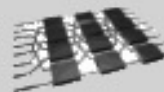


Approaches to Node and Service Discovery in 6lowPAN

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Geyer e Fernando Boavida, Joel Rodrigues



GPPD



Approaches to Node and Service Discovery in 6lowPAN

Summary

- Introduction
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Introduction

- WSNs
- Many of us low-cost collectors
- Composed of one or more nodes and “sink”

Discovering nodes and services in Wireless Sensor Networks poses several challenges.

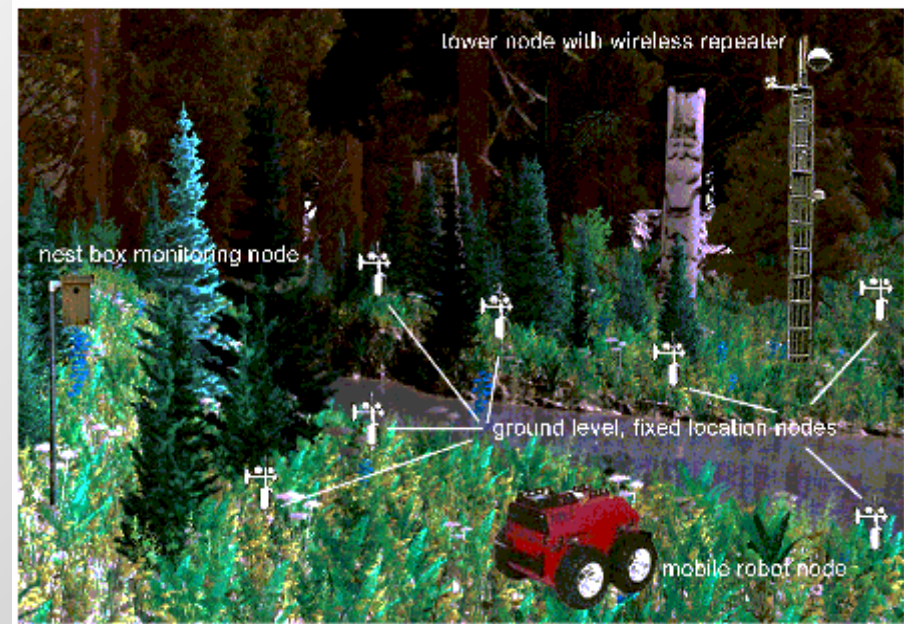
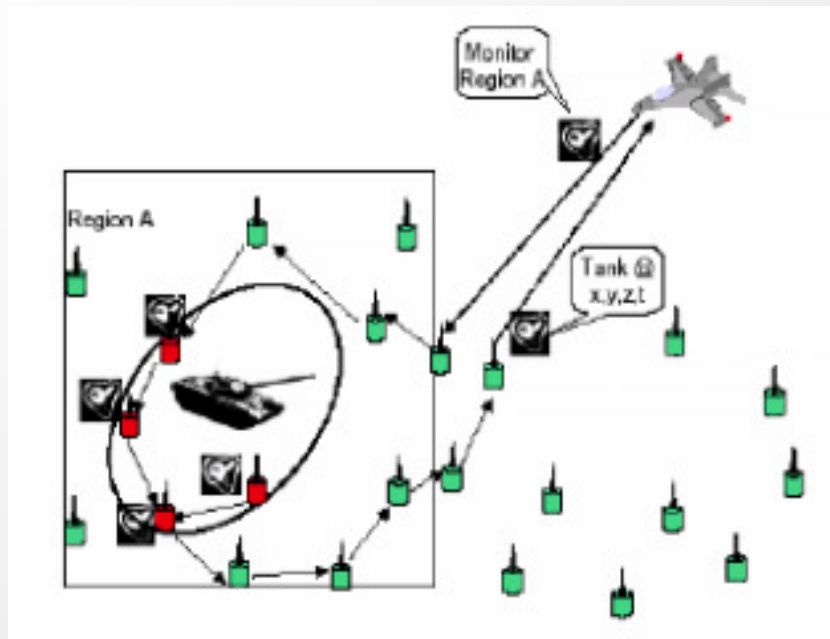
Different sink and sensor nodes announcement strategies lead to different amounts of resource consumption in terms of processing, memory, communication time and drained energy.

Currently the most common Layer 2 communication protocol used in WSNs is the IEEE 802.15.4 protocol (zigbee).

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Introduction

Scenarios where WSNs operate

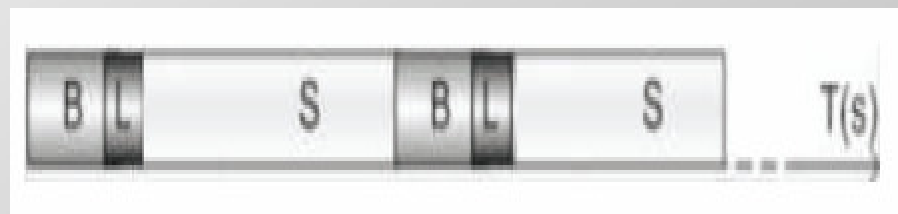


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YouCatchMe

The first approach, called "**YouCatchMe**", follows the philosophy of conventional wireless networks, where an access point periodically sends beacons, announcing their presence.

The YouCatchMe operation is based on a fixed cycle comprising three different periods: the B (broadcast) period, in which RA messages are broadcasted; the L (listening) period, in which acknowledgement messages are received and processed; and the S (sleep) period, during which no node discovery activity takes place, leaving room to data exchange with the sensors.

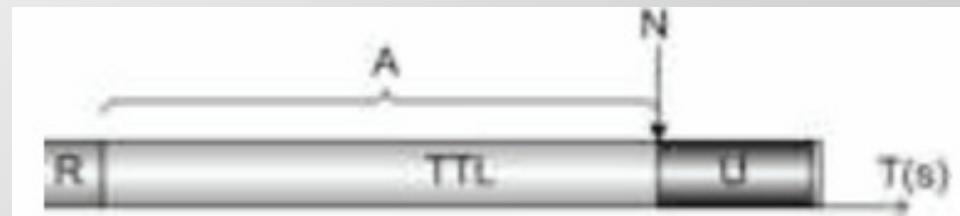


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ICatchYou

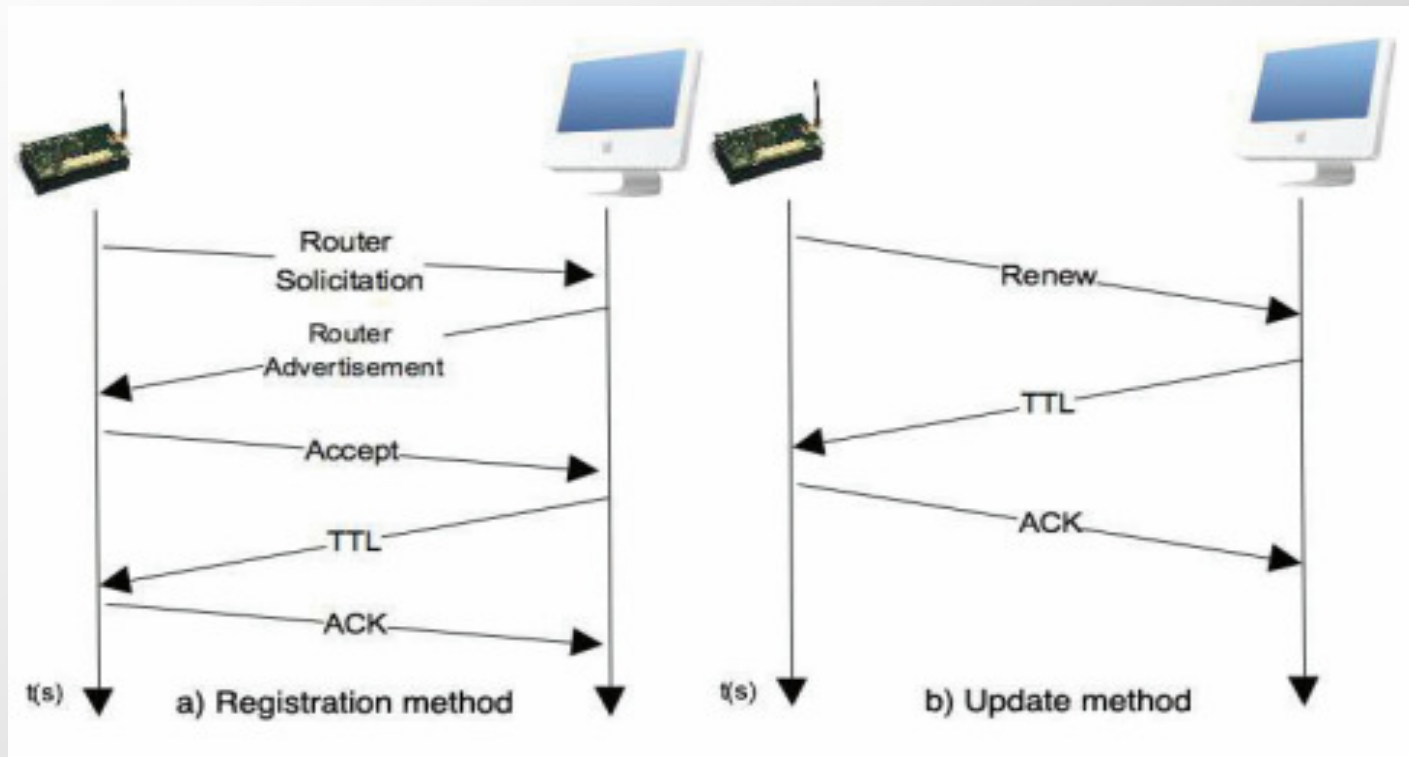
The second approach looks at the issue from a different perspective: in the "**ICatchYou**" approach, sink nodes are in silent and it is the responsibility of each sensor node to search and detect sink nodes.

The underlying discovery/registration protocol comprises an initial registration phase, a TTL phase and subsequent update/TTL phases



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ICatchYou



Some1CatchMe

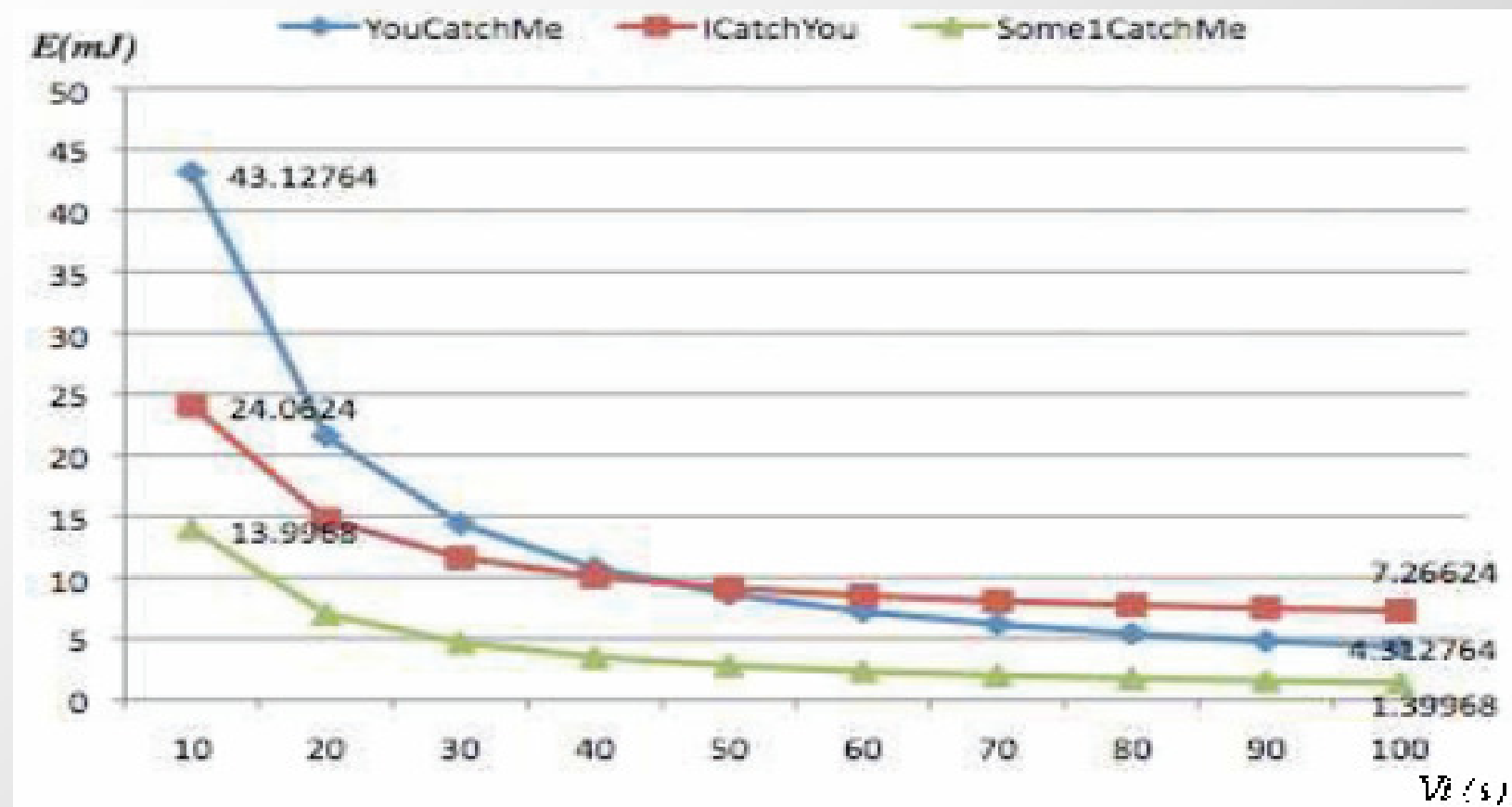
- Some1CatchMe makes use of RFID tags associated to IEEE 802.15.4. RFID tags do not process anything;
- They just contain an identification that can be read by RFID readers. All energy to read the tag comes from the RFID reader;
- The RFID reader can discover it without energy consumption by the node.

Thus, upon arrival of a sensor node to a new network, the sink node RFID reader reads the RFID tag of the sensor node, containing the IEEE 802.15.4 EUI 64 bits address. This allows the sink node to communicate with the new sensor node, using the Link Local IPv6 address obtained from the Layer-2 64-bits address.

When a sink node detects a new node, it initiates a registration process similar to the one presented for ICatchYou, using a TTL as well. Comparing the registration procedure of Some1CatchMe with that of ICatchYou, the Router Solicitations disappear. Thus, the node discovery process is completely transparent to the sensor node itself.

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Some1CatchMe



Conclusion

Current work has addressed the problem of service and node discovery in wireless sensor networks using the 6lowPAN framework. In this context, three paradigms were proposed, analyzed and evaluated, having in mind the resource restrictions that are typical of WSNs.

YouCatchMe

ICatchYou

Some1CatchMe

Approaches to Node and Service Discovery in 6lowPAN

Works in progress and future

A Comparison of Approaches to Node and Service Discovery in 6lowPAN Wireless Sensor Networks in 5-th ACM International Symposium on QoS and Security for Wireless and Mobile Networks (Q2SWinet 2009).

Estudo Comparativo entre protocolos utilizados em RSSFs in C3N - IV Congresso da Academia Trinacional de Ciências Parque Tecnológico Itaipu Binacional – PTI. Foz do Iguaçu, Paraná, Brasil.

Comparativo entre Simuladores utilizados em RSSFs in C3N - IV Congresso da Academia Trinacional de Ciências Parque Tecnológico Itaipu Binacional – PTI. Foz do Iguaçu, Paraná, Brasil.

Protocolos de segurança em RSSFs UC Coimbra Portugal, em desenvolvimento.

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Questions