

NetWorld2020 SME Working Group

SME Success Story

Ubiwhere



Founded in 2007, in Aveiro, Portugal, Ubiwhere is a high-tech SME that builds innovative, user centred software solutions with two core areas of application: Smart Cities and Telecommunications.

Our background on 5G deployments and our expertise on the development of 5G network service orchestration platforms, MEC orchestration services and 5g services based on NFV and SDN technologies, have allowed us to take part and lead diverse RDI projects addressing the 5th generation network. More recently, and leveraged by the need of both our Telecommunication and Smart City deployments and RDI projects, Ubiwhere has been focusing on Artificial Intelligence, Cyber Security and Blockchain. Such know-how drove our involvement in remarkable joint initiatives carried out by the EU, tackling challenges of the Europe of the future, namely 5G-PPP, 5G-IA, BDVA, AIOTI, ERTICO and EIP-SCC IMET and boosted our contribution to prominent standardization entities such as ETSI.

Ubiwhere has been participating in the 5G-PPP program through Phase 1, Phase 2 and Phase 3. This participation has fostered Ubiwhere's position as an active part of the 5G ecosystem while opening doors to the creation of innovative solutions with great business potential. Listed below, are the products which were created or affected by Ubiwhere's participation in the 5G-PPP program.

- Smartlamppost (<https://smartlamppost.com/>) is a clean solution that leverages on urban furniture to elegantly provide 5G network deployment, EV-charging stations and edge computing capabilities, among other plug-and-play functionalities, targeting municipalities but also other vertical businesses (such as MNOs). Its modularity, offers a flexible and cost-effective way of tackling current e-mobility and 5G communication barriers.
- The Urban Platform (<https://urbanplatform.ubiwhere.com/>) was created from Ubiwhere's vision of a holistic perspective of the smart urban environment for cities actively looking to contribute back to those who manage it and their inhabitants, providing a global and integrated view. Supporting centralised collection and processing of data from heterogeneous sources and city systems, while providing the seamless integration and standardisation of different kinds of communication protocols and standards, the Urban Platform helps the city with correlation of information for knowledge extraction, forecasting, reporting and impact assessment, as well as to meet the Sustainable Development Goals (SDGs) by taking into account the Sustainable Cities and Communities Indicators from ISO 37120 and 37122, among other indicators.
- Unicle (<https://unicle.io>) has been created out of Ubiwhere's approach to V2X and its convergence with 5G technologies. Knowing the ever-growing relevance of 5G in this domain, Ubiwhere has been

capitalising its knowledge on ETSI MEC and the C-ITS stack to create an Edge Computing framework focused on the deployment and management of V2X-oriented leveraging Edge Computing and 5G radio technology (such as C-V2X). The goal is to position such product as a complementary feature of Smartlamppost: besides being able to equip such urban furniture with dedicated V2X radio components and Edge Computing elements, Unicle provides now Service Providers from the Mobility space, Mobile Network Operators and the Automotive Industry with a platform which effectively allows them to deploy VNFs and or Linux Containers which will run co-located with the radio elements, providing access to the user plane via the local breakout and, thus, providing much reduced latency which are key for CCAM (Cooperative and Connected Automated Mobility) services and applications.

- NFVal tool is a software tool able to allow Network Service programmer to validate both VNF and NS packages (supporting different Orchestrators) and in case an incompatibility is detected, allow its fast identification by identifying its root cause. The tool performs three kinds of validation:
 - Syntax validation: The service descriptor and corresponding function descriptors are syntactically validated against the scheme templates specified by data model of the targeted Orchestrator
 - Integrity validation: The validation of integrity verifies the overall structure of descriptors through the inspection of references and identifiers both within and outside the individual descriptors
 - Topology validation: This tool provides a set of mechanisms to validate and aid the development of the network connectivity logic identifying potential loops/cycles, unlinked nodes and potential network bottlenecks

Below a list of the 5G-PPP projects as well as its main contribution for the previously mentioned products:

- SELFNET (<https://selfnet-5g.eu/>): SELFNET project enabled Ubiwhere to define and understand the lifecycle of a Service Orchestration framework with Self-Healing, Self-Optimization and Self-Protection capabilities. Smartlamppost product vision was born at the end of SELFNET project leveraging on its architecture as well as on its monitoring and self action capabilities for the edge computing and orchestration framework.
- SONATA (<https://www.sonata-nfv.eu/>): In the context of SONATA, Ubiwhere's contribution was mainly focused on the SDK for Service development component. NFVal tool first version was created in the context of SONATA (supporting only SONATA MANO) and later evolved by Ubiwhere's R&I department to support other NFV MANO orchestrators (latest version of NFVal presented to ETSI for integration in OSM). Additionally, Smartlamppost's platform targeting Service Providers (a relevant stakeholder in the broader 5G multi-stakeholder ecosystem) shares SONATA's vision of an SDK for the development and deployment of Network Services in a MANO Orchestration framework.
- 5GCity (<https://www.5gcity.eu/>): This phase 2 project shares the vision of Smartlamppost product in the fact that both projects envision the usage of urban furniture across a city to provide network and computational resources to third parties. Smartlamppost edge orchestration framework was considerably boosted by Ubiwhere's participation in the project and critical to Smartlamppost's path to market. Additionally, this project allowed Ubiwhere to establish important partnerships and co-creation activities with other partners of the project - namely, Accelleran, a Small Cell vendor, with whom Ubiwhere has already performed commercial activities in the scope of Smartlamppost through 4G media trials in Portugal, following also the Neutral Hosting approach. Having in mind the Edge

Computing capabilities of our Smartlamppost and alignment with the project's goal of having different Service Providers from different verticals deploying numerous applications leveraging 5G, Ubiwhere has contributed with a V2X use case which led to a new product called Unicle (<https://unicle.io>) (currently in BETA). Having contributed also with the front-facing multi-tenant web platform of the project, the technologies applied in the scope of this platform greatly influenced the development of our Urban Platform, which has already been also deployed in the city of Barcelona (one of 5GCity's targeted cities for trials).

- 5GZorro (<https://5gzorro.eu/>): With this Phase 3 5G-PPP project started in November 2019, Ubiwhere intends to continue its commitment to create a multi-stakeholder 5G marketplace, aligned with Smartlamppost's dedicated Marketplace app (<https://smartlamppost.com>). Through blockchain and Smart contracts technology, Ubiwhere hopes to design the new set of shared business logic and SLAs as Smart Contracts and benchmark 5GZorro's findings when applying such set of rules in the telecom space: Mobile Network Operators, Site Owners, Spectrum Regulators and, finally, Service Providers. With this convergence of 5G technology and DLTs (Distributed Ledger Technologies), Ubiwhere hopes to enhance the existing Smartlamppost Marketplace with a new trustless layer, effectively providing all of these entities with built-in protection mechanisms - as example, guarantying a certain SLA based on different monitored parameters which, if verified, may reflect positively or negatively in the billing process (automated P2P payments, through blockchain technology) .

As a final remark, Ubiwhere is always seeking for strategic partners that can provide strategic value to both its research activities but also to its commercial endeavours. Ubiwhere is already paving the 5G market with the outcomes of the research it performed in the 5G-PPP program and expects to follow this row in the immediate future.

Contact: rdi@ubiwhere.com