European Commission

VICINITY

"Interoperability as a Service for the Internet of things – a bottom-up approach."

The VICINITY project will build and demonstrate a platform and ecosystem that provides "interoperability as a service" for infrastructures in the Internet-of-Things (IoT). The approach is bottom-up, decentralized and user-centric and involved in standardization without relying on a single standard.

AT A GLANCE

Project title:

Open virtual neighbourhood network to connect IoT infrastructures and smart objects

Project coordinator:

TU Kaiserslautern (DE)

Partners from:

TU Kaiserslautern, ATOS Spain SA, Centre for Research and Technology Hellas, Aalborg University, Gorenje, bAvenir, Climate Associates, InterSoft, Universidad Politécnica de Madrid, Gnomon Informatics, Tiny Mesh, Hafenstrom, Enercoutim, Municipality of Pylaia Chortiatis

Duration:

01/2016 - 12/2019 (4 years)

Total cost:

7.5m €

EC Contribution:

7.5m €

Programme:

H2020-ICT-30-2015

Further information:

www.vicinity-h2020.eu

Context and motivation

Nowadays, various IoT infrastructures are being deployed for sensing, measuring, controlling, and business process optimization purposes in various domains. At the same time, different IoT platforms and standards are emerging. Nevertheless, these infrastructures are small, isolated islands in the global IoT landscape. Inter-operability between these islands, and obeying privacy is a necessary basis for significant value added services.

Challenge

Actually, there exists already a variety of standards and platforms for the Internet of Things.

For pure technical communication there is a limited number of standards, e.g. WiFi or ZigBee. Hence, exchange among IoT devices of data is not the problem.

The problem is the discovery and classification of services, and the communication at semantic layer that is summarized under the term "Machine to Machine communication (M2M)". In this context, achieving interoperability and establishing services is much more challenging. It requires in addition knowledge from different domains and applications that can hardly be standardized. Instead, knowledge is dynamically changing rapidly, and also dependent on particular applications, or locations and use cases.

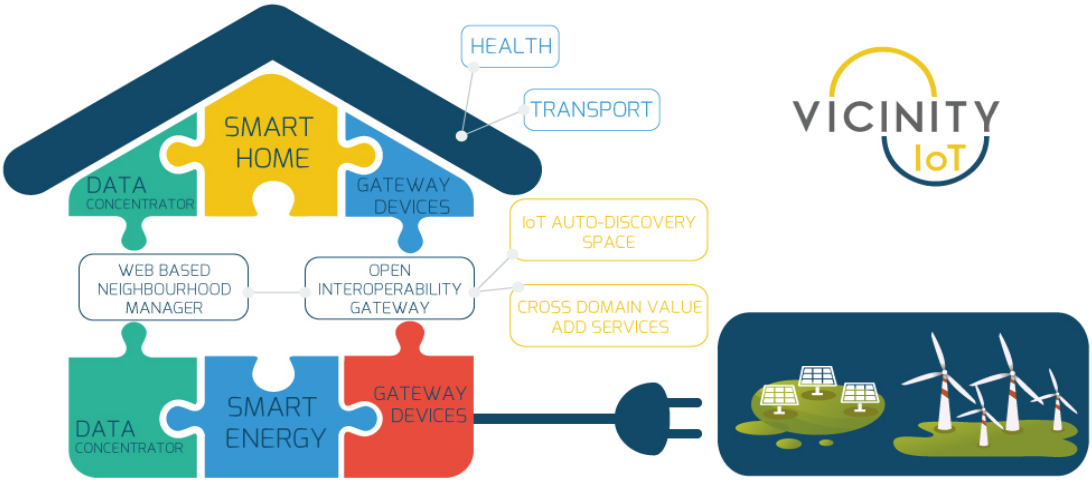

Figure 1 : Vicinity architecture for smart home.

VICINITY's Solution

The solution of VICINITY is to connect IoT devices in smart entities, i.e. a smart home contributing to a smart grid via a local gateway and the VICINITY open interoperability gateway.

The *local gateway* (Fig. 1, top middle) technically communicates with the local IoT devices. It is able to run apps that control local services, supported by the VICINITY open interoperability gateway.

The *open interoperability gateway* (Fig. 1, middle) provides the local premises with data for service discovery and semantic information. However, its main function is to host and provide value-added services that build on top of recognized services in local premises and its (digital) vicinity.

The *value added services* are a novel kind of functionality, based on availability of the rich data and functionality that stems from the IoT devices of different users, different smart entities that enables new business models. An example is the aggregation of different smart appliances to a virtual smart grid. Via VICINITY, then a kind of micro-energy trading driven bottom-up by users is enabled. Other value-added services are the use of the same infrastructure for other domains or use-cases, e.g. use of smart appliances and its data for eHealth applications.

A prime concern is *privacy*: the VICINITY approach gives each user the ultimate control of its data. Each user has the decision whether to contribute IoT devices and/or it's data to which value-added services or not via the *web-based neighbourhood manager (Fig. 1, left)*. Privacy in VICINITY is hence "built-in" as local data aggregators are under control of the users.

Demonstration and Impact

The VICINITY project's solution will provide an IoT platform that is able to connect so far isolated islands, and that allows integration of end-users and creation of new business models. VICINITY strives for large-scale demonstration of the applicability of the solution in different use cases that implement and demonstrate different value-added services on top of the VICINITY platform.

The first use case is a smart energy micro-grid that is enabled by municipal buildings (Enercoutim, Portugal). The VICINITY value-added services will provide users with information on potential energy savings and thereby increase awareness of the contributors.

The second use case shows how to *combine infrastructure* from different domains: a Smart Grid ecosystem is combines with an Assisted Living use case (Tiny Mesh, Norway).

The third use case is eHealth (GNOMON, Greece). In this use case we study particular applicability in the domain of eHealth with its specific needs and constraints. Value-added services are the detection of abnormal events, and the possible finding and clustering of similar patients based on data mining.

The last use case shows how a large number of different data sources from different domains can be combined for an intelligent parking space (Hafenstrom, Norway), considering data from booking, heating management, health status, and considering user incentives.

VICINTY is open and welcomes participation of further interested consumers, integrators and developers of value-added services.