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IQRF®

Technology, ecosystem and community for IoT



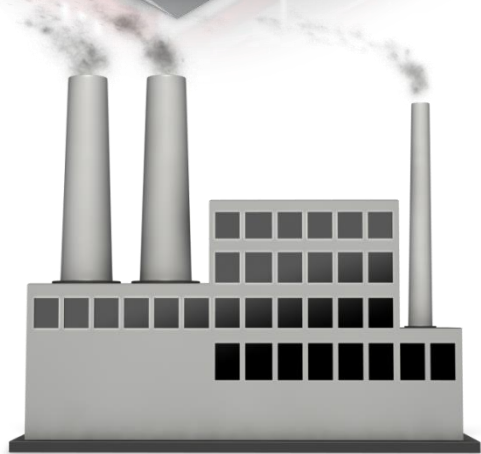
Šimon Chudoba
IQRF Alliance, CEO

September 1th, 2017

IoT seems to be simple



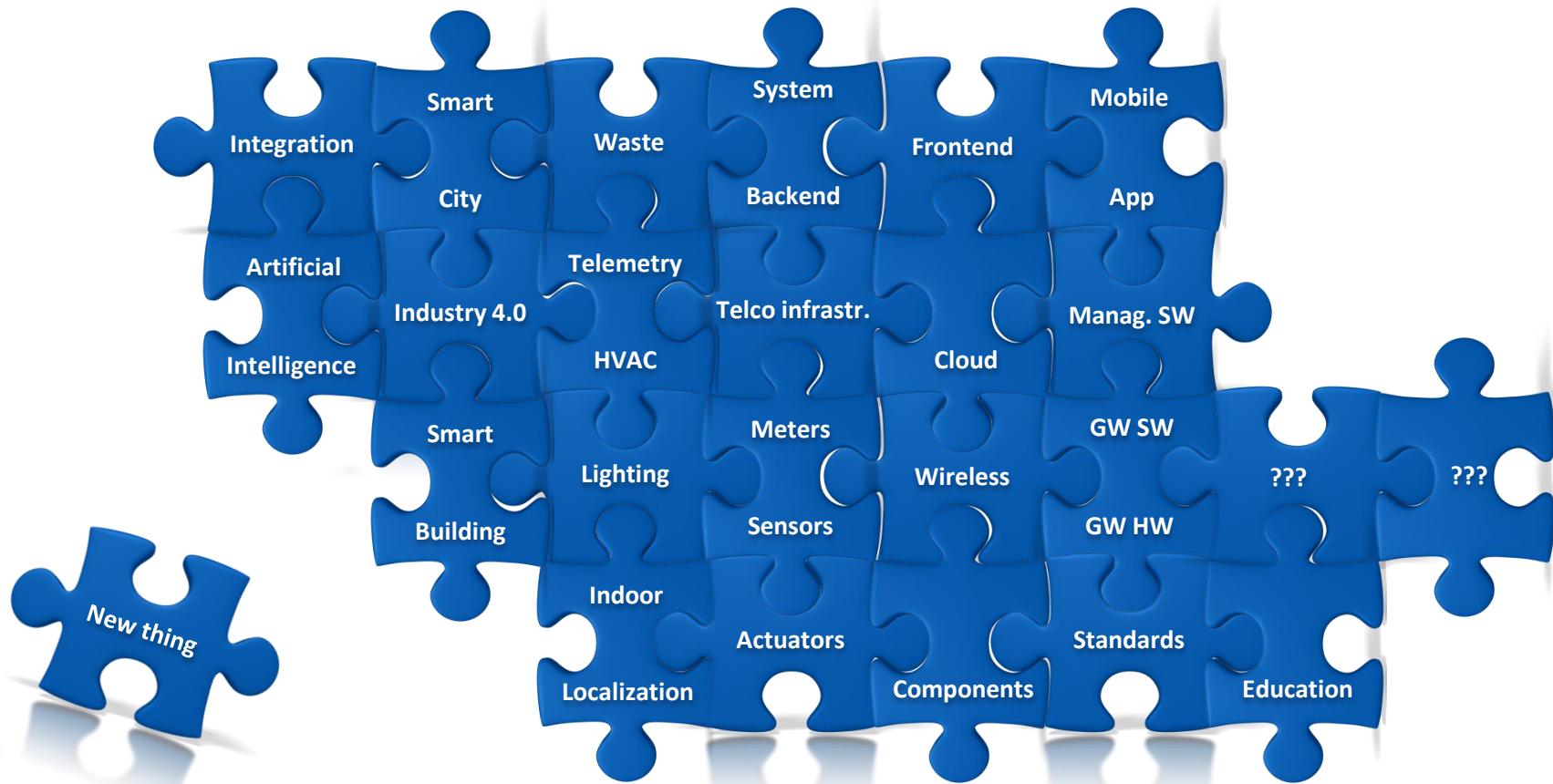
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IoT is complex puzzle



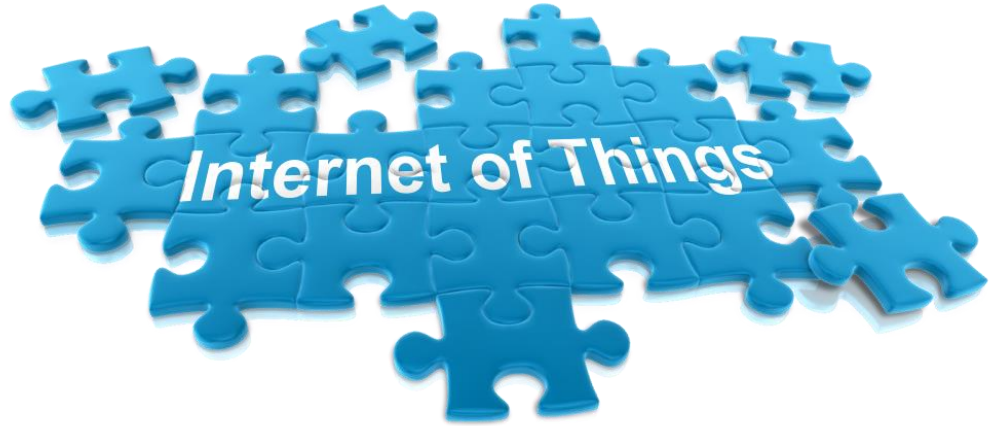
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IoT is hard if you are alone



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You need a team



There is one



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75+ members – 17+ countries



Community

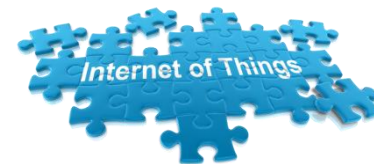


Interoperability



Promotion

Clouds & Services



Any cloud / SW / App

Gateways



IQRF Transceiver
IQRF Daemon

Any GW

End Devices



IQRF Transceiver
IQRF Standard

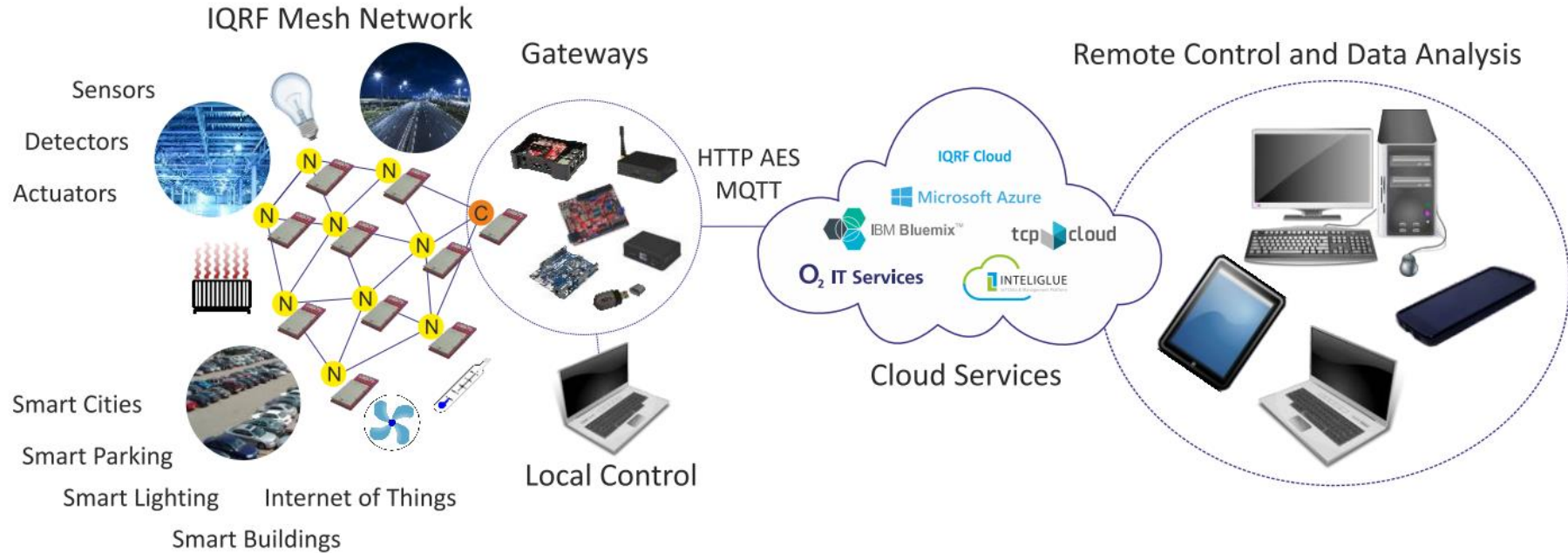
Any IQRF device

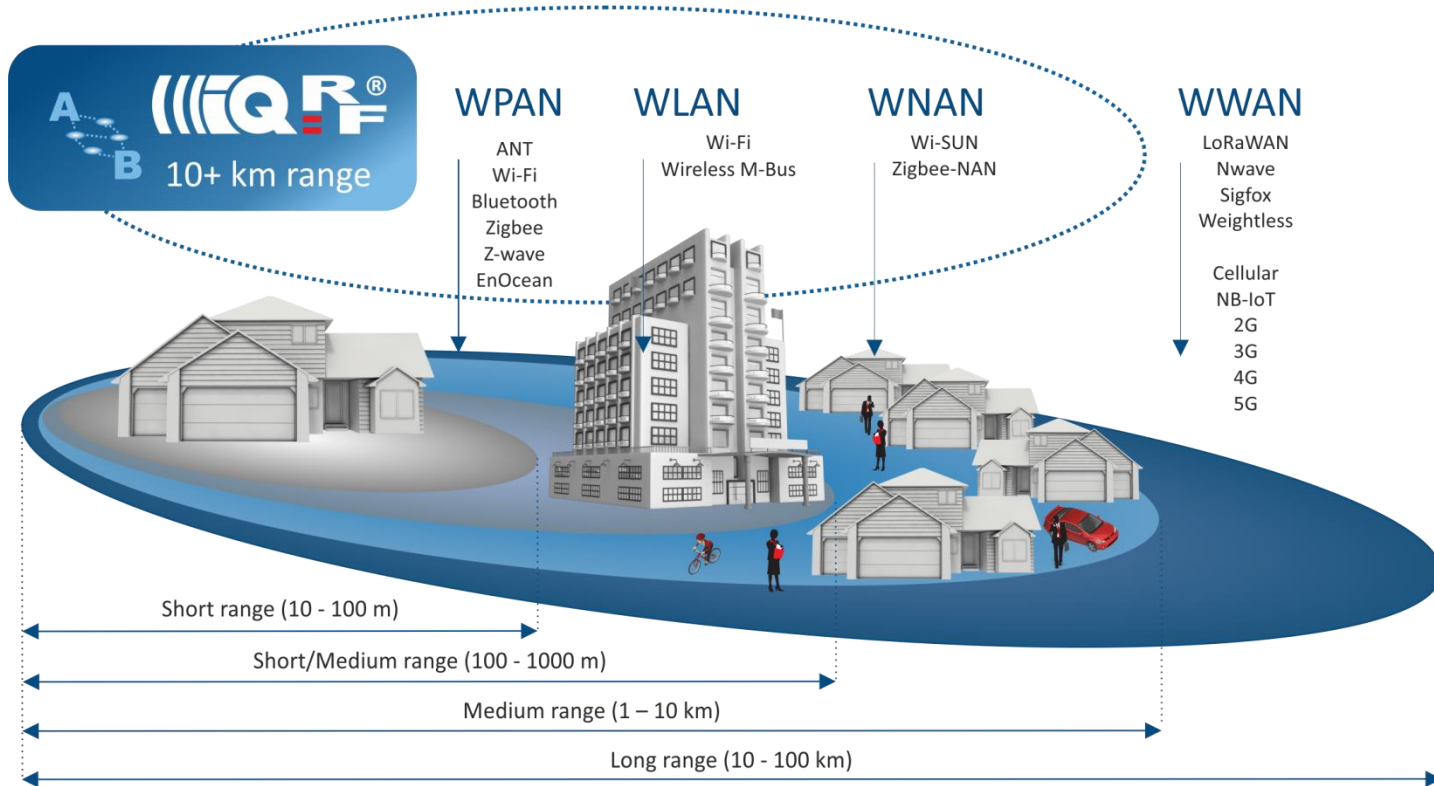
HTTPS / MQTT

IQRF DPA

IQRF Technology

Mature wireless platform for Internet of Things.





Project parameters for IQRF



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Needed parametr for you project	IQRF
Data acquisition	Yes
Control	Yes
Own gateway	Yes
Ready infrastructure and signal coverage (Fees)	No
Low density of nodes (less than every 200m)	No
Deep indoor functionality (underground, tunnels)	Yes
Low power	Yes
OTA upgrades	Yes
High robustness and reliability	Yes
Cloud flexibility	Yes

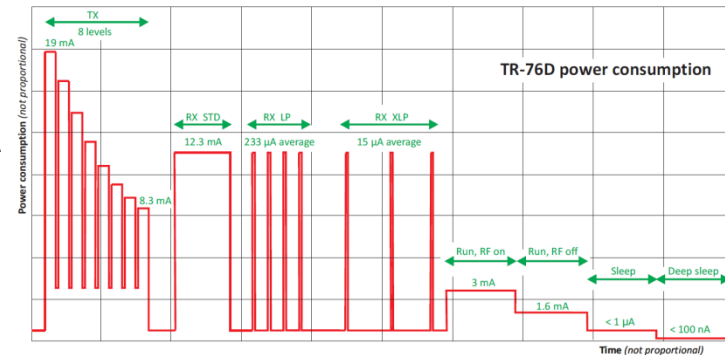
IQRF Technology – Basic features



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- **Bands** 868, 916, 433 MHz
- **Topology** full mesh with 240 hops (used in real applications), 239 nodes
- **References** mature technology with 250+k running devices worldwide since 2008
- **Protocol** IQMESH[®], patented directed flooding networking, secure communication, redundant packet deliver, no need for self healing, no latency after reset, etc.
- **Data** 20 kBauds, up to 64 B in 1 packet
- **Range** 500m+ line of sight @ 12 mW
- **Power consumption**

Standard RX	12.3 mA
Low Power RX	233 μ A
Sleep with watch dog	2 μ A
Deep sleep	100 nA

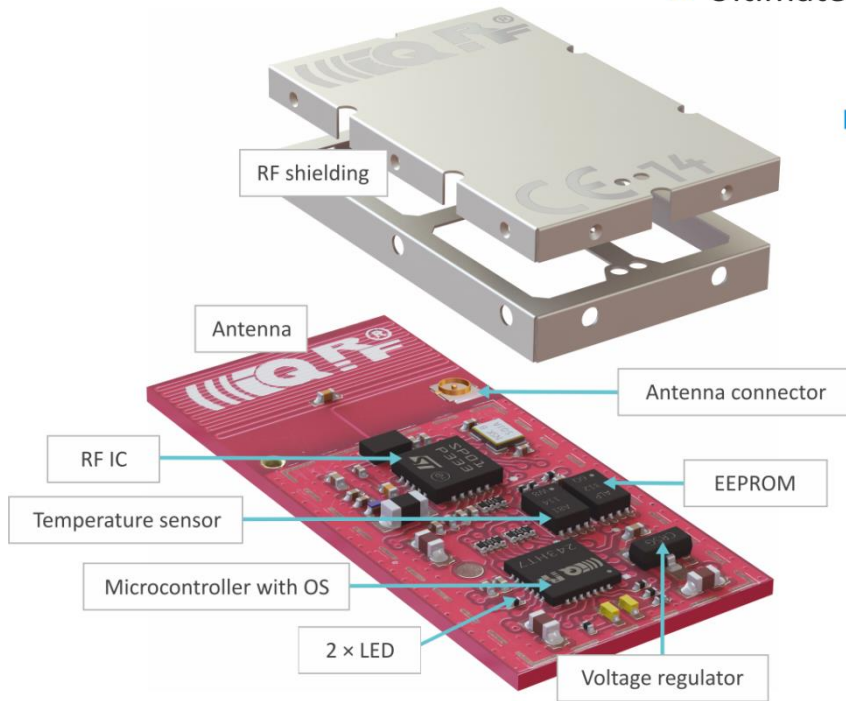


Unique features



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- **Transceiver architecture** **PATENTED**, used in many technologies worldwide, built-in OS
- **Robust routing algorithm** **PATENTED**, directed flooding – reliably working mesh network with 239 routers
- **Direct Peripherals Access** **PATENTED**, framework for wireless networks with no programming, easy-to-achieve interoperability, wireless integration in a few weeks
- **Fast Response Command** **PATENTED**, the fastest wireless mesh network data collection worldwide, 2bits from 240 nodes in 26s, minimal network traffic and power consumption
- **OTA programming and upgrades** robust wireless programming of hundreds of nodes simultaneously
- **Precise Sleep** 0.1% time variance on wake-up, often used in combination with FRC®
- **Back up and restore** back up of all network data for further easy network restore
- **Autonetwork** automated network build up
- **Service mode** direct connection to any node, FW upload, configuration, back up, restore,...
- **Security** based on standards (AES 128), pairing and communication encryption



- **Ultimate security:** based on industrial standards (AES-128)

- **Extra low power:** < 100 nA standby, 15 μ A receiving

- **Simple integration** and control: SPI, UART, DPA

- **Sub-GHz ISM bands:** 433 / 868 / 916 MHz

- **Range:** 500 m with small PCB antenna

- **Easily connectable** to Arduino, Raspberry Pi, chipKIT etc.

- **High reliability:** robust mesh networking

IQRF Applications



35k parking places in Budapest



50k+ street lights in Israel



30k+ street lights in CZ and SK



Smart City Pisek



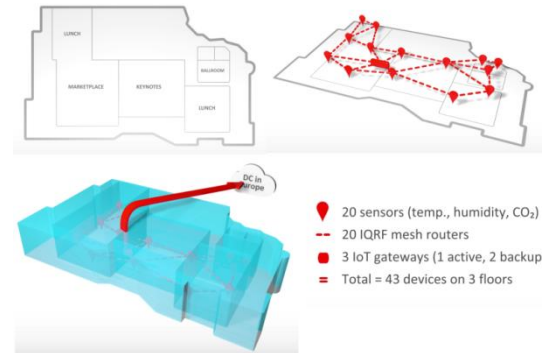
50k+ shopping malls lights, Mexico



Industry hall lighting



Industry hall heating



CO₂, T, RH monitoring



Smart Tire Valve Caps



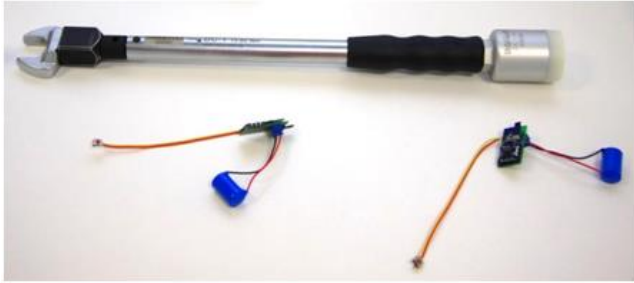
130k+ embankment monitoring in UK



Trailer monitoring



Train monitoring



Skoda auto production line monitoring



Wireless control of power plants



Air tools monitoring



Localization and safety monitoring



Snow gun control in China



Beehive monitoring



Intelligent cycling jersey with signal lights



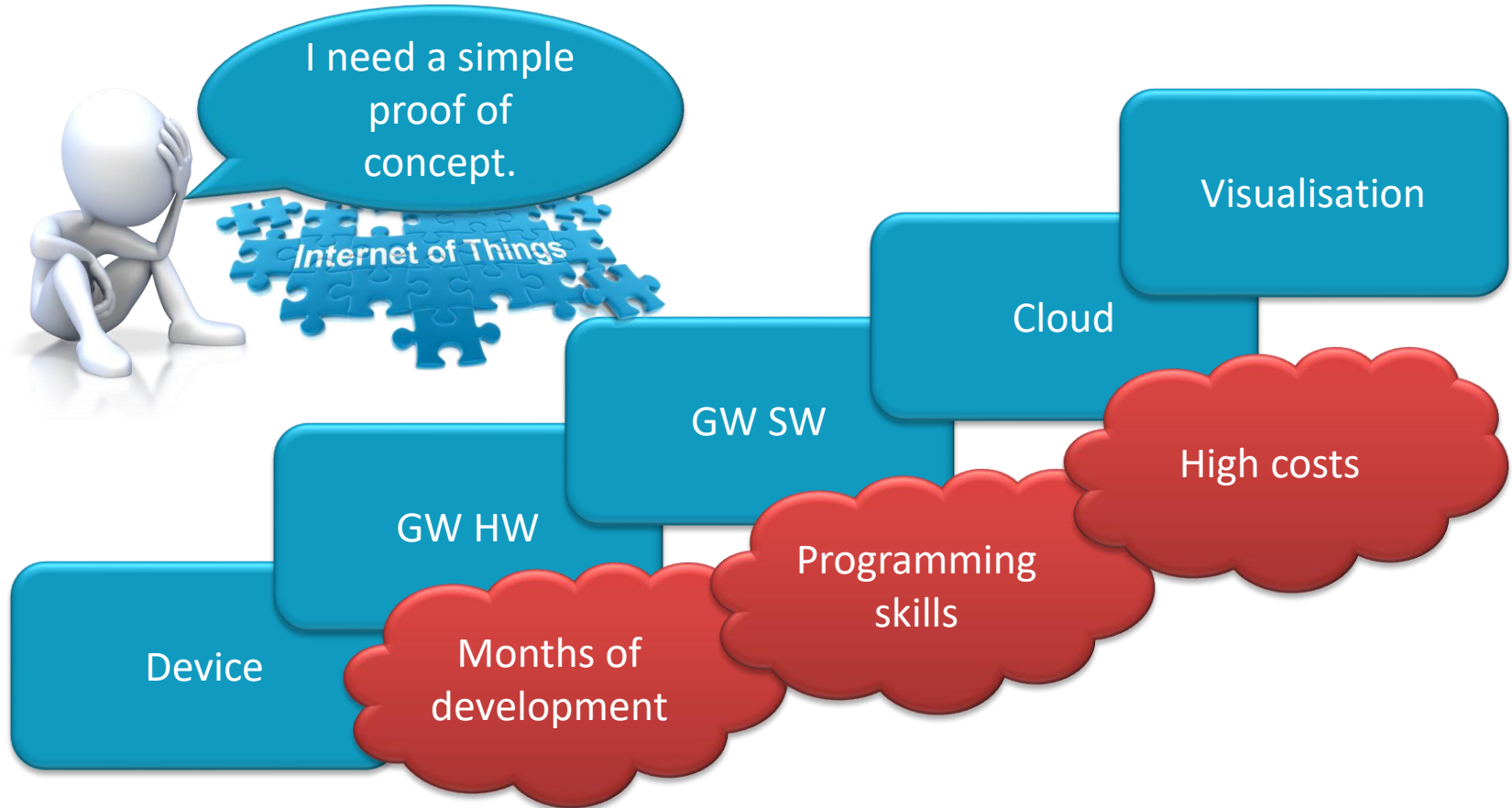
Remote control of shooting targets

IQRF Starter Kit

Simple proof of concept



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All key components in one box

Interoperable with real IoT devices

Up & running within 2 hours

SW extensions available on-line

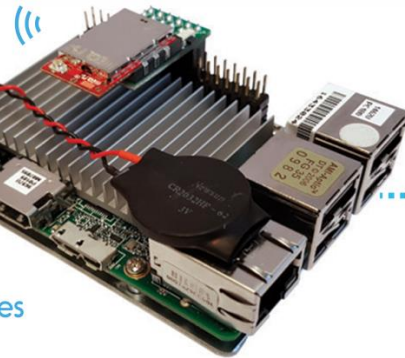
Flexible and scalable

Cost effective



 
IoT Starter Kit

UP with IQRF adapter



Microsoft Azure

IQRF Nodes



IQRF Router



Sensor kit



Relay kit

Ready extensions
github.com/iqrf/sdk

Inteliments Cloud

Ubiworr Framework

Resin Deployment

RehiveTech Management

NodeRed Dashboard

SW

www.iqrf.shop

Co₂, T Sensors

RH, VOC Sensors

Wireless Relays

Power Sockets

HW

- **IQRF Alliance** www.iqrfalliance.org
- **IQRF Technology** www.iqrf.org
- **IQRF Summit videos** www.youtube.com/playlist?list=PLEQy1I01En99hyDFXiqu86kAcwJ3v6fhq
- **IQRF Summit** <http://iqrf.org/summit2017/>
- **IQRF Starter Kit** <http://iqrfalliance.org/product/iot-starter-kit>
- **IQRF Daemon** <https://github.com/iqrfsdk>
- **IQRF Shop** <https://iqrf.shop/>



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