Quality of Service based Minimal Latency Routing for Industrial WSNs

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Minimized and nearly deterministic end-to-end latency facilitates real-time data acquisition and actuator control. In addition, defined latency is an integral part of quality-oriented service in order to get closer to the reliability of wired networks and at the same time take advantage of wireless networking. In this talk I will introduce a QoS routing protocol capable of balancing power consumption between wireless sensor and actuator nodes while minimizing end-to-end latency. A TDMA scheme is introduced in the routed wireless network to enable defined latency and in addition it improves the energy efficiency by avoiding collisions which eliminates time and energy consuming retries. This novel routing method allows latency and round-trip times to be calculated in advance. Finally, a hardware implementation is presented to demonstrate the concept of the routing scheme and its usability in low-power wireless sensor networks.