Battery-Q

Battery lifetime prediction and run-time optimization of IoT devices' battery lifetimes
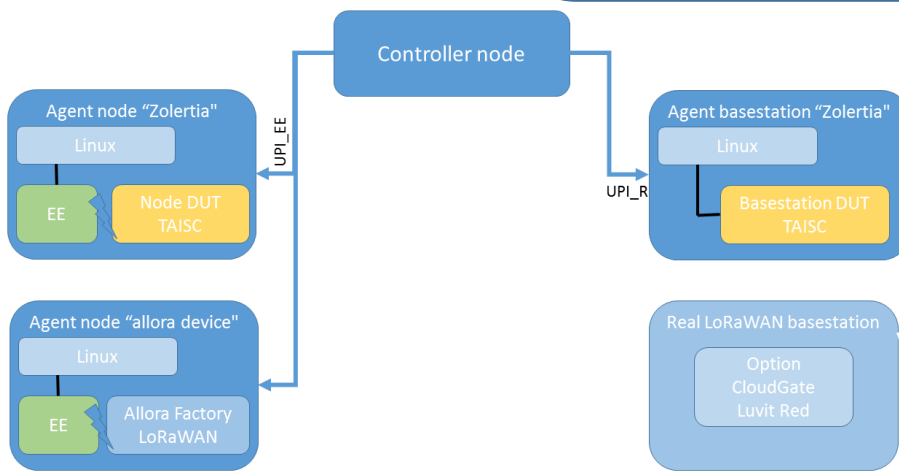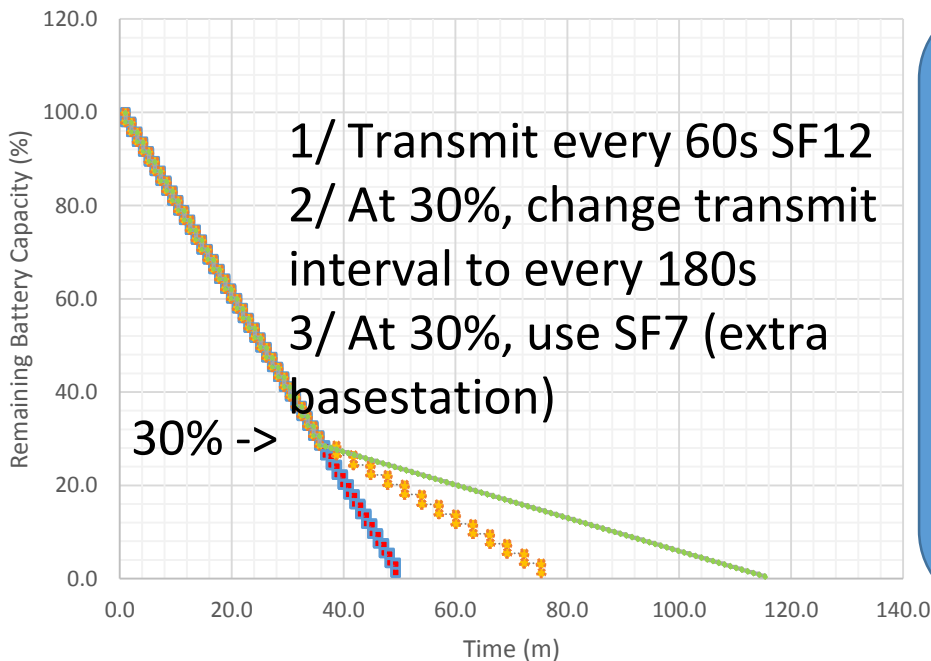
WiSHFUL

allora Factory

GOALS
Predict the battery lifetime based on the device current consumption profile and IoT network information.
Extend the lifetime by over-the-air reconfiguration

CHALLENGES
Measure real-time energy consumption
LoRaWAN-like sub-GHz setup
Over-the-air reconfiguration

Controller node

UPI_EE

UPI_R

Agent node "Zolertia"
Linux
EE
Node DUT TAISC

Agent node "allora device"
Linux
EE
Allora Factory LoRaWAN

Agent basestation "Zolertia"
Linux
Basestation DUT TAISC

Real LoRaWAN basestation
Option CloudGate Luvit Red

Remaining Battery Capacity

1/ Transmit every 60s SF12
2/ At 30%, change transmit interval to every 180s
3/ At 30%, use SF7 (extra basestation)

30% ->

Y-axis: Remaining Battery Capacity (%), values 0.0 to 120.0
X-axis: Time (m), values 0.0 to 140.0

CONCLUSION
The Environment Emulator is added to the WiSHFUL framework allowing battery emulation and real-time power consumption profiling.

Thanks to the software tools and hardware provided to us by WiSHFUL we were able to emulate the battery of our low-power long range IoT devices and verify our battery lifetime prediction in a short time.