Automated Testing and Verification of WSN Applications

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Case Study: Wireless Fire Detection and Alarm System developed at Siemens Building Technologies

Requirements
- 100+ nodes wireless multi-hop sensor network
- Lifetime > 5 years with 2xAA
- Detection of link and node failures < 300 sec
- Alarm notification < 10sec
- Bidirectional communication (alarm indication)

Why DSN (and not cable-based testing, or over-engineered fire-detectors with debugging capability)?
- wireless & battery operated: allows for realistic placement of nodes
- no modification of target hardware
- no implementation of debugging services on the target
- easy setup & deployment

How to set up the DSN?

1. Connect Target Nodes to DSN Nodes
2. Deploy Target-/DSN-Node Pairs
3. Server and Client Setup

Test Example:
- Measurement of channel quality between different pairs of deployed nodes.
- Quality difference between day and night?
- High-resolution measurements but also long term average.

Test Automation and Evaluation: Java Tool with integrated views as a client to the DSN Server

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