ULTIMATE NETWORK COMPARISON

LoRa®/LoRaWAN®	NB-IoT	Zigbee	Wi-Fi	BLE	5G

Top Six IoT Network Technologies Compared - Which IoT Network Is Best for You?

Pros & Cons

TOP PROS

LoRa/LoRaWAN
- Ground-up LPWAN design (low battery consumption, long range, seamless Cloud integration)
- Cost-efficient roll-out
- Open business models (public, private, open communities)

NB-IoT
- Leverage existing 4G coverage
- Large volume of data
- Download capacity on licensed spectrum

Zigbee
- Device security
- Better mesh capabilities when compared to Wi-Fi
- Flexibility for users and developers (backwards compatibility, etc.)

Wi-Fi
- Simplified cost-efficient deployment
- Alternative to 5G (Wi-Fi6)
- Ubiquitous mobility (open roaming)

BLE
- Low cost
- Simple setup
- No hardware required

5G
- Higher capacity
- Higher data rates and lower latency
- Software designed core network

TOP CONS

LoRa/LoRaWAN
- Not ideal for applications requiring high data rates
- Not ideal for applications requiring lower latency

NB-IoT
- High battery consumption and mobility issues
- Ecosystem complexity (2G, 3G, 4G, 5G) and multiple releases
- High cost LTE roll-out for massive IoT use cases only

Zigbee
- Low transmission and network stability
- Short range
- High maintenance costs

Wi-Fi
- Limited coverage range
- Limited security
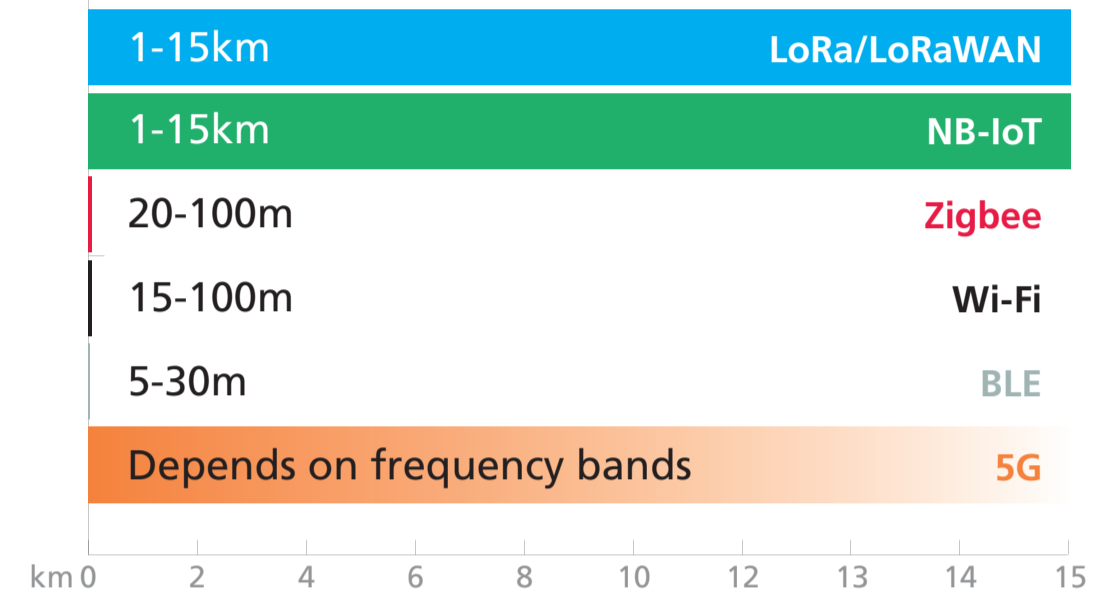- High energy requirements

BLE
- Short connection time
- Short range
- Low bandwidth

5G
- Short range in the millimeter waves
- High cost and complex infrastructure
- Complex ecosystem (2G, 3G, 4G, 5G releases)

Range

1-15km	LoRa/LoRaWAN
1-15km	NB-IoT
20-100m	Zigbee
15-100m	Wi-Fi
5-30m	BLE
Depends on frequency bands	5G

km 0   2   4   6   8   10   12   13   14   15

Power

- 5G — **High** POWER
- Wi-Fi — **Med** POWER
- NB-IoT — **Low** POWER
- BLE — **Low** POWER
- ZIGBEE — **Low** POWER
- LoRa/LoRaWAN — **Ultra** LOW POWER

Deployment

COST VS. LIFESPAN

LoRa/LoRaWAN

Reduces upfront infrastructure, operating and end-node sensor costs. Overall reduced costs over time due to battery life.

NB-IoT

Reduces cost over time due to battery life. However, there is a risk that ISP giants will rack up licensing fees in the future. LTE network roll-out is not cost effective for massive only use cases.

Zigbee

Low entry cost, but maintenance, devices, etc., can increase total cost of ownership.
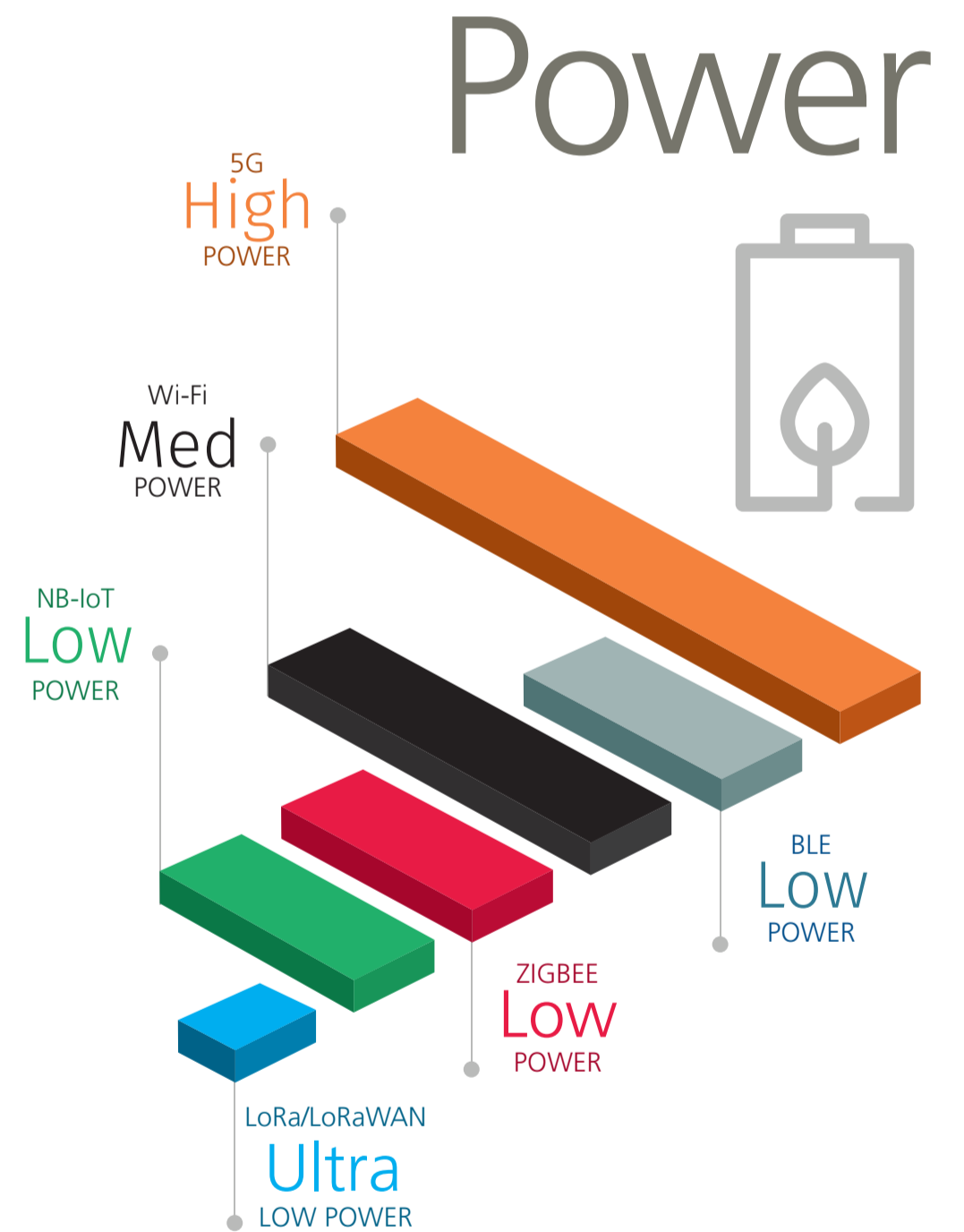
Wi-Fi

Requires a router, and it is recommended that routers are changed every three to four years.

BLE

A cheaper alternative to traditional Bluetooth because it exchanges small amounts of data and has a long battery life (up to five years).

5G

5G requires high investment costs/estimated 10 year lifespan.

SEMTECH

Explore leading IoT solutions offered by the ecosystem at
semtech.com/LoRa

LoRa®   LoRaWAN®

Source Reference:
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