

Network and Service Management for Cloud Computing and Data Centers: A Report on CNSM 2012

Philippe Owezarski · Jorge Lobo · Deep Medhi

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Abstract This short paper reports on the CNSM'2012 conference (International Conference on Network and Service Management). It presents an overview on the technical sessions, keynotes, tutorials, and panel, especially focusing on the original and dominating topics that raised the most comments and discussion. It then aims at indicating what the dominant research directions were in the network and service management community.

Keywords Mobile networks · Energy management · Security management · Software defined networks

1 Introduction

The 8th International Conference on Network and Service Management (CNSM)—the offspring of the six Management Workshops within the same Week—has become a premier venue for the presentation of novel results and experience reports

P. Owezarski
LAAS, CNRS, 7 Avenue du Colonel Roche, BP 54200, 31031 Toulouse Cedex 4, France

P. Owezarski (✉)
UPS, INSA, INP, ISAE; UT1, UTM, LAAS, Université de Toulouse,
31077 Toulouse Cedex 4, France
e-mail: owe@laas.fr

J. Lobo
Universitat Pompeu Fabra, Roc Boronat, 138 08018 Barcelona, Spain
e-mail: Jorge.lobo@upf.edu

D. Medhi
University of Missouri-Kansas City, 5100 Rockhill Road, Kansas City, MO 64110-2499, USA
e-mail: dmedhi@umkc.edu

in all aspects of management of networks, pervasive systems, enterprise and cloud computing environments. CNSM 2012 took place as a full-week event at The Mirage in Las Vegas, Nevada, USA during October 22–26, 2012. The conference is organized around a single track of paper presentations where fundamental research results are discussed. This core track is accompanied by a series of workshops, tutorials, mini-conference and short papers sessions where more focused discussions and progress reports are presented. CNSM'2012 is the place for academic, government and industry researchers of the worldwide community to present, to exchange and to discuss the latest contributions and achievements in all areas of Network and Service management.

2 Paper Selection

CNSM aims at being a very selective and attractive conference. The Technical Program Committee (TPC) selected the very best papers submitted to the CNSM review process. Fifteen out of the 97 submitted papers were accepted for presentation in the main conference track; that represents a 15 % selection ratio. All submitted papers underwent a rigorous review process with a minimum of 3, but usually 4, reviews for each paper. TPC discussions took place on-line through the JEMS conference management system and in a TPC tele-conference.

The program also selected 15 papers to be presented in the mini-conference sessions and 30 short papers. All these papers underwent the same rigorous review process like the ones submitted to the main conference.

3 A Very Rich Program

The program committee put together a very rich program for this CNSM event. The main conference track consisted of 5 sessions. The topics addressed by these sessions were:

- Energy management
- Workflow management
- Cloud computing
- Traffic management
- Planning and prediction

Some comments about the strongest papers presented in these sessions are provided later in this report.

The CNSM conference also includes 4 keynotes, 4 tutorials and a panel.

The 4 keynotes covered:

- End-to-End Service Management in Wireless Networks, by Chuck Kalmanek, AT&T Labs, USA
- Software-Defined Network Management, by Nick Feamster, Georgia Tech and University of Maryland, USA

- SDN in Windows Azure Cloud, by Deepak Bansal, Microsoft, USA
- Managing a PetaByte Scale Data Warehousing Service, by Dhruba Borthakur, Facebook, USA

The first three keynotes all addressed some aspects related to Software Defined Networks (SDN). It raised strong debates on the novelty of the SDN concept compared to researches that were performed 20 years ago. For some of the attendees, SDN is just a new sexy way of presenting research results that last for at least a decade. For the others, it is a completely new concept. Many arguments were put forward, but no consensus was reached.

The last keynote dealt with data warehousing services at Facebook. It presented the requirements for such new services in terms of availability, quick access, security, etc. It raised a lot of attention from the audience as it described actual issues and figures that are missing to academic researchers. This keynote definitely gave some insight to the conference participants working in this area.

The 4 tutorials dealt with:

- On the use of Clustering Algorithms for Unsupervised Traffic Monitoring and Analysis—Pedro Casas, Telecommunications Research Center Vienna, Austria.
- Enhancing Cloud Security Through Software Defined Networking Approaches—Dijiang Huang, Arizona State University, USA.
- Cloud Resource Management—David Breitgand, IBM-Haifa Research Lab, Israel; Danny Raz, Technion, Israel.
- Evolution of Service Control Platforms for Converging Communication Networks for Humans and Machines—Thomas Magedanz, TU-Berlin, Germany; Julius Mueller, TU Berlin, Germany.

As it was the case for papers presented in sessions and keynotes, SDN was again one of the key topics addressed in the tutorials, and is definitely the key scientific and technical point that has been addressed during this CNSM edition. The audience was greatly interested by this aspect that seemed to raise most of the attentions. Compared to paper sessions and keynote presentations, tutorial attendees did not debate any specific SDN issues raised in the tutorial presentations), but they did ask many practical questions on how to set-up and deploy SDN technology. The questions also strongly related to how SDN could solve the current issues in network management, especially dealing with mobility and security.

The panel on “Virtualization and Management Challenges in Large Data Centers” was chaired by Prosper Chemouil, from Orange labs, Issy-les-Moulineaux, France. It attracted a lot of questions from the audience and intense discussion between the audience and panelists, who were:

- Dhruba Borthakur, *Facebook, USA*
- Ajit Sanzgiri, *Cisco Systems, USA*
- Ravi Soundararajan, *VMware, USA*
- Vanish Talwar, *HP Labs, USA*.

There was no disagreement between the panelists who all largely agreed on the problems and possible solutions. The panel then addressed an exhaustive list of

problems raised by Large Data Centers, and the panelists gave advices on solutions to follow or to adopt depending on the requirements.

The mini-conference consisted of three sessions. It has the same format as the main track sessions, except that the duration of the presentations was reduced from 25 to 15 min. They nevertheless raised the same interest from the audience, and raised many questions and discussions between CNSM'2012 participants.

Last, three of the conference workdays ended with a short paper session, during which presenters had to expose their problematic and first results in short presentations for about 5 min. These three sessions were very successful especially for young researchers presenting their initial work.

Among all the papers presented during this CNSM event, the overarching themes dealt with the emerging technologies on cloud computing and data centers, i.e., technologies for providing added value services over best effort communication networks. The main issues to be addressed with such technologies are mainly related to mobility and wireless access, energy saving, and security (especially anomaly detection). A large part of the presentations, as well as the discussions, were considering to possibly take advantage of the SDN (Software Defined networking) concept, as an important tool for implementing management techniques.

The CNSM'2012 event also integrated in its program more unconstrained sessions. Two social events were organized—a welcome session, and a banquet—which served for informal discussions between participants, in a more relaxed atmosphere, in the comfortable facilities of the Mirage hotel.

4 Publications

To enforce a high visibility level, the proceedings of CNSM'2012 are published by IFIP and the papers will be available both in IEEEEXplore and ACM Digital library.

5 Best Paper Award

At the beginning of the conference an evaluation committee was created for evaluating the presentations of the papers that were ranked in the 6 top positions after the reviewing and selection process. The objective was then to nominate the best paper and award its presenter the best paper award and prize.

After having attended all the presentations, and after deliberation, the committee selected the following paper as deserving the best paper award:

Predicting Response Times for the Spotify Backend

Rerngvit Yanggratoke, *KTH Royal Institute of Technology, Sweden*; Gunnar Kreitz, Mikael Goldmann, *Spotify Ltd., Sweden*; Rolf Stadler, *KTH Royal Institute of Technology, Sweden*.

Rerngvit Yanggratoke, who gave this talk, was then awarded the CNSM'2012 best paper award and the associated prize, for this outstanding work and presentation. The

paper addressed the very important problem for efficiently managing the Spotify on-demand music streaming service, especially by simplifying the storage architecture for providing low latency access to the 16 millions tracks for the 10 million users. The strength of the paper relates to the analytical model for the distribution of response time, its parameter configuration for validation thanks to measurements made on two different testbeds. It then allows predicting the performance parameters of the new system architecture.

6 Joint Workshop

The last day of the conference, in parallel with the tutorials, the SVM'2012 workshop occurred. SVM'2012 was the 6th International DMTF Academic Alliance Workshop on Systems and Virtualization Management: Standards and the Cloud.

Its scope is to illuminate standards and research issues related to Cloud Computing, systems management and virtualization management. A report of this workshop appears elsewhere in the JNSM.

7 Side Meetings

The CNSM'2012, given the presence of a large number of researchers of the network management community, provided an opportunity for the IFIP TC 6.6 to meet for the purpose of planning future events.

The CNSM'2012 also provided an opportunity for TPC members of the IM'2013 conference to meet and to plan the IM program. This meeting lasted 1 full day and helped for issuing the IM'2013 program. The IM'2013 (IFIP/IEEE International Symposium on Integrated Network Management) was to take place in Ghent, Belgium, May 27–31, 2013.

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Author Biographies

Philippe Owezarski is a full time researcher of CNRS (the French center for scientific research), working at LAAS (Laboratory for Analysis and Architecture of Systems), in Toulouse, France. He got a PhD in computer science in 1996 from Paul Sabatier University, Toulouse III and a habilitation for advising

thesis in 2006. His main interests deal with high-speed networking and more specifically IP networks monitoring, and Quality of Service and security enforcement based on measurements.

Jorge Lobo is an ICREA Research Professor at the Department of Information and Communication Technologies at Universitat Pompeu Fabra (UPF) in Barcelona and a Research Staff Member at IBM T. J. Watson Research Center (currently on leave). Previous to IBM, he was principal architect at Teltier Technologies, a startup company in the wireless telecommunication area, and now part of Cisco Systems. Before Teltier, he was member of technical staff at Bell Labs and associate professor of computer science at the University of Illinois at Chicago. Jorge did pioneer work at Bell Labs in policy-based network management developing the policy language PDL that has been used for the management of the first generation of Lucent Technologies softswitches.

Deep Medhi is Curators' Professor in the Department of Computer Science and Electrical Engineering at the University of Missouri-Kansas City, USA. He received his B.Sc. in Mathematics from Cotton College, Gauhati University, India, M.Sc. in Mathematics from the University of Delhi, India, and his Ph.D. in Computer Sciences from the University of Wisconsin-Madison, USA. Prior to joining UMKC in 1989, he was a member of the technical staff at AT&T Bell Laboratories. He was an invited visiting professor at the Technical University of Denmark, a visiting research fellow at Lund Institute of Technology, Sweden, and University of Campinas, Brazil, and a Fulbright Senior Specialist.