

The logo for 'mioty' is displayed in white lowercase letters. To its left is a white icon of a document with a folded corner. The background of the top half of the slide is a cityscape at night, overlaid with a network diagram of white lines and nodes. Several circular icons are placed at nodes: a Wi-Fi symbol, a laptop, solar panels, and a satellite dish.

# MIOTY Base Stations

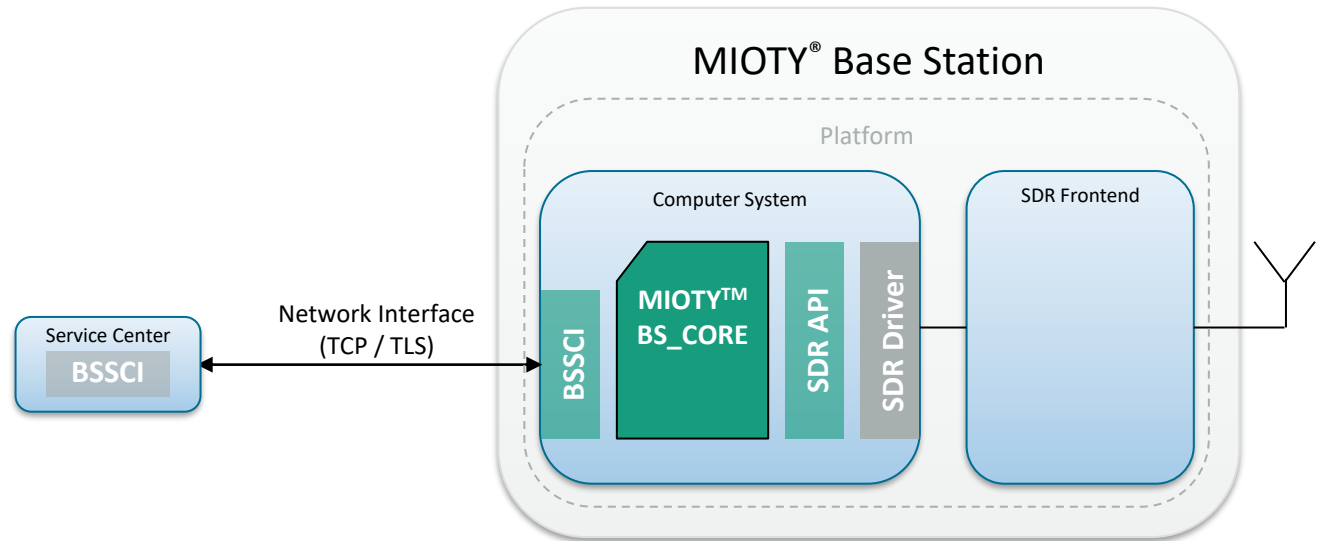
## How can you build a base station

Stefan Ereth, Dominik Soller  
Fraunhofer IIS

# MIOTY Base Station Device

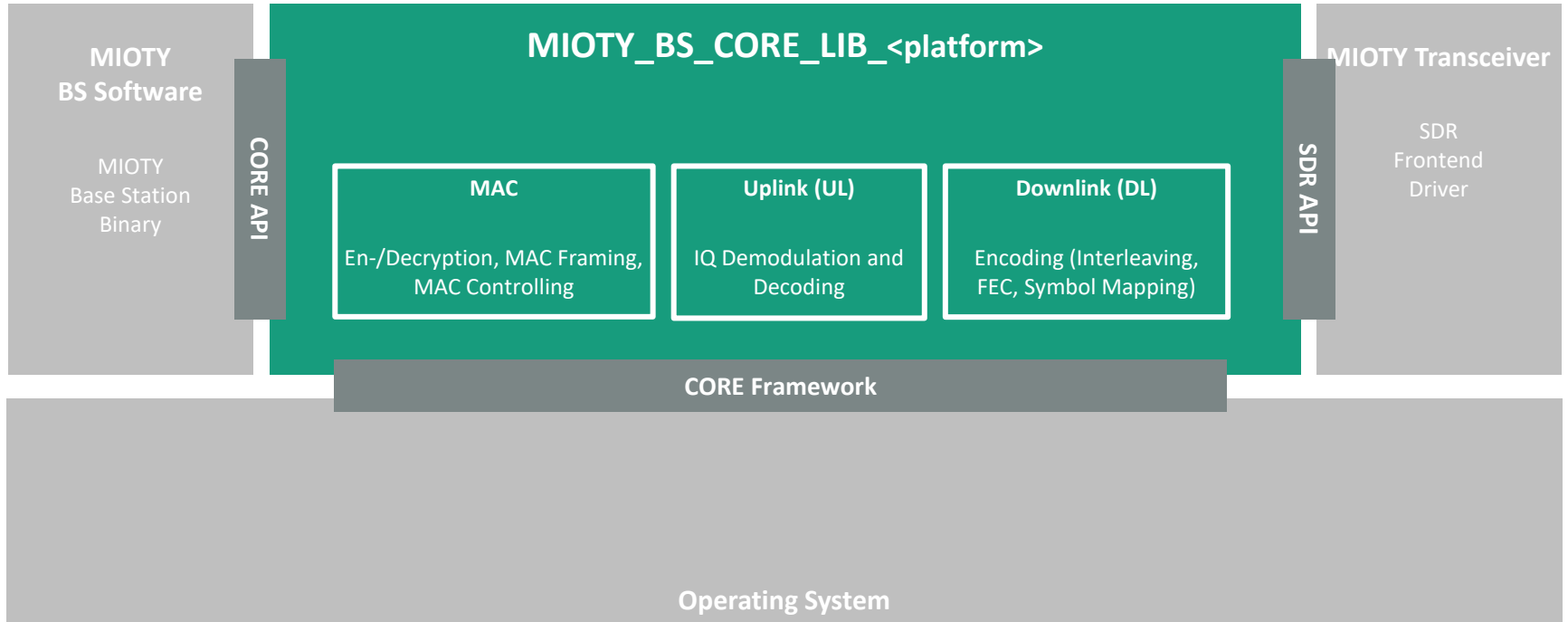
## Block Diagram

A MIOTY Base Station device comprises a computational unit and an SDR Frontend



# MIOTY Base Station Device

## Software Architecture Core v4



# MIOTY Base Station Device

## Overview

- The MIOTY Core Library **MIOTY\_BS\_CORE\_LIB\_<platform>** is implementing all functional blocks to realize the MIOTY radio protocol based on the ETSI specification TS103357.  
It comprises:
  - Uplink Physical layer functions
  - Downlink Physical layer functions
  - MAC/LINK Layer functions
- The MIOTY Core Library has Application Programming Interfaces (API) to:
  - MIOTY Base Station Software via **CORE API**
  - MIOTY Transceiver via **SDR API**

# MIOTY Base Station Device

## MIOTY\_BS\_CORE\_LIB\_<platform>

The MIOTY Core Library **MIOTY\_EP\_CORE\_LIB\_<platform>** is available for the following toolchains and architectures:

Toolchain	Architecture	Platform
GNU Compiler Collection (GCC) 5.3.1	x86-64	Linux
GNU Compiler Collection (GCC) 5.3.1	ARM64	Linux

# MIOTY Base Station Device

## Currently supported SDR Frontends

MIOTY Transceiver bindings are available for the following SDR frontends:

Manufacturer	SDR	Profiles	Mode	Status	Available
Fraunhofer IIS	Smarty	EU0/1	Uni/Bidi	Supported	✓
Fraunhofer IIS	HAT	EU0/1, EU2, US0	Uni/Bidi	Supported	✓
SDR Play	RSP1A, RSP2	EU0/1, EU2, US0	Uni	Beta/Demo	✓
Ettus	USRP B200, B200 mini	EU0/1, EU2, US0	Uni/Bidi	Beta/Demo	✓
Airspy	Airspy mini	EU0/1, EU2, US0	Uni	Beta/Demo	✓
...					

# mioty – Ultra Low Cost Frontend (HAT)

## developed by Fraunhofer IIS

### Smarty RF

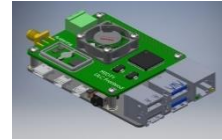
(High Performance RF Front End)



- supports all narrow-band mioty profiles
- medium scalable applications
- for environments with high extrinsic powers
- receive signals with a wide range of power levels
- components for base station
  - PC (Intel i3) / USB 2.0 interface
  - power supply
  - antenna
- BOM: 90 € w/o PCB

### mioty HAT

(Low Cost entry-level Front End)



- supports all mioty profiles
- B2C market and evaluation
- optimized for indoor use
- receive signals with a restricted range of power levels
- components for base station
  - Raspberry Pi 4
  - power supply
  - antenna
- BOM: 25 € w/o PCB

# RF Front Ends for MIOTY

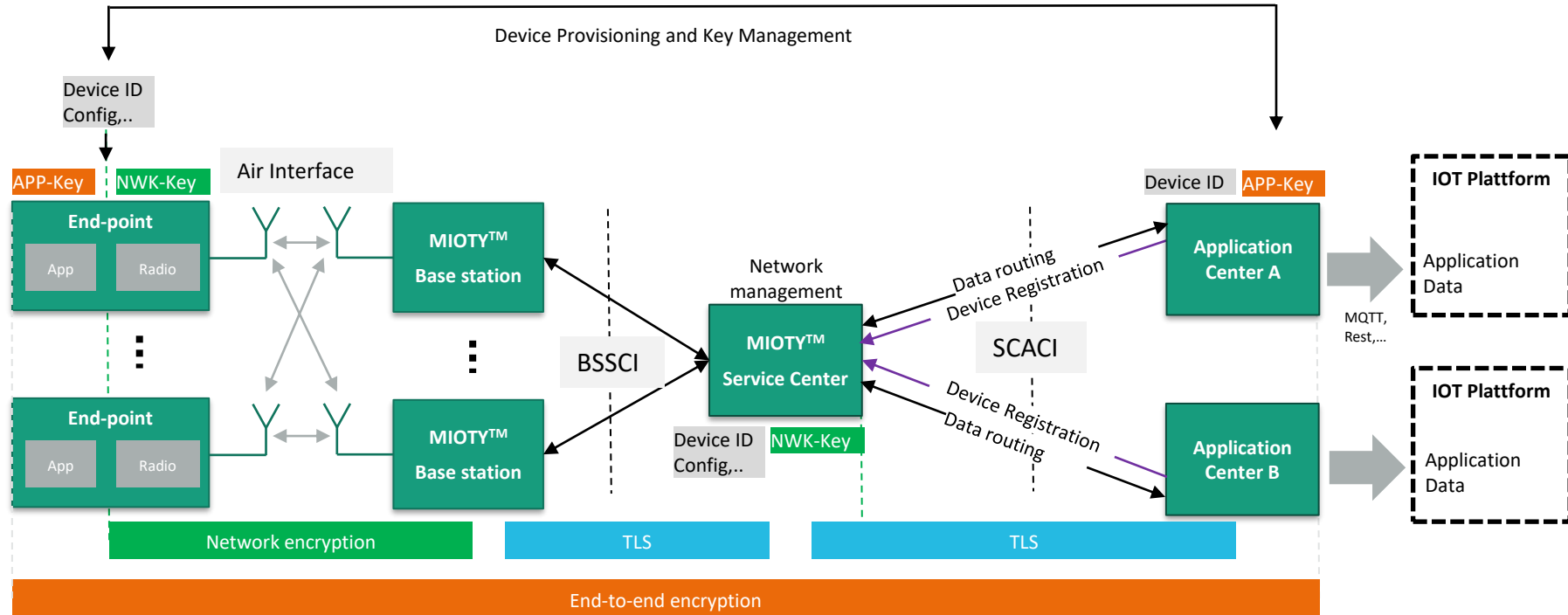
## Overview

Frontend	Smarty RF	Mioty HAT	Customized Frontend
<b>MIOTY Profiles</b>	EU0, EU1	EU0, EU1, EU2, US0	Any
<b>Frequency Bands</b>	169 MHz, 868 MHz	868 MHz, 915 MHz	Any
<b>Sensitivity (EU1)</b>	< -137 dBm	< -135 dBm	
<b>Blocking Dynamic Range (EU1)</b>	> 66 dB (100 kHz) > 126 dB (LTE20)	> 60 dB (100 kHz) > 90 dB (LTE20)	
<b>Clipping-Free Dynamic Range (EU1)</b>	> 114 dB	> 91 dB	Fully customized industrial frontend design
<b>TX Power</b>	27 dBm	14 dBm	
<b>Connectors</b>	USB 2.0	Raspberry PI GPIO	
<b>BOM (1k Pcs)</b>	Approx. 95€ w. PCB	Approx. 25€ w. PCB	
<b>Components for functional base station</b>	PC (Intel i3) with USB 2.0 interface, power supply, antenna	Raspberry Pi 4, power supply, antenna	



# ETSI LTN

## MIOTY Architecture



# Contact

MIOTY® - The Future Proven technology for the Industrial IOT

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