Distributed Topology Construction of Bluetooth Personal Area Networks

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Introduction

This paper is all about constructing a topology for Bluetooth Personal Area Networks (PANs). It discusses about link establishment in nodes using frequency hopping and introduces the Bluetooth Topology Construction Protocol (BTCP). The BTCP is a distributed protocol for constructing scatternets. The authors’ focus is on the BTCP.

**Description**

The authors have tried their hand at implementing the BTCP. Experimentation has been done on Bluetooth devices and outcomes generated keeping topology maintenance and protocol optimization in mind. To support the theory, graphs have been constructed using average time for connection establishment. Scatternet formation protocol has been researched thoroughly. All phases such as coordinator election and role determination are aptly described. This is true even of the connection establishment using paging between master and slave Bluetooth nodes in a scatternet.

The paper is well written, however there are some grammatical and spelling errors. References are properly cited but they do not seem to be following IEEE guidelines. Graphs and figures are clearly drawn and explained.

There were many statistics and lot of math including numbers of various outcomes representing the results of various experiments, included in this paper. This is one more advantage of the paper. With so much work that we observed until now, this paper is a good one. But talking about the disadvantages or negligible faults, results were not accurate and author didn’t explain the case of large scale networks and situations like connection failure of a transmission, its solution or fault tolerance when such cases arrive wasn’t given a big deal in this paper. Apart from that everything was good and well explained with enough supportive work provided by author.//s

**Assumptions**

Throughout the paper, certain assumptions have been made. Following are some of these assumptions.

* Authors have mentioned that point-to-multipoint communication over Bluetooth will evolve in the future. This is a general observation and there is no evidence pointing to it.
* While emulating Bluetooth in the experiments, it has been assumed that all devices will be in range of each other. Although this is a logical assumption, there is room for error.
* They have assumed that only a single broadcast channel or CSMA protocol has been used for a constructing self-organizing network.

**Positives**

The authors have done a great job in explaining the properties of Bluetooth. The formation of piconets and scatternets and master-slave bridges have been thoroughly researched and explained in way such that anybody new can understand. They have also used an emulator to test Bluetooth connections, thereby giving appropriate results for experiments.

**Negatives**

The BTCP has only been tested on emulators and its working in real life environment remains a question. Some real-world testing would have been better. Some results obtained through experimentation are inaccurate and scenarios such as fault tolerance have been avoided.

**Final Observations**

The paper is an honest effort in studying about Bluetooth, its properties and constructing topology. The authors have done a great job in fleshing out the details about Bluetooth PANs and creating piconets/scatternets. This is a well-researched paper which does not deviate from the topic. The BTCP algorithm has been explained clearly with figures and tables.

This is an interesting topic with lots of future scope for improvement. The paper has done justice to the topic and is overall satisfactory.