

Bridging the gap

EMSIG Presentation Thursday 12th November, 2015 Brian Boyles, Project Manager

You have the things. We have the Internet of Things solution.

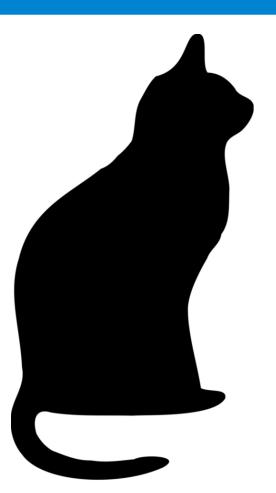




Why am I here?



ITOS Fieldbook case study



Porter model and smart home context

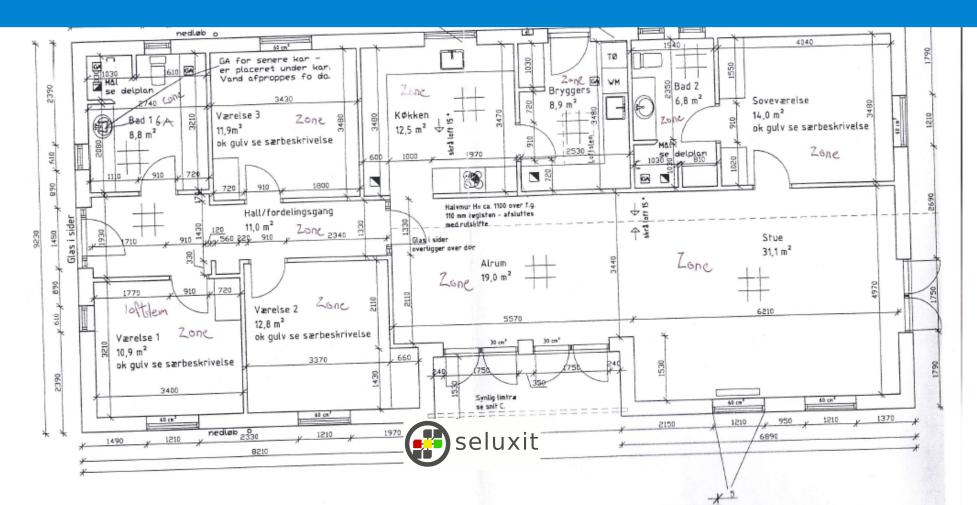
There's an app for that

The security system and the climate-control system

"A Method for Model Checking Feature Interactions" (Thomas Pedersen, Phd. stip., AAU, et. al.)



Cassting case study



Who we are



Seluxit ApS

IoT company with roots in home automation and smart energy

Based in Aalborg, DK

Founded (and profitable since) 2006

Self-owned

11 full-time employees and growing

International working environment

Close relations with various universities

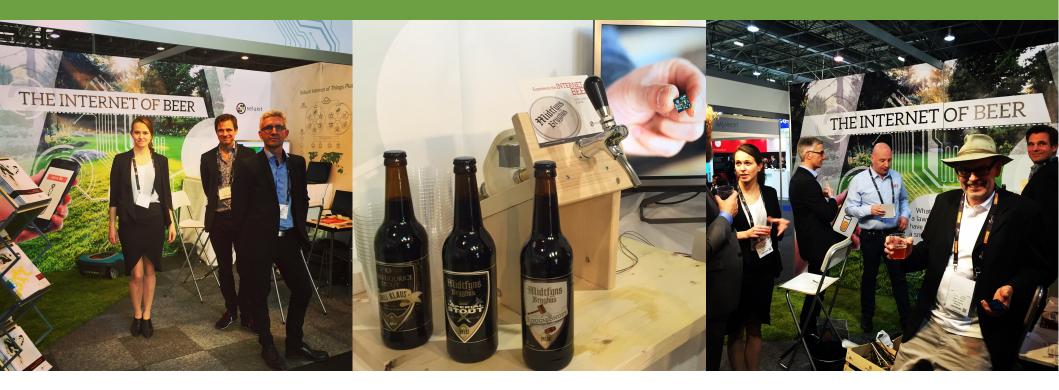


Our customers and partners





What does a lawnmower have to do with a smart meter?





What we do



The Internet of Things

Connectivity

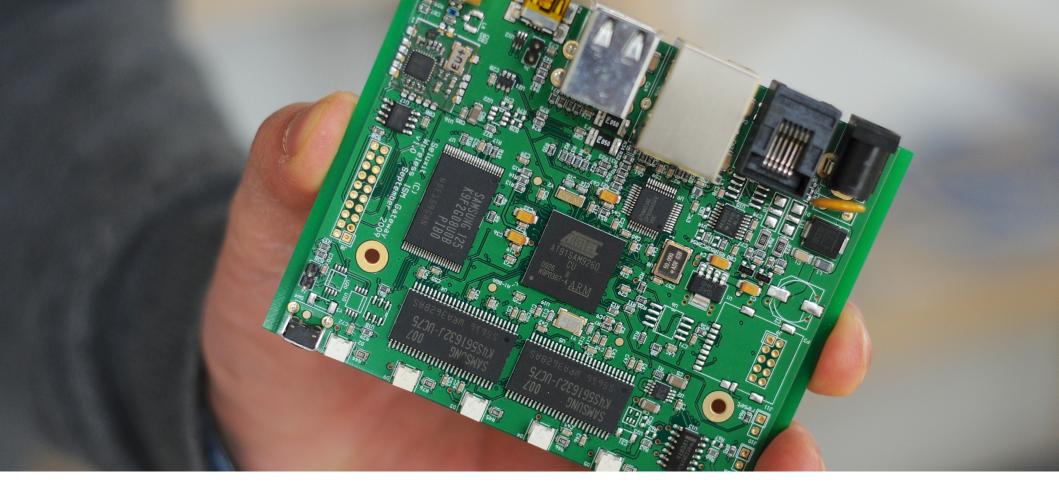
Data analysis

Intelligent applications

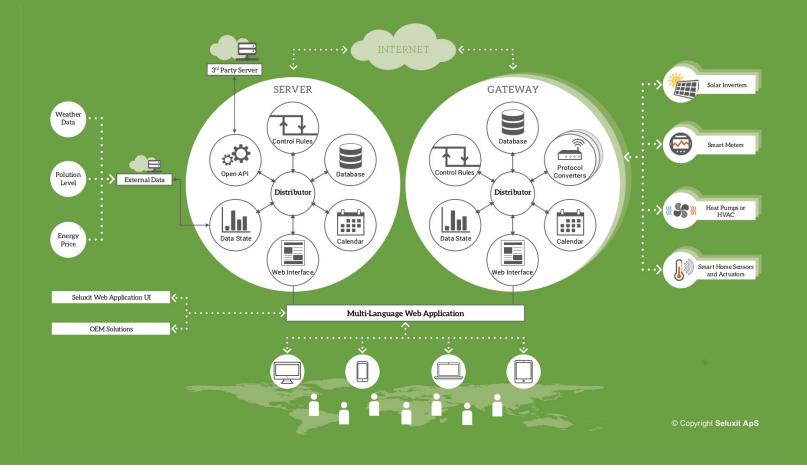
We focus on **connectivity** and provide the framework to enact intelligent applications

Configurable, distributed state machines +





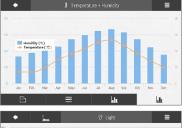








Reset zoonr



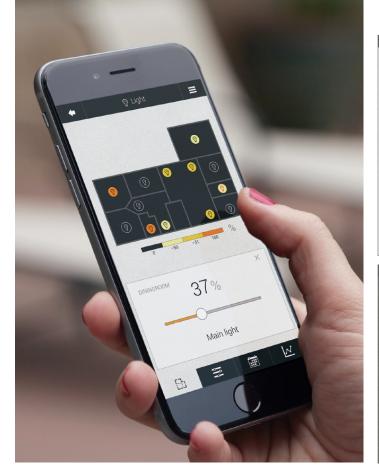
Value: 12°C

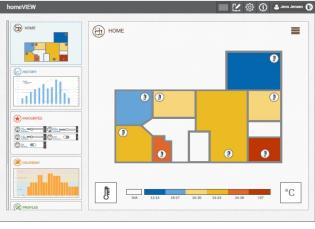
Noen 'pm

h

1











Our IoT Philosophy

Device interoperability still an open and crucial question

Current proposed standards strive for flexibility at the expense of structure

Web standards must be embraced (security, transport, etc.)

Even the most humble and constrained IoT devices should be IPv6 enabled and have a configurable application layer



RWE Lemonbeat

G		lemonbeat	
Home Automation Application	Application Layer	Generic IoT application layer	 Self-describing XML/EXI encoded services Device description Value description Configurable distributed state machines Actions Timers Calendar events Firmware updates
RFC 6690	COAP & other	RFC 6690, RFC 7252, RFC 5905	
RFC 768, RFC 5346, RFC 4279, RFC 4492	UDP + DTLS	RFC 768, RFC 5346, RFC 4279, RFC 4492, RFC 793, RFC 5246	
RFC 1058, RFC 2080	Distance Vector Routing	RFC 1058, RFC 2080	
6LowPAN (IPv6) RFC 4944, RFC 4861, RFC 4862, RFC 6282, RFC 6775	IP	RFC 791, RFC 792, RFC 2460, RFC 4861, RFC4862, RFC 2463, optional compression	
IEEE 802.15.4 (2006)	MAC (including MAC security)	RFC 5170, RFC 5342, Frequency Agility, AES CCM, MTU up to 2kB	
	Physical Radio (PHY)	Sub GHz 2GFSK@100kb/s	



Self-describing, interoperable and configurable things

Informative (self describing)

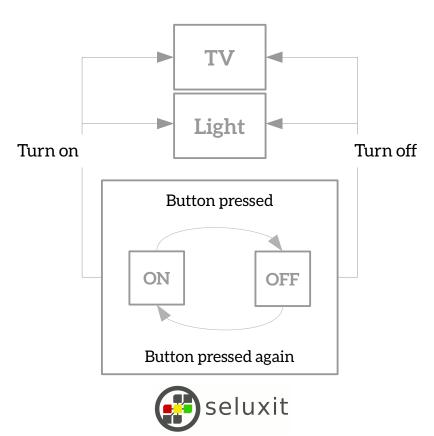
Configuration (configurable)

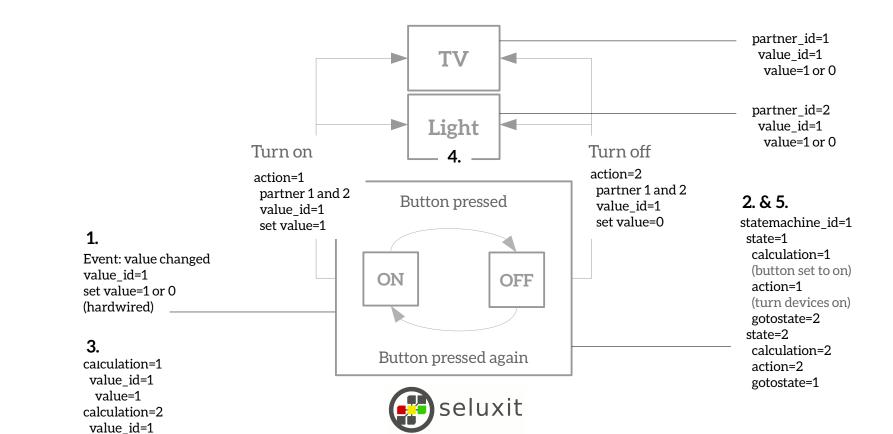
Events (interoperable)

Device > Service > Value

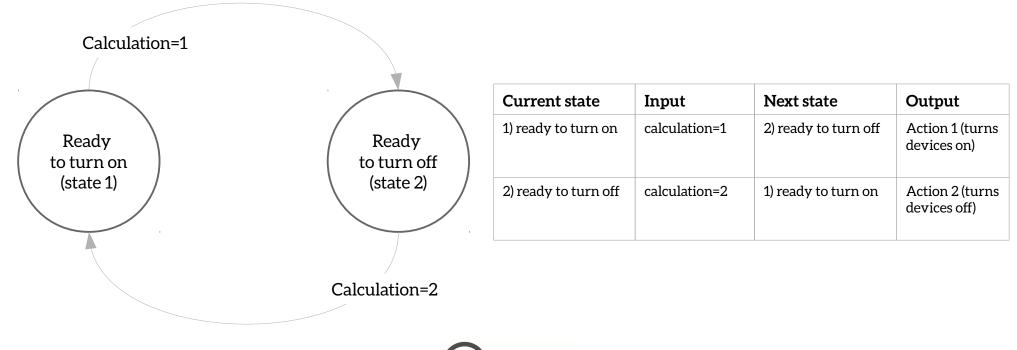
Partners, actions, calculations, state machines, timers, calendars, configuration







value=0





State machine service

```
<statemachine statemachine_id="1">
        <state state_id="1">
            <transaction calculation_id="1" action_id="1" goto_state_id="2"/>
            </state >
            <transaction calculation_id="2" action_id="2" goto_state_id="1"/>
            </state>
        </state>
    </state>
```



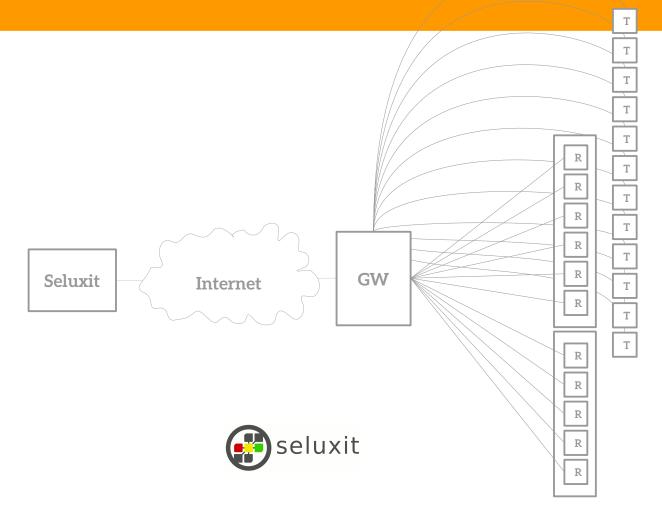
Calculation service



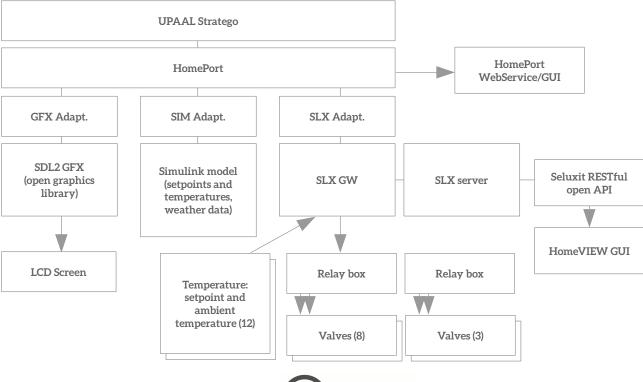
Action service



Floor-heating case study: the setup



Floor-heating case study: the architecture







Brian Boyles

brian@seluxit.com

+45 2383 2628

@bfboyles

linkedin.com/in/bfboyles





