Trust in the Internet of Things – EU project SCOTT made it happen

SCOTT builds trust in the Internet of Things, helping to unfold the full potential of the Internet of Things for the benefit of Europe's Industry, SMEs and Startups.

Graz, 02.11.2020 - The pan-European project SCOTT (coordinated by VIRTUAL VEHICLE Research GmbH from Graz, Austria) united top international industry and research partners. It reinforced Europe's leading position in the field of Smart and Connected Things and secured Europe's independence in the area of security-enabling components and systems.

In consumer electronics, IoT devices can be found in a large number of use cases in the home and personal environment: Doorbells, smart locks, light switches, thermostats, light bulbs, loudspeakers and so on. IoT solutions are to a large extend wireless solutions. However, wireless solutions - although having major benefits for usage, such as increased flexibility, mobile applications, weight reduction, adaptability for changes etc. - are not yet fully accepted. They are still regarded untrustworthy, in particular when it comes to application areas where security and privacy are required. This is also the reason why they are hardly found in industrial use nowadays. However, when taking the right precautions in the design, many industrial solutions can be realized based upon IoT technology.

That was the challenge and premise of the pan-European research project SCOTT – Secure Connected Trustable Things. After three years of fruitful scientific work, the €40-million research project led by VIRTUAL VEHICLE with 59 key partners from 12 countries (incl. Brazil) has successfully presented its impressing results at the final review meeting, such as:

- Boosting **Security, Privacy, Safety and Trust for IoT**
- Ensuring **Industry-compliant Connectivity** via **Cloud Integration**
- Innovative **Energy-constrained** and **Autonomous** IoT Components

- A **Reference Architecture** for Secure Connected Trustable Things demonstrated across 5 Domains (Automotive, Aeronautics, Home/Building, Rail, Healthcare, and Cross-domain (cross-disciplinary))
- A scientifically sound yet practical **Methodology** for developing **Trusted Systems**

Anticipating a fast spreading trend

These results are ahead of a trend which is already spreading fast: devices, vehicles, buildings and other items that feature embedded electronics, software, sensors, actuators and network connectivity are becoming connected via the internet, thereby enabling such objects to collect and exchange data. This is altering the foundation of the economy and drives the evolution of new business models for end users and suppliers.

Anticipating this development, SCOTT focussed on "trustable things that communicate securely" – including vehicles, control systems and other things, which are interconnected via dependable wireless technology and are vigilant about safeguarding the end-users privacy. The project provided comprehensive, cost-efficient solutions for wireless, end-to-end secure, trustable connectivity. The focus has been on applications in intelligent, integrated mobility for road, rail and air, as well as building technology, smart homes and infrastructure, and even health.

This means, for instance, advanced security paradigms for the Internet of Things, a privacy labelling of the Internet of Things, a clear link between Security and Safety and establishing a framework for trustable Internet of Things services. All these results, amongst others, have been impressively presented to and assessed by the European Commission (represented through the ECSEL Joint Untertaking[1]) during the final review meeting – due to the ongoing situation, the event has been performed online.

More information is available on the SCOTT Website: www.scottproject.eu

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[1] https://www.ecsel.eu/

SCOTT – results in numbers & videos

- 15 industry-driven use cases / demonstrators

  - **Final videos / demos are publicly** available on SCOTT YouTube channel, some examples below:

    - **About the SCOTT project**: This video gives a general introduction about the project and its results.
      https://www.youtube.com/watch?v=V8P_4UaotRY

    - **SCOTT Rail Use Cases**: In this impressive video from Rail Domain, the following Use Cases are presented in real environment:

      • Autonomous Wireless Network for Rail Logistics

      • Smart Train Composition Coupling

      • Trustable Warning System for Critical Areas

      https://www.youtube.com/watch?v=pMQ0CWzOKTI&feature=youtu.be
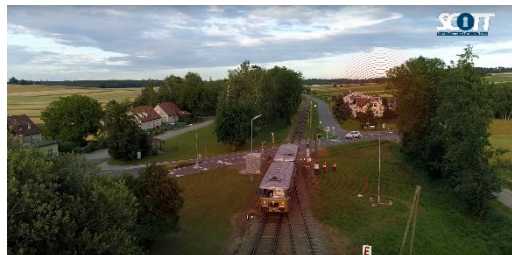
- **Vehicle-as-a-Sensor within Smart Infrastructure - Tablet Authentication and Path Control :** This video features the use-case **Vehicle-as-a-Sensor within Smart Infrastructure.**
https://www.youtube.com/watch?v=In81mR648yA

- Developing a cost-effective, battery-less, miniaturized, **wireless IOT switch for applications like in passenger planes**.
https://youtu.be/Mp_QWyykEs0

- Use Case Booklet & Demonstrator Booklet available

- SCOTT **Trustworthiness framework**

  - Shows how a trusted system can be built and how is it possible to label trust. The SCOTT Trust Framework channels Building Trust, Security Classes as well as Privacy Labels.

- **Whitepaper on Security Scan Methodology for Cloud Connected IoT Devices**: Within SCOTT project, the security researchers investigating specifically how to secure connected infrastructures have decided to write a general recommendation methodology for simple good practices. The document, so-called a „Security Scan", is

meant to be used as a sort of checklist of basics to ensure that the most common entry points, attack vectors, and typical oversights and mistakes, are avoided and covered. The Whitepaper is available here: Whitepaper – Security Scan Methodology for Cloud Connected IoT Devices

- **22 idea contests, hackathons, stakeholder engagement activities**

  - https://scottproject.eu/2020/07/27/one-more-week-to-apply-in-the-international-student-contest-on-wirelessly-connected-iot-in-2020/

  - https://scottproject.eu/2019/10/03/fh-hagenberg-students-won-scott-vehicle-data-hackathon/

- Big impact in **dissemination & exploitation**

  - Special Session on Trustworthiness and Security Focused Wireless Industrial IoT Networks (WFCS 2020)

  - SCOTT Workshop on Secure and Trustable Wirelessly Connected Industrial IoT at ETFA 2019: https://scottproject.eu/2019/09/11/scotts-workshop-at-etfa2019-big-success/

  - 168 publications in total

Statement Dr. Michael Karner, SCOTT Project Coordinator:

SCOTT provides solutions for wireless, end-to-end secure, trustworthy connectivity and interoperability. We do not just deal with 'things that are connected', but with 'trustable things that securely communicate' and are valuing the end-users' privacy rules. Only through the support of Europe's industry, Europe's leading Research Organizations, the European Union via the ECSEL Joint Undertaking and the participating national funding authorities like FFG in Austria it is possible to bring together European and International key players in one project as SCOTT did. SCOTT is not the first project of this size and it will not be the last. We had the very successful predecessor project DEWI, which dealt with bringing wireless sensor networks into harsh industrial environments. And I can already say that we are right now in the beginning of a new project about bringing two main drivers of innovation together: Artificial Intelligence and the Internet of Things.

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VIRTUAL VEHICLE

The Virtual Vehicle Research GmbH is Europe's largest R&D center for virtual vehicle technology with 300 employees. Research priority is the linking of numerical simulations and hardware testing, which leads to a powerful HW-SW whole system design and automation of testing and validation procedures. Following this focus on industry-related research VIRTUAL VEHICLE is the innovation catalyst for future vehicle technologies.

The international partner network of VIRTUAL VEHICLE consists of around 100 national and international industrial partners (OEMs, Tier 1 and Tier 2 suppliers as well as software providers) as well as over 40 national and international scientific institutions.

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Picture 1: SCOTT Logo

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