

SURVEY ON SYSTEM ARCHITECTURE FOR WIRELESS SENSOR NETWORKS

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ABSTRACT

In this paper we present an operating system and three generations of a hardware platform designed to address the needs of wireless sensor networks. In this operating system, called Tiny OS uses an event based execution model to provide support for fine-grained concurrency and incorporates a highly efficient component model; Tiny OS enables us to use a hardware architecture that has a single processor time shared between both application and protocol processing. It shows how a virtual partitioning of computational resources not only leads to efficient resource utilization but allows for a rich interface between application and protocol processing. In that rich interface, in turn, allows developers to exploit application specific communication protocols that significantly improve system performance. Hardware platforms we develop are used to validate a generalized architecture that is technology independent. This general architecture contains a single central controller that performs both application and protocol-level processing. Its flexibility, this controller is directly connected to the RF transceiver. Its efficiency, the controller is supported by a collection of hardware accelerators that provide basic communication primitives that can be flexibly composed into application specific protocols.

KEYWORDS: Wireless Sensor Networks, TinyOS, AM Communication Paradigm, Data Collection