The internet of Things
- a new dimension for services to citizens

Miroslav Vozňák
voznak@ieee.org

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IoT cluster in Moravian-Silesian Region

- Founded in 2016 as a consortium of VSB-TUO and industrial companies
- platform for IoT solutions development and supporting business in IoT

**Running projects with VSB-TUO participation**

- **Secure IoT Gateway** – within national security research programme of the Ministry of Interior (2017-2020, budget cca 0.6 mil. EUR)
- **Development of IoT product portfolio of Solidus Tech Ltd.** – a newly gained project, supported by the Ministry of Industry and Trade (2017-2020, cca 0.7 mil. EUR)
- **Pilot project using CESNET infrastructure for IoT network** – supported by CESNET (2017-2018)
- and finally internal sources are applied within **Student Grant Competition** – conducted in FEECS VSB-TUO
Technology used in IoT LPWAN

- **low bandwidth** to transfer small amounts of data, not often (duty cycle)
- SigFox, IQRF, NB-IoT, LoRa and others

**LoRa, Long ranged low power wireless platform**

- **LoRaWAN** (standard defining architecture and protocols – IoT GW, network and application servers)
- **Sensitivity** -142dBm, **range** up to 40 km (2km in an urban agglomeration)
- **Operates in the license-free ISM bands** all around the world (433, 868, 915 MHz)
- **Data rates** from 300 bps to 5.5 kbps with two high-speed channels at 11 kbps and 50 kbps (FSK)
- **Secure bi-directional** channels (in class A, B, C), OTAA and ABP modes
IoT campus network (VSB-TUO)

- **8 channels** concentrator iC880A connected to Rpi in our IoT GW
- own developed **network server** supporting MQTT
- In operation from 10/2016
Example of shock sensor

- Atmega 328, RFM96 Hope, 1800mAh (expected life of 3 years)
- Communication in IoT network is encrypted
- WebGUI and RESTful API for users
Conclusion

- Nowadays, the IoT campus network in VSB-TUO serves as **a best practice model for other universities** (Czech Technical University in Prague, University of West Bohemia in Pilsen, Brno University of Technology, Technical University in Liberec and Silesian University in Opava)

- **Ready for deployment in Ostrava** (cooperation with Ovanet)

- Possible **playground** for companies in Ostrava City and everyone who deals with IoT (as a free available and best effort service)

- Contact us [https://lora.vsb.cz](https://lora.vsb.cz)
Thank you for your attention

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