

ETTX 2009 EMNETS protocol stack (requested time slot 10min)

Abstract

The Embedded Networked Sensing (EMNETS) project, which is a collaboration between Cork Institute of Technology (CIT) and University College Cork (UCC), addresses the networking and protocol development requirements for building power efficient and scalable wireless sensor networks for application in the utilities and resource management space.

CIT is developing with this aim a power efficient protocol stack based on the IEEE 802.15.4 standard. Although, this IEEE standard is being considered as a promising one for low-cost low-power Wireless Sensor Networks (WSNs), several issues in the specification are still open. One of those open issues is how to build a synchronized multi-hop mesh network for scalable, reliable and robust networking. In fact, while the current specification supports multi-hop networking using peer-to-peer topology, it restricts its use to the beaconless mode. To overcome this, an extension to the current IEEE 802.15.4 standard in which mesh networking in the low power beacon mode is enabled, through the use of distributed beacon scheduling, has been implemented on top of the Open-ZB IEEE802.15.4 implementation in TinyOS-1.x.

The next steps for the protocol stack include:

- Porting and release of the new protocol called MeshMAC in TinyOS-2.x
- Further research to improve MeshMAC in several aspects.
- MeshMAC / b6LoWPAN integration to bring Ipv6 networking.
- Mesh-under low power routing using the MeshMAC / b6LoWPAN stack.

We would like to present our MeshMAC protocol contribution as well as our future research work on top of it to the TinyOS community. We think this is a good opportunity for possible collaborations and future directions.