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How Low Energy is Bluetooth Low Energy? Comparative Measurements with ZigBee/802.15.4.

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Executive summary / Internal release

Title: How Low Energy is Bluetooth Low Energy? Comparative Measurements with ZigBee/802.15.4.

This combined deliverable is a workshop paper to be presented at IEEE Wireless Communications and Networking Conference (Internet of Things Enabling Technologies Workshop).

Content: Results of a comparative measurement and modeling study of energy consumption of Bluetooth Low Energy and 802.15.4.

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Ultra low power communication mechanisms are essential for future Internet of Things deployments. Bluetooth Low Energy (BLE) is one promising candidate for such deployments. We study the energy consumption of BLE by measuring real devices with a power monitor and derive models of the basic energy consumption behavior observed from the measurement results. We investigate also the overhead of Ipv6-based communication over BLE, which is relevant for future IoT scenarios. We contrast our results by performing similar measurements with ZigBee/802.15.4 devices. Our results show that when compared to ZigBee, BLE is indeed very energy efficient in terms of number of bytes transferred per Joule spent. In addition, IPv6 communication energy overhead remains reasonable. We also point out a few specific limitations with current stack implementations and explain that removing those limitations could improve energy utility significantly.