

Multi-layered Security Technologies for hyper-connected smart cities

M-Sec Project

Antoni Paradell, Worldline Jin Nakazawa, Keio University 7th EU-Japan Symposium on ICT Research and Innovation, December, 2018



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A research project



M-Sec: an international research project

M-Sec is an EU-Japan research project which stands for:

"Multi-layered Security technologies to ensure hyperconnected smart cities with Blockchain, Big Data, Cloud and IoT".

We empower social entrepreneurs, researchers, businesses, public authorities and citizens across the EU and Japan to work together, design and adopt new IoT applications, which **improve the security and connectivity of smart cities.**

In practice, our **new IoT applications** will create solutions for smart city topics as the health and the inclusion of growing elderly populations and citizen participation.

They will be tested in the cities of **Fujisawa**, Japan, and **Santander**, Spain.





Behind M-Sec

The M-Sec consortium consists of a strong partnership of leading European and Japanese universities, research centers and companies in the area of Big Data, IoT, Cloud Computing, Blockchains:





Main goals

- To design the future decentralized architecture of IoT that will unlock the capacity of smart objects
- To enable seamless and highly autonomous and secure interaction between humans and devices in the context of smart city, through the use of blockchains and for business contexts relevant to specific smart city use cases enabling innovative machinehuman and machine-machine interactions
- To engineer new levels of security and trust in large scale autonomous and trust-less multipurpose smart city platforms and integrate privacy enhancing technologies at the design level of M-Sec Architecture
- To create reference implementations of future decentralized IoT ecosystems and validate their viability and sustainability
- To maximize the impact of the project benefits



Work in progress

Achievements so far

Achievements so far

- Project kick-off Online July 2018
- Partners first face-to-face meeting Barcelona – October 2018
- Deliverables submitted:
 - Project website (JP/EN): www.msecproject.eu
 - Quality Assurance Plan
- In progress:
 - Use Cases description
 - Pilot definition
 - M-Sec requirement analysis
 - Data Management Plan
 - M-Sec dissemination through social networks





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M-Sec Use cases – European pilots

Use Case 1 – Santander

Environmental Sensors for a Smart City

IoT devices to retrieve interesting environmental data along with a measurement of noise level while on the other hand will also be capable of sketching heat maps.

Use Case 2 – Santander and Barcelona Wellbeing and Healthcare for active and independent ageing people

Complete solution that encompasses most of the functionalities to overcome isolation, health and wellbeing fear while providing an additional added value through monitoring home with smart sensors.





M-Sec Use cases – Japanese pilots

🖵 Use Case 3 – Fujisawa

Secure and Trustworthy Environment sensing and data dissemination

Environment sensing data (air quality, traffic monitoring images, river monitoring images, human sensors) to collect data, and that entities are able to better serve their citizens with sophisticated environment monitoring data.





🖵 Use Case 4 – Fujisawa

Urban waste Management Hyper-connected society

IoT devices that measures urban waste generation per household/pedestrian flow/ traffic flow/etc.



M-Sec Use cases – Cross-border pilots

Use Case 5 – Japan and Europe Market place of IoT services

Constructing a market place to distribute data by ensuring credibility and safety so that people or organizations in EU and Japan can utilize the data more effectively.

Use Case 6 – Japan and Europe

Citizens engagement through "citizens as sensor"

Promote a participatory environment in which citizens can contribute to reflect the pulse of every city, reporting on various events (state of the public road, traffic incidents, etc.), as well as quantitative measures of physical sensing.



Future research trends

and Challenges

Beyond 2020

Future research trends and challenges

Secure and Trustworthy "Things"

The small connected things themselves are now attacked and implicitely cooperating to other attacks. M-Sec establishes the technology to better protect the things from malicious programs.

Secure and Trustworthy Cloud

IoT-generated data are often processed at the cloud-side combined with other data. If the cloud system is cracked, the resulting data are trustless. M-Sec establishes the technology to make this process secure.

Secure and Trustworthy Marketplace

IoT-generated data are disseminated through a platform over the Internet towards a range of different stakeholders. M-Sec establishes the platform, i.e., data marketplace, to make this data exchange secure and trustworthy.





Future topics

Between EU-JP



Future topics

Privacy enhancing technologies on IoT

How to anonymize sensors, data and content especially when we need to provide personalized and location based services through IoT infrastructures in smart cities

Artificial Intelligence and security

How to exploit the dynamics of AI for data leakage prevention from lot devices, anomaly/suspicious detection, hidden threats, and so on.

Blockchain security

How to engineer new modalities of security in Distributed Ledger Technologies in the area of fintech, identity management in IoT, supply chain and logistics.





Multi-layered Security Technologies for hyper-connected smart cities

Thank you!



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