

NETWORKING STANDARDS



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In this issue of the Networking Standards Series, we are touching the emerging topic of peer-to-peer wireless personal area networks (WPAN) for consumer and industrial fields of application. The Internet of Things (IoT) for personal as well as industrial applications is mainly driven by wireless networking standards that fulfill requirements regarding performance, energy efficiency, and low-effort infrastructure increase. Research to improve the behavior of networking systems shows that there are lots of challenges to face, although standards are already covering the main part to fulfill the mentioned requirements properly.

Addressing these requirements IEEE 802.15.8 has been introduced as a standard allowing for scalable, low-power and highly reliable peer-to-peer communication in IoT scenarios for both industrial and peer-aware consumer applications. Nevertheless, some issues in upcoming and future applications make it necessary to carefully analyze and compare if this standard still fulfills the requirements.

Nevertheless, the per-hop behavior in peer-to-peer IoT applications requires a lot of effort on each hop due to the fact that fragments are reassembled on each hop before they are forwarded to the next hop. This is a standard behavior well known in wired networks without requirements on energy-efficiency and low-effort infrastructure increase.

In the first article, Tanaka *et al.* show a different approach to overcome the negative influences by introducing a fragment forwarding technique. By lowering the memory effort while keeping reliability high and end-

to-end latency low, the new implementation technique shows some approach that may change the way peer-to-peer IoT networks will be designed in the future.

In the second article, Dao *et al.* present the standard's advanced features and compare it with other competitive standards which may also fulfill the requirements mentioned for a number of applications. Focusing on MAC and PHY behavior in multiple-hop scenarios, an evaluation gives some indication if IEEE 802.15.8 is still the best solution for the discussed scenarios.

In closing, we would like to remind you to check the web page for our Series at <https://www.comsoc.org/publications/magazines/ieee-communications-standards-magazine/cfp> and that our Series is published twice a year, in the March and September issues of this magazine. If you have any questions or feedback regarding the Series, please email us.

BIOGRAPHIES

PATRICK-BENJAMIN BÖK [M] (boek@ieee.org) is Vice President Global Digitalization at Weidmüller Group. Previously, he was a senior researcher at Ruhr-University Bochum and head of the "Highly Dynamic Networks, Wireless Robotics and Emergency Response Management" research group at TU Dortmund University. Currently, in addition to management, development and research, he is a co-author and member of several directives committees and a lecturer for computer networks. Visit <http://boek.de> for further information on his projects, publications, books and activities.

PANAGIOTIS SALTISIDIS (panagiotis.saltisidis@ericsson.com) is a main driver on many L2 standards. He is the editor of IEEE 802.1Qay PBB-TE, which introduced SDN in L2 networking and was the editor of the 802.1AX Link Aggregation project. He holds over 50 patents and in 2015 received Ericsson's Inventor of the Year award. He holds a Ph.D. in theoretical physics and worked on String Theory at the University of Cambridge alongside Stephen Hawking and Michael Green before joining Ericsson.