Scenario: energy-constrained TCP/IP-communication

Hardware: WiFi module ESP8266 (cost: 2 $, Internet of Things)

Tasks:
1. Make Sming\(^1\) framework energy-aware
2. Integrate TCP/IP stack into operating-system kernel

Goal: schedule communication under **hard energy constraints**

Supervisors: Peter W., Heiko

\(^1\)github.com/SmingHub/Sming

(February 4, 2016)
Exploiting DMA Controllers for Hardware-Based Scheduling

- **Scenario:** feature-rich DMA controllers in modern microcontrollers
- **DMA controllers considered turing-complete** [Rushanan, WOOT ’15]
- **Hardware:** NXP KL46z development board (ARM Cortex-M0+)
- **Tasks:**
  1. Identify potential/interaction patterns: write “DMA programs”
  2. Measure benefits in energy-consumption
- **Goal:** exploit DMA for energy-efficient hardware-based scheduling
- **Supervisors:** Heiko, Peter W.