

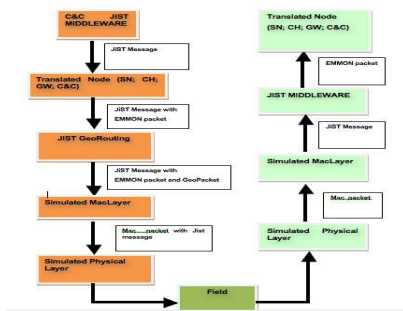
EMMON Middleware Scalability

SIMULATION

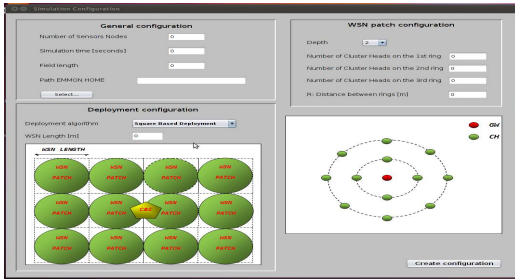
OBJECTIVE:

Investigate the relationship between the number of messages in the network and the network size.

Approach



Integration of the EMMON middleware with the JIST-SWANS simulator

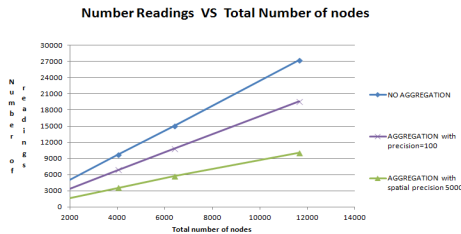


Network Deployment Tool

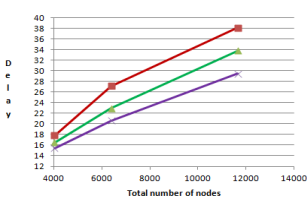
RESULTS:

The scalability is demonstrated by the linear relationship between the amount of messages and the number of nodes.

Number of readings and end-to-end delay needed to monitor light, temperature and humidity on the whole network



End-to-End Delay VS Total number of nodes



The number of sent readings and the delay scale linearly against the number of nodes

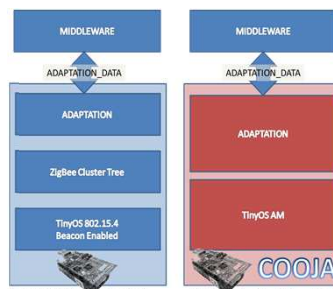
EMMON aggregation allows to reduce the number of sent messages and delay sensibly

EMULATION

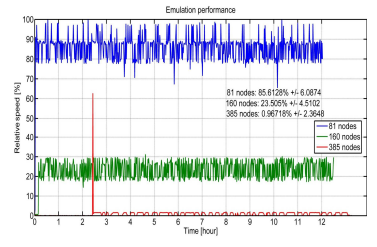
OBJECTIVE:

Run the real code in a simulation in (near) real wall clock time, and analyze in details the scalability with different network topologies.

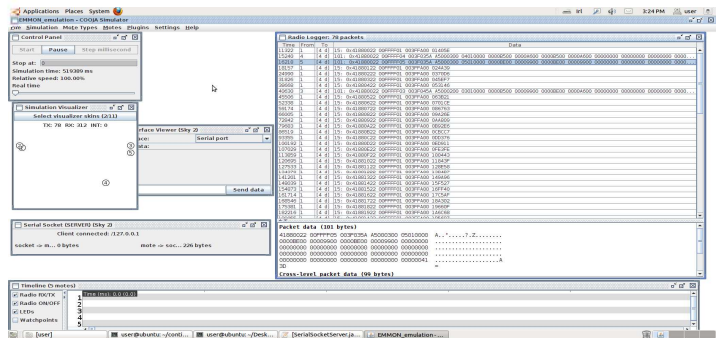
Approach



Integration of the EMMON middleware with COOJA



Emulation performance evaluation



COOJA Instruction-level Emulator

RESULTS:

- The shape of the number of readings as the spatial aggregation precision varies - for a constant SN density per CH - is constant.
- The load is increasing at worse linearly with the number of SNs per CH.

