

一种能量有效的基于虚拟骨干网的WSN范围选择再编程协议

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摘要：

本文提出了一种能量有效的具有范围选择的网络再编程协议。该协议首先根据要更新的应用程序、节点的剩余能量、有效度数和节点间的链路质量，选出合适的核心节点，创建虚拟骨干网。然后软件影像由sink节点通过流水线的方式，先传输给核心节点；再由核心节点并行传输到需要的普通节点。有效地减少了参与再编程的节点数,节省了能量，实现了范围选择。另外，引进协调的睡眠机制，进一步降低节点的能量消耗。性能分析与仿真实验表明：与已有的协议ThreeStages和Aqueeduct相比，本协议节省了大约5.6%-24.8%的平均延时和5.1%-27.7%的能量消耗。

关键词：无线传感器网络；再编程协议；异构的；范围选择

An Energy-Efficient Reprogramming Protocol of Wireless Sensor Networks with Scope Selection Based on Virtual Backbone

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Abstract:

In this paper an energy-efficient reprogramming protocol with selection of scope is presented. Firstly, based on the application that will be updated, nodes' residual energy, effective degree and link quality between nodes, the protocol selects proper core nodes to create a virtual backbone of the network. Then the software image is transferred from sink to the core nodes by pipeline, before being transferred from the core nodes to the needed ordinary nodes in parallel, reducing the number of nodes involved in the reprogramming efficiently, saving energy and achieving the selection of scope. A coordinated sleep schedule is introduced to further reduce energy consumption. The performance analysis and simulation experiments indicate that compared to the existing protocols ThreeStages and Aqueeduct, this protocol saves about 5.6%-24.8% of the average delay, and 5.1%-27.7% of energy consumption.

Keywords: wireless sensor networks; reprogramming protocol; heterogeneous; selection of scope

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