Modeling power consumption in OMNeT++

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Overview

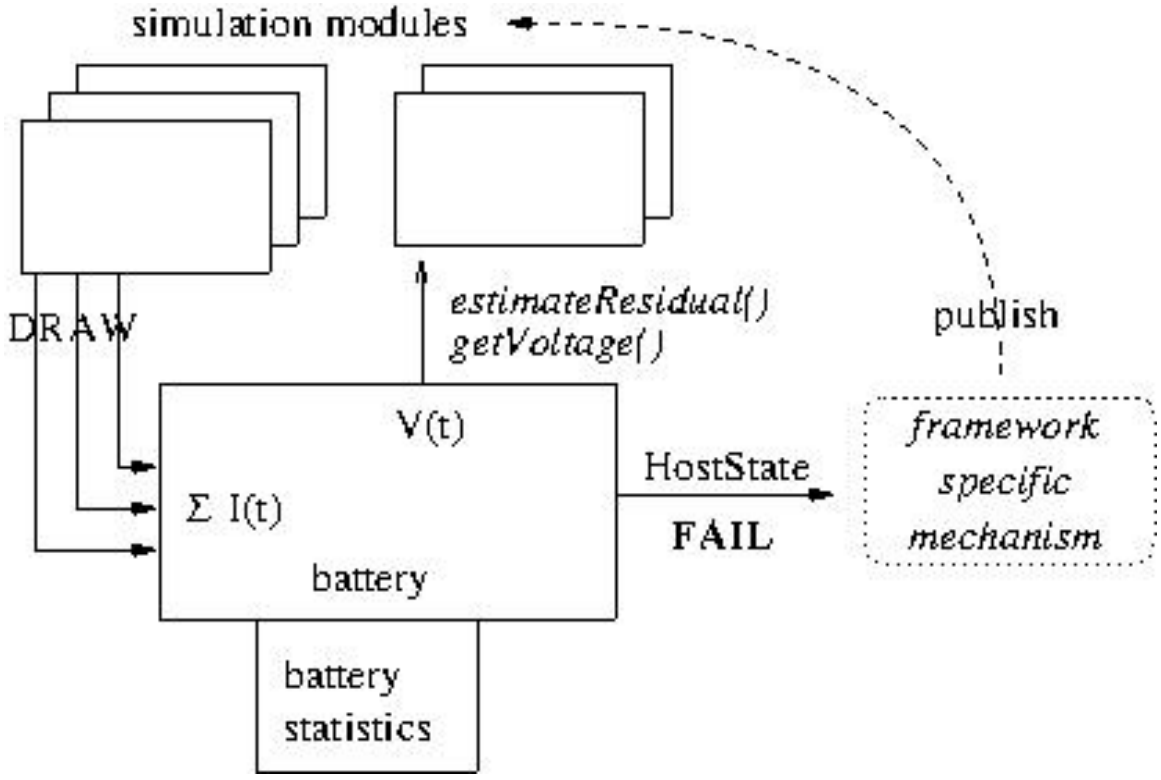
- networks of battery-powered devices
  - opportunistic, ad hoc, sensor, IoT
- sustainable computing and networking
  - network infrastructure
  - datacenters
  - smart grid
- simulate power consumption in many contexts
  - many frameworks developed

Overview

- INET
  - support for wired and wireless networks
  - power consumption issue for many scenarios
- more unified power consumption simulation framework?
  - generalization, common approach or structures
  - heterogeneous networks
  - reduce duplicated effort

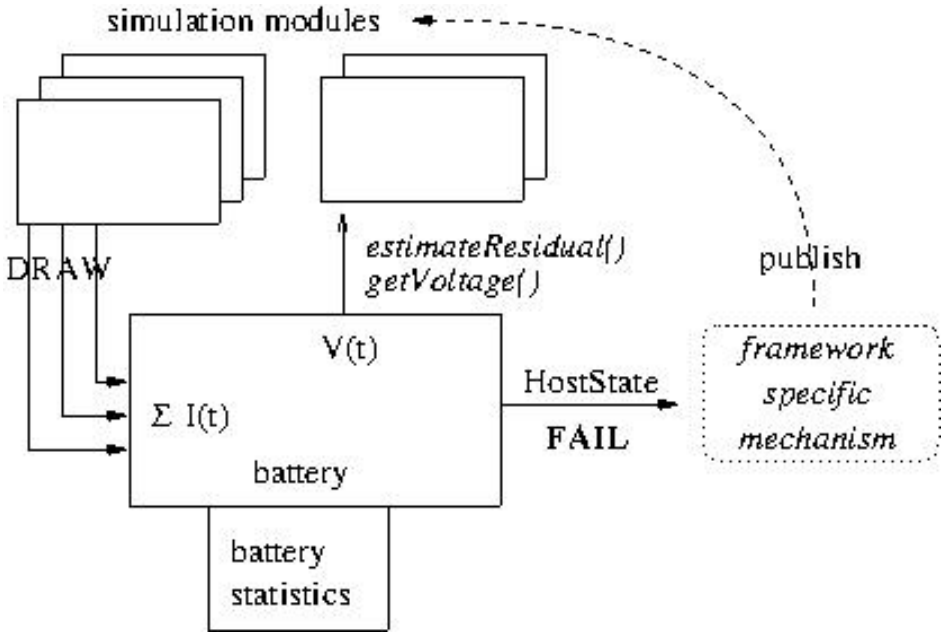
Energy Framework

- OMNeT++ 3.x (2009)
  - goal was extensibility
  - target mobility-fw
- integrated into several OMNeT++ 4 simulators
  - MiXiM, INETMANET...
  - no framework



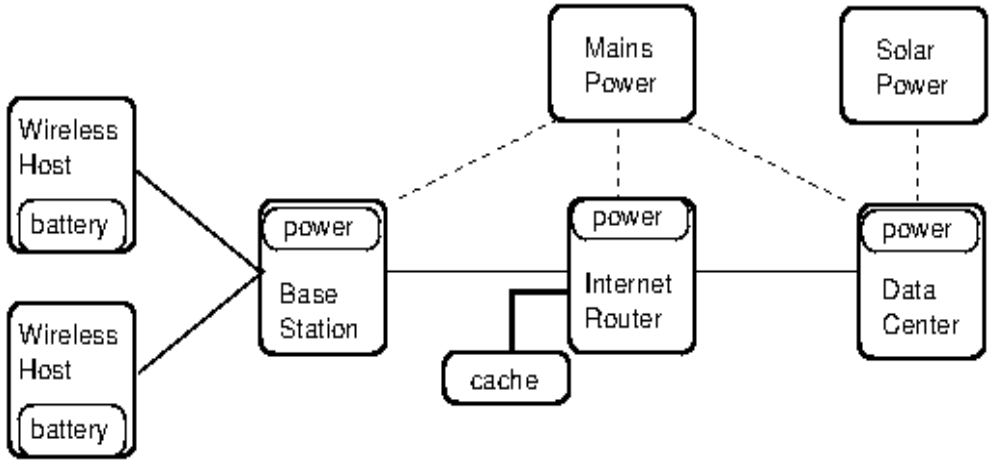
Good parts

- “device” module informs battery of load
  - radio, sensor
  - can have multiple devices
- feedback for state of power supply
  - output voltage
  - failure
- isolate data collection
  - customizable



Bad parts

- non-energy aware modules
  - host state
  - can still affect power consumption



- "device" module
  - responsible for informing power source of load
- easy for radio, hard for OS and system functionality
  - how much to model hardware and OS
  - different for WSN, routers, caching, data centers