Possibility of creating real sensor networks

Andrew Valikov

1 Introduction

IoT Systems of the home automation become more and more distributed among people. The engineers have to deal with increasing technical barriers to the creation of such systems, for example, the autonomy of devices, the process of gathered data from a large number of sensors and making the required decisions. For highly distributed systems with a large number of information to process, a wireless sensor network can become the most appropriate approach. This can be considered as cases of mobile sensors (the so-called MANET) and fixed networks.

2 Research traget

Investigation of the characteristics of real sensor networks. To talk exctly, the work is in progress in the following directions:

- To increase network lifetime (to reduce power consumption). Ideally, one sensor unit should consume as low energy as possible, and be connect to a battery unit for a long time.
- To investigate how much information can be gathered by network from the surrounding world without loss of data. Also, to vary the number of participants in the network. Develop algorithms that make it possible to get as close as possible to the theoretical limit of such networks (and we of course should find appropriate formula for this case).

3 Theory

3.1 Topology

The most important characteristic of the network is it **topology**. As a rule they use next types of tologies:

- Star
- Cluster tree
- Mesh

In this work, we use the mesh topology, where each node is associated with several of its neighbors, and there is one node in network that collects all the data.

3.2 Components of the sensor node

The necessary components of the sensory node are:

- Microcontroller
- Sensors
- Energy source (usually a battery)
- Radio transmitter