European Sixth Framework Network of Excellence FP6-2004-IST-026854-NoE

Deliverable D3.3
Conference and Event Report

The EMANICS Consortium

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Document Control

Title: Conference and Event Report

Type: Public

Editor(s):   Olivier Festor

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Author(s):   WP3 Partners

Doc ID: D3.3

AMENDMENT HISTORY

Version	Date	Author	Description/Comments
0.1	2008-04-11	J. Schönwälder	Initial version (ISSNSM '07, AIMS '08)
0.2	2008-05-26	O. Festor	P2P Workshop, Introduction, Conclusions
0.3	2008-06-10	O. Festor	Quality check and future workshops

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1   Executive Summary

This deliverable reports on the events organized under the Work-Package 3 umbrella of EMANICS in phase 2. Three events are presented here :

- the 1st International Summer School on Network and Service Management (ISSNSM) which took place in Bremen, July 2007;

- the first 1st EMANICS Workshop on Peer-to-Peer Management which took place in march 2008 in Zurich and,

- the second AIMS conference (AIMS'2008) which will take place from July 1st to July 3rd, in Bremen, Germany

In addition, the deliverable provides an overview of scientific dissemination activities performed since July 2007.

An updated version of the document will be delivered at the end of phase 2 in December 2008.

2 Introduction

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3 International Summer School on Network and Service Management (2007)

The 1st International Summer School on Network and Service Management (ISSNSM) was organized by and held at Jacobs University Bremen. The summer school provided advanced classes on selected advanced topics in network management. The courses were accompanied with practical hands-on labs in order to combine the theoretical background with some practical experience. The instructors are well known members of the academic and industrial community.

3.1 Content

The following three topics were covered in the summer school:

- Topic #1: Border Gateway Protocol (BGP)

  - Border Gateway Protocol BGP (Iljitsch van Beijnum)

    This session provided an introduction into BGP and how it is used in the current Internet for global policy routing. Some hands one experiments gave students a practical understanding how BGP is being used by Internet Service Providers.

  - BGP Analysis and Simulation (Bruno Quoitin)

    The purpose of the BGP Analysis and Simulation session is to get some hands on experience with real world BGP data and analysis/simulation tools. In a first step, prominent BGP-related data formats and analysis / simulation tools were reviewed and what kind of analysis they allow to perform, what research results have been published and what are the limitations. In a second step, some basic analysis of data collected in the Abilene backbone as well as by the RouteViews and RIPE RCC projects has been performed. Finally, it was discussed step-by-step how to build a model of a BGP network based on the C-BGP simulator.

- Topic #2: Packet Capturing and Time Series Storage (CAPTIME)

  - Round Robin Databases (RRDs) (Tobi Oetiker)

    The first step in network management is to find ways to acquire interesting data. Once the data is available, the challenge is to find a sensible way to store, analyze and present it. RRDtool helps with these tasks. The class will give an overview of RRDtool's capabilities and some insights into the finer points of this tool. The lab exercises will focus on applying RRDtool to store and graph data you acquired yourself, allowing you to quickly write your own monitoring application.

  - Monitoring Traffic with ntop (Luca Deri)

    This class introduced students to network traffic monitoring and covered the design and implementation of ntop, a popular open-source application developed by the instructor. ntop is able to collect traffic from various sources including

packet traces, live network feeds, NetFlow and sFlow sources. Traffic metrics and statistics are saved on disk in RRD format for historical and trend analysis. The lab exercise showed students how to use ntop for effective traffic monitoring.

- Topic #3: Flow Export and Visualization (FLOWVIZ)

    - NetFlow and IPFIX (Maurizio Molina)

      Netflow data is information collected and exported by routers about IP flows transiting through them. The most classical definition of a flow (although not the only one) is "packets with the same 5-tuple: src IP, dst IP, src port, dst port, protocol". In this course, a high level picture of what Netflow data is has been presented and which fundamental functional blocks are involved in its generation, collection and analysis. Some details about the main challenges associated with the mapping of these modules on real equipments have been discussed with a special focus on high-speed networks. Concrete examples have been presented from the Swiss National Research and Educational Network (SWITCH) and the European backbone network for education and research (GEANT).

    - NetFlow Sensor (NfSen) (Peter Haag)

      Collected Netflow data needs to be analyzed by appropriate tools. The details of two open source tools called nfdump and NfSen have been discussed. The tools have been developed by the instructor at SWITCH, the Swiss National Research and Educational Network. Nfdump and NfSen were developed with the daily security tasks of a CERT (Computer Emergency Response Team) in mind. In the lab session, students had the opportunity to investigate unusual network behaviour, digging into the details with nfdump and NfSen.

3.2 Schedule

The overall schedule of the summer school is show below. The summer school started on Monday after lunch time and closed on Friday at lunch time so that people could conveniently travel to/from Bremen.

```
                           [Lunch]
  Monday:     14:00 - 15:00   Welcome and Overview
              15:30 - 17:00   Lab Setup and Introduction
              17:30 - .....   Trip to Bremen Downtown

  Tuesday:    09:00 - 10:30   Course Slot #1 (BGP)
              11:00 - 12:30   Course Slot #2 (BGP)
              12:30 - 14:00   Lunch
              14:00 - 18:00   Lab Exercises  (BGP)

  Wednesday:  09:00 - 10:30   Course Slot #3 (CAPTIME)
              11:00 - 12:30   Course Slot #4 (CAPTIME)
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                    12:30 - 14:00    Lunch
                    14:00 - 18:00    Lab Exercises   (CAPTIME)


Thursday:   09:00 - 10:30    Course Slot #5 (FLOWVIZ)
            11:00 - 12:30    Course Slot #6 (FLOWVIZ)
            12:30 - 14:00    Lunch
            14:00 - 20:00    Boat Excursion


Friday:     09:00 - 13:00    Lab Exercises   (FLOWVIZ)
                             [Lunch]
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3.3 Instructors

- Iljitsch van Beijnum (www.bgpexpert.com, Netherlands)

  Iljitsch van Beijnum is a networking consultant and writer who focuses on BGP and IPv6. After working for several Dutch ISPs and starting one with a group of others in the 1990s, he became a freelance consultant and wrote a book about BGP (O'Reilly, 2002) and one about IPv6 (Apress, 2005) and started contributing to the IETF multi6 and shim6 working groups.

- Bruno Quoitin (Universite Catholique de Louvain (UCL), Belgium)

  Bruno Quoitin is a research fellow within the Computer Science and Engineering Department at Universite Catholique de Louvain (UCL) in Belgium. His main research interests are interdomain routing and large scale network modeling. He is the main author of C-BGP, an open-source BGP routing solver (http://cbgp.info.ucl.ac.be).

- Tobias Oetiker (Oetiker + Partner, Switzerland)

  Tobias Oetiker is an electrical engineer by education and a system administrator by vocation. For the last ten years he has been working for the ETH Zurich, making sure students and staff get ahead with their computers. Last year he started to work for his own company OETIKER+PARTNER, spending amongst other things much more payed time on his pet open source projects MRTG, RRDtool, and SmokePing. In November 2006, Tobias received the prestigious SAGE Outstanding Achievement Award for his work on MRTG and RRDtool. Find out more about Tobi Oetiker on http://tobi.oetiker.ch/

- Luca Deri (ntop.org, Italy)

  Luca Deri is the leader of the ntop project (http://www.ntop.org/) aimed at developing an open source monitoring platform for high speed traffic analysis. He currently shares his time between NETikos S.p.A. and the University of Pisa where he has been appointed as lecturer at the CS department. His home page is http://luca.ntop.org/.

- Maurizio Molina (Dante, United Kingdom)

  Maurizio Molina graduated in Electronic Engineering (Italian Laurea) from the Polytechnic of Turin in 1993. Since then, he has worked in the telecommunications industry, mainly in research centres, including Telecom Italia Labs (Turin, Italy) and

the NEC Network Laboratories (Heidelberg, Germany). He published several papers about IP and ATM traffic modeling and network measurements. He contributed to the ITU-T ATM standardization process, and to working groups in the IETF (on IPFIX and PSAMP). He joined DANTE's Systems group in November 2004, working on performance monitoring, security and authentication and authorization infrastructures.

- Peter Haag (Switch, Switzerland)

  Peter Haag is a member of SWITCH-CERT, the Swiss Education and Research Network CERT. He received a master's degree (1991) in electrical engineering from the Swiss Federal Institute of Technology in Zurich and worked as a digital hardware design engineer for four years. In 1995, he changed into the design, development and operation of Internet Server Systems. In 2002, Peter Haag joined SWITCH as an network security engineer. Within SWITCH-CERT he is in charge of incident handling, computer forensics, malware analysis and security tool design. He is the author of the open source netflow tools nfdump and NfSen. At the moment he is actively involved in several projects doing netflow and traffic analysis.

3.4   Evaluation

The summer school was evaluated by distributing an evaluation form to the participants. A total of 19 evaluation forms were returned. Below is the summary of the numeric data collected. All grades are given on a scale of 1 to 5 (1 being excellent and 5 poor).

Question	Grade
How do you rate the overall organization?	1.5
How do you rate your accommodation on campus?	1.4
How do you rate the rooms and infrastructure provided?	1.4
Did you have enough time to interact with other people?	1.4
How do you rate the selection of the topics?	1.4
How do you rate the selection of presenters?	1.5

Overall, most attendees were very happy. We asked who would attend a second incarnation of the summer school and 14/19 (73%) indicated they would attend ISSNSM in 2008. We also asked free form questions concerning topics participants are specifically interested in, concerning things that can be improved in a future event, and we were asking which aspects of the summer school participants liked very much. This information has been passed on to the organizers of the ISSNSM 2008 event, which is scheduled to take place in June 2008, hosted by the University of Zurich.

3.5   Conclusion

The summer school was attended by 32 persons and turned out to be a highly interactive and successful event. The evaluation of the summer school was very positive. A second incarnation of the summer school following the same principle of combining leactures with practical lab sessions will take place in June 2008, hosted by the University of Zurich.

4   Peer-to-Peer Workshop (2008)

This section reports on the 1st EMANICS Workshop on Peer-to-Peer Management[1] organized by the EMANICS members, that took place at University of Zurich on March 3 and 4, 2008. The chairs of the workshop were Burkhard Stiller and David Hausheer from University of Zurich.

4.1   Workshop Scope

The goal of this workshop was to exchange ideas in the area of peer-to-peer (P2P) management.

P2P networking concepts have been applied successfully in different areas of Internet-based communication, including P2P file sharing, P2P telephony, and P2P video streaming. P2P-based applications are known to scale well and to achieve a high robustness against failures. However, due to the absence of a central point of control, the management of P2P networks as well as the use of P2P principles for management remains a challenge.

This workshop did address the application of P2P concepts for network and service management, the management of P2P networks, as well as fully decentralized and distributed management approaches. The program includes presentations from several EMANICS members who have done work in this area or who have performed experiments on EmanicsLab, the research network of EMANICS.

4.2   Programme

The workshop was held over two days and had the following programme :

Monday, March 3, 2008 :

10:00   Registration

10:30   Welcome, David Hausheer and Burkhard Stiller, University of Zurich

10:45   Keynote: Efficiency and Information Management in Peer-to-Peer Systems, Ralf Steinmetz, Darmstadt University of Technology

11:45   P2P Technologies Employed in Network Management, Lisandro Zambenedetti Granville, University of Twente and UFRGS

12:30   Lunch break

14:00   Distributed and Autonomic Real-Time Traffic Analysis, Cristian Morariu, University of Zurich

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[1]http://www.csg.uzh.ch/events/p2p-ws/

14:45 Distributed Monitoring of Resource Usage in a Virtual Lab (Slides), Pau Valles and Joan Serrat, Technical University of Catalonia

15:30 Coffee break

16:00 Distributed Case-Based Reasoning for Fault Management, Ha Manh Tran, Jacobs University Bremen

16:45 EmanicsLab A Distributed Computing and Storage Testbed for EMANICS, David Hausheer, University of Zurich

17:30 End of first workshop day

19:00 Social event

Tuesday, March 4, 2008:

09:00 Start of second workshop day

09:15 Policy-based Management of Wireless Ad Hoc and P2P Networks, Antonis Hadjiantonis, University of Surrey

10:00 Coffee break

10:30 Revocation Mechanisms in P2P Networks, Thibault Cholez, Nancy University

11:15 Agent based Modelization for P2P Networks, Julien Siebert, INRIA Lorraine

12:00 Lunch break

13:00 Fast Similarity Search for Structured P2P Systems, Thomas Bocek and Fabio Hecht, University of Zurich

13:45 Interworking of P2P-SIP and traditional SIP Network, Balamurugan Karpagavinayagam, INRIA Lorraine and Cristian Stefan, University of Pitesti

14:30 Wrap up and discussion

15:00 End of second workshop day

4.3   Local Arrangements and costs

The organizational and hosting costs of the workshop were of 2000 Euros for EMANICS. The workshop was open to non-EMANICS members and registration was free.

All presentation slides and workshop material has been made freely available to the public on the Workshop web site : http://www.csg.uzh.ch/events/p2p-ws/

4.4 Evaluation

The first workshop on P2P management was a great success. With 37 attendees out of which 40% coming from outside EMANICS (industry, universities), it did lead to many fruitful discussions and scientific exchange. A new occurrence of this event is thought in 2009.

5   Autonomous Infrastructure, Management, and Security (2008)

This section reports on the status of the preparation of the 2nd Conference on Autonomous Infrastructure, Management, and Security (AIMS 2008). AIMS 2008[2] will take place on July 1-3 2008 at Jacobs University Bremen.

5.1   Steering Committee

To ensure the longer term planning and organization of the AIMS conference series, a steering committee was established. It consists of the people involved in major roles in the AIMS 2007 event and the AIMS 2008 event. The steering committee members are:

- Arosha Bandara, The Open University, UK

- Mark Burgess, HIO, Norway

- Olivier Festor, INRIA, France

- David Hausheer, University of Zurich, Switzerland

- Aiko Pras, University of Twente, Netherlands

- Jürgen Schönwälder, Jacobs University Bremen, Germany

- Rolf Stadler, KTH, Sweden

The committee is chaired by Oliver Festor. The idea is that the committee is not static but dynamically changes over time, essentially keeping the chairs of previous events and the next event closely involved.

5.2   Organization Committee

The general chair of AIMS 2008 is Jürgen Schönwälder (Jacobs University Bremen). The organization committee has the following structure:

- General Chair
    - Jürgen Schönwälder, Jacobs University Bremen, Germany
- Programm Chairs
    - David Hausheer, University of Zurich, Switzerland
    - Jürgen Schönwälder, Jacobs University Bremen, Germany

[2]http://www.aims2008.org/

- PhD Workshop Chairs

    - Lisandro Zambenedetti Granville, UFRGS, Brazil
    - Aiko Pras, University of Twente, Netherlands

- Tutorial / Keynote Chair

    - Arosha Bandara, The Open University, UK

5.3 Technical Programm Committee

- Panayotis Antoniadis, University of Pierre and Marie Curie Paris, France

- Arosha Bandara, The Open University, UK

- Jan Bergstra, University of Amsterdam, The Netherlands

- Mark Burgess, Oslo University College, Norway

- Georg Carle, Univeristy of Tuebingen, Germany

- Isabelle Chrisment, Nancy University, France

- Alva Couch, Tufts University, USA

- Costas A. Courcoubetis, Athens University of Economics and Business, Greece

- Vasilios Darlagiannis, EPFL, Switzerland

- Hermann de Meer, University of Passau, Germany

- Zoran Despotovic, DoCoMo Euro-Labs, Germany

- Gabi Dreo Rodosek, University of Federal Armed Forces Munich, Germany

- Olivier Festor, INRIA Lorraine, France

- Thomas Fuhrmann, University of Karlsruhe, Germany

- Lisandro Zambenedetti Granville, UFRGS, Brazil

- Heinz-Gerd Hegering, Leibniz Supercomputing Center, Germany

- James Won-Ki Hong, POSTECH, Korea

- Alexander Keller, IBM, USA

- Jorge Lobo, IBM Research, USA

- Emil Lupu, Imperial College London, UK

- Hanan Lutfiyya, University of Western Ontario, Canada

- David A. Maltz, Microsoft Research, USA

- Martin May, ETH Zurich, Switzerland

- George Pavlou, CCSR, University of Surrey, UK

- Aiko Pras, University of Twente, The Netherlands

- Bruno Quoitin, Universite Catholique de Louvain, Belgium

- Danny Raz, Technion, Israel

- Helmut Reiser, Leibniz Supercomputing Center, Germany

- Giancarlo Ruffo, Universita di Torino, Italy

- Joan Serrat, UPC, Spain

- Radu State, INRIA Lorraine, France

- Burkhard Stiller, University of Zurich, Switzerland

- Maarten van Steen, University of Amsterdam, The Netherlands

- Kurt Tutschku, University of Wuerzburg, Germany

- Marcel Waldvogel, University of Konstanz, Germany

- Felix Wu, University of California at Davis, USA

5.4 PhD Workshop Committee

- Gabi Dreo Rodosek, University of Federal Armed Forces Munich, Germany

- Olivier Festor, INRIA Lorraine, France

- Hanan Lutfiyya, University of Western Ontario, Canada

- Joan Serrat, UPC, Spain

- Rolf Stadler, KTH, Sweden

- Burkhard Stiller, University of Zurich, Switzerland

5.5 Sponsorship

The AIMS 2008 event is financially sponsored by EMANICS WP3. In addition, AIMS 2008 received sponsorship from IFIP WG 6.6 and ACM SIGAPP and SIGMIS. The proceedings will appear in the IFIP-LNCS series of Springer.

Attempts were made to receive also technical co-sponsorship from IEEE ComSoc via CNOM. Although IEEE decided to support AIMS, it turned out that the IEEE regulations are in conflict with the IFIP regulations when publishing the proceedings in the IFIP-LNCS series. It was therefore decided to withdraw the application for IEEE ComSoc sponsorship. The issue with the IEEE ComSoc regulations has been raised within the IEEE and has been brought to the attention of the ComSoc chair and there are indications that IEEE ComSoc might change their regulations.

5.6 Paper Submission and Evaluation

The JEMS conference management system has been used to handle the paper submissions and the review process. A total of 33 papers were registered. Before assigning the papers to the reviewers, all papers were checked using Docoloc[3] to identify papers containing large portions of already published texts.

The technical programm committee chairs went through all submitted papers to identify papers that are either incomplete (way too short), out of scope for the AIMS conference, or had plagiarism issues. After a quick reject of these papers, a total of 25 papers entered the review process. Each paper received at least three reviews while the majority received four reviews. A total of 95 reviews were received, most of them written by the programm committee members themself. Before the selection of the papers, the authors were invited to take a look at the reviews and to write a rebuttal in case something should be taken into account during the paper selection. The selection of the papers took place on April 9th by carefully studying the reviews, the rebuttal messages and online programm committee member discussions. In some cases, it was necessary to seek additional information; another plagiarism case was caught this way.

5.7 PhD Workshop Submission and Evaluation

The AIMS PhD workshop is a venue for doctoral students to present and discuss their research ideas, as well as, and most importantly, obtain feedback from the audience about their investigation carried out so far. This year, the workshop will be organized in two technical sessions where selected PhD investigations are presented and discussed. The PhD papers (five pages) included in the proceedings describe the current state of such investigations, including their research problem statements, investigation approaches, and outlines of the results achieved so far. For AIMS 2008, 12 papers have been submitted to the workshop. Each of them was assigned for review to three members of the PhD workshop technical program committee, composed of experienced researchers of the field.

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[3]http://www.docoloc.de/

After the review phase, the PhD workshop chairs together with the PhD workshop technical program committee identified eight papers to be included in the proceedings and to be presented during the conference.

5.8   Keynote and Tutorial

Next to the technical papers, AIMS 2008 will have a keynote talk and six tutorials. Several proposals have been received and the tutorial and keynote chair is working together with the organizing committee to select proposals and to work out the logistics. Since the tutorials are embedded into the AIMS event and covered by the AIMS registration, it is expected that tutorials are well attended and raise discussion during the event.

5.9   Conclusions

The organization of the AIMS 2008 event is progressing on schedule. The selection of the paper to be presented at the conference and the creation of the conference proceedings has been achieved and the advance program has been posted to the AIMS 2008 web site (http://www.aims2008.org/). In addition, several organizational measures such as the formation of a steering committee have been taken to make AIMS a longer lasting conference series.

6 Dissemination Management

EMANICS did support the following international events through sponsorship of travel grants for EMANICS Ph.D. students :

- IFIP/IEEE Manweek 2007 : 3rd International Week on Management ofNetworks and Services - End to End Virtualizaiton of Networks and Services, October 29-November 2, San Jos, CA, USA;

- IEEE/IFIP NOMS'2008 : Network Operations and Management Symposium - Pervasive management for Ubiquitous Networks and Services.

EMANICS did financially support the building of the following tutorials :

- EMANICSLab Tutorial (Author, David Hausheer, UniZH)

- Do you know SNMP ? (Author Aiko Pras, UT)

- Web 2.0 Hacking (Author Radu State, INRIA)

- Service Monitoring with Nagios (Authors Rmi Badonnel and Laurent Andrey, INRIA)

7 Future events

In 2008, EMANICS will organize two aditional PhD student workshops on the following themes :

- Workshop on Economic Traffic Management Schemes

  This workshop will be organized in late 2008. A joint organization between EMANICS WP8 and the FP7 SmoothIT project is foreseen.

- Flow-based monitoring

  This workshop will be held in the october timeframe. It will be jointly organized by Work-Package 7 and 2 of EMANICS.

8 Conclusions

In this report we have presented the conference/summer school organizations and scientific dissemination activities performed in the network since July 2007. All organized events so far have been very successful with even requests from outside Europe to export some models, especially the summer school.

During the reporting period the network as also very active in scientific dissemination management through the support of the two major events worldwide and the support of 4 new tutorials.

9   Abbreviations

AIMS   Autonomous Infrastructure, Management and Security
ISSNSM   Internation Summar School on Network and Service Management

10   Acknowledgement

This deliverable was made possible due to the large and open help of the WP3 Partners of the EMANICS NoE. Many thanks to all of them.