Smarter wireless. Simply.

IQRF® technology simply connects devices to IoT through wireless mesh networks

IQRF Tech s.r.o.
Vladimír Šulc, CEO

IQRF Tech s.r.o.

IQRF® is **technological platform** enabling manufacturers to produce **interoperable wireless products.**

MICRORISC s.r.o.

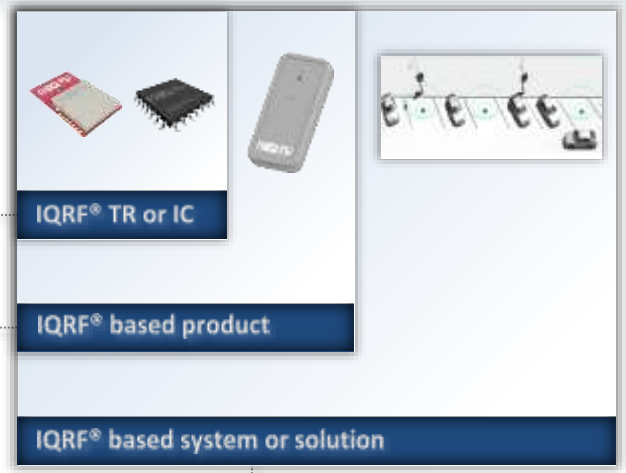
IQRF® developer/owner since 2004 till 2017

IQRF Tech s.r.o.

MICRORISC's technological spin-off
- found in 2017
- owns IP related to the IQRF®
- develops IQRF® Core Infrastructure

IQI s.r.o.

Options company for key people behind IQRF®



MANUFACTURERS | INTEGRATORS | ACADEMICS

IQRF Alliance

Non-profit alliance promoting IQRF® based solutions
- international community
- technically assures interoperability
- found in 2014

- 100+ IoT professionals

Interoperable products extend IQRF® ecosystem and enable integrators to build IQRF® based systems and solutions. IQRF Alliance connects professionals to profit from mutual cooperation.


Internet & Things
Nirvana is Far. And Cl
2016

Where are we going to?

IQRF.zones combine robustness and reliability of IQMESH network with fast responses in star based networks. 1+ km2

IQRF DPA more interoperability easier, more functionalities, support for IQRF.zones, automatic network

IQRF IDE to support multiplatformed development even of the lowest layers

IQRF SDK extend support, provide complete services to manage IQRF mesh networks and IQRF.zones

... all that to enable **OPEN GATEWAYS** and achieve **freedom** to chose services and cloud provider.

INDUSTRY 4.0 in IQRF production from July 2016

DCTR chip to get IQRF modules from different vendors

IQRF Alliance will be IQRF Alliance, independent on MICRORISC

IQRF.zones: 2016 - 2020

Different connection providers

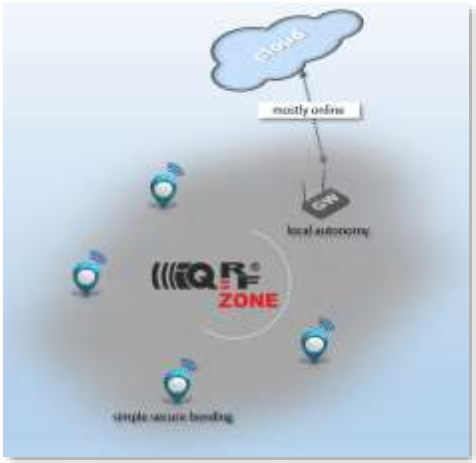
Each device can choose

Myth 1

Myth 2

Myth 3

2016



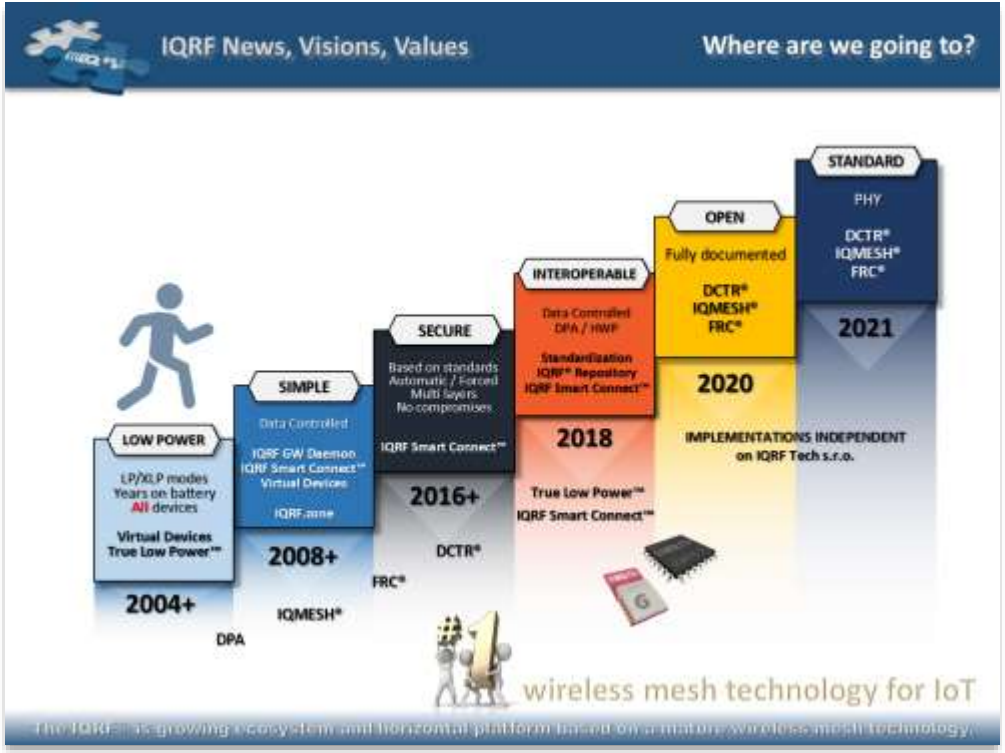
Simple.
Secure.
Interoperable.

IQRF® tomorrow

wireless mesh technology for IoT

2017

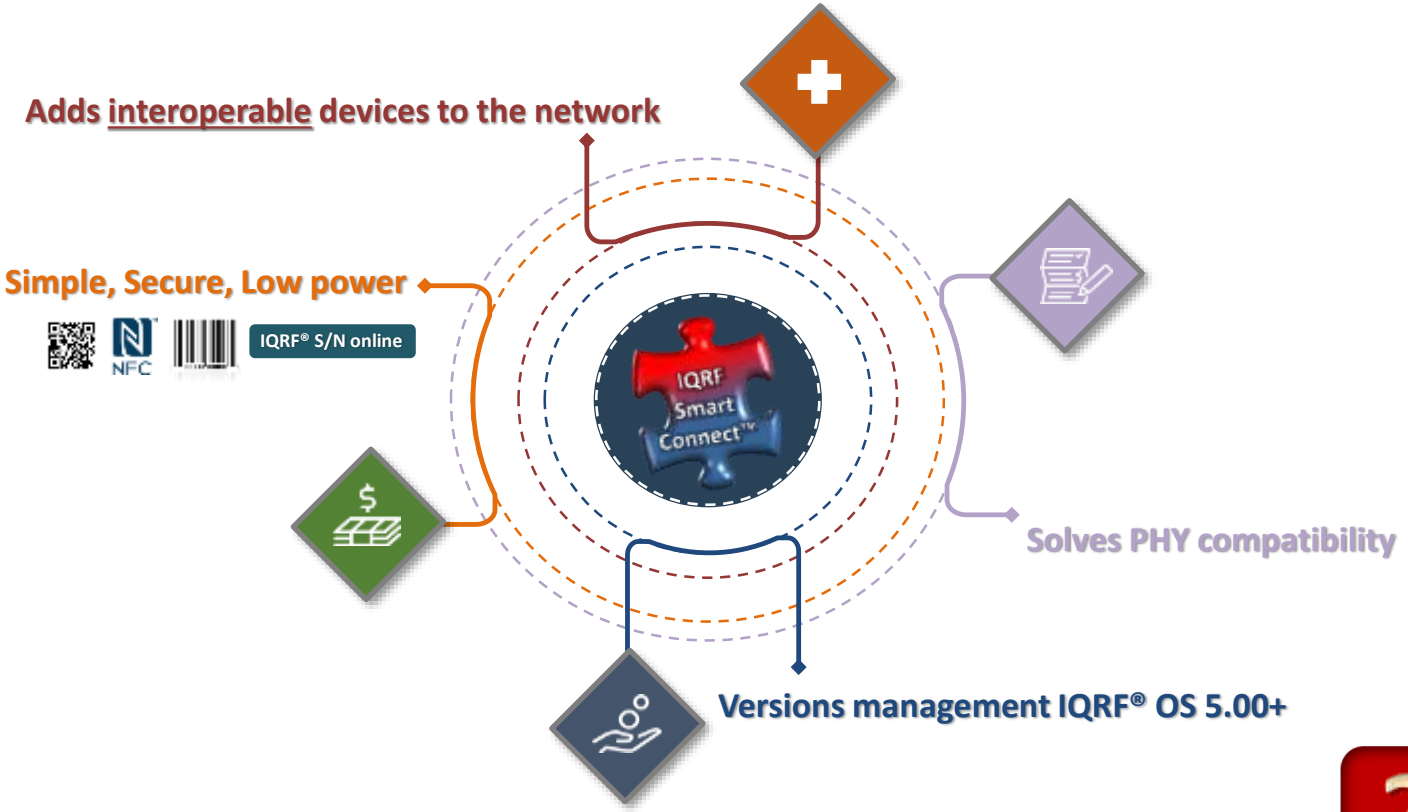

IQRF Summit 2018
real solutions for real world
2018



tomorrow

2018

IQRF Smart Connect™



2018

True Low Power™

TR-76D power consumption example

- Deep sleep mode: **< 100 nA**
- Run mode
  - RF sleep: 1.6 mA
  - RF ready: 3.0 mA
- TX mode: **8.3 - 19 mA**
- Sleep mode: **< 1 µA**
- RX mode
  - STD: 12.3 mA
  - LP: **233 µA**
  - XLP: **15 µA**

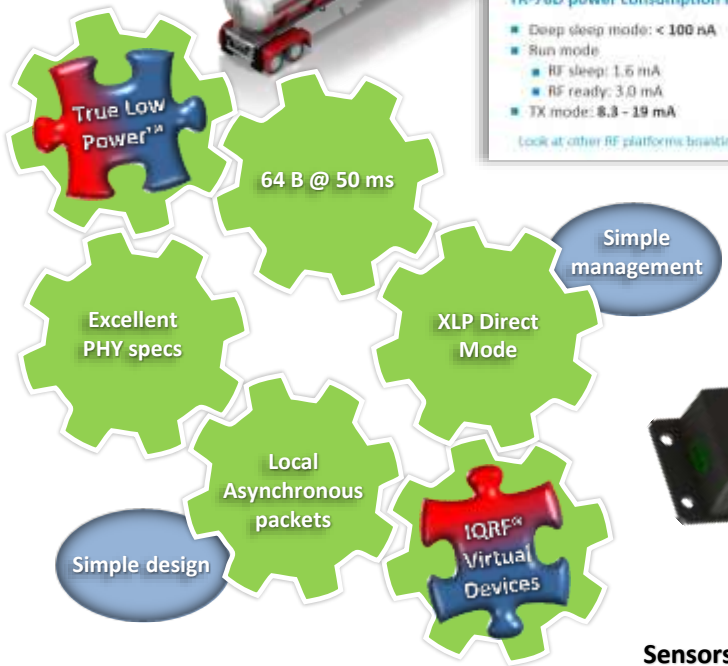
Look at other RF platforms boasting ultra/extra low power.

IQRF **lifetime** * for 1 Ah, 3.6 V, ½ AA sized battery:

- **1000 years** in Deep **sleep**
- **7 years** continually **receiving** in XLP **
- **300 MB** data **received**
- **200 MB** data **transmitted** (at highest RF output power)

* *Theoretical values*

** *Without an incoming RF signal including a noise*



Controllers

- Normally sleeping device, activated by user
- Life expectancy: years
- **True life expectancy: >100.000 events**

Actuators

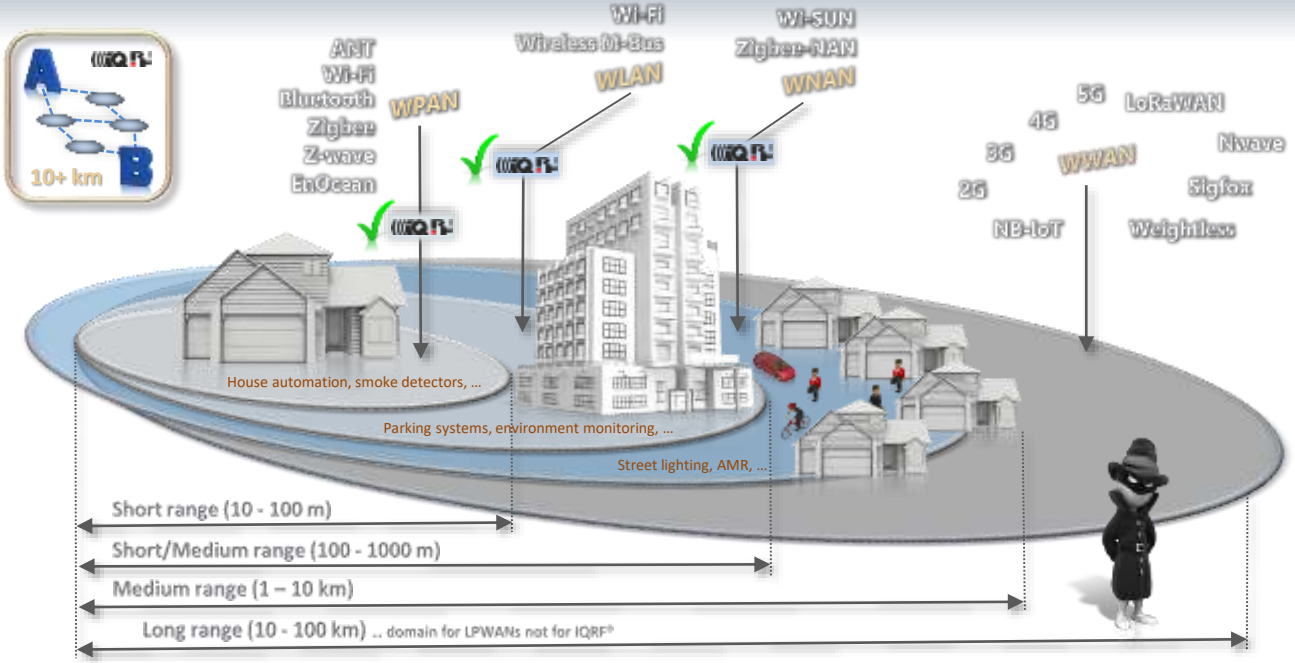
- Battery operated device processing commands
- **True life expectancy: years being online**

Sensors

- Sending data when needed
- Life expectancy: years
- **True life expectancy: >100.000 events**

2018

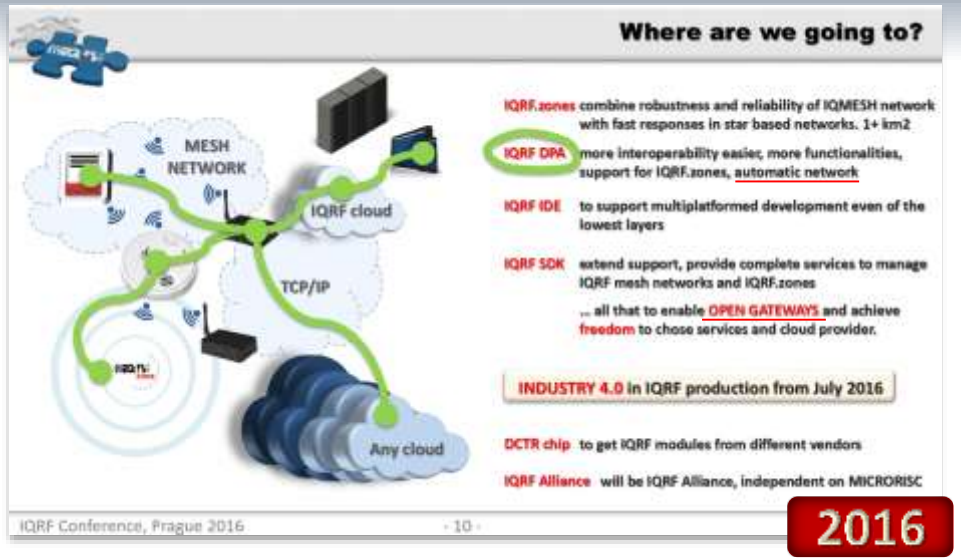
Security as added value



2018

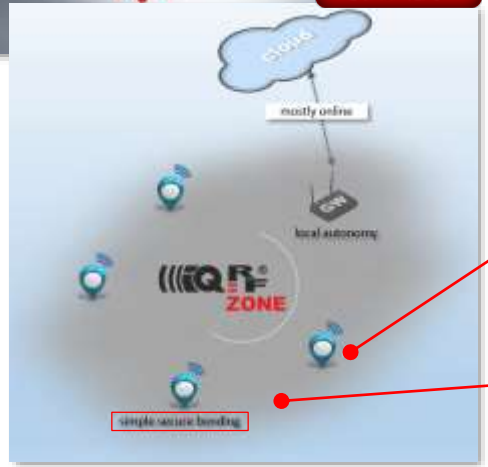
Market is deeply fragmented, there is no globally accepted standard due to the technological, legal or application limitations.

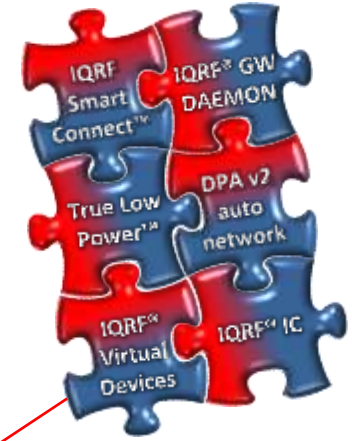
Consistency in time?



2016

2017

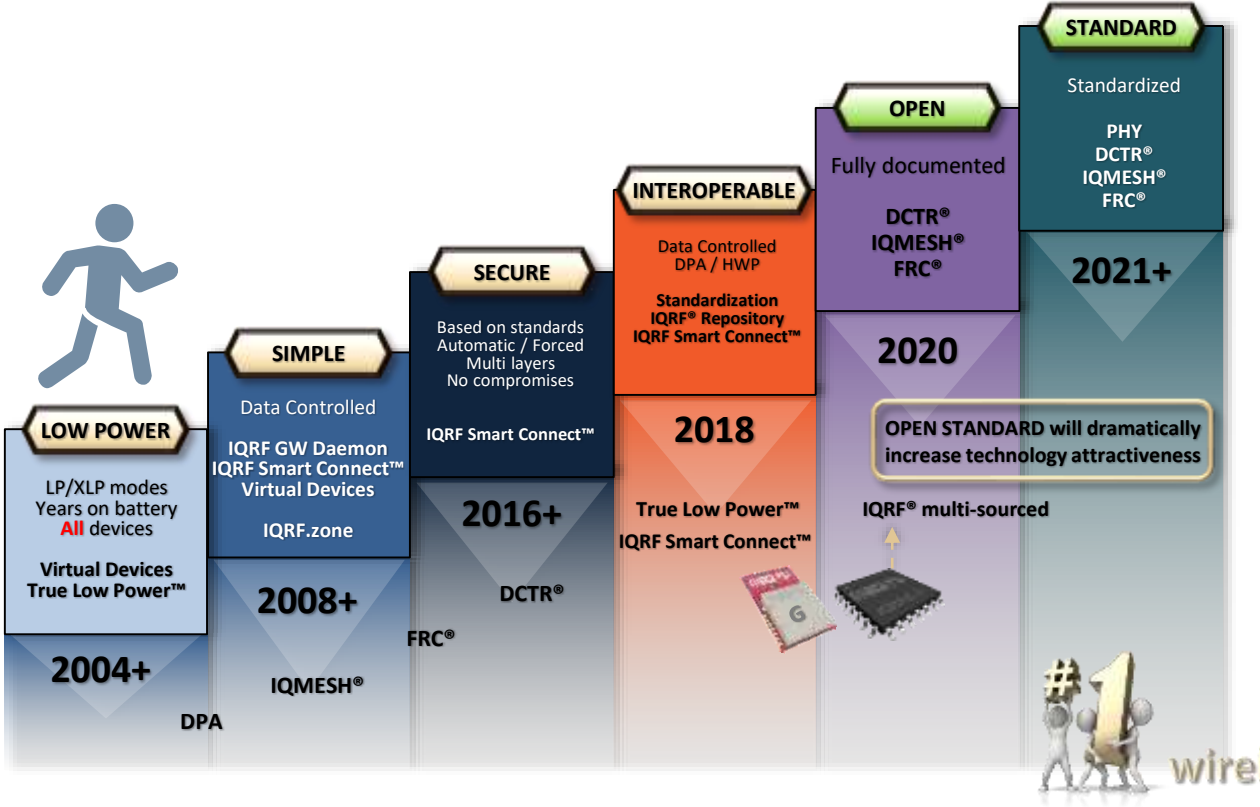




2018

Further plans

IQRF® evolves from a low power technology. Our vision is to bring global open standard for wireless mesh networks.



2019-QT2: TR-7xG transceiver modules
adding users more hardware resources

2019-QT3: IQRF-IC1 chip (target: $2,00)
IQRF Tech s.r.o. becomes fabless chip manufacturer

2020-QT2: IQRF® fully documented
final step before standardization

2021-QT4: IQRF-IC2 chip (target: $1,00)
economical attractiveness dramatically increased

2021-QT4: IQRF® standardized
global acceptance preposition fulfilled

wireless mesh technology for IoT

IQRF Tech s.r.o. mission is to deliver LOW POWER , SIMPLE, SECURE and INTEROPERABLE WIRELESS connectivity and become #1 wireless mesh networks provider.


Thank you

WHY IQRF®?

Basic specs and features generate high application potential, which is further multiplied by unique technical solutions.

Recognized technical limitations

NO (or not efficient) BIDIRECTIONAL COMMUNICATION
- Not usable for control systems
- Maintenance issues (management, maintenance, upgrades)
- Problem with security (no security updates)

NO ROUTING (= NO MESH SUPPORT)
- Not covering "difficult" areas (deep indoor, obstacles, ...)
- Relaying on problematic power budget

COMMUNICATION RANGE AND SPEED should fit to application

LIMITED POWER BUDGET (especially) for battery operated devices

LOW COMMUNICATION SPEED (LPWANs)
- Longer TX time leads to higher power consumption

Recognized legal limitations

OUTPUT POWER LIMITS
- Increasing sensitivity to extend range = decreasing immunity to noise

VERY LOW COMMUNICATION SPEED
- Legal limits for duty cycle disable more frequent communication
- Limits number of packets per hour

Recognized application concerns

- MATURITY and AVAILABILITY

IQMESH®

FRC®

DCTR®

True Low Power™

Virtual Devices

IQRF Smart Connect™

TECHNICAL UNIQUENESS

LOW POWER — ENABLING BATTERY OPERATED DEVICES
... as most of IoT devices will be wireless

SIMPLE — EASY INTEGRATION both on HW and SW level
- To shorten design and time-to-market
- To enable faster monetization
- To save both initial and total cost

SECURE — SECURITY is a must for wireless devices
- To avoid future lost and costs
- To assure functionality and consistency

INTEROPERABLE — INTEROPERABILITY is the first step to standard
- To address bigger application market

The world (re)discovered beauty (and need) of wireless mesh networks.

wireless mesh technology for IoT

DELIVERED UNIQUE VALUE
- order less consumption per byte compared to LPWANs
- reliable and robust routing, fast data aggregation
- simple integration, interoperability multiplying effect

Combination of low power, high reliability and bi-directionality is the best fit for monitoring applications, street lighting, industrial automation or heating control.