

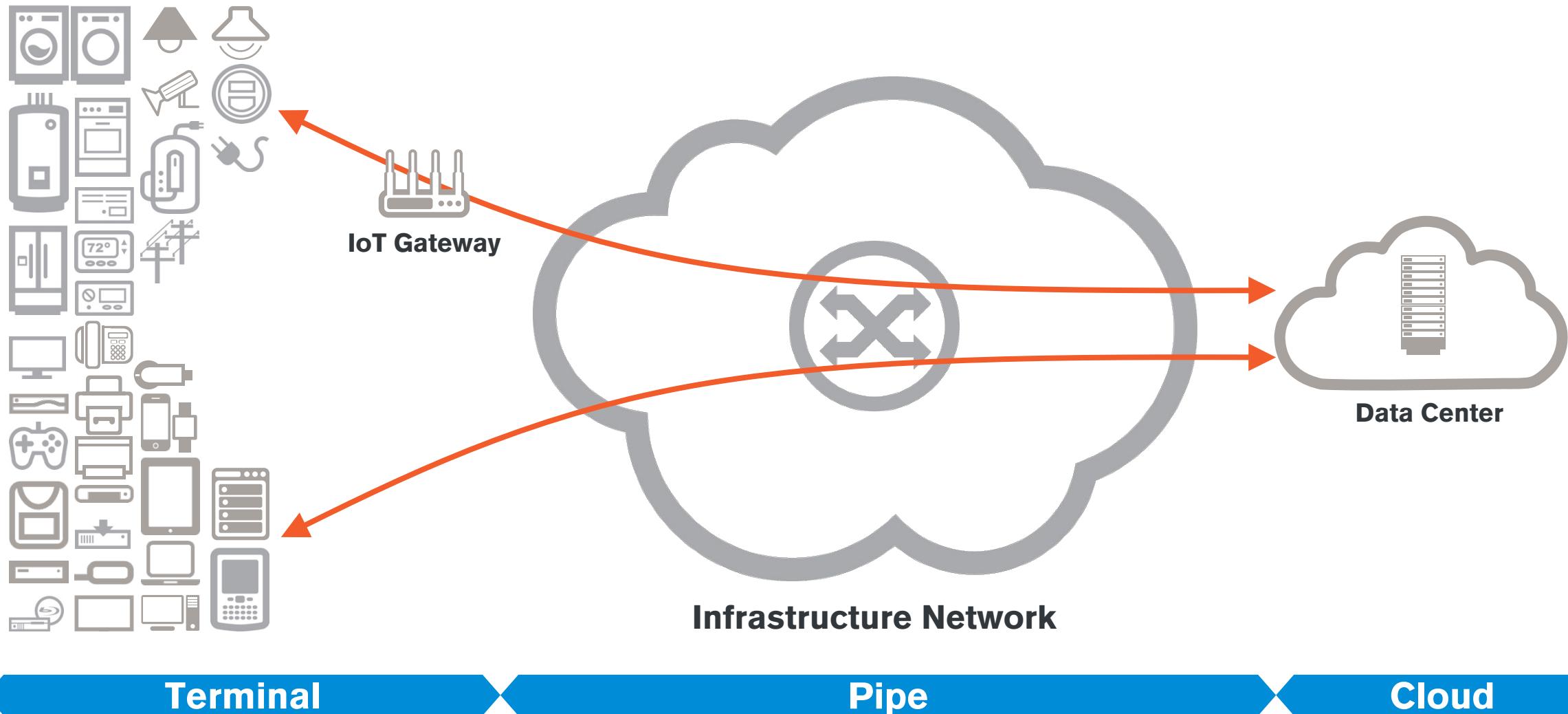


RAKWIRELESS OVERVIEW

– ACCELERATING TIME-TO-MARKET IOT SOLUTIONS

MAY 2018

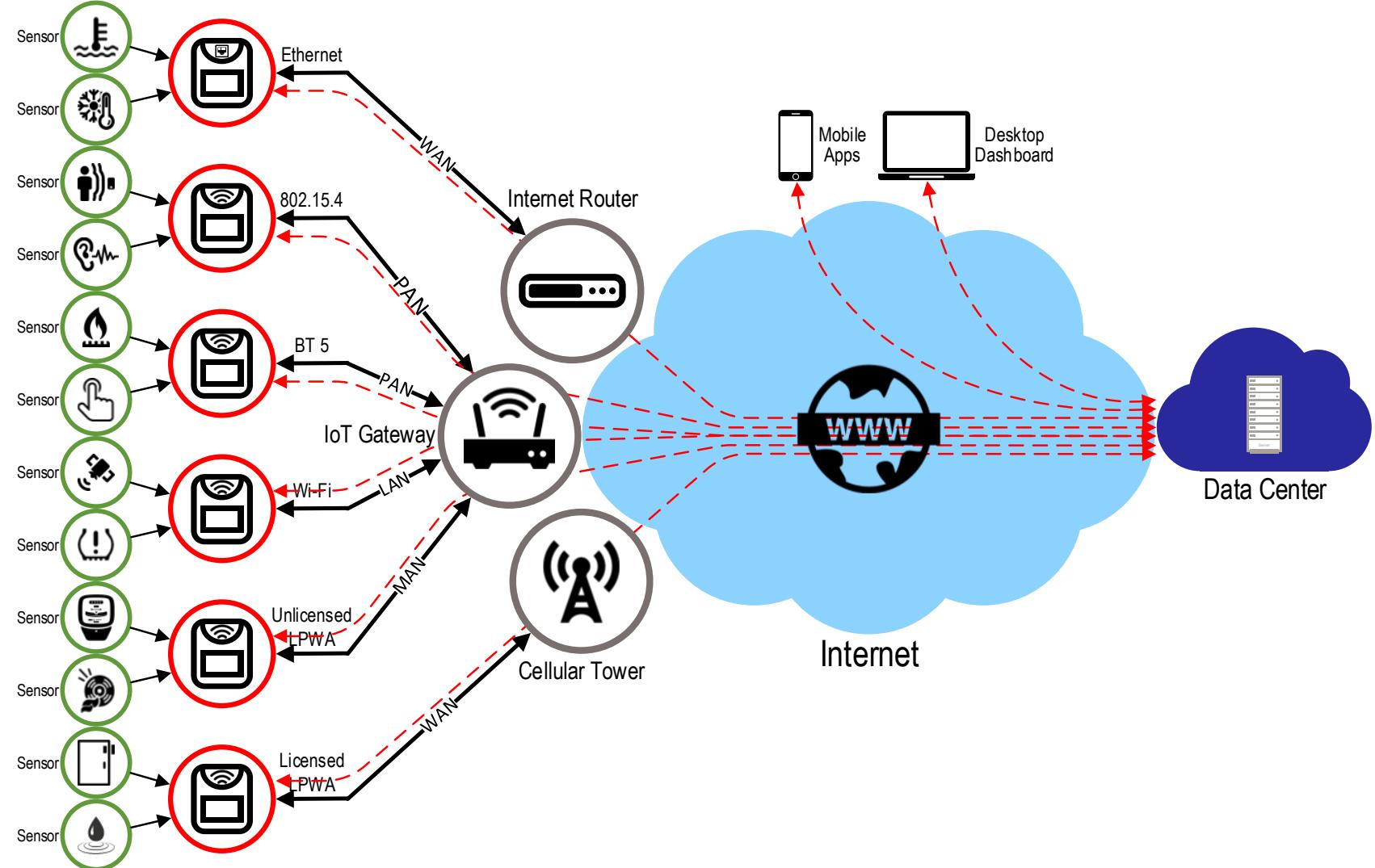
IoT End-to-End Network Architecture



IoT End-to-End Network Breakdown

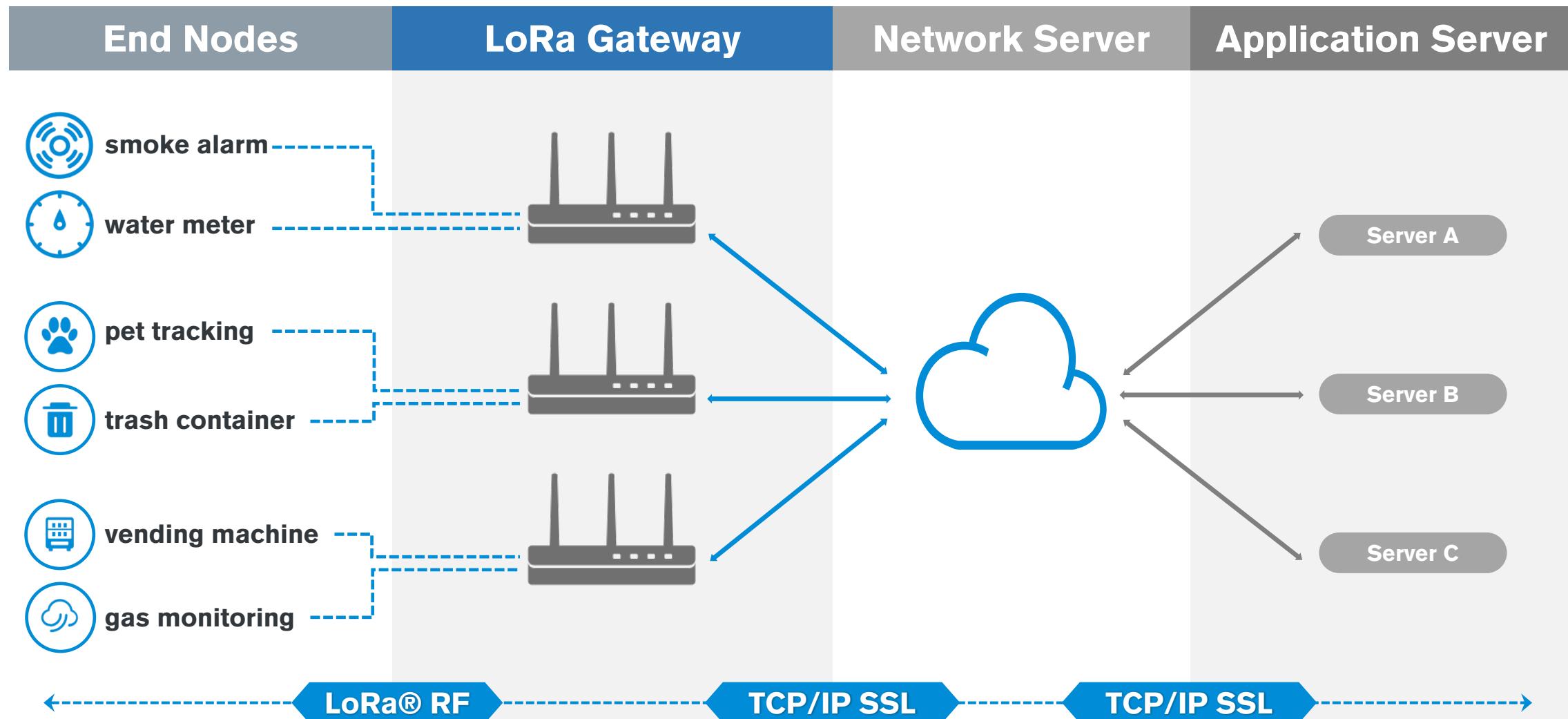


**THE THINGS
N E T W O R K**



LoRaWAN Solutions

LoRaWAN Network Architecture



LoRa Node Device & Module

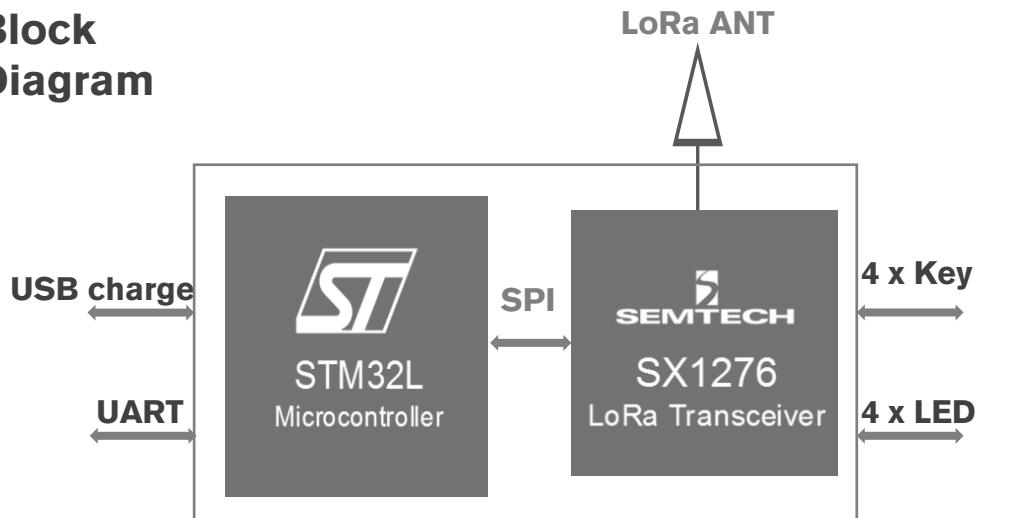


- LoRaWan Button—RAK LB801
- RAK811 Tracker
- RAK815 Tracker(LoRa + BLE)

LoRaWan Button—RAK LB801



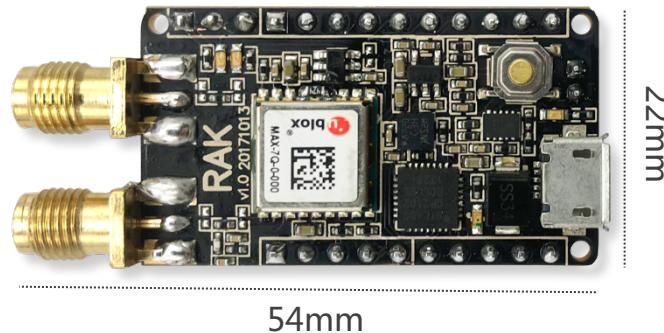
Block Diagram



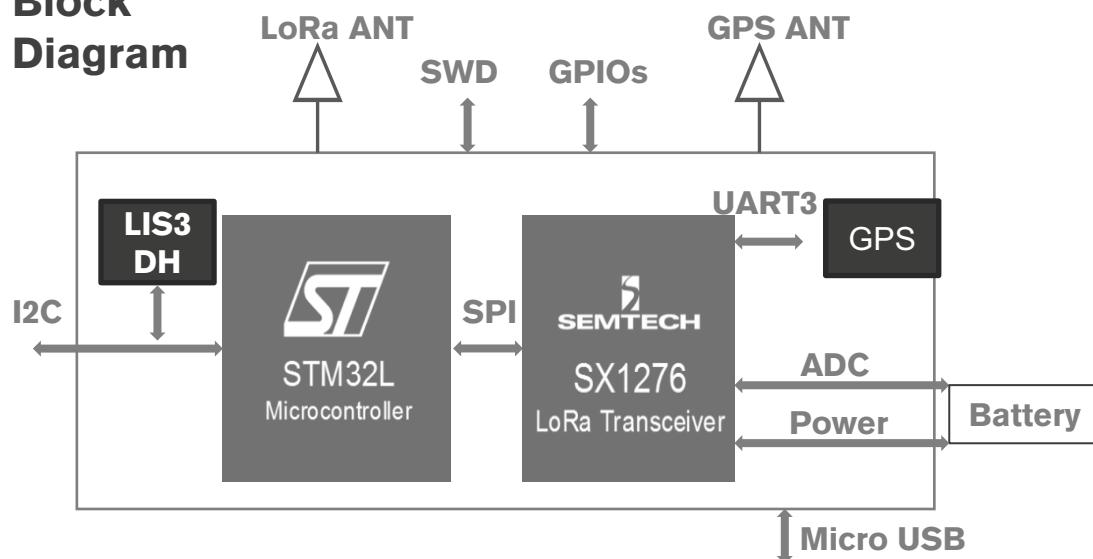
Key Features

Computing	ARM Cortex-M3@32MHz
Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Interface	USB
Battery	300mAh (To be ordered individually)
Battery working time	2 year(Chargeable)
Transmitting	14dBm,20dBm(max)
Receiving	-130dBm(RSSI), -15dBm(SNR)
Power Consumption	Tx 30ma , Standby 10ua
Distance	up to 15km
Dimension	57mm x 43mm x 15mm
Operating Temp	-20°C ~ 60°C
Working environment	Indoor or Outdoor
Network Activation way	ABP and OTAA
Upgrade Method	Serial port

RAK811 Tracker



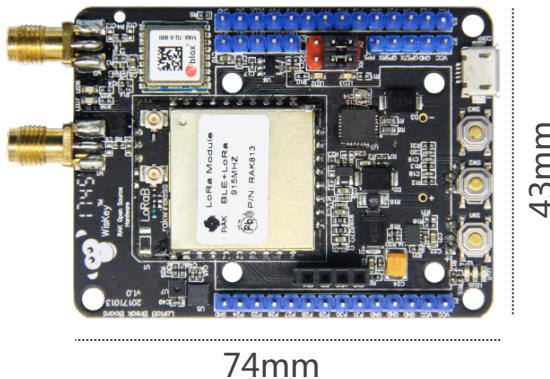
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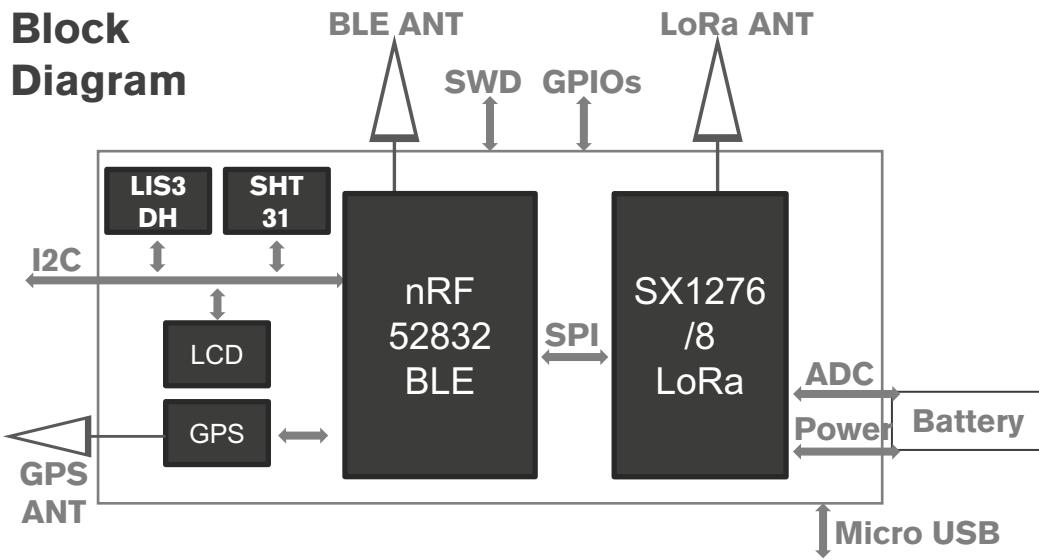
Key Features

Computing	ARM Cortex-M3@32MHz
Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Equipped with module	RAK811+GPS+MEMS
Interface	I2C,ADC,SWD,GPIOs
Battery	2200mAh (To be ordered individually)
Transmitting	14dBm,20dBm(max)
Receiving	-130dBm(RSSI), -15dBm(SNR)
Distance	up to 15km
Antenna Interface	SMA Interface
Dimension	54mm x 22mm x17mm(With antenna)
Operating Temp	-20°C ~ 60°C
Working environment	Outdoor
Network Activation way	ABP and OTAA
Open source code	Yes
Charging interface	Micro USB

RAK815 Tracker (LoRa + BLE)



Block Diagram

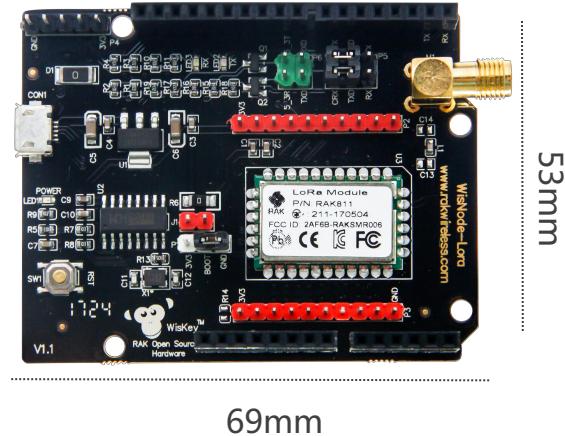


Key Features

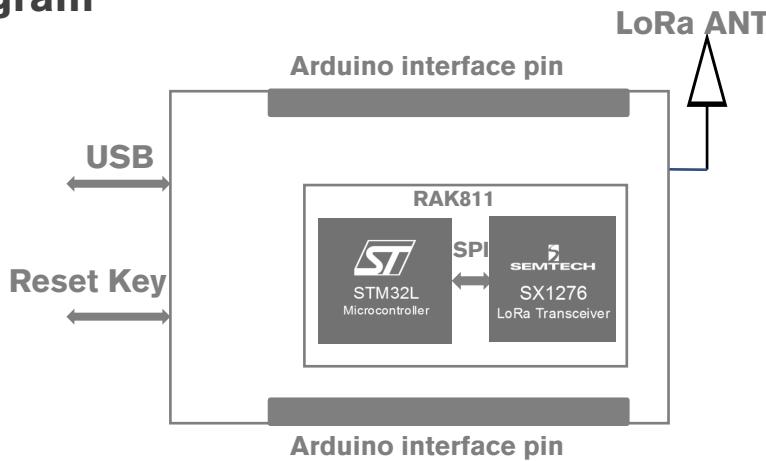
Computing	ARM Cortex-M4F@64MHz
Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Interface	I2C, GPIOs, ADC, SWD, UART
Equipped with module	RAK813+GPS+MEMS+HT+LCD
Battery	2200mAh (To be ordered individually)
Antenna Interface	SMA Interface
Dimension	74mm x 43mm x 17mm (With antenna)
Operation temperature	-20°C ~ 60°C
Working environment	Outdoor/Indoor
LoRaWAN Version	V1.0.2
Bluetooth Version	5.0
LoRa Network Activation	ABP and OTAA
Open source code	Yes
Charging interface	Micro USB

LoRa Node Device

wisnode-Lora



Block Diagram



Key Features

Module	RAK811 development board compatible Arduino development board
Frequency	433/470/868/915MHz
Interface	Micro USB(DC 5V Input/USB to TTL communication interface), Reset Key Pin Interfaces: Boot Pin, Debug Pin, Power Test Pin, Uart Switch Pin, Function expansion pin, Serial voltage conversion 3.3V to 5V pin
Antenna Interface	SMA Interface
Power Supply	USB DC 5V, Power Indicator Light
Transmitting	14dBm, 20dBm(max)
Receiving	-130dBm(RSSI), -15dBm(SNR)
Distance	up to 15km
Dimension	69mm x 53mm x 24mm
Operating Temp	-40°C ~ 85°C(industrial)

LoRa Node Device & Module

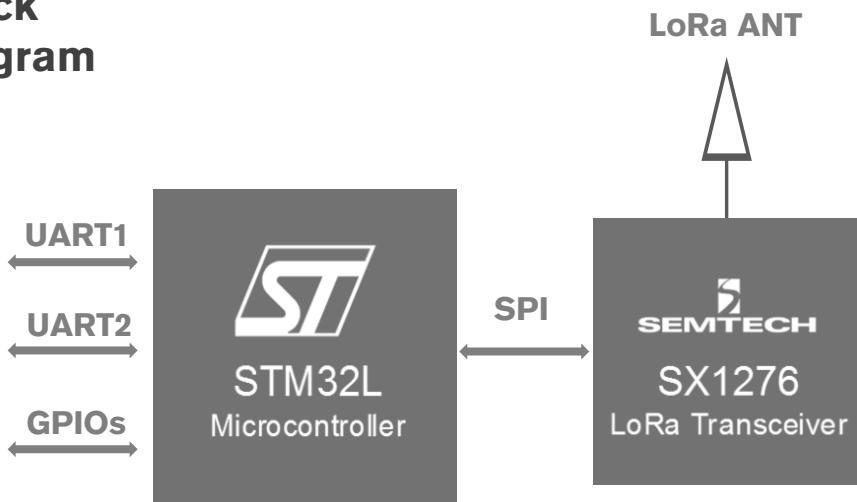


- **RAK811**
- **RAK813 (LoRa+BLE)**

LoRa Node Module **RAK811**



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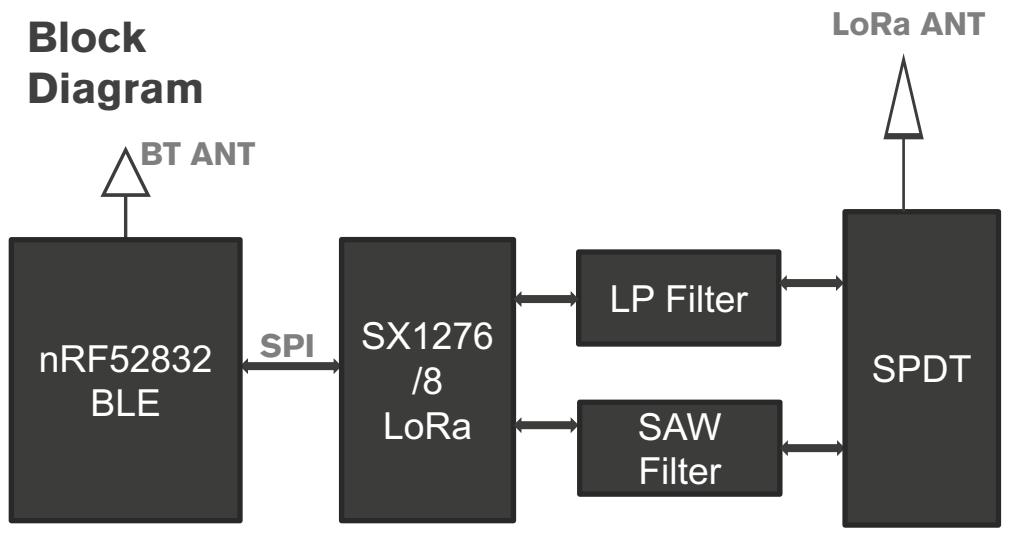
Key Features

Computing	ARM Cortex-M3@32MHz
Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Interface	UART1, UART2, GPIOs
Transmitting	14dBm,20dBm(max)
Receiving	-130dBm(RSSI), -15dBm(SNR)
Power Consumption	TX:60mA;RX:9.9mA;idle:500nA
Distance	up to 15km
Dimension	22mm x 14mm x 1.7 mm
Operating Temp	-40°C ~ 85°C(industrial)
Storage Temp	-40°C ~ 85°C(non-condense)

RAK813 (LoRa + BLE)



Block Diagram



Key Features

Computing	ARM Cortex-M4F@64MHz
Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Interface	UART, SPI, I2C, GPIOs
Transmitting	LoRa: 14dBm, 20dBm(max); BLE: -20dBm, 4 dBm in 4 dB steps
Receiving	LoRa: -146 dBm, BLE: -96dBm
LoRaWAN Version	V1.0.2
Bluetooth Version	5.0
Distance	up to 15km
Antenna Interface	U.FL Interface
Dimension	27mm x 23mm x 1.7 mm
Operating Temp	-40°C ~ 85°C(industrial)
Storage Temp	-40°C ~ 85°C(non-condense)

LoRa Gateway Device & Module

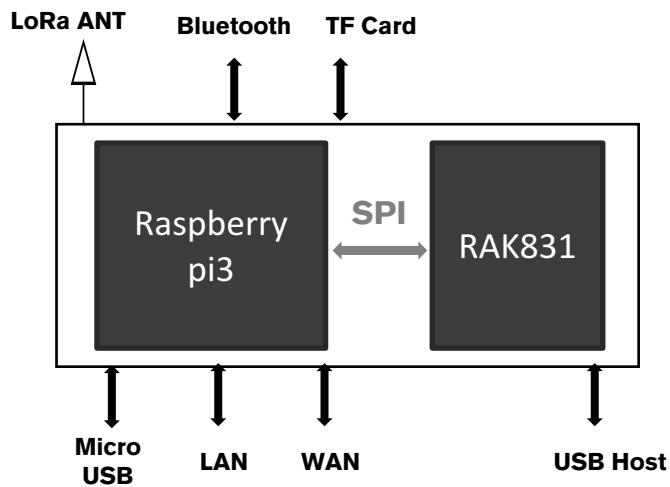


- Indoor—RAK831 Pilot Gateway
- RAK833 EVB Kit

Indoor—RAK831 Pilot Gateway



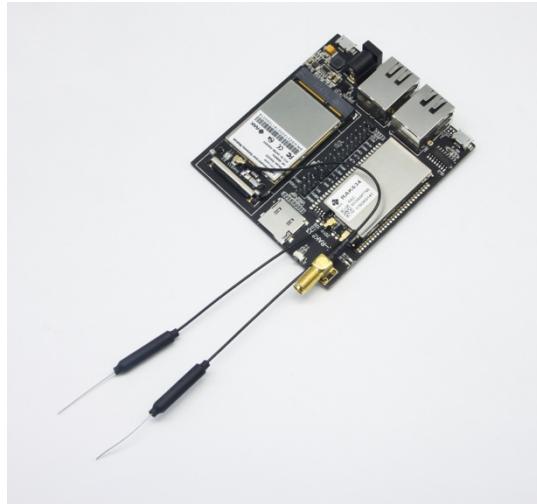
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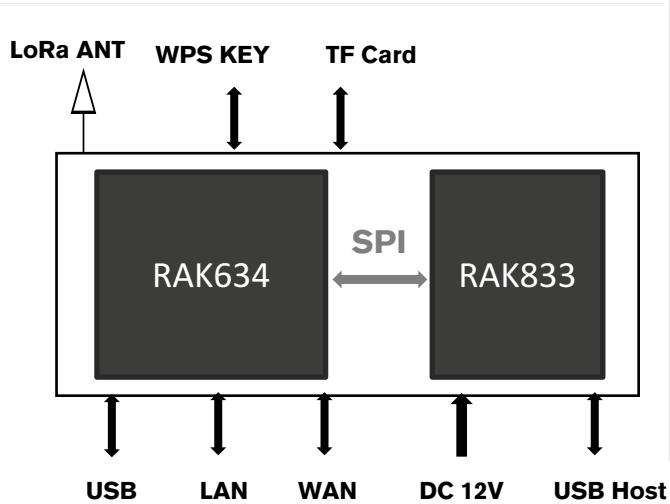
Key Features

Computing	Raspberry pi 3(Liunx)
Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Interface	SPI
Transmitting	25dBm(max)
Receiving	-142.5 dBm(min)
TRX Indication	two LEDs to indication the status of TX or RX
Power Consumption	TX:149mA; RX:211mA; Standby :27mA
Distance	up to 15 km
Antenna Interface	SMA Interface
Dimension	92mm x 68.3mm x 53.5mm
Operating Temp	-40°C ~ 85°C(industrial)
Optional	GPS receiver

RAK833 EVB Kit



Block Diagram



Key Features

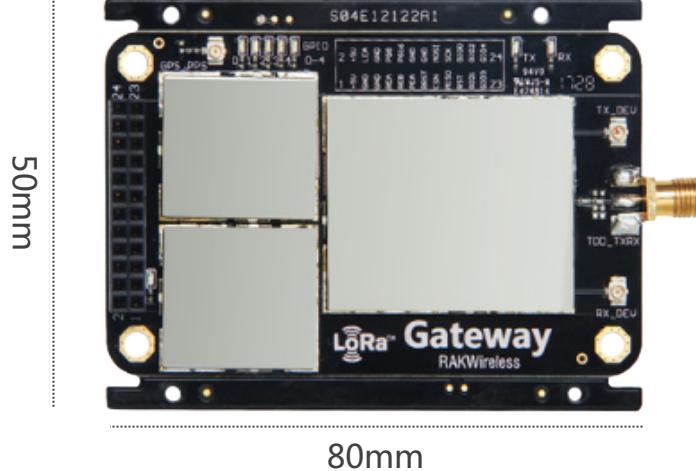
Module	LoRa Gateway: RAK833 Wireless Router: RAK634
LoRa Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Interface	WAN, LAN, USB(2), DC, TF Card, Reset/WPS KEY
RAK833 Feature	Standard Mini PCIE form factor with 52Pin Transmitting: 27dBm(max) Receiving: -142 dBm(min) Multichannel: up to 8 RX channel and 1 TX channel for 125K LoRa Distance: up to 15 km
RAK634 Feature	Frequency: 2.400-2.4835GHz(802.11b/g/n) Date Rate: up to 300Mbps 16MB Flash, 40 MHz XTAL, 128MB DDR2 External antenna through i-peX connector or layout
Antenna Interface	SMA Interface
Dimension	90mm x 80mm
Operating Temp	-40°C ~ 85°C(industrial)

LoRa Gateway Device & Module

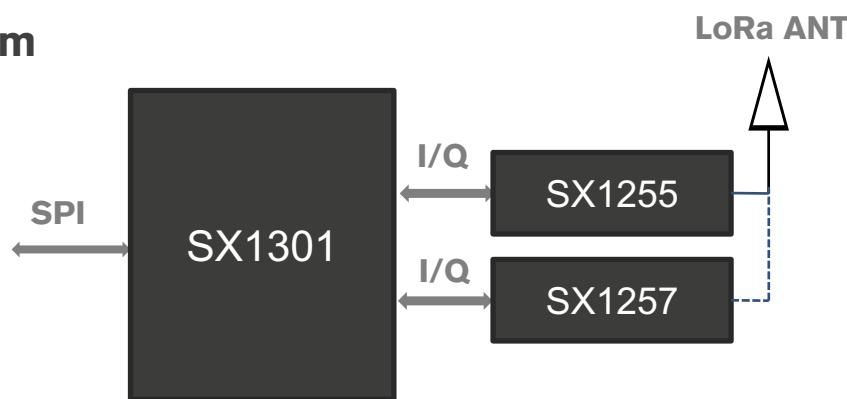


- **RAK831**
- **RAK833**

LoRa Node Module **RAK831**



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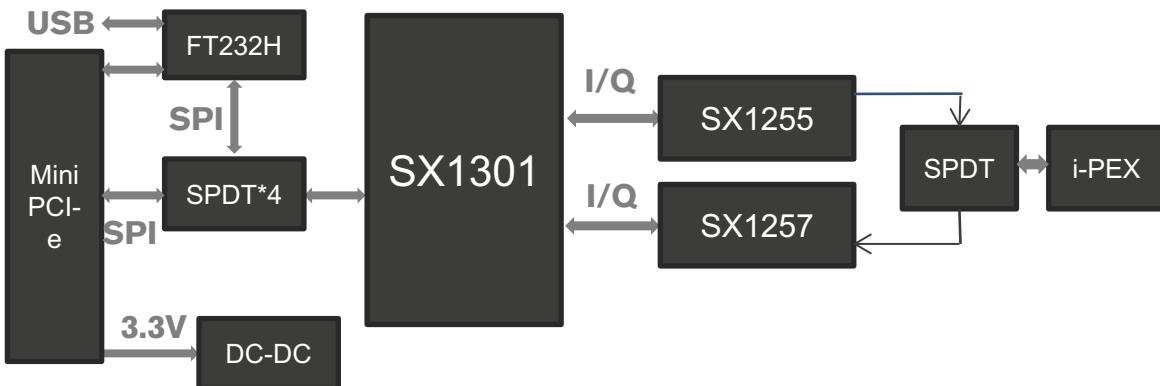
Key Features

Computing	SX1301 base band processor, LoRaTM modulation technology Emulates 49 x LoRa demodulators, 12 parallel demodulation paths
Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Interface	SPI
Transmitting	-169dBm(RSSI)
Receiving	Sensitivity down to -142.5 dBm
TRX Indication	two LEDs to indication the status of TX or RX
Power Consumption	TX:80mA; RX:100mA
Distance	up to 15 km
Antenna Interface	SMA Interface
Dimension	80mm x 50mm x 5mm
Operating Temp	-40°C ~ 85°C (industrial)

LoRa Node Module **RAK833**



Block Diagram



Key Features

Computing	SX1301(1), SX1255/7(2)
Frequency	433/470/868/915MHz (Support LoRaWAN V1.0.2)
Interface	SPI, USB2.0
Transmitting	27dBm(max)
Receiving	-142 dBm
TRX Indication	two LEDs to indication the status of TX or RX
Power Consumption	up to 8 RX channel and 1 TX channel for 125K LoRa
Distance	up to 15 km
Antenna Interface	U.FL Interface
Dimension	50.95mm x 30mm x 4.5mm
Operating Temp	-40°C ~ 85°C (industrial)

LoRa Gateway Support Mode

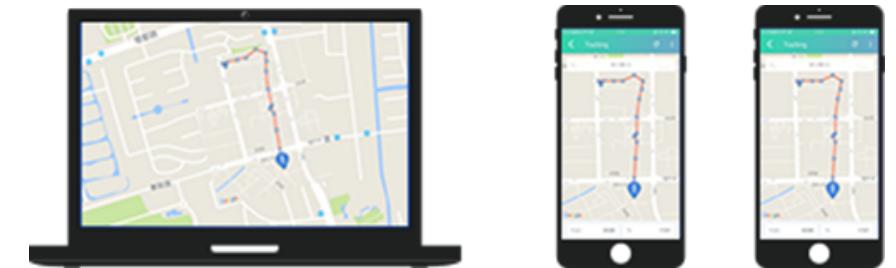
	LoRaWAN Packet Forwarder	LoRaWAN Packet Forwarder (Customization)
Join Method	OTAA/ABP	OTAA/ABP
Join Management	1. Join rule is managed via remote network server 2. All packets will be sent to network server directly	1. Join rule is managed via remote network server 2. All packets will be sent to network server directly
Protocol	TCP/UDP	Depends on third party network server
Routing	Third party network server(ex: TTN, Loriot)	Third party network server(ex: Orbiwise, Actility)

RAK LoRa Gateway Modes

IoT Solution Kit

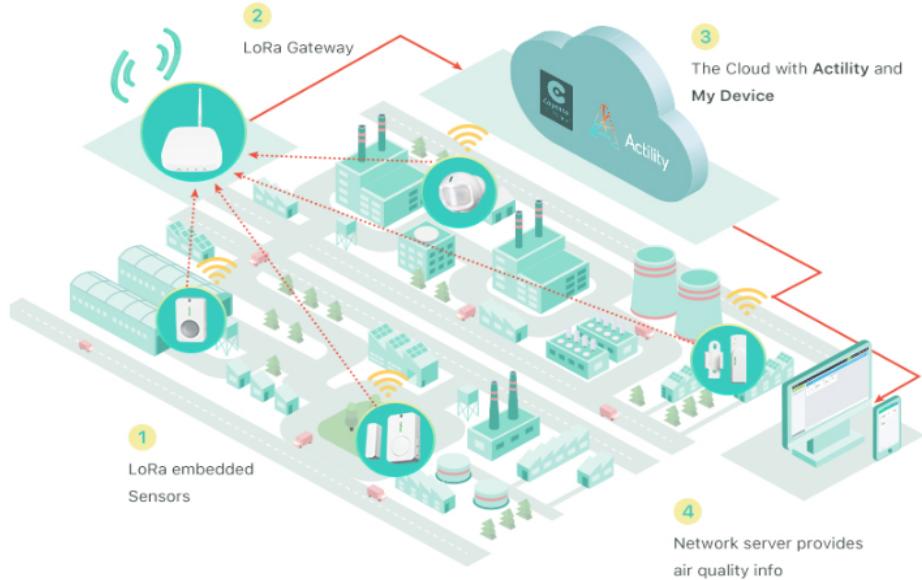
IoT Location Solution Kit

- GPS tracking
- Webpage support
- APP support

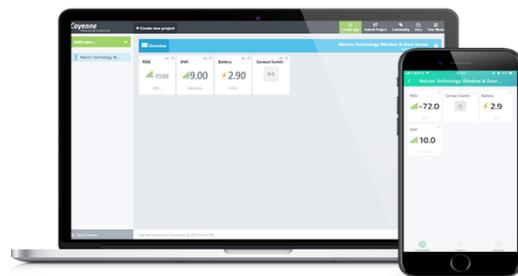


ShenZhen Guangdong, China

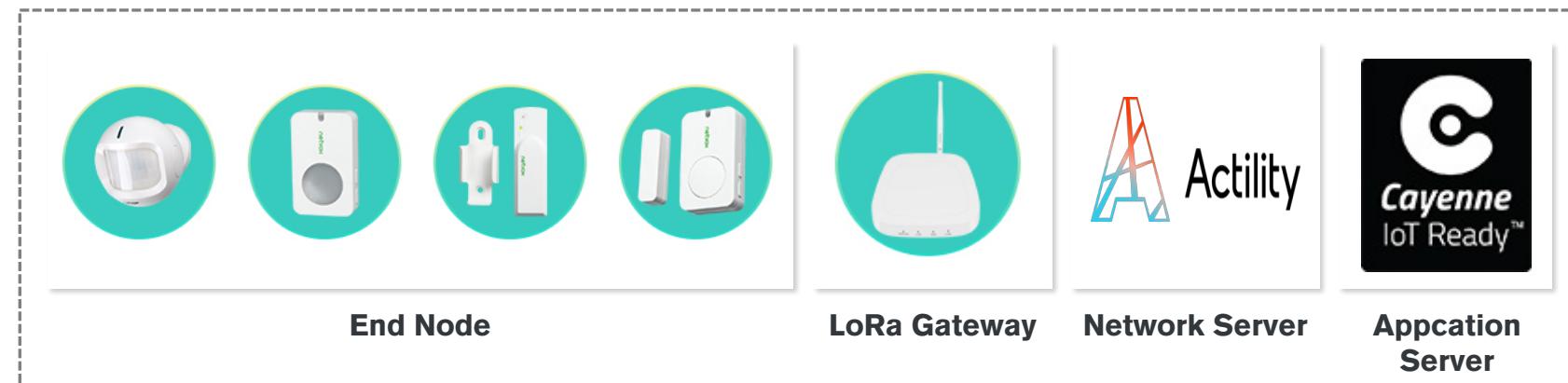
IoT Sensor Monitor Solution Kit



- Temp & Hum Detector
- Light Switch On/Off
- Windows/Door Control
- Infrared motion detection
- Webpage support
- APP support



Show data in webpage and APP





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