FIESTA–IoT Project: Federated Interoperable Semantic IoT/cloud Testbeds and Applications

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ABSTRACT

FIESTA-IoT project provides a blueprint experimental infrastructure, software tools, semantic techniques, certification processes and best practices enabling IoT testbed/platforms to interconnect their facility's resources in an interoperable semantic way.

FIESTA-IoT project enables the integration of IoT platform's resources, testbeds infrastructure and their associated applications. FIESTA-IoT opens up new opportunities in the development and deployment of experiments using data from IoT testbeds.

The FIESTA-IoT infrastructure enables experimenters to use a single EaaS API (i.e. the FIESTA-IoT EaaS API) for executing experiments over multiple IoT federated testbeds in a testbed agnostic way i.e. like accessing a single large scale virtualized testbed.

The main goal of the FIESTA-IoT project is to open new horizons in the development and deployment of IoT applications and experiments at a EU (and global) scale, based on the interconnection and interoperability of diverse IoT platforms and testbeds. FIESTA-IoT project's experimental infrastructure provides to the European experimenters in the IoT domain with the unique capability for accessing and sharing IoT semantically annotated datasets in a testbed-agnostic way. FIESTA-IoT enables execution of experiments across multiple IoT testbeds, based on a single API for submitting the experiment and a single set of credentials for the researcher and the portability of IoT experiments across different testbeds and the provision of interoperable standards-based IoT/cloud interfaces over diverse IoT experimental facilities.

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1 PROJECT PROPOSAL

Dr. Martin Serrano (Principal Investigator)
Dr. Elias Tragos (Project Manager)
Dr. Amelie Gyrard (Co-Scientific Project Leader)
Mr. Hung Nguyen (Research Assistant)

Name of the Presenter: Dr. Martin Serrano (Project Coordinator), alternatively Dr. Elias Tragos (Project Manager) or Dr. Amelie Gyrard (Co-Scientific Project Leader) – All with extensive experience and good track record activity on tutorials and workshops and presentations.

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Contract Number: CNECT-ICT-643943
Official WebSite: http://fiesta-iot.eu/

Project Partners: National University of Ireland (NUIGalway) / Coordinator (Ireland), University of Southampton IT Innovation - ITINNOV (United Kingdom), Institut National Recherche en Informatique & Automatique - INRIA (France), University of Surrey - UNIS (United Kingdom), Unparallel Innovation, Lda - UNINNOVA (Portugal), Easy Global Market - EGM (France), NEC Europe Ltd. NEC (United Kingdom), University of Cantabria UNICAN (Spain), Association Plate-forme Telecom - Com4innov (France), Research and Education Laboratory in Information Technologies - Athens Information Technology - AIT (Greece), Sociedad para el desarrollo de Cantabria – SODERCAN (Spain), Ayuntamiento de Santander – SDR (Spain), Korea Electronics Technology Institute KETI, (Korea).

2 RELATED WORK

The Pay-for-Knowledge Communities (PKC) is a new application. Generally, PKC are developed from normal CQA platform, but are more specific and advanced. As rare studies have focused on this specific platform, we will discuss the literature from CQA.

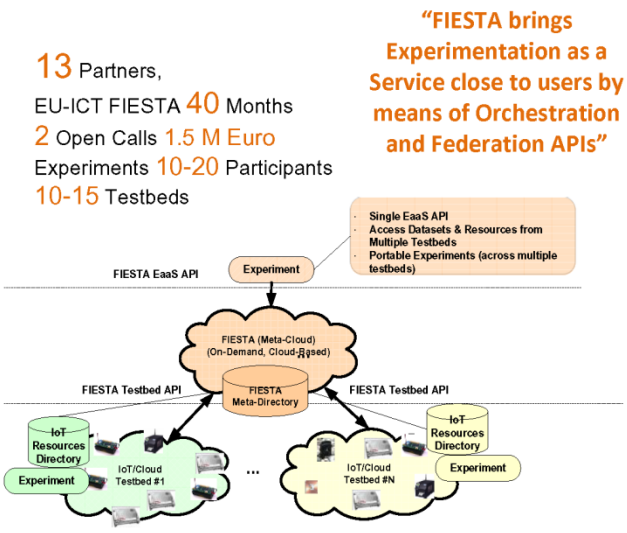
3. STATE OF THE ART

Compared to other similar approaches FIESTA-IoT stands out by enabling federation using semantics, defining service orchestration, security by design and also reusing and repurposing existing sensors and IoT systems without requiring extensive changes in the deployed infrastructure.

"FIESTA brings Experimentation as a Service close to users by means of Orchestration and Federation APIs"

4. CHALLENGES & TECHNICAL APPROACH

FIESTA-IoT project is associated with the need to aggregate and ensure the interoperability of data streams steaming from different IoT platforms or testbeds as well as the necessary ways to provide semantic tools and techniques for building applications that integrate silo platforms and applications horizontally for interoperability.



5. KEY OBJECTIVES

The FIESTA-IoT project's experimental infrastructure provides to the European experimenters in the IoT domain with the following unique capabilities/objectives:

- Access to and sharing of IoT datasets in a testbed-agnostic way, providing tools for accessing IoT data resources (including Linked sensor data sets) independently of their source IoT platform/testbed.
- Enable execution of experiments across multiple IoT testbeds, based on a single API for submitting the experiment and a single set of credentials for the researcher.
- Portability of IoT experiments across different testbeds, through the provision of interoperable standards-based IoT/cloud interfaces over diverse IoT experimental facilities.

6. BEST PRACTICES

The FIESTA-IoT infrastructure integrates more than 24 Pan-European IoT Platforms/Testbeds and enables more than 20 third parties with capability for practical experiments. The project works on providing/specifying concrete best practices for the federation of testbeds (addressed to testbed owners/administrators). Similar best practices are also produced for European researchers and enterprises in line with semantic annotation to run semantic queries over the FIESTA-IoT EaaS infrastructure. These FIESTA-IoT project best practices are disseminated widely as part of the project's EU-wide/global outreach.

"FIESTA project works for researchers and experimenters to share and reuse data from diverse IoT testbeds using semantic technologies in a seamless and flexible way".

7 IMPACT

FIESTA-IoT project issues, manages and executes open calls and, with a budget of 1.5 Million Euro, to get involved third-parties in the project.

- To ensure the design and integration (within FIESTA-IoT) of more innovative experiments, through the involvement of additional partners in the project (including SMEs).
- To expand the FIESTA-IoT experimental infrastructure on the basis of additional testbeds. In this case the new partners will undertake to contribute additional testbeds and to demonstrate their blending and interoperability (already adapted to FIESTA-IoT).

The involvement of third parties therefore plays an instrumental role for the large-scale validation of the FIESTA-IoT experimental infrastructure, but also for the take-up of the project's towards an infrastructure/ecosystem for global IoT EaaS..

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