A Broadcast-Based Routing Protocol for Smart Lighting Systems

Author(s) - Institution(s):
Chiara Buratti, UNIBO
Andrea Stajkic, UNIBO
Roberto Verdone, UNIBO

Corresponding author email: c.buratti@unibo.it

Corresponding WG group: WG3

Abstract:

We consider a smart lighting system, where sensors and actuators are located over lamp posts in a street, generating data to be sent to a final sink, that is a 3G gateway. According to nodes location, a linear wireless network is created being devices deployed over a line and sending data to a final destination at the end of the line. We propose a novel efficient routing protocol for this type of networks, based on broadcast transmissions. In particular, during an initial discovery phase each node identifies its neighbours and selects its best neighbour as the one being closest to the sink, that is the farthest in the line. Data is then transmitted in broadcast, by prioritising the best neigh-bour selected as forwarder, in order to reduce overhead. The proposed protocol has been implemented on the EuWIn platform, developed in the framework of the EC-funded Network of Excellence, NEWCOM#. The protocol has been tested and compared to standard solutions, based on IEEE 802.15.4 and Zigbee. Experimental results, in terms of packet loss rate, throughput and number of hops to reach the sink, show the improvement achieved with the proposed solution with respect to the existing ones.