

# Newsletter

July 2018 - November 2018



"Interoperability as a Service" – Connecting IoT infrastructures and smart objects

## Editorial

Yet another newsletter!

But we have a number of interesting events and outcomes to report:

First of all, we had a General Assembly meeting in Tromsø including a co-creation workshop with stakeholders.

Secondly, we have upcoming events including the second open call for new partners to bid to work alongside the core VICINITY project.

Thirdly, we shall report on the award of four contracts for sub-projects from the first open call.

Fourthly, introduce several technical achievements.

Finally, the breaking news is: We are very proud that we are approaching an agreement with Springer to publish a book on VICINITY.

That's maybe a nice Christmas present. Isn't it?



**Prof. Dr. Christoph Grimm**

*Coordinator of VICINITY project  
Technische Universität Kaiserslautern*

## Latest News and Upcoming Events

### Latest News

- MPH presented the VICINITY project in the journal of the municipality of Pilea- Hortiatis, Oct. 2018, Thessaloniki, Greece.
- ATOS represented the VICINITY project in “Madrid Engineering Week” organised by BEST Madrid Carlos III, 14th Nov. 2018, Madrid, Spain.
- ATOS and UPM participated on behalf of VICINITY in the “IoT Meetup” organised by the Symbiote and VICINITY Projects on 14th November 2018 in Madrid, Spain.
- OTE participated in the “20th InfoCom World, New Horizons: The Techonomy of Gigabit Era!” on 21th November 2018 in Athens, Greece, on behalf of the VICINITY project.

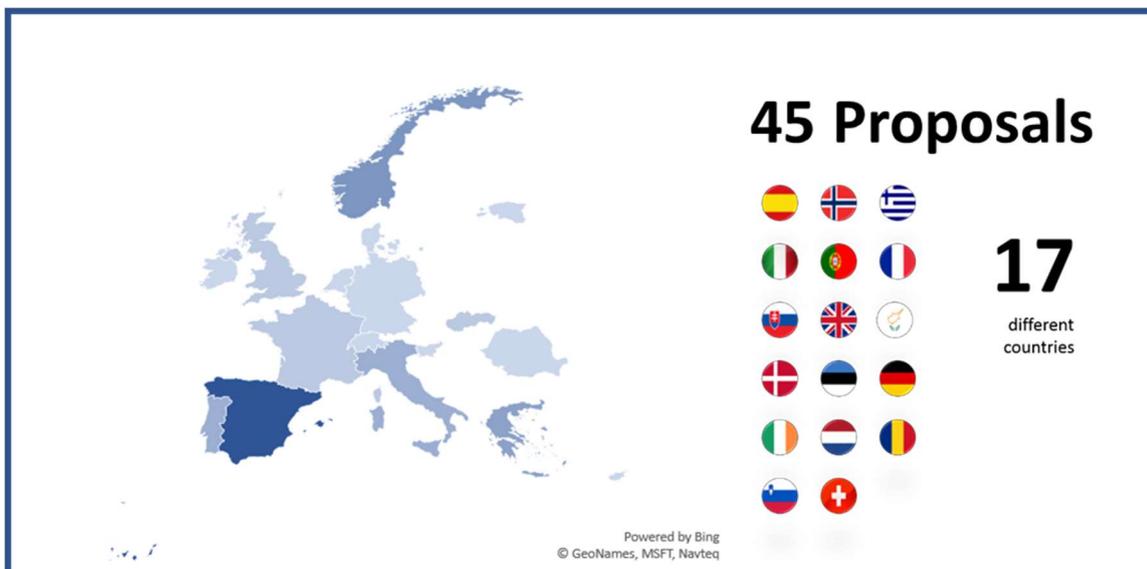
### Upcoming Events

- Second Open Call announcement (target) 15<sup>th</sup> December 2018.
- GA7 preparation for review meeting, & stakeholder co-creation workshop, London, January, 2019.
- EC Review in Brussels, 1<sup>st</sup> March 2019.

## VICINITY 1st Open Call Winners Have Started

### Their Work in the Project.

Four new partners have recently joined the VICINITY Project, administrative processes have already finished and the new partners are on-board.



45 eligible proposals were submitted through the F6S platform, from applicants coming from 17 different countries across Europe. Proposals were evaluated for External Evaluators, they considered everything very thoroughly indeed and we want to thank them for their contribution and for working with us, even during the summer's break. Formal processes are now complete and the top 4 project proposals are now funded with work on these sub-projects starting in October 2018.

Project	Organization	Country	Brief Description
Demand Response energy infrastructure	Pilot Things	France	The project consists of building a demand response energy infrastructure that combines oneM2M for collecting building energy consumption regardless of the protocols used and VICINITY to get the best energy price from producers using the innovative neighbourhood concept.
SAMMY	I. PANARETOU - CH. KOSTOPOULOS O.E.	Greece	SaMMY leverages on-demand economy to fulfil the unique needs of both yachters and marinas, by exploiting cutting edge technologies/tools. SaMMY will share data coming from the IoT devices applied, able to be used by 3rd party cross-domain applications or other members of the VICINITY ecosystem.
INCANT	Thinkinside Srl	Italy	INCANT will integrate the VICINITY ecosystem with the support for the indoor localisation of objects and people, together with all the relevant supporting services.
Worker 4.0 – Connected. Empowered. Safe. Healthy.	WearHealth	Germany	WearHealth will enable VICINITY to demonstrate the advances of IoT interoperability on new value-added services by using the WearHealth “Safety and Health Intelligence” Platform and connecting to Wearables and IoT ecosystem through VICINITY open gateway API.

The new partners have been involved in the project through co-creation activities, technical webinars, and mentorship. On October 25th 2018, VICINITY organized a technical webinar to introduce the new partners to the VICINITY architecture and software to help them to plan their next steps in the project. We have great expectations for the new partners.

## 2<sup>rd</sup> Open Call Is Coming Soon.

Be ready for the VICINITY 2nd Open call!!

In order to be considered as candidate sub-projects to receive financial support proposals need to:

- Create new specific value-added services based on the VICINITY platform or create new specific micro-services to enhance the VICINITY Platform. Both services and microservice requirements are specified in the call information.
- Plan to co-operate with the VICINITY partners to demonstrate the open call project's results within the duration of the proposed project.
- Explain how the value-added service will support existing use-cases, services, and/or business models in VICINITY, or propose new use-cases, and/or undertake co-creation activities.

Financial support will be provided to individual SMEs, large companies, research institutes, and public authorities such as (city) communities, which are established in an EU Member State or in an Associated Country that is qualified and is compliant with the rules of participation H2020. Only one entity per proposal will be admitted, so activities in co-operation with other organisations will not be considered eligible.

Attention! The provisional dates below may change:

- Publication date: 15th December 2018
- Deadline: 15th March 2019 at 17:00 (Brussels time)
- Expected duration of participation: 5 Months
- Maximum amount of financial support for each third party: 60.000 €
- Call identifier: VICINITY 2nd Open Call Value Added Services.
  - Value Added Services for the VICINITY Pilots.
  - Micro-Services for the VICINITY Platform.

Stay tuned and check the VICINITY web pages periodically.

## Visit Tromsø Pilot Site, 9<sup>th</sup> Oct. 2018

Representatives from VICINITY visited the Tromsø pilotsite at Teaterkvarteret on both the 9th and 11th of October. Located on the southeastern part of Tromsøya, the pilot site is located in scenic surroundings and is strategically placed in relation to the central parts of the city. Teaterkvarteret will demonstrate how parking sensors can be combined with smart lights and smart appliances from Gorenje to offer value added services to the municipality, residents and car owners alike.

A typical use case is that: unusual operation of the refrigerator door may indicate that a vulnerable resident is unwell, so that a care worker can be dispatched to visit them, with guidance to a nearby private car-parking space that is currently unused to enable the carer to operate efficiently.



*Information:*

- *Tromsø is Northern Norway's largest municipality with approximately 75,000 inhabitants and has about 7,000 employees, spread over 86 units and services.*
- *The Sørøya care service is a unit under the monitoring service in Tromsø municipality. The unit provides practical assistance and health care at home, day care, relief and care homes for people with physical, mental and/or social disabilities.*

The first visit took place on a grey and rainy afternoon. Karla Jeanine Hilaire, Department manager for the care services at Sørøya, kindly took time out of a busy schedule to meet the representatives and tell more about the pilot site.

Hilaire talked about how several of the apartments were prepared for residents with disabilities, and how the building was equipped with an activity room and offices for carers and medical personal. She explained that although each building could have up to 10 residents in need of special care, they had typically only 1 person on duty to cater for their needs at night, if a problem should arise. Topics related to work and other services were touched upon, the same goes for how freehold apartments are managed, as well as who chooses to purchase a parking space. There are several elements that the carers are responsible for, including reporting assistance, journal systems for visits, etc.



Several sensors are used to raise alarms and monitoring devices are available in case of emergency. Examples of these are smoke detectors that are connected to the fire department, physical and virtual safety alarms, phones with direct lines to the care centers, as well as cameras in some apartments. A new function is that all residents have access to an iPad that offers support at the touch of a button. Making these services as intuitive as possible was considered essential since not all the residents have the cognitive capability to handle smart devices like the Gorenje refrigerator and oven. The visitors from VICINITY were able to inspect the sensor systems that are currently installed, to enable understanding of how the smart appliances are being used and will be integrated with VICINITY.



After looking at the installation cabinet containing the necessary gateways and hubs (PNI RF-gateway, Trådfri, Raspberry Pi 3), the next visit was to the garage facilities that will be used for testing the services. One of the locations for the parking sensor was presented, and topics related to agreements for access, sharing keys and other kinds of authorisation were discussed.

The visit concluded by a last look of the entrance where medical personal would get access. Then the group headed back to the hotel to prepare for next days workshop.



*All photos: Flemming Sveen © 2018*

## Stakeholders Co-Creation workshop in Tromsø ,11<sup>th</sup> Oct. 2018

The consortium considers that external opinion is very valuable for the project. The points of view of stakeholders coming from different business fields enrich the VICINITY solution. To foster this approach a co-creation workshop was held in Tromsø (Norway).

The main objectives of the workshop were:

- Explain and discuss the applicability of the VICINTIY concept with end users.
- Identify potential new requirements and applications.
- Establish business links.

The workshop methodology was based on the Value Proposition Canvas<sup>[1]</sup>.

Relevant stakeholders from the Tromsø community were invited to the workshop. Based on the list of external registered participants, 3 different groups were created:

- Industrial
- Smartcities
- eHealth

In order to stimulate the groups interaction, VICINITY partners were distributed among the groups. People with different specialisms (business, technical, management) were placed in the groups.



### ***Tromso co-creation workshop***

VICINITY partners held previous training sessions to be able to facilitate the work in each table. Three discussion tables were distributed round the room to stimulate the interaction. The agenda was as follows:

- Presentations: Once the participants took their seats, informal presentations were conducted among the stakeholders.
- A presentation about how VICINITY provide value was given by Kostis Kaggelidis (GNOMON).
- Working session: the working session was split into two parts:
  - Customer Profile: To obtain a detailed picture of each customer.
  - Value Map: to describe how VICINITY can create Value for the identified customer profile.
- Presentation of results.

[1] Osterwalder, A., Pigneur, Y., Bernarda, G., Smith, A., & Papadacos, T. (2014). Value proposition design. Hoboken, NJ: Wiley.

## **Reaching Developers**

Atos organized a workshop to present two Horizon 2020 Projects: SymbloTe & VICINITY.

This was in the framework of the Madrid Engineering Week 2018 (<https://mew.bestuc3m.es/>), an event that took place from the 12th to the 16th of November in Leganés, at Universidad Carlos III de Madrid. During this week students had the opportunity to attend different technical talks about new technologies, participate on the biggest engineering competition in Europe (EBEC), make contacts with the business world during cocktail networking or visit the facilities of some companies.

VICINITY's main objective was to introduce the VICINITY project to developers and to highlight the opportunities to be involved in the VICINITY project. The VICINITY catalogue, the GITHUB and the Second open call outline was presented.

Jose Gato (Head of the Internet of everything Lab) presents the VICINITY project from a technical point of view. The following main concepts were explained:

- VICINITY technical challenges.
- A technical overview.
- Become part of VICINITY.



**Jose Gato (Head of ATOS Research of Innovation Internet of Everything Lab) explained the VICINITY GitHub**

After this Carmen Perea explained the VICINITY Use Cases and the VICINITY Open Call

- VICINITY Consortium
- VICINITY Use Cases
- VICINITY Develop with us
- VICINITY Catalogue
- VICINITY Second Open Call

## Connecting to Stakeholders

IoT Meetup Madrid was an open event where different stakeholders, from different backgrounds met to talk about IoT. Organized by two Horizon 2020 projects (SymbloTe (<https://www.symbiote-h2020.eu/>) and VICINITY 2020 (<https://www.vicinity2020.eu/vicinity/>)). They shared their experiences with the public. SymbloTe's team presented a project introduction and some pitches provided by the Second Open Call winners ModoSmart and University of Cyprus.

VICINITY contributed with 2 presentations:

- VICINITY overview and use cases presented by ATOS (José Gato (Head of Internet of Everything Lab)).
  - This talk provided an overview about the VICINITY platform.

- It was explained how developers can actively participate with VICINITY through the VICINITY Github and the Open Call.
- Semantic interoperability in VICINITY presented by Andrea Cimmino UPM.
  - An overview of the VICINITY platform and how the Semantic Interoperability was addressed and implemented in this platform.
  - The main concepts, strategies, and several examples of this implementation are introduced during the presentation.



**Andrea Cimmino (UPM) presenting VICINITY**

## Integrated VICINITY Core Components

Over the past few months, the VICINITY Core components implementation team has focusing on the integration of the VICINITY Neighbourhood Manager, the VICINITY Communication Server and the VICINITY Gateway APIs with other VICINITY components. The goal was to build the integrated VICINITY Platform which can be the core platform for the three VICINITY Testing labs, the four Pilot sites and the four VICINITY Open calls winners. Currently, integrated core components are running in a staging monitored environment with close to 100% availability. During integration and deployment of the VICINITY Platform 455 testing organizations and households were set-up, 271 testing infrastructures were integrated, and 103 testing cloud and micro-services were connected. Moreover, the VICINITY Neighbourhood Manager integrated the data contracting mechanism from the H2020 project SHAR-Q which enables sharing of the VICINITY IoT infrastructure to provide data to VICINITY Service providers, based on mutually agreed data contracts. The

VICINITY Platform currently manages 1,598 of these contracts. Current statistics of VICINITY platform are visible on:<https://vicinityh2020.github.io/>.

## VICINITY Agent and Auto-discovery Platform

The VICINITY Agent serves as the interface between a VICINITY Gateway and VICINITY Adapter. The Agent is a functional extension of the Adapter. The role of the Agent is to make the life of Adapter-developers easier.

The responsibility of the agent is to:

- Translate between object infrastructure identifiers (infrastructure-id) used by the Adapter and VICINITY identifiers (OID).
- Automate common tasks, like discovery/configuration and opening/subscribing to event channels.
- Translate between common VICINITY consumption/eventing services (implemented in GTW API) into specific Adapter services, depending how they are described in Thing Descriptions.
- Translate Adapter requests for consumption/event services into common VICINITY services (implemented in GTW API) with proper credentials.

The Agent Service is implemented as standalone Representational State Transfer (REST) server.

The Agent Service has been enhanced to handle multiple client nodes, so it was been developed from agent to multi-agent. The multi-agent service is now able to manage multiple agent configurations. Currently, if a service provider wants to run multiple client nodes (e.g. in the cloud), then for each client node the separate software (Adapters, Agent, Gateway API) modules have to be deployed and run. If the provider has to run many client nodes, the management of deployed software becomes critical. For each client node, they should physically run three software components. The switch to the multi-agent concept enables the use of only one physical deployment for as many client nodes as are needed in single software installation.

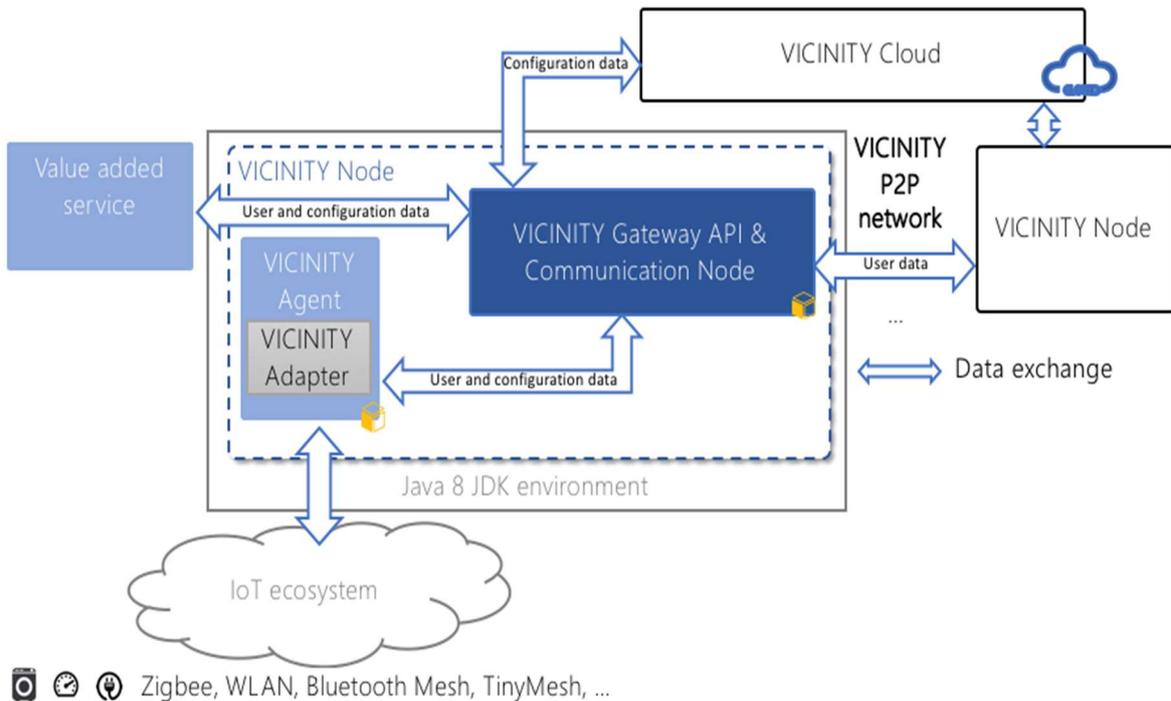
## VICINITY Gateway Adapters

IoT manufacturers tend to use private, proprietary communication solutions which are usually also copyrighted. Many of them also joined one or more existing IoT initiatives and implement common protocols. Yet the number of various IoT initiatives rises from year to year, as does the diversity of communication techniques and protocols.

A VICINITY adapter represents a two-way gateway between manufacturer's infrastructure to the VICINITY infrastructure. It could also be used as a translation layer from various IoT initiatives to and from the VICINITY infrastructure. As such it serves as an entry point to VICINITY infrastructure.

Manufacturers that use proprietary communication solutions will need to develop their own VICINITY adapter in order to enter the world of VICINITY. Adapter implementations could be implemented either as a pure software solution (as standalone services, simple code extensions, etc.) or as an additional piece of hardware, with dedicated software implementation.

According to the VICINITY overall architecture, a VICINITY Adapter is one of the VICINITY Node components which ensures the translation of a local infrastructure to the common VICINITY format. The VICINITY Adapter communicates directly with VICINITY Agent which provided IoT object discovery functionality and handles the communication with the VICINITY Gateway API.



### **VICINITY Node Architecture**

The VICINITY Adapter interface towards the VICINITY Agent includes the following capabilities:

- IoT object discovery – which exposes the description of each IoT object accessible through the VICINITY Adapter.
- Provides consuming and exposing services for IoT objects properties and actions accessible through the VICINITY Adapter

- Provides services to consume events by the VICINITY Adapter from the VICINITY Peer-to-peer network.

Detailed description of these interfaces is available at: <https://github.com/vicinityh2020/vicinity-agent/blob/master/docs/ADAPTER.md>.

The IoT object discovery and exposing services are necessary to provide semantic discovery services through the Gateway API Services in a VICINITY Gateway API to distribute interoperable queries over different IoT objects in the P2P network.

## Implementation of Value-added Services

October, 2018 was a crucial month for the VICINITY project: we managed to reach the last and most important milestone, MS6, which was aiming at making a first version of the VICINITY Value-Added Services available. A Value-Added Service is defined as a piece of software that is fully integrated with the VICINITY infrastructure and implements an algorithm, from a simple calculation to a more advanced operation, with input(s) provided by relevant IoT data from other IoT infrastructures that are part of the VICINITY network and could be considered as VICINITY entities.

Therefore, the developed prototype versions are expected to run within each pilot use case and are planned to be regularly updated during the forthcoming deployment and operation phase. Apart from the real-life use cases that include the four pilot sites (i.e. Oslo (NO), Tromsø (NO), Martim Longo (PO), Pilea-Hortiatis (GR)), Value-Added Services were developed for a testing case (i.e. Aalborg (DK)) as well.

Relevant ethical issues that arise per case were also considered during implementation and have been overcome. As a result, interesting prospects, that are currently under discussion, have also emerged, with the concept of homomorphic encryption as a possible extension for data anonymization/privacy being the most promising one.

## Milestone

Prototypes for VICINITY value-added services are available, and deliverable 5.2 ("VICINITY Value-Added Services Implementation") was completed in August.



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