

# New STM32WB Series MCU



# Make the Choice of STM32WB Series

*The 7 keys points to make the difference*

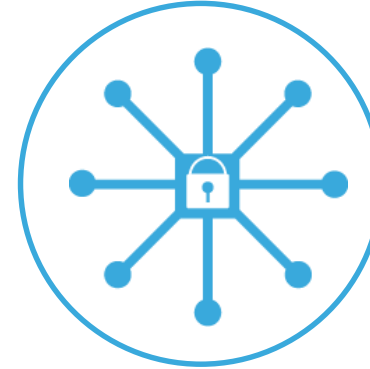
2



**Open 2.4 GHz radio  
Multi-protocol**



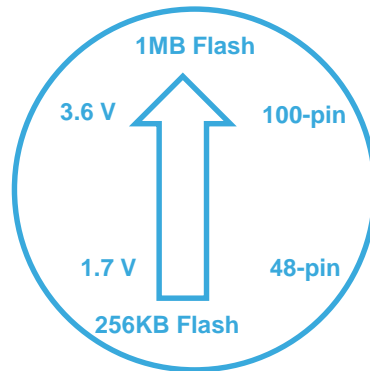
**Dual-core / Full control  
Ultra-low-power**



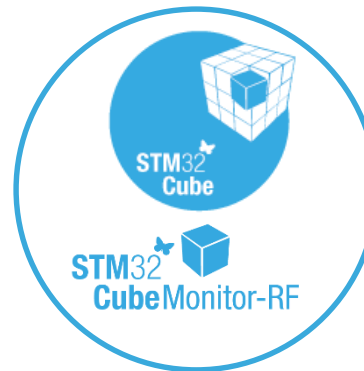
**IoT Protection ready**



**Massive integration  
Cost saving**



**A large offer**



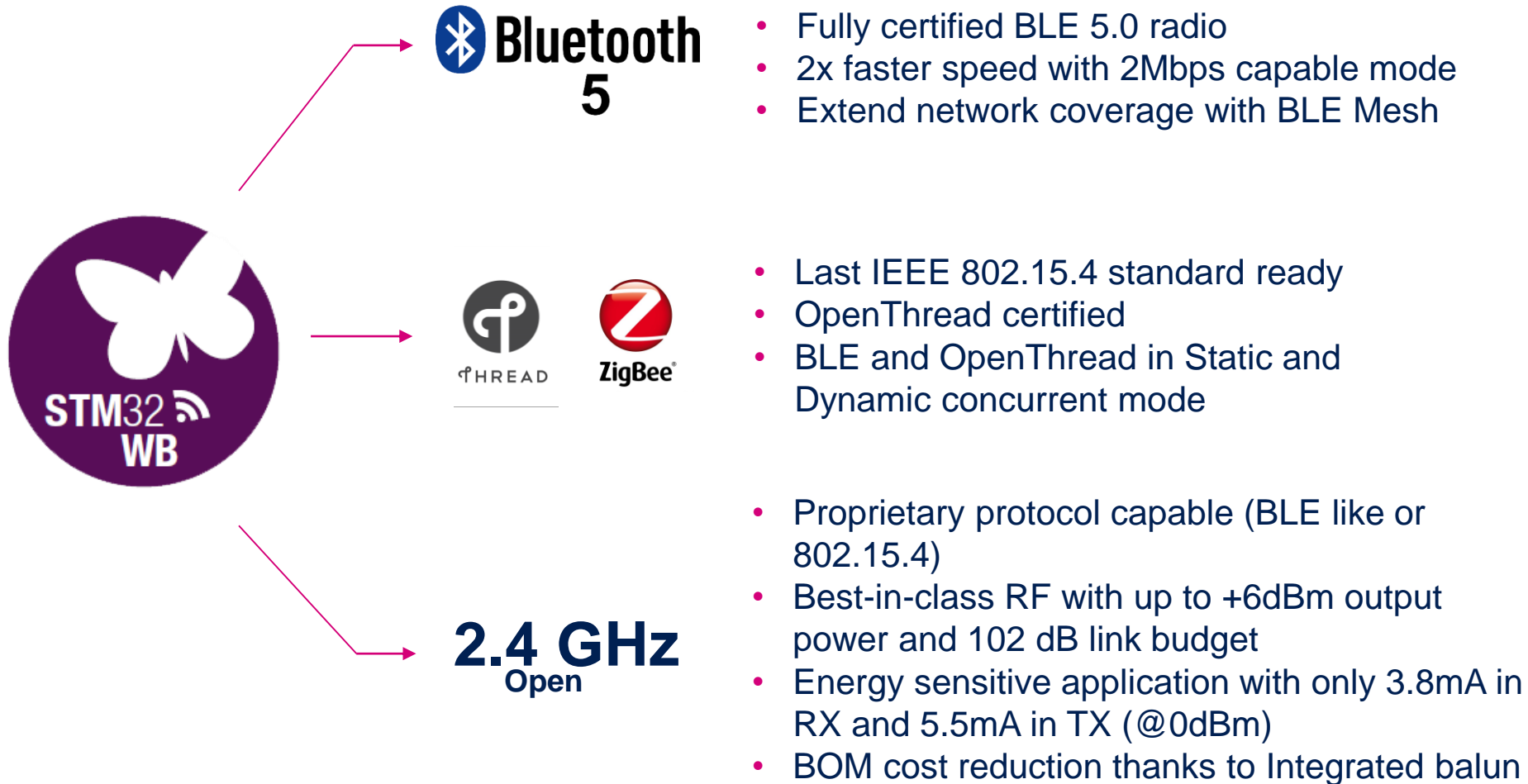
**Advanced RF tool, Energy control  
with C code generation**



**No matter what!**

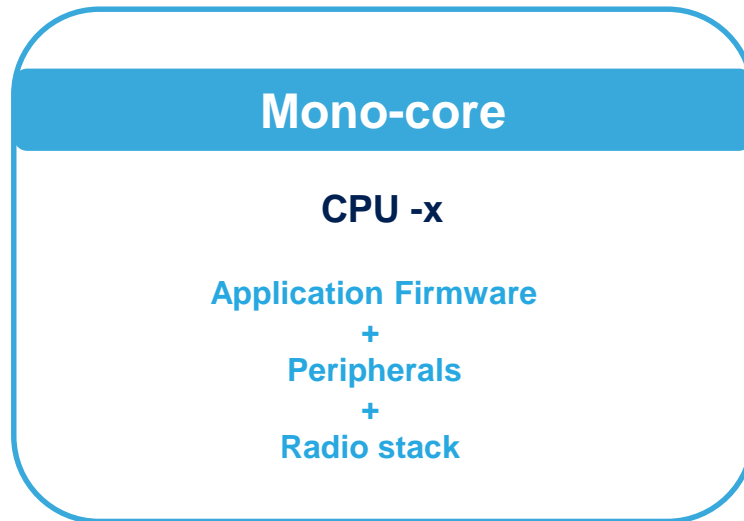
# Multiprotocol and Open radio

3



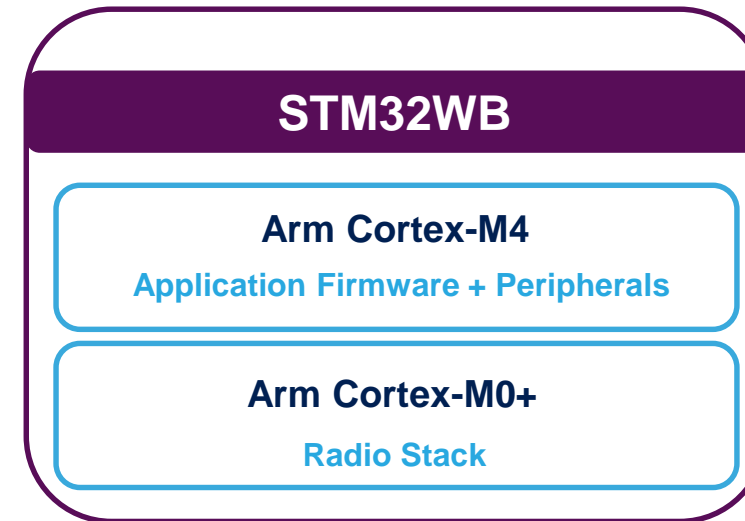


## 2 independent cores for real-time execution



### • Drawbacks

- Time sharing
- Longer processing time – Greedy current consumption
- Need companion MCU (increased cost)



### • Benefits

- SOC solution (1 single die)
- Full flexibility - Easy development – User experience
- Increase battery life
- All-in-1 solution - cost saving
- Speed up time to market





# Rich feature set

5

## KEY FEATURES

- **2 independent core for real time execution**
- **Ultra-low-power consumption**
  - 50  $\mu$ A/MHz Active mode (at 3.0V)
  - 1.8  $\mu$ A Stop mode (Radio in standby + 256KB RAM)
  - < 30 nA Shutdown mode
- **Peripherals**
  - 2xI<sup>2</sup>C, 1xUSART, 1xLP-UART, 2xSPI, 1x USB 2.0 FS device supporting Battery Charging Detection, 1xSAI, Quad-SPI (XIP), 6x 16-bit timer (including LPWM and low-power one)
- **1.71V to 3.6V voltage range (DC/DC, LDO)**
- **- 40°C to + 105°C temperature range**

**Security**  
PCROP,  
PKA,  
TRNG  
AES 256-bit,  
CKS

Arm® Cortex®-  
M4 MPU + FPU  
+ DSP Inst.  
@ 64MHz

ART Accelerator™  
Up to 1MB Flash  
Up to 256KB SRAM

LCD 8x40

ADC 12-bit  
2x Comp  
Temp sensor  
Cap. Touch

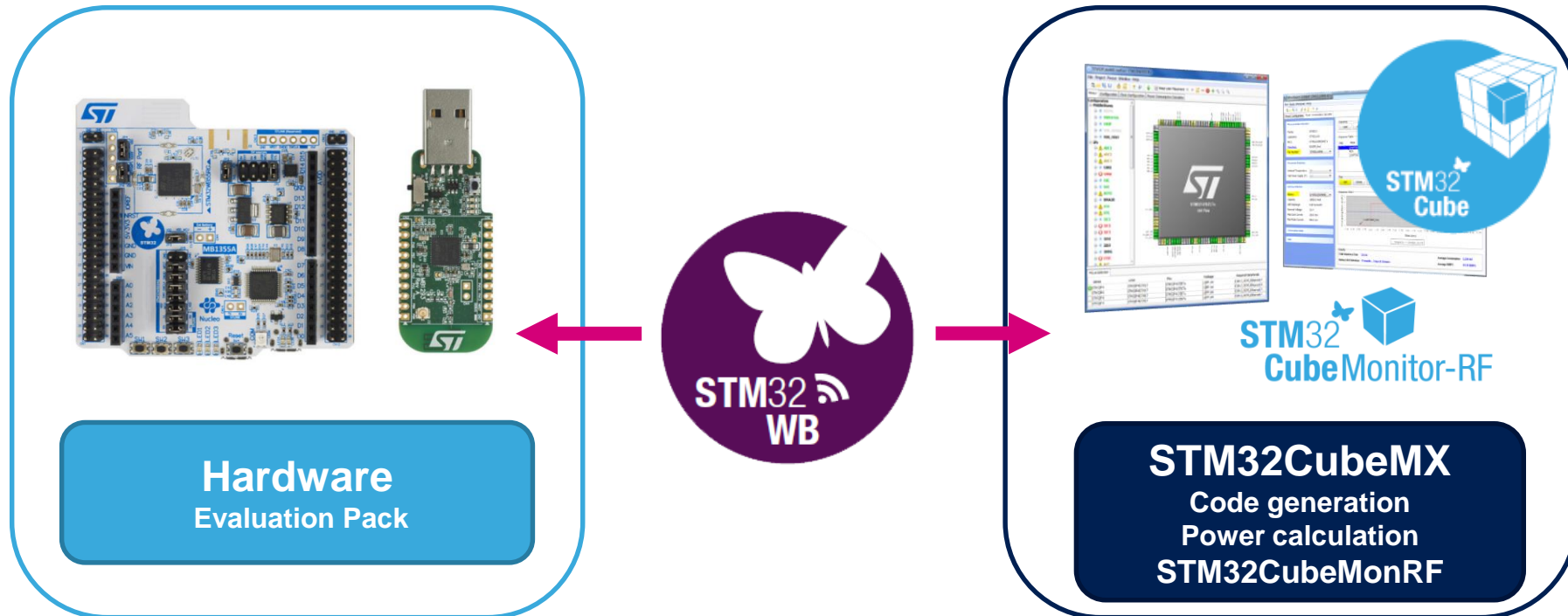
USB 2.0 FS  
Crystal-less SPI,  
Quad-SPI,  
I<sup>2</sup>C,  
LP-UART  
SAI

Cortex-M0+ Core  
@32 MHz  
2.4 GHz Radio  
**BLE 5**  
**802.15.4**  
Concurrent mode

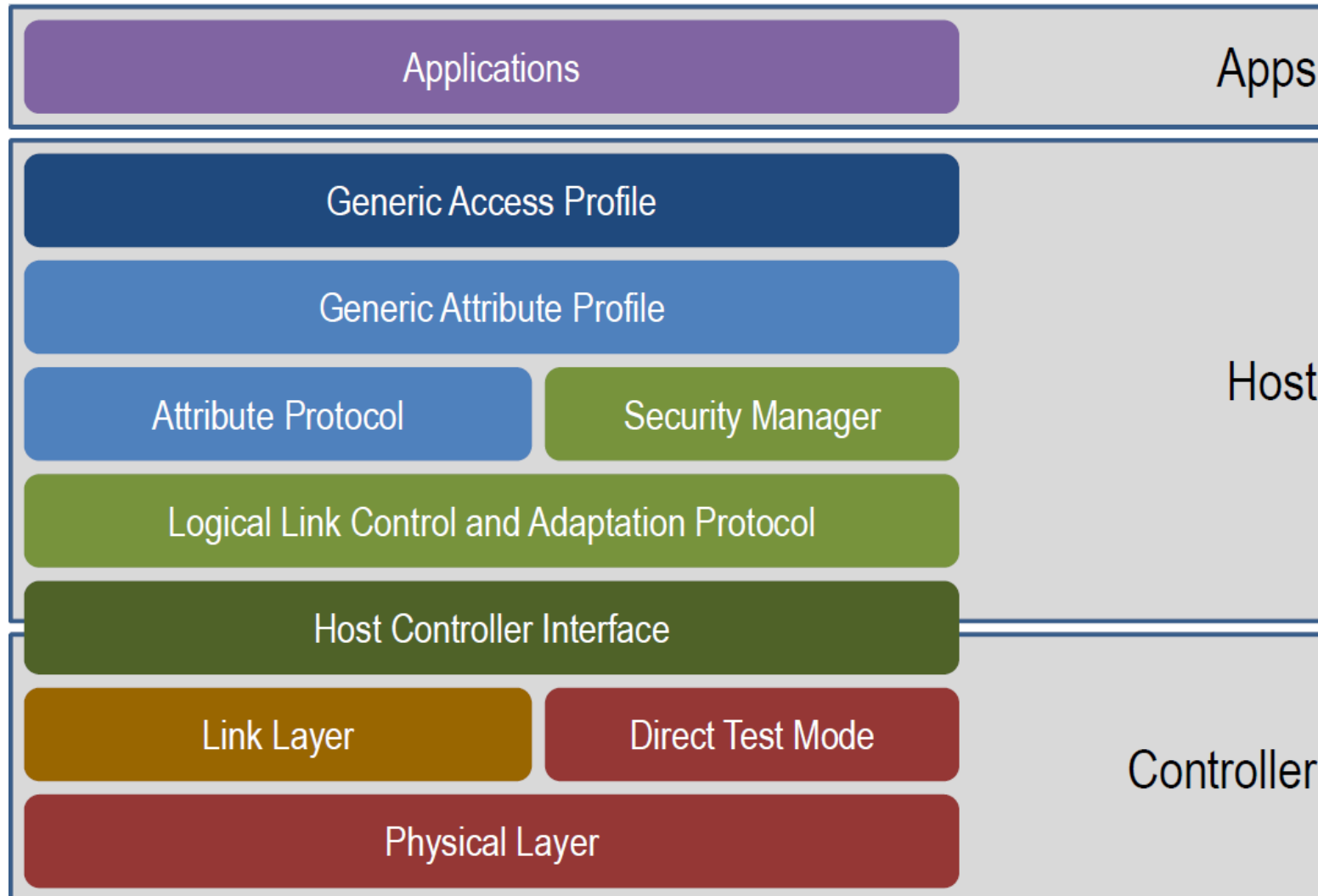


# Easy Prototyping

6



# BLE Block Diagram 7



# What is Thread (1/2)

8

## THREAD What it delivers

**A secure wireless mesh network for your home and its connected products**

Built on well-proven, existing technologies

Uses 6LoWPAN and carries IPv6 natively

Runs on existing 802.15.4 silicon

New security architecture to make it simple and secure to add / remove products

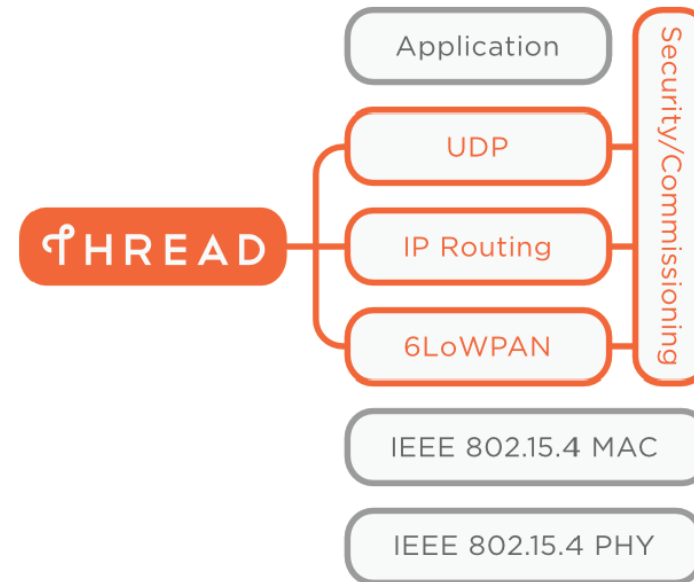
250+ products per network

Designed for very low power operation

Reliable for critical infrastructure

ST is member of  
Thread Group  
(Contributor level)

Can support many popular application layer protocols and platforms



A software upgrade can add Thread to currently shipping 802.15.4 products



# What is Thread (2/2)

9

## THREAD Direct Addressability of devices

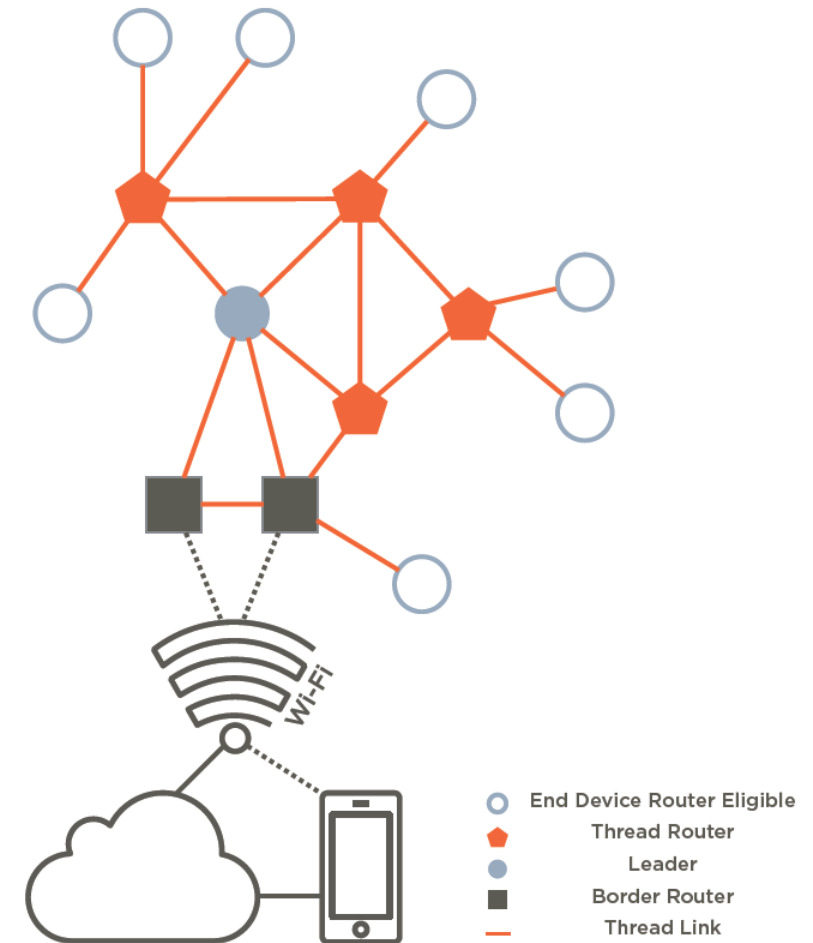
All devices have IPv6 addresses plus short address on HAN

DHCPv6 used for router address assignment

Home Network can directly address devices through Border Routers

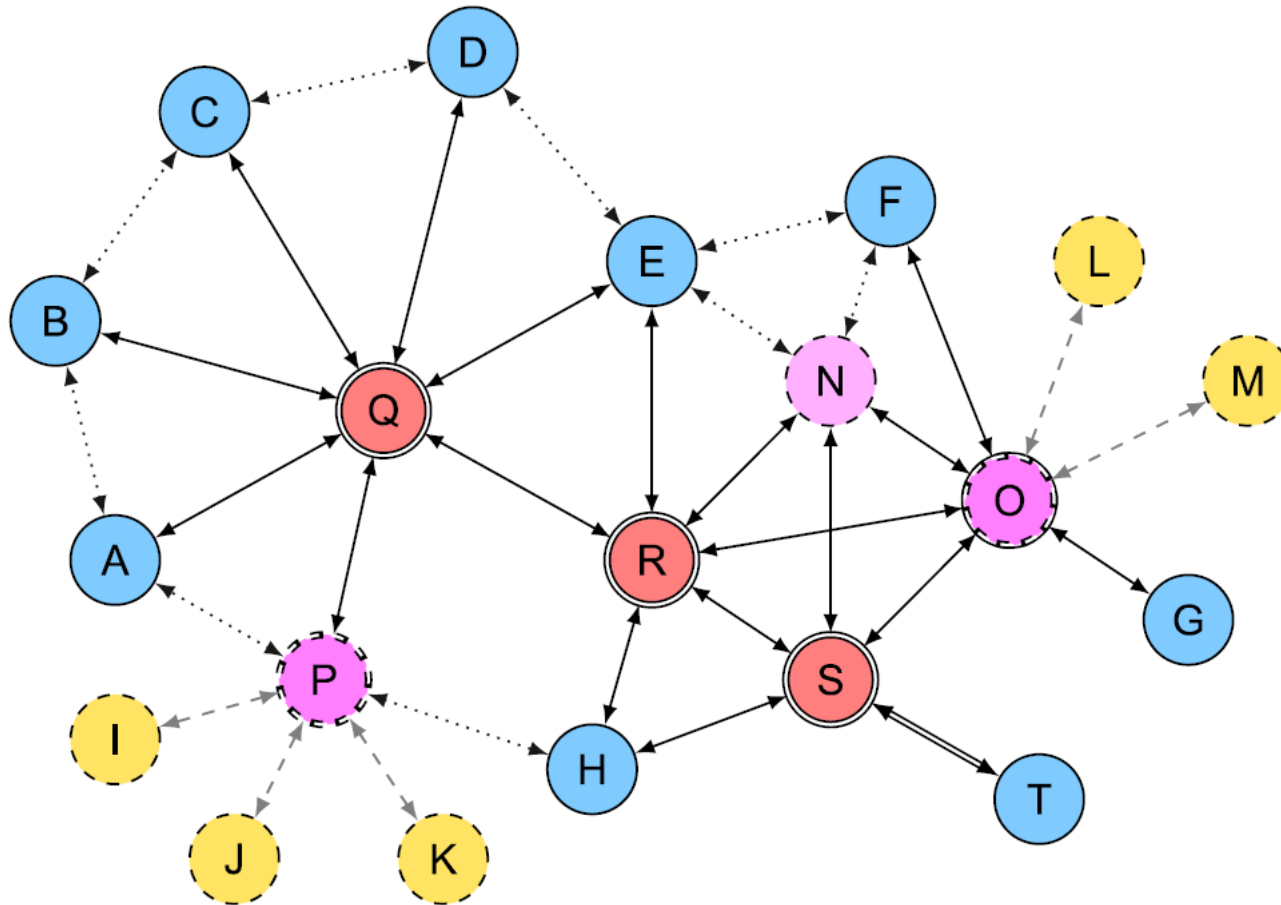
Cloud Services can address devices from the Internet

Devices can address local devices on HAN or off network devices using normal IP addressing



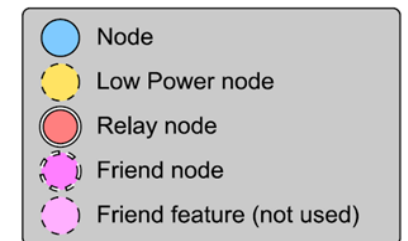
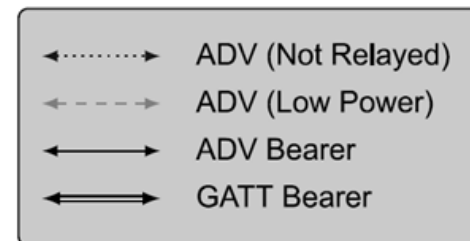
# BLE Mesh - Topology

10



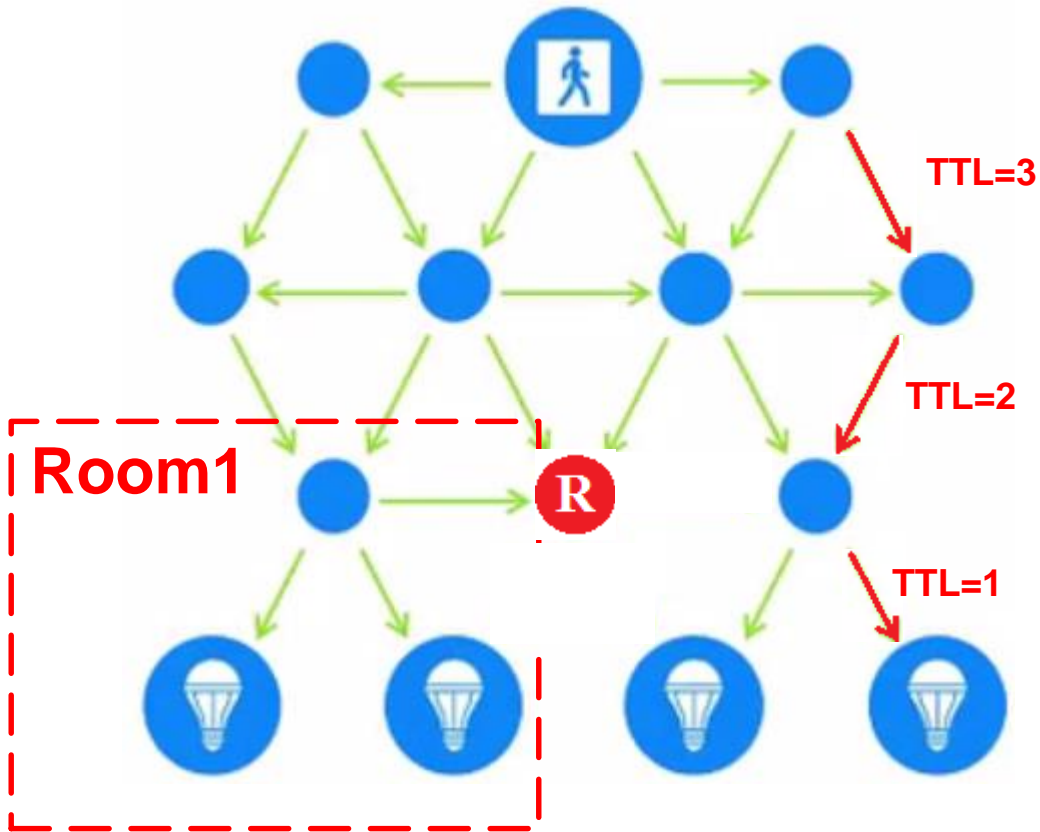
Many-to-many Decentralized control

- **Reliable**: No single point of failure
- **Simple**: Management and device replacement
- **Cost**: Reduced hardware and setup
- **Congestion**: Reduced network traffic



# BLE Mesh – Flood Architecture

11



- **Message caching:** Managed flood to reduce message propagation and node power.
- **Time-to-live counter:** A counter reduces with every hop.
- **Subnets:** Multiple subnets
- **Enable/disable Relay**

# BLE Mesh Examples

12

## Industry 4.0



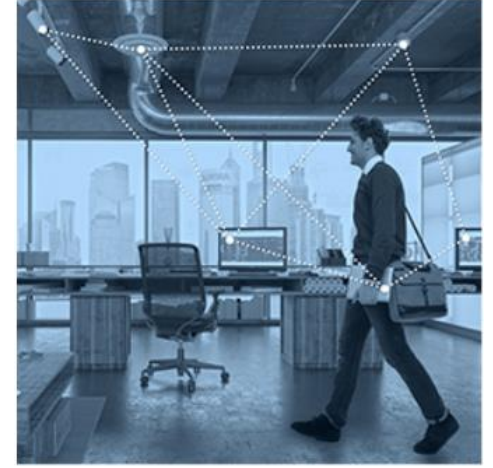
## Smart Building



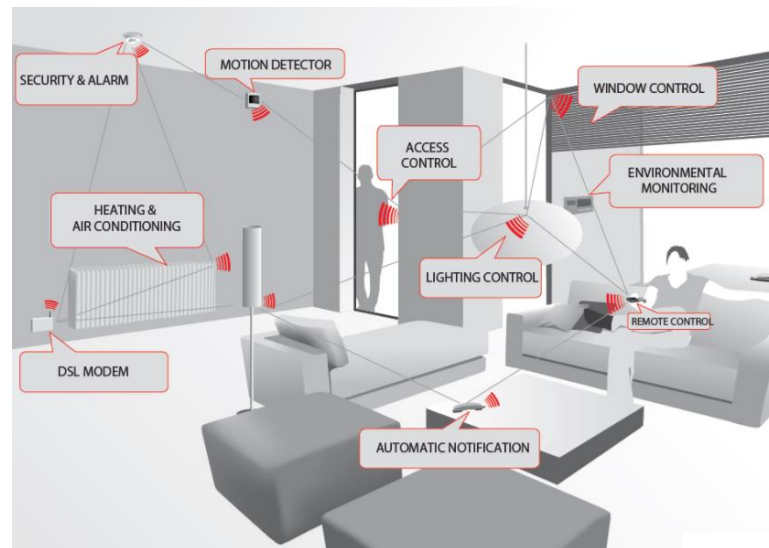
## Smart Lighting



## Real Time Location

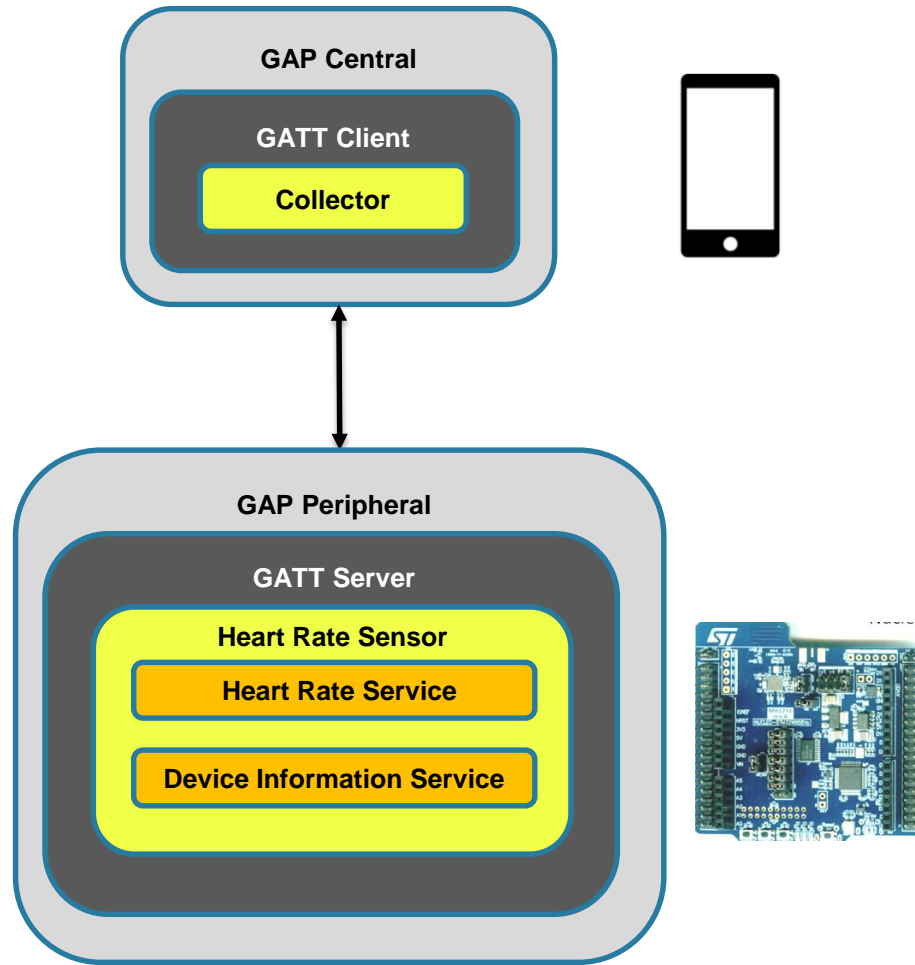


## Home Automation



# Demo 1: Heart Rate Sensor

13

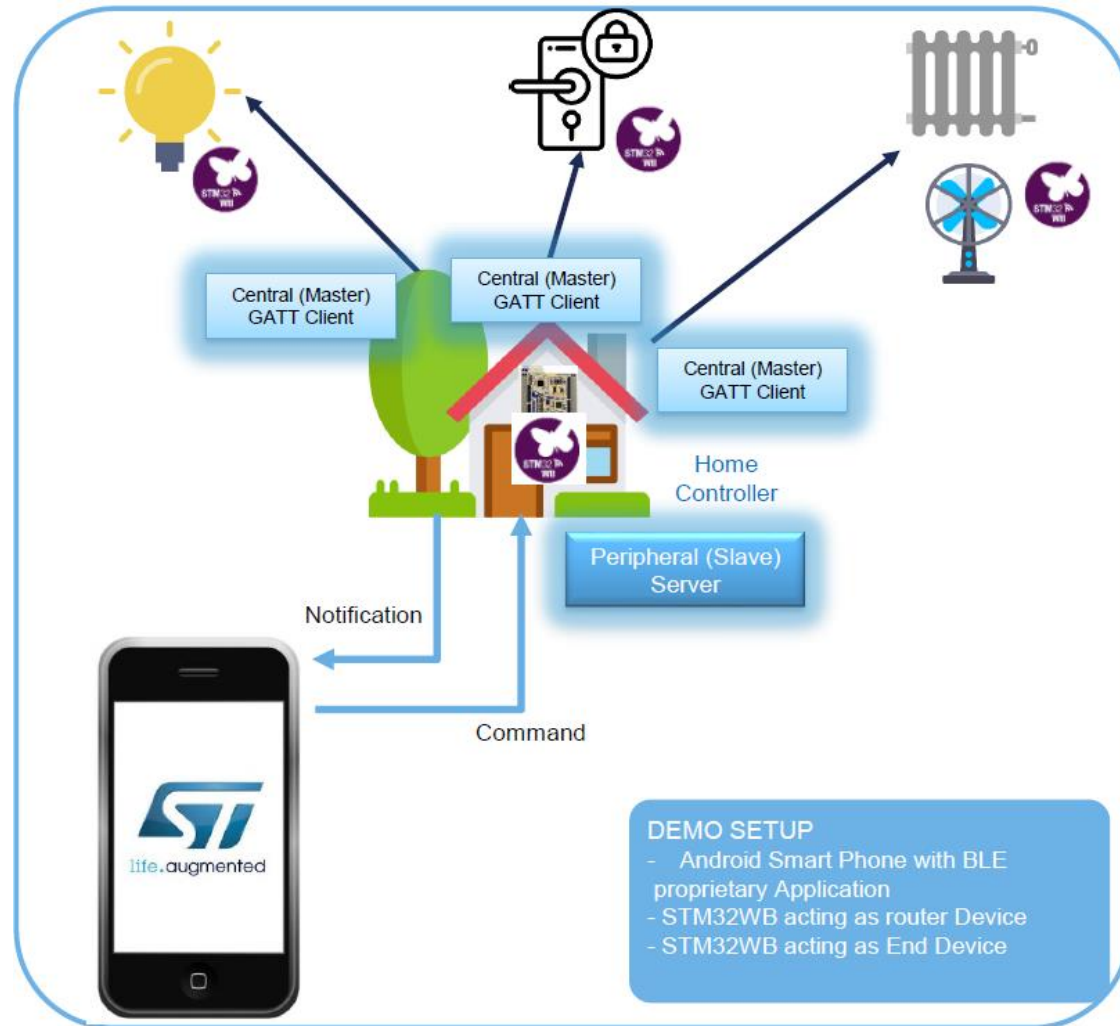


Heart Rate Profile roles :

- **Collector:**  
receive measurement and other data shall be a GATT Client and a GAP Central
- **Heart Rate Sensor:**  
measure heart rate and other information, shall be a GATT Server and a GAP Peripheral  
Shall composed with:
  - Device Information Service - 0x180A
    - Manufacturers Name String – 0x2A29
  - Heart Rate Service – 0x180D
    - Heart Rate Measurement – 0x2A37
    - Body Sensor Location – 0x2A38
    - Heart Rate Control Point – 0x2A39

# Demo2: Home Automation

14



## Home Controller Roles

- Central to connect to Peripherals
- Peripheral to be connected by the smart phone.

## Light, Temperature and Lock controllers Roles

- Peripheral to be connected by the home controller device.

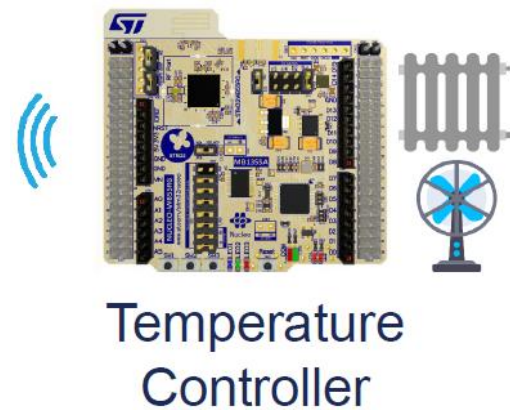
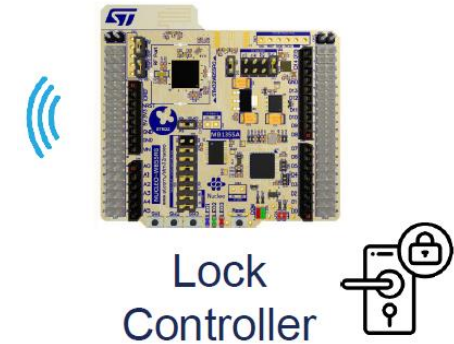
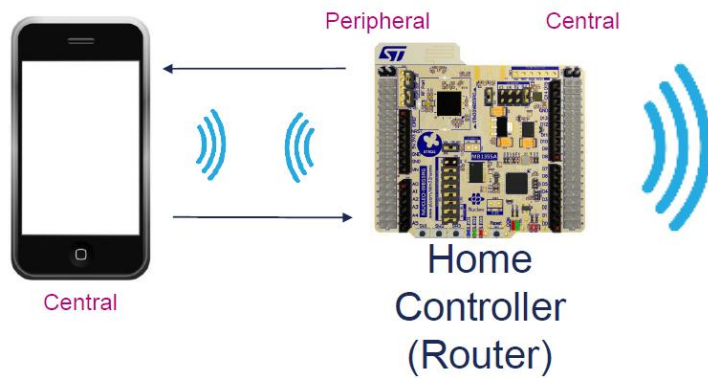
## Smartphone Role:

- Central to connect to the home controller.



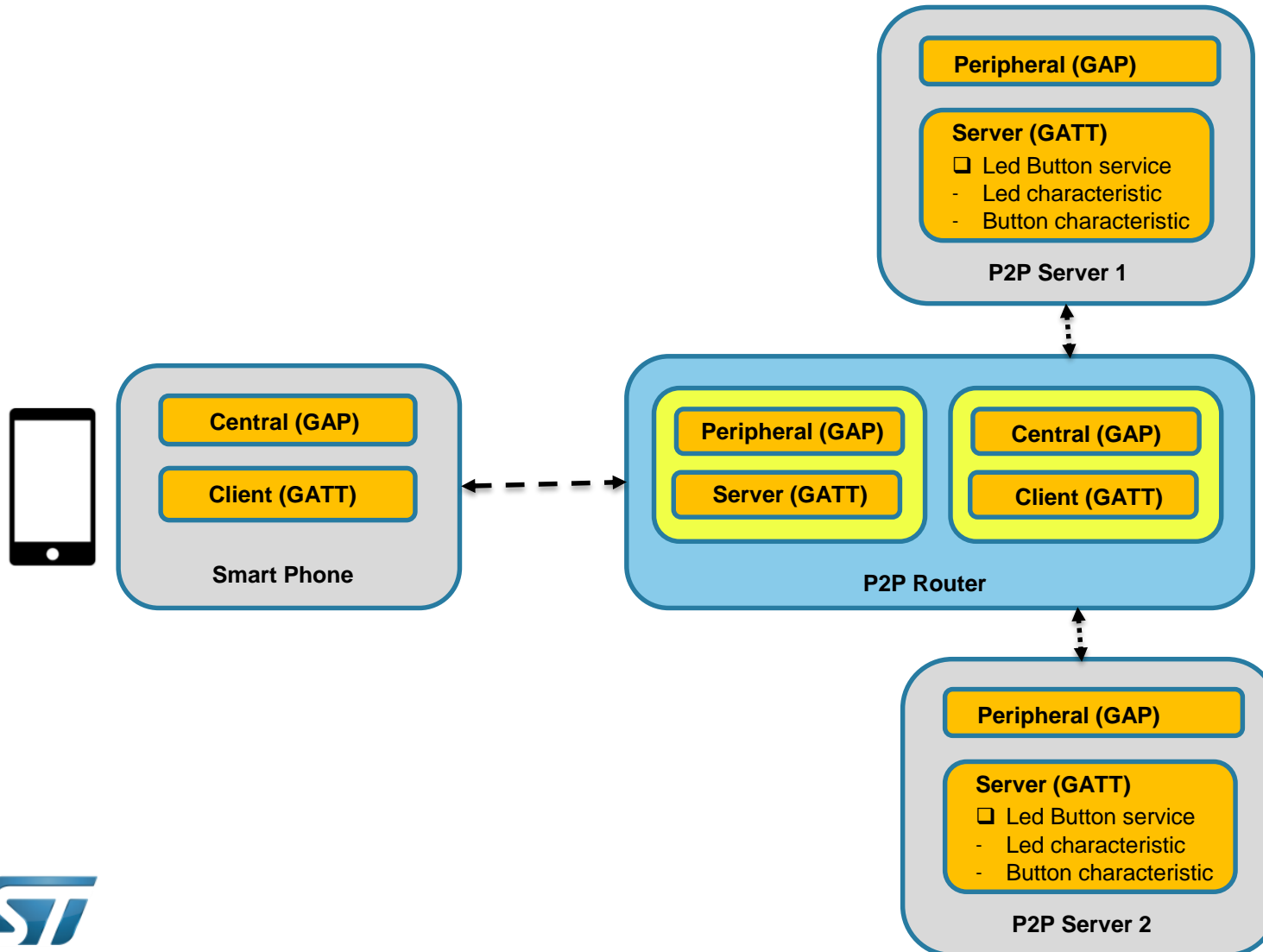
# Home Automation

15



# Technical Description

16



Easy architecture to support on the same device.

- Multi roles: Central & Peripheral
- Multi profiles: Server & Client
- Multi Connections

Easy & quick control via low latency data transfer.

Proprietary mesh network with low power consumption.



*Thank you!*



**Releasing Your Creativity**