A framework for linear infrastructures monitoring and control using pasive acknowledgement technique in WSN

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1. Motivation of the work

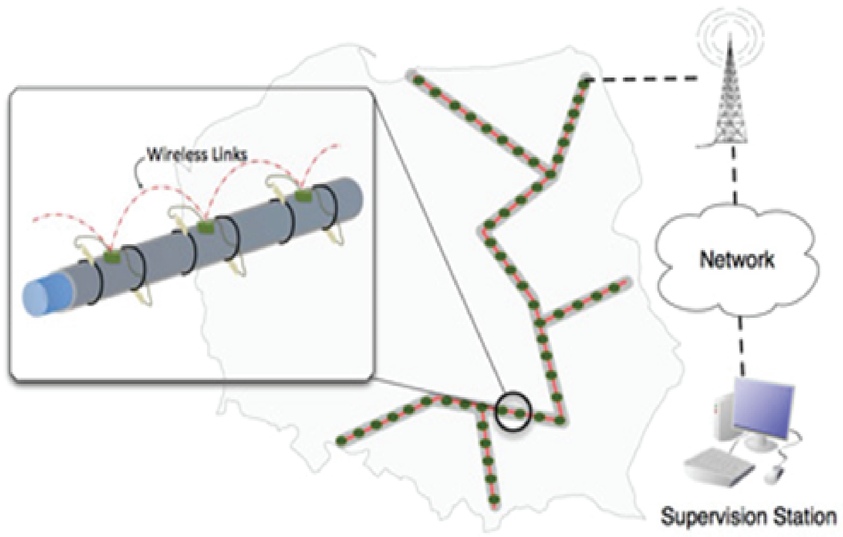
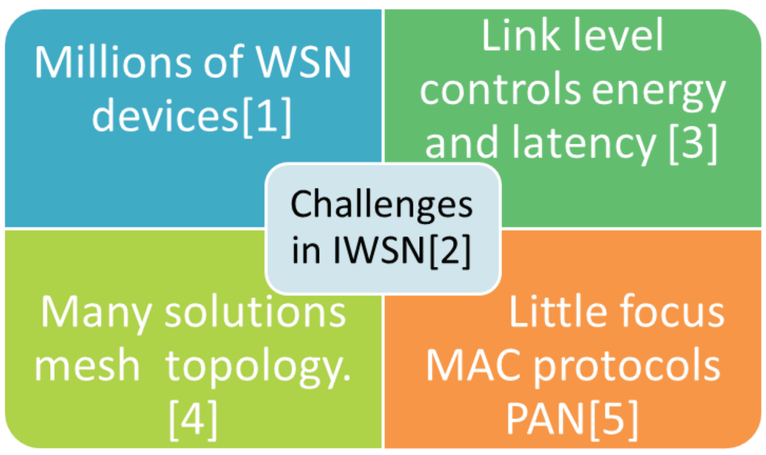


Fig. 1 Pipeline monitoring system



2. Thesis Objectives

- Introduce the pasive acknowledgement technique
- Take advantage of linear topology,and TDMA
- Propose a new communication scheme
- Introduce new LLDN superframe
- Optimize the radio frecuency transmisions

3. Research Plan

- **2015**
  - State of art
  - New communication scheme
- **2016**
  - Validate the proposed solution
  - Publication of results
- **2017**
  - Thesis writing
  - Publication of results

4. Results: Solution Design

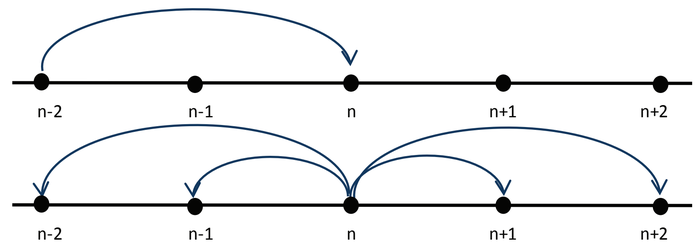


Fig.2 Pasive acknowledgement technique

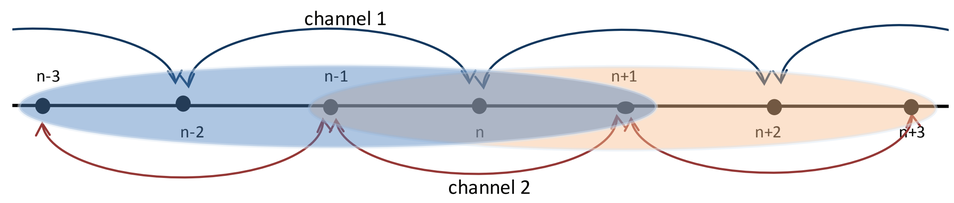


Fig.3 Channels Transmissions

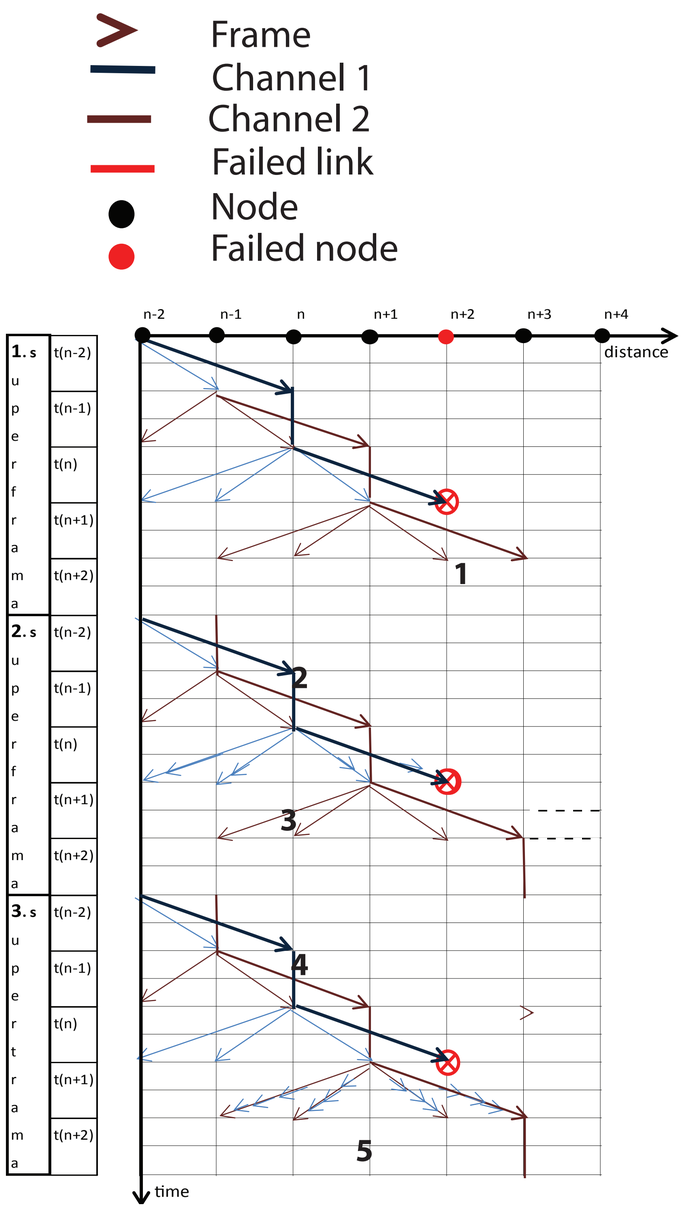


Fig. 5 Failed node

1. Failed node
2. Node n, pasive ACK fails
3. Node n, retransmits frame
4. Node n, pasive ACK fails
5. Node n+1, retransmits frames of node n

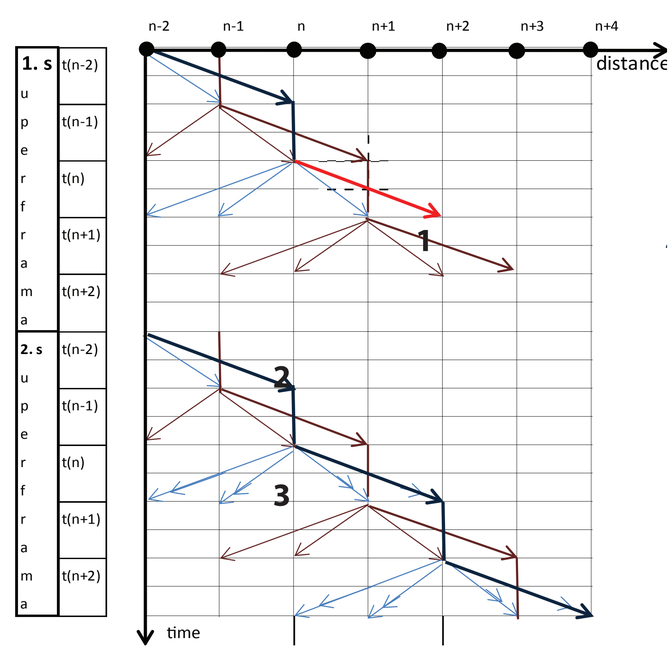


Fig 4. Failed link or frame errors

1. Failed transmission of n to n+1
2. Node n, pasive ACK fails
3. Node n , retransmits frame

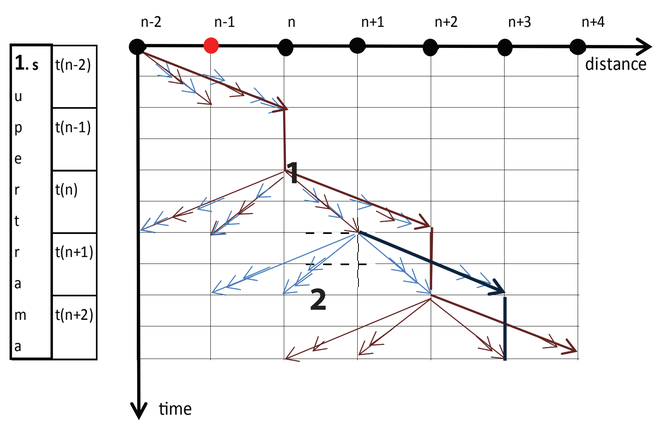


Fig. 6 Transmission flow recovery

1. Node n in channel 2, transmits frames of failed channel 1
2. Node n+1 receive frames in channel 2, and retransmits only frames of channel 1

We are proposing new techniques that are the basis to create a new framework that will increase the energy efficiency, reliability, and security of oil pipelines or other critical infrastructures

5. Next Year Planning

- Validate the proposed solution
- Identify parameters to be used
- Evaluate QoS parameters
- Possibilities to improve performance of IWSN

6. Bibliografy

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