in speed without an increase in energy consumption will enable faster data transfers in applications such as medical devices. The mesh networking ability in Bluetooth will connect together to create networks that can cover a whole building. Every wireless device have a limited range, and each need to connect to a centralized hub, like a router. But mesh networking would enable all devices to talk to one another, either directly or through other nodes if they're not within range. Adding mesh networking capability to Bluetooth could be a key to transfer important data among every device in your future smart home. The range of Bluetooth is set to increase by a maximum of 400%, data transfers could be doubled responsiveness will be increased, and latency will be reduced. It is better, faster, and smoother, less power, greater flexibility, and increase in network coverage.

IV. ISSUES IN BLUETOOTH

A. Pairing Issues

Bluetooth devices to be connected with each other need to be paired. Pairing means exchanging the passwords or passkeys of two various devices. Once paired, all data which is transferred between the two devices is encrypted, means that any device that is not paired with other is unable to translate the data. However, there are times when pairing is not necessary, such as transferring business cards. There is a setting on most devices to lower the security for these lower grade transfers

Device Cannot Be Identified

Since it is paired, another error message that may occur is that devices "cannot be identified". This is normally because the device we are trying to link, is either off, or is not in "discoverable mode". To solve, we simply need to turn the device we are trying to connect into discoverable mode. If we are scared that somebody will hack into our device, we can always turn it back to non-discoverable mode after we complete. However, this technology is quite robust as far as security is considered.

Unsuccessful Pairing

Another error message that may occur is the "pairing is unsuccessful". This means that the two devices tried to be paired but failed to do. The often reason for this is that somebody is using the incorrect password or PIN. If we are sure that we are using the proper PIN and password, then we should try to first switch off the devices and then switch on it.

Paired but Not Communicating

Another issue is that when the devices pair successfully, but still do not want to communicate with each other. The main reason is that the devices do not share the same profile. One way to find out is to look in the manual that came with the device, as it depends on the manufacturer.

CONCLUSION

Thus this paper states certain information about Bluetooth technology in wireless ad hoc networks. Since the technology continues to improve, more problems with Bluetooth are bound to rise up. But still, the most common ones are under control, and are very easy to tackle with. It is a technology to be fully improved yet. The drawback in this technology has to be solved and reduced soon.

References

[1] Sushmita Kopekar Amresh Kumar "A Study of AdHoc Wireless Networks Various Issues in Architectures and Protocols" International Journal of Computer Applications (0975 –8887) Volume 122 –No.6, July 2015.

[2] Kamani Krunal C., Kathiriya Dhaval R. and Ghodasara Yogesh R "Proposed Bluetooth Protocol for Short Range Communication"

[3] MadhviVerma, Satbir Singh and BaljitKaur "An Overview of Bluetooth Technology and its Communication Applications" E -ISSN 2277-4106, P-ISSN 2347 -5161.