



# IoT for Public Safety

## Harold Linke PSCE

PSGR Meeting  
Prague October 18<sup>th</sup>, 2018

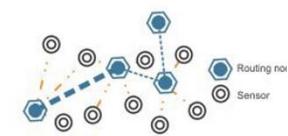
# Internet of Things



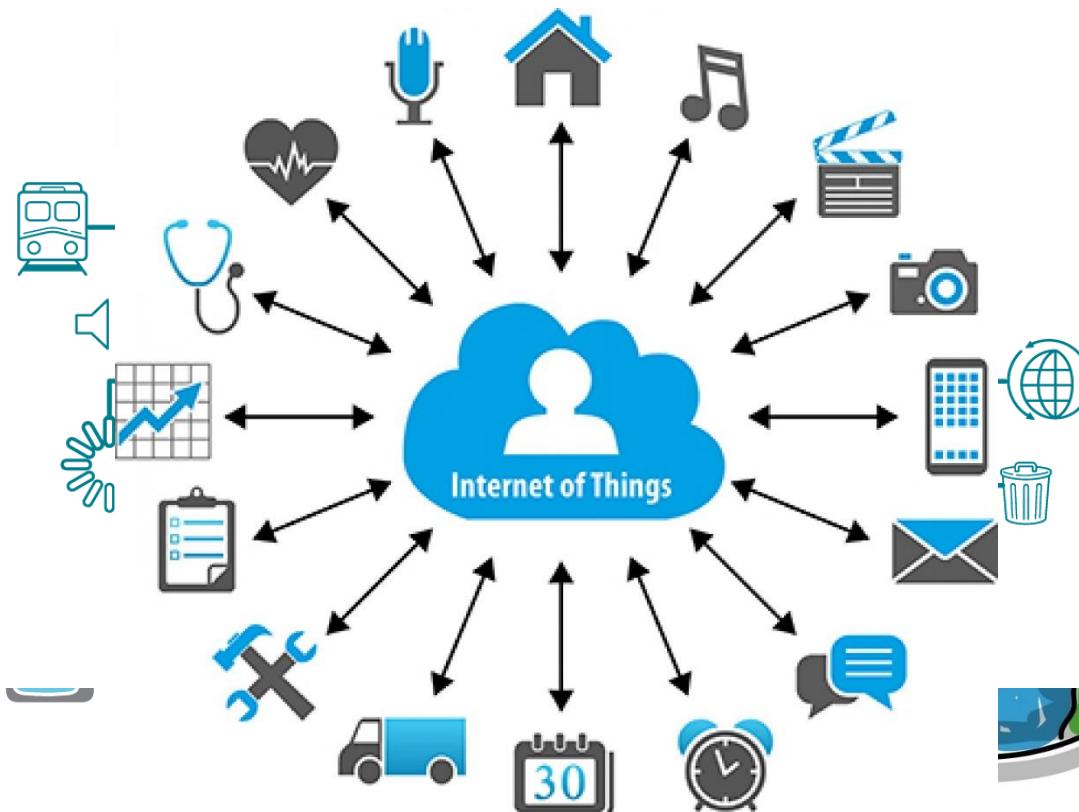
Vehicle,asset,person monitoring &



Embed Mobile



M2M & wireless sensor netw



management

or smarter tomorrow



healthcare



# Internet of Public Safety Things

- What are the use cases?
- Which network technology can be used for which use case?



# IoT Network Technologies

- **Narrow Band IoT (NB-IoT)**  
Low Power Wide Area Network (LPWAN) by 3GPP - 250kBit/s max )
- **LTE-M**  
Low Power Wide Area Network (LPWAN) by 3GPP - 1 Mbit/s max )
- **EC-GSM Extended coverage GSM IoT**  
Low Power Wide Area technology based on eGPRS – 70kBit/s
- **LoRa (Long Range)**  
license-free sub-gigahertz radio frequency bands. Open source.  
Very-long-range transmissions (more than 10 km in rural areas)  
< 50Kbit/s
- **SigFox** - proprietary technology, ISM radio band 868MHz (Europe) , 902MHz (US). wide-reaching signal, passes freely through solid objects – 0.3 Kbit/s (12 Bytes per message – 40 messages per day)



# Example use cases

- Mountain rescue
- Early fire warning and fire monitoring
- Water level metering
- Sensors for Landslides Monitoring and Alarming
- Air pollution detection
- Smart locks
- Wooden poles used for electricity transmission lines

# Questionnaire



## QUESTIONNAIRE

[www.psc-europe.eu](http://www.psc-europe.eu)

This questionnaire aims at gathering feedback and potential use cases for Internet of Things (IoT) devices and solution in the public safety area. The results will be used as input for a PSC-E white paper IoT for Public Safety Services.

Organization type:	<input checked="" type="checkbox"/> Emergency Medical Services	<input type="checkbox"/> Police
	<input checked="" type="checkbox"/> Fire-brigades	<input type="checkbox"/> Civil Protection
	<input type="checkbox"/> Communication Operators	<input checked="" type="checkbox"/> Other

The Internet of Things (IoT) for Public safety white paper describes use cases for IoT in Public Safety. The scope of the white paper is to describe a selection of use cases that demonstrate the potential of IoT from licenced and non-licenced Technologies and from Technologies that have been Standardised (i.e. 3GPP) and those which are proprietary.

The objective of the white paper is to show how IoT can be used to aid the practitioners in public protection and disaster response in saving human life and help local communities tackle emergencies and dangerous situations, by deploying sensors or devices to monitor the environment (e.g. air pollution, river water-level detection, fire, gas detection), or in controlling devices such as remotely accessing door locks.

- Following technologies are discussed in the white paper:
  - Narrow Band IoT (NB-IoT) is a Low Power Wide Area Network (LPWAN) radio technology standard developed by 3GPP to enable a wide range of cellular devices and services - 250kB/s max.
  - LTE-M is a Low Power Wide Area Network (LPWAN) radio technology standard developed by 3GPP to enable a wide range of cellular devices and services - 1 Mbit/s max.
  - EC-GSM Extended coverage GSM IoT is a standard-based Low Power Wide Area technology. It is based on GPRS and designed as a high capacity, long range, low energy and low complexity cellular technology for IoT communication - 70kB/s
  - LoRa (Long Range Radio) is a digital wireless communication technology using license-free sub-gigahertz radio frequency bands. LoRa enables very-long-range transmissions (more than 10 km in rural areas) with low power consumption < 50Kb/s
  - SigFox employs a proprietary technology that enables communication using the Industrial-, Scientific and Medical (ISM radio band) which uses 868MHz in Europe and 902MHz in the US. It utilizes a wide-reaching signal that passes freely through solid objects, called "ultra-narrowband" and requires no energy (12 Bytes per message)

A description of the technologies can be found in the annex.

Following example use cases are under discussion:

- Mountain rescue
- Early fire warning and fire monitoring
- Water management
- Sensors for Landslides Monitoring and Alarming
- Air pollution detection
- Smart locks
- Wooden poles used for electricity transmission lines

A short description of the use cases can be found in the annex.

Page Break

[www.psc-europe.eu](http://www.psc-europe.eu)

## QUESTIONNAIRE IoT for Public Safety

### IoT technologies

IoT is a robust network of (small and ideally cheap) devices, all embedded with electronics, software, and sensors that enable them to exchange and analyze data. In a nutshell, IoT could simply be viewed as merging sensors with technology that will allow such sensors to transfer data to a repository. These data are then analyzed through Big Data algorithms and transformed into actionable insights.

Q1. Do you believe IoT could be applicable to the Public Safety sector?

Yes    No

If yes, please provide some short examples:

(This field is empty)

Q2. Have you heard about one of the following IoT technologies before?

Narrow-Band IoT  
LTE-M  
GSM  
LoRa  
SigFox

Yes    No

If yes, which one?

(This field is empty)

Page Break

2/6

## QUESTIONNAIRE IoT for Public Safety

### IoT technologies

Q4. Have you, or are you aware that any of your fellow-colleagues felt the need to use such technology in any emergency situation?

Yes    No

If yes, please describe what was the purpose:

(This field is empty)

Q5. Do you believe this technology can improve the task of public safety services?

Yes    No

If yes, please provide some examples:

(This field is empty)

Page Break

3/6



# PSRG workshop Prague

## October 18<sup>th</sup>

- 8 questionnaires filled
- 67 use cases (some double)
- Unique use cases:



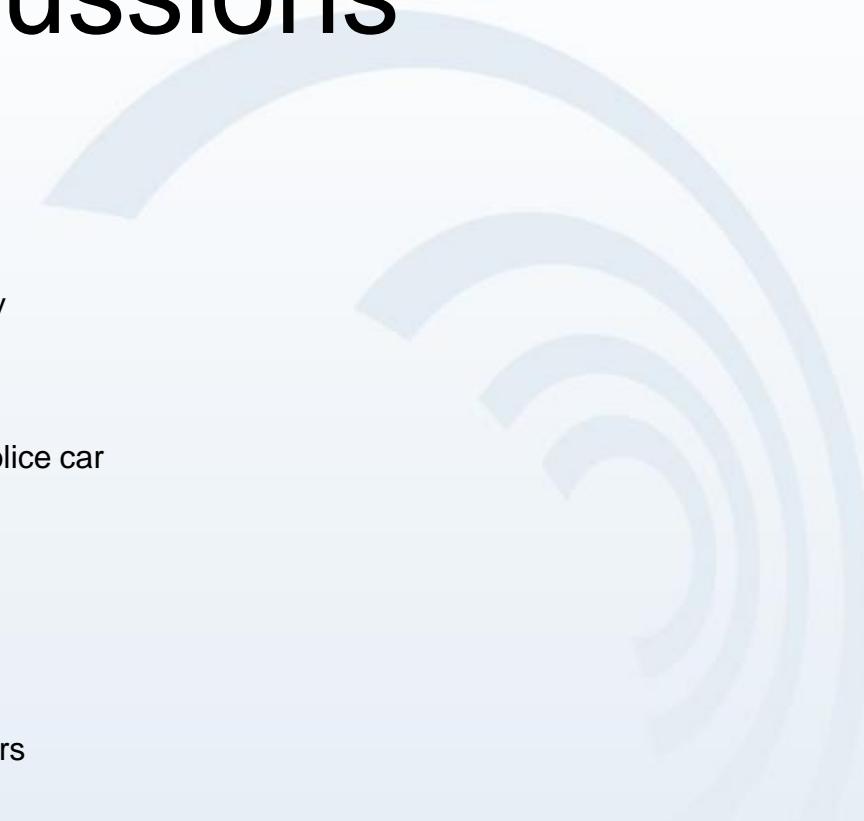
# Results from PSRG discussions

- Automated external Defibrillators
  - Management
- Alerting
  - Automatically detect critical situations
- Avalances
  - Warning
  - Detecting victims
- Border
  - Movement sensors, intelligent cameras (Migration detector)
- Cameras
  - Management
  - Body cameras
  - Public cameras
- Crowd
  - Control
  - Counting number of crowd members
  - Behavior prediction
  - Infrastructure monitoring
  - Access control



# Results from PSRG discussions

- Drones
  - Autonomous drones
  - Bring AED
  - Bring special goods
  - Monitoring of security and safety
- Equipment
  - Management of batteries
  - Management of equipment in police car
- Fire
  - Fire detection
  - Smoke detection
  - Gas detection
  - Forrest fire warning
  - In door localisation for fire fighters
  - Medical sensors for firefighters
  - Temperature sensors on firefighters
- Floods
  - Automatic Flood alerting





# Results from PSRG discussions

- Medical
  - Heart rate sensors
  - General health sensors, heart rate,.. Blood pressure, temperature
- Sensors
  - Mountains – landslides, snow, avalanche
  - Radiation
  - Earthquake
  - Propoerty protection
  - Eruption
  - Pollution
  - Toxic chemicals
- Smart locks
  - Access control
  - Cars
- Sound
  - Shoot detection
  - Explosion detection
- Weapon sensors
  - Shoot sensor – alert
  - Holder sensors - alert



# Results from use case workshop Lancaster

- **Social media: Triangulating data**
- **Water level metering**
- **Early fire warning and fire monitoring by monitoring animal movement**
- **Equipment management**
- **Augmenting the environment**
- **IoPST Business Case + Evacuation**
- **No network in rural areas**
- **IoPST Park Guide and Panic Button**
- **IoPST Don't light a fire here**



# Status

- Living use case list
- White paper on IoT for Public Safety with some example use case end of January 2019