

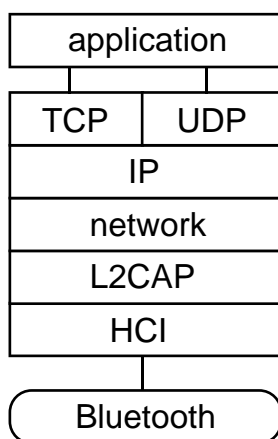
# The Mulle Platform

*"small form factor, ultra-low power  
Embedded Internet System"*

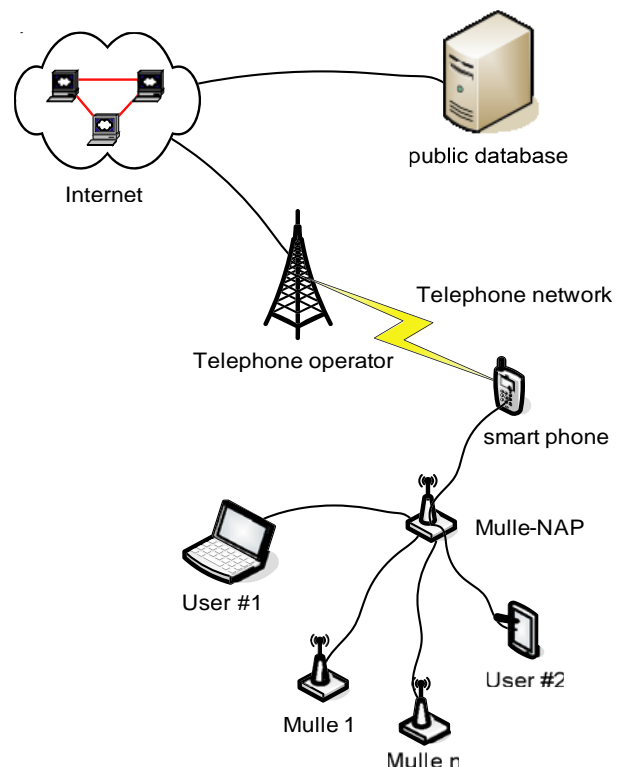
The Mulle platform is a low-power sensor node capable of transmitting sensor data directly to the Internet using Bluetooth-enabled mobile phones and the TCP/IP protocol suite.



The small form factor of only 24x26x5 mm allows the Mulle to be easily embedded in its environment. The 60-pin expansion connector enables a large variety of sensors to be attached. Supported sensors are GPS, temperature, IR, motion, and others...



The Mulle software is licensed as open source, thus allowing customers to modify existing software to suite their specific needs.



By the use of standardised protocols, the Mulle platform can communicate with a large number of consumer devices such as mobile phones, PDAs and computers. The Mulle supports the following Bluetooth Profiles: DUN, LAP, PAN-NAP, PAN-GN, PANU and SPP.

Its ultra-low power consumption with multi-year lifetime on a single battery and the use of Bluetooth and IP makes it highly suitable for sensor networking applications with Internet support.

## Mulle v3 product brief

### Physical properties

**Size** 26 x 24 x 5 mm  
**Weight** 4 g

### Connectivity

#### Wireless

Bluetooth 2.0  
 TCP/IP support  
 HTTP (web server) support

#### Bluetooth profiles

DUN, LAP, PAN and SPP

#### Pads

Power supply  
 Programming  
 LED connection

#### 60 pin multi-purpose connector

16+ digital I/O  
 8+ analog inputs, 10 bit on CPU ADC  
 2 analog outputs, 8 bit on CPU DAC  
 Interrupt signals  
 Power supply input  
 Power supply output  
 Serial programming  
 I2C  
 Voltage reference  
 Timer inputs and outputs  
 UART  
 Reset

### Power supply

#### Supply voltage

Absolute minimum 3.2 V  
 Normal range 3.5 V - 5.5 V  
 Absolute maximum 6.0 V

#### Supply current

Sleep mode 4  $\mu$ A  
 CPU only 3 - 8 mA  
 CPU and BT 6 - 50 mA

### Hardware specifics

#### CPU

Renesas M16C/62P @ 10 MHz

#### Bluetooth chipset

Mitsumi WML C46AHR

#### Sensors

Temperature sensor  
 Battery monitor unit

#### Operating temperature range

-40 – +85 °C

#### Memory

2 MB serial flash  
 31 kB on CPU RAM  
 384 kB on CPU Flash

#### Miscellaneous

Precision 1.3 V reference  
 Real time clock  
 Red and green LEDs  
 Reset circuitry

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