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Solutions for asset tracking applications

Overview



Asset Tracking Applications and segmentation

Outdoor real-time monitoring



Containers



Fleet management



Livestock monitoring



Tractor



Mobility sharing



Indoor localization & Warehouse logistics



RTLS



Mobile assets



pallet



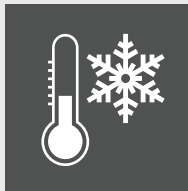
Smart parcels



Employee Safety



Good guarantee



Cold chain



Food tracing



Medical



Disposable



Letters



Packages



Parcels



Asset tracking – Needs per applications

		Processing & security	Sensing	Connectivity	Power management	
Outdoor real-time monitoring Containers, livestock monitoring, Mobility sharing, fleet management, pet, tractor		Dedicated MCU Dedicated secure chip	HI-G 	 UHF Sigfox LoRa GNSS NB-IoT LTE-M	 	Real-time tracker
Indoor localization & Industrial logistics Pallets, racks, Real Time Localization, Smart Parcels, Employ safety		Dedicated MCU Embedded security	HI-G 	 UHF Sigfox LoRa UWB Wi-Fi NB-IoT LTE-M		Complexity (# of sensors, connectivity)
Good guarantee Cold chain, food tracing, medical		Dedicated MCU Embedded security	HI-G 	 UHF Sigfox LoRa Wi-Fi NB-IoT LTE-M		
Disposable Letters, packages, parcels		Sensor with processing Embedded security	 	 UHF Sigfox LoRa NB-IoT LTE-M		Logger

Asset tracking

ST 360° portfolio delivers 100% flexibility

Outdoor real-time
monitoring



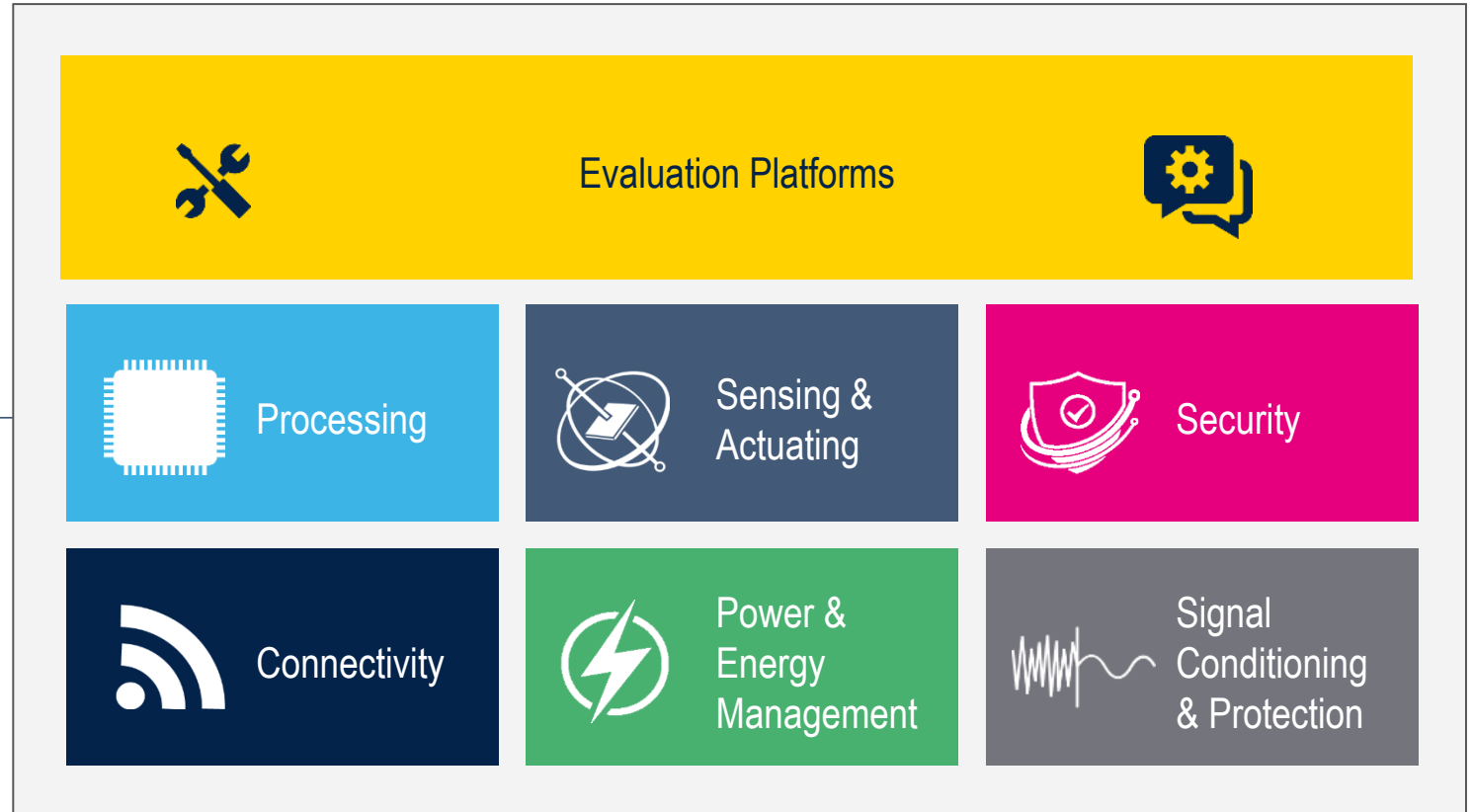
Indoor localization &
Warehouse logistics



Good guarantee

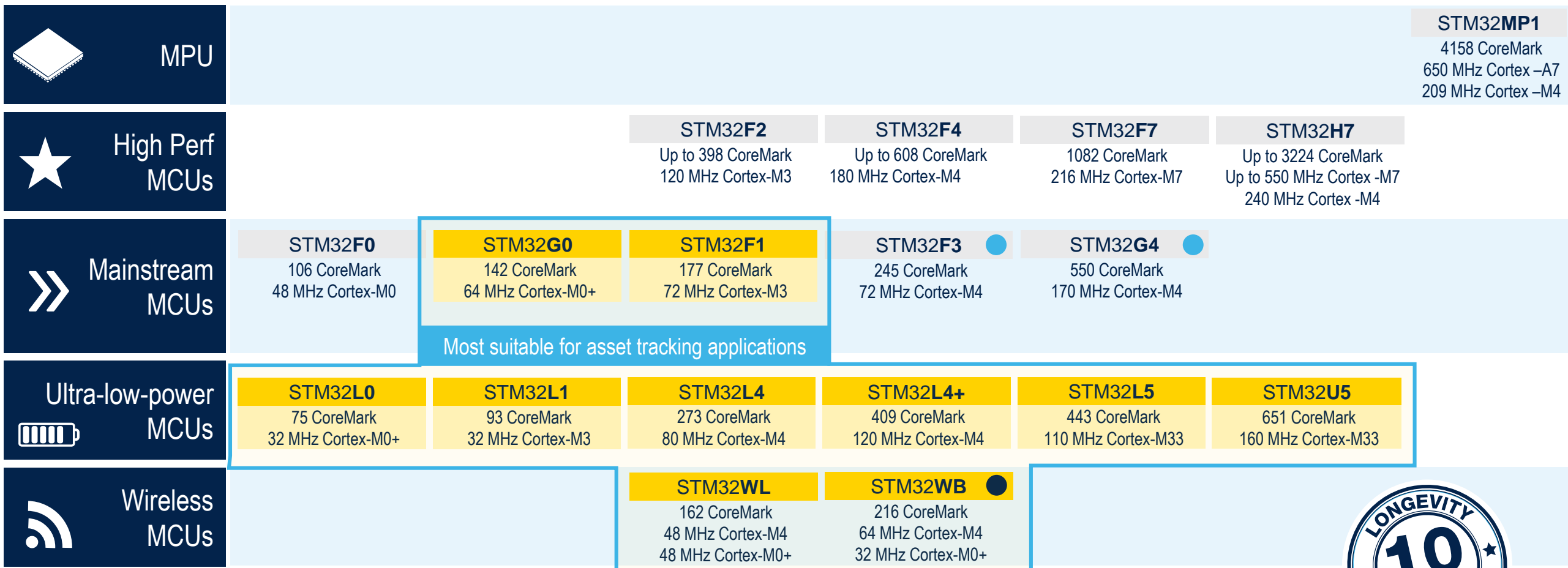


Disposable





STM32 portfolio



● Optimized for mixed-signal applications

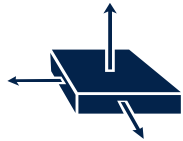
● Cortex-M0+ Radio co-processor



Sensors for asset tracking



Temperature, Humidity sensors to monitor environmental changes/activate the de-humidification system, check sealing, consistency of cold chain



Accelerometer to detect motion/wake-up, vibration, crash/shocks, freefall, upright and orientation



Proximity and Light Sensor for container door open/close monitoring and shipment security



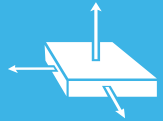
Pressure airplane Take off and landing detection or altitude detection



Microphones for security and emerging applications.

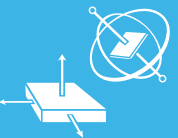


ST sensors for asset tracking



Accelerometers

High-g shock accelerometer	H3LIS331DL
Vibration	IIS3DWB
Ultra-low power	LIS2DW12 LIS2DH12
With embedded temperature sensor	LIS2DTW12
Inclinometer	IIS3DHHC IIS2ICLX



iNEMO® Inertial Module

6x IMU	LSM6DSOX LSM6DSO32
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Magnetometer

Magnetometer	LIS2MDL
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Pressure Sensors

Precision pressure sensor	LPS22HH
Waterproof pressure sensor	LPS27HHW LPS27HHTW * LPS33W



Temperature & Humidity Sensors

Humidity & temperature sensor	HTS221
Digital temperature sensor	STTS751 STTS22H
Analog temperature sensor	LM235 STLM20



MEMS Microphones


Digital high-performance Microphone	MP34DT05-A MP23DB01HP
Analog high-bandwidth Microphone	MP23ABS1 IMP23ABSU

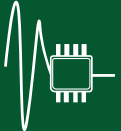



FlightSense Time-of-Flight sensor


Proximity sensor (with ALS)	VL6180/80X
Ranging sensor	VL53L0X
Long distance ranging sensor	VL53L1X
Extra-long distance & Multi-target	VL53L1CB

Complementary products for asset tracking

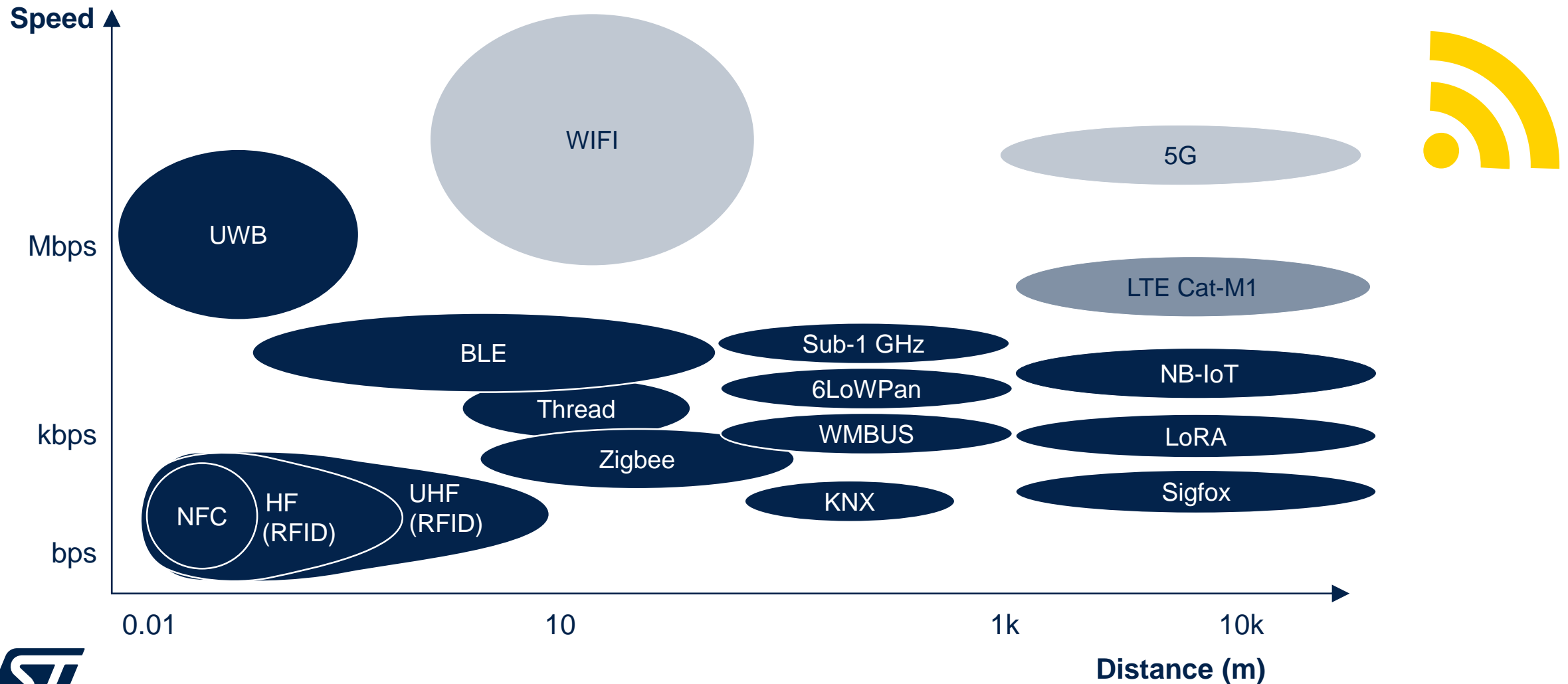
 DC/DC converters	
Synchronous converter, Output voltage flexibility, 400 mA output current, Nano-quiescent current (500 nA) for extended sensors battery life	ST1PS01/02

 Voltage regulators	
200 mA ultra-low quiescent current LDO	STLQ020
Low Iq, ultra low noise 300 mA LDO with power good	LDLN030
Low Iq, ultra low noise 250 mA LDO	LDLN025
Low Iq, ultra low drop 300 mA LDO	LD59030

 Operational amplifiers	
Zero Drift CMOS amplifier <ul style="list-style-type: none"> • Very low offset 5 μV max • Very low drift in temperature 30 nV/$^{\circ}\text{C}$ 	TSZ12 Series
Zero Drift & Speed Amplifier <ul style="list-style-type: none"> • Very low offset 25 μV max • Very low drift in temperature 0.1 $\mu\text{V}/^{\circ}\text{C}$ • Excellent speed/power ratio 3 MHz/1 mA 	TSZ18 Series
Nano-power amplifiers - Zero Drift <ul style="list-style-type: none"> • 900 nA current consumption • Only 150 μV max input offset voltage • Operating from 1.5 V 	TSU11 Series
Nano-power amplifiers <ul style="list-style-type: none"> • 580 nA current consumption • Operating from 1.5 V 	TSU10 Series
Nano-power comparator <ul style="list-style-type: none"> • 200 nA current consumption • Operating from 0.9 V • Push Pull & Open Drain 	TS88 Series

 Protection devices	
SD card protection	EMIF06-MSD02N16
USB 2.0 dataline	ECMF02-4CMX8
DC-DC protection	ESDA7P120-1U1M
ESD protection	USBULC6-2M6
USB TYPE-C Power Delivery protection	TCPP01-M12

IoT wireless connectivity



ST connectivity for asset tracking



NFC & RFID

NFC / RFID tags	ST25TV
Dynamic NFC / RFID tags	ST25DV-I2C
NFC Readers	ST25R
NFC Readers for UHF	ST25RU



Bluetooth Low Energy

Multi-protocol (Bluetooth 5.0 / 802.15.4) Wireless SOC with integrated balun	STM32WB55 / 50 / 35 / 30
Multi-protocol Module (Bluetooth 5.0 / 802.15.4)	STM32WB5MMGH
Highly energy-efficient Bluetooth 5.x Wireless SoC	BlueNRG-2 BlueNRG-LP
Bluetooth 5.0 Modules	BlueNRG-M2
Balun & Filter	BALF-NRG-02D3 MLPF-NRG-01D3 MLPF-WB55-0xE3



Sub-1 GHz

Sub-1 GHz Transceiver/Transmitter Sigfox compatibility	S2-LP S2-LPTX
Balun for S2-LP	BALF-SPI2-01D3
STM32 Sub-1 GHz SOC LoRa/Sigfox compatibility	STM32WL



WPAN

Bluetooth LE 5, Zigbee, Thread, proprietary Wireless SOC (integrated balun)	STM32WB
Balun for UWB	BAL-UWB-01E3
Ultra wideband connectivity	STM32x*



Positioning

GNSS Module	TESEO-LIV3x
GNSS Multi-Bands Module	TESEO-LIV4x*



Cellular

Cellular connectivity	STM32x*
eSIM	ST4SIM



Asset tracking reference design by connectivity



NFC & RFID



NFC Sensor Tag
STEVAL-SMARTAG1



Bluetooth®
Low Energy



SensorTile.box
STEVAL-MKSBOX1V1



Wi-Fi



STWIN
STEVAL-STWINKT1B



Sub-1 GHz



IoT LoRA® Tracker
STEVAL-STRKT01



Sub-1 GHz



Sigfox Tracker
FR-ATR-SIGFOX1



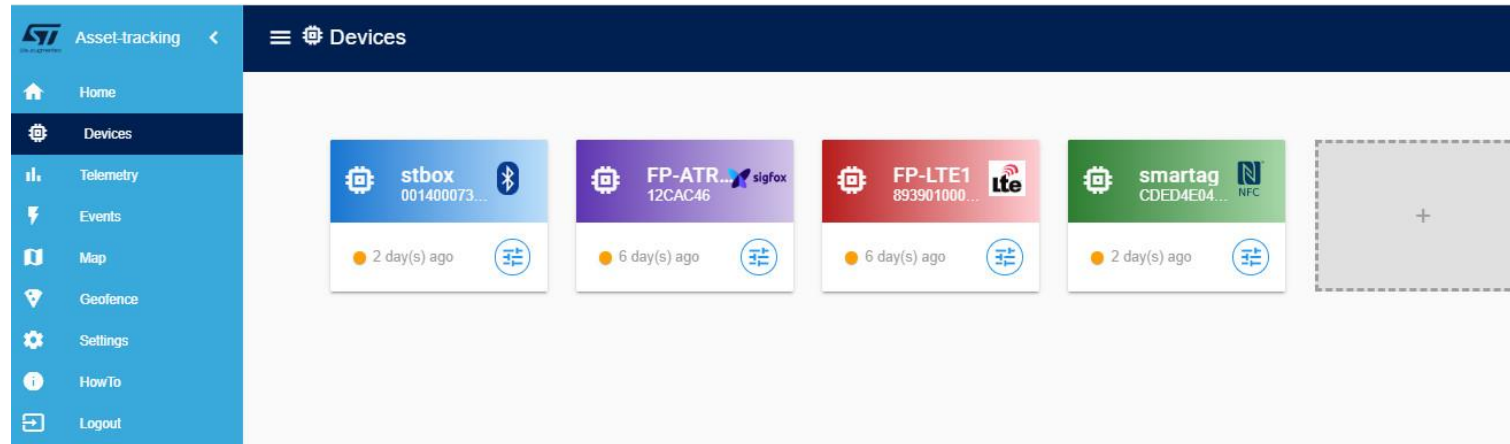
Cellular & GNSS



LTE™ Tracker
FR-ATR-LTE1

ST asset tracking Cloud dashboard DSH-ASSETTRACKING

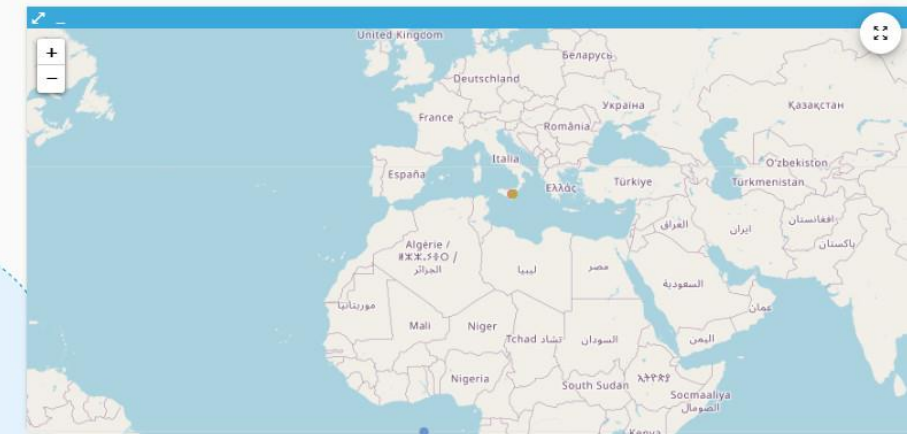
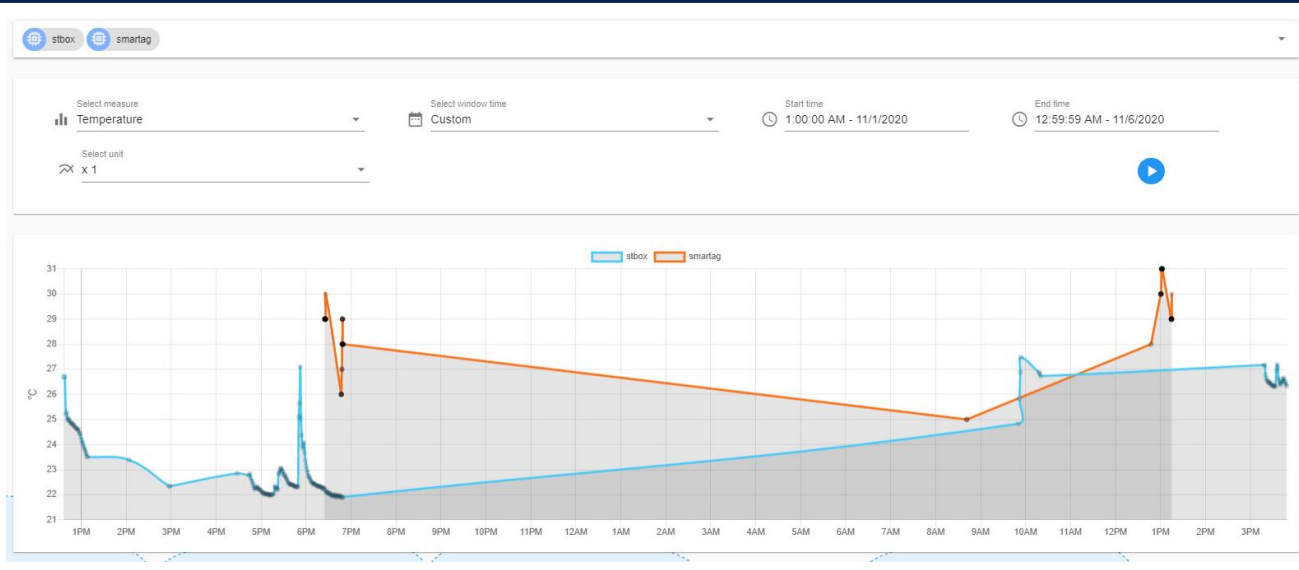
<https://dsh-assettracking.st.com/>



Alert on custom event

Geo-localization

Plotting on chart the data telemetry coming from a selected device



End-to-end Proof of Concepts Asset Tracking



Thank you

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