How *IoT* drives the Innovation towards *Integrated Command Control* & *Public Safety Solutions*

teltronic
a Hytera company

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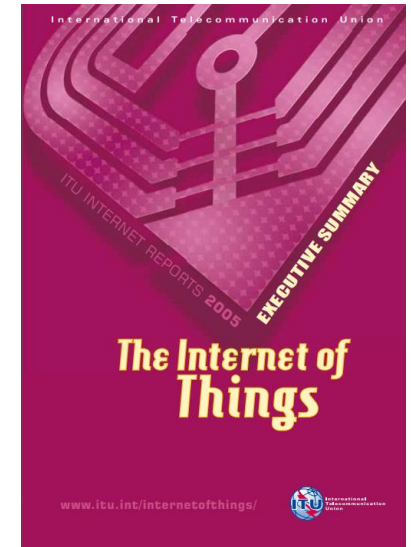
IoT Ecosystem

What is IoT?

- The term IoT was used for the first time by United Nations in an International Telecommunications Union report in 2005:

  "A new dimension has been added to the world of information and communication… from anytime, anyplace connectivity for anyone, we will now have connectivity for anything. Connections will multiply and create an entirely new Dynamic network of networks – an Internet of Things"

What is IoT?

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The Internet of Things (IoT) is the Interconnectivity of the world around us.

"The Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment."

"The IoT links objects to the Internet, enabling data and insights never available before"
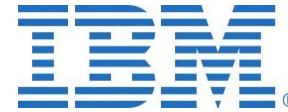
"The Internet of Things refers to the growing range of connected devices that send data across the Internet"

"The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to-computer interaction."

IoT is the technology that establishes intelligent communication between things.

Internet of Things (IoT) is a sprawling set of technologies and use cases that has no clear, single definition

What is IoT?

Gartner

"The Internet of Things (IoT) is the network of physical objects that contain embedded technology to communicate and sense or interact with their internal states or the external environment."

Physical Objects

*"…**physical objects** that contain embedded **technology…**"*

INDUSTRY

Logistics

Construction Machinery

Factories

Industrial robots & machinery

DOMESTIC & COMMERCIAL MARKETS

Digital appliances

Agriculture

Urban facilities

Computers & smartphones

CRITICAL INFRASTRUCTURES
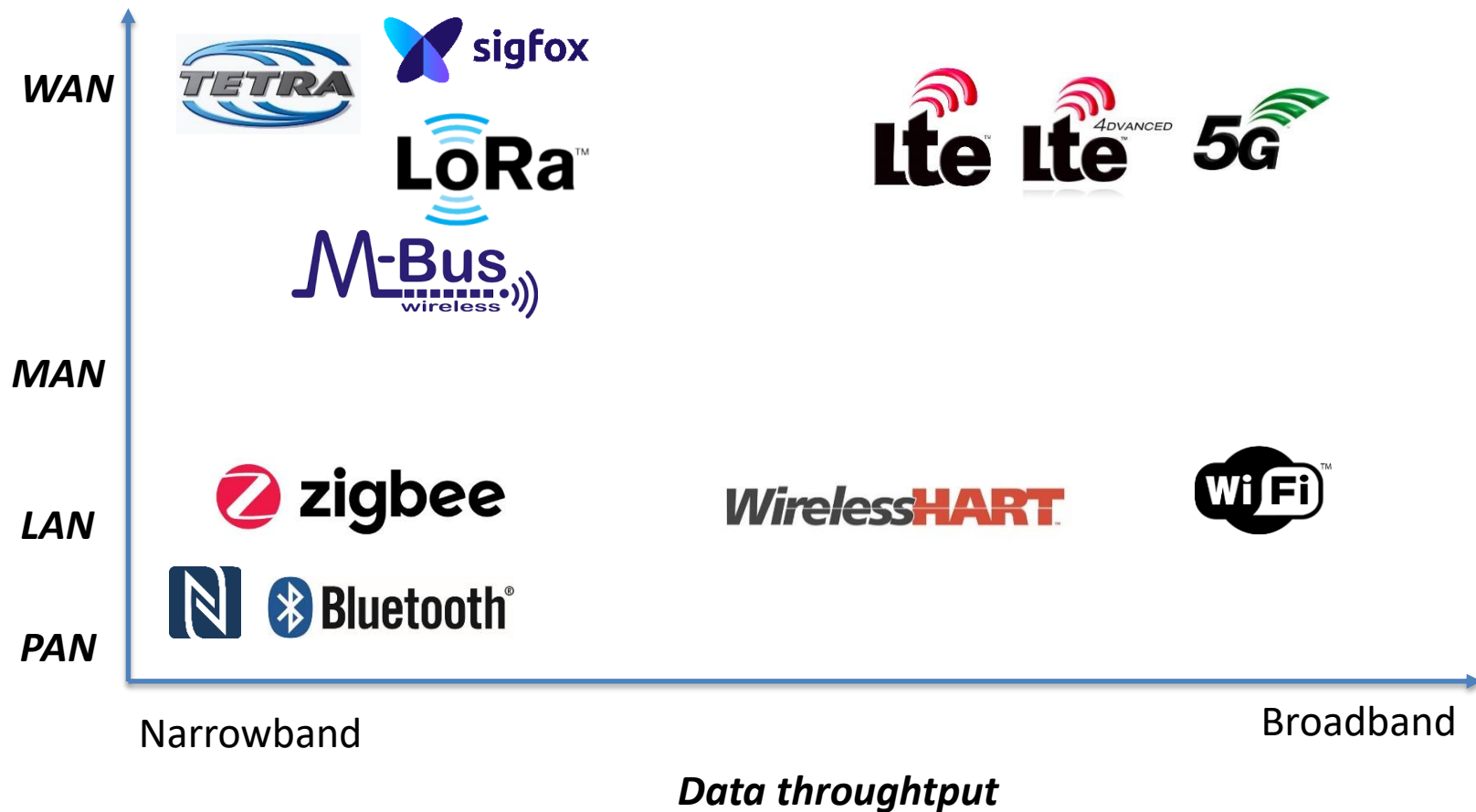
Aviation

Railroads

Energy

Gas pipelines

Ships

Automobiles

Communication technologies

"… technology to communicate…"

Interaction with the environment

*"… **interact** with their internal states or the external **environment** …"*
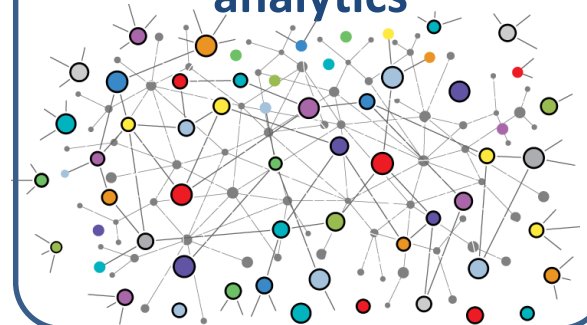
Tracking behaviour	Enhanced situational awareness	Sensor-driven decision analytics
Process optimization	Optimized resource consumption	Complex autonomous systems

*Based on McKinsey categories

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The Internet of Public Safety Things

Commercial IoT vs Critical IoT

Commercial IoT	*Critical IoT*
• Low-cost embedded sensors are preferred.	• May use commercial but also industrial-grade sensors.
• IoT Wireless service provided by public operators or specialized IoT service providers.	• IoT Wireless service relay on private networks or secured IoT services.
• Large cloud providers take care of IoT devices and their data.	• End user prefer to take care of its IoT devices and protect their data on their own.
• Data security relies on IoT platform provider.	• Data security is a must and must be guaranteed.
• Lack of reliability may reduce customer satisfaction index.	• A failure in security may affect to critical operations and cause a risks in the safety for people.
• Real-time is not critical.	• Data must be available in real-time.

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Mandatory in Public Safety IoT

Agile and smart decisions: Big Data

Integrated and Intelligent Command & Control

Mandatory in Public Safety IoT
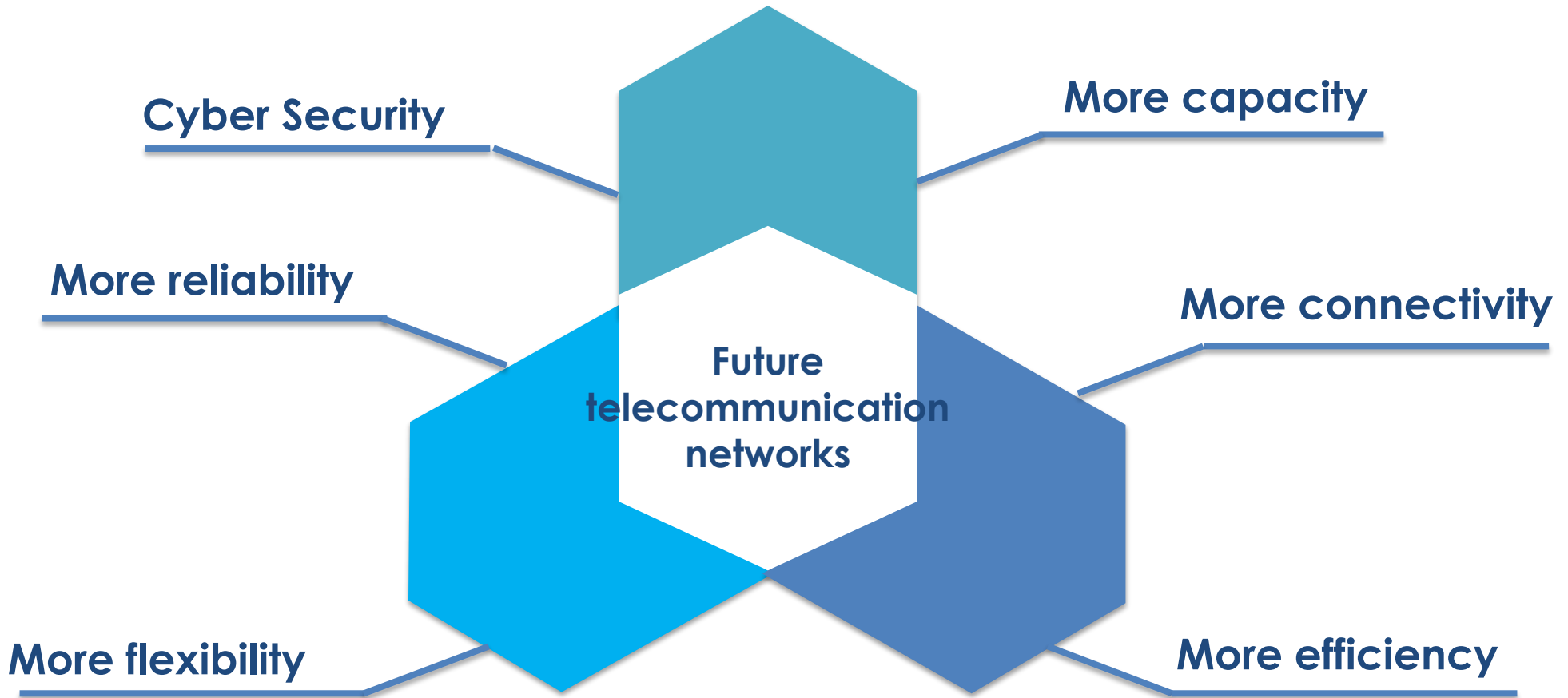
Agile and smart decisions: Big Data

Integrated and Intelligent Command & Control

- Multiple sources of information.

- Intelligent analysis of information

- Rapid decision-taking process.

- Direct interaction with citizens.

- Contextual awareness is a must: **who**, **what**, **where**, **when** and **why**.

Are we ready for a change?

Cyber Security

More capacity

More reliability

More connectivity

Future telecommunication networks

More flexibility

More efficiency

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Trends and challenges for future ICCS in Public Safety

Current ICC Solution

TELTRONIC Command & Control offering is based on an integrated communications solution compatible with a variety of DIGITAL RADIO & TELEPHONY technologies

Call taking

GIS/AVL

Computed Aided Dispatch

Video Management

Incident Management

Voice & Event Recording

Radio dispatch

Rail Dispatcher

112/911   **IMS**

GIS   **Rec**

CeCoCo

CAD   **Radio**

Video   **Trans**

But is this enough for IoT?

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Key challenges

Wireless technologies:

- How to Exchange data among IoT applications and devices?

- Will we use new radio technologies or reuse existing networks?

IoT Platforms:

- How to Exchange data among IoT applications and devices?

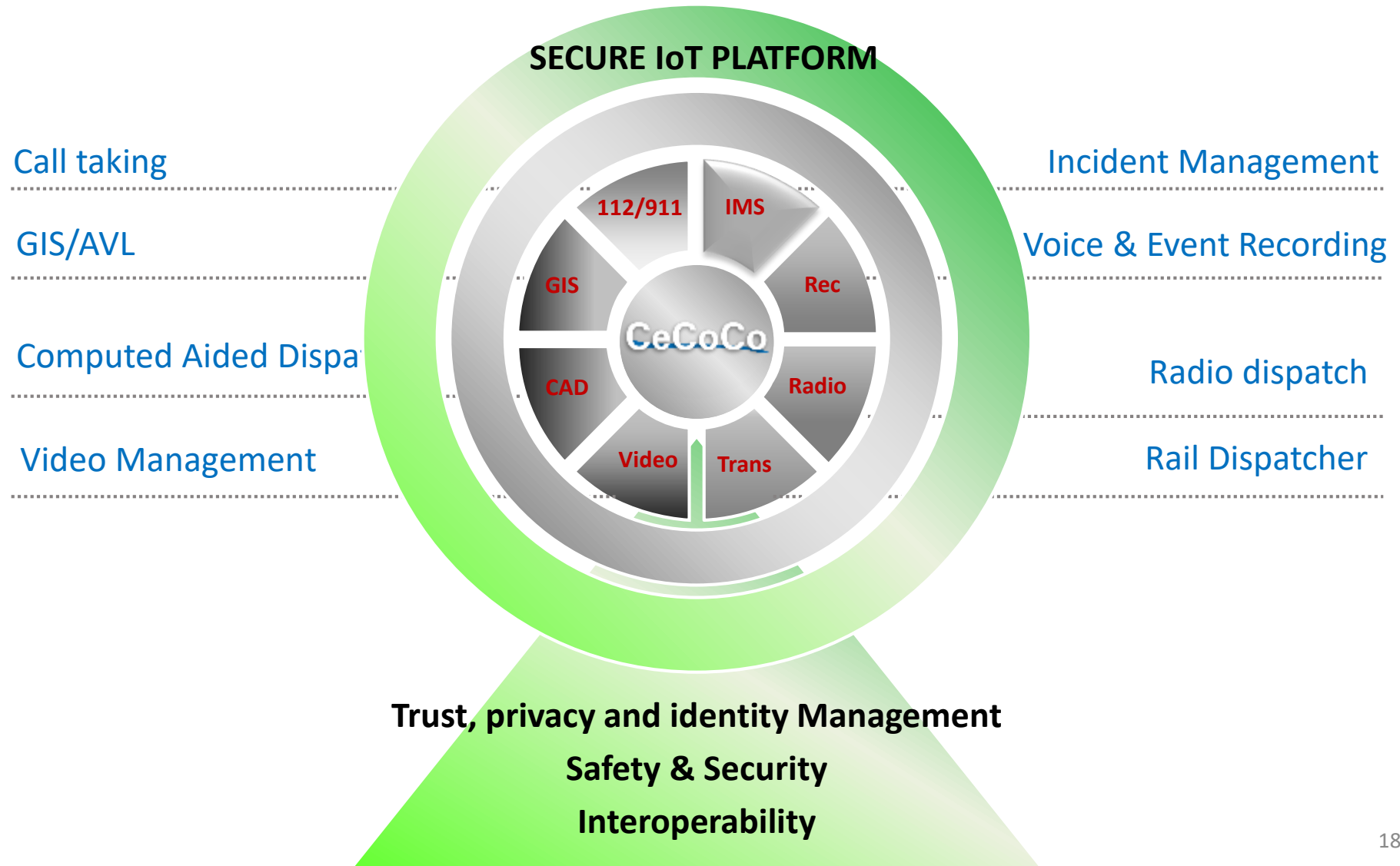- Which kind of IoT platforms will take care about sensor data?

IoT privacy:

- How to protect sensitive information collected by IoT devices ?

- How to establish a standardised agreement to protect sensitive information?

IoT Cyber Security:

- How to use secure IoT Platforms?

- How to protect sensors vulnerability from cyber attacks?

Next Generation ICC Solution

SECURE IoT PLATFORM

Call taking

GIS/AVL

Computed Aided Dispa

Video Management

Incident Management

Voice & Event Recording

Radio dispatch

Rail Dispatcher

112/911

IMS

GIS

Rec

CeCoCo

CAD

Radio

Video

Trans

Trust, privacy and identity Management

Safety & Security

Interoperability

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Sample use cases

1. *CALL TAKERS: Identify the emergency before someone alerts!*
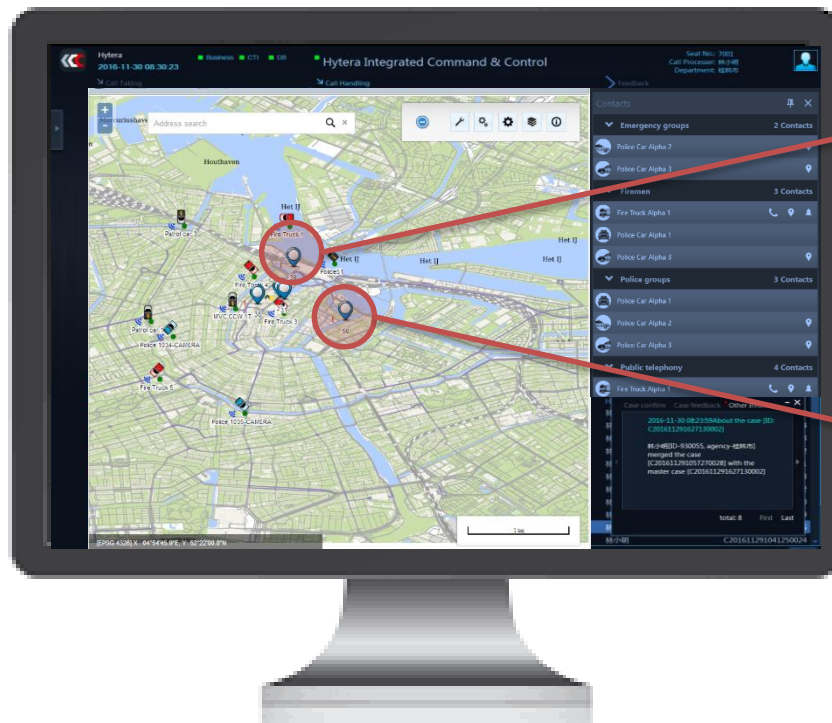

- Integrating automatic notifications from external sensors:

  ▪ Automatic Crash notification from vehicles.

 ▪ Automatic Fire notifications from buildings

Sample use cases

2. DISPATCHING SYSTEMS: Detecting the incident and protecting first responders:

- IoT Triggers in patrol cars: doors opening, emergency lighting, speed alerts.
- Personal IoT Triggers: speed, biometrics, man down emergency alerts, alerts after drawing a weapon.
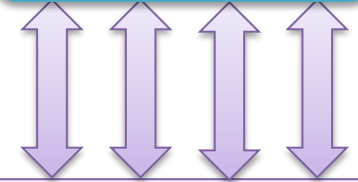- Gunshot audio detection.
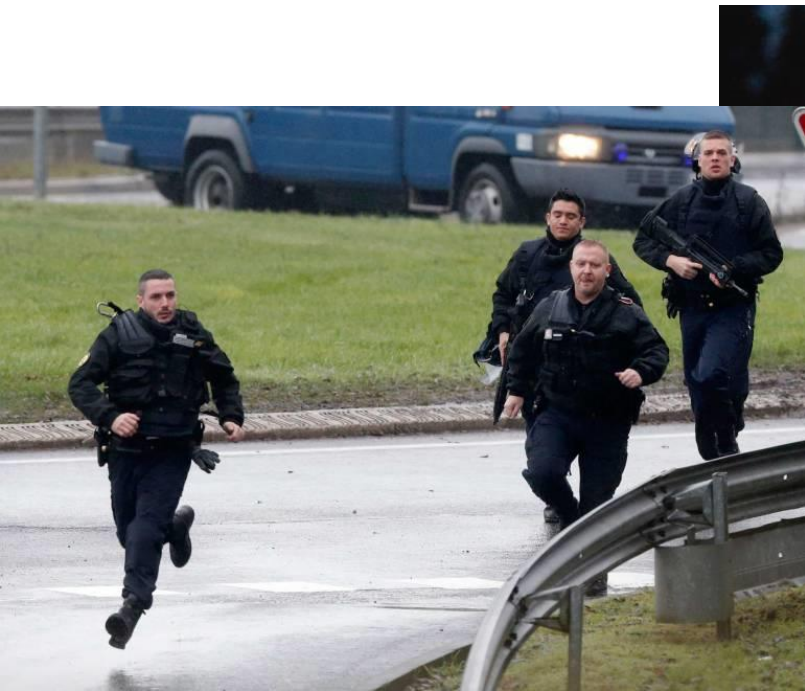
Summarizing deployment scenario
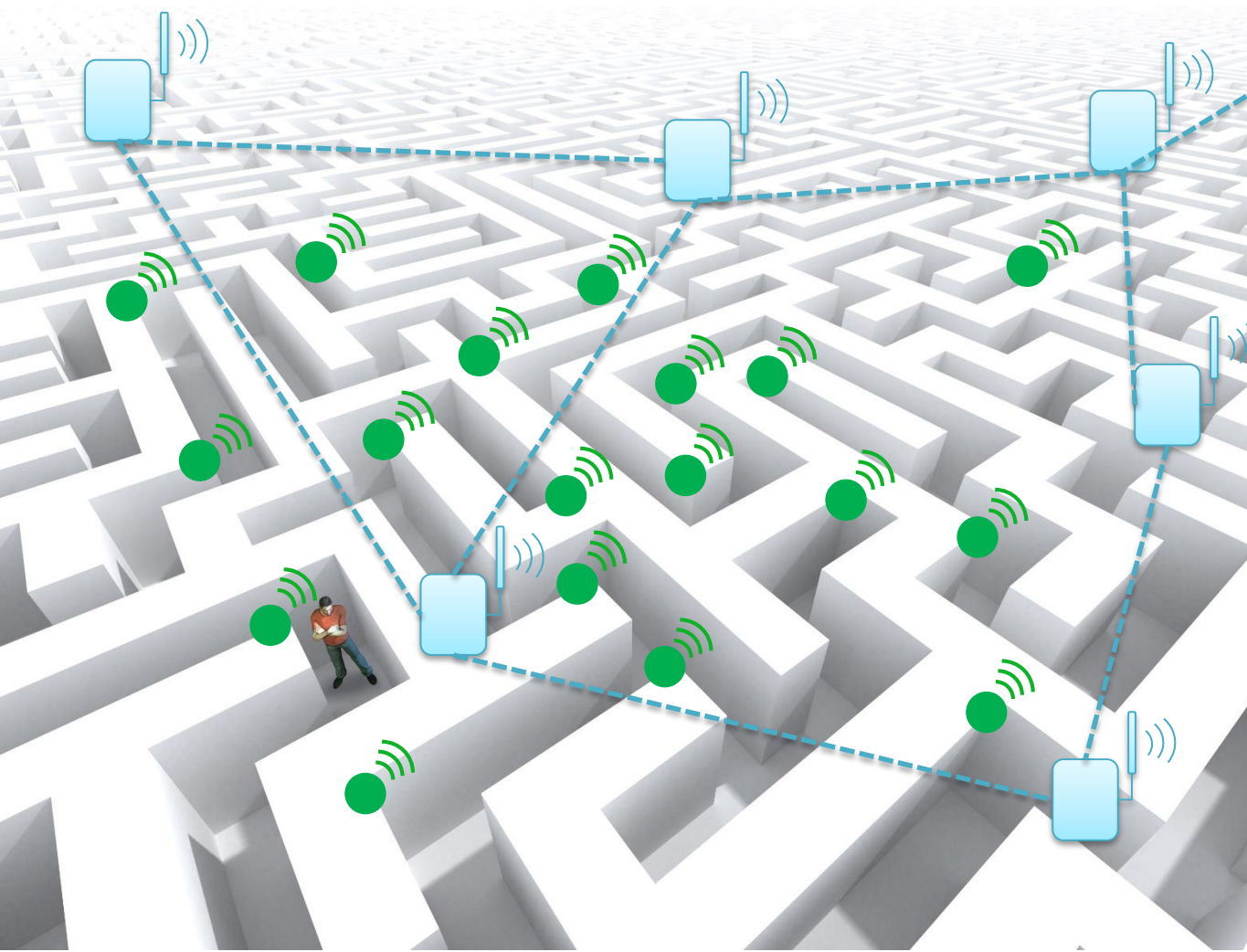
Secure Cloud PS sensor platform

Big Data Analysis

Integrated Command & Control

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