



Management of the Internet and Complex Services

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Deliverable D3.2 **AIMS Conference Report**

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1 Introduction

During the sixth quarter the only WP3 activity has been the practical organization of the Autonomous Infrastructure, Management and Security (AIMS) conference and summer schools. Thus this report fulfils the dual roles of the sixth quarter report and the conference report deliverable.

Our estimates about the numbers of attendees have been fortuitously close to reality and hence our budget has also been close to expectation and well within the margin for error. Participants ranged from academic and industrial institutions across Europe and the USA and included those from outside the EMANICS NoE. Industry involvement included Telenor, Motorola, Siemens, Ericsson and Hewlett Packard who all presented papers in the technical programme. In addition, IBM and Opera Software attended the conference. Table 1 presents an overview of the AIMS conference.

Table 1: Conference Overview

| | | |
|------------------------------------|-----------|--|
| Dates / Duration | | 21-22 June 2007 / 2 Days |
| Organisers | | Arosha Bandara, Mark Burgess, Isabelle Chrisment, David Hausheer, Rolf Stadler |
| External organisation involvement | | In co-operation with the ACM |
| # of tracks | | 2 |
| # of submitted papers | Main | 58 |
| | PhD Symp. | 38 |
| # of accepted papers | Main | 14 |
| | PhD Symp. | 18 |
| # of presenters | Main | 12 |
| | PhD Symp. | 17 |
| # registrations tutorials / tracks | | 9 tutorials / 4 tracks |
| # of attendees | | 81 |
| Proceedings | | "Inter-domain Management", Proceedings of Autonomous Infrastructure, Management and Security (AIMS), Bandara A. K. and Burgess M. (eds.), LNCS, Springer-Verlag. |

Local details were organized by a team from Oslo, led by Mark Burgess. Coordination of the session chairs and the review process was performed by Arosha Bandara.

The conference consisted of 3 distinct components – the main technical programme, a tutorial programme and a PhD Student Symposium. We report on each of these in the remainder of this document.

2 Main Technical Programme

The principal objective of the AIMS technical programme was to bring together researchers from both within and outside the EMANICS network to a strong cross-disciplinary forum in which novelty and open discussion are central. The motivation for the conference is described in detail in the following excerpt from the introduction to the proceedings:

“Research needs ideas, discourse and experimentation in order to thrive, but more than ever we are expected to make research immediately ‘relevant’ and available to society and the world of commerce. Of these three poles (ideas, discourse and experimentation), ideas lie farthest from a finished product, and it is therefore ideas that are most easily left behind in the rush to catch the gravy train. The pressure to prioritize applications rather than understanding hinders research from thinking deeply about problems, and in the worst case prevents us from truly understanding and innovating.

The first Autonomous Infrastructure Management and Security conference (AIMS 2007) was proposed as an act of optimism by the leaders of the EMANICS Network of Excellence in Network and Service Management. It was a proposal aimed at avoiding the tar-pit of ‘apply existing knowledge only’, to reach out for new ideas that might expand our network of concepts and solutions. There are many excellent conferences in the field of Network of System Management already: LISA, IM, NOMS, DSOM, Policy Workshop, etc. Although there is overlap, both in attendance and ideas, AIMS does not compete with any of these. Rather we have sought a strong cross-disciplinary forum, in which novelty and discussion are made paramount. An additional objective of AIMS is to provide a forum for doctoral students, the future leaders of our research, to discuss their research with a wider audience and receive training to help make their research careers successful. To this end, AIMS incorporates a European PhD Student Symposium and a tutorial programme that covers the following range of topics:

- *Scalable Network Management*
- *Cross-domain Network Management Concepts*
- *Management Models*
- *Policy Interactions*
- *Security Management*
- *Logic and Validation*
- *Promise Theory and Ubiquitous Management*
- *Autonomous Infrastructure and Security”*

Because a number of existing conferences in the field are sponsored by the IEEE, it was thought that one way of involving researchers from other computing disciplines would be to involve the ACM and the USENIX communities. This was achieved by securing ‘co-operative sponsorship’ from the ACM and inviting members of the USENIX board to join the technical programme committee.

2.1 Review Procedures

Recognising that there are already numerous conferences in the area of network and system management and we felt it important that AIMS did not directly compete with these. Therefore, the technical programme covers ambitious ideas, even those that are unfinished, and this naturally invites controversy.

In order to ensure the highest possible standards, each paper was reviewed by three members of the technical programme committee and each paper in the final proceedings received not merely acceptance, but at least one enthusiastic endorsement from a referee.

Based on the feedback received from members of the network, it was decided that the proceedings of the AIMS conference should be published as a volume of Lecture Notes in Computer Science (LNCS - Springer-Verlag). The proposal to Springer was provisionally accepted with the observation that the technical programme committee should be composed of experts from both inside and outside the EMANCS network. This requirement was satisfied by having a number of international experts, from both academia and industry, serving on the TPC. The full membership of the technical programme committee was as follows:

- Arosha Bandara, The Open University, UK
- Jan Bergstra, University of Amsterdam, The Netherlands
- Claudio Bartolini, HP Labs.
- Artur Binczewski, Poznan Supercomputing and Networking Center, Poland
- Mark Burgess, Oslo University College, Norway
- Geoffrey Canright, Telenor Research,
- Isabelle Chrisment, LORIA, Nancy University, France
- Alva Couch, Tufts University, USA
- Gabi Dreo, University of Federal Armed Forces Munich, Germany
- Olivier Festor, INRIA, France
- David Hausheer, University of Zurich, Switzerland
- Heinz-Gerd Hegering, Leibniz Supercomputing Center, Germany
- Alexander Keller, IBM, USA
- Karst Koymans, University of Amsterdam, The Netherlands
- Jorge Lobo, IBM Research, USA
- Emil Lupu, Imperial College London, UK
- Hanan Lutfiyya, University of Western Ontario, Canada
- George Pavlou, CCSR, University of Surrey, UK
- Aiko Pras, University of Twente, The Netherlands
- Helmut Reiser, Leibniz Supercomputing Center, Germany
- Frode Eika Sandnes, Oslo University College, Norway
- Jacques Sauve, UFCG, Brazil
- Juergen Schoenwaelder, IU Bremen, Germany
- Joan Serrat, UPC, Spain
- Morris Sloman, Imperial College London, UK
- Rolf Stadler, KTH, Sweden
- Burkhard Stiller, University of Zurich, Switzerland
- John Strassner, Motorola Inc., USA

2.2 Submission/Final Programme Statistics

For the main track, 58 submissions were received and 14 were accepted. Out of the 58 submissions, 7 were from EMANICS members and 5 of these were accepted in the final programme.

The conference also attracted significant interest from industrial researchers with 8/58 submissions being made by authors with industrial affiliations, including Telenor, Motorola, Siemens, Ericsson and Hewlett-Packard. The final programme included 3 papers from industrial researchers – namely from Telenor, Motorola and HP Labs.

During the acceptance process, one paper was withdrawn due to the change of status in Lecture Notes on Computer Science, with regard to Science Citation Index registration. Another accepted paper could not be presented due to travel restrictions from Iran.

2.3 Session Organisation

The sessions of the main technical programme were organised as follows:

- **Session 1: Scalable Network Management**
Chair – Aiko Pras, University of Twente
- **Session 2: Inter-domain Concepts**
Chair – John Strassner, Motorola
- **Session 3: Promises and Ubiquitous Management**
Chair – Arosha Bandara, The Open University, UK
- **Session 4: Autonomous Infrastructure and Security**
Chair – Alva Couch, Tufts University

The key objective of the AIMS conference was to provide a forum for open discourse on ideas. With this in mind, each session was structured into three 15 minute presentations plus a few questions (5 mins) per paper. Then the speakers were gathered into a panel formation to answer questions from the floor as directed by the session chair. In addition to specific questions based on the papers, authors were asked to prepare for the following questions (without slides):

- *Why is this topic interesting?*
- *What is the one-minute summary or main message from your paper?*
- *Why is your work important compared to other approaches?*
- *What can you do that others cannot?*
- *What have you contributed?*

This format resulted in lively discussion and provided ample opportunity for the presenters and audience to interact.

2.4 Miscellaneous

The session discussions were recorded on video tape for future use and possible pod casts, subject to the agreement of participants.

Some of the residual gift articles were given to organizers of the Summer schools.

3 PhD Student Symposium

An additional objective of AIMS is to provide a forum for doctoral students, the future leaders of our research, to discuss their research with a wider audience and receive training to help make their research careers successful. To this end, the AIMS programme included a PhD student symposium where students were invited to submit short (4 page) papers that described their research topic. Accepted papers were included in the final proceedings and students were given the opportunity to present their work using both a short presentation and poster. The PhD student symposium was chaired by Rolf Stadler of KTH, Sweden.

The AIMS 2007 student symposium received 31 submissions, out of which were 18 accepted for presentation. The evaluation criteria for accepting a submission were the clarity and quality of the research statement, including problem statement, approach, explanation of the difficulties and the research plan. The members of the evaluation committees were:

- Gyorgy Dan, KTH, Sweden
- Emil Lupu, Imperial College London, UK
- Joan Serrat, UPC, Spain
- Burkhard Stiller, University of Zurich, Switzerland
- Felix WU, UC Davis, USA.

The symposium was organized in two sessions. During the first session, each student presented his research statements in concise form within a 6-min time slot. The second session consisted of poster presentations, where a student had the opportunity to present his/her work in 20 min in an interactive format.

The quality of the student presentations was very high, with everyone being able to describe their research within the allotted time. The interactive sessions at each poster were well attended and produced some excellent discussions.

4 Tutorials

The final objective of the AIMS conference was to educate participants, particularly PhD students, in the state of the art in networks and systems administration. Therefore, tutorials were made an integral part of the conference programme and were included in the conference registration fee.

The tutorial planning started in August 2006 with the preparation of a Call for Tutorials which was distributed over several mailing lists and also as printed flyers at conferences. The CFT was also included in the AIMS Call for Papers. A highly modern tutorial approach was envisioned with a mix of tutorials between 1-3 hours duration serving one or more of the topics covered by the AIMS conference.

As there were only few responses to this first call, the tutorial chairs started to collect a list of about 50 candidates, which they contacted individually via phone and e-mail, inviting them to submit a tutorial proposal on a specific topic in their area of expertise. After the deadline for AIMS tutorials had passed end of February 2007, the tutorial instructors had received as many as 15 high-quality proposals covering a broad range of topics relevant to AIMS. Out of these 6 tutorials were proposed by EMANICS partners. The proposed duration of the tutorials was between 1-3 hours (1.8 hours on average).

The tutorial chairs then performed a thorough evaluation of the proposals, considering the quality of a proposal, the target audience, the importance of the technical subject and its match with AIMS topics, as well as the expertise of the instructor. Additionally, a good mix had to be achieved between academic and practical tutorials as well as EMANICS internal and external tutorials and mix of technical subjects. Moreover, the duration of some tutorials had to be reduced in order to be able to comply with the time constraints of the conference.

At the end of March 2007, the tutorial chairs selected 8 technical and 1 non-technical tutorials for presentation at the AIMS conference. A contract was established with each instructor in order to formalize their agreement to present the tutorial. The technical tutorials were classified into four main categories, for each of which 1 of 4 parallel tutorial tracks with two 1.5 hours tutorials was allocated. These tutorials were held in the afternoon of the first conference day (21 June 2007), between 14.00-15.30 and 16.00-17.30. A 30 min coffee break between the first and the second tutorial in every track allowed the conference participants to move between the tracks. The non-technical 1 hour tutorial about how to write a paper was run at the end of the main tutorial sessions and advertised to the participants of the AIMS doctoral symposium.

The AIMS budget allowed to pay an honorarium of 500 EUR for each tutorial presentation and to offer the tutorials for free to all conference participants.

For each tutorial the abstract as well as the biography and a photo of the instructor(s) was included in the AIMS website. In addition, the abstracts of all technical tutorials were included in the AIMS proceedings. Around the end of May 2007 the tutorial chairs collected the draft slides from the instructors to make sure that the slides did not exceed a maximum number of pages and to check them for consistency, completeness, errors, slide design, match with tutorial title, layout, ability to print etc. Based on this feedback, the tutorial instructors submitted their final version of the slides, based on which a tutorial handbook was prepared, printed, and distributed to all conference participants.

The final tutorial programme was as follows:

- ***Track 1: Modelling/Tools for System Management***

- [Xen Virtualization and Multi-Host Management using MLN](#)

- Kyrre Begnum, Oslo University College, Norway

- [Ponder2 - Policy-Based Self Managed Cells](#)

- Kevin Twidle, Emil Lupu, Imperial College London, U.K

- ***Track 2: Economics of Infrastructure Management***

- [From Charging for QoS to Charging for QoE: Internet Economics in the Era of Next Generation Multimedia Networks](#)

- Peter Reichl, Telecommunications Research Center Vienna (ftw.), Austria

- [Next Generation Semantic Business Process Management](#)

- Armin Haller, National University of Ireland, Galway, Ireland; Marin Dimitrov, Ontotext Lab, Sirma Group, Sofia, Bulgaria

- **Track 3: Distributed and Decentralized Systems**

- [Programmability Models for Sensor Networks](#)

- Torsten Braun, University of Bern, Switzerland

- [Scalable Routing for Large Self-Organizing Networks](#)

- Thomas Fuhrmann, Technical University Munich, Germany

- **Track 4: Selected Topics**

- [The IT Infrastructure Library \(ITIL\) - An Introduction for Practitioners and Researchers](#)

- Thomas Schaaf, Ludwig Maximilians Universitaet Muenchen, Germany

- [Peer-to-Peer Market Places: Technical Issues and Revenue Models](#)

- Giancarlo Ruffo, Universita di Torino, Italy

- **Non-technical Track**

- [How to get your paper accepted](#)

- Aiko Pras, University of Twente, The Netherlands

5 Conclusions

We believe that the number of papers submitted, the informal poll conducted during the conference and the ability to draw attendees from as far as America show that the conference has been a success. The original aim of the conference was to be cross disciplinary in nature. Although one could have hoped for a greater level of daring in the academic fusions, for a first event of its kind it is felt that there was a sufficiently wide span of topics, many of which bring in ideas from outside the standard curriculum. Also new topics like promise theory were represented – some of the first papers of their kind.

Attendees commented appreciatively on the discussion based format of the conference. It was even suggested that the next event could involve fewer papers and even more discussion. Audience participation was impressive and questions were rich and interesting. There was also an appreciation of the free tutorials which were well attended.

It was already decided during the conference that there should be a second event AIMS 2008. Our Zurich partners offered to host this event.

Appendix: AIMS 2007 Final Programme

Day 1: 21 June 2007

09:00 – 10:30 - Session 1: Scalable Network Management

Session Chair: Aiko Pras, University of Twente

- ***On the Impact of Management Instrumentation Models: a JMX Case Study***
Abdelkader Lahmadi (LORIA), Anca Ghitescu (LORIA), Laurent Andrey (INRIA-LORIA), Olivier Festor (LORIA)
- ***RAQNet: A Topology-Aware Overlay Network****
Seyed Iman Mirrezaei (Sharif University of Technology), Javad Shahparian (Sharif University of Technology), Mohammad Ghodsi (Sharif University of Technology)
- ***IBGP confederation provisioning***
Mohamed Nassar (LORIA-INRIA Lorraine), Radu State (LORIA - INRIA Lorraine), Olivier Festor (LORIA)

**** Paper not presented due to travel problems from Iran***

11:00 – 12:30 - Session 2: Inter-domain Concepts

Session Chair: John Strassner, Motorola

- ***Ontology-Based Management for Context Integration in Pervasive Services Operations***
Joan Serrat (University Politecnica de Catalunya), Jaime Martin Serrano (Universitat Politècnica de Catalunya), Mícheál Ó Foghlú (Waterford Institute of Technology), Sven van der Meer (Waterford Institute of Technology)
- ***A Terminology for Control Models at Optical Exchanges***
Freek Dijkstra (Universiteit van Amsterdam), Bas van Oudernaarde (Finalist IT group), Bert Andree (Universiteit van Amsterdam), Leon Gommans (University of Amsterdam), Paola Grosso (Universiteit van Amsterdam), Jeroen van der Ham (Universiteit van Amsterdam)
- ***Self-Forming Network Management Topologies in the Madeira Management System***
Liam Fallon (Ericsson), Daryl Parker (Ericsson R&D Ireland), Sandra Collins (Ericsson R&D Ireland), Martin Zach (Siemens AG Austria), Markus Leitner (Siemens AG Austria)
- ***Activity based scheduling of IT changes***
David Trastour (HP Labs), Maher Rahmouni (HP Laboratories), Claudio Bartolini (HP Laboratories)

12:30 – 14:00 Lunch

14:00 – 17:30 Tutorials (See Section 4 for details)

Day 2: 22 June 2007

09:00-11:00 - PhD Symposium Session 1

Session Chair: Rolf Stadler, KTH

Management Models

- ***Modelling and Performance Evaluation of the Network and Service Management Plane***
Abdelkader Lahmadi (LORIA), Laurent Andrey (INRIA- LORIA), Olivier Festor (LORIA)
- ***Abstractions to Support Interactions between Self-Managed Cells ****
Alberto Schaeffer-Filho (Imperial College London), Emil Lupu (Imperial College London)
- ***Self-Management Framework for Unmanned Autonomous Vehicles***
Eskindir Asmare (Imperial College London), Morris Sloman (Imperial College London)
- ***Towards a Toolkit for the Analysis and Design of Systems with Self-Management Capabilities***
Ralf Koenig (Ludwig-Maximilians-Universität München), Heinz-Gerd Hegering (Leibniz Supercomputing Center)

**** Paper not presented due to travel problems***

Policy Interactions

- ***Estimating Local Cardinalities in a Multidimensional Multiset***
Patrick Truong (France Telecom R&D), Fabrice Guillemin (France Telecom R&D)
- ***Harnessing Models for Policy Conflict Analysis***
Steven Davy (TSSG, Waterford Institute of Technology),
Brendan Jennings (TSSG, Waterford Institute of Technology)
- ***Distributed end-to-end QoS contract negotiation***
Hélia Pouyllau (Irisa/Inria)
- ***Distributed and Heuristic Policy-based Resource Management System for Large-scale Grids ****
Edgar Magana (Cisco Systems), Joan Serrat (University Politecnica de Catalunya)

**** Paper not presented due to travel problems***

Security Management

- ***Risk Based Authorisation for Mobile Ad Hoc Networks***
Nilufer Tuptuk (Imperial College), Emil Lupu (Imperial College)
- ***Malware models for network and service management***
Jérôme François (CNRS - University Henri Poincaré), Radu State (LORIA - INRIA Lorraine), Olivier Festor (LORIA - INRIA Lorraine)
- ***A Survey of the High-Speed Self-Learning Intrusion Detection Research***
Anna Sperotto (University of Twente), Remco van de Meent (University of Twente)

Logic and Validation

- ***Distributed Case-based Reasoning for Fault Management***
Ha Manh Tran (International University Bremen), Juergen Schoenwaelder (International University Bremen)
- ***Validating the Promise Theory Syntax using Rewriting Logic***
Kyrre Begnum (Oslo University College), Mark Burgess (Oslo University College)
- ***Graph Models of Critical Infrastructure Interdependencies***
Nils Svendsen (Gjøvik University College), Stephen D. Wolthusen (Royal Holloway, University of London)

Networks

- ***Self-management of lambda-connections in optical networks***
Tiago Fioreze (University of Twente), Aiko Pras (University of Twente)
- ***A Distributed Architecture for IP Traffic Analysis***
Cristian Morariu (University of Zurich), Burkhard Stiller (ETH Zurich)
- ***Iterative Key Based Routing for Web Services Addressing and Discovery***
Marco Milanese (University of Turin), Giancarlo Ruffo (Università di Torino)
- ***Peer-to-peer Large-scale Collaborative Storage Networks***
Thomas Bocek (University of Zürich), Burkhard Stiller (ETH Zurich)

11:30 – 12:30 - PhD Symposium Poster Sessions

12:30 – 14:00 Lunch

14:00 – 15:30 - Session 3: Promises and Ubiquitous Management

Session Chair: Arosha Bandara, The Open University, UK

- ***Estimating Reliability of Conditional Promises***
Alva Couch (Tufts University), Marc Chiarini (Tufts University), Hengky Susanto (Tufts University)
- ***Modelling Change Without Breaking Promises***
Alva Couch (Tufts University), Hengky Susanto (Tufts University), Marc Chiarini (Tufts University)
- ***Norms and Swarms***
Mark Burgess (Oslo University College), Siri Fagernes (Oslo University College)

16:00 – 17:30 - Session 4: Autonomous Infrastructure and Security

Session Chair: Alva Couch, Tufts University

- ***Providing Seamless Mobility in Wireless Networks Using Autonomic Mechanisms***
John Strassner (Motorola), Barry Menich (Motorola), Walter Johnson (Motorola)
- ***A pumping model for the spreading of computer viruses***
Geoff Canright (Telenor Research), Kenth Engø-Monsen (Telenor R&I)
- ***Improving Anomaly Detection Event Analysis Using the EventRank Algorithm***
Kyrre Begnum (Oslo University College), Mark Burgess (Oslo University College)