



IoT Innovation Hackfest

as Part of the IoT Week 2018

BIG IoT Innovation Challenge

Design, create and prototype a project-idea by identifying the most valuable aspects from BIG IoT technologies. The selection of those valuable technologies should help you to enable “IoT innovation” like a NEW BUSINESS IDEA, or to promote “IoT knowledge transfer” like to MATURE BIG IoT technologies and solutions into A CURRENT PRODUCT/SOLUTION and to motivate BIG IoT-based services and applications that can be commercially exploited “accelerating” MARKET ADOPTION. The pitch and the presentation of your project-idea, should be supported by implementation work (code) and/or a simulation video that should be submitted to be considered part of the IoT Innovation hackfest final evaluation.

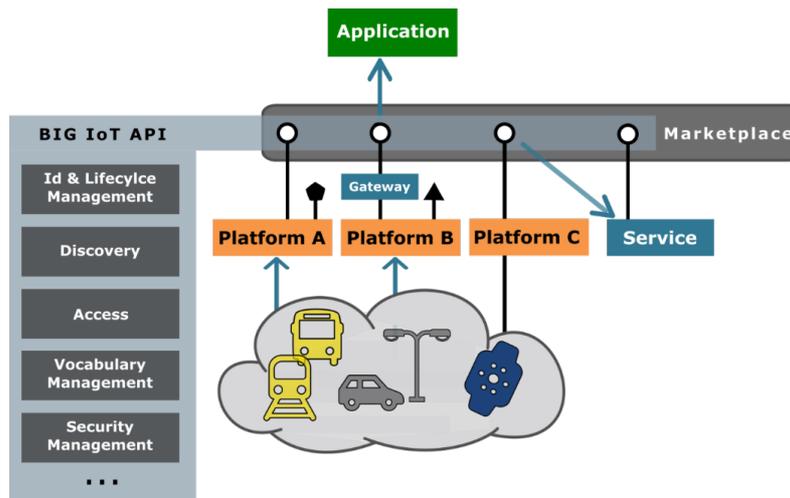
Introduction

BIG IoT is a H2020 European project that focuses on providing open source tools to enable IoT Ecosystems interoperability, with BIG IoT technologies it is possible to enable cross-standard, cross-platform, and cross-domain IoT services and applications. BIG IoT is part of the European IoT Platforms Initiative (IoT-EPI). BIG IoT focuses on services and applications, starting with connecting IoT platforms from the BIG IoT partner companies and implement services and applications in different cities i.e. Barcelona, Piedmont, and Berlin/Wolfsburg.

The BIG IoT project has implemented: The BIG IoT API and the BIG IoT Marketplace. The BIG IoT consortium aims that with these two technologies, it is possible to build IoT ecosystem(s) where European companies can exploit their data business potential.

The BIG IoT Overall Design

The figure below illustrates the BIG IoT approach. All registered platforms and services are discoverable on the Marketplace. The API gives the functionality (discovery, data access, security, etc) to easily build IoT applications on top of this ecosystem.



BIG IoT Functional Architecture Approach

What you can do with the BIG IoT API and the BIG IoT Marketplace?

You can Integrate ... with the BIG IoT Ecosystem by implementing its standards-based BIG IoT API. This enables an interoperable interaction of services and applications with existing IoT platforms.

You can Share... your services and applications through the BIG IoT Marketplace. It enables their advertisement, discovery, monetization, and reuse by the ecosystem participants.

You can Engage... your potential customers to offer them data services in the form of offerings and they can act as online consumers to your data assets.

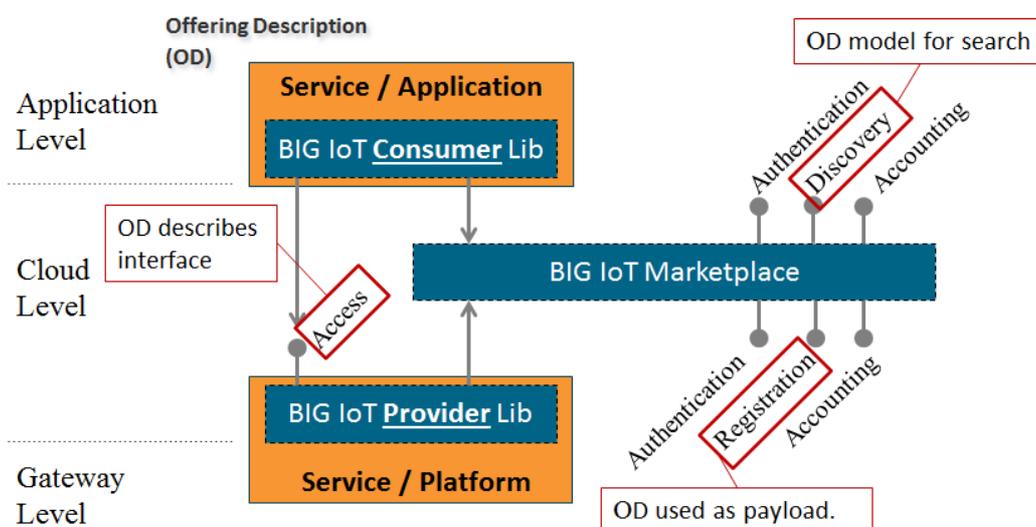
Tools and APIs

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| BIG IoT API | <p>BIG IoT API is offered as a lib, you can download it [here], with this BIG IoT API lib, IoT platforms and services can provide their resources in a generic way. Using the same API lib, IoT applications (but also services) can consume those resources very easily. In this way, the BIG IoT API lib solves the today's interoperability issues between IoT providers and consumers.</p> |
| BIG IoT Marketplace and On-line Portal | <p>BIG IoT Marketplace is a platform or service using the lib, for registered resources that can be exposed as offerings on the BIG IoT Marketplace.</p> <p>Visit the BIG IoT Marketplace online Portal at https://market.big-iot.org/</p> |
| | <p>You can have access to BIG IoT Developers' Guide with instruction for: Getting started / Provider</p> |

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| <p>BIG IoT Developers' Guide</p> | <p>Tutorial / Consumer Tutorial / Release Notes / Examples of the last stable versions, https://big-iot.github.io/ from which you also have the possibility to Download BIG IoT LIBs.</p> |
| <p>BIG IoT Standards Compliant Data Model</p> | <p>The online pages with the documentation of BIG IoT Domain Models that contain the semantic terminologies used to annotate our Offering Description Can be found at: http://schema.big-iot.org/mobility/ http://schema.big-iot.org/environment/ http://schema.big-iot.org/common/</p> |
| <p>BIG IoT Online overall Information</p> | <p>More information in BIG IoT's project deliverables, in particular deliverables 3.2 and 4.2. If you are looking to more details about the BIG IoT project go to BIG IoT website http://big-iot.eu/ where you can find a list of public deliverables with more details about the project and technologies.</p> |

Using the BIG IoT Libraries

It is easy to get started to dive into the BIG IoT ecosystem. These libs allow providers to register and manage their offerings and consumers to access offerings from the BIG IoT Marketplace for example, an IoT platform could offer data on the status of parking spots (occupied or available) within a city. An IoT service could provide the functionality to reserve resources. An application could access both with the BIG IoT API and combine them to enable reservation of parking spots. See Figure below.





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SymbIoTe Challenge

Design, create and prototype a project-idea by identifying the most valuable aspects from SymbIoTe technologies. The selection of those valuable technologies should help you to enable “IoT innovation” like a NEW BUSINESS IDEA, or to promote “IoT knowledge transfer” like to MATURE SymbIoTe IoT technologies and solutions into A CURRENT PRODUCT/SOLUTION and to motivate SymbIoTe-based IoT services and applications that can be commercially exploited “accelerating” MARKET ADOPTION. The pitch and the presentation of your project-idea, should be supported by implementation work (code) and/or a simulation video that should be submitted to be considered part of the IoT Innovation hackfest final evaluation.

Introduction

The SymbIoTe Overall Design

What you can do with the SymbloTe Tools?

Tools and APIs

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| SymbloTe... | SymbloTe... |

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Using the SymbloTe Libraries



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FIESTA-IoT Challenge

Design, create and prototype a project-idea by identifying the most valuable aspects from FIESTA-IoT Platform and Tools. The selection of those valuable technologies should help you to enable “IoT innovation” like a NEW BUSINESS IDEA, or to promote “IoT knowledge transfer” like to MATURE FIESTA-IoT technologies and solutions into A CURRENT PRODUCT/SOLUTION and to motivate FIESTA-IoT-based services and applications can be commercially exploited “accelerating” MARKET ADOPTION. The pitch and the presentation of your project-idea, should be supported by implementation work (code) and/or a simulation video that should be submitted to be considered part of the IoT Innovation hackfest final evaluation.

Introduction

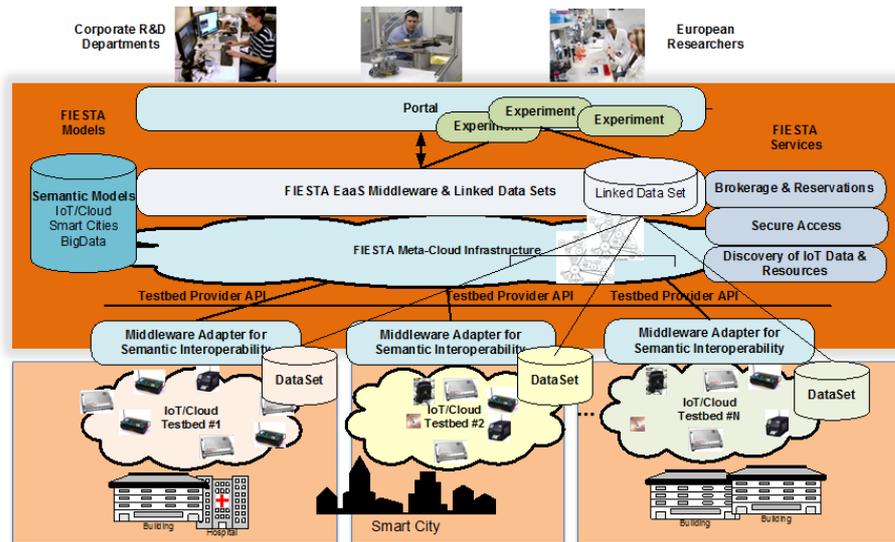
FIESTA-IoT is a H2020 European project that provides IoT Experiment as a Service, an open source middleware infrastructure that federates heterogeneous IoT platforms (testbeds). FIESTA-IoT main objective is to offer a federated entry point to all FIESTA-IoT EaaS services using a single set of credentials for this FIESTA-IoT enable the design and execution of experiments across a virtualized infrastructure i.e. access the data and resources from multiple testbeds and IoT platforms using a common approach. FIESTA-IoT entails the adaptation of the data of those testbeds to a common FIESTA-IoT ontology (i.e. compliance to common semantics), as well as the provision of a common standards-based API for accessing the IoT services of the testbeds.

FIESTA-IoT offers three types of tools i) to design and execute experimental workflows, ii) dynamically discover IoT resources, and iii) access data in a testbed agnostic manner.

The FIESTA-IoT Overall Design

FIESTA-IoT provides an online platform for federating IoT infrastructures (IoT testbeds) using a common semantic model that builds upon ontologies for sensors and observations, IoT concepts, and spatial and temporal contexts. The common semantic model also adopts a taxonomy for sensing devices, measurements, which grows based on the federated IoT testbeds. The figure

below illustrates the FIESTA-IoT approach. Data integrity is achieved by a resource and observation validation process. Quality is enforced by a certification suite that testbed providers must pass. In terms of IoT data business intelligence, All testbeds and their sensor devices are required to register with the platform in order to be accessible and make their resources available by the FIESTA discovery and analytics tools.



FIESTA-IoT Functional Architecture Approach

What you can do with the FIESTA-IoT Tools?

You can Federate... with the FIESTA-IoT platform by registering heterogeneous IoT platforms using FIESTA-IoT W3C-based (sensors and observations) semantic data models. This enables an agnostic interaction of IoT sensor data services.

You can Share... IoT sensor data through the FIESTA-IoT ecosystem using the FIESTA-IoT Experimentation Execution Engine, Experiment Resource Manager and the Experiment Editor UI. They enable discovery, monitoring, and reuse of data by the FIESTA-IoT ecosystem registered experimenters.

You can Interoperate... potential IoT data processors integrating IoT testbeds as data providers and enabling data consumers for offering data exchange services in the form of defined experiments that they can act as online services over IoT data resources.

Portal Tools and TPI

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| FIESTA-IoT Online Platform (FIESTA-Portal) | FIESTA-IoT provides an online platform for enabling “Experimentation as a Service” a way of federating IoT infrastructures called IoT testbeds, the platforms is available and include registered testbeds with a large variety of sensors. |
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| | https://platform.fiesta-iot.eu |
| FIESTA-IoT Semantic Model and Data Sets | FIESTA-IoT common semantic model is an ontology-based language that uses W3C standards and is compliant with reference vocabularies in IoT. Datasets are accessible through the online portal. Available datasets can be found at: http://fiesta-iot.eu/index.php/fiesta-testbeds . http://ontology.fiesta-iot.eu/ |
| FIESTA-IoT Dashboard for Monitoring | FIESTA-IoT provides a dashboard for testbed monitoring and threshold alerting. An example on how this is used can be found at: https://github.com/fiesta-iot/enmonitor-demo |
| FIESTA-IoT TPI Testbeds Platform Interface. Procedure & Tools | FIESTA-IoT testbeds and their sensor devices are registered within the platform. The registration involves the submission of descriptions which define the properties of a "Resource". FIESTA enables the registration through a common interface called FIESTA TPI, see more here: http://fiesta-iot.eu/index.php/fiesta-testbeds/ https://github.com/fiesta-iot/testbed.tpi |
| FIESTA-IoT Experimentation | Experiments is the way IoT testbed data is seen as "data resources" in FIESTA-IoT platform, data resources can be shared in a federated environment like fiesta like application/services. To learn more about experimentation as a service: http://fiesta-iot.eu/index.php/fiesta-experiments/ |
| FIESTA-IoT Registry | The FIESTA-IoT Registry is the IoT storage point where SPARQL endpoint-like, dataset retrieval can be acquired using various formats, and can then be reused with other datasets, based on the query response structure and format. |
| FIESTA-IoT Training Material | FIESTA-IoT YouTube channel host 42 videos including instructional and demonstration videos. http://fiesta-iot.eu/index.php/videos-first-fiesta-iot-training-workshops/ FIESTA-IoT Moodle host all training documents http://fiesta-iot.eu/index.php/eb-courses/ |
| FIESTA-IoT Online overall Information | More information about the FIESTA-IoT project is available online at the Website. If you are looking for more details about the FIESTA-IoT project go to http://fiesta-iot.eu where you can find a list of public deliverables and more details about the project and available technologies. |



Using the FIESTA-IoT Tools

The FIESTA-IoT provides a dashboard for testbed monitoring and sensors data provisioning. Metadata management is a core feature in the FIESTA-IoT platform. All testbeds and their sensor devices are required to register with the platform. The registration involves the submission of descriptions which define the properties of a “Resource”. All descriptions must comply with the FIESTA-IoT Ontology. All descriptions must comply with the FIESTA-IoT Ontology. Once validated, it is then stored in the IoT Registry. The IoT registry is also the point of contact for experimenters to discover “Resources” of interest, and hence retrieve the datasets generated by them. Using the IoT registry’s SPARQL endpoint, dataset retrieval can be acquired using various formats, and can then be reused with other datasets, based on the query response structure and format. FIESTA-IoT enable IoT data analytic services in the form of APIs’ enabling Analytics and Reasoning through Federated Analytics Tool (FIESTA-IoT FAT) and Reasoning Analytics Tool (FIESTA-IoT RAS)

FIESTA-IoT Innovation Challenge – IoT Week 2018