



ITC 28 in Würzburg
12–16 September 2016
University of Würzburg, Germany

PROCON 2016 Preface

**Proceedings of the
First International Workshop on
Programmability for Cloud Networks and
Applications**

**Co-located with the 2016 28th International Teletraffic Congress –
The First International Conference in Networking Science & Practice**

Florian Wamser, Roberto Bruschi, Anastasios Zafeiropoulos
(PROCON 2016 Workshop Co-Chairs)

Monday 12th September, 2016

Volume Editors

Tobias Hoßfeld
University of Duisburg-Essen
Modeling of Adaptive Systems
Schützenbahn 70
D-45127 Essen, Germany
tobias.hossfeld@uni-due.de

Brian L. Mark
Dept. of Electrical and Computer Engineering
George Mason University
4400 University Drive, MS 1G5
Fairfax, VA 22030-4444, USA
bmark@gmu.edu

Gary Chan
The Hong Kong University of
Science and Technology
Clear Water Bay, Kowloon
Hong Kong
gchan@cse.ust.hk

Andreas Timm-Giel
Hamburg University of Technology
Institute of Communication Networks
Am Schwarzenberg-Campus 3
D-21073 Hamburg, Germany
timm-giel@tuhh.de

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ITC is the first international conference in networking science & practice, first held in 1955.

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Patrick Kellenberger (CPS Production Editor)
Conference Publishing Services (CPS), IEEE Computer Society
10662 Los Vaqueros Circle, Los Alamitos, California 90720-1314
Email: pkellenberger@computer.org
Phone: +1 714 821 8380 Ext. 2105 Fax: +1 714 761 1784

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Welcome Message from PROCON 2016 Co-Chairs

The continuous growth of Internet content, applications and services has resulted in ever more demanding requirements of computing power, scalability, data processing, data storage, energy consumption and transfer speed. To meet this, one solution is the use of the cloud paradigm for applications and services. The cloud paradigm describes the hosting of services and execution of tasks in the cloud. The cloud offers with this principle the promise of almost unlimited and scalable resources. Thus, more and more application providers adopt their applications and move their solution to the cloud. From the scientific point of view, the cloud paradigm covers a broad range of distributed computing principles as well as related application paradigms, networking approaches or architecture models.

The workshop addresses directly all areas mentioned above. It is intended as a forum for scientists to discuss and present new ideas. The aim is to promote cooperation between scientists and to foster the exchange of knowledge, so that developments and concepts in Cloud Networking can be debated. The PROCON Workshop covers the scientific areas around Cloud Networks, Programmability inside Networks, Cloud and Fog Computing principles, Software Defined Networking, Network Function Virtualization, and Software Engineering approaches for Highly Distributed Applications.

The workshop program is consequently filled with a keynote, a demonstration and scientific papers, providing new results and insights in the area of cloud computing and related fields. The workshop will focus on the development of highly distributed applications and related infrastructures. Additionally, both a platform for Fog Computing is presented as well as topics related to Software-Defined Networking and Cloud Service Placement are discussed. PROCON will combine original full and short paper presentations with a motivating keynote to thoroughly explore the domain of Cloud Computing.

With respect to the technical structure of the workshop, PROCON 2016 provides a single-track and one-day program, including a keynote, a demonstration, five full papers and one short paper presentation. The keynote talk is given by Robert Birke, IBM Zurich Research Laboratory, Switzerland. His research focuses on virtual resource management for large scale data centers, aiming at optimizing the application latency, system throughput, and resource efficiency, particularly energy. His talk will reflect the IBM view on contemporary cloud architectures, and discusses existing and upcoming challenges in this area. The demonstration at the workshop is presented by CNIT, University of Catania and Telecom Italia as a joint presentation with demonstration. It is entitled with "An SDN/NFV Telco Operator Platform for Multipoint Video Live Streaming: Design and Prototyping".

A total of 20 papers were registered for the workshop, out of those 13 papers were finally submitted and 7 paper were withdrawn. Papers submitted to PROCON Workshop underwent a rigorous review process. Each paper received three or more independent reviews (on average 3.5 reviews), and was discussed among the workshop chairs. In certain cases, when the reviews did not match, additional expert reviews were solicited. Based on the reviews and extensive discussions of the co-chairs, 6 full papers and one short paper were finally selected for the workshop program resulting in an acceptance rate of 46.15%.

The PROCON International Workshop on Programmability for Cloud Networks and Applications will be held in conjunction with the ITC 28 in Würzburg, which is technically co-sponsored by IEEE Communications Society (IEEE ComSoc) and the Informa-

tion Technology Society within VDE (ITG VDE), and in cooperation with ACM SIGCOMM. The workshop is supported and initiated by the two EC H2020 projects INPUT (<http://input-project.eu/>) and ARCADIA (<http://arcadia-framework.eu/>).

The PROCON Workshop would not be a success without the excellent work that has been performed by the members of the technical program committee as well as those reviewers who have spent a considerable amount of their time providing highly qualified reviews.

As organizers of the workshop, we thank all members of the Technical Program Committee and all reviewers. We express our sincere appreciation to the organizers of ITC 28 in Würzburg, in particular Phuoc Tran-Gia and his team at the University of Würzburg, and Tobias Hossfeld, University of Duisburg-Essen, Germany. Furthermore, we thank Christopher Metter and Florian Metzger for their technical support.

PROCON 2016 Workshop Co-Chairs

Florian Wamser, University of Würzburg, Germany
Roberto Bruschi, Consortium for Telecommunications (CNIT), Italy
Anastasios Zafeiropoulos, Ubitech, Greece

September 2016

Workshop Committee

Workshop Co-Chairs

Florian Wamser	University of Würzburg, Germany
Roberto Bruschi	Consortium for Telecommunications (CNIT), Genova, Italy
Anastasios Zafeiropoulos	Ubitech, Greece

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Workshop on Programmability for Cloud Networks and Applications (PROCON)

Monday 12th September, 2016

- 11:00 – 12:00 **Keynote** by Robert Birke (IBM Research – Zurich, Switzerland)
Ensuring Performance in the Virtual Environment
- 12:00 – 12:30 *ZOOM: Lightweight SDN-based Elephant Detection* by Steffen Gebert; Stefan Geißler; Thomas Zinner; Anh Nguyen-Ngoc; Stanislav Lange; Phuoc Tran-Gia
- 12:30 – 13:00 Short Lunch & Coffee Break
- 13:00 – 14:30 *A Novel Reconfigurable-by-Design Highly Distributed Applications Development Paradigm Over Programmable Infrastructure* by Panagiotis Gouvas; Constantinos Vassilakis; Eleni Fotopoulou; Anastasios Zafeiropoulo
On the Necessity of Accounting for Resiliency in SFC by Ghada Moualla; Thierry Turletti; Mathieu Bouet; Damien Saucez
Automated Decision Making Methods for the Multi-objective Optimization Task of Cloud Service Placement by Michael Seufert; Stanislav Lange; Markus Meixner
- 14:30 – 15:00 Coffee Break
- 15:00 – 15:30 Invited Demonstration & Live Talk: *An SDN/NFV Telco Operator Platform for Multipoint Video Live Streaming: Design and Prototyping* by Giovanni Schembra; Marcello Natale Melita
- 15:30 – 16:30 *OpenVolcano: An Open-Source Software Platform for Fog Computing* by Roberto Bruschi; Paolo Lago; Guerino Lamanna; Chiara Lombardo; Sergio Mangialardi
An Analytical Model to Design Processor Sharing for SDN/NFV Nodes by Giuseppe Faraci; Alfio Lombardo; Giovanni Schembra
- 16:30 – 16:45 Closing

ITC 28 Sponsors



The International Advisory Committee (IAC) of the ITC has decided to offer a number of travel grants that will be available to support full-time students for attending ITC 28. The IAC financially supports three prestigious awards for ITC 28: Best Paper Award, Best Student Paper Award, Best Demo Award.

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