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CS-Colloquium

The Opportunistically Fully-Networked Car: Electric Vehicles in Smart Grids

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Wann? 30. Oktober 2013, 15:00 Uhr

Wo? Hörsaal 3
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Abstract

The car industry is currently evolving in a way to provide both smarter and safer cars. Nowadays, embedded electronics provide users with a safer and more enjoyable travelling experience than ever before. In the context of this evolution, the connection of vehicles to the Internet serves as a key step which opens the way to an infinite number of enhancements. Corresponding services related to Intelligent Transportation Systems (ITS) basically can be categorized into safety related and infotainment related services, some of which use Internet-based communications while others rely on car-to-car communications, mainly to provide safety related services. In this talk we will discuss how vehicles can take advantages from wireless communication technology diversity using IPv6 mobility protocols and standards to provide on-board applications with a full continuous IPv6 connectivity. As an immediate consequence, the flexibility offered by the Internet is able to simplify the development of various services (from security to infotainment). Moreover, the ITS communication architecture designed at ISO and ETSI is described, with a specific focus on the support of multiple heterogeneous communication interfaces.

After a brief review of the work done in standardization bodies and in the academic world, the second part of the talk will demonstrate how such communication capabilities and architecture can be used to enable interaction between electric vehicles, buildings, and smart grids. We will conclude with sharing some insights of what a "full-featured" heterogeneous networks and mobility management framework for ITS could/should be. Finally, a few promising future research directions will be sketched, which are related to the way the IP-based architecture may integrate other communication paradigms (DTN, Geo-routing) in order to meet safety-related application requirements or to alleviate constraints (performance, bandwidth, ...) for the future on-road communication infrastructure.



Bio

Professor Jean-Marie Bonnin got his PhD degree in Computer Science at the University of Strasbourg, France, in 1998. He has been with Télécom Bretagne since 2001, where he is currently heading the “Networks, Security and Multimedia” (RSM) department. He is member of IRISA Lab where he leads the Networks, Telecommunications and Services department.

His main research interests lie in the convergence between IP networks and mobile telephony networks, and especially in heterogeneous handover issues. Recently, he has been involved in projects dealing with network mobility and its application to ITS (Intelligent Transportation Systems) and more recently on the interaction between vehicles and smart grids. Moreover, he is involved in several collaborative research projects at the French and European levels and through international academic collaborations (mainly with Asia and North Africa).

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