

KuVS Newsletter

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Editor Message

Sehr geehrte KuVS Mitglieder,

wir möchten Sie recht herzlich zur zweiten Ausgabe des KuVS Newsletters begrüßen. Nach dem ersten Newsletter vor einem halben Jahr haben wir zahlreiche positive Rückmeldungen und weitere interessante Beiträge für den neuen Newsletter erhalten. In diesem Rahmen möchten wir sowohl über aktuelle Geschehnisse der Fachgruppe, als auch deren Mitglieder berichten. Hierzu zählen insbesondere Geschäftsberichte der Fachgruppe, Neuigkeiten aus den Arbeitsgruppen (Promotionen, Auszeichnungen, Stellenbewegungen), Projektberichte, sowie Veranstaltungsberichte und Calls. Der Newsletter ist zur Zeit auf ein halbjährliches Erscheinen ausgerichtet. Die nächste Ausgabe erscheint im Juni des nächsten Jahres.

Aktuelle Informationen finden Sie unter <https://www.kuvs.de/newsletter/>.

Die aktuelle Ausgabe ist geprägt von Berichten zu der Neugründung des GI-Fachbereichs "Betriebssysteme, Kommunikationssysteme, Verteilte Systeme", zur CleanSky ITN Summer School, zu 60 Jahren International Teletraffic Congress (ITC), der ITC 28 Tagung und dem QCMan Workshop in Würzburg, zu dem Dagstuhl Seminar 15481 "Evaluation in the Crowd: Crowdsourcing and Human-Centred Experiments" und zu dem kommenden Spring Workshop 2016 & Winter School zu Operating Systems. Ferner berichten wir über die neuen GI Juniorfellows die auf der GI Informatik im Ende Oktober vorgestellt wurden, zu der Verlängerung des SFB 901 in Paderborn. Der Newsletter beinhaltet weiterhin Ausschreibungen zu offenen Stellen und zu abgeschlossenen Promotionen. Einreichungen für den nächsten Newsletter sind herzlich erbeten.

Wir wünschen viel Spaß bei der Lektüre des vorliegenden Newsletters.

Ihre Newsletter Editoren,

Kalman Graffi
Heinrich-Heine-Universität Düsseldorf

Oliver Hohlfeld
RWTH Aachen

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Neues aus den Arbeitsgruppen

2.1 Termine

NetSys 2017 13.-17. März 2017 in Göttingen

General Co-Chairs: Dieter Hogrefe (Uni Göttingen) and Volker Hilt (Bell Labs)

TPC Co-Chairs: Xiaoming Fu (Uni Göttingen) and Michael Welzl (Uni Oslo)

Local Chair: David Koll (Uni Göttingen)

Indicative dates:

Submission deadline: Sept 15, 2016

Notification deadline: Dec 1, 2016

Conference: Mar 13-17, 2017

Sponsored by VDE/ITG, co-sponsored by GI. ACM and IEEE technical co-sponsorship pending approval. Proceedings by IEEE and IEEEExplore planned.

NetSys'17 welcomes industrial sponsors and supporters. Feel free to send any inquires or comments to netsys17-local@gwdg.de

KuVS Treffen 2016 Das nächste KuVS Treffen wird im April 2016 in Aachen stattfinden. Der genaue Termin wird noch bekanntgegeben.

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2.2 GI-Juniorfellows 2015: drei herausragende Persönlichkeiten ausgewählt

Die GI INFORMATIK 2015 tagte Ende Oktober in Cottbus und wählte in diesem Jahr zwei Fellows und drei Juniorfellows.

In diesem Jahr ernannte die Gesellschaft für Informatik e.V. (GI) mit Kalman Graffi, Elmar Jürgens und Judith Michael nach 2013 und 2014 weitere herausragende junge Leute zu GI-Juniorfellows. Die GI-Fellows und GI-Juniorfellows wurden am 30. September 2015 auf der INFORMATIK 2015 in Cottbus ausgezeichnet: www.informatik2015.de. GI-Präsident Peter Liggesmeyer: "Bereits jetzt profitiert die GI von den Juniorfellows und ihrem eigenen Blick auf die Welt. Ich freue mich, mich den drei neuen Juniorfellows diesen Kreis gestärkt zu sehen und bin zuversichtlich, dass wir zukünftig noch mehr aktuelle und drängende Themen gemeinsam angehen können."

Kalman Graffi, Mitglied der Fachgruppe KuVS, leitet die Arbeitsgruppe "Technik sozialer Netzwerke" an der Heinrich-Heine-Universität in Düsseldorf. Mit seinen neun Doktoranden erforscht er sichere, dezentrale Kommunikationslösungen im Internet, die dazu beitragen sollen, Überwachung und Zensur leichter umgehen zu können. Er setzt sich für den internationalen Austausch mit Entwicklungs- und Krisenländern ein und engagiert sich für eine Vielfalt in Informatik und Gesellschaft. Die Fragestellung der sicheren, dezentralen Kommunikation und Entscheidungsfindung betrachtet er mit seinen Doktoranden an drei ausgewählten Themenfeldern. Zum einen forscht er an Peer-to-Peer-Frameworks für qualitätskontrollierte sichere soziale Netzwerke, zum anderen an Android-basierten Verfahren für die lokale Vernetzungen, sowie an Ansätzen für Online-Demokratie und -Deliberation.

Elmar Jürgens engagiert sich an der Schnittstelle zwischen Forschung und Praxis. Seine preisgekrönten Forschungsarbeiten zu Qualitätsanalysen von Software setzt er als Mitgründer der CQSE GmbH in der Beratung ein. Die dabei erlebten Praxisprobleme lenken seine Forschungsarbeiten als Leiter des Kompetenzzentrums für Software Maintenance in der Forschungsgruppe Software & Systems Engineering an der TU München.

Judith Michael forscht und lehrt an der Alpen-Adria-Universität Klagenfurt am Institut für Angewandte Informatik in der Forschungsgruppe Application Engineering als Postdoc. In ihrer Forschung beschäftigt sie sich mit Assistenzsystemen für Menschen mit kognitiven Einschränkungen, die durch Wissen aus ihrem eigenen Verhalten bei Erinnerungslücken unterstützt werden können.



Figure 1: GI Fellow Burkhard Monien und die GI Juniorfellows

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Die GI bietet den Junior-Fellows einen Rahmen, eigenverantwortlich Ideen zur Gestaltung der Informatik in Wissenschaft und Gesellschaft zu entwickeln und umzusetzen. Damit haben die Junior-Fellows die Gelegenheit, in die GI hineinzuwirken und mit national und international renommierten Informatikerinnen und Informatikern in Kontakt zu kommen. Sie beraten Vorstand und Präsidium und können maßgeblichen Einfluss auf die Ausrichtung der GI nehmen. Als GI Fellows ausgezeichnet wurden Frau Isabel Münch und Herr Prof. Alfons Kemper.

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2.3 Neugründung des GI-Fachbereichs “Betriebssysteme, Kommunikationssysteme, Verteilte Systeme”

Christian Becker Olaf Spinczyk
Universität Mannheim TU Dortmund

Bislang waren die Fachgruppen Betriebssysteme (BS) und Kommunikation und verteilte Systeme (KuVS) im Fachbereich Technische Informatik der Gesellschaft für Informatik e.V. eingeordnet. Betrachtet man die Struktur der Fachkollegien in der Deutschen Forschungsgemeinschaft, die üblichen Curricula in der Informatik und auch andere Fachgesellschaften, ist dies eine Einordnung, die diesen entgegensteht. In den Leitungsgremien beider Fachgruppen wurde der Vorschlag diskutiert, einen gemeinsamen Fachbereich zu gründen, um die aktuellen Themen der Fachgruppen besser nach außen zu vertreten.

Erste Gespräche mit dem Präsidium der GI verliefen sehr positiv so dass ein entsprechender Antrag erarbeitet wurde. Auf der Präsidiumssitzung im Rahmen der Informatik 2015 wurde er ohne Gegenstimmen angenommen und durch eine einstimmige Zustimmung des Fachbereichs Technische Informatik in Kraft gesetzt.

Als kommissarische Leitung sind als Sprecher Prof. Christian Becker (Universität Mannheim) und Prof. Olaf Spinczyk (Universität Dortmund) benannt worden. Prof. Kurt Rothermel (Universität Stuttgart) und Prof. Wolfgang Schröder-Preikschat (Universität Erlangen) ergänzen die Fachbereichsleitung als Fachexperten.

Als nächste Schritte steht die konstituierende Sitzung im Januar an. Über die Feiertage werden wir an einer Darstellung des Fachbereichs auf den Seiten der Gesellschaft für Informatik arbeiten.

Wir freuen uns über eine gemeinsame Klammer unserer beiden Fachgruppen und sehen einer aktiven Arbeit in den Fachgruppen und darüber hinaus entgegen.

Christian Becker, Olaf Spinczyk

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2.4 Offene Stellen

2.4.1 Bell Labs: Cloud Systems/Networking Researcher

Bell Labs is the innovation engine of Alcatel-Lucent and a global research organization with sites in the US, Europe and Asia. The lab builds on the rich traditions of Bell Labs research, including the invention of UNIX, the C and C++ programming languages, modern information theory, the laser and the transistor. Its mission is to create outstanding research and innovative technologies for networking, telecommunication, and software systems.

Bell Labs is looking for enthusiastic post-doctoral or senior-level researchers to join our research efforts on cloud computing systems and networking in Stuttgart, Germany.

A successful candidate is expected to have experience in one or more of the following topics:

- cloud computing technologies,
- distributed systems and algorithms,
- Internet protocols and technologies,
- software-defined networks,
- big data and data analytics.

Role description

- Identify new and ambitious research challenges, define research projects to address these challenges, and carry out these projects to completion.
- Publish research results in major scientific venues worldwide, including top conferences and journals.
- Collaborate with other researchers in Bell Labs and partners in the external research community.
- Partner with Alcatel-Lucent business units to transfer research results into products.
- Generate intellectual property through the patenting of ideas.

Qualifications, skills, and experience Candidates must have a PhD in computer science or electrical engineering or a related field.

A proven track record of high-quality research publications in major international conferences and an in-depth understanding of the field is required.

Candidates are expected to have the ability to conduct independent research while also contributing to team-oriented projects that often span across multiple Bell Labs sites.

Strong written and spoken communication skills and the ability to participate in robust discussions in English are required. German language skills are helpful but not mandatory.

Application In order to apply, please send an e-mail including your CV and publication record to volker.hilt@bell-labs.com. More information about Bell Labs is available at www.bell-labs.com.

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2.4.2 RWTH Aachen: Stelle als Wissenschaftliche/r Mitarbeiter/in im Bereich SDN/NFV

Ab sofort wird ein(e) wissenschaftliche(r) Mitarbeiter/in gesucht, der/die sich mit Forschungsfragestellungen im Rahmen des DFG Sonderforschungsbereichs MAKI im Bereich von Architekturkonzepten für dynamische und adaptive Kommunikationssystemen (z.B. SDN oder NFV) beschäftigen möchte. Im Fokus steht hier insbesondere das Design von adaptiven Kommunikationssystemen, deren Architektur sich dynamisch auf neue Anforderungen und veränderte Rahmenbedingungen im Netzwerk und in der Umgebung adaptiert werden kann.

Im Rahmen dieser Stelle wird die eigenverantwortliche Bearbeitung von anspruchsvollen Forschungsvorhaben auf dem Gebiet der Kommunikationsnetze erwartet. Diese Tätigkeit beinhaltet die Teilnahme an (und Organisation von) Projekttreffen, sowie die Präsentation von Projektergebnissen auf internationalen Konferenzen. Darüberhinaus ist die Bereitschaft zur Ausübung von Lehrtätigkeiten an der RWTH Aachen (Vorlesung, Übung, Betreuung von Bachelor- und Masterarbeiten) wünschenswert.

Ihr Profil: Interessierte Kandidat(inn)en sollten über einen überdurchschnittlichen Hochschulabschluss in den Fächern Informatik, Elektrotechnik oder verwandten Gebieten und über umfangreiche Kenntnisse im Bereich Modellierung, Rechnernetze und/oder Betriebssysteme verfügen. Es werden großes Engagement, Teamfähigkeit, soziale Kompetenz, sowie die Bereitschaft zur Präsentation der eigenen wissenschaftlichen Ergebnisse auf internationalen Fachtagungen erwartet. Auf Grund der engen Kooperation mit Partnerinstitutionen im In- und Ausland sind sehr gute Deutsch- und Englischkenntnisse in Wort und Schrift zwingend erforderlich.

Unser Angebot:

- Die Einstellung erfolgt im Beschäftigtenverhältnis.
- Die Stelle ist zum nächstmöglichen Zeitpunkt zu besetzen und befristet 1 Jahr.
- Es handelt sich um eine Vollzeitstelle.
- Eine Promotionsmöglichkeit besteht. Die Eingruppierung richtet sich nach dem TV-L.

Die RWTH ist als familiengerechte Hochschule zertifiziert. Wir wollen an der RWTH Aachen besonders die Karrieren von Frauen fördern und freuen uns daher über Bewerberinnen.

Frauen werden bei gleicher Eignung, Befähigung und fachlicher Leistung bevorzugt berücksichtigt, sofern sie in der Organisationseinheit unterrepräsentiert sind und sofern nicht in der Person eines Mitbewerbers liegende Gründe überwiegen.

Bewerbungen geeigneter schwerbehinderter Menschen sind ausdrücklich erwünscht.

Ihre Bewerbung richten Sie bitte postalisch an

Chair of Communication and Distributed Systems - COMSYS - Informatik 4

Ahornstraße 55 - Building E3

52074 Aachen

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2.5 Call: Ausschreibung zum GI-Dissertationspreis

Die Gesellschaft für Informatik vergibt jährlich einen Preis für eine hervorragende Dissertation (GI-Dissertationspreis). Die Dissertation muss in der Informatik angesiedelt sein. Hierzu zählen nicht nur Arbeiten, die einen Fortschritt für die Informatik bedeuten, sondern auch Arbeiten aus den Anwendungen der Informatik in anderen Disziplinen und Arbeiten, die die Wechselwirkungen zwischen Informatik und Gesellschaft untersuchen. Die beteiligten Gesellschaften möchten besonders wichtige Arbeiten junger Wissenschaftlerinnen und Wissenschaftler in der Öffentlichkeit herausstellen. Sie möchten darüber hinaus einen Beitrag zum Wissenstransfer von den Universitäten in die Bereiche Technik, Wirtschaft und Gesellschaft leisten.

Vorschlagsberechtigt sind die wissenschaftlichen Hochschulen in der Bundesrepublik Deutschland, in Österreich und in der Schweiz, die das Promotionsrecht in den oben genannten Bereichen haben. Jede dieser Hochschulen darf eine Dissertation für den Preis vorschlagen.

Weitere Informationen:

<https://www.gi.de/wir-ueber-uns/wettbewerbe/gi-dissertationspreis.html>

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3.1 Universität Paderborn: SFB 901 - On-The-Fly Computing - geht in die zweite Phase

Die Deutsche Forschungsgemeinschaft (DFG) fördert weiterhin den Sonderforschungsbereich (SFB) 901 “On-The-Fly Computing” an der Universität Paderborn. Die zweite Projektphase des SFB startete am 1. Juli 2015 und ist auf vier Jahre angesetzt.

Sofort abrufbare IT-Dienstleistungen, maßgeschneidert für individuelle Unternehmensanforderungen – das ist die Vision des SFB “On-The-Fly Computing”, in dessen Rahmen Informatiker und Wirtschaftswissenschaftler der Universität Paderborn zusammenarbeiten. Die Wissenschaftler entwickeln gemeinsam Techniken und Verfahren zur automatischen Konfiguration und Ausführung von individualisierten IT-Diensten. Insgesamt 18 Lehrstühle aus dem Institut für Informatik und dem Heinz Nixdorf Institut sowie der Fakultät für Wirtschaftswissenschaften der Universität Paderborn sind an dem Projekt beteiligt.

“Unsere Vision ist ein Paradigmenwechsel bei der Erstellung und Ausführung von zukünftigen IT-Dienstleistungen. Die Zielsetzung des SFB offenbart sich dabei bereits in der Paderborner Wortschöpfung des “On-The-Fly Computing”: Der Terminus ‘On-The-Fly Computing’ verweist auf unser Anliegen, die Grundlagen dafür zu entwickeln, dass zukünftig ad hoc auf spezielle Bedürfnisse der Nutzer reagiert werden kann und entsprechende maßgeschneiderte Dienstleistungen angeboten werden können. Dabei soll eine spezifizierte Anfrage des Nutzers aufgegriffen und analysiert, die benötigten Komponenten in einem weltweiten Markt gesucht, evaluiert, konfiguriert und auf dazu passender Rechnerumgebung ausgeführt werden”, erklärt Prof. Dr. Meyer auf der Heide, Vorstandsvorsitzender des Heinz Nixdorf Institut sowie Sprecher des Sonderforschungsbereichs. Statt einem Programm “von der Stange” soll dem Nutzer ein individueller Dienst angeboten werden.

In den ersten vier Jahren konnten die Wissenschaftler nachweisen, dass “On-The-Fly Computing” grundsätzlich durchführbar ist. Diverse Publikationen zu Einzelfragestellungen und prototypische Entwicklungen von Tools und Demonstratoren überzeugten die DFG-Gutachter vom Stand des SFB. Prof. Dr. Meyer auf der Heide erklärt: “Mit der Verlängerung der Förderung durch die DFG können wir den nächsten Schritt gehen und u.a. Konzepte für die Nutzerfreundlichkeit, die Sicherheit und die Kosteneffizienz des On-The-Fly Computing erarbeiten. Damit wird aus der Vision ein konkurrenzfähiges Paradigma für zukünftige Märkte für IT-Dienstleistungen.”

“Wir freuen uns sehr, dass die Forschungsstärke unserer Universität durch ein weiteres international sichtbares Großprojekt unterstrichen wird”, so der Präsident der Universität Paderborn Prof. Dr. Wilhelm Schäfer. Die Orientierung auf interdisziplinäre, neue Schwerpunkte, wie hier die vorbildliche Kooperation zwischen Informatik und Wirtschaftswissenschaften, bringe die Universität weiter voran. Das Projekt leiste zudem wertvolle Grundlagenforschung für die weiteren anwendungsorientierten Großprojekte Software Innovation Campus Paderborn und



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den Spitzencluster “it’s OWL” und wirke so auch in die gesamte Region.

<http://sfb901.uni-paderborn.de/>



Figure 2: Gruppenfoto des SFB 901 - On-the-Fly Computing

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4.1 Report on the 1st CleanSky ITN Summer School

David Koll
Universität Göttingen

CleanSky is an Initial Training Network (ITN) funded by the Marie-Curie-Actions within the 7th Framework Programme of the European Union (EU FP7). The project aims to develop innovative ideas in the emerging areas within the eco-system of cloud computing via structural training of young researchers. To facilitate this structural training, the project consortium organized a very successful summer school at the University of Goettingen in September 2015.

The goal of this summer school was to introduce major relevant principles of cloud computing to the approximately 50 attendees of the summer school, including twelve researchers hired as Marie-Curie research fellows within CleanSky ITN. The technical program therefore consisted of both theoretical and practical sessions and tutorials, as well as several keynote talks by renowned invited speakers, including Jon Crowcroft (University of Cambridge), Yongguang Zhang (Microsoft Research) and Stefan Schmid (Deutsche Telekom Laboratories). Besides the main summer school track, the young researchers were also educated in transferable research skills as, for instance, scientific writing or mathematical modeling. The summer school was accompanied by a comprehensive social program.

For a detailed program, proceedings including presentation slides, and further information, please visit <http://www.cleansky-itn.eu> and <http://cleanskysummer.uni-goettingen.de>. The second edition of the CleanSky summer school will be held at the University of Helsinki, Finland, in early June 2016.



Figure 3: Summer school participants

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4.2 Report on the Dagstuhl Seminar 15481 “Evaluation in the Crowd: Crowdsourcing and Human-Centred Experiments” (November 2015)

Tobias Hoßfeld Daniel Archambault Helen C. Purchase
Universität Duisburg-Essen, DE Swansea University, GB University of Glasgow, GB

This report documents the program and the outcomes of Dagstuhl Seminar 15481 “Evaluation in the Crowd: Crowdsourcing and Human-Centred Experiments”. Human-centred empirical evaluations play important roles in the fields of human-computer interaction, visualization, graphics, multimedia, and psychology. It is often necessary to involve the users, e.g. to measure the performance of the system with respect to users, e.g. to measure the user perceived quality or usability of a system. A popular and scientifically rigorous method for assessing this performance or subjective quality is through formal experimentation, where participants are asked to perform tasks on visual representations and their performance is measured quantitatively (often through response time and errors). For the evaluation of user perceived Quality of Experience (QoE), users perform experiments with the system under investigation and complete user surveys to assess QoE. One approach is to conduct such empirical evaluations in the laboratory, often with the experimenter present, allowing for the controlled collection of quantitative and qualitative data.

The advent of crowdsourcing platforms, such as Amazon Mechanical Turk or Microworkers, has provided a revolutionary methodology to conduct human-centred experiments. Through such platforms, experiments can now collect data from hundreds, even thousands, of participants from a diverse user community over a matter of weeks, greatly increasing the ease with which we can collect data as well as the power and generalizability of experimental results. However, such an experimental platform does not come without its problems: ensuring participant investment in the task, defining experimental controls, and understanding the ethics behind deploying such experiments en-masse.

The focus of this Dagstuhl seminar was to discuss experiences and methodological considerations when using crowdsourcing platforms to run human-centred experiments. The seminar participants are active in human-computer interaction, multimedia, visualization, and applied perception research. These communities often engage in human-centred experimental methodologies to evaluate their developed technologies and have deployed such technologies on crowdsourcing platforms in the past. Also, we engaged researchers who study the technology



Figure 4: Dagstuhl seminar participants

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that makes crowdsourcing possible. Finally, researchers from psychology, social science and computer science that study the crowdsourcing community participated and brought another perspective on this topic. In total, 40 researchers from 13 different countries participated in the seminar. The seminar was held over one week, and included topic talks, stimulus talks and flash (“late breaking”) talks. The major interests of the seminar participants were focused in different working groups.

- Technology to support Crowdsourcing
- Crowdworkers and the Crowdsourcing Community
- Crowdsourcing experiments vs laboratory experiments
- The use of Crowdsourcing in Psychology research
- The use of Crowdsourcing in Visualisation research
- Using Crowdsourcing to assess Quality of Experience



The abstracts from the different talks, as well as the summary of the working groups can be found on the seminar homepage and the corresponding Dagstuhl report. Apart from the report, we will produce an edited volume of articles that will become a primer text on (1) the crowdsourcing technology and methodology, (2) a comparison between crowdsourcing and lab experiments, (3) the use of crowdsourcing for visualization, psychology, and applied perception empirical studies, and (4) the nature of crowdworkers and their work, their motivation and demographic background, as well as the relationships among people forming the crowdsourcing community.

Homepage (including a link to the Dagstuhl report): <http://www.dagstuhl.de/15481/>

Organizers:

- Daniel Archambault (Swansea University, GB)
- Tobias Hoßfeld (Universität Duisburg-Essen, DE)
- Helen C. Purchase (University of Glasgow, GB)

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4.3 Report zum Workshop für Chancen und Herausforderungen im Cyber-Physical Networking, München, September 2015

Jó Ágila Bitsch
RWTH Aachen

Die stetige Erhöhung von Datenraten und Übertragungsqualität sind seit langem die Schwerpunkte der Forschung im Bereich der drahtlosen und mobilen Kommunikationssysteme. In den letzten Jahren rückt aber zunehmend auch die Reduzierung von Latenzen in den Fokus, insbesondere getrieben durch den Bedarf nach drahtloser Kopplung von Regelungsprozessen in unterschiedlichsten Anwendungsbereichen, wie Industrie (4.0), Smart Grids und Medizin. Hierbei entstehen jedoch neuartige Anforderungen an die Kommunikationstechnologie, woraus sich das Gebiet des Cyber-Physical Networking (CPN) entwickelt.

Am 22. September fand hierzu in München der Workshop für Chancen und Herausforderungen im Cyber-Physical Networking statt. Nach einer Einführung von Prof. Wehrle (Aachen), und Impulsvorträgen von Prof. Herfet (Saarbrücken) und Prof. Hirche (München) wurden spannende Keynotes von Dr. Obradovic (Siemens), Prof. Epple (Aachen) und Prof. Steinbach (München) präsentiert, welche die Spannweite von CPN aufzeigten.



Figure 6: Presentations

Insgesamt waren sowohl Teilnehmer als auch Organisatoren äußerst zufrieden mit dem Workshop. Eine Neuauflage in den folgenden Jahren ist geplant.



Figure 5: Presentations

Im Plenum sammelten die mehr als 50 Teilnehmer aus verschiedenen Disziplinen (darunter: Informatik, Regelungstechnik, Elektrotechnik, Automatisierungstechnik, Mathematik und Medizintechnik) zunächst, wo sie die Hauptherausforderungen im Bereich CPN für die nächsten Jahre sehen. Danach wurden in fünf Arbeitsgruppen (Co-Design of Control/CPN applications and networks; Abstractions for CPN; Fundamental Limits and Trade-Offs in CPN; Modeling Paradigms for CPN; Tools and Methods) erste Ansätze entwickelt. Zwischendurch gab es immer wieder Gelegenheit zum direkten Austausch und Kennenlernen für die Teilnehmer.

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4.4 Report zu 60 Jahren International Teletraffic Congress - ITC

Tobias Hofffeld Prosper Chemouil Michela Meo
Universität Duisburg-Essen, DE Orange Labs, FR Politecnico di Torino, IT

Over the past 60 years, ITC has provided a forum for leading researchers from academia and industry to present and discuss key technological and methodological advances in the design, performance evaluation and control of communication networks like the Internet, protocols and applications and in traffic measurement and management. Today, ITC addresses the emerging paradigm changes that we are witnessing. It results in an increasing diversity of distributed applications and services over various media like mobile/optical networks and enables new markets and economy. For example, the convergence between networking and information technology enabled by virtualization techniques and cloud architectures is providing new stakes in terms of network architecture and service operations. Beyond performance and QoS, different challenges like QoE, economic aspects, energy savings, but also societal impact are considered.

In 1955, ITC emerged as the conference for all theoretical fundamentals and engineering practices regarding the large-scale deployments of telecommunications networks. For long time, ITC was the sole venue that brought together at large scale researchers from industry, network operators and service providers, as well as scientists from academia. These groups are the three strong traditional roots of ITC. For decades, the scientific roots of communications traffic have been primarily based on the theory of probability and stochastic processes, modelling and performance evaluation and gave rise to the teletraffic term. However, along with time and technology and service evolutions, additional scientific areas have been considered to address issues raised by network design, economics and regulatory challenges.

ITC congresses were organized on most continents and visited 16 different countries while Specialist Seminars were organized in in 14 different countries. Additionally, as part of its objective to disseminate know-how and expertise, ITC has set up regional seminars in 11 developing countries including Africa and Oceania, at a time when opening to the world was not as common as today. That time ITU was the leading standardization in telecommunications. The long tradition of ITC in connection with ITU fostered the liaison activity in standardization and in the development program.

The evolution of technologies of the 20th century

ITC has been witnessing the change of communication and networking technologies which are reflected in the proceedings and programs of the congresses. The specialist seminars and the motto of the congresses thereby reflect the hot topics of that time and the evolution. Selected topics of the 70's, 80's and 90's were

1977: Modeling of SPC Exchanges and Data Networks

1984: Fundamentals of Teletraffic Theory

1986: ISDN Traffic Issues

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1990: Broadband Technologies: Architectures, Applications, Control and Performance

1995: Traffic Modeling and Measurement in Broadband and Mobile Communications

1998: Traffic Issues related to Multimedia and Nomadic Communications

Recent topics in the 21st century

With the rise of the Internet, new networking paradigms and technologies but also new challenges emerged:

2002: Internet Traffic Engineering and Traffic Management

2008: Quality of Experience

2008: Future Internet Design and Experimental Facilities

2009: Network Virtualization - Concepts and Performance

2010: Multimedia Applications - Traffic, Performance and QoE

2013: Energy Efficient and Green Networking

2014: Towards a Sustainable World

2015: Traffic, Performance and Big Data

2016: Digital Connected World

Recent Changes in the IAC and ITC Conference in 2016

Since its creation in 1955, the ITC is steered by an International Advisory Council (IAC). The role of the IAC is quite significant in the choice and the follow-up of all ITC-organized events. During the successful ITC 27 in Ghent, Belgium, we celebrated the 60th Anniversary of ITC, which makes ITC the oldest still-running event in ICT.

It was a perfect opportunity to hand over the responsibility of the IAC to a new team that has been progressively involved in the IAC since last year. The former IAC did an excellent job and was chaired by Prosper Chemouil with the very strong support and dedication of: Luigi Fratta Ulf Körner Deep Medhi Hiroshi Saito Phuoc Tran-Gia Hans Van den Berg Villy-Baek Iversen Peter Key Paul J Kuehn Xiongjian Liang Jim Yan

The new IAC team is very motivated and enthusiastic and is chaired by Michela Meo:

Michela Meo, Politecnico Torino, Italy

Markus Fiedler, BTH, Sweden

Tobias Hossfeld, University of Duisburg-Essen, Germany

Fabrice Guillemin, Orange Labs, France

Michael Menth, University of Tuebingen, Germany

Zhisheng Niu, Tsinghua University, China

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Dario Rossi, Telecom ParisTech, France

Benny Van Houdt, University of Antwerp, Belgium

ITC 28 introduced also some changes, which are the concept of areas and a demo session. ITC 28 is structured into eight different areas which address hot topics in networking. Each area is chaired by two international well recognized experts in that area. The area chairs have formed a smaller TPC per area. The idea is that the area chairs invite the experts for their area, that are experts from the ITC community as well as well-known experts worldwide. On the one hand, the concept aims at opening the ITC community and attracting submissions. On the other hand, the areas help to improve the quality of the review process. The area chairs assign the reviews to the experts in their domain and evaluate all papers in their domain.

In addition, we introduced demo sessions for ITC 28. The demo session is distinguished only in presentation format. “Demo papers” are simply papers whose content is best understood by an audience if the material is demonstrated rather than presented in a slideshow. With the demo session, we aim at attracting more submissions and make ITC attractive for other communities.

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4.5 Call: ITC 28 in Würzburg, 12.-16. September 2016

Tobias Hofffeld
Universität Duisburg-Essen

The evolution of communications and networking is changing the world we are living in. The digital connected world is triggered by the influence of computer science on telecommunication, the advent of the Internet and the massive deployment of mobile communications and optics, the appearance of collaborative networking and social networks, the ever-increasing speed and flexibility of new communication technologies, networks, user devices, and applications, and the ever-changing operational challenges arising from this development.

ITC 28 solicits original contributions that address the latest changes and developments in design, modelling, measurement, and performance evaluation of communication systems, networks, and services. ITC 28 is structured into eight different areas. The objectives in these areas include, among others, energy-efficiency and green IT, network security and privacy, QoS and QoE, and resilience.

Area 1: Smart cities and IoT (Alberto Leon-Garcia, Yanmin Zhu)

Area 2: Cloud services and networking (Arup Acharya, Patrick Lee)

Area 3: Mobile, wireless and 5G (Kin Leung, Thomas Hou)

Area 4: Next generation and future Internet architectures (Michael Zink, Thomas Zinner)

Area 5: Network and traffic management (Florin Ciucu, Peter Reichl)

Area 6: Network design and optimization (Thomas Bauschert, Eric Wong)

Area 7: Network measurements and analysis (Marco Mellia, Mark Squillante)

Area 8: Networked applications (Zhu Li, Lea Skorin-Kapov)]

In addition, there will be a demo session across the areas. Demonstration Session (Mark Berman, Michael Jarschel, Rick McGeer)

We are happy that Nikhil Jain (Qualcomm Technologies) will give a keynote talk on Internet of Everything: Engineering Challenges and Opportunities.

The conference takes place in the computer science building on the Hubland Campus of the University of Würzburg. The social event will be on Wednesday in the historical Würzburg residence.

The submission deadline is March 4th, 2016. More information is online at <http://itc28.org/>.

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4.6 Call: Workshop on Quality of Experience Centric Management (QCMan) 2016

Oliver Hohlfeld
RWTH Aachen

The Forth International Workshop on Quality of Experience Centric Management (QCMan) will be held in conjunction with ITC 2016. The workshop is supported by the University of Würzburg, RWTH Aachen, FTW Wien, and the University of Missouri.

In recent years, the Internet has evolved from a pure packet forwarder to a provider of complex and high demanding services and applications (e.g., video, voice, on-line gaming, cloud applications). These services and applications are typically managed through a set of Quality of Services parameters (e.g. packet loss, delay, jitter). However, it is widely agreed that the management of these services and applications should be centered on their quality as perceived by the end user: the Quality of Experience (QoE). However, this QoE centric management is greatly challenged in today's Internet by (i) the stringent QoE requirements of the supported services and applications (e.g., timing constraints, loss intolerance) and users (e.g., unpredictability of user behavior, request for high quality services), (ii) the plethora of service consumption possibilities (e.g. for video: live vs on-demand, managed vs over-the-top), (iii) the inherent complexity of services and applications which can be offered to users in several ways to reach the same QoE level and (iv) the difficulty in assessing the quality as perceived by the end user also due to insufficient insight in the psychological and sociological factors of the service and application consumption.

QCMan 2016 aims at providing an international forum for researchers addressing these challenges. QCMan 2016 will combine original full paper presentations with a motivating keynote to thoroughly explore this challenging topic.

Important Dates:

Abstract registration deadline: March 15th, 2016

Paper submission: April 1st, 2016

Notification of acceptance: June 1st, 2016

Final version of papers due: June 15th, 2016

Workshop date: September 12-16, 2016

TPC Chairs:

Thomas Zinner, University of Wuerzburg, Germany

Oliver Hohlfeld, RWTH Aachen, Germany

Raimund Schatz, FTW Wien, Austria

Prasad Calyam, University of Missouri, USA

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4.7 Call: Frühjahrstreffen Betriebssysteme 2016 und Winter School on Operating Systems (WSOS)

Graz, Österreich vom 22.-26.02.2016

Das Frühjahrstreffen 2016 der Fachgruppe Betriebssysteme wird an der TU Graz in der Steiermark stattfinden und erstmals zusammen mit einer “Winter School on Operating Systems” (WSOS) angeboten. Thematisch fokussieren beide Veranstaltungen auf sämtliche Aspekte im Bereich

Systemsoftware-Unterstützung für verlässliche Systeme

Das Frühjahrstreffen vom 25.-26.02.2016 (Do-Fr) richtet sich traditionell vorrangig aber nicht nur an die Mitglieder der Fachgruppe Betriebssysteme und ermöglicht die Einreichung bzw. Veröffentlichung themenspezifischer Beiträge.

Die Winter School on Operating Systems vom 22.-25.02.2016 (Mo-Do) richtet sich grundsätzlich an sämtliche Studierende und Promovierende sowie junge Wissenschaftler und Forscher in diesem Bereich. Sie soll den Erwerb themenspezifischen Wissens im Rahmen von Vorlesungen und Hands-On Workshops ermöglichen und zum allgemeinen Erfahrungsaustausch beitragen. Die Sprecher der Winter School sind international angesehene Experten aus Forschung und Industrie, wie zum Beispiel Gernot Heiser (NICTA, UNSW), unter dessen Leitung der komplett formal verifizierte Mikrokern seL4 entwickelt wurde, und Gilles Muller (LIP6), der seit Jahren an Techniken zur statischen Code-Analyse arbeitet, mit denen man automatisiert Bugs in Linux aufspüren kann.

Beide Veranstaltungen werden von der Embedded Automotive Systems Group der TU Graz zusammen mit der GI Fachgruppe Betriebssysteme organisiert. Sie bieten insbesondere eine Plattform zur regen Diskussion über zukünftige Forschungsschwerpunkte und potenzielle Kooperationsprojekte sowie zur Vernetzung innerhalb und außerhalb der Community.

Weitere Details, die Liste der Sprecher sowie die Möglichkeit zur Einreichung und Registrierung finden sich auf der Homepage: <http://wsos2016.tugraz.at>.



Figure 7: Graz by Bernd Thaller - CC BY-SA

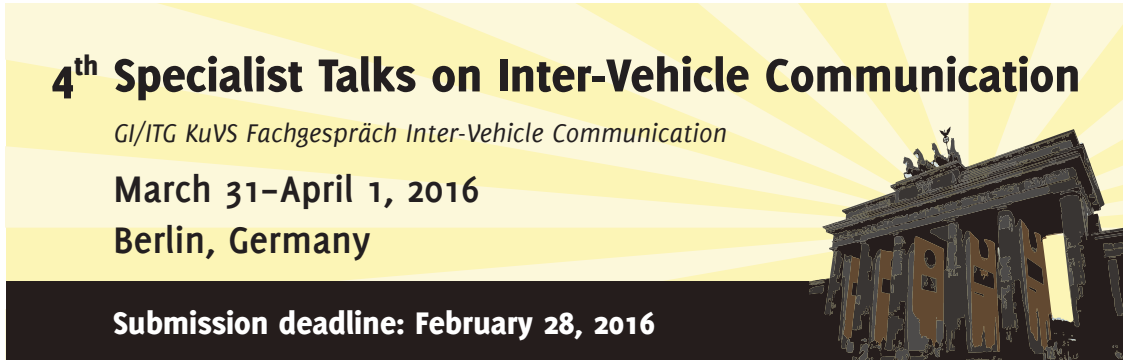
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4.8 Call: KuVS Fachgespräch Inter-Vehicle Communication



4th Specialist Talks on Inter-Vehicle Communication
GI/ITG KuVS Fachgespräch Inter-Vehicle Communication
March 31–April 1, 2016
Berlin, Germany
Submission deadline: February 28, 2016

Motivation. Inter-vehicle communication (IVC), the management and control of network connections among vehicles as well as between vehicles and an existing network infrastructure, is a maturing research field that continues to attract researchers and practitioners alike. Automobile manufacturers and OEMs have collaborated to reserve a dedicated, harmonized radio spectrum in Europe; several large-scale projects have developed software and hardware solutions for vehicular communication; and ETSI, as well as the IEEE, have standardized protocols covering many communication aspects.

Yet, IVC as a research field continues to evolve, and new research questions arise. What is the role of IVC as supporting technology for autonomous vehicles? Will reliability and latency requirements be met with current standards? Should IVC support large-scale information dissemination, which requires more advanced algorithms than those currently standardized? What are the benefits and drawbacks of cellular communication compared to IEEE 802.11p-based networks? Should IVC be open to other road users, such as pedestrians and bicycles, which would require interaction with mobile phones using suitable protocols?

The 4th Fachgespräch on IVC aims to provide an open forum to discuss such on-going and emerging questions, as well as to provide an overview of the research field to scientists that just joined the IVC community.

Goals. The GI/ITG KuVS Fachgespräch Inter-Vehicle Communication is a highly engaging, interactive meeting where young researchers and experienced colleagues share and discuss new research directions and early results in the areas of inter-vehicle communication and automated vehicles. Participants can expect an open and welcoming atmosphere with an emphasis on discussions and networking opportunities, as well as presentations of novel and on-going work.

Topics of Interest

- Communication protocol design and network management
- Channel modeling, modulation and coding

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- Congestion control and scalability issues
- Medium access control protocols
- Vehicle-to-cyclist/Vehicle-to-pedestrian communication
- Applications of vehicular networks
- Simulation frameworks
- Real-world testbeds
- Autonomous driving
- Cooperative driving
- Security in automated vehicles
- Traffic management for automated vehicles
- Human interfaces for automated vehicles
- Security issues and countermeasures
- Misbehavior detection in vehicular and in-vehicle communication
- Privacy in traffic applications
- Electric vehicle applications

Submission. Manuscripts of 2 to 4 pages length, formatted according to IEEE conference layout, should be submitted as PDF documents. Submissions are handled using Easy Chair. Accepted contributions will be published in a technical report (thus, the copyright will remain with the authors). More information is available at the event website:

<https://hu.berlin/fg-ivc-2016/>

Organizing Committee

- Stefan Dietzel (Humboldt-Universität zu Berlin)
- Björn Scheuermann (Humboldt-Universität zu Berlin)
- Falko Dressler (Paderborn University)
- Raphaël Frank (University of Luxembourg)
- Frank Kargl (Ulm University)
- Christoph Sommer (Paderborn University)

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5.1 Diana-Elena Reichle (K. Geihs, U Kassel)

Title: Managing Quality Properties of Web Service Compositions

Abstract: Web services from different partners can be combined to applications that realize a more complex business goal. Such applications built as Web service compositions define how interactions between Web services take place in order to implement the business logic. Web service compositions not only have to provide the desired functionality but also have to comply with certain Quality of Service (QoS) levels. Maximizing the users' satisfaction, also reflected as Quality of Experience (QoE), is a primary goal to be achieved in a Service-Oriented Architecture (SOA). Unfortunately, in a dynamic environment like SOA unforeseen situations might appear like services not being available or not responding in the desired time frame. In such situations, appropriate actions need to be triggered in order to avoid the violation of QoS and QoE constraints.

In this thesis, proper solutions are developed to manage Web services and Web service compositions with regard to QoS and QoE requirements. The Business Process Rules Language (BPRules) was developed to manage Web service compositions when un- desired QoS or QoE values are detected. BPRules provides a rich set of management actions that may be triggered for controlling the service composition and for improving its quality behavior. Regarding the quality properties, BPRules allows to distinguish between the QoS values as they are promised by the service providers, QoE values that were assigned by end-users, the monitored QoS as measured by our BPR framework and the predicted QoS and QoE values. BPRules facilitates the specification of certain user groups characterized by different context properties and allows triggering a personalized, context-aware service selection tailored for the specified user groups. In a service market where a multitude of services with the same functionality and different quality values are available, the right services need to be selected for realizing the service composition. We developed new and efficient heuristic algorithms that are applied to choose high quality services for the composition. BPRules offers the possibility to integrate multiple service selection algorithms. The selection algorithms are applicable also for non-linear objective functions and constraints. The BPR framework includes new approaches for context-aware service selection and quality property predictions. We consider the location information of users and services as context dimension for the prediction of response time and throughput. The BPR framework combines all new features and contributions to a comprehensive management solution. Furthermore, it facilitates flexible monitoring of QoS properties without having to modify the description of the service composition. We show how the different modules of the BPR framework work together in order to execute the management rules. We evaluate how our selection algorithms outperform a genetic algorithm from related research. The evaluation reveals how context data can be used for a personalized prediction of response time and throughput.

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5.2 Nguyen Xuan Thang (K. Geihs, U Kassel)

Title: Model-driven development of sensor network applications with optimization of non-functional constraints

Abstract: Wireless sensor networks (WSNs) differ from conventional distributed systems in many aspects. The resource limitation of sensor nodes, the ad-hoc communication and topology of the network, coupled with an unpredictable deployment environment are difficult non-functional constraints that must be carefully taken into account when developing software systems for a WSN. Thus, more research needs to be done on designing, implementing and maintaining software for WSNs. This thesis aims to contribute to research being done in this area by presenting an approach to WSN application development that will improve the reusability, flexibility, and maintainability of the software.

Firstly, we present a programming model and software architecture aimed at describing WSN applications, independently of the underlying operating system and hardware. The proposed architecture is described and realized using the Model-Driven Architecture (MDA) standard in order to achieve satisfactory levels of encapsulation and abstraction when programming sensor nodes. Besides, we study different non-functional constraints of WSN application and propose two approaches to optimize the application to satisfy these constraints.

A real prototype framework was built to demonstrate the developed solutions in the thesis. The framework implemented the programming model and the multi-layered software architecture as components. A graphical interface, code generation components and supporting tools were also included to help developers design, implement, optimize, and test the WSN software.

Finally, we evaluate and critically assess the proposed concepts. Two case studies are provided to support the evaluation. The first case study, a framework evaluation, is designed to assess the ease at which novice and intermediate users can develop correct and power efficient WSN applications, the portability level achieved by developing applications at a high-level of abstraction, and the estimated overhead due to usage of the framework in terms of the footprint and executable code size of the application. In the second case study, we discuss the design, implementation and optimization of a real-world application named TempSense, where a sensor network is used to monitor the temperature within an area.

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5.3 Rene Hummen (K. Wehrle, RWTH Aachen)

Title: Resource-Conscious Network Security for the IP-Based Internet of Things

Abstract: The Internet of Things envisions an unprecedented interleaving of the physical with the virtual world to enhance automation and to improve comfort in a variety of application domains ranging from home automation to healthcare and smart cities. Based on recent advances in standardization, many of these application domains are expected to employ IP-enabled embedded devices to realize the envisioned interconnection of the physical world. Such IP connectivity, however, also exposes networked embedded devices to similar network attacks as conventional IP-enabled hosts or services. The severity of these attacks is considerably aggravated in the IoT as attacks in the virtual world suddenly can have detrimental physical impact. Hence, effective network security is a vital precondition for a secure IP-based IoT.

Standard E2E security protocols such as TLS have the potential to provide an important building block for interoperable network security in the IoT. The device and network constraints in the embedded domain and the resource asymmetry in the IoT, however, challenge the design of existing security solutions. The resource constraints of embedded devices, e.g., require these solutions to be applicable in the context of only a few MHz of computational power, several kB of RAM, and several tens of kB of ROM. Similarly, energy constraints and low-power wireless communication demand for a high transmission efficiency. Research and standardization, thus, recently started to adapt standard IP security solutions to IoT requirements.

In this thesis, we contribute to these adaptation efforts by addressing emerging protocol design challenges for end-to-end IP security in the context of the IoT. In this, we specifically consider the IoT security protocol adaptations DTLS, HIP DEX, and Minimal IKEv2 that are currently proposed for standardization at the IETF. Notably, while these protocol adaptations should already satisfy IoT requirements, we identify several design-level efficiency and security issues that render the deployment of these protocols in their current state inefficient, infeasible, and even insecure. First, the high computation overhead of DTLS, HIP DEX, and Minimal IKEv2 significantly hampers the availability and response time of networked embedded devices during the protocol handshake. We present three complementary protocol extensions that account for these computation overheads in the overall protocol design. Second, the extensive message wire-format of these protocol adaptations leads to undesirable transmission overheads in the embedded domain. We devise the Slimfit compression layer that addresses message conciseness issues in the context of HIP DEX. Combined, these two contributions considerably reduce the run-time overheads and improve the security properties of the considered end-to-end security protocols. Third, extensive RAM and ROM requirements render the use of DTLS, HIP DEX, and Minimal IKEv2 infeasible for a wide range of memory-constrained embedded devices. To still enable these devices to communicate securely, we introduce the handshake delegation architecture that also provides an authorization framework for the embedded domain. Fourth, the 6LoWPAN packet fragmentation of the DTLS, HIP DEX, and Minimal IKEv2 handshake messages is vulnerable to DoS attacks. To protect against these attacks, we present two lightweight defense mechanisms. Overall, our contributions in this thesis effectively complement each other and, in combination, achieve significant security and efficiency improvements for the considered standard end-to-end security protocols in the context of the IP-based IoT.

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5.4 Florian Schmidt (K. Wehrle, RWTH Aachen)

Title: Heuristic Header Error Recovery for Corrupted Network Packets

Abstract: Wireless communication provides many advantages over wired communication, such as easier deployment due the lack of cabling infrastructure and higher mobility for users. However, one of its most important downsides is the significantly higher error rate. This is exacerbated by the fact that traditional Internet communication enforces perfect bit-by-bit correctness of each packet. While this ensures high reliability in the received data, it is very inefficient: even a single bit error leads to a packet drop, leading to high packet loss even at comparably low bit error rates. Such a behavior is especially wasteful when considering error-tolerant applications. For example, many media codecs have been designed to tolerate and mask bit errors in their data.

To better support these types of transmissions, suggestions in the past have aimed at tolerating errors in the payload portions of packets, the most well-known example being UDP-Lite. However, these solutions suffer from several drawbacks. First, they suffer from low acceptance unless they ensure they stay fully interoperable with standard protocols. Second, they focus on single protocols, without taking the layered nature of protocol combinations into account. This is problematic because error tolerance in one protocol can be rendered useless by combining it with a lowerlayer protocol that drops all packets that contain errors. Third, focusing only on payload error tolerance means any errors in the header portions of packets still lead to drops. Especially in small packets, headers form a large part of the packet, limiting the effectiveness of payload error tolerance.

In this dissertation, we design and present solutions that address these shortcomings. First, by introducing error tolerance into existing standard protocols, we ensure interoperability. Second, by taking the whole stack into account, we ensure that packets are not dropped before error tolerance can recover them. Third, by allowing errors to also occur in the header portions of packets, we increase the effectiveness of error tolerance. This last contribution means that control information in packet headers is not reliable any more. Thus, packets for one application could be misattributed to another. Hence, we will present solutions to identify the correct application a packet belongs to, even under header errors, as well as ways to repair corrupted header information, to prevent this misattribution.

Our first contribution is a solution to introduce header error tolerance and repair into existing protocols at the examples of IPv4, UDP, and RTP. As a second contribution, we design a protocol-independent approach that can identify which packet a connection belongs to, as well as repair certain errors in protocol headers, without requiring any knowledge about the protocols it works on. Our final contribution focuses on the popular 802.11 wireless technology. To fully unlock the potential of header error recovery in 802.11, we design a novel rate adaptation algorithm that can adapt to changes in channel quality without relying on acknowledgments, which is not possible with state-of-the-art solutions.

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5.5 Ismet Aktas (K. Wehrle, RWTH Aachen)

Title: Harnessing Cross-Layer Design

Abstract: The success of today's Internet can partly be attributed to the design of the layered protocol stack. This design organizes communication protocols, that establish the rules of communication between different communicating entities, in hierarchical layers. These layers are strictly separated and offer only limited interfaces among adjacent layers. Essentially, protocols at each layer have a very specific task and they need to fulfill this task independently. Although this self-contained design of protocols worked well in wired networks, several problems appeared with the emergence of wireless and mobile communication. A prominent example is TCP's performance drop in wireless networks as it misinterprets packet loss, due to poor link conditions, as congestion in the network. In principle, the missing knowledge of higher layers about volatile wireless conditions and in case of lower layers about higher layer requirements leads to misinterpretation and misbehavior causing suboptimal performance.

A promising concept that addresses the lack of information availability is the cross-layer design paradigm which in fact circumvent the rules of strict layer separation and allows the interaction across non-adjacent layers. Many specific solutions, i.e., problem-oriented and tailor-made implementations, have demonstrated the utility of this paradigm by highlighting adaptivity advantages and performance improvements of applications and protocols. But a typical consequence of the very specific focus of the tailor-made solutions was the violation of software engineering principles such as maintainability and extensibility which are the major driving factors for the success and proliferation of software in general.

As a result of this observation, a few static cross-layer architectures have been proposed that facilitate systematic design and the integration of several specific solutions. Unfortunately, in static cross-layer architectures the cross-layer coordination algorithms are deeply embedded into the operating system (OS) and are realized at compile-time. This static and deep integration into the OS has several drawbacks. First, the design of cross-layer coordination algorithms requires relevant expertise to understand and modify protocols residing in the OS. Second, the experimentation with cross-layer coordination algorithms is tedious since their modification requires a recompilation. Third, coordination algorithms are always active even if not needed.

In this thesis, we present Crawler, a flexible cross-layer architecture that allows the specification, realization, and adaptation (i.e., addition, removal and modification) of cross-layer coordination algorithms at runtime. Based on the detection of underlying environmental changes, Crawler allows to automatically load the adequate set of coordination algorithms. It alleviates the problem of complicated access to relevant application, protocol, and system information by enabling a declarative and abstract way to describe cross-layer coordination algorithms and by providing a unified interface to inject such abstractions into the system. The generic design of this unified interface further enables the extensive experimentation with diverse compositions of cross-layer coordination algorithms and their adaptations. Moreover, the interface allows applications to provide own coordination algorithms, to share information with the system and system monitoring. In this context, we classify problems such as conflicts when adding multiple cross-layer coordination algorithms and support developers to tackle them. In general, we enable an unprecedented degree of flexibility and convenience to monitor, experiment and run

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several cross-layer coordination algorithms. To further support the developer while experimenting, we even allow to remotely add, remove, and modify cross-layer coordination algorithms and their monitoring. We demonstrate the usability of Crawler for monitoring and experimentation with cross-layer coordination algorithms in five diverse use cases from different areas of wireless networking such as manipulating TCP behavior, VoIP codec switching, jamming detection and reaction.

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Termine

Nächster Newsletter : Juni 2016

Einreichungsfrist für Beiträge : 1. Mai 2016

Wir bitten dabei um Einreichungen zu den folgenden Themengebieten:

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 - Geschäftsberichte der GI – KuVS – Fachgruppe
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- Neues aus den Arbeitsgruppen
 - Abgeschlossene Promotionen
 - Preise
 - Personenbewegungen
 - Stellenmarkt
 - ...
- Neue Projekte
 - Initiativen
 - Großprojekte
 - ...
- Calls und Berichte zu Veranstaltungen
 - Konferenzberichte (Konferenzen, Fachgespräche, Dagstuhl, ...)
 - Call for Papers and Participation (“Eigene” Konferenzen, Fachgespräche, Summer-school, ...)
 - ...

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