

CHRISTOPH P. MAYER

Karlsruhe Institute of Technology (KIT), Zirkel 2, 76131 Karlsruhe, Germany
+49 (0)721 608 46415 • mayer@kit.edu • www.tm.kit.edu/~mayer • www.chrismc.de

RESEARCH STATEMENT

I design and build distributed systems using scalable overlay-based networks. My current research focuses on the integration of opportunistic Delay Tolerant Networks with today's infrastructure networks with the goal to bring connectivity to unconnected areas, provide for cost-efficient communication with focus on the Internet of Things, and offload infrastructure networks to make communication flexible, spontaneous, and cost-efficient.

EDUCATION

Ph.D. Institute of Telematics, Karlsruhe Institute of Technology (KIT), Germany graded "very good" 1.0 Dissertation <i>Hybrid Routing in Delay Tolerant Networks</i>	Jan 2008 – Oct 2011
Diploma Computer Science, University of Karlsruhe (TH), Germany graded "very good" 1.5 Thesis <i>Distack Framework for Distributed Anomaly-based Attack Detection</i> Thesis <i>PktAnon Packet Trace Anonymization</i>	Oct 2002 – Nov 2007

RESEARCH INTERESTS

- Integration of DTN Routing and infrastructure routing.
- Mobility modelling and analysis.
- Overlay-based spontaneous and flexible services.
- Security in future networks, focus on transparent mechanisms like cryptographic identifiers.

AWARDS AND HONORS

KuVS Communication Software Award Kommunikation in Verteilten Systemen (KiVS) <i>ariba: Rahmenwerk für Overlay-basierte Dienste</i>	Mar 2011
Best Paper Award Int. Conf. on Measurement, Modelling, and Evaluation of Computing Systems <i>User-perceived Performance of the NICE Application Layer Multicast Protocol in Large and Highly Dynamic Groups</i>	Mar 2010
Honorable Mention Demo Award ACM SIGCOMM, Barcelona, Spain <i>Reconnecting the Internet with ariba: Self-Organizing Provisioning of End-to-End Connectivity in Heterogeneous Networks</i>	Aug 2009
1st Place IPv6 Contest Winning Entry Idea Category, IPv6 Council, www.ipv6council.de/contest <i>Decentralized and Autonomous Bootstrapping for IPv6-based Peer-to-Peer Networks</i>	May 2009
Award for Outstanding Diploma Thesis Andrena/ObjektForum Karlsruhe <i>Framework for Anomaly-based Distributed Attack Detection</i>	Jun 2008

WORK EXPERIENCE

ITM Zitterbart, KIT telematics.tm.kit.edu Scientific staff and researcher in the "Spontaneous Virtual Networks" project	Jan 2008 – Dec 2011
---	---------------------

ITM Zitterbart, KIT telematics.tm.kit.edu	Aug 2006 – Sep 2006
Student research assistant, Network trace anonymization	Jan 2007 – Mar 2007
IBM R&D www.ibm.com/de/entwicklung	Oct 2006 – Dec 2006
Internship, Speech recognition on Windows Mobile handhelds	
Rapidsolution www.rapidsolution.de	May 2005 – Jul 2006
Part-time software developer, packaging machines for pharmacy industry, team leader	
ISL Waibel, KIT isl.ira.uka.de	Sep 2004 – Aug 2005
Student research assistant, Brain-Computer-Interfaces, Speech recognition	
Auma www.auma.de	Aug 2002 – Oct 2002
Software developer, quality assurance, test-benches	Mar 2003 – May 2003
Herzzentrum Bad Krozingen www.herzzentrum.de	Aug 2001 – Jun 2002
Civilian service as programmer, 3D heart reconstruction	
Software Development Hirsch www.programmier-hirsch.com	Oct 2000 – Oct 2001
Part-time software developer	

DEVELOPMENT PROJECTS

Ariba Overlay-based virtual network substrate library, Open Source	www.ariba-underlay.org, www.spovnet.de
Distack Framework for attack detection and traffic analysis, Open Source	www.tm.kit.edu/distack
PktAnon Profile-based traffic anonymization, Open Source	www.tm.kit.edu/pktanon
XArp Advanced ARP spoofing detection	www.chrismc.de/development/xarp
SomaView Augmented Reality for Android	www.chrismc.de/development/somaview

PROGRAMMING LANGUAGES AND PLATFORMS

Expert C++, Java, wxWidgets, Boost, STL, Windows, Linux, Android, Nokia Tablets
Advanced Visual Basic, Databases, Qt, XML, Ruby on Rails, Python
Basic Java Script, PHP

LANGUAGES

German native speaker
English fluent in speaking and writing
Spanish, French basic

TECHNICAL PROGRAM COMMITTEE MEMBER, REVIEWER

Reviewer for VERDIKT ICT Security Panel Research Council of Norway	2011
Journal on Security and Communication Networks Wiley	2011
AFIN'11 International Conference on Advances in Future Internet	Aug 2011
SECURWARE'11 Intl. Conference on Emerging Security Information, Systems and Technologies	Aug 2011
SecIoT'10 International Workshop on the Security of the Internet of Things	Nov 2010
AFIN'10 International Conference on Advances in Future Internet	Jul 2010
SECURWARE'10 Intl. Conference on Emerging Security Information, Systems and Technologies	Jul 2010
SECURWARE'09 Intl. Conference on Emerging Security Information, Systems and Technologies	Jul 2009

ORGANIZATION

WASA-NGI IV'11 Web Chair, Workshop on Arch., Serv. and Appl. for the Next Generation Internet	Oct 2011
IWSOS Shadow TPC'11 IWSOS Shadow TPC Chair and Organizer	Feb 2011
IWSOS'11 International Workshop on Self-Organizing Systems, Karlsruhe	Feb 2011
WASA-NGI'10 Workshop on Arch., Serv. and Appl. for the Next Generation Internet, Karlsruhe	Jul 2010
KuVS-FI'08 GI/ITG KuVS Workshop on Future Internet, Karlsruhe	Nov 2008
TT'08 Telematik Treff Seminar, Karlsruhe	Jul 2008
WASA-NGI'08 Workshop on Arch., Serv. and Appl. for the Next Generation Internet, Karlsruhe	Jul 2008

REFERENCES

Prof. Dr. Martina Zitterbart

Institute of Telematics
Karlsruhe Institute of Technology (KIT)
Karlsruhe, Germany
Phone: +49 721 608 46400
Email: zit@tm.uka.de
Web: <http://telematics.tm.kit.edu>

Dr. habil. Oliver P. Waldhorst

Integrated Communication Systems Group
Technical University of Ilmenau
Ilmenau, Germany
Phone: +49 3677 69 2788
Email: oliver.waldhorst@tu-ilmenau.de
Web: <http://www.tu-ilmenau.de/iks>

Prof. Dr. Jörg Ott

Department of Communications and Networking
Aalto University
Helsinki, Finland
Phone: +358 9 470 22460
Email: jo@netlab.tkk.fi
Web: <http://www.netlab.tkk.fi/~jo>

Andreas Schwind, CTO

RapidSolution Software AG
Erbprinzenstr. 27, Karlsruhe
Phone: +49 721 663388 0
Email: andreas.schwind@rapidsolution.de
Web: <http://www.rapidsolution.de>

PUBLICATIONS

Journals and Bookchapters

- [1] Christian Hübsch, Christoph P. Mayer, Sebastian Mies, Roland Bless, Oliver P. Waldhorst, and Martina Zitterbart. ariba: Rahmenwerk für Overlay-basierte Dienste. *Praxis der Informationsverarbeitung und Kommunikation (PIK)*, 34, 2011. to appear.
- [2] Thomas Gamer and Christoph P. Mayer. Simulative Evaluation of Distributed Attack Detection in Large-scale Realistic Environments. *SIMULATION: Transaction of The Society for Modeling and Simulation International*, 87(7):630–647, July 2011.
- [3] Roland Bless, Christian Hübsch, Christoph P. Mayer, and Oliver P. Waldhorst. *Future Internet Services and Service Architectures*, chapter SpoVNet: An Architecture for Easy Creation and Deployment of Service Overlays, pages 23–47. River Publishers Series in Communications. River Publishers, Aalborg, Denmark, 1st edition, June 2011.
- [4] Christian Hübsch, Christoph P. Mayer, and Oliver P. Waldhorst. The Ariba Framework for Application Development using Service Overlays. *Praxis der Informationsverarbeitung und Kommunikation (PIK)*, 33(1):7–11, March 2010.
- [5] Christian Hübsch, Christoph P. Mayer, Sebastian Mies, Roland Bless, Oliver P. Waldhorst, and Martina Zitterbart. Reconnecting the Internet with ariba: Self-Organizing Provisioning of End-to-End Connectivity in Heterogeneous Networks. *ACM SIGCOMM Computer Communication Review*, 40(1):131–132, January 2010. (an earlier version appeared in Proceedings of ACM SIGCOMM 2009, Barcelona, Spain).

- [6] Nathan Farrington, Nikhil Handigol, Christoph P. Mayer, Kok-Kiong Yap, and Jeffrey C. Mogul. Report on WREN 2009 – Workshop: Research on Enterprise Networking. *ACM SIGCOMM Computer Communication Review*, 40(1):44–49, January 2010.
- [7] Oliver P. Waldhorst, Christian Blankenhorn, Dirk Haage, Ralph Holz, Gerald Koch, Boris Koldehofe, Fleming Lampi, Christoph P. Mayer, and Sebastian Mies. Spontaneous Virtual Networks: On the Road towards the Internet’s Next Generation. *it – Information Technology Special Issue on Next Generation Internet*, 50(6):367–375, December 2008.
- [8] Thomas Gamer, Christoph P. Mayer, and Marcus Schöller. PktAnon - A Generic Framework for Profile-based Traffic Anonymization. *Praxis der Informationsverarbeitung und Kommunikation (PIK)*, 31(2):76–81, June 2008.

Conferences and Workshops

- [1] Christoph P. Mayer and Oliver P. Waldhorst. Offloading Infrastructure using Delay Tolerant Networks and Assurance of Delivery. In *Proceedings of IFIP Wireless Days (WD)*, pages 1–8, Niagara Falls, ON, Canada, October 2011.
- [2] Christoph P. Mayer and Oliver P. Waldhorst. On the Impact of Graph Structure on Mobility in Opportunistic Mobile Networks. In *Proceedings of INFOCOM Workshop on Network Science for Communication Networks (NetSciCom, INFOCOM WKSHPs)*, pages 899–904, Shanghai, China, April 2011.
- [3] Ingmar Baumgart, Thomas Gamer, Christian Hübsch, and Christoph P. Mayer. Realistic Underlays for Overlay Simulation. In *Proceedings of Workshop on OMNeT++*, Barcelona, Spain, March 2011.
- [4] Gerald G. Koch, Andreas Benzing, and Christoph P. Mayer. An Approach for Urban Sensing with Quality-Aware Situation Detection and Efficient Communication. In *Proceedings of Workshops der wissenschaftlichen Konferenz Kommunikation in verteilten Systemen (WowKiVS)*, WASA-NGI, pages 1–10, Kiel, Germany, March 2011.
- [5] Christian Hübsch, Christoph P. Mayer, Sebastian Mies, Roland Bless, Oliver P. Waldhorst, and Martina Zitterbart. ariba: Rahmenwerk für Overlay-basierte Dienste. In *Kommunikation in Verteilten Systemen (KiVS)*, Kiel, Germany, March 2011. Demo.
- [6] Christian Hübsch, Christoph P. Mayer, and Oliver P. Waldhorst. On Runtime Adaptation of Application-Layer Multicast Protocol Parameters. In *Proceedings of Networked Services and Applications Engineering, Control and Management (EUNICE)*, number 6164 in Lecture Notes in Computer Science, pages 226–235, Trondheim, Norway, June 2010. Springer.
- [7] Christian Hübsch, Christoph P. Mayer, Sebastian Mies, Roland Bless, Oliver P. Waldhorst, and Martina Zitterbart. Using Legacy Applications in Future Heterogeneous Networks with ariba. In *Proceedings of IEEE INFOCOM*, San Diego, CA, USA, March 2010. Demo.
- [8] Christian Hübsch, Christoph P. Mayer, and Oliver P. Waldhorst. User-perceived Performance of the NICE Application Layer Multicast Protocol in Large and Highly Dynamic Groups. In *Proceedings of International GI/ITG Conference on "Measurement, Modelling and Evaluation of Computing Systems" and "Dependability and Fault Tolerance" (MMB & DFT)*, pages 62–77, Essen, Germany, March 2010. Best Paper Award.
- [9] Christoph P. Mayer. Bloom Filters and Overlays for Routing in Pocket Switched Networks. In *Proceedings of ACM CoNEXT Student Workshop*, pages 43–44, Rome, Italy, December 2009.
- [10] Christian Hübsch, Christoph P. Mayer, Sebastian Mies, Roland Bless, Oliver P. Waldhorst, and Martina Zitterbart. Reconnecting the Internet with ariba: Self-Organizing Provisioning of End-to-End Connectivity in Heterogeneous Networks. In *Proceedings of ACM SIGCOMM*, pages 131–132, Barcelona, Spain, August 2009. Demo, Honorable Mention Award.

- [11] Christoph P. Mayer. Security and Privacy Challenges in the Internet of Things. In *Proceedings of KiVS Workshop on Global Sensor Networks (GSN09)*, volume 17, Kassel, Germany, March 2009.
- [12] Thomas Gamer and Christoph P. Mayer. Large-scale Evaluation of Distributed Attack Detection. In *Proceedings Workshop on OMNeT++*, pages 68:1–68:8, Rome, Italy, March 2009.
- [13] Thomas Gamer, Christoph P. Mayer, and Martina Zitterbart. Distack - A Framework for Anomaly-based Large-scale Attack Detection. In *Proceedings of International Conference on Emerging Security Information, Systems and Technologies (SECURWARE)*, pages 34–40, Cap Esterel, France, August 2008.

Presentations/Extended Abstracts/Technical Reports/Thesis

- [1] Christoph P. Mayer. *Hybrid Routing in Delay Tolerant Networks*. Dissertation, Karlsruhe Institute of Technology (KIT), Karlsruhe, Germany, October 2011. to appear.
- [2] Ingmar Baumgart, Thomas Gamer, Christian Hübsch, and Christoph P. Mayer. Realistic Underlays for Overlay Simulation. Telematics Technical Report (ISSN 1613-849X) TM-2011-1, Institute of Telematics, Karlsruhe Institute of Technology (KIT), Germany, January 2011. <http://doc.tm.uka.de/tr/TM-2011-1.pdf>.
- [3] Christoph P. Mayer and Oliver P. Waldhorst. Where the Network ends: Infrastructure and Delay Tolerant Networks in a Hybrid Future Internet. Presentation at 6. GI/ITG KuVS Fachgespräch Future Internet, Hannover, Germany, November 2010.
- [4] Christian Hübsch, Christoph P. Mayer, and Oliver P. Waldhorst. Ariba: A Framework for Developing Decentralized Services. Presentation at GI/ITG KuVS NGN Service Delivery Platforms & Service Overlay Networks, Berlin, Germany, December 2009. extended abstract.
- [5] Ralph Holz, Christoph P. Mayer, Sebastian Mies, Heiko Niedermayer, and Muhammad Adnan Tariq. SpoVNet Security Task Force Report. Telematics Technical Report TM-2009-3, Institute of Telematics, University of Karlsruhe (TH), Germany, December 2009. <http://doc.tm.uka.de/tr>, ISSN 1613-849X.
- [6] Christoph P. Mayer and Christian Hübsch. Distributed Experiment Management for Large-Scale Testbeds. Presentation at the 9th Würzburg Workshop on IP: Joint EuroNF, ITC, and ITG Workshop on Visions of Future Generation Networks (EuroView2009), Würzburg, Germany, July 2009. extended abstract.
- [7] Roland Bless, Oliver P. Waldhorst, Christoph P. Mayer, and Hans Wippel. Decentralized and Autonomous Bootstrapping for IPv6-based Peer-to-Peer Networks. Winning Paper in International IPv6 Contest by the IPv6 Council, Leipzig, Germany, May 2009.
- [8] Christoph P. Mayer, Thomas Gamer, and Martina Zitterbart. Towards Understanding the Global Behavior of DDoS Attacks - A Framework for Distributed Attack Detection and Beyond. Presentation at EURECOM Security Research Seminar, Sophia-Antipolis, France, August 2008.
- [9] Christoph P. Mayer and Oliver P. Waldhorst. Connecting Sensor Network Islands to the Future Internet using the SpoVNet Architecture. Presentation at the 8th Würzburg Workshop on IP: Joint EuroNF, ITC, and ITG Workshop on 'Visions of Future Generation Networks' (EuroView2008), Würzburg, Germany, July 2008. extended abstract.
- [10] Christoph P. Mayer and Thomas Gamer. Distack: Framework zur einfachen Entwicklung von Mechanismen zur lokalen und verteilten Angriffserkennung. Presentation at the 3. Essener Workshop "Neue Herausforderungen in der Netzsicherheit", EWNS08, Duisburg/Essen, Germany, April 2008. extended abstract.

- [11] Roland Bless, Oliver P. Waldhorst, and Christoph P. Mayer. The Spontaneous Virtual Networks Architecture for Supporting Future Internet Services and Applications. Presentation at 1st GI/ITG KuVS Meeting on Future Internet, Heidelberg, Germany, June 2008. extended abstract.
- [12] Christoph P. Mayer and Thomas Gamer. Integrating Real World Applications into OMNeT++. Telematics Technical Reports TM-2008-2, Institute of Telematics, University of Karlsruhe (TH), Germany, February 2008. <http://doc.tm.uka.de/tr>, ISSN 1613-849X.
- [13] Christoph P. Mayer. Framework zur Anomalie-basierten Angriffserkennung durch verteilte Instanzen. Master thesis, Institute of Telematics, University of Karlsruhe (TH), November 2007. Arena Thesis Award.
- [14] Thomas Gamer, Christoph P. Mayer, and Marcus Schöller. Datenschutzkonforme Anonymisierung von Datenverkehr auf einem Vermittlungssystem. Presentation at the 2. Essener Workshop "Neue Herausforderungen in der Netzsicherheit", EWNS06, Duisburg/Essen, Germany, October 2006. extended abstract.
- [15] Christoph P. Mayer. Datenschutzkonforme Anonymisierung von Datenverkehr auf einem Vermittlungssystem. Bachelor thesis, Institute of Telematics, University of Karlsruhe (TH), July 2006.

Under Submission

- [1] Christoph P. Mayer and Oliver P. Waldhorst. Routing in Hybrid Delay Tolerant Networks. under submission, available at <http://www.tm.kit.edu/~mayer/papers/tmc2011-hybridtdnrouting-submitted.pdf>.