



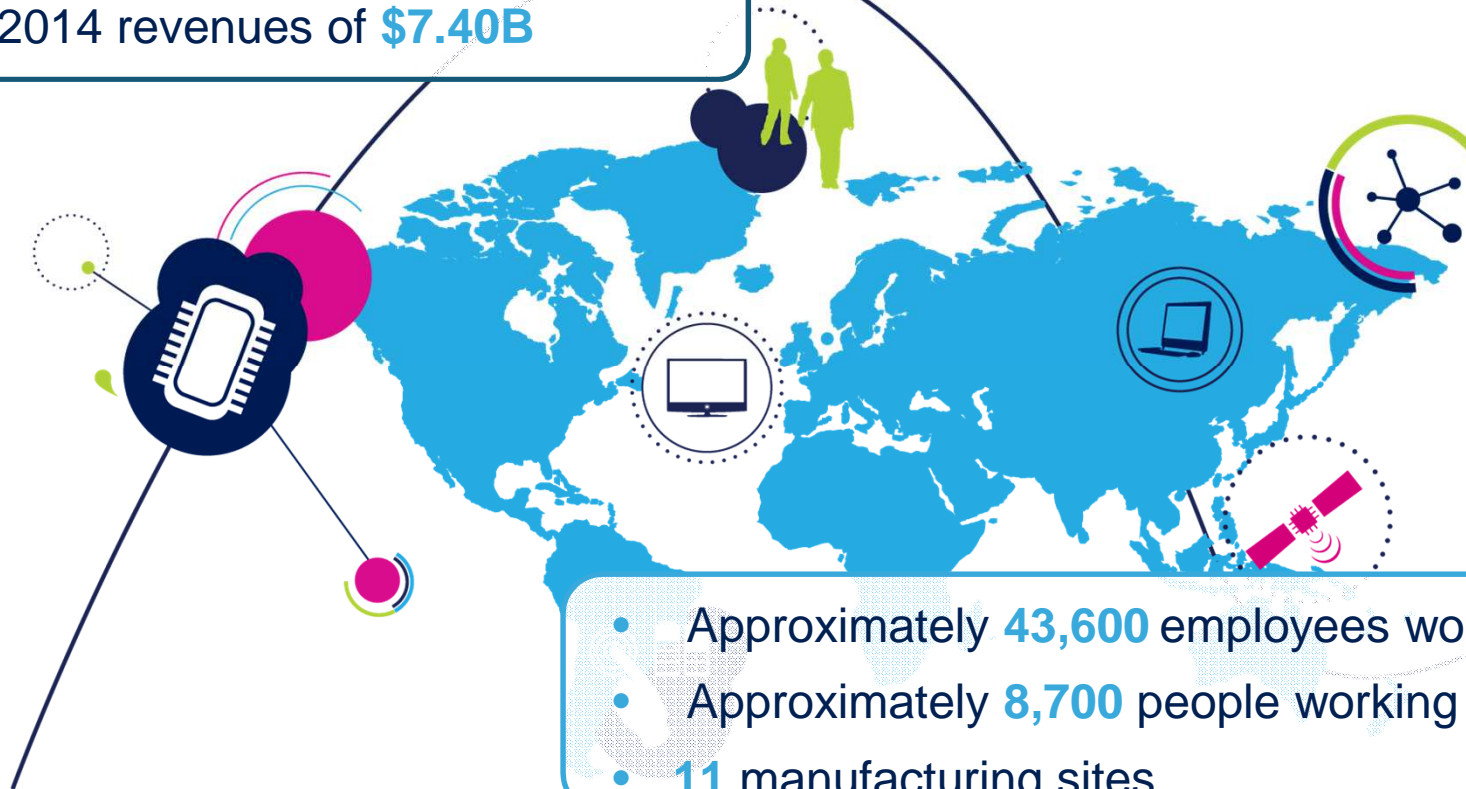
STMicroelectronics: Open Development Environment (ODE) un sistema di sviluppo per applicazioni IoT

Politecnico di Torino – ICT Days – June 4, 2015

Fabio Osnato, Fabien Castanier, Fulvio Corazzo

Who we are 2

- A global semiconductor leader
- 2014 revenues of **\$7.40B**



- Approximately **43,600** employees worldwide
- Approximately **8,700** people working in R&D
- **11** manufacturing sites



Listed on New York Stock Exchange,
Euronext Paris and Borsa Italiana, Milano

Flexible and Independent Manufacturing

- Front-End
- Back-End

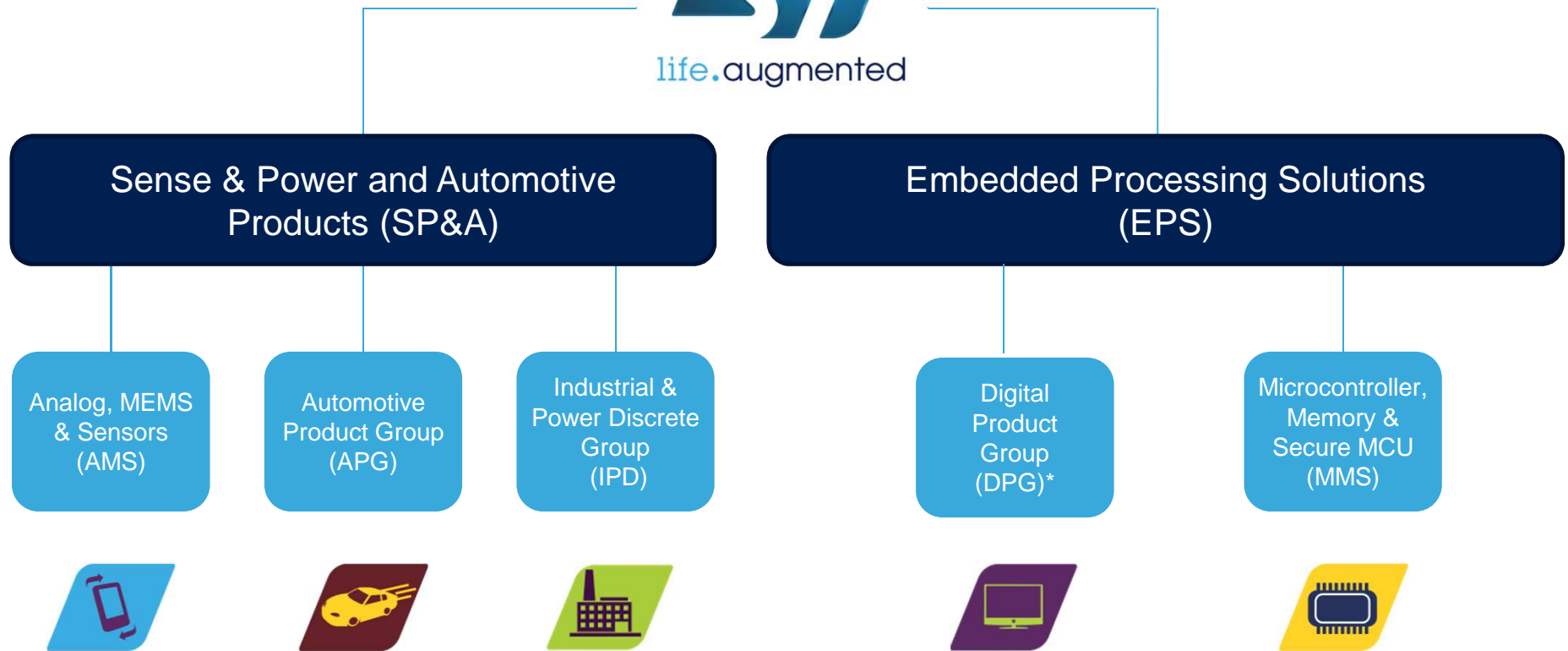


Advanced research and development centers around the globe

~15,000 patents; ~9,000 patent families; 500 new filings (in 2014)

~ 8,700 people working in R&D and product design

Product Segments



* Includes legacy ST-Ericsson products

Where you find us



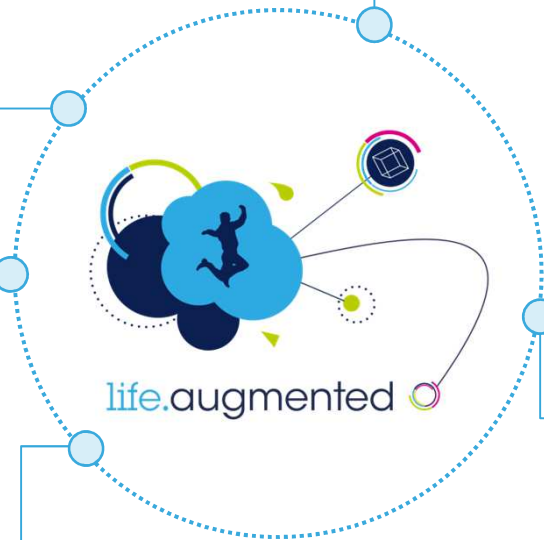
Our MEMS & Sensors
are augmenting
the consumer experience



Our digital consumer products
are powering the augmented
digital lifestyle



Our automotive products
are making driving safer,
greener and more
entertaining



Our Microcontrollers
are everywhere
making everything smarter
and more secure



Our smart power products
are allowing our mobile products to operate longer
and making more of our energy resources

New Things to Augment Life

Smart City

- Reduce traffic congestion
- Better use of resources
- Improve security



Smart Car

- Reduce emissions
- Increase safety
- Save fuel



Smart Home

- Make entertainment more interactive and immersive
- Increase comfort
- Save energy



Smart Me Healthcare

- Empower patients
- Help physicians monitor and diagnose remotely



Smart Me Fitness & Wellness

- Help to lead healthier lives
- Optimize sports performance
- Early warning of illness



ST's vision and strategy

OUR VISION

Everywhere microelectronics make a positive contribution to people's lives, ST is there



Smart Power



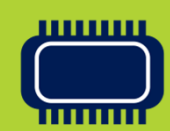
MEMS and Sensors



Digital Consumer & ASICs



Automotive



Microcontrollers

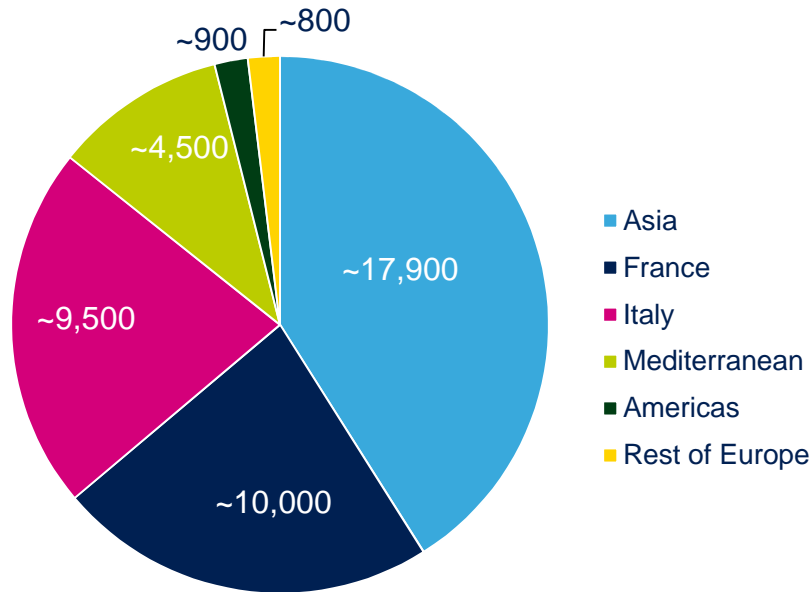
OUR STRATEGY

Leadership in Sense & Power, Automotive Products and Embedded Processing Solutions



People are our Foundation...

Present in **over 35 countries**



Manufacturing ~ 64%

Research & Development ~ 20%

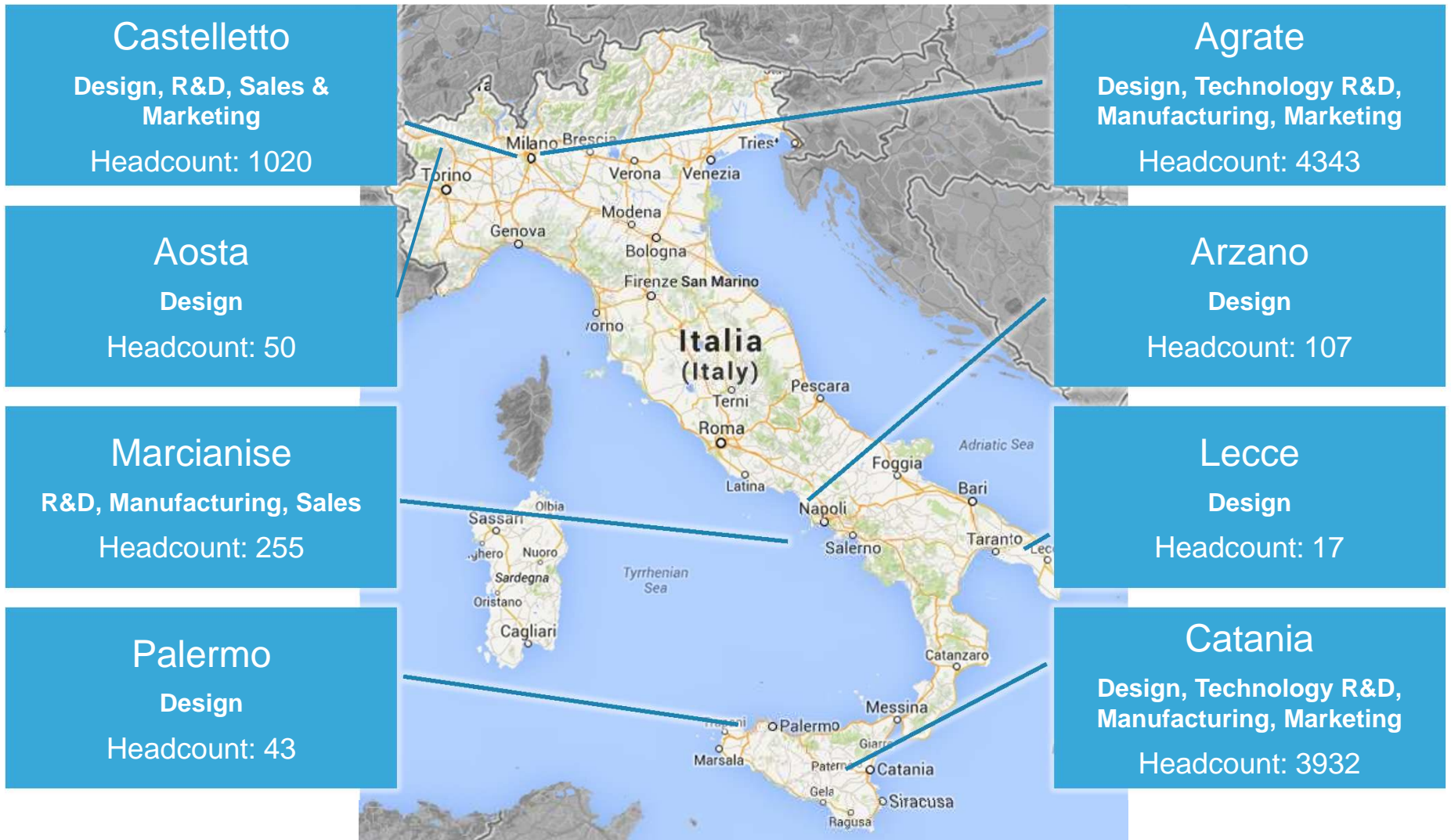
Marketing & Sales, Divisional Functions, Administration & General services ~ 16%

...working everyday to increase the quality and experience of life for all



ST in Italy

9



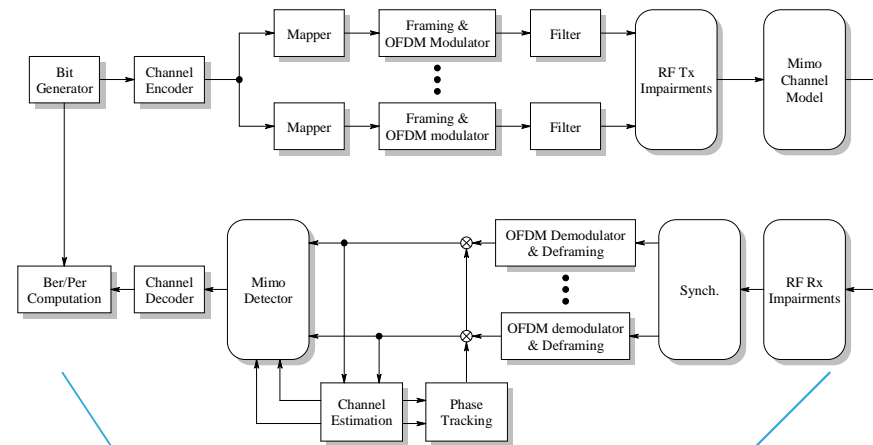
Total ST census in Italy in 2015 : 9767

Job functions at ST (1/3)

10

- **Design Architecture**

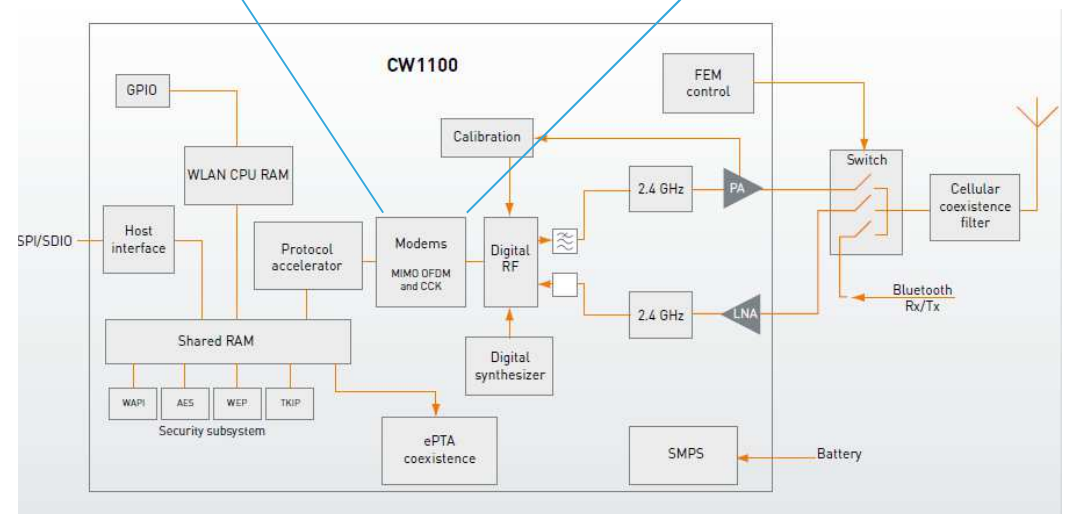
- System specification
- System modeling and simulation
- Definition of system architecture
- Performance study



Example: Wi-Fi PHY BaseBand IP Model

- **Design H/W**

- Digital design
- Analog design
- Testing
- Documentation



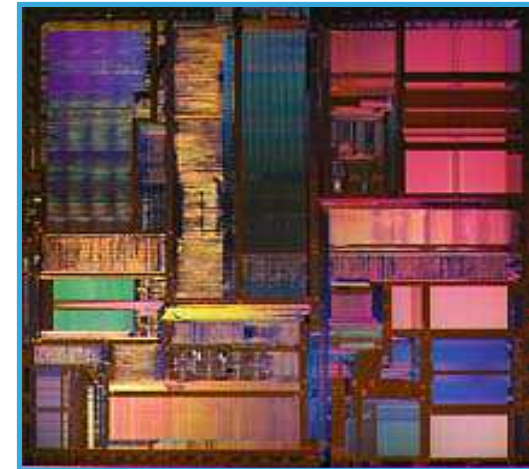
Example: Wi-Fi Transceiver SoC Architecture

- **Layout**

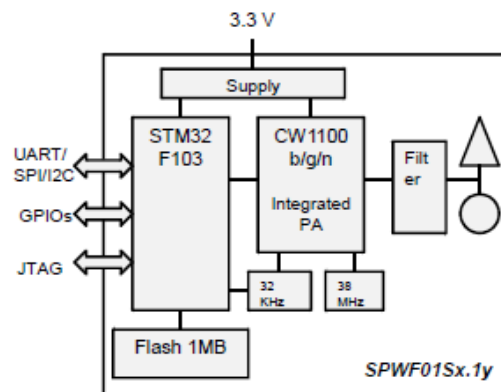
- Physical realization of project layout guaranteeing quality standards, time to market and costs

- **Product and Test Engineering**

- Ensuring new device industrialization and achieving the highest possible production standard



Ex.: SoC Layout



Example: SPWF01SA Wi-Fi Module

- **Design S/W**

- Study of requirements
- Embedded software development
- Software testing

- **Application Development**

- Application reference software development
- Demo tools and lab solutions

```
#include <stdio.h>
#include <stdlib.h>
#include <sys/types.h>
#include <arpa/inet.h>

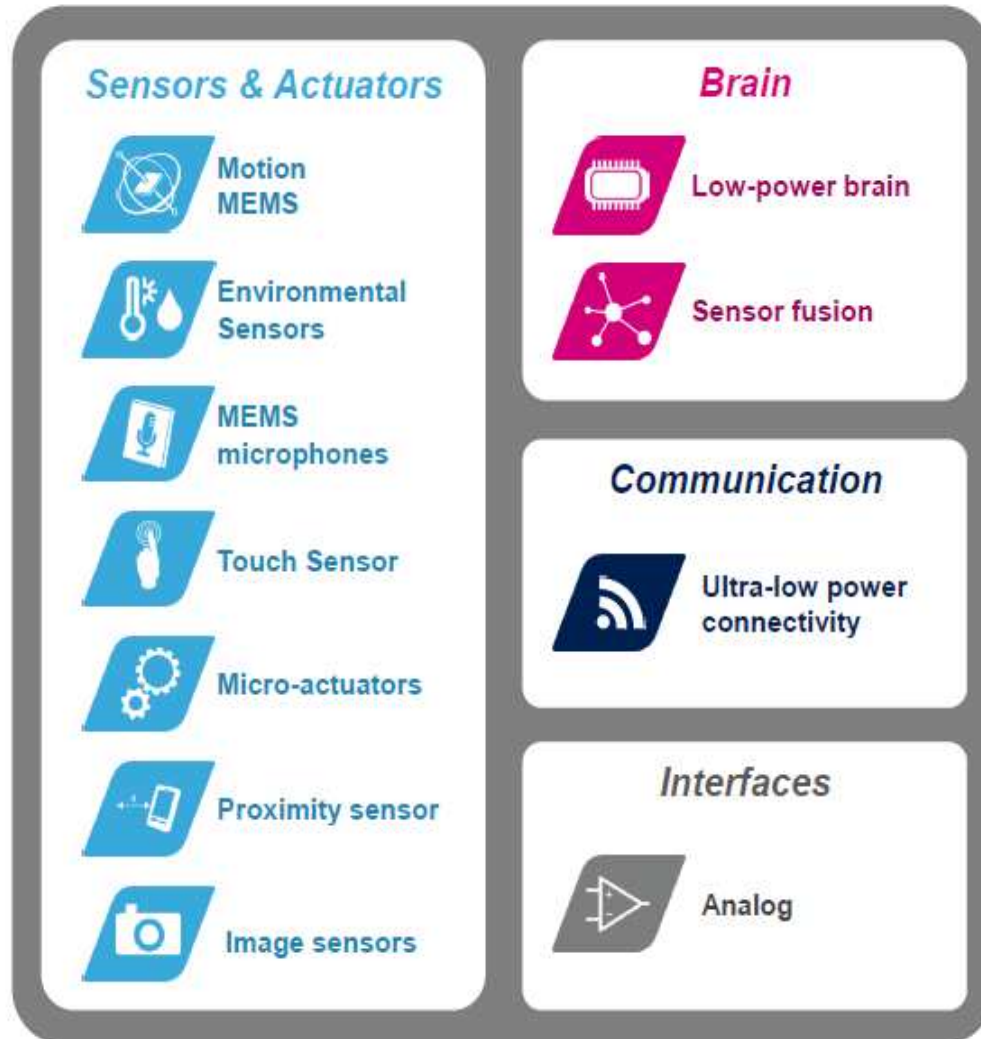
void serveur1(portServ ports)
{
    int sockServ1, sockServ2, sockClient;
    struct sockaddr_in monAddr, addrClient, addrServ2;
    socklen_t lenAddrClient;

    if ((sockServ1 = socket(AF_INET, SOCK_STREAM, 0)) == -1) {
        perror("Erreur socket");
        exit(1);
    }
    if ((sockServ2 = socket(AF_INET, SOCK_STREAM, 0)) == -1) {
        perror("Erreur socket");
        exit(1);
    }

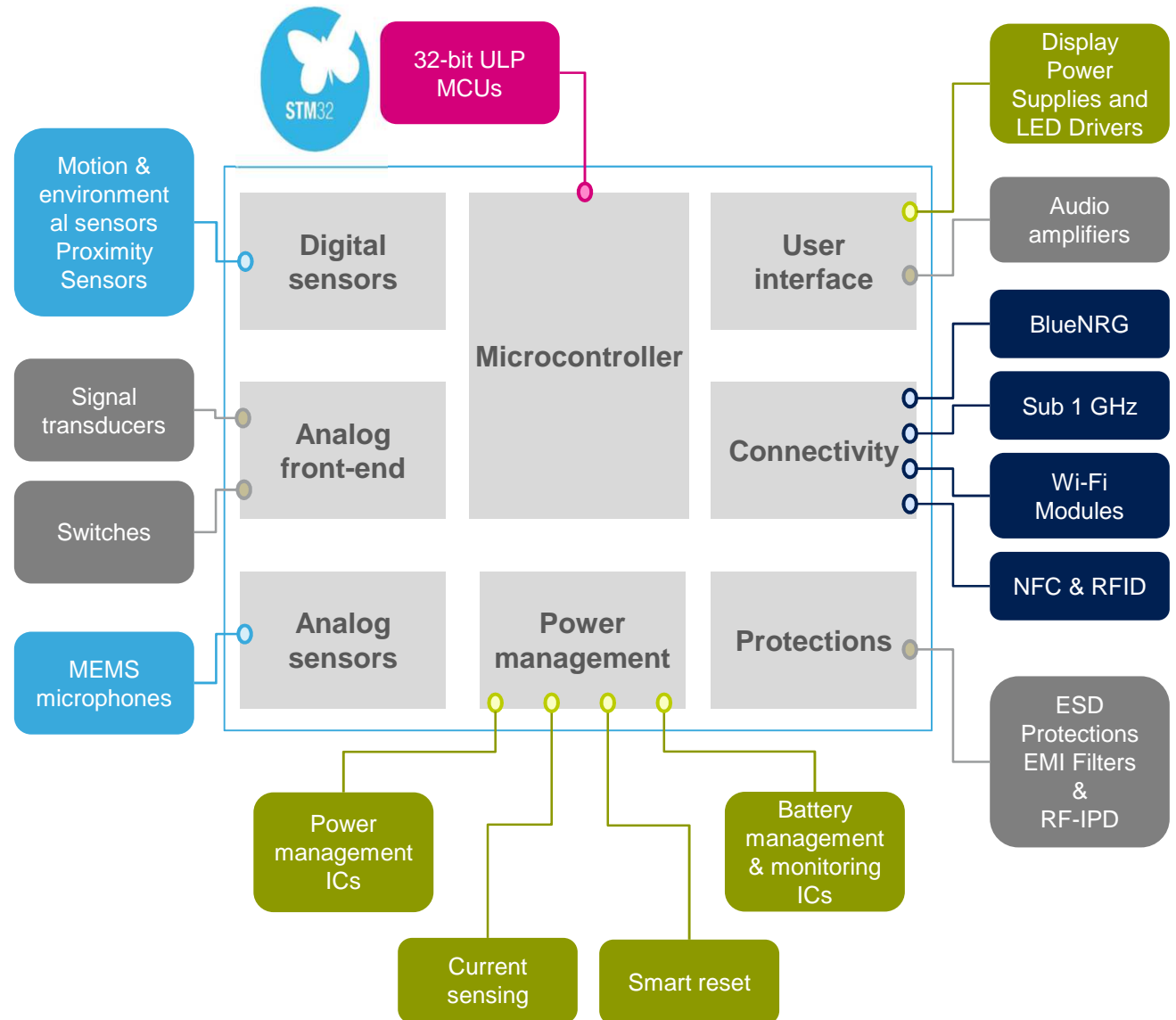
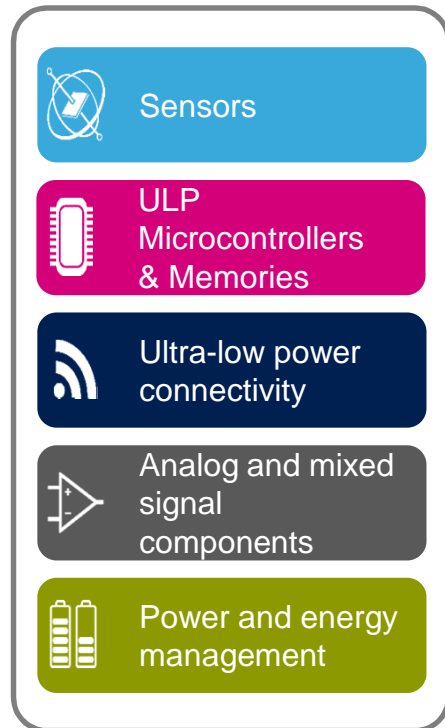
    bzero(&monAddr, sizeof(monAddr));
    monAddr.sin_family = AF_INET;
    monAddr.sin_port = htons(ports.port1);
    monAddr.sin_addr.s_addr = INADDR_ANY;
    bzero(&addrServ2, sizeof(addrServ2));
```



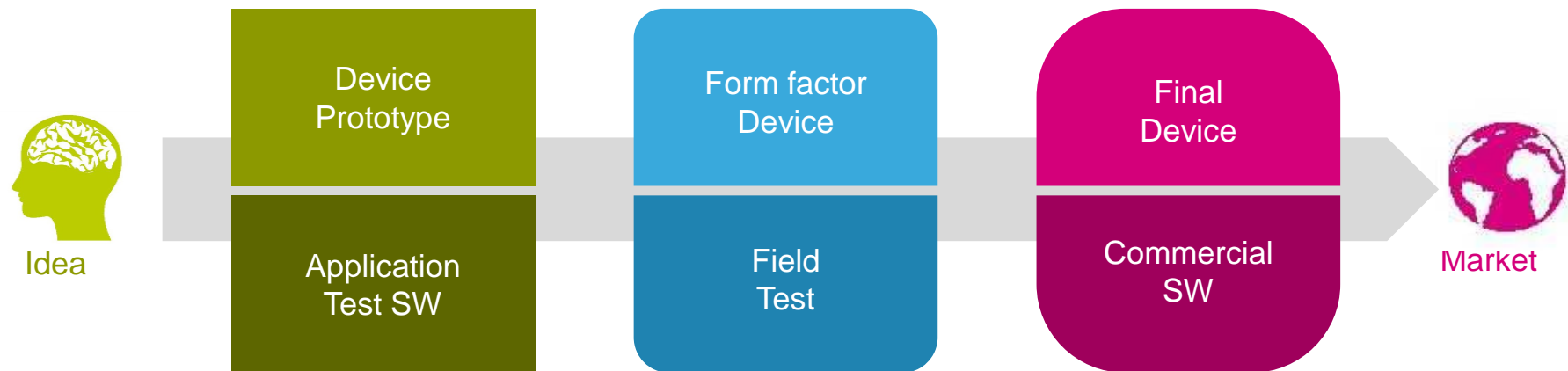
The Building Blocks of the IoT



ST Offering for Wearable



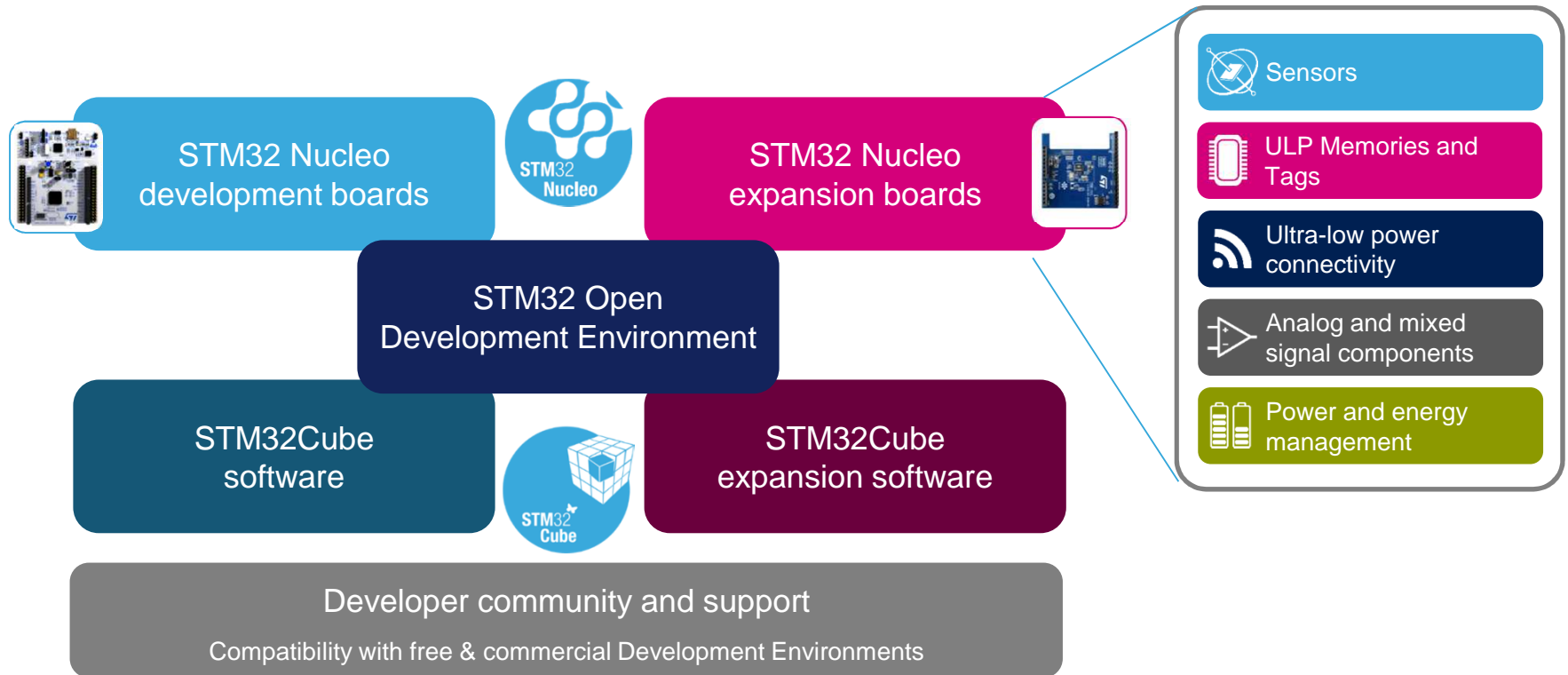
Lowering the Barriers for Developers



Fast, flexible, affordable and based on commercial components

STM32 Open Development Environment

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www.st.com/stm32ode

STM32 Nucleo Development Boards

Flexible power supply through USB or external source

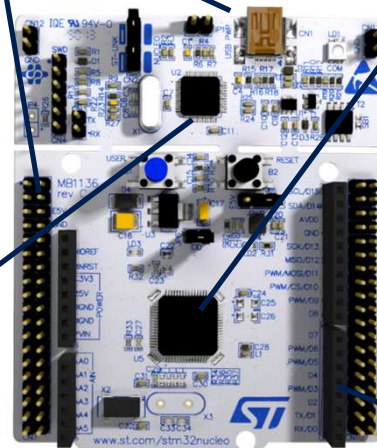
Integrated debugging and programming ST-LINK probe

STM32 microcontroller

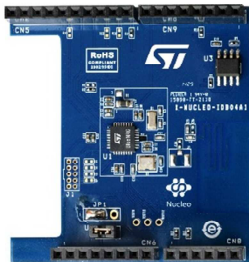
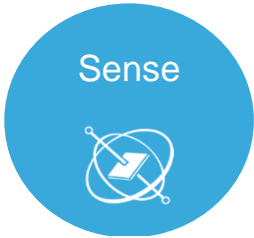


complete product range from ultra-low power to high-performance

Morpho and Arduino expansion headers



STM32 Nucleo Expansion Boards



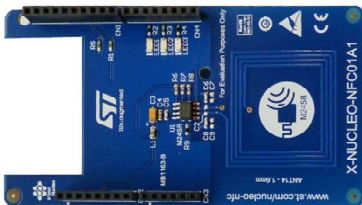
X-NUCLEO-IDB04A1
Bluetooth Low Energy
Expansion Board based
on BlueNRG

X-NUCLEO-IHM01A1
Stepper motor driver
expansion board based
on easySPIN™ L6474



X-NUCLEO-IDS01A4/5
Sub-1GHz expansion
board based on
SPGRF-868/-915

X-NUCLEO-CCA02M1
Audio In Expansion
Board based on
MP34DT01

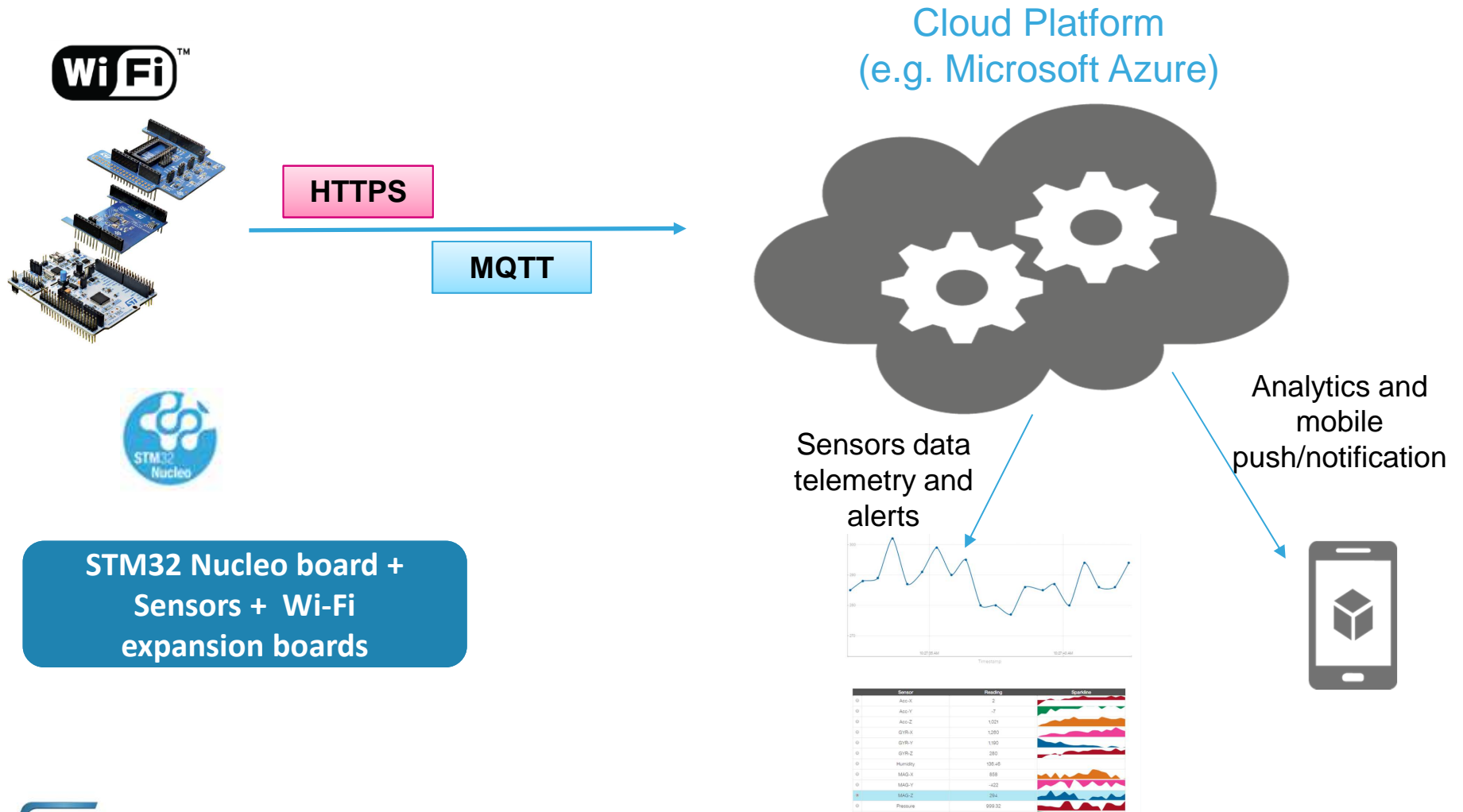


X-NUCLEO-NFC01A1
Dynamic NFC tag
Expansion Board based
on M24SR

X-NUCLEO-IKS01A1
Motion MEMS and
Environmental Sensor
expansion board



An example of IoT End-to-End scenario From Wi-Fi sensor to Cloud



Thank you!



ST stands for
life.augmented