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Transformation to meet challenges of C-ITS and future cooperative automated driving

by Dr. Karl-Oskar Proskawetz, Administrator of the CAR 2 CAR Communication Consortium

In 2017, the CAR 2 CAR Communication Consortium has developed a new C2C-CC Agreement, and started the signing procedure of the declaration of accession by its members. Based on the new contract, the C2C-CC has an indefinite lifetime, with clear rules for joining, leaving and exclusion. The General Assembly has received more voting power. The former side letter has been integrated in the statutes, and complementing annexes describe the work plan, the organisation, the working procedures as well as appointed chairs and members of the Steering Committee.

The CAR 2 CAR Communication Consortium took the new agreement as opportunity for changing the work mode of the C2C-CC Working Groups. This transformation process is still ongoing. The step-by-step implementation considers feedback and lessons-learned. During the second half of 2018, the descriptions of the organisation, working procedures etc. will be updated. As a consequence of the already established two track organisation, the Working Groups are split into 1. WGs focusing on R&D issues and 2. WGs focusing on deployment issues. Furthermore, the document and release management is being professionalised for maintaining the Basic System Profile for initial C-ITS Deployment, for harmonising the requirements with the C-Roads Platform, and for taking care of profiling for the future deployment phases. Most obvious is the change of the work mode through the newly established CAR 2 CAR Weeks which take place prior to the ETSI TC ITS Working Weeks. During three to four CAR 2 CAR Weeks per year, the experts of the CAR 2 CAR Communication Consortium shall meet in parallel and sequential sessions for discussing technical issues and developments to meet the work plan. The first CAR 2 CAR Week was hosted by TASS International in March 2018. The second CAR 2 CAR Week will be organised from 19 to 21 June 2018 in Wolfsburg.

Next year, the initial deployment of the ad-hoc V2X communication will enter the European market, driven by automotive vehicle manufacturers as well as by C-ROADS road operators in 16 countries. Also in the USA, further vehicle manufacturers announced to launch the DSRC technology to vehicles and infrastructure in 2021.

These developments in C-ITS will be discussed among others during the CAR 2 CAR Forum 2018. This event will be organised on 20 and 21 November 2018 in the Aviodrome in Lelystad (The Netherlands).



CONSORTIUM NEWS

CAR 2 CAR Weeks – new work mode to foster ad-hoc discussions and synchronisation

by Dr. Karl-Oskar Proskawetz, Administrator of the CAR 2 CAR Communication Consortium

Starting in 2018, the CAR 2 CAR Communication Consortium changes its work mode: Instead of decentralised, individual working group meetings, aligned working group meetings will take place during long-term planned CAR 2 CAR Weeks. The new work mode is expected to foster ad-hoc discussions between the experts, improvements in the workflow, as well as a better synchronisation of the document release management and with other external organisations.

During the past years, the working groups of the CAR 2 CAR Communication Consortium organised their individual meetings independent from each other. The approach of hosting the meetings rotationally by team members offered high flexibility. Only one working group met at this venue at this point in time, and the work items as well as preferences of individual team members could be easily considered. By contrast, this work mode hindered ad-hoc cross-working group discussions, and a synchronised approach for developing, revising and releasing documents by several parties. As the synchronised cooperation with other organisations, pilots and projects is becoming more important in future, the CAR 2 CAR Communication Consortium has decided to change its work mode.

During the CAR 2 CAR Weeks, all working groups and taskforces have the opportunity to meet each other at the same location. The three days

meeting schedule allows individual working group meetings as well as combined sessions, plenary meetings or side meetings of the chairs. The long-term schedule allows a foresighted trip planning for all participants. Experts joining several meetings benefit from the reduced travel efforts. Furthermore, the aligned working group meetings enable a better workflow and synchronisation with other C-ITS cooperation partners.

In 2018, for the first time, three CAR 2 CAR Weeks will be organised at fixed times synchronised with the meeting schedule of ETSI TC ITS. The first CAR 2 CAR Week already took place in March 2018 and was hosted by TASS International in Helmond, The Netherlands. Next CAR 2 CAR Weeks are scheduled for 19 to 21 June 2018 (Wolfsburg, Germany) and 25 to 27 September 2018 (Magdeburg, Germany).

A continuously updated list of venue options will facilitate the organisation of the regular CAR 2 CAR Weeks in future. Considering the lessons-learned from the previous events, a successive improvement of the event organisation is expected. Your suggestions and comments are welcome!

Read more about the CAR 2 CAR weeks on page 3 of this newsletter!

CAR 2 CAR Forum 2018 in the Aviodrome in Lelystad

by Sonja Eickmann, CAR 2 CAR Communication Consortium

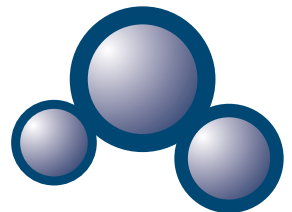
This year, the CAR 2 CAR Communication Consortiums welcomes its members to the CAR 2 CAR Forum on 20 and 21 November 2018 in the Aviodrome in Lelystad, the Netherlands. As annual conference of the Consortium, the CAR 2 CAR Forum is open to all active and basic subscription members interested in receiving first-hand insights into the consortiums work on C-ITS deployment preparation in Europe.

In a tried and tested manner, the Forum consists of a two-day conference programme. Traditionally, the first day provides an overview on the status and strategic framework for deployment from the perspective of the automotive industry, road operators, cities and regions, politics as well as corridor projects and pilots. The second day is meanwhile typically shaped by the CAR 2 CAR working groups presenting the latest results on technical as well as organisational deployment issues, and developments beyond initial deployment. The conference will again be accompanied by an exhibition where active and basic subscription members can showcase innovations and projects in the field of V2X communication.

The Aviodrome is an aviation museum that focuses on the history of Dutch civil aviation. Located on the grounds of Lelystad Airport, it shows an extensive collection of aircrafts.

Further information about the CAR 2 CAR Forum 2018, possibilities to participate in the exhibition, travel and hotel information as well as the registration will soon be provided on the [CAR 2 CAR website](#).

12th CAR 2 CAR Forum
20 and 21 November 2018
Aviodrome, Lelystad



The Aviodrome in Lelystad, the Netherlands, is the venue for this year's CAR 2 CAR Forum, taking place on 20 and 21 November 2018.



WORKING GROUP NEWS

Report on 1st CAR 2 CAR Week in Helmond

by Dr. Karl-Oskar Proskawetz, Administrator of the CAR 2 CAR Communication Consortium

The CAR 2 CAR Communication Consortium organised its first CAR 2 CAR Week from 13 to 15 March 2018 in the Automotive Campus in Helmond. More than 70 experts participated in the event hosted by TASS International. The working groups held their individual work meetings in parallel, and organised joint meetings where required. Coffee and lunch breaks offered additional networking opportunities.

The first CAR 2 CAR Week started with a plenary opening session. Gwen van Vugt welcomed the participants on behalf of TASS International, the first member hosting a CAR 2 CAR Week, and outlined the company, facilities and the areas of activities. Then, Karl-Oskar Proskawetz explained the background and objectives of organising three to four CAR 2 CAR Weeks per year prior to the ETSI TC ITS standardisation weeks.

The CAR 2 CAR Weeks shall support the working groups in organising their meetings, and in synchronising the status of documents and specifications internally as well as with external organisations ([see article on page 2 of this newsletter](#)).

Furthermore, a revision of the technical organisation of the CAR 2 CAR Communication Consortium was proposed. According to their scope, the existing working groups shall be clustered in 1. functional and 2. technology R&D as well as 3. deployment / serial development. The three groups are expected to cover cross-WG aspects more efficiently in future. All experts have been motivated to discuss the proposed revision of the technical organisation, and to provide the required input for updating the documents on the technical organisation and working procedures.

Following the opening session, WG COM and WG ARCH organised their joint meeting in parallel to WG DEPLOY. On the next day, the joint WG COM / ARCH meeting continued in parallel to the WG SEC meeting and a WG DEPLOY meeting in the afternoon. Furthermore, a COM-COSP break-out session was organised for discussing dedicated issues.

The last day started with joint meetings of the proposed Functional, Technology and Deployment Groups. During the plenary closing session after lunch, the WGs reported their main results and discussed the lessons-learned.

All documents of the 1st CAR 2 CAR Week can be found in the respective folder in the Collaboration Area.

2nd CAR 2 CAR Week

19 to 21 June 2018

Wolfsburg, Germany, hosted by Volkswagen

3rd CAR 2 CAR Week

25 to 27 September 2018

Magdeburg, Germany, hosted by ifak



The CAR 2 CAR Weeks as new work format support individual working group meetings as well as plenary sessions for synchronising the status of activities.



About 60 CAR 2 CAR members joined the first CAR 2 CAR Week in March 2018, hosted by TASS International in Helmond, the Netherlands.





PROJECT ENVIRONMENT

ETSI TC ITS Workshop: Establishing a regulatory and policy framework for achieving European C-ITS Deployment

by Dr. Karl-Oskar Proskawetz, Administrator of the CAR 2 CAR Communication Consortium

ETSI organised this year's 9th workshop on Intelligent Transport Systems (ITS) on 6 to 8 March 2018 in Berlin, Germany, hosted by the Federal Ministry of Economic Affairs and Energy. In 2017, the European Commission finalised the C-ITS Deployment Platform. For achieving European deployment of C-ITS, a regulatory and policy framework shall be established in 2018. The workshop provided a status of the ongoing activities to facilitate the deployment of cooperative ITS in Europe and around the globe. Furthermore, several presentations also addressed the next step moving from the initial Day 1 C-ITS services through the next phases of C-ITS towards higher degrees of automation.

About 160 experts participated in the 2018 ETSI TC ITS workshop which was organised in four sessions with 27 presentations. The first session addressed the C-ITS status around the globe. The second session focused on C-ITS next challenges. The last two sessions highlighted framing the needs towards accident-free automated driving. The presentations and the speakers' biographies are published on the ETSI website.

From the perspective of the CAR 2 CAR Communication Consortium, especially the following notes shall be highlighted:

- The European Commission plans to publish a dedicated communication on CCAM (Cooperative, Connected and Automated Mobility) during 2018. This communication will follow the EU C-ITS Strategy from 2016 based on hybrid communication of ITS G5 short-range communication complemented by cellular communication with a strong link on road safety and traffic efficiency. Harmonised service profiles are required as interoperability (across borders and brands) is key for CCAM. The road to Vision Zero is long, but Europe has an idea on how to get there and already made the crucial first steps.
- CEPT/ECC outlined their status of work so far and highlighted the principles and concept for future spectrum regulation. CEPT/ECC pointed out their technology neutrality, required mitigation techniques, and no segmentation or segregation of the band 5875-5925 MHz. With respect to new technologies, CEPT/ECC stated that the overall communication channel loading and decentralized congestion control are required to ensure that safety related messages have a very high predictability to be received by other ITS stations.
- ETSI outlined the plugtests performed since 2010, and test suits available for download. New plugtests are planned to address ITS security, and plugtests on co-existence of G5 and C-V2X communications were proposed as well as the organisation of a crackathon as a part of ITS security plugtest events. In general, security is seen as one of the challenges of C-ITS for enabling future cooperative

automated mobility, and for facing the quantum computing threat to cryptography.

- Article WP29 working party and federal data protection officer clearly stated that vehicular data exchanged is personal data and the GDPR applies. Especially kinematic and static data of the cooperative awareness messages (CAM) is seen to bear traceability risks by concatenating different message elements. The drivers' consent is required for using the data for clearly dedicated

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Niels Peter Skov Andersen at the ETSI TC ITS Workshop in Berlin.



About 160 experts joined the ETSI TC ITS Workshop addressing status of the ongoing activities to facilitate the deployment of cooperative ITS in Europe and around the globe.



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purposes. In case of having not received explicit acceptance, the data controller is neither allowed to track the driver nor to use the data for other purposes. Privacy by design and security can mitigate the risks. As most of the proposed measures are not in line with the needs of future cooperative automated driving requirements, the privacy issue results in further actions to find required compromises.

- The hybrid communication of 5G – short range V2X and long range cellular – is expected to contribute to cooperative connected and automated driving. The cellular features and improvements are generally accepted.
- However, the short-range LTE-V2X using the PC5 interface as specified in 3GPP Rel14 resulted in discussions as this system cannot coexist with ETSI ITS-G5 in the same band and is not interoperable. Furthermore, the LTE-V2X Rel14 will not be interoperable with the upcoming planned 3GPP 5G V2X system based on the 5G NR (New Radio) to be specified in the Rel16. The actual Rel15 under development in 3GPP will focus on bug-fixes of the Rel14 LTE-V2X and will not include any new features of wave forms.

- The mobile network operators focus on 5G cellular technologies for enabling and supporting strategic C-ITS use cases, as well as other applications like map updates, valet parking and tele-operation. Furthermore, cellular communication can augment short-range communication. Cellular is seen to have a role for maintenance and lifecycle management like remote device management, over-the-air SW updates / firmware over-the-air updates and over-the-air V2V credential and certificate management.
- Looking to future developments beyond initial C-ITS deployment, the R&D project HIGHTS proposed cooperative positioning to improve accuracy of C-ITS stations. Also, the needs and future use-cases of powered two-wheelers and truck platooning were discussed. A presentation of the IMAGinE and MARVEN projects outlined functional features of Day 2 applications. Furthermore, an initial evaluation highlighted that future heterogeneous V2X services will require improved DCC algorithms.

The workshop presentations and speakers' biographies have been made available at the [ETSI website](#)

Coordination & Support Action CODECS finalised

by Dr. Karl-Oskar Proskawetz, ITS mobility GmbH, Coordinator of CODECS

After three years lifetime, the coordination and support action CODECS finalised its operations by 30 April 2018. In close cooperation with the Amsterdam Group, CODECS aimed on achieving a concerted roll-out of C-ITS applications across Europe. CODECS supported the alignment of stakeholder views, developed templates, and took the initiative on strategic issues to foster interoperability of C-ITS implementations. Deliverables and documentations can be downloaded from the CODECS website www.codecs-project.eu.

For providing some detailed guidance on the project activities and results, the CODECS team has developed a brochure which outlines the main focus areas, issues and findings. The brochure contains some background information on cooperative Intelligent Transport Systems and Services (C-ITS), and the main focus areas starting with networking, know-how exchange and harmonising views of initial deployment initiatives. CODECS also approached new stakeholders representing further road users for raising their interest in using C-ITS to improve road safety and for bringing in their specific needs. A common understanding of use cases and aligned road mapping between stakeholders has been fostered for complementing the planning of C-ITS deployments beyond the initial deployment phase starting next year in 2019.

CODECS did not only focus on functional and technical issues, but also addressed related strategic issues for consideration by the C-ITS deployment actors for pushing interoperable C-ITS initial deployment in 2019 as well as in successive deployment phases. Dedicated views from drivers, cities and implementing states gave insight on stakeholder specific issues and needs as well as on achievements reached in making use of C-ITS.

The reports in the brochure refer to related documentation of workshops and webinars organised by CODECS as well as to deliverables developed and published by CODECS. As example, the developed template for a harmonised C-ITS use-case description, and the report on hybrid communication for achieving common understanding have to be highlighted.

The CODECS team hopes that the brochure supports you in better understanding C-ITS, and that it guides you in finding the relevant documentation of interest. You can download the brochure and all other published material as pdf-documents from the [CODECS website www.codecs-project.eu](http://www.codecs-project.eu).



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Security assurance challenges for connected vehicles

by Andras Varadi, commsignia

The Secure Connected Vehicle is a buzzword, an ambitious goal, but also essential for deployment! However, the way to achieve a secure vehicular and traffic ecosystem with so many actors and elements is not trivial, especially since they are rapidly changing and evolving. New adapted tools are required to suit the Connected Vehicle characteristics.

Vehicles equipped with cooperative safety systems, telematic services and consumer electronics consisting of numerous 3rd party services imply a multitude of security, privacy and safety requirements. The countermeasures adopted for satisfying the new requirements turn the connected vehicle ecosystem into an even more complex one, while they increase uncertainty in terms of their relevance and effectiveness.

Existing standardized approaches such as NIST FIPS 140-X, ISO Common Criteria 3.1 R5.3 and relevant industrial recommendations do not suit all aspects related to the automotive and connected vehicle eco-system; in most cases they are rather generic and typically expensive to apply on the automotive setting.

Objectives

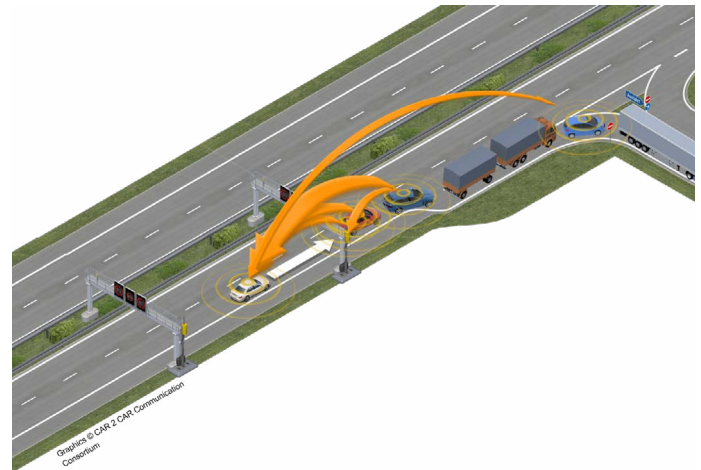
SAFERtec, a H2020 EC-funded research and innovation action, addresses the above-mentioned challenge and intends to quantify the confidence that the involved security, privacy and safety needs are satisfied.

A consortium of high complementarity and distinct roles (see [SAFERtec website](#)) has been put together towards the introduction of a cost-effective ITS security assurance framework and its experimental evaluation. The focus is on both V2I (Vehicle-to-Infrastructure) and V2C (Vehicle-to-Cloud) communication instances realized in carefully selected use cases that expose a large attack surface and/or trust-establishment processes among numerous involved entities. Investigation takes into account security, privacy and safety (reliability and trustworthiness) at all stages of the analysis; threat, vulnerability and risk assessment.

Achievements so-far and on-going work

Started in 2017 and thus arriving soon to its mid-term period, SAFERtec has worked on the following tasks:

- Selection of timely V2I and V2C use-cases (e.g., the provision of traffic-hazard information, see figure) based on the partners' experiences and the EC-identified as highly-beneficial ITS services.
- Attack modelling and vulnerability analysis of all selected use-cases by employing, in an integrated way, three distinct methodologies, namely EBIOS, SecureTropos and PriS. The integration has facilitated the exploitation of the benefits and special features of each methodology on specific parts of the security, privacy and safety requirements elicitation process and of the system modelling process. EBIOS assists in understanding the system configuration and recording its assets as well as in its security, privacy and safety objectives definition. SecureTropos capitalizes on EBIOS results in order to model the entire system (i.e., assets, threats, vulnerabilities, attacks, countermeasures) and represent the derived requirements in a more formal way. Finally, PriS provides an extra focus on privacy which is a very important topic in the field of ITS security.

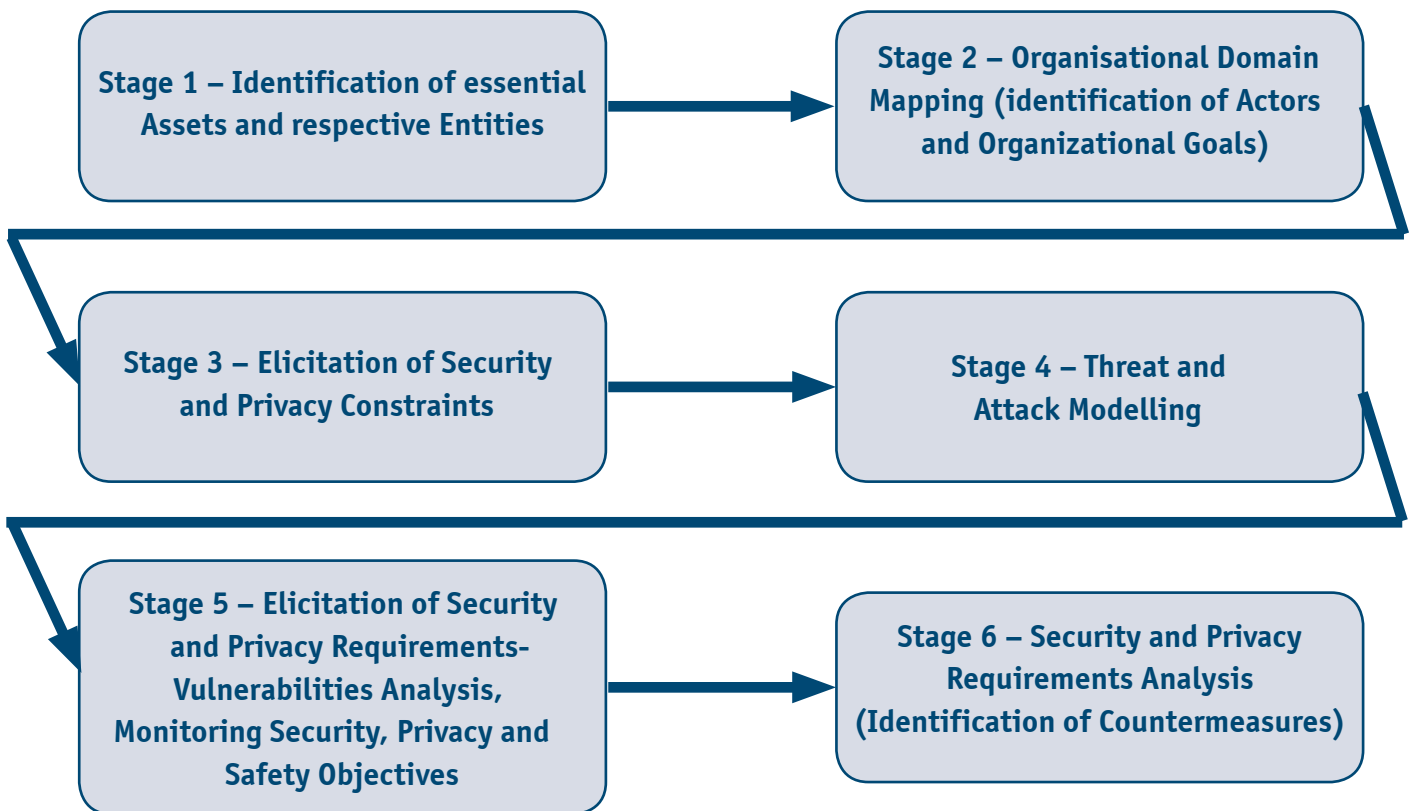


The new SAFERtec integrated methodology comprises six stages. Specifically, in stage 1 EBIOS is used for the identification of the essential assets (elements) and respective entities that correspond to the main elements of the system. In stage 2 the main effort is to understand the current organisational structure based on the identification of the entities and the essential elements from stage 1 to identify actors, organisational goals, plans, resources, services and infrastructures. In stage 3 the identification of security and privacy constraints, related to the organisational needs, are identified. Security and privacy needs are identified based on the security and privacy concerns that the organisation has. In stage 4, the threat analysis is performed following the EBIOS process along with the methodology of the ETSI standard. Attack models are constructed for every identified threat per security and privacy constraint for every functional goal (organisational goal). In stage 5 the vulnerability analysis is conducted based on the identified threats and attack methods. Then, the security and privacy requirements, that basically describe in a specific way the realisation of the identified objectives, are defined. Finally, in stage 6 the security and privacy requirements analysis is conducted. This specific stage is of vital importance since all the information collected from the previous stages will be modelled under a unified model in order to proceed with the identification of possible conflicts among security and privacy, threat mitigation and vulnerability satisfaction, etc.

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This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no 732319



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What is currently under exploration amounts to:

- Prototype implementation of the ‘connected vehicle system’ (i.e., vehicle and connected infrastructure) where the framework’s accuracy will be experimentally assessed. The different devices of the system will undergo several penetration tests using a various methods and tools.
- Design of an agile (security) assurance framework customized to meet the connected vehicle ecosystem requirements. Based on the penetration test feedback, the framework will be updated and improved in order to guarantee that it provides high levels of security, safety and privacy for the entire system.
- Transforming the proposed framework into an online toolkit (i.e., a near-future task) to serve as an open-access guide for the industry. The Assurance Framework Toolkit (AFT) will be realized as a modular software platform to host the security-specifications of the involved HW/SW assets and the computational interpretations of the threat, vulnerability, risk analysis and KPIs.

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Relevance and benefits for the industry

Considerable overlap between the SAFERtec achievements and the C2C activities is expected along the following axis:

- Elicitation of security- and privacy- requirements for pervasive V2I/V2C use-cases of interest
- SAFERtec proposal to provide assurance arguments in the system-level rather than individual modules
- SAFERtec proposal for a modular Protection Profile for the connected vehicle system
- Faster and cost-efficient assessment of the involved security assurance for the connected-vehicle components through targeted estimations using the AFT toolkit.

Establishing vehicular connectivity comes with further cyber-security, privacy and safety concerns. Automotive Security Assurance is under-explored while more general approaches require increased costs, both in terms of resources and time. SAFERtec puts V2I/V2C security assurance under the microscope and contributes to automotive cybersecurity research aiming to increase trust in connected vehicles/ITS and enable more secure products at a lower cost.

All interested stakeholders are invited to visit the [SAFERtec Website](#) and get to know or be involved in our initiative.



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Announcements

C-Roads published new release of harmonised C-ITS specifications

The C-Roads initiative has recently published the new release of the harmonised communication profile for Cooperative Intelligent Transport (C-ITS) services. It concluded from several test cycles of the C-Roads partners across Europe and is already fine-tuned with the automotive industry. While C-Roads is focusing on a hybrid communication approach, which is a combination of existing short range and cellular communication technologies, the new release focusses on the communication profile for IEEE 802.11p/ETSI ITS-G5 short range communication. The document defines the common base for the ITS-G5 functional and technical specifications. The specification targets the communication between roadside units and vehicles (I2V Infrastructure-to-Vehicle and V2I Vehicle-to-Infrastructure communication). The harmonised communication profile for C-ITS services is publicly available and can be requested via the **C-ROADS Platform website**.

New Study Group on next generation vehicular (SG NVG) at IEEE802.11

During its March 2018 plenary meeting in Chicago of Working Group IEEE 802.11 a proposal for a new study group on next generation vehicular has been presented by a group of companies led by Marvell. The working group has approved this new study group with the goal of preparing the creation of a new Task Group to develop an enhanced standard for vehicular environments as evolution to the existing 802.11p system which is part of the actual IEEE802.11-16 standard. The proposed evolutions should be fully backward compatible and should bring enhancements of the existing 802.11p standard, which is the bases for the world-wide adapted ETSI ITS-G5 standard and the US DSRC standard. The deployment of the actual generation of the standard should not be influenced by this activity. The study group Next Generation Vehicular (SG NVG) started its activities during the IEEE meeting in Warsaw from 6th to 11th of May 2018. SG NVG will prepare a Project Authorisation Request (PAR) and Criteria for standards development (CSD) for the update and evolution of the existing 802.11p standard. The study group is lead Bo Sun from ZTE, China. During the study group phase of around 1 year the use cases and corresponding requirements for the updated standard will be defined and documented. In addition, initial ideas for the update of the specification will be presented. The starting point for the activities will be the existing 802.11p standard (as part of the IEEE802.11-16 Standard) and the new 801.11ax standard. The CAR 2 CAR Communications Consortium welcomes the creation of the Study Group and will support the further development of the activity in IEEE802.11 working group with the main goal of guaranteeing the full compatibility of the new standard with the systems under deployment today. The new standard should support the extension beyond the existing day one and two use cases in the domain of autonomous driving and the deployment in new frequency bands other than the 5.9GHz band.

Toyota and Lexus to Launch Technology to Connect Vehicles and Infrastructure in the U.S. in 2021

Toyota and Lexus recently announced in a press release that they plan to start deployment of Dedicated Short-Range Communications (DSRC) systems on vehicles sold in the United States starting in 2021. The plans of both vehicle manufacturers to introduce DSRC represents a significant step forward in creating a safer and more efficient driving ecosystem while advancing connected and automated technology deployment. "By allowing vehicles' intelligent systems to collaborate more broadly and effectively through DSRC technology, we can help drivers realize a future with zero fatalities from crashes, better traffic flow and less congestion," said Jim Lentz, CEO of Toyota Motor North America (TMNA). DSRC transmissions enable vehicle-to-vehicle (V2V) and vehicle-to-infrastructure (V2I) communications – collectively known as V2X. DSRC technology, which has been comprehensively tested through government-industry collaborations and is already deployed in some areas of the U.S., supports the broadcast of precise anonymized vehicle information several times per second, including location, speed and acceleration. This information can be used by other DSRC-enabled vehicles and devices to help drivers prevent collisions. Communication can also be enabled to provide helpful real-time information to drivers, such as potential hazards, slow or stopped vehicles ahead, or signals, signs, and road conditions that may be difficult to see. DSRC communicates using 7 channels of the 5.9 GHz spectrum band allocated for Intelligent Transportation Systems. Importantly for consumers, because the technology does not require a cellular or data network, vehicles equipped with DSRC do not incur any cellular network carrier charges. DSRC is based on industry standards, so that vehicles will be able to communicate with other automakers' equipped vehicles, multiplying the safety benefits for all.

Imprint

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