CAR 2 CAR -Newsletter-

Issue 2 / November 2007

Source: Daimler

In the Second Issue:

CAR 2 CAR COMMUNICATION CONSORTIUM

Editorial

Dear partners and members

The year 2007 draws to a close and we have made a tremendous progress in all aspects of our Consortium Missions. The first issue of the CAR 2 CAR Newsletter was well taken up and we will continue, in our effort to improve the quality of the issues to come. Our 1st CAR 2 CAR Forum on the 22nd and 23rd May, 2007 which took place in Ingolstadt at the AUDI Forum was very successful. More than 100 members joined the forum during 1 ½ days. I would like to say thanks to all participants and especially to our host AUDI AG. You will find a short summary of the Forum inside the newsletter. We would like to use this opportunity to inform you about the next CAR 2 CAR Forum combined with the Demonstrator, which will take place at the test track of Opel in Dudenhofen near Rüsselsheim at the end of October 2008.

In this issue we will also notify you about the latest status of the important frequency allocation task, which is pushed forward from our COMeSafety projects, it is nearly finished and it looks like we will get the requested spectrum in the 5.8/5.9 GHz band. We expect the EU decision in the Q1/2008 on this ITS Spectrum issue. More details follow in the Standardisation Workgroup article.
According to the 1st issue we will continue to give you a brief statement about the ongoing activities and progresses in our Workgroup rubric. Also we picked up information and news around the world.

As always, if you have any comments or feedback concerning the newsletter, don't hesitate to contact me via mail: mietzner@car-2-car.org. Or, if you want to see your name in lights, or at least on our website you should post your thoughts to us.

Yours faithfully,
Rudolf Mietzner
General Manager

At a Glance: 14th World Congress and Exhibition on ITS, Beijing, 9th-13th October, 2007

by Juhani Jääskeläinen

Overview – the 14th ITS World Congress

The four-day 14th World Congress and Exhibition on Intelligent Transport Systems took place in Beijing on 9th – 13th October, 2007 with the title "ITS for a Better Life". It was hosted by a number of Chinese ministries, most notably by the Ministry of Communications and the Ministry of Science and Technology. It took place at Beijing Exhibition Centre, a communist era relic converted to a modern conference and exhibition facility. The estimates on the number of delegates vary between 2000 and 4500, however the exhibition was partly opened for public so it was always very busy.

China had a strong presence in the conference and exhibition, showing its industrial prowess and emphasing its willingness to work with the rest of the world in ITS. It is evident, however, that China is facing enormous problems in meeting its exploding transport demand and problems created by it, such as an alarming increase in number of fatalities, and ITS is only one area being looked at in China. The European Commission concentrated this year on the congress only, and it was mostly the ITS organisations from Europe which had stands in the exhibition. Mrs Rosalie Zobel made a presentation at the Opening Ceremony, Minister's Plenary Session and Executive Session on Global Safety, while DG INFSO representatives were either chairs or speakers at ten Special Sessions covering a very wide range of our activities. Other important meetings and workshops during the week included 3rd International Workshop on Vehicle Communications on 13th October, and the EU-Japan bilateral meeting.

A lot of positive feedback was received on the European Commission contributions in the above-mentioned sessions, and on the sessions we organised. The Intelligent Car Initiative and its three pillars – eSafety Forum, RTD and User Awareness actions form the strong basis for the European excellence in ITS, and in many areas we are world leaders: after the London ITS Congress, most progress has been achieved in Europe.

The Beijing Exhibition Center

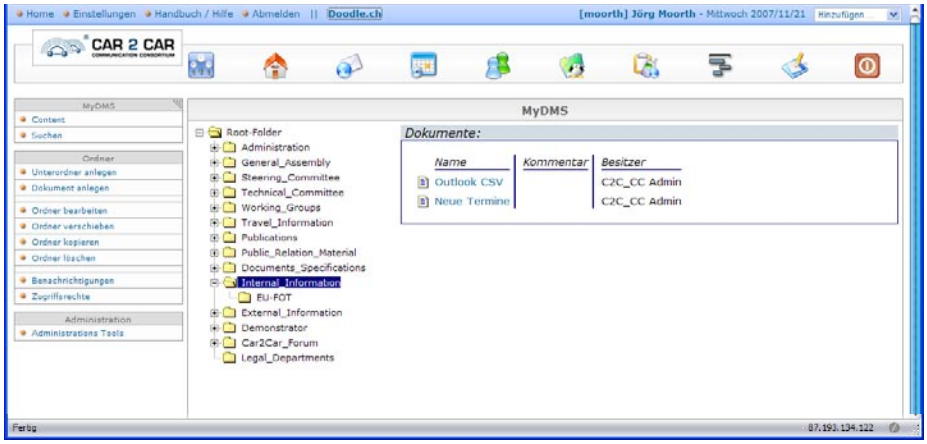
Please find the whole article in the news section of the website www.comesafety.org

Membership News: Internet collaboration area

by Gunnar Heyms

Since November 2004 the CAR 2 CAR Communication Consortium is present on the Internet via the registered domain www.car-2-car.org. In addition to the public website a password secured Membership Area is offered for all members of the consortium. Having logged in on the left hand side, the menu extends and offers additional menu items like videos, publications of the members of the CAR 2 CAR Communication Consortium or information about the annual CAR 2 CAR Forum, the semi-annual released newsletters and internal workshops. As the consortium continuously evolved during the past a revision of the public website and the membership area is planned for next year.

With their login all active members (basic members excluded), which contribute either to the Working Groups or to the Committees of the CAR 2 CAR Communication Consortium, get addition access to the Consortium Area providing the exchange of working and project related files. Today the data structure of the document section on the right hand side menu of the Consortium Area contains 19 main items with 776 files in 280 directories which takes approximately 470 MB of the server capacity. Due to the grown consortium and its increased activities the functionality of the current implementation based on a Content Management System does no longer fulfil the requirements for efficient collaboration within the consortium. As consequence a complete relaunch of the Consortium Area is currently being prepared based on an open source collaboration tool. The customised tool shall improve the workflow within the CAR 2 CAR Communication Consortium by offering better operability and extended range of functionalities than today. The functionalities of the groupware tool comprises among others:



- *Group calendar*
  Comprehensive calendar functionality, including outlook synchronisation and group scheduling.
- *Address book*
- *Task Management*
  System to manage the tasks including assignment of responsibilities, progress and notification service.
- *Document Management*
  Including folder management, version management, locking of documents and request review of documents.
- *Project planning*
  Element based project administration with deep going directory linkage to other applications. Gantt chart display of the projects included.

For the beginning of December a friendly user test by the members of the Technical Committee is planned. As soon as the implementation is released the migration of the existing data has to be executed. All active members will be informed in time before the switching to the relaunched Consortium Area will take place at the beginning of 2008.

If all works well the public website and Membership Area of www.car-to-car.org will remain unaffected. Just login as usual. According to your membership status the new features will be provided automatically.

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Workgroup Security

by Benjamin Weyl, Hans-Jörg Vögel

A Reference Model for developing CAR 2 CAR Communication Consortium standards

The draft reference architecture of the CAR 2 CAR Communication System [1] comprises three distinct domains, the in-vehicle, ad hoc, and infrastructure domain. The reference architecture can be mapped to an abstract reference model as shown in Figure 1, clearly identifying reference entities and reference points.

- Ad hoc communication among vehicles is represented by reference point **I1**, the communication to road-side units by reference point **I2**.
- Access to dedicated C2C Service infrastructure happens via reference point **I3**, whereas in particular commercial services can be accessed via **I4**. When the same C2C Service infrastructure is accessed via an RSU this happens by reference point **I7**
- Services of the C2C Operation Support System (C2C OSS) are available at reference point **I5**, The C2C OSS comprises all functionality, systems and services related to operation of the C2C System, such as authentication, authorisation, certificate management, registry databases, service provisioning and general systems management. Whenever a vehicle also uses commercial telecommunication access networks the respective service provisioning infrastructure may be accessed via reference points **I6**, and **I13**. Similarly operational management happens at reference point **I8** and **I9**
- Both C2C OSS and Telco SPP may need to interoperate and provide respective interfaces at reference point **I11**. Similarly, **I10**, **I12** and **I14** are further reference points for discussing interworking of backend components.

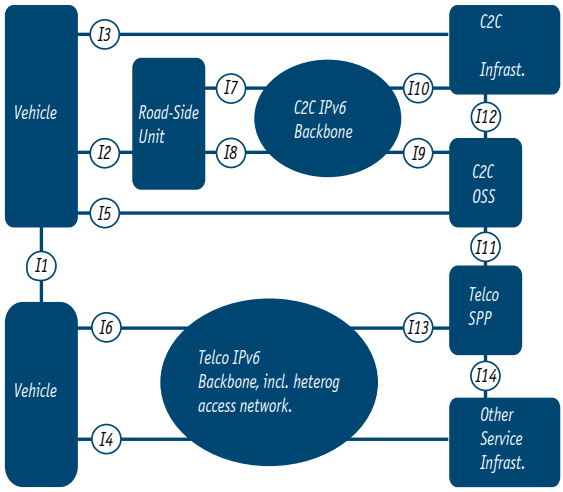

Figure 1: Draft reference model

Based on this reference model, the relations and interfaces among the subsystems and stakeholders are in discussion within the consortium.

Based on the reference model (cf. Figure 1) logical interfaces for the reference points are to be specified. Note that there may be multiple logical/technical interfaces per reference point.

The logical interfaces described hereafter focus on the communication sublayers. The core component of the vehicle is the OBU, which hosts the C2C Communication Software and hardware and may host or be connected to in-vehicle application units (AUs).

At reference point **I1** communication interfaces will most probably be based on IEEE 802.11p wireless technology adapted to European conditions (802.11p*). This interface supports all anticipated communication procedures.

At reference points **I2** to **I6** communication interfaces will most probably be based on IEEE 802.11 a/b/g/n radio technology.

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Workgroup Application

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by Cornelius Menig, Andreas Hiller, Matthias Röckl

The main issues of the Workgroup Application are the standardisation of the application layer and the description of use cases and deriving technical and non-technical requirements from this. At the moment two aspects are in focus. On the one hand standardising the cooperative awareness message on the other hand the preparation of an Application Document, both are to be delivered to national and European projects.

Cooperative Awareness

Cooperative Awareness use cases base on the information about the presence, basic attributes, and status information of other communicating nodes close by. All nodes shall provide a com-

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Workgroup Architecture

by Konrad Roßrucker

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Flash Report on progress of the Architecture Workgroup

On 24th-25th of September an Architecture Workshop – organised and moderated by COMeSafety - aiming at interoperability among the research projects CVIS, COOPERS and Safespot took place at the BMW Research & Technology site in Munich. The workshop refined and continued the ongoing activities towards a common European communication architecture for cooperative safety applications. As a major task, the communication requirements (already collected by the projects) are mapped to the ITS Framework Architecture. ITS Frame provides a proven methodology and a set of communication requirements identified in current or completed projects dealing with communication in ITS related applications. This mapping process strongly supports a seamless

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Workgroup Physical Layer / Mac / Net

by Andreas Festag

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The work on frequency allocation has significantly progressed in the last months and the availability of 30~MHz spectrum for road safety across Europe is a big step towards deployment. At the same time it raises technical questions about partitioning the available spectrum: From the networking perspective, a single channel would clearly be an appealing solution due to effectiveness and simplicity for the networking protocol. Unfortunately, the solution can be ruled out since a radio operating on a single 30 MHz channel would require a complete radio redesign. The demand to utilise the spectrum efficiently inhibits to leave bandwidth unused. This inevitably leads to a C2C-C system design with multiple wireless channels.

The U.S. have allocated 75 MHz for ITS since 1999 and divided it in 7 channels of 10 MHz bandwidth each. Accord-

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Workgroup Standardisation

by Dieter Seeberger & Søren Hess

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Latest news on spectrum for ITS in the 5.9 GHz band in Europe

Introduction

Intelligent Transport Systems (ITS) are under development in Europe and world wide.

In Europe safety related ITS supports the European Union eSafety initiative with the goals to reduce road fatalities and improve the efficiency of road traffic.

European industry in ETSI has presented requirements for European wide harmonisation of spectrum to CEPT and European telecommunication administrations for deployment of ITS within the 5.9 GHz band. Harmonisation is needed in order to enable free movement and seamless border crossing of ITS all over Europe.

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Summary: PReVENT Paris Versaille

by Rudolf Mietzner

The IP PReVENT in Action was a big success!

On 18th to 20th of September, 2007 the IP PReVENT (PReVENTive and Active Safety Applications) exhibition was held in Versailles. It took place at the Versailles MOV'EO Test Truck facility. This time the IP PReVENT exhibition also hosted the i2010 Intelligent Car Event 2007 and the 8th safety Forum Plenary Meeting.

The PReVENT Integrated Project is devoted to introducing new technologies in order to improve traffic safety by reducing road accidents. Since four years this project on preventive and active safety systems has positioned itself as the European and indeed international reference platform for research in this field.

A 30M€ Community funding by the Directorate General for the Information Society and Media, demonstrates the importance of the largest European automotive industry research project, co- founded by the European Commission.

Important Guests/ Participants

The exhibition was supported and visited by political associations, many representatives of the press and multi class experts and hosted including Commissioner Mrs. Viviane Reding.

Important Participants

- *Portuguese Minister for Public Works, Transport and Communications, Mr Mário Lino Soares Correia;*
- *French Minister for Higher Education and Research, Mme Valerie Pécresse;*
- *Mr Etienne Pinte, Member of the French National Assembly and Mayor of Versailles;*
- *Senior executives from industry were also present on the podium, Professor Bharat Balasubramanian, Vice President of Group Research and Advanced Engineering at Daimler-Chrysler;*
- *Dr Rémi Kaiser, Chief Executive Officer of Delphi France;*
- *Mr David Ward, Director General of FIA Foundation.*
- *Audience of key representatives from interested organisations across Europe, as well as a host of international delegates from the United States, Japan, South Korea, and China.*
- *Chairman Mr Fabio Colasanti, Director General for Information Society and Media.*

Highlights

More than 25 PReVENT cars and trucks which demonstrated the most advanced safety applications developed throughout the 4 year Integrated Project, were displayed at this four day exhibition.

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Summary: CAR 2 CAR Forum 2007

by Karl-Oskar Proskawetz

During the 1st CAR 2 CAR Forum more than a hundred active and basic members of the CAR 2 CAR Communication Consortium as well as invited experts and speakers from all over Europe outlined the state of the art and next activities planned in the field of CAR 2 CAR and CAR 2 Infrastructure Communication and its applications towards more safe and more efficient cooperative traffic in future.

For the first time the European CAR 2 CAR Communication Consortium organised the CAR 2 CAR Forum as annual meeting of all members at the prestigious Audi Forum, Ingolstadt on 22nd and 23rd May, 2007. The 1st CAR 2 CAR Forum succeeded in bringing together the experts and decision makers of the CAR 2 CAR Communication Consortium for discussion of the work status reached so far and the planned activities to overcome the identified challenges. Furthermore coffee breaks, lunch and an evening reception offered the opportunity for networking as well as deepened technical and private conversations between all participants.

The CAR 2 CAR Forum comprised two plenary sessions focused on international and European activities and initiatives. During the following workshops organised by the working groups more technical details of Applications and Business Opportunities, PHY / MAC and NET layers, Security and Architecture have been presented and discussed. The allocation of the requested frequency spectrum seems feasible until 2008. A first description of applications and use-cases will be released during the oncoming year. Business models and deployment strategies as well as questions related to legislative and insurance still have to be addressed more detailed in future. Harmonisation of the various R&D solutions towards a common architecture pointed out as a very important and challenging task with interdependencies to all working groups. So far the security aspects are in a research phase and have to be transferred into the pre-development phase. For the 1st CAR 2 CAR Forum the Manifesto was published. The Manifesto proved as a good starting point for jointly addressing the identified gaps and challenges to be addressed by all working groups in future.

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Project Environment News

The Project NOW: Network on Wheels

Started in 2004 by Daimler AG, BMW AG, Volkswagen AG, Fraunhofer Institute for Open Communication Systems, NEC Deutschland GmbH and Siemens AG and supported by Federal Ministry of Education and Research
www.network-on-wheels.de

New ETSI Technical Committee

The European Telecommunications Standards Institute (ETSI) created a Technical Committee for Intelligent Transport Systems (TC ITS). This step was necessary to cope with the increasing importance of ITS and ETSI's responsibility as the leading European Standardisation Organisation for information and communications technologies. The scope of the TC ITS covers all aspects of communication systems required for ITS service provision including application requirements, radio access technologies, cross layer issues as well as security and legal intercept aspects. This involves both wireless communications with and between vehicles, and backbone system telecommunications.

The first meeting of the TC ITS which will take place at the ETSI premises in Sophia Antipolis 11th-12th December, 2007. Further information is available at: http://portal.etsi.org.

Smartway 2007 Demo

The Demo took place from 15th-17th October, 2007 at the International Forum Tokyo. Please find more information on: www.its.go.jp/ITS/topindex/topindex_sw2007.html

Related Project Information:
Global System for Telematics

by Hans-Jörg Vögel

The project GST- Global System for Telematics, a large Integrated Project of the 6th EC research framework programme, just completed in March this year.
GST was organised in subprojects and test sites: subprojects developing and implementing technology components, and test sites adapting, integrating and complementing them in actual live deployments at 7 major locations throughout Europe.
GST was part of the EUCAR eSafety range of projects and e.g. at the GST Munich Test Site collaborated closely with PReVENT, e.g. by integrating into a joint prototype demonstrator vehicle. It is looking at both, safety- and non-safety-related telematics applications and portions of the service delivery infrastructure required to deploy and operate those services. Among others, a major focus in GST was to implement, and validate a telematics approach based on open protocols, such as OMA DM and Web Services, and including end-to-end security and identity management to elaborate trustworthy personalisation. On top of this, innovative safety telematics including, but not limited to emergency response such as eCall, TPEG broadcasting, and Vehicle 2 Vehicle Communciation, have been conceptualized and implemented.
GST integrated and successfully validated and demonstrated basic enabling and supporting infrastructure that in the future may be relevant for the operation of any cooperative, communication-based system such as developed in the C2C-CC. This includes:

- Focus on protocol-based openness, including specification of an innovative telematics protocol stack (Web Services / SOAP) for telematics applications.
- Fielding vital parts of an open service provisioning framework (OMA DM, SAML).
- Highlighting benefits of an open, federated approach in setting up and operating a telematics infrastructure (SAML).

Based on this, an integrated approach has been created and succcessfully demonstrated for operating safety- and non-safety-related communication-based telematics applications. Selected integration aspects, such as integrating WILLWARN V2V warnings with broadcast TPEG warnings have been highlighted. See also: www.gstforum.org

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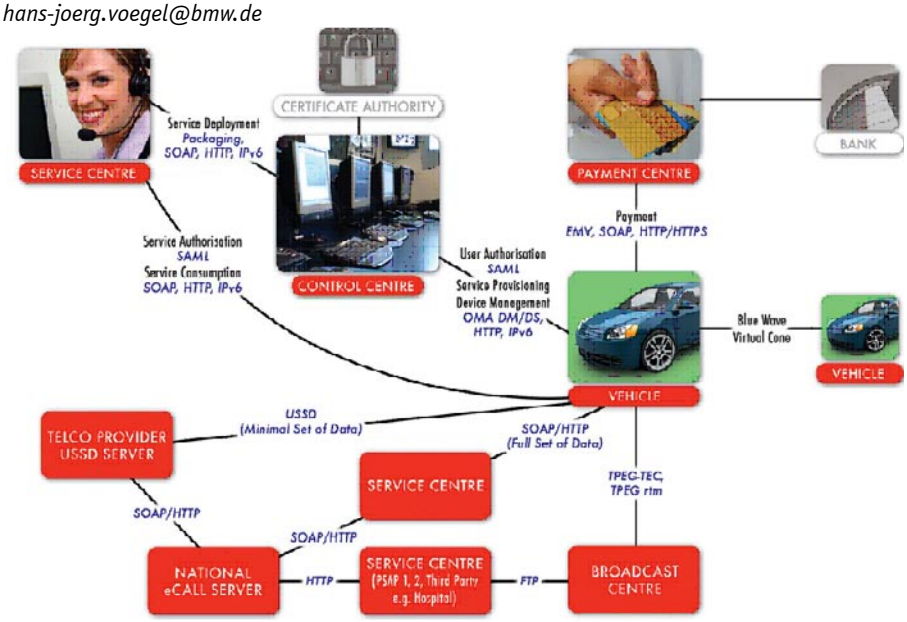

Interesting Links and Events

CAR 2 CAR Forum and Demonstrator
the second event of the annually forum for all active and basic members to provide and discuss the latest consortium news as well as the Demonstrator 2008.
20th-24th October, 2008, Opel Test Track, Dudenhofen, Germany
www.car-2-car.org

European Congress and Exhibition on ITS
The 7th event will be held at the Palexpo Convention Centre.
4th-6th June, 2008, Geneva, Switzerland
www.itsineurope.com

World Congress on ITS
The 15th World Congress will be held at the Jacob K. Javits Convention Center. 16th-20th November, 2008. Online paper submission will open on 1st November, 2007.
New York City, America
http://www.itsa.org/worldcongress/c341/ITSA_Events/2008_World_Congress.html

i2010 Intelligent Car Initiative
Less polluting, safer, and smarter thanks to digitial technologies - to be found in the car of tomorrow
http://ec.europa.eu/information_society/activities/intelligentcar/index_en.htm

NEC CAR 2 X Communication SDK
NEC makes its "Car2X Communication SDK" with open API available for the research community. The SDK is a software toolkit that enables the use of NEC's protocol stack for CAR 2 CAR and CAR 2 Infrastructure communication based on wireless short-range technology. The open API enables software developers to easily write applications for road safety, traffic information and infotainment.
Additional information: http://c2x-sdk.neclab.eu
Contact: c2x-sdk@neclab.eu

Imprint

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Workgroup Security

by Benjamin Weyl, Hans-Jörg Vögel

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Privacy-Preserving Trustworthy C2X-Messages

External communication interfaces, fixed and wireless, increasingly become an integral part of automotive on-board architectures. This development is not the least driven by future safety application scenarios. eSafety applications based on Car-to-X communication have been identified as a measure for decreasing the number of fatal traffic accidents. Examples for such eSafety applications are local danger warnings, traffic light pre-emption, or traffic information via road-side units. While these functionalities inspire a new era of safety in transportation, new security requirements need to be considered in order to prevent attacks on these systems. Attacks can be manifold: illegally forced malfunctioning of safety critical in-vehicular components as well as the illegal influence of traffic provoked by means of fake messages are just tow likely possibilities. Attacks must be prevented or at least detected and contained, so that privacy of the communicating entities is preserved and fake messages injected into the (wireless) communication infrastructure are properly identified and eliminated before influencing eSafety applications.

Digital signatures are a convenient way to provide message integrity and authentication. In particular, the authentication is guaranteed by the employment of digital certificates used to bind a certain public key to the identity, and other information of a person, entity or an organization.
Within the C2C-CC Security WG various approaches based on digital signatures have been discussed, outweighing the advantages and drawbacks with respect to the security and privacy requirements, as well as scalability and performance constraints.
The use of long-lived pseudonym certificates fails to meet privacy requirements, since it makes vehicle and profile tracking possible, and node exclusion is not possible without the intervention of complex certificate revocation lists (CRL).
The lacks of the previous approach could be fixed by using a pseudonymous certificates pool, but, it is desirable that a node does not own multiple simultaneously valid pseudonyms in order to avoid the Sybil attack. Moreover, the revocation of such pseudonym pool does not scale with a large number of nodes.
Providing vehicles with a short-lived pseudonymous certificate, instead of several ones, solves the problem of the Sybil attack while keeping the benefits of the certificates pool approach.
Group signatures meet the privacy and scalability requirements, however, since rekeying mechanisms and computational effort are yet too high, this mechanism is currently not applicable.
Thus, the C2C-CC Security WG has chosen to advocate the use of short-lived pseudonymous certificates for enabling the secure exchange of vehicular messages while preserving the vehicle's privacy. Currently, the C2C-CC Security WG is discussing and specifying the appliance of this approach based on the C2C-CC reference model.

C2C-CC Security WG Discussion Areas

Besides this technical work, security within C2C-CC considers various further discussion areas (cf. Figure 2):

- The goal of the security mechanisms is to ensure acceptance and credibility of the system by the end user, who trusts the system.
- Current standards are to be considered and properly applied to the system design. Where necessary, standards need to be extended or new ones created.
- In addition to pure ad hoc communication, the integration of communication infrastructures and telecommunication platforms into the overall system architecture are to be properly set.
- Thereby, the discussions are driven by commercial requirements conveying business models and operational concepts, partnerships and regulations.
- Legislation aspects need to address privacy, law enforcement and liability questions.

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References:

[1] CAR 2 CAR Communication Consortium Manifesto – Overview of the C2C-CC System
[2] B. Weyl: C2C-CC Baseline Concepts. Car 2 Car Forum, Ingolstadt, 2007.

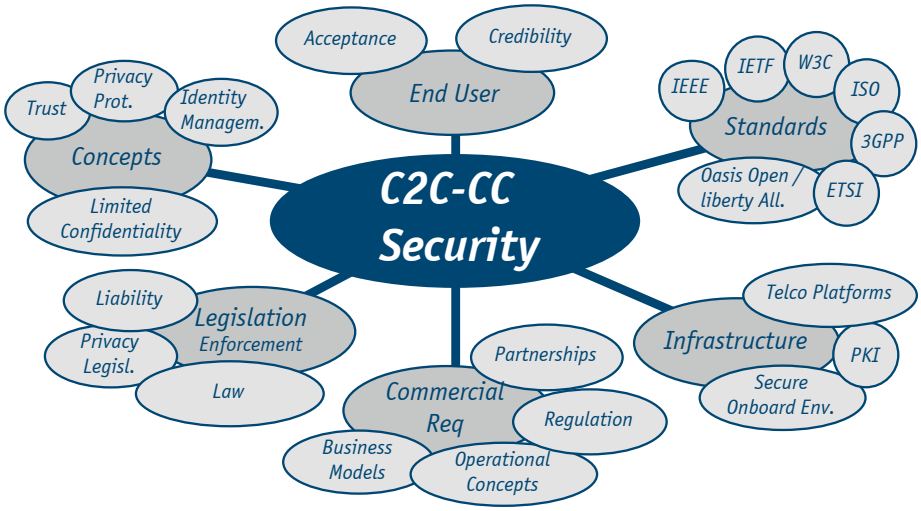

Figure 2: Scope of the Workgroup Security work agenda

Workgroup Application

by Cornelius Menig, Andreas Hiller, Matthias Röckl

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mon set of data including position and identifier. Cooperative Awareness messages are different for different types of communicating nodes, e.g. general vehicles, intelligent traffic signs. The Cooperative Awareness Vehicle Message is a standard message generated periodically by all vehicles that do not generate a more specific, standardised message.

Received Cooperative Awareness information provides an overview about all communicating objects in the communication range, their movement and basic attributes. Vehicles have a general, use case-independent functionality providing this data and collecting the received Cooperative Awareness data, i.e., preparing a neighbour table.
Broadcasting Cooperative Awareness Vehicle Messages is a mandatory basic functionality. Therefore the content must be available at all communicating vehicles with reasonable effort. This data have to be available even at field trials during the next years in order to set up depending use cases.

This information might be used to take non safety critical actions, e.g., Cooperative Glare Reduction, to provide warning information that does not need high precise position data, e.g., Approaching Emergency Vehicle Warning, to adapt system behaviour in a general safe manner, e.g., Cooperative Adaptive Cruise Control, or to trigger further use case specific communication.

Application Document

The Application Document consists of three parts. A general document gives an overview over scenarios, views, applications and short descriptions of use cases, while roles and use cases are described in detail in separate individual documents. Parts of the general documents had already been integrated into the first release of the Manifesto.

The intention is to deliver the Application Document to interested projects, which are invited to specify use cases using the use cases and roles template.
The Cooperative Awareness Message Set as well as the Application Document will be released in the first half of 2008.

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Workgroup Architecture

by Konrad Roßrucker

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integration of requirements and provides a solid base for the development of functional-, physical and communication views of future cooperative systems. This consolidation of requirements among selected IPs is expected to be completed end of November 2007 and a first "common architecture picture" will be available.

In parallel, the frame structure (i.e. the "heartbeat", "data" and "service announcement" part) of a "European" Wave Short Message Protocol (WSMP) is under investigation within the participating projects. This "European" WSMP is intended to be used for common demonstration purposes in Stockholm 2009 and the above mentioned projects agreed to investigate common use cases like "service download", "slippery road notification" and "speed limit information".

The final objective of these investigations is a standardised WSMP - in liaison with other projects (e.g. SeVeCom to address security) and within the scope of related European standardisation bodies. Especially for the Architecture Workgroup of the C2C Communication Consortium this joint work of selected projects constitutes invaluable input to elaborate architectural building blocks. Open standards are extremely important for the deployment of safety applications and the worldwide efforts towards standardisation are growing fast on IEEE 802.11p and 1609 as well as CALM. This fact was also unanimously agreed among experts participating in the 3rd International Workshop on Vehicle Communications in Beijing (Oct. 2007). Hence a joint workshop of CALM and C2C Communication Consortium to identify and evaluate further harmonisation topics took place in Vienna (24th – 25th of Oct.).

Contact

For more detailed information please contact the new leader of the Working Group Architecture

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Markus Straßberger recently took over the responsibility for the Architecture Workgroup from Dr. Timo Kosch who is also in charge of the Specific Support Action COMeSafety.

Workgroup Physical Layer / Mac / Net

by Andreas Festag

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ingly, the IEEE 1609 standard defines a channel scheme with service announcements for channel switching, where a transceiver shifts from a control channel to a service channel to send and receive data. Channel switching is a critical function as it must also ensure that an important safety message can always be transmitted within a certain time interval and received by all vehicles in the vicinity. Considering the fact that the European 30 MHz bandwidth will most likely be split up in multiple channels, an announcement scheme for (e.g. just two) channels seems inappropriate.
In the work group NET, channel allocation, partitioning and utilisation have stimulated a technically in-depth and controversial discussion. Currently a two-transceiver solution is favoured, but interference analyses and measurements have revealed that it is practically unfeasible to transmit and receive on two adjacent channels simultaneously. Nevertheless, a two-transceiver solution is still regarded as beneficial as it alleviates impairments by hidden node scenarios. A conclusion of the 'channelisation' question will become the fundament for the C2C-CC network protocol and consolidate the congestion control framework as another cornerstone, which recently made great progress.

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Workgroup Standardisation

by Dieter Seeberger & Søren Hess

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ITS for road safety has a strong political importance in Europe and the European Commission has requested technical information about the spectrum requirements and compatibility issues with the aim to issue a European Commission Decision providing mandatory implementation and availability of spectrum for safety critical ITS applications within EU member states (27 European countries but in practise most European countries).

Frequency requirements and technical justification

The frequency band 5875-5925 MHz has been requested for deployment of safety related ITS applications in Europe and the frequency band 5855-5875 MHz for non-safety related ITS.

The safety related spectrum requires low latency communication and therefore needs a predictable sharing situation and protection against interference from other services. The non-safety applications can be operated on a non-protected/ non-interference basis.

The CEPT has studied the background for the spectrum requirements based on realistic traffic scenarios and confirmed that between 30-50 MHz would be needed for safety related ITS applications in the 5.9 GHz band.

Compatibility studies

Extensive compatibility studies performed within the CEPT concludes that within the frequency band 5875-5905 MHz, ITS applications will not suffer from excessive interference resulting from other services/systems and ITS in this band is compatible with all other services providing that the unwanted emission levels are

- less than -55 dBm/MHz below 5850 MHz in order to protect the Radiolocation Services;
- less than -65 dBm/MHz below 5815 MHz in order to protect the RTTT applications;
- less than -65 dBm/MHz above 5925 MHz in order to protect the Fixed Service.

With this conclusion ITS can achieve a predictable sharing situation with existing radio services as well as protection against interference from possible new systems and applications of the Fixed and Mobile Service within the band 5875-5905 MHz. ITS can, however, not claim protection from FSS earth stations but the usage of those stations are very limited.

The use of the frequency band 5905-5925 MHz for ITS may suffer interference from the Fixed Service above 5925 MHz and will be subject to the same restrictions regarding unwanted emissions as for the band 5875-5905 MHz.

The frequency band 5855-5875 MHz intended for non-safety applications is also subject to the same restrictions as for the band 5875-5925 MHz, but in line with the requirements without protection.

Regulation provided by the CEPT

Within the CEPT ECC Decisions are used for frequency allocation matters of significant harmonisation. Implementation of ECC Decisions is formally on a voluntary basis where administrations commit themselves to the implementation and update the national regulation accordingly. ECC Recommendations guides administrations to a certain use of spectrum and are less binding without commitment.

For ITS an **ECC Decision** has been developed and adopted by the WG FM for public consultation.
The Decision harmonise the band 5875-5925 MHz for ITS road safety applications in a two step approach where the sub band 5875-5905 MHz is designated to ITS on a European basis immediately and the subband 5905-5925 MHz considered for future extension within the CEPT review process. The frequency band extension will be based on evidence of future market needs. It is agreed that a review process should allow sufficient time for development and initial deployment of ITS systems in Europe.

It is agreed that both in-vehicle and roadside units will be subject to free circulation and use all over CEPT. On-board units will be exempted from individual licensing and even if authorisation of roadside units is technically not necessary it may be considered by administrations.

The ECC Decision is expected to be finally adopted by December 2007 or at the March meeting 2008 of the ECC. It is expected that all CEPT administrations including countries outside the European Union like the Russian Federation will implement the Decision.

An **ECC Recommendation** suggests that CEPT administrations make the frequency sub band 5855-5875 MHz available for non-safety ITS applications on a non-protected/non-interference basis.

Regulation envisaged from the European Commission

Based on a report from CEPT the European Commission is expected to issue a Commission Decision on spectrum and regulatory issues for safety related ITS in the 5.9 GHz band. Implementation of such a decision will be mandatory for EU member states and will ensure legally harmonised spectrum for ITS in Europe.

The CEPT Report to the Commission includes background explanation for the spectrum requirement, spectrum justification, details of the compatibility studies and the level of protection to be afforded to ITS in the 5.9 GHz band.

The CEPT has also developed an Impact Assessment with cost benefit analyses on ITS concluding that the benefits of ITS in terms of improving road safety will exceed the opportunity costs of allocating spectrum for ITS on a fully protected basis as soon as the ITS generates a road safety improvement in excess of 1%. The report also concludes that ITS is based on the principle of free movement and seamless border crossing all over Europe which supports a strong requirement for European harmonised spectrum.

The CEPT Report recommends European harmonisation of spectrum for ITS including the two step approach with an immediate frequency designation of 30 MHz and another 20 MHz at a later stage based on evidence of future market needs. A European Commission decision on ITS in the 5.9 GHz band is expected to support the European Union eSafety initiative.

Timescales for availability of spectrum

Adoption of the voluntary CEPT decision is expected by the end of 2007/beginning 2008 with implementation during 2008. The mandatory EC Decision will probably be adopted during spring 2008 with binding implementation by end 2008.

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[1] European Telecommunications Standards Institute
[2] ETSI TR 102 492-1/2
[3] European Conference of Postal and Telecommunications Administrations

Summary: Prevent Paris Versaille by Rudolf Mietzner

Sequel of page 4:

The following applications where shown at the exhibition:

- Safe speed and safe following
- Lateral support
- Intersection safety
- Vulnerable Road Users & Collision mitigation
- Cross-Functional Activities

All PReVENT subprojects were shown in a large exhibition village. This exhibition offered the perfect opportunity to meet the masterminds behind the PReVENT fabrications.

Personalities like the Chairman Mr. Colasanti and Commissioner Viviane Reding welcomed the invited guest to the Opening Day, 18th of September. The Opening Ceremony was framed by

speeches from top-class experts among others Mr. Bharat Balasubramanian (Vice President, Group Research & Advanced Engineering, Daimler AG) and Max Mosley (President FIA safety Aware! Communication platform).

Mr. Matthias Schulze, the coordinator of IP PReVENT from Daimler AG, opened the first Expert Day on the 19th of September.

The Expert Days gave an opportunity to experience the next steps in the advancement of active & preventive safety applications.

On the first public day the PReVENT partners brought their experimental vehicles to the public. The exhibition provided a variety of astonishing demonstrations of future security within road traffic.

While the vehicles are running on the test tracks, a large exhibition village gathered all PReVENT subprojects in one single showcase and provide the perfect opportunity to meet the masterminds behind the PReVENT findings.

Schedule

18th September 2007
Opening Day

Only accessible for invited guests, the opening day kicked – off to mark the i2010 Intelligent Car Event 2007 and to open the IP exhibition.

Mr Fabio Colasanti, who is Director-General, of the Information Society and Media DG, at the European Commission, Mrs Viviane Reding, the European Commissioner for Information Society and Media as well as the Vice President, from DaimlerChrysler, Dr Bharat Balasubramanian and Dr Rémi Kaiser, President of DELPHI in France were present at the opening day and held the conference and test tracks with an opening ceremony, a demonstration of the vehicles and a press conference.

This was followed by the 8th eSafety Forum Plenary Meeting. Demonstrations on the test tracks continue for executive participants and the press.

19th–20th September 2007
Expert Days

The 19th and 20th was open to all professionals involved in active and preventive safety applications.

The Expert Days gave an opportunity to experience the next steps in the advancement of active safety applications with over 25 experimental vehicles out of PReVENT's European research.

An outdoor exhibition village offered insight into IP PReVENT's findings with demonstration platforms, PC simulations and videos. This was a truly unique opportunity to get a complete overview of the PReVENT project in both an entertaining and straightforward way.

The Expert Days gave an opportunity to experience the next steps in the advancement of active & preventive safety applications. The PReVENT technical achievements were presented in a thematic conference with technical presentations and discussion panels involving the most active experts in the field.

22nd September 2007
Public Day

The PReVENT days were rounded off by experts and vehicles which ended the event in style at a demo rally just outside the famous walls of the Palace of Versailles. Open to all, the Public Day offered a chance for anyone who has ever had any questions regarding active safety to field them to the experts.

Conclusions

In summation the EC-supported Integrated Project PReVENT, in Versailles, France was a big success, as a large exhibition of technologies for safer road traffic. The event received strong political support as the list of Guests above indicates.

A large number of representatives of the press turned up as well to experience the demonstrations which included simulators and various vehicles.

With a wide range and variety of applications that help drivers to watch their speed and lane departure, all the way to those that brake to help to mitigate the damage in case of an unavoidable collision, the PReVENT in Action! Exhibition delivered what it promised - an amazing array of demonstrations of what's to come in future road safety.

The 22nd September was the final day and open to the public, the PReVENT partners brought their experimental vehicles to the public. Prototype cars were showcased in front of the magnificent Versailles palace - effectively opening research directly to the masses. This symbolic gesture fostered hands-on awareness of the upcoming technology and car of the future.

You will find more information on www.prevent-ip.org/

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