Integration of Event-Driven Embedded Operating Systems into OMNeT++ A Case Study with REFLEX

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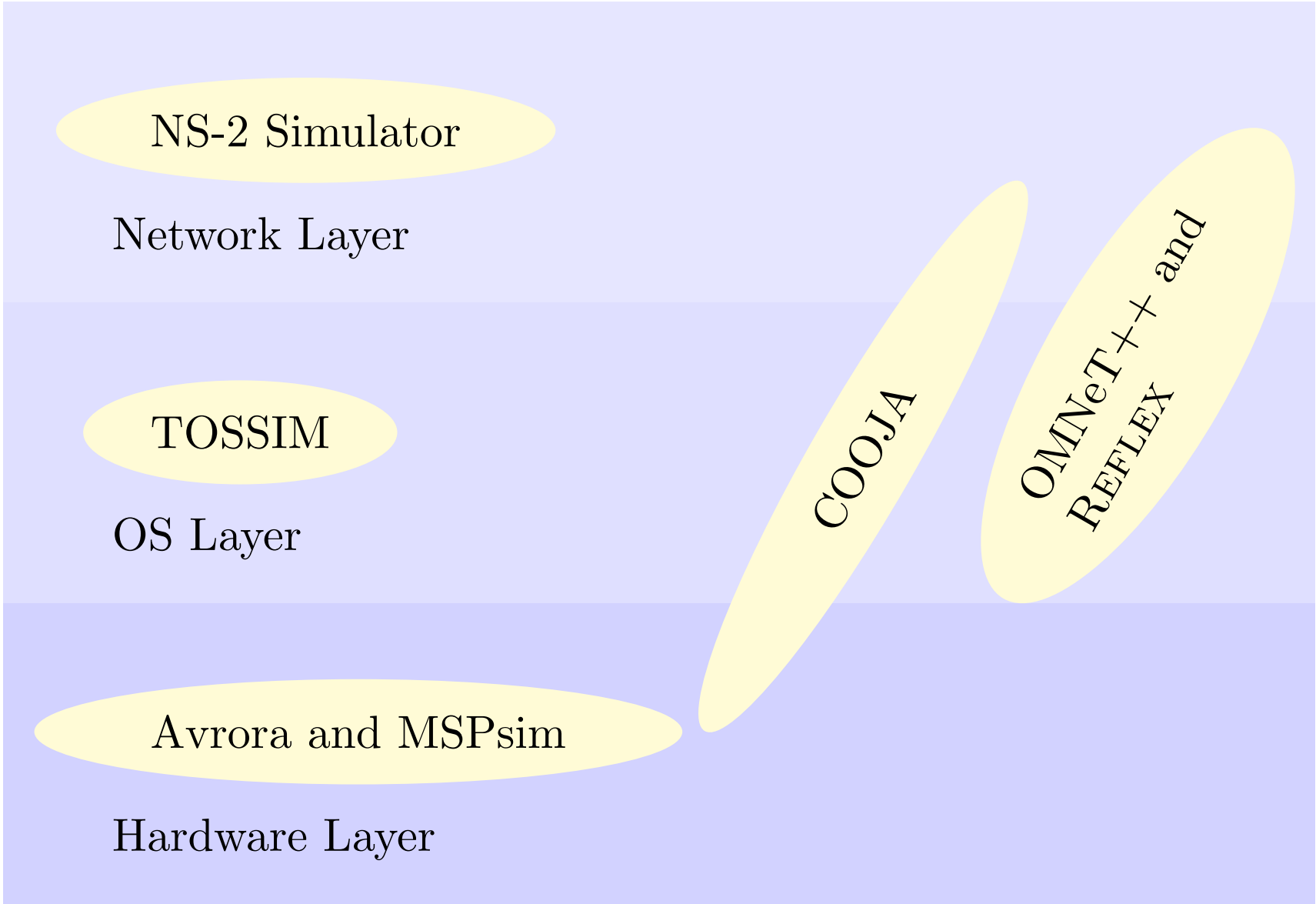
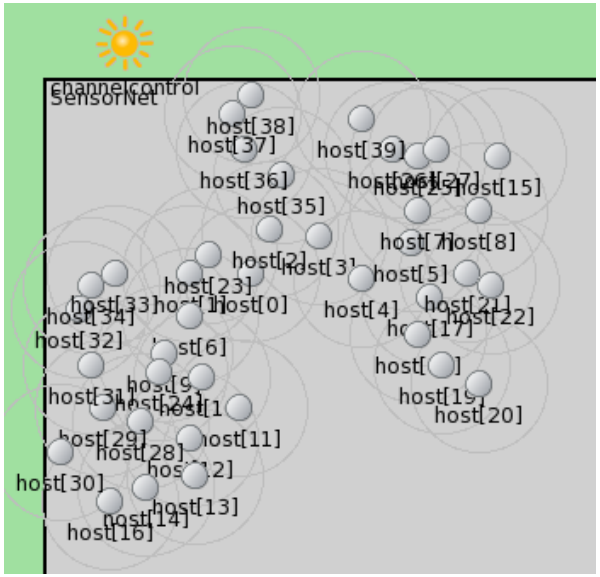
Motivation

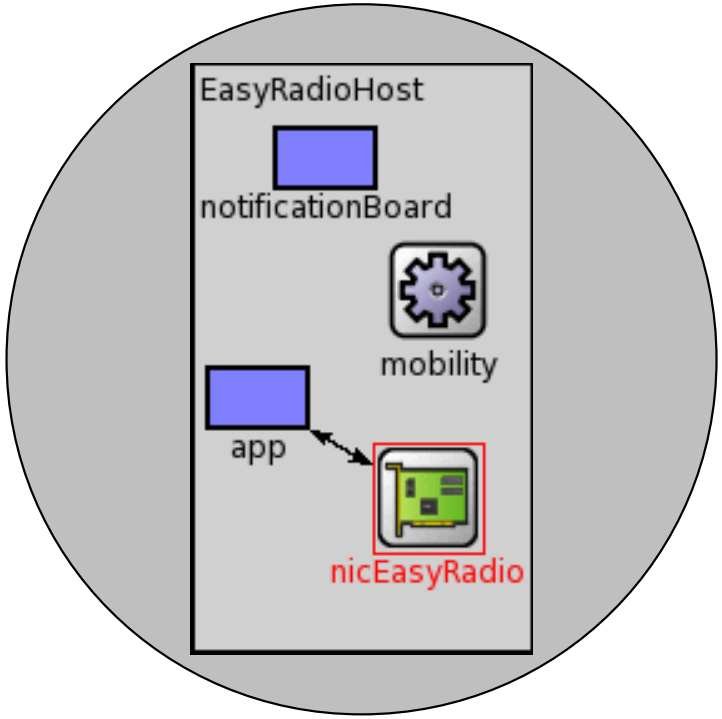
- WSN are inherently event driven (Typical applications: *sense and send* or *monitoring*)
- Evaluation and testing on a single node basis is impossible
- Simulation of Algorithms on an abstract layer is not sufficient: implementation is not evaluated
- Simulation must provide means to evaluate the actual implementation
- OMNeT++ provides flexibility and a great amount of ready-to-use modules
- Integration of operating system (REFLEX) into discrete event simulator (OMNeT++)

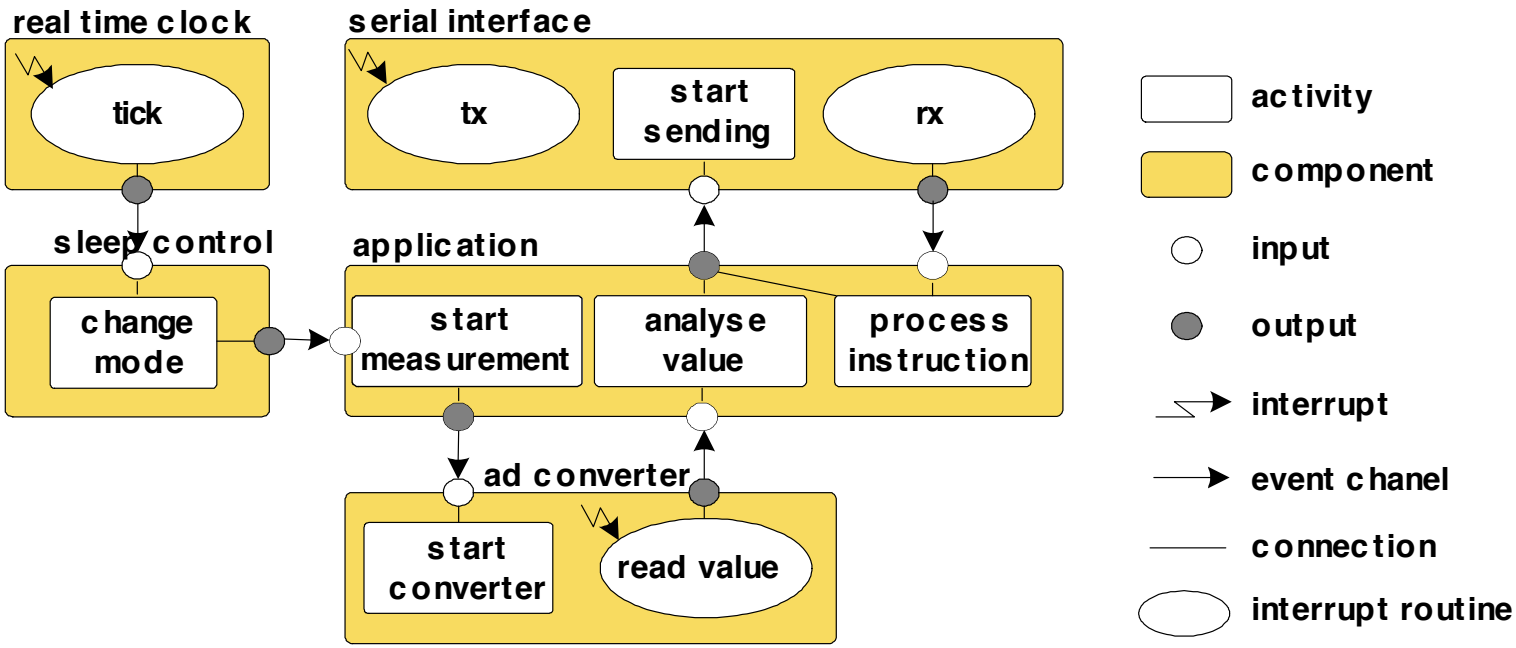
Wireless Sensor Network Simulators



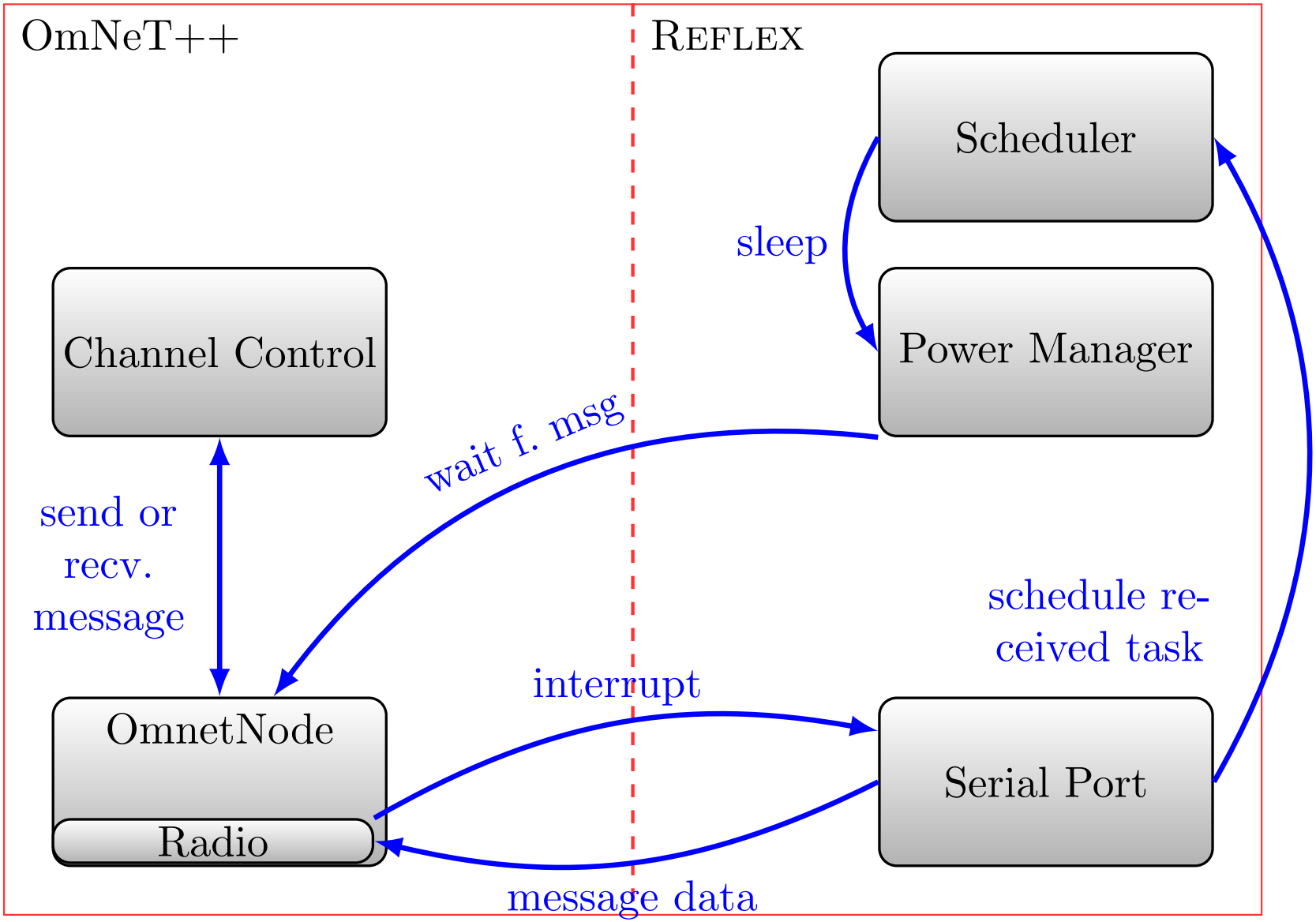
OMNeT++


channelcontrol
SensorNet
host[38]
host[37]
host[39]
host[36]
host[35]
host[15]
host[8]
host[2]
host[23]
host[5]
host[0]
host[4]
host[22]
host[32]
host[6]
host[20]
host[29]
host[28]
host[30]
host[13]
host[16]


EasyRadioHost
notificationBoard
mobility
app
nicEasyRadio


real time clock
tick
serial interface
tx
start sending
rx
sleep control
change mode
application
start measurement
analyse value
process instruction
ad converter
start converter
read value
activity
component
input
output
interrupt
event chanel
connection
interrupt routine

Reflex for OMNeT++



Interaction of REFLEX and OMNeT++