



50125 Shiraz Ali Bhatti

Extend the Range of Bluetooth Piconets by Tunneling Communications over IP Networks

Abstract

In this Thesis, the IP over tunnel is presented. IP over tunnel is an architecture that allows Bluetooth devices to communicate to each other out of 100 meters range. Bluetooth devices operate at 2.4 GHz, in the globally available, license-free, ISM band. The basic networking unit in Bluetooth is piconet, and a larger area Bluetooth network can be formed by multiple Piconets, called scatternet. IP over Tunneling is the ability to extend the communication range of Bluetooth Piconets.

What we want to be able to do is to extend this range by offering “Repeater” nodes that are connected to an IP network. These Repeater nodes would allow two Bluetooth nodes to communicate with each other and belong to the same Piconet even though they are not in the vicinity of each other. The Master (Piconet -A) are in one location and the Master (Piconet -B) is in another distant enough that Master (Piconet-B) can not see. There are Repeater nodes in both locations connected to an IP network backbone, which pick up broadcasted Bluetooth packets, encapsulate them and tunnel them over the IP network across to the other Repeater , which then broadcasts them as if they where transmitted in the same room. IP Tunneling architecture allows remote Bluetooth nodes to interact and join up into Piconets.

The basic structure of Bluetooth network is a master-slave relation where a maximum of seven slaves nodes connect to a single master forming a Piconet. These networks are very temporal and are formed in an ad hoc manner, with the node that originates the communication usually becoming the master.

Extend the range of Bluetooth devices provided by the several benefits such as Bluetooth Piconets devices can communicate over the 100 meter range and second one is that the limitation of Bluetooth devices is also resolve by using IT Tunneling. Because only eight devices including Master device can communicate with in 100 meter range. Bluetooth transmit the data 100 meters. Extend the Piconets range purpose is to provide the unlimited range for not only home user but also for industries users.

This research indicates that the performance of these tools can be significantly improved by including gateway in their IP Tunnel frameworks. This architecture would solve the range and numbers of nodes communication problems. This architecture provide the link between two bluetooth Master nodes and transmit the data accurately through tunnel one Piconet to another Piconet.