ENERGY EFFICIENT SPECTRUM RESOURCES USAGE IN WPANS;IEEE 802. 15. 4 MAC SUB-LAYER PROTOCOLS [

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Monografía

This book proposes IEEE 802.15.4 Medium Access Control (MAC) sub-layer performance enhancements by employing not only RTS/CTS combined with packetconcatenation but also scheduled channel poling (MC-SCP).This book documentsthe importance of such an appropriate design for the MAC sub-layer protocol forthe desired WSN application. Depending on the mission of the WSN application,different protocols are required. Therefore, the overall performance of a WSN applicat

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on Scheduled MAC protocols -- 2.7.3 Survey on Hybrid MAC protocols 2.7.4 Survey on QoS MAC protocols: EQ-MAC -- 2.7.5 Survey on Cross-Layer MAC protocols: MERLIN -- 2.7.6 Survey on Multiple based MAC protocols: 1-hop MAC -- 2.8 Classification of MAC Protocols Characteristics -- 2.9 Summary and Conclusions -- 3 Further Insights into the IEEE 802.15.4 Standard -- 3.1 Physical Layer -- 3.1.1 Channel Assignment -- 3.1.2 Carrier Sense -- 3.1.3 Received Signal Strength Indication -- 3.1.4 Clear Channel Assessment -- 3.2 Medium Access Control Sub-layer -- 3.2.1 MAC frames -- 3.2.2 Carrier Sense Multiple Access with Collision Avoidance 3.2.3 Non-beacon-enabled operation -- 3.2.4 Beacon-enabled operation -- 3.2.5 Hidden and Exposed terminal problems -- 3.2.6 Coexistence in the 2.4 GHz ISM band -- 4 Scheduled Channel Polling MAC Protocol -- 4.1 Context and Motivation -- 4.2 Two-Phase Scheduled Channel Polling Mechanism -- 4.3 Synchronization Phase -- 4.4 State Transition Diagram for SCP -- 4.5 Implementation of the SCP Simulation Framework -- 4.5.1 SCP Simulator Parameters and General Definitions -- 4.5.2 SCP Simulator Layer Modes -- 4.6 Summary and Conclusions -- 5 Performance Evaluation of the SCP-MAC Protocol 5.1 Single-hop Performance Results -- 5.1.1 Power Consumption without Piggyback and Periodic Traffic -- 5.1.2 Power Consumption with Piggyback and Periodic Traffic -- 5.1.3 Throughput Performance with Heavy Traffic Load -- 5.2 Multi-hop Energy Efficiency -- Linear Chain Scenario -- 5.3 Lifetime Analysis with piggyback (Periodic Traffic) -- 5.4 Performance Analysis of a Two-Phase Contention Scheme -- 5.4.1 Motivation for Using Two Contention Windows -- 5.4.2 Overview for the Saturated Regime -- 5.4.3 Overview for the Unsaturated Regime

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