Development, Operation, and Quality Assurance of Trustworthy Smart IoT Systems

Results

Project Information

ENACT
Grant agreement ID: 780351

Funded under
H2020-EU.2.1.1.

Overall budget
€ 4 928 542,50

EU contribution
€ 4 928 542,50

Coordinated by
SINTEF AS
Norway

Deliverables

Documents, reports (5)

Agile Integration Methodologies and tools
This deliverable will present a catalogue of agile methodologies and tools for continuous integration suiting the needs of the ENACT DevOps Framework.

Survey and requirements of Risk-driven Continuous Delivery of Trustworthy Smart IoT Systems
This deliverable will provide an overview of the state-of-the-art mechanisms for the risk-driven continuous delivery of trustworthy SIS. In addition, this deliverable will characterize the requirement, including trustworthiness requirements, to be considered.
Requirements and conceptual design of techniques and methods for trustworthy & agile operation of smart IoT systems

This deliverable will provide an overview of the state-of-the-art mechanisms for the operation of IoT systems. In addition, it will characterize the requirement, including trustworthiness requirements, to be considered and provide an initial design of the solutions developed in WP3.

Use case definition and requirements, & validation and evaluation plan

The use cases definitions and scenarios, the use case requirements and the evaluation and validation plan.

Trustworthiness mechanisms specification

This deliverable provides an overview of the state-of-the-art mechanisms for trustworthiness in particular related to end-to-end security and privacy monitoring and control as well as resilience and robustness.

Websites, patent fillings, videos etc. (2)

ENACT business model

This deliverable will describe the business models enabled by the ENACT technologies for the different stakeholders: App Developers, App Operators, App Owners and End users.

ENACT website

Public online website to promote ENACT results and activities

Other (4)

Case studies implementation—First version

The first version of the use case implementations demonstrating the initial ENACT DevOps Framework.

ENACT DevOps Framework- First version

This deliverable provides the ENACT DevOps platform and the integration platform.

Trustworthy & agile operation of smart IoT systems - First version

This deliverable provides the ENACT Agile Operation toolkit. This includes the developments made in all WP3’s tasks (T3.*).

Trustworthiness mechanisms for smart IoT Systems - First Version
This deliverable provides the first version of the Security and Privacy Monitoring and Control Enabler and the Robustness and Resilience Enabler of the ENACT Trustworthiness toolkit. This includes the developments made in all WP4’s tasks (T4.*).

Open Research Data Pilot (1)

Data Management Plan
Report on how data will be handled in ENACT during the project’s lifetime and after its completion, in accordance with the guidelines on FAIR Data Management in H2020.

Publications

Conference proceedings (14)

Auto-Adjusting Self-Adaptive Software Systems
Author(s): Zoltan Adam Mann, Andreas Metzger
Published in: 2018 IEEE International Conference on Autonomic Computing (ICAC), Issue 2018, 2018, Page(s) 181-186
DOI: 10.1109/icac.2018.00030

Multi-layered Adaptation for the Failure Prevention and Recovery in Cloud Service Brokerage Platforms
Author(s): Nicolas Ferry, Franck Chauvel, Brice Morin
Published in: 2018 11th International Conference on the Quality of Information and Communications Technology (QUATIC), 2018, Page(s) 21-29
DOI: 10.1109/quatic.2018.00014

Engineering Software Diversity - a Model-Based Approach to Systematically Diversify Communications
Author(s): Brice Morin, Jakob Høgenes, Hui Song, Nicolas Harrand, Benoit Baudry
Published in: Proceedings of the 21th ACM/IEEE International Conference on Model Driven Engineering Languages and Systems - MODELS '18, 2018, Page(s) 155-165
DOI: 10.1145/3239372.3239393

A security policy enforcement framework for controlling IoT tenant applications in the edge
The preliminary results of a mapping study of deployment and orchestration for IoT

Author(s): Phu H. Nguyen, Phu H. Phung, Hong-Linh Truong
Published in: Proceedings of the 8th International Conference on the Internet of Things - IOT '18, 2018, Page(s) 1-8
DOI: 10.1145/3277593.3277602

A Systematic Mapping Study of Deployment and Orchestration Approaches for IoT

Author(s): Phu H. Nguyen, Nicolas Ferry, Gencer Erdogan, Hui Song, Stéphane Lavirotte, Jean-Yves Tigli, Arnor Solberg
Published in: Proceedings of the 34th ACM/SIGAPP Symposium on Applied Computing - SAC '19, 2019, Page(s) 2040-2043
DOI: 10.1145/3297280.3297617

Advances in Deployment and Orchestration Approaches for IoT - A Systematic Review

Author(s): Phu Nguyen, Nicolas Ferry, Gencer Erdogan, Hui Song, Stéphane Lavirotte, Jean-Yves Tigli, Arnor Solberg
Published in: Proceedings of the 4th International Conference on Internet of Things, Big Data and Security, 2019, Page(s) 69-82
DOI: 10.5220/0007675700690082

Implementing the MDETools’18 challenge with ThingML

Author(s): Jakob Høgenes and Brice Morin
Published in: MDETools’18 Workshop co-located with IEEE/ACM MODELS conference, 2018, Page(s) 9

GeneSIS: Continuous Orchestration and Deployment of Smart IoT Systems

Author(s): Nicolas Ferry, Phu Nguyen, Hui Song, Pierre-Emmanuel Novac, Stephane Lavirotte, Jean-Yves Tigli, Arnor Solberg
Published in: 2019 IEEE International Congress on Internet of Things (ICIOT), 2019, Page(s) 53-60
DOI: 10.1109/iciot.2019.00021

Towards Early Prototyping of Services based on Open Transport Data: A Feasibility Study

Author(s): Nicolas Ferry, Aida Omerovic, Marit Natvig
Published in: Proceedings of the 9th International Conference on Cloud Computing and Services Science, 2019, Page(s) 257-262
DOI: 10.5220/0007675402570262
Towards IoT Diversity via Automated Fleet Management

**Author(s):** Rustem Dautov, Hui Song  
**Published in:** Joint Proceedings of the Workshop on Model-Driven Engineering for the Internet of Things (MDE4IoT) & of the Workshop on Interplay of Model-Driven and Component-Based Software Engineering (ModComp), Issue Vol-2442, 15-Sep-2019, 2019, Page(s) 47-54

Model-driven Evidence-based Privacy Risk Control in Trustworthy Smart IoT Systems

**Author(s):** Muntes-Mulero, Victor and Dominiak, Jacek and Gonzalez, Elena and Sanchez-Charles, David  
**Published in:** Joint Proceedings of the Workshop on Model-Driven Engineering for the Internet of Things (MDE4IoT) & of the Workshop on Interplay of Model-Driven and Component-Based Software Engineering (ModComp), Issue Vol-2442, 15-Sep-2019, 2019, Page(s) 23-30

Towards Model-Based Continuous Deployment of Secure IoT Systems

**Author(s):** Nicolas Ferry, Phu H. Nguyen  
**Published in:** 1st International Workshop on DevOps at MODELS (DevOps@MODELS) colocated with MODELS, 2019

Challenges of DevOps ready IoT Testbed

**Author(s):** Janis Judvaitis, Krisjanis Nesenbergs, Rihards Balass, Modris Greitans  
**Published in:** Joint Proceedings of the Workshop on Model-Driven Engineering for the Internet of Things (MDE4IoT) & of the Workshop on Interplay of Model-Driven and Component-Based Software Engineering (ModComp), Issue Vol-2442, 15-Sep-2019, 2019, Page(s) 3-6

**Peer reviewed articles (1)**

Agile risk management for multi-cloud software development

**Author(s):** Victor Muntés-Mulero, Oscar Ripolles, Smrati Gupta, Jacek Dominiak, Eric Willeke, Peter Matthews, Balázs Somoskői  
**Published in:** IET Software, Issue 13/3, 2019, Page(s) 172-181, ISSN 1751-8806  
**DOI:** 10.1049/iet-sen.2018.5295

**Book chapters (2)**
ENACT: Development, Operation, and Quality Assurance of Trustworthy Smart IoT Systems
Author(s): Nicolas Ferry, Arnor Solberg, Hui Song, Stéphane Lavirotte, Jean-Yves Tigli, Thierry Winter, Victor Muntés-Mulero, Andreas Metzger, Erkuden Rios Velasco, Amaia Castelruiz Aguirre
Published in: Software Engineering Aspects of Continuous Development and New Paradigms of Software Production and Deployment - First International Workshop, DEVOPS 2018, Chateau de Villebrumier, France, March 5-6, 2018, Revised Selected Papers, Issue 11350, 2019, Page(s) 112-127
DOI: 10.1007/978-3-030-06019-0_9

Next Generation Internet of Things
Author(s): Ovidiu Vermesan, Joël Bacquet
Published in: Next Generation Internet of Things, Issue 1, 2018, Page(s) 1-352
DOI: 10.13052/rp-9788770220071

Software

Software via OpenAIRE (5)

Local agent for DivEnact running on RPi-like edge devices
Author(s): Dautov, Rustem; Song, Hui
Publisher: Zenodo

Central repository for Enact tools
Author(s): Song, Hui
Publisher: Zenodo

GeneSIS: Generation, orchestration and deployment of Smart IoT Systems
Author(s): Ferry, Nicolas; Nguyen, Phu; Chauvel, Franck; Song, Hui; Dautov, Rustem
Publisher: Zenodo

DivENACT: Diversity-Aware Fleet Management of Edge Devices
Author(s): Song, Hui; Dautov, Rustem