CAR 2 CAR -Newsletter-

Issue 5 / January 2010

Traffic jam ahead

CAR 2 CAR
COMMUNICATION CONSORTIUM

In the fifth issue:

C2C-CC – the vision and how we get there   *by Søren Hess*

The CAR 2 CAR Communication Consortium includes a variety of main industry and development stakeholders with the common mission to foster development and deployment of a European Intelligent Transport System based on Inter-Vehicle and Vehicle-2-Roadside Communication – the so-called cooperative systems.

We have developed and demonstrated the Vehicle-2-Vehicle Technology and we are ready for implementation of cooperative Intelligent Transport Systems.
We have successfully achieved a radio spectrum allocation in the 5.9 GHz band in line with the frequency allocation in North America.

The first set of ITS standards within ETSI will soon be released providing technical deliverables for
• The ITS communication architecture,
• The basic set of ITS applications with definitions,
  functional - and operational requirements
• GeoNetworking and network architecture
• Basic transport protocols
• A European profile standard on the physical and medium access layer
  of 5 GHz ITS
and a number of other deliverables are in the pipeline including the security area.
The working groups of the C2C-CC are strongly contributing to and cooperating with ETSI on the standardisation work. A number of ETSI standards and deliverables are based on the C2C-CC developments and ideas.

For 2010 a number of new standardisation activities are planned. We are establishing 4 new Specialist Task Force (STFs) in accordance with the European Commission Standardisation Work Programme where the C2C-CC will provide its expertise to the development of high quality standards.

The European Commission has issued a standardisation mandate which provides strong political support to the standardisation activities on ITS within the European standards organisations (ETSI and CEN).

The C2C-CC activity is highly appreciated by the European Commission and we support the Commission initiatives for a harmonised deployment of cooperative ITS in Europe to further improve road safety, traffic efficiency and sustainability as well as new infotainment services.

Large scale field operational tests are being prepared and will provide ITS equipment in hundreds of vehicles and roadside units to test the operational issues of cooperative systems over the next couple of years either as national projects such as the simTD or as European Commission supported FOTs. The results of those tests are of course important to verify the technical solutions and validation of the impact on road safety and traffic efficiency and contributing to deployment activities - and the CAR 2 CAR Communication Consortium is active in these activities.

The next step towards deployment?

A roadmap towards deployment is under development within the C2C-CC and strategies are being discussed. In general the technology is ready for deployment and standardisation will be ready within the next couple of years. For market deployment we need agreements between the main stakeholders – the car manufactures – the road operators and road authorities as well as the supplier industry and telecom operators to bring cooperative ITS to life in Europe and world wide.

The C2C-CC strategic decisions towards deployment will be taken and a public private partnership is necessary.

The automotive industry market is global and we need to ensure globally available standards and deployment for cooperative ITS. Global cooperation on both R&D and standardisation that has been initiated and supported by the European Commission is important and we will contribute to the success.

Deployment of cooperative ITS is not too far away and during 2010 we will take the decisions necessary to ensure that cooperative ITS will be successful.

I look forward to continued excellent cooperation – and thank the C2C-CC members for all your activities in 2009.

Søren Hess, General Manager of the C2C-CC
Soeren.Hess@car-2-car.org

Membership News: CAR 2 CAR Forum 2009   *by Gunnar Heyms (C2C-CC)*

On 3rd and 4th November 2009 the 3rd CAR 2 CAR Forum was organised at the MobileLifeCampus, Wolfsburg. Prof. Jürgen Leohold, Executive Director of the Volkswagen Group Research welcomed about 150 participants. In his speech he highlighted the current challenges for improving road safety, efficiency and ecology and the possible contributions of cooperative ITS systems being under research and standardisation. Especially the presentations of Søren Hess on the status and road map of ETSI TC ITS standardisation, of Wolfgang Höfs on the European Commission activities and of Bengt Hallstöm and Rui Camolino on the road operators view reflected the particular interest of the CAR 2 CAR Communication Consortium in pushing forward standardisation and deployment of European cooperative ITS systems.

The first day of the CAR 2 CAR Forum was divided in three sessions on European Focus and European Projects while the second day was reserved for worshops organised by the Work-

Figure 1: The participants of this year's CAR 2 CAR Forum in Wolfsburg

ing Groups Application, Security, Architecture and Communication. The exhibition in the foyer area presented the research cars auto@web and Stadtpilot, hardware communication units and communication models for simulation. In addition to the scientific programme a guided tour at the Autostadt and the visitation of the Volkswagen production line complemented the CAR 2 CAR Forum. At the beginning of the

evening event Rolf Schnellecke, Major of Wolfsburg city, warmly welcomed all participants at the Wolfsburg Castle. All participants took advantage of the breaks, lunches and social events for lively discussions.

All presentations of the CAR 2 CAR Forum and pictures of the event are provided for download on the internal website of the CAR 2 CAR Communication Consortium.

Membership News: Enlargement of the C2C-CC Membership Classes   *by Karl-Oskar Proskawetz (C2C-CC)*

In the course of the last Steering Committee conference call the representatives of the CAR 2 CAR Communication Consortium Partners decided to offer an active membership class for small and medium enterprises (SME) in addition to the existing passive and active classes. SME which are fulfilling the criteria can apply for the active membership to special conditions with a reduced annually fee of 5000 Euros in 2010. All companies interested in this op-

tion are kindly asked to download the membership questionnaire from the C2C-CC website: www.car-2-car.org/index.php?id=Active Membership and fill-in the company information.

Please point out your competences and possible contributions to the C2C-CC objectives as well as your interests. Your filled-in questionnaire (and complementing information) will be assessed by the New Member Group. Based on

the decision of this group the C2C-CC will inform you about the further steps to become an active member of the European CAR 2 CAR Communication Consortium in the field of Car-2-Car and Car-2-X Communication Technology.

For getting further information you should not hesitate to contact the administrator Karl-Oskar Proskawetz under the following e-mail address: contact@car-2-car.org.

Membership News: ETSI TC ITS and Standardisation Mandate   *by Søren Hess (C2C-CC)*

The European Commission has issued a Standardisation Mandate on cooperative ITS.

The Mandate is an important element in the European Commission ITS action plan and is a strong political support to the ITS standardisation work with requirements to ETSI and CEN/ CENELEC to produce a minimum set of standards in the field of cooperative systems to ensure interoperability for Vehicle-2-Vehicle Communications (V2V), for Vehicle-2-Infrastructure Communications (V2I) and for communications between infrastructure operators. The standardisation activities should be divided into communication, information and security standards and based on the existing road maps.

The Mandate requires EN standards (European Norm based on national votes) but also related technical specifications and Reports to cover also test specifications for the standards to be developed. Special focus on the EC Decision for the 5.9 GHz spectrum for ITS safety related applications is mentioned in the Mandate.

A joint task force between ETSI and CEN has been set up and discussions on the required minimum set of standards initiated. A detailed work program to be forwarded to the Commission before the end of March 2010 will also include division of work and possible joint standardisation activities between ETSI and CEN.

This new Mandate will form the basis for the ETSI TC ITS standardisation activities for the next 2-3 years.

For further information please contact: Soeren.Hess@car-2-car.org

Workgroup Application: Platform for Preparation of Standards   *by Lan Lin (Hitachi Europe SAS))*

Collaboration and contributions to standardisation of V2X Systems

CAR 2 CAR Communication Consortiums Working Group Applications (WG APP) is playing an important role in collaboration with standard bodies (STO) in the field e.g. ETSI TC ITS, CEN and IEEE. In particular, collaboration between the CAR 2 CAR Communication Consortium and ETSI has been active and successful. Since April 2008, C2C-CC has been providing continuous inputs and supports to ETSI ITS WG1 (User and Application Requirements) work. Until now, the main contributions are:

1) C2C-CC contributed to the definition of Basic Set of Applications, a selection of deployable applications/use cases within three-year time after standardisation in order to scope the standardisation work This document has been published by ETSI as Technical Report;

2) C2C-CC proposed and supported the Cooperative Awareness Message and Decentralised Environmental Notification Message specifications within ETSI;

3) Demonstration specifications produced for C2C-CC 2008 interoperability demonstration had been published by ETSI ITS WG1 as Technical Report.

A standardisation mandate to support interoperability of Cooperative systems has been recently approved by EC, with the clear objective to support European Community wide implementation and deployment of Co-operative ITS systems. Several task forces are under preparation in the field of applications and facilities. WG APP will continue the active support of this work.

Consolidation and discussion platform for EU R&D and EU FOT projects

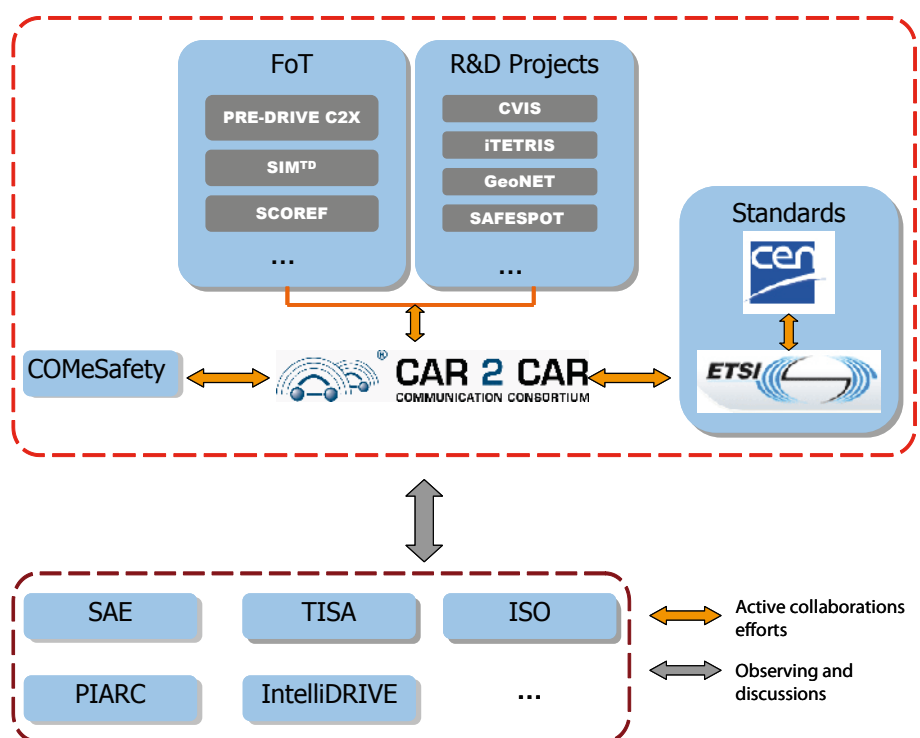C2C-CC WG APP is encouraging and providing a discussion platform to consolidate technical results from different European R&D and FOT projects e.g. PRE-DRIVE C2X, simTD. SAFESPOT, CVIS etc. For example German FOT project simTD has proposed new message sets, applications and use cases to C2C-CC, which provide a base line for future technical work in WG APP.

Collaboration with other WGs within CAR 2 CAR Communication Consortium

Needs for discussions and collaborations between WGs of the C2C-CC are becoming important in order to ensure harmonisation and compatibility of technical specifications. As example, WG APP has started discussions with WG Roadmap and Deployment (WG RD) to support technical roadmap definition. Future joint meetings will be organised with WG COM, WG ARCH, WG SEC.

International discussions and observations

CAR 2 CAR Communication Consortium APP WG has been observing and establishing contacts with counterpart international organisations within the field, e.g. SAE in USA, PIARC etc. Continuous efforts will be made to take into account needs and works from important stakeholders and standardisation bodies. Therefore, C2C-CC WG APP would welcome and open the door for active collaborations with such stakeholders and STOs.

Figure: Platform for Preparation of Standards

Workgroup Architecture: Current Status of COMeSafety European ITS Communication Common Architecture Document

by Ilse Kulp (BMW Group Research and Technology)

When COMeSafety started in 2006, many European projects and activities were planned or already on their way dealing with different aspects of vehicle communications and cooperative road traffic systems. They have achieved a number of great results on various complementary issues. A European wide process was needed to consolidate these results and to support the projects to introduce these results into the European and world wide standardisation process.

In October last year, COMeSafety published the consolidated European ITS Communication Architecture Document (version 2.0), which was the result of the COMeSafety architecture task force group. Members of this task force mainly come from CVIS, COOPERS and SAFESPOT.

In 2009, PRE-DRIVE C2X joined the COMeSafety architecture task force and extended the document by the backend service integration view. In two workshops and many phone conferences, the COMeSafety architecture task force restructured the document and updated and improved the content. The next version of the consolidated European ITS Communication Architecture Document (version 3.0) is expected by the end of the year 2009 and will be published on the COMeSafety website (www.comesafety.org).

The European ITS Communication Architecture Document (version 2.5) refines and extends the system architecture by integrating the updated contents of the European ITS Communication Architecture Document (version 2.0), the PRE-DRIVE C2X deliverable D1.4 and content from the COMeSafety Architecture Task Force and describes the baseline for a European ITS communications architecture for cooperative systems. It has been developed within the scope of the EC funded specific support action COMeSafety.
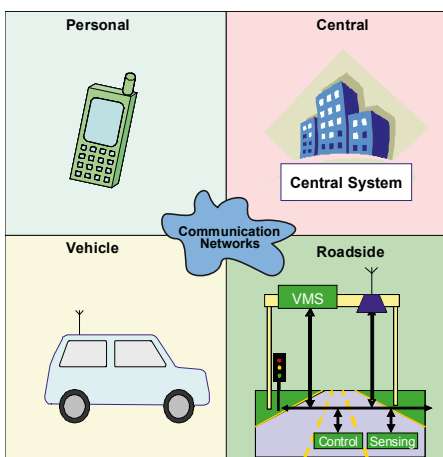

Figure 1: ITS communication system components

Basis for the refinements was the European ITS Communication Architecture Document (version 2.0), which was evolved towards standardisation conformance by incorporating relevant standardisation efforts and guidelines for architecture descriptions. It has been developed as a joint effort together with the EC funded projects COOPERS, CVIS, PRE-DRIVE C2X and SAFESPOT and in cooperation with the CAR 2 CAR Communication Consortium, ETSI, IETF and ISO and with input from IEEE and SAE.

The European ITS Communication Architecture Document describes several architectural views, namely the ITS communication system component (see figure 1), the protocol stack view for ITS stations (see figure 2), the Vehicle-2-Business Communication integration view and the security view (see below).

The European ITS Communication Architecture Document (version 2.5) provides several important contributions to the system architecture, namely:

- *IEEE 1471-2000 and ISO/IEC 42010 Compliance:* In order to fulfil the guidelines of architectural system description, the document evolves and extends the COMeSafety system architecture towards compatibility with existing guidelines for system architecture description.
- *Introduction of a Profile Concept:* In order to support a flexible deployment of the ITS communications architecture, the document introduces a profile concept. Profiles enable a scalable and future-proof deployment of the system architecture, since they enable a gradual introduction of a system by implementing a sub-set of the overall functionality.
- *Vehicle-2-Business Communication Integration View:* the document comprises a Vehicle-2-Business Communication integration view, which integrates and customises the Vehicle-2-Business Communication infrastructure into the system architecture.
- *Use Case Validation:* Utilising the recent results of the use case selection process, the relevant use cases are examined with respect to their requirements. Based on these requirements, the system architecture is validated in order to ensure that the use cases are in conformance with the system architecture specification.

On the other side the Common Architecture Document (version 2.5) is also concerned with the security view on the overall ITS architecture, namely the mitigation of risks of malicious at-
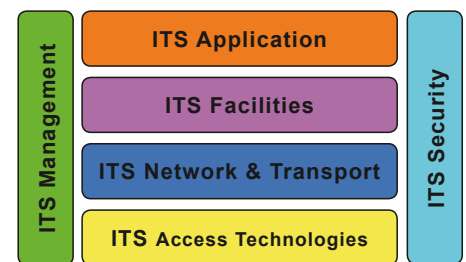

Figure 2: Reference Protocol Stack of an ITS Station

tacks that deteriorate the ITS functionality or threaten potential ITS business models realised. The document specifies a security architecture which is consistent with existing projects and standardisation efforts targeting secure ITS G5A communication. The most important provided contributions to the system security are:

- *Secure communication* deals with security related to the actual communication process. Security services can be used on any layer of the communication stack and will be provided through a layer-independent interface that creates generic secure messages. They can be configured to be insecure, signed or encrypted, and to also include mobility data that need particular protection for ITS G5A safety use cases.
- *Identity management* describes how identities and keys for their use in secure communications are managed. This includes a description and management of identities for vehicular communications.
- *In-vehicle security* stresses the necessary components within the vehicle, such as intrusion detection systems or firewalls, to create a trustworthy sender and protect in-vehicle systems.
- *Privacy* defines the components necessary for protecting the privacy of the users of the communication system.
- *The administrative processes* look at vehicular communications to ensure vehicle homologation, insurance updates, and in-field operation.

The development of a European ITS communications architecture for cooperative systems is of course an ongoing process. Thus the document is continuously adapted and updated. The Working Group Architecture of the C2C-CC has been reviewing the document and has been actively contributing to the ongoing process. Thus, the C2C-CC explicitly supports the overall European ITS Communication Architecture as it is being harmonised by the COMeSafety partners.

Workgroup Communication: European ITS Profile Standard ES 202 663   *by C2C-CC WG Communication*

The ETSI ES 202 663 is the European profile standard on the physical and medium access control layers of 5 GHz Intelligent Transport Systems (ITS). The ES 202 663 defines a subset (a profile) of IEEE802.11-2007 specification, adapted to the requirements of EC Decision 2008/671/EC on the harmonised use of radio spectrum in the 5875-5905 MHz frequency band for ITS. The ES 202 663 considers the enhancements of IEEE802.11p D8.0 draft. Finally, the profile standard also includes the operation in the 5470-5725 MHz RLAN frequency band. Figure 1 explains the relation of ES 202 663 to other standards and organisations.

By defining the physical and medium access layer including the station management and the related service access points the ES 202 663 offers a reliable basis for road safety, traffic efficiency and non-safety related applications in the European 5 GHz ITS band.

The basic mode of operation is the so-called "Communication outside the context of a BSS" (OCB) of IEEE802.11p. In this mode, all messages are transmitted without preliminary signalling, which exactly corresponds to the requirements of highly dynamic vehicular ad hoc networks.

The profile standard provides the interfaces for Decentralised Congestion Control (DCC) that regulates the channel access of ITS nodes in a wide range of different traffic circumstances – in dense traffic jam situations as well as communication in rural areas with only a few vehicles in range.

The profile standard defines the receiver performance, the transmitter properties and extends the IEEE802.11-2007 Management In-
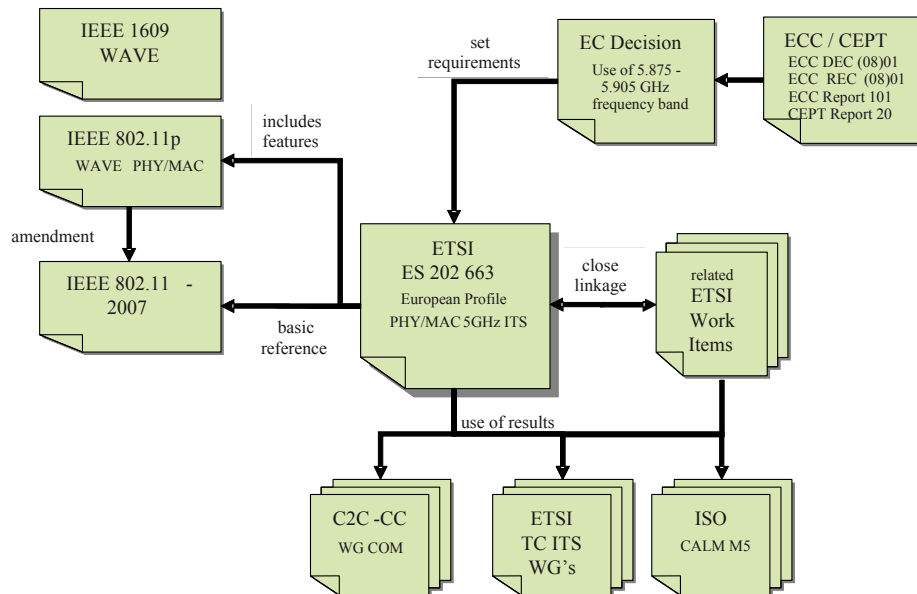

Figure 1: European profile standard, its relation to other standards and bodies (Source: C2C-CC, WG COM, 2009)

formation Base (MIB) as well as the MAC data service definition. A set of new terms and abbreviations is introduced.

Figure 2 indicates the ITS frequency band allocated by the European commission with power constrains as defined in the European profile standard. The allocated 50 MHz band for ITS is subdivided into five channels - one is a control channel (G5CC), the four others are service channels (G5SC1-G5SC4). Not included are service channels located in the RLAN band on the left hand side of Figure 2. The red line in the figure indicates the maximum transmit power spectral density limits allowed within the frequency band.

Note that the control channel uses a different frequency band than in the US (5890 MHz). The reason is the "guard-zone" concept pursued in the European profile standard: a guard zone channel G5SC2 is introduced between control channel G5CC and service channel G5SC1 to avoid interference between G5CC and G5SC1. The intention is to use the guard zone channel only for low-priority messages. Packages transmitted on G5SC2 will not interfere with those transmitted on G5CC or

G5SC1 because of the use of lower transmit power. In this concept, the two busiest channels will be G5CC and G5SC1.

According to the European profile standard, all ITS devices providing safety applications have to listen permanently on the control channel G5CC while they are not transmitting in the frequency band between 5855 MHz and 5905 MHz. Practically, this will result in dual receiver implementations. This is different from the current specification being adopted in the US (IEEE 802.11p in conjunction with IEEE 1609.4), where a single receiver switches between service channels and control channel following fixed time slots. Other differences with respect to IEEE 802.11p D8.0 consist of per-packet transmission parameters enabled via the MAC_SAP and available to every network layer protocol as well as the introduction of an additional optional receiver performance class.

ES 202 663 was submitted to ETSI Membership vote Oct 13th, 2009 and is expected to be published by ETSI after 90 days. The voting procedure has already indicated a strong support to this document by the involved industrial partners.

The European profile standard was prepared with significant contributions of the WG COM and is an excellent example of the way the C2C-CC can bring its results and recommendations into European standards. It is now a stable and suitable basis for future work of the WG COM and the C2C-CC, in particular on decentralised congestion control DCC and upper layer protocols. Further, the profile standard enables the interoperability among current and future field operational trials for cooperative systems in Europe.
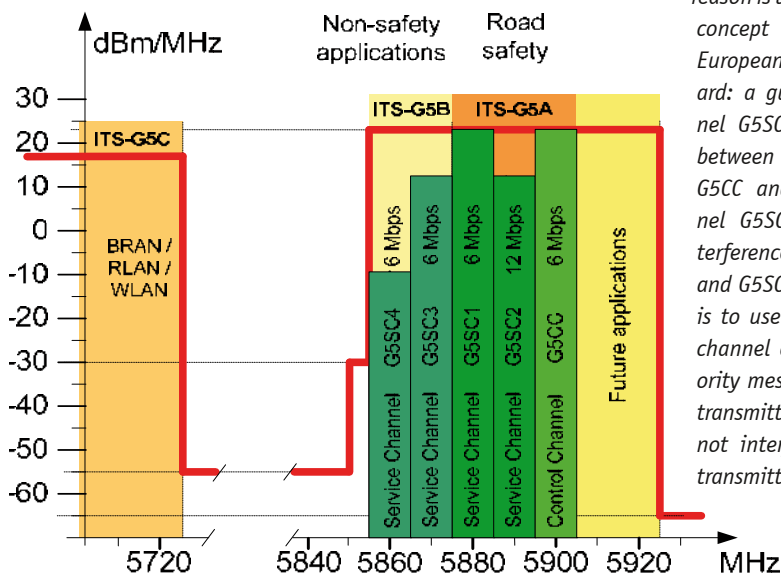

Figure 2: ITS G5 channels with respective maximum TX power spectral density limit. Missing: G5SC5 in RLAN band (Source: C2C-CC, WG COM, 2009)

Workgroup Communication: Comparison of Single- and Multi-hop Approaches for CAM dissemination

by Jens Mittag (Karlsruhe Institute of Technology)

The periodic process of exchanging cooperative awareness messages (CAM) with surrounding and neighbouring vehicles is a building block in future Vehicle-2-Vehicle Communication Systems. However, there is currently no consensus in the CAR 2 CAR WG APP and WG COM whether CAM messages should be disseminated over a single hop or whether they should be relayed over multiple hops. To address this issue, the Karlsruhe Institute of Technology (KIT) has recently studied the specific question whether it is more efficient and reliable to broadcast CAM messages with full transmit power over a single hop or to disseminate them over multiple hops with reduced transmit powers.

According to the study, which has been presented at the last ACM VANET Workshop in Beijing, SAR China, it is theoretically possible to save network resources by the usage of a multi-hop dissemination approach for CAM messages as long as the communication is reliable, transmissions by neighbouring nodes are not colliding and the wireless channel is not fading. Yet, in case the communication is unreliable due to colliding transmissions or a fading channel, as it is in a distributed and wireless communication system, multi-hop dissemination protocols have to introduce redundant retransmissions in order to overcome these impairments and succeed the dissemination process. The possible benefit of a multi-hop approach is thereby lost since the ad-

ditional retransmissions lead to a worse efficiency as compared to a simple single-hop approach. It was also shown that a multi-hop approach does not necessarily provide a better reliability and awareness than a single-hop approach.

From a network and system perspective as well as for simplicity reasons, a single-hop approach should therefore be favoured and used as the standard mode of operation for CAM message dissemination. Multi-hop approaches should only be used as an exception, for instance in intersection scenarios where no direct line-of-sight is available or in situations where messages have to be delivered beyond the maximum possible 1-hop communication range.

Workgroup Roadmap & Deployment: Established this summer

by Søren Hess (C2C-CC)

The standardisation process of Intelligent Transport Systems (ITS) is gaining more and more momentum. CAR 2 CAR Communication Consortium members are already actively participating in the work on European standards at ETSI TC ITS. Beyond that, in October the European Commission has released a standardisation mandate in the field of ITS, addressed to ETSI, CEN, and CENELEC. In this context, there is a strong need for a detailed technical roadmap indicating what minimum set of standards has to be developed before vehicles can be equipped with cooperative systems, and an according work plan.

To contribute to the aforementioned activities, this summer, the CAR 2 CAR Communication Consortium has established the new working group „Roadmap and Deployment" (WG RD), chaired by Christian Wewetzer from Volkswagen Group, and co-chaired by Thomas Kuhn from Continental Automotive. Since then, the group has had its first two meetings.

The first kick-off meeting took place on September 8th, 2009 at Volkswagen Group, Wolfsburg, and attracted an impressive number of 22 participants representing OEMs, suppliers and academia. The group initially developed an overview of existing roadmapping activities, elaborated in presentations by Søren Hess (ITS Roadmap in ETSI TC ITS and on EC-Level) and Mats Rosenquist (CVIS roadmap). In the meeting the group had a first open exchange of interests on market, product, and technology layer of the C2C-CC roadmap. What followed was a first collection of „gaps" on technical level, i.e. unsolved issues that the participants considered as important for a product. Examples include device certification issues and a commitment towards implementing a certain set of security features in the communication unit.

In the follow-up meeting on November 10th, 2009, the group gathered at Continental Automotive, Regensburg. This time, discussion in the group was monitored by Oliver Schwandner,

a Fraunhofer employee with experience in supporting roadmapping activities, who also gave a talk on his past roadmapping projects. The main results from the meeting were as follows. Results of WG RD have the purpose of: supporting definition of a minimum set of standards (in the context of the EC standardisation mandate), supporting the strategical decisions of C2C-CC steering committee and members, and supporting communication with stakeholders outside C2C-CC (e.g. road operators, service providers, legislation). The final „product" the roadmap aims for is a „C2C-CC Basic System", which is a collection of technical requirements (i.e. providing communication hardware fulfilling certain standards such as the ETSI European Profile Standard for 5 GHz communication). The participants had an initial discussion on the elements of the C2C-CC Basic System.
In the next meeting, taking into consideration the ETSI Basic Set of Applications, the preliminary results will be refined towards a first draft document.

Workgroup Security: Liaison Workshop accomplished

by Benjamin Weyl (BMW Group Research and Technology)

Within the C2C-CC Security Working Group Liaison Workshop supported by the COMeSafety project beginning of November at the MobileLifeCampus in Wolfsburg, experts from different projects have met in order to exchange information on current security issues and discuss respective solutions. The outcome of the work across the projects serves as input to standardisation bodies, such the ETSI Working

Group 5 (www.etsi.org), where a standard for the secure and privacy preserving ITS communication is being prepared. Besides the technical view, a current status from the eSafety eSecurity Working Group (www.esafetysupport.org/en/esafety_activities/esafety_working_groups/esecurity.htm) has been presented where legal and political aspects on security and privacy are covered. Specifically, the eSecurity WG discusses

data protection and privacy issues in close collaboration with the Article 29 Working Group. The experts from the workshop agree, that privacy-preserving mechanisms are a prerequisite for the deployment of Car-2-X Applications. The European funded project PRECIOSA (www.preciosa-project.org) focuses on the development of such privacy-preserving mechanisms and shows, how ITS systems can incorporate these mecha-

nisms and how privacy can be reliably enforced. In addition to privacy, mechanisms in order to enable the secure communication of application data are required for the successful deployment of ITS applications. The SeVeCom project (www.sevecom.org) has developed a security architecture, which supports the secure exchange of ITS related data while applying privacy-preserving mechanisms based on pseudonyms. While the SeVeCom project mainly covers security for the external ITS communication, the EVITA project (www.evita-project.org) focuses on aspects for

the security of vehicular on-board architecture by applying hardware security measures and dedicated security protocols. Projects like Pre-Drive-C2X (www.pre-drive-c2x.eu) and simTD (www.simtd.de) further develop and integrate these concepts in an overall ITS architecture where tests can be carried out within field-operational test environments.

The security experts work closely together across the projects in order to jointly discuss and harmonise various approaches and prepare input for standardisation bodies like the ETSI WG 5.

In addition to the exchange of information across European activities, close cooperation with other security experts, e.g. from US projects, lays the foundation for the international harmonised view on security and privacy solutions for ITS systems, which will a specific topic of the next Security Liaison Workshop.

The presentations from the C2C-CC Security WG Liaison Workshop can be found on the homepage of the CAR 2 CAR Communication Consortium (www.car-2-car.org).

Workgroup Simulation: Handbook and Liaison Workshop

by Tobias Lorenz (DLR)

For upcoming driver assistance and information systems Car-2-X Communication Technology will be the basic technology underlying. With this new technology a bundle of new challenges arise like the rapidly changing and highly complex ad-hoc networks, the heterogeneous and dynamic environment and the influence of different penetration rates.

To develop and evaluate Car-2-X Communication Systems and applications the use of already established test methods is not applicable because of the immense number of necessary prototypes and costs for these test trials. Thus simulation is an indispensable tool to tackle these challenges.

Therefore the major goal of the workgroup simulation is to set up guidelines, standards and codes of practice on how to perform simulations, evaluations and certifications. Furthermore a standardised description of Car-2-X Systems under test and test scenarios is focused. A handbook will be created to support the members of the CAR 2 CAR Communication Consortium with recommendations on how to conduct simulations. The work for this handbook already

started with the definition of the goals for the workgroup as well as for the handbook itself. A common glossary, the collection of the state of the art in the area of simulation and the description of systems under test and test scenarios is currently under elaboration. For the outlined topics the work already done in relating projects e.g. PreDrive C2X, simTD, ITS Testbeds etc. and by ETSI is taken into account.

At the workshop of the workgroup simulation at the 5th of November 2009 at the DLR in Brunswick 18 members of the CAR 2 CAR Communication Consortium took part. The new chair Klaus Jaschke (DLR) introduced the goals and approaches of the workgroup. Alexander Geraldy (Bosch) was designated as co-chair of the workgroup simulation.

The first presentation of the workshop (Tobias Lorenz, DLR) was given on the possible structure and the content of the handbook for Car-2-X Cooperative Systems simulation. Thereby each planned chapter of the handbook was presented and the intentions of these chapters were outlined. Regarding the following discussion a pri-

oritisation of the different topics according to the members needs turned out as meaningful. Secondly a presentation (Alexander Geraldy, Bosch) on the special issue of standardised description of test scenarios using a template or description language was held. Thereby the long term goal is to provide automatically generated test scenarios for the evaluation and testing of Car-2-X Systems under test. Therefore a common approach of scenario description using XML was presented and the set up of a task force to derive test scenario descriptions was discussed.

Finally ETSI CTI (Sebastian Müller) presented an approach of interoperability and conformance testing as well as the possible transfer of the ETSI knowledge to the workgroup simulation. All presentations were followed by intensive discussions and some members committed to intensify their contributions to the workgroup.
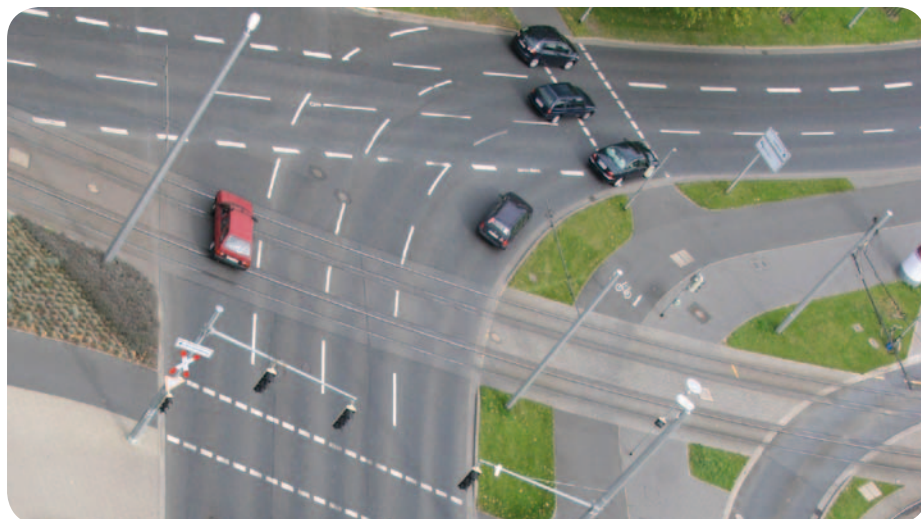
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