

Dr. Alexander Clemm

Publications, Patents, and other Professional Activities

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Books and Edited Volumes

1. A. Clemm, R. Wolter (editors): *Network-Embedded Management and Applications: Understanding Programmable Networking Infrastructure*. ISBN-13: 978-1-4419-6768-1, Springer, July 2012.
2. A. Clemm, R. Wolter (editors): *Advances in Network-Embedded Management and Applications*. ISBN-13: 978-1441977526, Springer, October 2010.
3. A. Clemm, L. Granville, R. Stadler (editors): *Managing Virtualization of Networks and Services*. ISBN-13: 978-3540756934, Springer Lecture Notes in Computer Science, October 2007.
4. A. Clemm: *Network Management Fundamentals*. ISBN-10: 1-58720-137-2, ISBN-13: 978-1-58720-137-0 (softbound), ISBN-10: 1-58705-280-6, ISBN-13: 978-1-58705-280-4 (E-Book), Pearson/ Cisco Press, Indianapolis, Indiana/ USA, November 2006.
Also translated into Chinese: *网络管理技术架构*. ISBN-13: 978-7-115-16936-5, Posts and Telecommunications Press, China, January 2008.
5. Clemm, O. Festor, A. Pras (editors): *Integrated Network Management IX- Managing New Networked Worlds*. ISBN 0-7803-9087-3 (casebound), 0-7803-9088-1 (CD-ROM), IEEE, May 2005.
6. A. Clemm: *Modellierung und Handhabung von Beziehungen zwischen Management-objekten im OSI-Netzmanagement*. ISBN 3-8265-0197-7, Shaker Verlag, Aachen, Germany, 1994. (Dissertation)

Peer-Reviewed Publications

1. M. Chandramouli, A. Clemm: *Model-Driven Analytics in SDN Networks*. IFIP/IEEE International Symposium on Integrated Network Management (IM 2017), Lisbon, Portugal, May 2017.
2. M Uddin, R. Stadler, A. Clemm: *Spatial Search in Networked Systems*. 11th International Conference on Network and Service Management (CNSM 2015), Barcelona, Spain, November 2015.
3. A. Clemm, M. Chandramouli, S. Krishnamurthy: *DNA: A Distributed SDN Framework for Distributed Network Analytics*. IFIP/IEEE International Symposium on Integrated Network Management (IM 2015), Ottawa, Canada, May 2015.
4. A. Clemm et al: *DNA: A Distributed SDN Framework for Distributed Network Analytics (Demo Paper)*. IFIP/IEEE International Symposium on Integrated Network Management (IM 2015), Ottawa, Canada, May 2015.
5. J. Nobre, L. Granville, A. Clemm, A. Gonzalez. *On the Use of Traffic Information to Improve the Coordinated P2P Detection of SLA Violations*. 28th IEEE International Conference on Advanced Information Networking and Applications (AINA 2014), Victoria, Canada, May 2014.
6. M Uddin, R. Stadler, A. Clemm: *Scalable Matching and Ranking for Network Search*. 9th International Conference on Network and Service Management (CNSM 2013), Zürich, Switzerland, October 2013.

7. J. Nobre, L. Granville, A. Clemm, A. Gonzalez Prieto. *Coordination in P2P Management Overlays to Improve Decentralized Detection of SLA Violations*. IEEE International Conference on Communications (ICC 2013), Budapest, Hungary, June 2013.
8. M Uddin, R. Stadler, A. Clemm: *A Query Language for Network Search*. IFIP/IEEE International Symposium on Integrated Network Management (IM 2013), Ghent, Belgium, May 2013.
9. M. Uddin, A. Skinner, R. Stadler, A. Clemm: *Real-time search in clouds*. Demonstration Paper, IFIP/IEEE International Symposium on Integrated Network Management (IM 2013), Gent, Belgium, May 2013.
10. J. Campos Nobre, L. Granville, A. Clemm, A. Gonzalez Prieto: *Decentralized Detection of SLA Violations Using P2P Technology*. 8th International Conference on Network and Service Management (CNSM 2012), Las Vegas/Nevada, USA, October 2012.
11. M. Uddin, R. Stadler, A. Clemm: *Network Management by Network Search*. The 8th Swedish National Computer Networking Workshop 2012, Stockholm, Sweden, June 2012.
12. M. Uddin, R. Stadler, A. Clemm: *Management by Network Search*. IEEE/IFIP Network Operations and Management Symposium (NOMS 2012), Maui/Hawaii, USA, April 2012.
13. E. Magana, M. Hasan, A. Clemm, S. Gudreddi: *Autonomic Cloud Resource Scaling*. IEEE/IFIP International Workshop on Cloud Management (CloudMan), Maui/Hawaii, USA, April 2012
14. A. Clemm, M. Hartwig: *NETradamus – A Forecasting System for System Event Messages*. IEEE/IFIP Network Operations and Management Symposium (NOMS 2010), Osaka, Japan, April 2010.
15. F. Wuhib, M. Dam, R. Stadler, A. Clemm: *Robust Monitoring of Network-Wide Aggregates through Gossiping*. IEEE Transactions on Network and Service Management (TNSM), Vol. 6 No. 2, June 2009.
16. A. Clemm, L. Zambenedetti Granville, R. Stadler: *Shaping the Network Management Research Agenda – A Report on DSOM 2007*. Journal of Network and Systems Management Vol. 16 No. 2, Springer, New York, June 2008
17. F. Wuhib, M. Dam, R. Stadler, A. Clemm: *Robust Monitoring of Network-Wide Aggregates through Gossiping*. IFIP/IEEE International Symposium on Integrated Network Management (IM 2007), Munich, Germany, May 2007.
18. F. Wuhib, R. Stadler, A. Clemm: *Decentralized Service Level Monitoring Using Network Threshold Crossing Alerts*. IEEE Communications Magazine Vol. 44 No. 10, October 2006.
19. F. Wuhib, R. Stadler, A. Clemm: *Implementation and Evaluation of a Protocol for Detecting Network-Wide Threshold Crossing Alerts*. Fourth IFIP/IEEE Workshop on End-to-End Monitoring Techniques and Services (E2EMON), Vancouver, Canada, April 2006.
20. R. Stadler, F. Wuhib, M. Dam, A. Clemm: *Decentralized Computation of Threshold Crossing Alerts*. IFIP/IEEE International Workshop on Distributed Systems: Operations and Management (DSOM 2005), Barcelona, Spain, October 2005.
21. A. Clemm, O. Festor, A. Pras: *Managing New Networked Worlds – A Report on IM 2005*. Journal of Network and Systems Management, Springer Science + Business Media B.V. (formerly Kluwer Academic Publishers B.V.), Vol. 13 No 3, pp. 351-354, September 2005.

22. O. Dini, M. Moh, A. Clemm: *Web Services: Self-Adaptable Trust Mechanisms*. IARIA Workshop on E-Learning on Telecommunications (ELETE) 2005, Lisbon, Portugal, July 2005.
23. P. Dini, L. Logrippo, A. Clemm, T. Gray, S. Reiff-Marganiec, F. J. Lin: *Policy-Enabled Mechanisms for Feature Interactions: Reality, Expectations, Challenges*. Computer Networks, Special Issue on Directions in Feature Interactions Research, Vol. 45 No 5, August 2004.
24. M. Cheung, A. Clemm, G. Lin, A. Rayes: *Applying a Service On Demand Policy Management Framework to an ETTx Environment*. IEEE/IFIP 2004 Network Operations and Management Symposium (NOMS 2004), Seoul, Korea, 20 April 2004.
25. A. Clemm, F. Shen, V. Lee: *Generic Provisioning for Diverging Services – A Close Encounter with Service Profiles*. Computer Networks, Special Issue on Service Management, Elsevier Publishers, Vol 43 No 1, September 2003.
26. A. Clemm, A. Bansal: *Auto-Discovery at the Network and Service Management Layer*. Proceedings IEEE/IFIP 2003 International Symposium on Integrated Management (IM 2003), Colorado Springs, Colorado/USA, March 2003.
27. A. Clemm, A. Prasad: *Managing Large-Scale H.323 and MGCP Voice Networks*. Proceedings TMF TeleManagement World, Las Vegas, Nevada/USA, October 2002.
28. A. Clemm, P. Leung: *Model-Driven Open Packet Telephony Management*. Proceedings IEEE/IFIP 2002 Network Operations and Management Symposium (NOMS 2002), Florence, Italy, April 2002.
29. F. Shen, A. Clemm: *Profile-Based Subscriber Service Provisioning*. Proceedings IEEE/IFIP 2002 Network Operations and Management Symposium (NOMS 2002), Florence, Italy, April 2002.
30. J. Tjong, P. Bettadapur, A. Clemm: *Provisioning Voice Over Packet Networks: A Metadata Driven, Service Object Based Approach*. Proceedings IEEE/IFIP 2001 International Workshop on Distributed Systems: Operations and Management (DSOM 2001), Nancy, France, October 2001.
31. P. Bettadapur, A. Clemm, A. Bedoyan: *Next Generation Network Management for Voice over Packet Networks*. Proceedings TMF TeleManagement World, Las Vegas, Nevada/USA, October 2001.
32. A. Clemm, P. Bettadapur: *Building Management Solutions for Open Packet Telephony Networks*. Proceedings IEEE/IFIP 2001 International Symposium on Integrated Network Management (IM 2001), Seattle, Washington/USA, May 2001.
33. A. Bedoyan, A. Clemm: *Experiences with the Integration of a Legacy Management System into a TMN Environment*. Proceedings IEEE/IFIP 1998 Network Operations and Management Symposium (NOMS 98), New Orleans, Louisiana/USA, February 1998.
34. A. Clemm, A. Bedoyan: *TMN Information Models for the Management of Access Networks: A Practical Perspective*. IEC Communications Forum at SUPERCOMM'97, New Orleans, Louisiana/USA, June 1997.
35. A. Clemm: *SNMP and TL-1: Simply Integrating Management of Legacy Systems?* Proceedings 5th IEEE/IFIP International Symposium on Integrated Network Management (IM 97), San Diego, California/USA, May 1997.
36. A. Clemm: *Management Protocols and their Tradeoffs – CMIP, SNMP, and TL-1*. IEC

Communications Forum at SUPERCOMM'96, Dallas, Texas/USA, June 1996.

37. A. Clemm: *Adding Value to MIBs: A Relationship Layer for Management Platforms*. International Journal of Network Management, Volume 5 Nr. 3, Wiley, New York, New York/USA, May/June 1995.
38. B. Bär, A. Clemm: *Testing of Relationships in an OSI Management Information Base*. Proceedings 4th IEEE/IFIP International Symposium on Integrated Network Management (ISINM 95), Santa Barbara, California/USA, May 1995.
39. A. Clemm, O. Festor: *Behavior, Documentation, and Knowledge: An Approach for the Treatment of OSI Behavior*. 4th IEEE/IFIP International Workshop on Distributed Systems: Operations and Management (DSOM 93), Long Branch, New Jersey/USA, October 1993.
40. A. Clemm: *Incorporating Relationships into OSI Management Information*. 2nd IEEE Network Management and Control Workshop, Tarrytown, New York/USA, September 1993.

Also published in: *Network Management and Control Vol. 2*, I. Frisch, M. Malek, S. Panwar (eds.), Plenum Press, New York, New York/USA 1994.

41. S. Abeck, A. Clemm, U. Hollberg: *Simply Open Network Management - An Approach for the Integration of SMP into OSI Management Concepts*. Proceedings 3rd IEEE/IFIP International Symposium on Integrated Network Management (ISINM 93), San Francisco, California/USA, April 1993.
42. B. Bär, D. Brunn, A. Clemm, J. Dinger, W. Filip, U. Hollberg, D. Jordaan, G. Kar, K.-P. Keilmann, M. Paterok: *An ISO/OSI Based Prototype for Fault Correlation in Heterogeneous Networks - Design and Experiences*. IEEE First International Workshop on Systems Management, Los Angeles, California/USA, April 1993.
43. B. Schott, A. Clemm, U. Hollberg: *An ISO/OSI Based Approach for Modeling Heterogeneous Networks*. Proceedings 4th IFIP International Conference on Information Networks and Data Communication (INDC 92), Espoo, Finland, March 1992.

Also published as IBM ENC Technical Report No. 43.9204, IBM Heidelberg, 1992.

44. A. Clemm, B. Schott: *Ein ISO/OSI-basierter Ansatz zur Modellierung von Netzen und Netzbeziehungen*. Workshop Entwicklungstendenzen in Rechnernetzen, Ausgewählte Beiträge Band 1, Technische Universität Dresden, Dresden, Germany, November 1991.

Magazine publication without peer review:

45. A. Böttcher, A. Clemm: *Geschlossene Gesellschaft – Corporate Networks: Realisierung, Betrieb und Nutzen*. Gateway 1/96, Heise Verlag, Munich, Germany, January 1996.

Issued Patents

1. A. Clemm, W. Dec: *Automating monitoring using configuration event triggers in a network environment*. US Patent 9,531,589, issued 27 December 2016.
2. A. Clemm, E. Dorman, S. Chang, G. Mokashi: *Visualization of performance data over a network path*. US Patent 9,489,279, issued 8 November 2016.
3. B. Klausner, A. Clemm: *Autonomic network sentinels*. US Patent 9,450,819, issued 20 September 2016.

4. A. Clemm, D. Famula: *System and method for provisioning connections as a distributed digital cross-connect over a packet network*. US Patent 9,252,971, issued 15 March 2016.
5. E. Tychon, A. Clemm: *Autonomous performance probing*. US Patent 9,231,844, issued 5 January 2016. (Continuation Patent to 8,751,619)
6. A. Clemm, T. Jiang, A. Akhter, S. Chang, S. Lin: *Performing path-oriented systems management*. US Patent 8,995,266, issued 31. March 2015.
7. A. Clemm, J. Tjong: *Application of an embedded instrumentation interface definition language*. US Patent 8,954,998, issued 10 February 2015. (Continuation Patent to 8,255,932)
8. S. Chang, S. Lin, J. Yan, Y. Zhao, A. Clemm: *Adaptive cross-network message bandwidth allocation by message servers*. US Patent 8,948,010, issued 3 February 2015. (Continuation Patent to 8,305,895)
9. A. Clemm, A. Gonzalez Prieto: *Method and apparatus for efficient decentralized information dissemination in a network*. US Patent 8,908,565, issued 9 December 2014.
10. A. Clemm, J. Yang, S. Chang, J. Zhao, S. Lin: *Self-restarting network devices*. US Patent 8,868,897, issued 21 October 2014. (Continuation Patent to 8,156,319)
11. A. Clemm, E. Dorman, S. Chang, G. Mokashi: *Visualization of changes and trends over time in performance data over a network path*. US Patent 8,850,324, issued 30 September 2014.
12. A. Clemm, T. Jiang, S. Chang, S. Lin: *Continuous and autonomous monitoring of systems along a path*. US Patent 8,838,781, issued 16 September 2014.
13. A. Athreya, A. Clemm, J. Tjong, P. Sanampudi: *Translating an object-oriented data model to a YANG data model*. US Patent 8,838,653, issued 16 September 2014.
14. E. Tychon, A. Clemm: *Autonomous performance probing*. US Patent 8,751,619, issued 10 June 2014.
15. A. Clemm, N. Pai, R. Rohit, Z. Blaszczyk: *Method and system for creating an overlay structure for management information bases*. US Patent 8,589,589, issued 19 November 2013. (Continuation Patent to 7,904,588)
16. S. Chang, S. Lin, J. Yan, Y. Zhao, A. Clemm: *Adaptive cross-network message bandwidth allocation by message servers*. US Patent 8,305,895, issued 6 November 2012.
17. B. Pithawala, A. Clemm: *Method and apparatus providing device-initiated network management*. US Patent 8,291,072, issued 16 October 2012. (Continuation Patent to 7,856,493)
18. A. Clemm, K. Narayan, K. McCloghrie: *Tracking policy decisions in a network*. US Patent 8,266,088, issued 11 September 2012.
19. S. Chang, A. Clemm, P. Dini, S. Lin: *Techniques for sequencing syslog messages*. US Patent 8,260,980, issued 4 September 2012.
20. P. Dini, A. Clemm, C. Dini, M. Popescu: *Method and system to generate execution-based scheduling signature for an application*. US Patent 8,255,535, issued 28 August 2012.
21. A. Clemm, J. Tjong: *Application of an embedded instrumentation interface definition language*. US Patent 8,255,932, issued 28 August 2012.

22. A. Clemm, C. Dini, P. Dini, M. Popescu: *Method and system for processing directives included in management events*. US Patent 8,180,883, issued 15 May 2012.
23. A. Clemm, J. Yang, S. Chang, J. Zhao, S. Lin: *Self-restarting network devices*. US Patent 8,156,319, issued 10 April 2012.
24. A. Clemm, D. Famula: *A method and apparatus for provisioning a non-switched packet voice network as a distributed digital cross-connect*. US Patent 8,150,018, issued 3 April 2012.
25. A. Clemm, C. Pignataro, R. Dunn, S. Chang, S. Lin: *Adaptively collecting network event forensic data*. US Patent 8,032,779, issued 4 October 2011.
26. B. Claise, A. Clemm: *Periodic exporting of information over a flow protocol*. US Patent 7,941,529, issued 10 May 2011.
27. A. Clemm, N. Pai, R. Rohit, Z. Blaszczyk: *Method and system for creating an overlay structure for management information bases*. US Patent 7,904,588, issued 8 March 2011.
28. B. Pithawala, A. Clemm: *Method and apparatus providing device-initiated network management*. US Patent 7,856,493, issued 21 December 2010.
29. A. Clemm, P. Leung, P. Bettadapur, H. Trevino: *Managing packet voice networks using a virtual switch approach*. US Patent 7,821,965, issued 26 October 2010. (Continuation Patent to 7,126,941)
30. A. Clemm, P. Dini, C. Dini: *Improving event reliability and latency for rate limited devices*. US Patent 7,792,036, issued 7 September 2010.
31. S. Chang, A. Clemm, J. Yang, J. Zhao, S. Lin: *Improving system diagnostics with dynamic contextual information of events*. US Patent 7,752,504, issued 6 July 2010.
32. A. Clemm, J. Tjong, E. Yedavalli: *Method and system for creating Management Information Base specifications*. US Patent 7,734,588, issued 8 June 2010.
33. M. Hasan, A. Clemm, P. Dini: *Method and apparatus for correlating events in a network*. US Patent 7,631,222, issued 8 December 2009.
34. A. Clemm, P. Dini: *Method and apparatus for providing instant trend indication from network devices*. US Patent 7,562,140, issued 14 July 2009.
35. R. Tayi, A. Clemm, F. Shen, P. Dini, R. Sridar: *Method for providing views of a managed network that uses network address translation*. US Patent 7,502,847, issued 10 March 2009.
36. A. Clemm, P. Leung, Z. Blaszczyk, E. Yedavalli, S. Thombare: *Managing H.323-based VoIP networks using a virtual entity approach*. US Patent 7,466,710, issued 16 December 2008.
37. A. Clemm, A. Bansal, P. Bettadapur: *Automatically discovering management information about services in a communications network*. US Patent 7,293,080, issued 6 November 2007.
38. A. Clemm, P. Leung, P. Bettadapur, H. Trevino: *Managing packet voice networks using a virtual switch approach*. US Patent 7,126,941, issued 24 October 2006.
39. A. Clemm: *Elimination of clipping associated with VAD-directed silence suppression*. US Patent 6,865,162, issued 8 March 2005.

20+ more patents filed (pending)

Standardization

IETF RFCs

1. IETF RFC 7923: E. Voit, A. Clemm, A. Gonzalez Prieto: *Requirements for Subscriptions to YANG Datastores*. Informational Track RFC, June 2016.
2. IETF RFC 7575: M. Behringer, M. Pritikin, S. Bjarnason, A. Clemm, B. Carbenter, S. Jiang, L. Ciavaglia: *Autonomic Networking: Definitions and Design Goals*. Informational Track RFC, June 2015.
3. IETF RFC 6812: M. Chiba, A. Clemm, S. Medley, J. Salowey, S. Thombare, E. Yedavalli: *Cisco Service Level Assurance Protocol*. Informational Track RFC, January 2013.
4. IETF RFC 5848: J. Kelsey, J. Callas, A. Clemm: *Signed Syslog Messages*. Standards Track RFC, IETF, May 2010.
5. IETF RFC 5676: J. Schoenwaelder, A. Clemm, A. Karmakar: *Definitions of Managed Objects for Mapping SYSLOG Messages to Simple Network Management Protocol (SNMP) Notifications*. Standards Track RFC, October 2009.

Internet Drafts (Adopted Working Group Drafts)

6. A. Clemm, J. Medved, T. Tkacik, R. Varga, N. Bahadur, H. Ananthakrishnan, X. Liu: *A YANG Data Model for Network Topologies*. Standards Track, draft-ietf-i2rs-yang-network-topo-16, September 2017.
7. A. Clemm, J. Medved, R. Varga, T. Tkacik, X. Liu, I. Bryskin, A. Guo, H. Ananthakrishnan, N. Bahadur, V. Beeram: *A YANG Data Model for Layer 3 Topologies*. Standards Track, draft-ietf-i2rs-yang-l3-topo-11, September 2017.
8. E. Voit, A. Clemm, A. Gonzalez Prieto, E. Nilsen-Nygaard, A. Tripathy: *Custom Subscription to Event Notifications*. Standards Track, draft-ietf-netconf-subscribed-notifications-05, October 2017.
9. A. Clemm, A. Gonzalez Prieto, E. Voit, A. Tripathy, E. Nilsen-Nygaard: *Subscribing to YANG Datastore Push Updates*. Standards Track, draft-ietf-netconf-yang-push-10, October 2017.
10. E. Voit, A. Clemm, A. Tripathy, E. Nilsen-Nygaard, A. Gonzalez Prieto: *Restconf and HTTP Transport for Event Notifications*. Standards Track, draft-ietf-netconf-restconf-notif-03, August 2017.
11. A. Gonzalez Prieto, A. Clemm, E. Voit, A. Tripathy, E. Nilsen-Nygaard: *NETCONF Support for Event Notifications*. Standards Track, draft-ietf-netconf-netconf-event-notifications-05, October 2017.
12. G. Zheng, T. Zhou, A. Clemm: *UDP Based Publication Channel for Streaming Telemetry*. draft-ietf-netconf-udp-pub-channel-00, September 2017.
13. J. Nobre, L. Granville, A. Clemm, A. Gonzalez Prieto: *Autonomic Networking Use Case for Distributed Detection of SLA Violations*. draft-irtf-nmrg-autonomic-sla-violation-detection-11, September 2017.

Internet Drafts (Individual Submissions)

14. E. Voit, A. Clemm: *Subscription and Notifications Overview*. draft-voit-netconf-subscription-and-notif-overview-00, September 2017.
15. A. Clemm, Y. Qu, J. Tantsura: *Discrepancy Detection Between NMDA Datastores*. draft-clemm-netconf-nmda-diff-00, October 2017.
16. P. Pillay-Esnault, A. Clemm, D. Farinacci, D. Meyer: *Requirements for Generic Identity Services in Identity Enabled Networks*. draft-padma-ideas-req-grids-01, July 2017.
17. U. Chunduri, A. Clemm, M. Menth: *Identity Use Cases in IDEAS*. draft-ccm-ideas-identity-use-cases-02, October 2017.
18. A. Clemm, P. Pillay-Esnault: *Information Elements for Identity-Enabled Networks*. draft-clemm-ideas-ipfix-00, July 2017.

Invited Talks – Keynotes und Panels

1. *Analytics for Big Data on Clouds – Hype or Reality?* Panel, IFIP/IEEE International Symposium on Integrated Management (IM), Lisbon, Portugal, 10 May 2017.
2. *Managing Hyperconnected Entities – But How?* Panel, IFIP/IEEE Network Operations and Management Symposium (NOMS), Istanbul, Turkey, 27 April 2016.
3. *Can We Manage “Everything”? Management Implications of IoT, IoE, IoX*. Distinguished Experts Panel, IFIP/IEEE International Symposium on Integrated Management (IM), Ottawa, Canada, 14 May 2015.
4. *Bridging Network Management and Software-Defined Networking*. Panel, IFIP/IEEE Network Operations and Management Symposium (NOMS), Krakow, Poland, 8 May 2014.
5. *On the Road towards Autonomous, Collaborating Networks: Trends and Advances in Network Manageability*. Keynote, US-Taiwan High Tech Forum 2010, Santa Clara, California/USA, 2 October 2010.
6. *New Trends in Intelligent Manageability Instrumentation*. Keynote, 28th Brazilian Symposium on Computer Networks and Distributed Systems (SBRC 2010), Gramado, Brazil, 25 May 2010.
7. *Programmable Networks – Networking Game Changer or DOA?* Panel, IEEE/IFIP Network Operations and Management Symposium (NOMS), Osaka, Japan, 22 April 2010.
8. *Self-Management and Cloud Computing*. Panel, IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO), San Francisco, California/USA, 14 September 2009.
9. *Making Management Matters Matter*. Distinguished Experts Panel, IFIP/IEEE International Symposium on Integrated Network Management (IM), Long Island, New York/USA, June 2009.
10. *The Evolution of Management Patterns*. Opening Keynote, IEEE/IFIP CNSM (former Manweek) 2006, Dublin, Ireland, 23 October 2006.
11. *Autonomous Systems and Self-Management: Hype or Reality?* Expert panel, IARIA International Conference on Networking and Services (ICNS), Santa Clara, California/USA,

21 July 2006.

12. *Management Metrics – How Do We Know that Management Is Working?* Panel, IFIP/IEEE Network Operations and Management Symposium (NOMS), Vancouver, Canada, 6 April 2006.
13. *Managing New Networked Worlds – Dealing with Their Complexity and Keeping Them Manageable.* Distinguished Experts Panel, IFIP/IEEE International Symposium on Integrated Network Management (IM), Nice, France, 18 May 2005.
14. *Self-Management and Self-Adaptability: The End of Management?* Expert Panel “Internet, Grid, Self-Adaptability and Beyond: Are We Ready”, Workshop on Self-Adaptable and Autonomic Computing (SAACS 2004) in conjunction with 15th International Conference on Database and Expert System Applications (DEXA), Zaragoza, Spain, 2 September 2004.
15. *Self-Managing Systems.* Expert Panel “Self-Managing Systems”, IFIP/IEEE 2003 Workshop on Distributed Systems Operations and Management (DSOM), Heidelberg, Germany, 21 October 2003.
16. *Feature Interaction in Service Provisioning.* Expert Panel “Policy-Enabled Mechanisms for Feature Interaction: Reality, Expectation, Challenges”, Seventh International Workshop on Feature Interactions in Telecommunications and Software Systems (FIW’03), Ottawa, Canada, 12 June 2003.
17. *Is the Internet Ready for Multimedia?* Expert Panel, IFIP/IEEE 2002 Management of Multimedia Networks and Services (MMNS), Santa Barbara, California/USA, 8 October 2002.

Editorial Boards and Conference Organizing Committees

1. Steering Committee, IEEE/IFIP Network and Operations Management Symposium (NOMS) and International Symposium on Integrated Network Management (IM) (since 2007).
2. Editorial Board, *IEEE Transactions on Network and Service Management (TNSM)*, IEEE (2010-2011 and since 2015).
3. Editorial Board, *International Journal of Network Management*, Wiley (since 2009).
4. Guest Editor, *IEEE Communications Magazine*, Feature Topic on *Advances in Networking Software*, June 2017.
5. Co-Chair, Keynote Program and member of Organizing Committee, *IEEE Conference on Network Softwarization (IEEE Netsoft)*, Montreal, Canada, June 2018.
6. Co-Chair, Technical Program Committee and member of Organizing Committee, *IEEE Conference on Network Softwarization (IEEE Netsoft)*, Bologna, Italy, July 2017.
7. Co-Chair, Workshops and member of Organizing Committee, *IFIP/IEEE International Symposium on Integrated Management (IM)*, Lisbon, Portugal, May 2017.
8. Co-Chair, Panel Program and member of Organizing Committee, *IFIP/IEEE International Symposium on Integrated Management (IM)*, Ottawa, Canada, May 2015.
9. Co-Chair, Experience Program and member of Organizing Committee, *IFIP/IEEE Network Operations and Management Symposium (NOMS)*, Krakow, Poland, May 2014.

10. General Co-Chair, *IEEE/IFIP International Symposium on Integrated Network Management (IM 2013)*, Ghent, Belgium, May 2013.
11. Co-Chair, Application Session Program and member of Organizing Committee, *IFIP/IEEE Network Operations and Management Symposium (NOMS)*, Maui, Hawaii/USA, April 2012.
12. General Co-Chair, *2nd International Workshop on Network Embedded Management and Applications (NEMA)*, technically cosponsored by IEEE and IFIP, Paris, France, October 2011.
13. Co-Chair, Application Session Program, Co-Chair, Cloud Management Track and member of Organizing Committee, *IFIP/IEEE International Symposium on Integrated Management (IM)*, Dublin, Ireland, May 2011.
14. General Co-Chair, *1st International Workshop on Network Embedded Management and Applications (NEMA)*, technically sponsored by IEEE and IFIP, Niagara Falls, Canada, October 2010.
15. Co-Chair, Panel Program and member of Organizing Committee, *IFIP/IEEE Network Operations and Management Symposium (IM)*, Osaka, Japan, April 2010.
16. Co-Chair, Keynotes und Distinguished Experts Panel, and member of Organizing Committee, *IFIP/IEEE International Symposium on Integrated Management (IM)*, New York, New York/USA, June 2009.
17. Member of Organizing Committee, *IFIP/IEEE Network Operations and Management Symposium (NOMS)*, Salvador Bahia, Brazil, April 2008.
18. General Co-Chair, *IEEE Conference on Network and Service Management (CNSM, former Manweek)*, Silicon Valley, California/USA, October 2007.
19. General Co-Chair, *IFIP/IEEE Distributed Systems: Operations and Management (DSOM)*, Silicon Valley, California/USA, October 2007.
20. Co-Chair, Application Program and member of Organizing Committee, *IFIP/IEEE International Symposium on Integrated Management (IM)*, Munich, Germany, May 2007.
21. Co-Chair, Panel Program and member of Organizing Committee, *IFIP/IEEE Network Operations and Management Symposium (NOMS)*, Vancouver, Canada, April 2006.
22. Co-Chair, Technical Program Committee and member of Organizing Committee, *IFIP/IEEE 2005 International Symposium on Integrated Management (IM)*, Nice, France, May 2005.

Technical Program Committees

1. IFIP/IEEE Network Operations and Management Symposium (NOMS) – since 2000
 - a. Taipei, Taiwan, April 2018
 - b. Istanbul, Turkey, April 2016
 - c. Krakow, Poland, April 2014
 - d. Maui, Hawaii/USA, April 2012
 - e. Osaka, Japan, April 2010
 - f. Salvador Bahia, Brazil, April 2008
 - g. Vancouver, Canada, April 2006
 - h. Seoul, Korea, April 2004
 - i. Florence, Italy, April 2002

- j. Honolulu, Hawaii/USA, April 2000
- 2. IFIP/IEEE International Symposium on Integrated Network Management (IM) – since 2001
 - a. Lisbon, Portugal, May 2017
 - b. Ottawa, Canada, May 2015
 - c. Ghent, Belgium, May 2013
 - d. Dublin, Ireland, May 2011
 - e. New York, New York/USA, June 2009
 - f. Munich, Germany, May 2007
 - g. Nice, France, May 2005
 - h. Colorado Springs, Colorado/USA, March 2003
 - i. Seattle, Washington/USA, May 2001
- 3. DFN-Forum Kommunikationstechnologien – Verteilte Systeme im Wissenschaftsbereich – since 2008
 - a. Günzburg, Germany, June 2018
 - b. Berlin, Germany, May 2017
 - c. Rostock, Germany, May 2016
 - d. Luebeck, Germany, June 2015
 - e. Fulda, Germany, June 2014
 - f. Erlangen, Germany, June 2013
 - g. Regensburg, Germany, May 2012
 - h. Bonn, Germany, May 2011
 - i. Konstanz, Germany, May 2010
 - j. München, Germany, May 2009
 - k. Kaiserslautern, Germany, May 2008
- 4. International Conference on Network and Service Management (CNSM – former Manweek), technically sponsored by IEEE and IFIP – since 2010
 - a. Tokyo, Japan, November 2017
 - b. Montreal, Canada, November 2016
 - c. Barcelona, Spain, October 2015
 - d. Rio de Janeiro, Brazil, October 2014
 - e. Zürich, Switzerland, October 2013
 - f. Las Vegas, Nevada/USA, October 2012
 - g. Paris, France, October 2011
 - h. Niagara Falls, Canada, October 2010
- 5. IEEE Conference on Network Softwarization (NetSoft) – since 2015
 - a. Montreal, Canada, June 2018
 - b. Bologna, Italy, July 2017
 - c. Seoul, Korea, June 2016
 - d. London, United Kingdom, April 2015
- 6. IEEE/IFIP International Workshop on Management of the Future Internet (ManFI) – 2009-2016
 - a. Istanbul, Turkey, May 2016
 - b. Ottawa, Canada, May 2015
 - c. Krakow, Poland, May 2014
 - d. Ghent, Belgium, May 2013
 - e. Maui, Hawaii/USA, April 2012
 - f. Dublin, Ireland, May 2011
 - g. Osaka, Japan, April 2010

- h. New York, New York/USA, June 2009
- 7. IEEE International Conference on Self-Adaptive and Self-Organizing Systems (SASO) – 2007-2012
 - a. Lyon, France, September 2012
 - b. Ann Arbor, Michigan/USA, September 2011
 - c. Budapest, Ungarn, September 2010
 - d. San Francisco, California/USA, September 2009
 - e. Venedig, Italy, October 2008
 - f. Boston, Massachusetts/USA, July 2007
- 8. Eight IEEE International Conference on Collaborative Computing (COLLABCOM), Pittsburgh, Pennsylvania/USA, October 2012.
- 9. International Workshop on Self-Organizing Systems (IWSOS) – 2008 - 2011
 - a. Karlsruhe, Germany, February 2011
 - b. Zürich, Switzerland, December 2009
 - c. Vienna, Austria, December 2008
- 10. IFIP/IEEE International Workshop on Distributed Systems Operations and Management (DSOM) – 2001-2009
 - a. Venice, Italy, October 2009
 - b. Samos, Greece, September 2008
 - c. San Jose, California/USA, October 2007
 - d. Dublin, Irleand, October 2006
 - e. Barcelona, Spain, October 2005
 - f. Davis, California/USA, November 2004
 - g. Heidelberg, Germany, October 2003
 - h. Montreal, Canada, October 2002
 - i. Nancy, France, October 2001
- 11. IEEE Workshop on IP Operations and Management (IPOM) – 2002-2009
 - a. Venice, Italy, October 2009
 - b. Samos, Greece, September 2008
 - c. San Jose, California/USA, November 2007
 - d. Dublin, Irleand, October 2006
 - e. Barcelona, Spain, October 2005
 - f. Beijing, China, October 2004
 - g. Kansas City, Missouri/USA, October 2003
 - h. Dallas, Texas/USA, October 2002
- 12. IFIP/IEEE International Conference on Mobile and Multimedia Networks and Services (MMNS) – 2003-2009
 - a. Venice, Italy, October 2009
 - b. Samos, Greece, September 2008
 - c. San Jose, California/USA, November 2007
 - d. Dublin, Ireland, October 2006
 - e. Barcelona, Spain, October 2005
 - f. San Diego, California/USA, October 2004
 - g. Belfast, Northern Ireland/UK, September 2003
- 13. IEEE Globecom – Next Generation Networks Protocols and Services Symposium, New Orleans/ LA, November/December 2008.
- 14. Second IEEE Workshop on Autonomic Communications and Network Management (ACNM), Salvador Bahia, Brazil, April 2008.

15. IEEE International Conference on Communications (ICC) – 2005-2007
 - a. Network Services and Operations Symposium, Glasgow, Schottland/UK, June 2007.
 - b. Next Generation Mobile Networks Symposium, Istanbul, Turkei, June 2006.
 - c. Symposium on Next Generation Networks for Universal Services, Seoul, Korea, May 2005.
16. First IEEE Workshop on Autonomic Communications and Network Management (ACNM), Munich, Germany, May 2007.
17. 2006 International Conference on Self-Organization and Autonomic Systems in Computing and Communications (SOAS), Erfurt, Germany, September 2006.
18. International Conference on Wireless Information Networks and Systems (Winsys) 2006, Setubal, Portugal, August 2006.
19. First IEEE Workshop on VoIP Management and Security (VoIP MaSe), Vancouver, Canada, April 2006.
20. DEXA 2005 International Workshop on Self-Adaptive and Autonomic Computing Systems (SAACS), Copenhagen, Denmark, August 2005.
21. First International Workshop on Service Assurance with Partial and Intermittent Resources (SAPIR), Fortaleza, Brazil, August 2004.
22. IEC Communications Forum at SUPERCOMM'97, New Orleans, Louisiana/USA, June 1997.

Teaching

Adjunct Professor at the Faculty for Computer Engineering, Santa Clara University , Santa Clara, California/USA (since 2008).

Class “Network Management”
(COEN 234, 2 Units, Graduate Computer Engineering Program) since 2008:

- Winter 2017
- Winter 2016
- Winter 2015
- Winter 2014
- Winter 2013
- Winter 2012
- Winter 2011
- Winter 2010
- Fall 2008

Tutorials

- *Programmable Cloud Computing and Networking* (with M. Hasan, H. Dumcke). Tutorial, IFIP/IEEE International Symposium on Integrated Management (IM), Ghent, Belgium, 31 May 2013.
- *Device Instrumentation for Performance Monitoring and Its Applications in Service Level Management* (with R. Wolter). Tutorial, 28th Brazilian Symposium on Computer Networks

and Distributed Systems (SBRC 2010), Gramado, Brazil, 25 May 2010.

Earlier version of the same tutorial: IFIP/IEEE International Symposium on Integrated Network Management (IM), Long Island, New York/USA, 5 June 2009.

Earlier version of the same tutorial: IFIP/IEEE Network Operations and Management Symposium (NOMS), Salvador Bahia, Brazil, April 2008.

- *Rethinking Manageability – Advances in the Management of IP Networks* (with G. Lin). Tutorial, IFIP/IEEE 2004 Network Operations and Management Symposium (NOMS), Seoul, Korea, 21 April 2004.

Also given at: First International Conference on E-Business and Telecommunications Networks (ICETE), Setubal, Portugal, 28 August 2004.

Other Professional Activities, Prizes

- Applied Networking Research Prize 2014, Internet Research Task Force (IRTF), awarded for: M Uddin, R. Stadler, A. Clemm: *Scalable Matching and Ranking for Network Search*, 9th International Conference on Network and Service Management (CNSM 2013).
- Member of PhD Committee, Stefan Hommes, Universität Luxemburg, Luxemburg, March 2014.
- Appointment for *External Expert Evaluation Panel of INRIA's Network and Telecommunications Theme*, Rungis, France, March 2012.
- Cisco Pioneer Award 2011.
- Member of PhD Committee Alberto Gonzalez Prieto, KTH Stockholm, Sweden, November 2008.
- Member of Advisory Board *European Network of Excellence for the Management of Internet Technologies and Complex Services (EMANICS)* (2006-2010).
- Technical Editor – B. Claise, R. Wolter: *Network Management: Accounting and Performance Strategies*. Pearson/ Cisco Press, Indianapolis, Indiana/ USA, 2007.
- Advised ca. 30 students for their Bachelor and/or Master theses and industry internships
- Member IEEE Communications Society, IFIP WG 6.6