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The Internet of Things (IoT) is [...] a dynamic global network infrastructure with self-configuring capabilities based on standard and interoperable communication protocols where physical and virtual ‘things’ have identities, physical attributes, and virtual personalities and use intelligent interfaces, and are seamlessly integrated into the information network.

The world is full of objects generating information and things bear a lot of useful information.

- Over time this information has been lost.

When we make things communicate between themselves (M2M) we create a new digital ecosystem enabling:

- Optimized interaction with the environment
- Increased variety of data for decision making
- Improved quality of life and services
IoT decouples producers and consumers of M2M data
The overall goal of the INTER-IoT project is to provide an interoperable open IoT framework (with associated engineering tools and methodology) for seamless integration of heterogeneous IoT platforms functioning in the same or different application domains.

Application domains considered in the project are:

- **INTER-LogP**: Port transportation and logistics, increasing efficiency in transportation time, reducing CO2 emission, improving access control and safety;
- **INTER-Health**: m-Health, improving remote subject monitoring; increasing the number of people that medical units can assist using the same resources.
- **INTER-Domain use case**

The INTER-IoT approach is generic and may be applied to any application domain and across domains, in which there is a need to interconnect IoT systems already deployed or add new ones.

- Enabling bottom-up formation of interoperable IoT ecosystems
INTEROPERABILITY STANDARDS

No global reference standard for IoT platforms interoperability and...

Source: http://xkcd.com
INTER-IoT will be based on three main building blocks:

- Methods and tools for providing interoperability among and across each layers of IoT platforms;
- Global framework (INTER-FW) for programming and managing interoperable IoT platforms, including INTER-API and several interoperability tools for every layer;
- Engineering Methodology based on CASE tool for IoT platforms integration/interconnection, in order to support the INTER-IoT methodology INTER-METH.
INTER-IoT CONCEPT

Applications and Services

- INTRA-DOMAIN
- INTER-DOMAIN
- Platform Specific

Integrated IoT Platform

- IoT Platform A
- IoT Platform B
- IoT Platform C

Things
- Smart Objects

Application Domain X

Cross Domain

Application Domain Y
INTER-IOT CONCEPT
INTER-LOGP USE CASE

In the ports of the future, port users, equipment and infrastructures will achieve a zero distance interaction offering more sustainable transport solutions.

- The use of IoT platforms will enable locating, monitoring, and handling different transport and cargo equipment and storage areas.
- This use case illustrates the need to seamlessly IoT platforms interoperation within port premises: container terminal, transportation companies, warehouses, road haulers, port authorities, customs, border protection agencies, and outside the port.
- Port IoT ecosystems use to be operated by a large number of stakeholders, and typically require high security and trust, due to mobility and seamless connectivity requirements, that currently are not available with the exception of proprietary and isolated solutions.
The Decentralized and Mobile Monitoring of Assisted Livings' Lifestyle use case, aims at developing an integrated IoT system for monitoring humans' lifestyle in a decentralized way and in mobility, to prevent health issues mainly resulting from food and physical activity disorders.

- The medical environment in which the pilot will be developed and deployed is the Dept. of Prevention/Hygiene Nutrition Unit at ASLTO5.
- By exploiting an integrated IoT environment, the aforementioned monitoring process can be decentralized from the healthcare center to the monitored subjects' homes, and supported in mobility by using on-body physical activity monitors.
INTER-IoT PILOTS

INTER-LogP Use case

INTER-Health Use case
INTER-LogP Functionalities

- Closed solutions to communicate different objects and sensors for a particular purpose.
- Ports need more open solutions, especially in port transport and logistics where there are hundreds of companies working in the transport hub, able to interact and interface securely and effortlessly with a wide variety of objects and sensors that are not all of them owned by the same entity and acquired to the same vendor and manufacturer.
- It is also required to reduce the total cost of ownership for enabling these objects and sensors to be introduced, interfaced and used in different IoT ecosystems and entities.
INTER-IOT PILOTS

INTER-LogP

Applications and Services

INTER-IoT

Valencia Port

NOATUM SEAMS

IoT Platform X

Integrated IoT Platform
INTER-IOT PILOTS

INTER-LogP Use case

Wearable Lifestyle Sensors

Cloud Connection

Medical Devices

INTER-Health Use case
INTER-Health Functionalities

• collection of objective (weight, height, body mass index, blood pressure or waist circumference) and subjective (questionnaires concerning the eating habits and the practice of physical activity) measures during the visits at the health-care center

• telemonitoring at the health-care center of subjective (questionnaires) and objective (weight, blood pressure, ..) measures sent by the patients at home

• telemonitoring at the health-care center of the physical activities performed by patient at home with wearable devices

• report and visualization of all the measurement collected for analysis and interaction on treatments
INTER-IoT PILOTS

INTER-Health

Applications and Services

INTER-IoT

BodyCloud UniCal

eCare Telecom Italia

Integrated IoT Platform
INTER-IoT PILOTS

INTER-DOMAIN

Applications and Services

INTER-IoT

LogP Application Domain

m-Health Application Domain

New App Domain

New App/services

New App/services

LogP Application Domain

m-Health Application Domain

New App Domain

New App/services

New App/services