interiot

INTEROPERABILITY
OF HETEREOGENEUS
IOT PLATFORMS.

OPEN CALL

Guide for Applicants v1.1

September 2016

INTER-IoT

INTER-IoT aim is to design, implement and test a framework that will allow interoperability among different Internet of Things (IoT) platforms.

Most current existing IoT developments are based on “closed-loop” concepts, focusing on a specific purpose and being isolated from the rest of the world. Integration between heterogeneous elements is usually done at device or network level, and is just limited to data gathering. Our belief is that a multi-layered approach integrating different IoT devices, networks, platforms, services and applications will allow a global continuum of data, infrastructures and services that can will enable different IoT scenarios. As well, reuse and integration of existing and future IoT systems will be facilitated, creating a defacto global ecosystem of interoperable IoT platforms.

In the absence of global IoT standards, the INTER-IoT results will allow any company to design and develop new IoT devices or services, leveraging on the existing ecosystem, and bring get them to market quickly.

INTER-IoT offers the opportunity to third parties to contribute in the implementation of the project and get financially supported after its selection via open call on the basis of submitted proposals.

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INTER-IoT

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Executive Summary

The INTER-IoT project currently active under H2020 Framework Programme of the European Commission calls for project proposals for its Open Call. This Guide for Applicants presents a brief overview of the context and approach of INTER-IoT project and details all the information needed to guide you in preparing a proposal for INTER-IoT Open Call. It provides instructions on structuring and submitting your proposal as well as information on the eligibility and evaluation criteria.

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Definitions

(1) 'Contribution' set of tasks to be conducted by the Third Party in the framework of the INTER-IoT project, pertaining to one of more of the categories of activities listed in the open call (Call ID INTER-IoT#1) that qualify for financial support;

(2) 'INTER-IoT solution' methodological and technological suite composed of several software components and hardware devices combined in three main building blocks: (i) Layer-oriented infrastructures to adapt heterogeneous peer layers; (ii) Interoperable open framework to program and manage integrated IoT platforms; (iii) engineering methodology and tools to drive the integration process of heterogeneous IoT platforms.

(3) 'Large Contribution' contribution funded with a maximum of Eur 125.000,00, consisting in the provision of new IoT Platforms to be integrated in the two application domain and the INTER-DOMAIN use cases pilots, following the INTER-IoT methodology and associated tools;

(4) 'Third Party[1]' legal entity final recipient of the EU Funds and target population of the INTER-IoT project, who contributes to the implementation of INTER-IoT project and are financially supported by the INTER-IoT Consortium. For the avoidance of doubt, recipients of financial support do not became a party to the Grant Agreement number 687283 or the INTER-IoT Consortium and has no contractual link with the European Commission.

(5) 'Financial support' re-distribution of EU Funds from one beneficiary of a H2020 grant to a selected third party by virtue of the rules and provisions set out in article 15 of the Multi-Beneficiary General Model Grant Agreement[2].

(6) 'Small Contribution' contribution funded with a maximum of Eur 60.000,00, corresponding to new devices, protocols, middleware and services development integrated in the ecosystem, and also applications from end users and stakeholders that may interact with the interoperable INTER-IoT ecosystem;

[1] For more detail, see ocument "Guidance note on financial support to third parties under 2020" available for download on http://eshorizonte2020.cdti.es/recursos/doc/Programas/Cooperacion_internacional/HORIZONTE%202020/ICT/18247_4114112015153433.pdf

[2] Document available on http://ec.europa.eu/research/participants/data/ref/h2020/mga/gga/h2020-mga-gga-multi_en.pdf

1 Introduction

The main objective of the open call is testing the INTER-IoT proposed components and methodology by proposing new scenarios, platforms and components to achieve interoperability between IoT platforms. The proposals will help to validate INTER-IoT proposal and components in scenarios deployed in different application domains. Allowing the evolution of the INTER-IoT products (i.e. INTER-LAYER, INTER-FW and INTER-METH) as a whole to match the needs of proposers, but at the same time evolve their products in order to add new interoperability features.

The development of INTER-IoT may allow more stakeholders and developers to interact with different IoT platforms in a domain agnostic ecosystem. The Open Call addresses the needs of use cases and scenarios in which different IoT platforms are involved, and mainly in those in which more than one application domain is addressed. INTER-IoT is funded by the European Commission and is subject to the regulations established in the Horizon 2020 Programme.[3]

1.1 Overview of INTER-IoT project

INTER-IoT project aims at the design, implementation and experimentation of an open cross-layer framework, an associated methodology and tools to enable voluntary interoperability among heterogeneous Internet of Things (IoT) platforms. The proposal will allow effective and efficient development of adaptive, smart IoT applications and services, atop different heterogeneous IoT platforms, spanning single and/or multiple application domains. The project will be tested in two application domains: transport and logistics in a port environment and mobile health, additionally it will be validated in a cross-domain use case. The INTER-IoT approach is general-purpose and may be applied to any application domain and across domains, in which there is a need to interconnect IoT systems already deployed or add new ones.

INTER-IoT will be based on three main building blocks: (i) Methods and tools for providing interoperability among and across each layers of IoT platforms (INTER-LAYER); (ii) Global framework (INTER-FW) for programming and managing interoperable IoT platforms; and (iii) Engineering Methodology (INTER-METH) based on CASE tool for IoT platforms integration/interconnection.

Open interoperability delivers on the promise of enabling vendors and developers to interact and interoperate, without interfering with anyone's ability to compete by delivering a superior product and

[3] More information can be found at the rules for the participation and dissemination in Horizon 2020. This Guide for Applicants does not supersede the rules and conditions laid out, in particular, in Council and Parliament Decisions relevant to the Horizon 2020 Research and Innovation Programme of the European Commission

experience. In the absence of global IoT standards, the INTER-IoT project will support and make it easy for any company to design IoT devices, smart objects, or services and get them to market quickly, and create new IoT interoperable ecosystems.

The INTER-IoT approach will be use case-driven, implemented and tested in three realistic large-scale pilots: (i) Port of Valencia transportation and logistics involving heterogeneous platforms with ~400 smart objects; (ii) an Italian National Health Center for m-health involving ~200 patients, equipped with body sensor networks with wearable sensors and mobile smart devices and (iii) a cross domain pilot involving IoT platforms from different application domains.

- INTER-LogP: The use of IoT platforms in the ports of the future will enable locating, monitoring, and handling different transport and cargo equipment and storage areas. This use case will address the need to seamlessly handle IoT platforms interoperation within port premises: container terminal, transportation companies, warehouses, road hauliers, port authorities, customs, and outside the port.
- INTER-Health: The Decentralized and Mobile Monitoring of Assisted Livings' Lifestyle use case, aims to develop an integrated IoT system for monitoring humans' lifestyle in a decentralized mobile way to prevent health issues resulting from food and physical activity disorders. The aforementioned monitoring process can be decentralized from the healthcare center to the monitored subjects' homes, and supported in mobility by using on-body physical activity monitors.
- INTER-Domain: use case which will combine IoT platforms from the two previous domains and others from other application domains in order to demonstrate that INTER-IoT proposal is application domain agnostic. This will be the main focus of the open call.

The project will analyse usability of the provided solutions from the perspective of IoT platform creators, IoT platform owners, IoT application programmers and users investigating business perspectives and creating new business models. The most important benefits expected for third parties are related with the new features and components that will be released by the consortium: Methodologies, tools, protocols and API. That will be released as open items available to develop new applications and services. The variety and cross availability of the results could be used to build and integrate services and platforms at different layers according to the needs of the stakeholders and developers. The availability of more and new data will stimulate the creation of new opportunities and products.

2 Application process

2.1 Who can apply?

The call is open to individual European[4] SME, Universities and Research Centres that can contribute to the INTER-IoT paradigm. Selected entities will receive funds as third parties of UPV. Only one entity per proposal will be admitted, so activities in co-operation will not be considered eligible. It is not necessary that the applicants are located in any of the two demonstration sites (i.e. Valencia or Torino).

Successful applicants who have been awarded funding are expected to provide proof of their registration in one of the countries mentioned using the PIC number. In addition successful applicants will be required to sign a collaboration agreement with UPV, INTER-IoT Project Coordinator, on behalf of the INTER-IoT Consortium in order to be able to receive the funds and become third party of the project. The draft collaboration agreement with the rights and obligations assumed by the third party is included in the application package.

2.2 Prepare and submit a proposal

Proposals are submitted in a one-stage process that means that applicants submit a full proposal before the deadline. The proposal language is English. Proposals submitted in any other language will not be eligible. The consortium has prepared a template in order to be used by the interested entities, and that is included in the application package. Information requested in your proposal:

1. Title of your contribution, and identification of organization and contact person.
2. The description of the contribution and the objectives, relating to the INTER-IoT approach, and how the proposed collaboration may fit in INTER-.IoT and help to achieve interoperability
3. A list of activities and their time plan, aligned with the experimentation period – activity will be from April 2017 to October 2018. Please explicitly list what you consider to be the key milestones and deliverables within this plan, considering also the alignment with the internal evaluation periods.
4. Which of the INTER-IoT components you plan to use or enhance (e.g. INTER-LAYER D2D gateway) and how. Information about the different components and their requirements will be provided in the open call web site
5. The ways the entity plan to achieve impact at any level, e.g. standardization and open source management. A preliminary business and sustainability plan of the solution has to be included. This must include any consideration on ethics and privacy
6. The organization profile and key members CV, organization, skills and resources you have
7. The budget for cost related to the funding proposal, the template will include a section for these aspects.

Application steps:

- Step 1: Visit and review the instructions at http://www.inter-iot-project.eu/open-call
- Step 2: Prepare your application. Go to http://www.inter-iot-project.eu/open-call, sign up

[4] Legally registered in a member state of the European Union or in an H2020 associated country

for an account and complete the application form. Using the template available and considering the restrictions, prepare and submit your proposal

- Step 3: Once the submission is closed, the procedure is finished. You'll hear back from us by email by the end of February 2017.

The submission will be managed through the INTER-IoT website. If you discover an error in your proposal, you may modify your application, provided the call deadline has not passed. Only the final version received before the call deadline will be considered in the evaluation. The link to access the tool will be available on inter-iot-project.eu/open-call. The application package contains a tutorial on how to use the application. The application will be open and available to receive proposals on 14th October 2016.

Proposals must be received by 17:00h (CET) of 13th January, the application toll will be closed. Proposals which are incomplete will not be evaluated.

2.3 Funding conditions

The financial support to be provided to the third parties corresponds to a total of 850.000€. The third parties involved in the open call will be funded through two kind of contributions: large and small contributions.

- **Large contributions** correspond to a maximum of 125.000€, the provision of new IoT Platforms to be integrated in the two application domain and the INTER-DOMAIN use cases pilots, following the INTER-IoT methodology and associated tools.
- **Small contributions** correspond to a maximum of 60.000€, new devices, protocols, middleware and services development integrated in the ecosystem, and also applications from end users and stakeholders that may interact with the interoperable INTER-IoT ecosystem.

INTER-IoT may fund a minimum of two large third party contributions and a minimum of five small third party contributions.

The activities eligible for receiving funding, as listed in the Grant Agreement between EC and INTER-IoT Consortium are:

- Design, implementation and integration of interoperable device layer components for INTER-FW. Device layer components should be based on different low-level communication standards (e.g. Zigbee, 6LowPan, WIFI, Bluetooth, IEEE 802.15.4, NFC, etc) or on ad-hoc proprietary device solutions.
- Design, implementation and integration of interoperable networking layer components for INTER-FW. Networking layer components should be based on different standards higher-level communication standards (e.g. TCP/IP, HTTP, CoAP, etc) or on ad-hoc proprietary networking solutions.
- Design, implementation and integration of interoperable middleware layer components for INTER-FW. Middleware layer components need to deal with the different middleware services such as discovery, management, querying, coordination and interaction.
- Design, implementation and integration of interoperable application service components for INTER-FW. Application service layer components should exploit major standards e.g HTTP, SOA, or REST as well as proprietary solutions.
- Design, implementation and integration of interoperable data and semantics layer components for INTER-FW. Specifically semantics layer components have to deal with

heterogeneous IoT ontology matching.

- Design, implementation and integration of virtualization mechanism for smart objects and platform of smart objects for INTER-FW, including context-aware mechanisms and transfer of virtual objects between servers and cloud platforms.
- Design, implementation and integration of cloud support mechanisms to be integrated in INTER-FW, including support for different services, inter cloud mechanisms applied to IoT and support for virtualization.
- Design and implementation of new components of the INTER-METH tool for supporting integration among IoT platforms. Extension of the INTER-METH tool is needed to include the support for other IoT platforms to be made interoperable.
- Development of services/applications on top of the proposed use cases (INTER-Health and INTER-LogP) by (re)using the INTER-API to obtain a novel INTER-IoT ecosystem, representing the INTER-DOMAIN use case.
- Integration of IoT platforms in the three addressed use cases (INTER-Health, INTER-LogP, INTER-DOMAIN), following the INTER-METH methodology and the associated tools.

Regarding the eligible costs, as it is indicated in the Collaboration Agreement included in the Applicant Package. Costs for the contribution (direct and indirect costs) are eligible ('eligible costs'), if they correspond to the lump sum set out in Annex 2 (of the Collaboration Agreement) and if the corresponding tasks have been properly implemented in accordance with Annex 1 (of the Collaboration Agreement).

In addition, to be eligible the costs must meet the following criteria:

(i) they must be incurred in the period set out in Article 9.4, with the exception of costs relating to the submission of the technical report and financial statement (see Article 9);

(ii) they must be identifiable and verifiable, in particular recorded in the Third Party's accounts in accordance with the accounting standards applicable in the country where the Third Party is established and with the Third Party's usual cost accounting practices;

(iii) they must comply with the applicable national law on taxes, labour and social security, and

(iv) they must be reasonable, justified and must comply with the principle of sound financial management, in particular regarding economy and efficiency;

'Ineligible costs' are:

(a) costs that do not comply with the conditions set out above (see Article 7.1) and

(b) costs reimbursed under another EU or Euratom grant (including grants awarded by a Member State and financed by the EU or Euratom budget and grants awarded by bodies other than the European Commission for the purpose of implementing the EU and Euratom budget).

(c) The form of financial support to be used will be a pre-defined lump sum. Funds will be provided to the third parties following the accomplishment of different milestones verified on the basis on the presentation of technical and financial reports.

The planned funding conditions include in case of not fulfillment of contractual obligations certain control measures and the possibility of reducing the financial support as described in the collaboration agreement to concluded with the selected third parties

2.4 Evaluation Process

2.4.1 Who will evaluate my proposal?

Every proposal will be checked to ensure that it meets requirements before it is sent for evaluation to the INTER-IoT Experiment Evaluation Committee (EEC). This committee consists of two external observers and the PCC. The two observers will be monitoring the whole process in order to ensure tracking of every action.

Each application will be assessed by at least two external experts. The experts will be individuals with experience in the fields of innovation linked to this Open Call and also with the highest level of knowledge. The selected experts will sign a declaration of confidentiality concerning the evaluation process and the content of the proposals they evaluate. They will also declare their absence of any conflict of interest for the assigned tasks.

Each proposal will be evaluated by two evaluators. Each evaluator will record his/her individual opinion on each proposal using the attached evaluation form. They will then communicate in order to reach consensus on the quality of each proposal. The result of that agreement (comments and scores) will be reflected on the Evaluation Summary Report (ESR), which will be signed by both.

After the applications are evaluated they will be ranked by the EEC. For both the large and small contributions, the EEC will provide any feedback and give a score for each of the evaluation criteria (described in the section below).

A ranking list will be assembled with all proposals that score above the thresholds (the proposals will be evaluated under five criteria: (i) Relevance to INTER-IoT; (ii) Impact and sustainability; (iii) Technical excellence; (iv) Quality of implementation (v) Quality of the team, the thresholds to be applied to the different criteria are 4/4/3/3/3 over 5 for the different criteria, and 18 as a global threshold over 25). The EEC will meet and make a final funding decision based on the ranking list. In case of applications receiving an equal score the criteria will be marks in criteria 1, criteria 2, criteria 3, criteria 4 and criteria 5. Notifications on funding or rejections will together with any feedback be sent out by the end of February 2016.

Once the Open Call evaluation is finalised, representatives of the selected proposals will be invited to sign a Collaboration Agreement (final version included in the application package) with UPV to become third party. During the Collaboration Agreement signing process, the selected applicants will have to provide all relevant documentation concerning their legal and financial status, as well as any amendments in their technical proposals according to the comments received by the evaluators during the evaluation process, if applicable.

2.4.2 What does evaluation measure?

The applications will be evaluated based on five aspects:

- Relevance to INTER-IoT: (4/5)
  - Does your idea address the INTER-IoT challenges?
  - Does your proposal use INTER-IoT components?
  - Does your proposal provide an improvement to INTER-IoT approach?
- Impact and sustainability: (4/5)
  - In which ways can your experiment contribute to further maturing and integrating IoT interoperability?
  - Who will benefit from the implementation of your idea or development of your service, experience or solution?

- Is there an adequate business model supporting your proposal?
- In which way the proposed project will be sustained in the future?

- Technical excellence: (3/5)
  - Soundness of concept, and quality of objectives
  - Have you described your idea convincingly?
  - Does your proposed idea include innovative elements (for example, development of new products, processes, data or services, adapting a solution to a new context…)?
  - Innovation capacity of the component to be developed
- Quality of implementation: (3/5)
  - Quality and effectiveness of the technical methodology, including the workplan
  - Contribution to collaboration with INTER-IoT to achieve objectives of the project
  - Appropriateness of the allocation and justification of the resources to be committed (staff, equipment)
- Quality of the team: (3/5)
  - Quality and relevant experience of the individual participants
  - Quality of the team as a whole (including complementarity, balance)

Notice that for readability of the proposals, the different sections of the template follow a different order.

2.4.3 Timeline

2.5 Support options

The consortium will maintain a frequently asked questions (FAQ) section available in inter-iot-eu/opencall/help/. It will be updated continuously. For specifically technical details check first the available documentation in the website.

The answers that you can't find in the FAQ section can be submitted by contacting helpdesk@inter-iot.eu. Here you can get support regarding technical matters or the proposal.

There will be different events in which the open call will be presented and support will be provided in preparing the applications. Follow the web site and also de social networks accounts of the project to get information about the open call.

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