

## Smart grid solution for metering

### Case study

Client:

**Leading semiconductor supplier of communications and metering technologies for the smart grid industry**

Technologies and tools:

ZigBee and ZigBee IP

WPAN (IEEE 802.15.4, 4g, 4e)

PLC (PRIME, G3, IEEE P1901.2)

6LowPAN and IPv6

Python

Cortex-M3 SoC

XML/JSON

3G implementations

C++

IDE: Eclipse, Keil, IAR

Agile



Full implementation for low-power communication

## Challenge

Our client was a significant system-on-chip (SoC) manufacturer that provided over 25 ARM technology-based SoCs to their customers, from architecture to chip including low-level driver design, OS porting and device bring-up.

The client requested Luxoft to help develop a low-power communication stack for a new Cortex-M3 based SoC.

## Solution

Luxoft independently implemented the entire communication stack covering all stages of the project:

- Feasibility studies (HW/SW integration analysis), requirements analysis and development
- Software architecture, design and implementation/integration for the low-power communication stack (L1-L3)
- Hardware integration and BSP development for new Cortex-M3 SoC
- GUI-based test/configuration/monitoring applications
- Support for certification ("live" support cycles performed on the certification company's premises)
- QEMU-based emulator for Cortex-M3 board (supporting ZigBee, PRIME, G3 implementations)

# Results

- The client was able to build from scratch a smart grid platform using a new Cortex-M3 SoC
- Full implementation for low-power communication stack (L1-L2)
- Power line communication and support for both PRIME and G3 standards
- IEEE 802.15.4/4g enhancements based on 802.15.4e
- Low-power networking solutions
- Integration of Contiki IPv6 and web over 802.15.4
- ZigBee Pro stack
- Smart grid application development
- Smart energy profile (v1.0) integration
- Smart utility network extensions for IEEE 802.15.4g (4g)
- GUI-based applications for testing and configuration control
- The new platform was certified for smart grid applications

# Technologies

- Embedded C, C++, Python, XML/JSON
- Real-time OS: FreeRTOS, RTX
- IDE: Eclipse, Keil, IAR
- Agile methodology for software engineering
- Networking:
  - ZigBee and ZigBee IP
  - WPAN (IEEE 802.15.4, 4g, 4e)
  - PLC (PRIME, G3, IEEE P1901.2)
  - 6LoWPAN and IPv6

## About Luxoft

Luxoft is the design, data and development arm of DXC Technology, providing bespoke, end-to-end technology solutions for mission-critical systems, products and services. We help create data-fueled organizations, solving complex operational, technological and strategic challenges. Our passion is building resilient businesses, while generating new business channels and revenue streams, exceptional user experiences and modernized operations at scale.

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