News

New Research Staff
At the beginning of April, Andreas Kuntz joined the Telematics research team. As a member of the Research Training Group GRK 1194 “Self-organizing Sensor-Actuator Networks”, his main research emphasis will be in the field of content based addressing and forwarding, accuracy, robustness and privacy. He wrote his diploma thesis at the Institute of Biomedical Engineering about “ScatterNet-Routing (SNR) Multihop Communication for Medical Bluetooth Ad Hoc Networks”.
03.04.2006 Andreas Kuntz akuntz@tm.uka.de

Marcus Schöller earns PhD
Today Marcus Schöller (Fig. 1) earned his PhD with his work about security and robustness of programmable networks. Second Examiner was Mr. Prof. Dr. Uwe Brinkschulte. Afterwards Mr. Schöller invited colleagues and friends to a party with Buffet at the computer center. Mr. Schöller leaves the Institute early in June to begin as a research assistant at the University of Lancaster under the guidance of Prof. David Hutchison. We wish him a good start!
04.05.2006 Mark Doll doll@tm.uka.de

Award for best diploma thesis
The group “Communication and Distributed Systems” of GI/ITG awarded a prize to Thomas Gamer for its diploma thesis. The thesis describes a system for anomaly-based detection of DDoS attacks and worm propagations in backbone networks. The official award ceremony takes place during the KiVS conference 2007.
10.05.2006 Thomas Gamer gamer@tm.uka.de

Official opening of the Graduate School
On May, 19th the Graduate School “Self-Organizing Sensor-Actuator-Systems” was officially launched. After introducing the research fellows (Fig. 2) and their research focus, three internationally renowned guest speaker gave an overview of the state of the art in sensor-actuator-systems. In the subsequent poster session the graduate school was presented in detail.
19.05.2006 Andreas Kuntz akuntz@tm.uka.de

University in the City Hall
In the “Year of the science 2006” the faculty of computer science of the University of Karlsruhe presented itself to the public with the motto “Human Centered Computing”. Firstly, Prof. Zitterbart, dean of the faculty, gave an overview of the computer science. Afterwards representatives from different institutes showed, how information technology can help in everyday life: vehicles, communicating with each other to avoid accidents, secure trip planning or robots suppor-
Daniel Kraft earns PhD

After Daniel Kraft, the last PhD candidate of Prof. em. Gerhard Krüger, yesterday earned his doctoral degree (Fig. 4) with his research about security in ad-hoc networks (second examiner was Prof. Roland Volkmar), he today celebrated his PhD with friends and old and new colleagues of Prof. Krüger’s successor Prof. Martina Zitterbart.
Peter Baumung baumung@tm.uka.de

Network Operations & Management Symposium
Uwe Walter attended the 10th IEEE/IFIP Network Operations & Management Symposium (NOMS 2006), where he presented a concept for the flexible configuration of the strategy used in a central network management node for modern data networks. This Network Control Server aids in the efficient operation of such a Next Generation Network (NGN) by optimizing several network parameters.

http://www.noms2006.org/

08.04.2006 Uwe Walter walter@tm.uka.de

Demo during the MDM 2006
From the 10th to the 13th of May, the demonstrator “P2P-Based Semantic Service Management in Mobile Ad-hoc Networks” was shown during the international conference on Mobile Data Management (MDM) 2006. The demonstrator was jointly developed within the DFG SPP1140 by projects from Jena, Aachen and Karlsruhe. It unifies different aspects, such as semantic service description, service management and Peer-to-Peer-based query dissemination, within a fully functional software package.

http://hmsp.infb-uni-jena.de/diane/
http://www.i4.informatik.rwth-aachen.de/ahsm/ http://www.tm.uka.de/itm/projects.php?id=1

12.05.2006 Peter Baumung baumung@tm.uka.de

Attending the IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks
Christian Vogt attended the IEEE International Symposium on a World of Wireless, Mobile and Multimedia Networks (WoWMoM), which took place from June 26 through 29 in Niagara Falls, NY, USA. Christian Vogt presented analyzes and optimizations for handoff management in IPv6. This work attends to all handoff-related activities at IP layer, including router and neighbor discovery, address configuration, mechanisms to detect changes in IP connectivity, and Mobile IPv6 signaling. The evaluations are based on today’s IETF standards, proposals currently in the standardization process, as well as own optimization proposals for Mobile IPv6.


28.06.2006 Christian Vogt chvogt@tm.uka.de

Presentation during the IWWAN 2006
On the 30th of June Peter Baumung presented his work on configurable application-layer multicast services during the International Workshop on Wireless Ad-hoc and Sensor Networks (IWWAN) 2006, held in New York (USA). The presented software architecture allows the flexible composition of multicast-services through combination of different protocol components, as well as their evaluation within network simulation software or real-world testbed environments.

http://maam.pcb-net.org/

30.06.2006 Peter Baumung baumung@tm.uka.de

Guests & Visits

SESAM project evaluation meeting
The evaluation meeting was opened by three invited talks on chances and challenges of a distributed energy supply infrastructure held by Mr. Frey (EnBW AG), Mr Scharper (SAP AG) and Mr. Dr. Block (Chamber of Agriculture NRW). The presentation of research results convinced the evaluation board and project founders by its complete and inter-facultive integrated analysis and solutions. Our demonstrator Faller-Town visualised the already achieved results but also the outstanding tasks and challenges.


23.06.2006 Marcus Schöller marcus.schoeller@tm.uka.de

Siemens Com Innovation Management at the ITM
Karl Klug and Jürgen Totszke from Siemens Com Enterprise Systems CTO Innovation Management today visited the Institute of Telematics, to catch up on the newest research activities at the Institute: the Projects SESAM and ScaleNet, aggregating sensor networks, service-oriented sensor networks with secure service discovery, adaptive multicast routing in mobile ad-hoc networks and anomaly-based attack detection in high speed networks.

Infrastructure

Pure coffee pleasure

After four years and about 25000 Coffess our old Jura Impressa S90 coffee machine has gone into its well-earned retirement. The new Jura Impressa Z5 alu (Fig. ??) not only impresses due to its elegant appearance, but its computer interface allows the integration into a sensor network - one of the research focuses at the institute.


IPv6 for the dormitory Nancystraße

Since today the dormitory Nancystraße 2 & 4 has access to the world wide IPv6 Internet via an IPv6-in-IPv4 tunnel. The Internet Protocol version 6 is the successor of the current protocol version 4 and will replace it in the future. Now the dormitories HaDiKo, HEK & WAA and Nancystraße as well as the AKK have IPv6 connectivity via the Institute of Telematics.

http://www.ipv6forum.org/
http://www.ipv6tf.de/
http://www.6.akk.org/

Miscellaneous

Second ITM cocktail party

Since the first cocktail party was a complete success, this evening the remake of ITM’s cocktail party took place in the staff lounge in the 3rd floor, organized by Doris Weber. Achim Hof (Fig. 5) full of verve celebrated the classics of the cocktail repertoire for colleagues, friends and alumni of the ITM.

Publications

for specific scenarios. We in this contribution propose a novel architecture for the flexible composition of scalable application-layer multicast services. To do so, we subdivide the latter into different modules, such as transport and overlay routing. By making modules arbitrarily interchangeable, we increase a service’s adaptability and facilitate its development. The service’s scalability is generically ensured, by including our approved technique of Local Broadcast Clustering, which is applicable to arbitrary overlay-multicast algorithms, inside the architecture. As we additionally abstract from a specific network access, developed services can easily be operated and evaluated on top of different network technologies, comprising event-based network simulation software as well as true WLAN-capable devices.

http://doc.tm.uka.de/2006/IWWAN06_BMN


Service management in mobile ad-hoc networks has been a hot research topic in the past few years. With this demonstrator, we present the first service-oriented middleware that unifies semantic service description, service query management and Peer-to-Peer-based query dissemination. By adding a comfortable graphical interface on top of our middleware, we provide and demonstrate a fully functional software package that lets end-users elegantly manage and share application-level services on their wireless devices.

http://doc.tm.uka.de/2006/MDM06_BaPeKl.pdf


Transportation of data between nodes in a sensor network is expensive, as wireless radio transmission depletes finite battery capacity. In addition, wireless data transmission is prone to errors, like static, making reliable data exchange between sensor nodes even more expensive. This paper describes a novel transport scheme that allows sensors to predict data from other sensors. Thereby, communication can partially be omitted, which in return results in reduced radio traffic, less energy consumption, and thus improved network lifetime. In addition to that, simple techniques to ensure reliable communication become much more affordable. The proposed scheme seamlessly integrates into in-network data aggregation. The prediction mechanism is based on the evaluation of polynomials derived from simplified Kalman filters.


In times of network convergence and increasingly challenging customer demands, automated tools can help operating Next Generation Networks more efficiently. Since operators have different ideas and requirements about the strategies they use for network operation and maintenance, automated solutions need to be very flexible. This paper will present a concept that allows for an easy and flexible configuration of the operational strategy carried out by a traffic and performance management node.

http://doc.tm.uka.de/2006/WaZiCh_FlexStratConf.pdf


This document discusses security threats to NETLMM-based mobility management with a focus on threats on the interface between mobile nodes and access routers. Threats to the NETLMM protocol itself, which runs between the access routers and mobility anchor points, are similar to those faced by other protocols between network entities like routers. These threats are handled in the NETLMM protocol specification. In contrast, threats on
the interface between mobile nodes and access routers are different, because the access routers are presenting the NETLMM domain as a single subnet, in order to allow mobile nodes to continue using the same IP address as they move from one access router to another.

http://doc.tm.uka.de/2006/draft-ietf-netlmm-threats-01.txt


The secure transmission of messages via computer networks is, in many scenarios, considered to be a solved problem. However, a related problem, being almost as crucial, has been widely ignored: To whom to entrust information? We argue that confidentiality modeling is a question of trust. Therefore, the article at hand addresses this problem based on a reputation system. We consider a Peer-to-Peer network whose participants decide on whether or not to make information available to other nodes based on the author’s trust relationships. Documents are only forwarded to another node if, according to the sender’s local view, the recipient is considered to be sufficiently trustworthy. In contrast to most existing reputation systems, trust relationships are considered only with respect to a specific domain. Privacy is preserved by limiting the revelation of trust relationships.


Handoff performance with Mobile IPv6 Route Optimization strongly depends on the efficiency of IP-layer auto-configuration mechanisms as well as the flexibility of mobile nodes to schedule and parallelize their signaling. This paper provides a comprehensive analysis of the handoff performance with the standard IPv6 protocol suite and Mobile IPv6, and it identifies several sources for delay. While some of the delays are already well known, an optimized and widely applicable handoff approach is yet to be found. The paper hence proceeds to discuss existing and new optimization proposals, some of which are currently under standardization within the IETF, and elaborates how a combination of those can significantly improve handoff experience.


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Christian Vogt und Jari Arkko: Taxonomy and Analysis of Enhancements to Mobile IPv6 Route Optimization, Mai 2006. Internet Draft,
This document describes and evaluates strategies to enhance Mobile IPv6 Route Optimization, on the basis of existing proposals, in order to motivate and guide further research in this context. This document is a product of the IP Mobility Optimizations (MobOpts) Research Group.


The efficiency of Mobile IPv6 Route Optimization in terms of propagation latencies and packet overhead is contrasted by significant handoff delays. Much analytic effort has recently been spent on reducing these delays, but little practical experience has yet been gathered. This paper compares the efficiency of the combination of two proposals, Early Binding Updates and Credit-Based Authorization, with that of standard Route Optimization. This is based on measurements for RTP/UDP voice traffic and TCP file transfers, which were taken in an experimental testbed.


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This document discusses security threats to NETLMM mobility management. Threats to NETLMM occur on two interfaces: the access router/localized mobility anchor interface and the access router/mobile node interface. Threats to the access router/localized mobility anchor interface are threats to the NETLMM protocol itself. This document discusses threats on these two interfaces.


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