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1 CHAIR’S WELCOME

As we witness the explosion of demand for bandwidth and exciting changes in the ways we do networking brought about by SDN, virtualization, cloud, IoT and ubiquitous broadband wireless, we are facing new challenges in measurement and analysis across the entire network stack, from the physical layer up to applications and services in the cloud. The Network Traffic Measurement and Analysis Conference, TMA Conference, focuses on improving the practice or application of measurements, across the entire network stack up to the application layer, with an emphasis on new areas of network communication such as Software-Defined Networks, Cloud services, Content Distribution Networks, Social Networks, mobile applications and data centers. TMA Conference 2018 also tackles traditional measurement topics, such as traffic classification, anomaly detection, network performance evaluation and traffic analysis.

TMA Conference 2018 accepted 22 technical papers out of 56, high-quality submissions. The paper review process included an evaluation phase by PC members, followed by an online discussion and a subsequent shepherding phase on selected papers. The resulting program features a variety of high-quality papers focusing on different aspects of network measurement and analysis, including traffic analysis, data analytics, mobile measurement, content and application measurement, as well as network characterization. This year, the main program also included a special technical session on Hands-on Network Traffic Measurement and Analysis, as well as a Demos and PhD School Student Posters session.

TMA Conference 2018 hosted three events: the first TMA Experts Summit, the second edition of the workshop on Mobile Network Measurement (MNM), and the 8th TMA PhD school, started back in 2010 and recognized as the most important PhD school in network measurement and analysis topics today. The TMA Experts Summit consisted of a full-day event featuring keynotes from renown researchers worldwide on different aspects of network measurement and analysis (e.g., Artificial Intelligence and Machine Learning, Blockchain and Cryptocurrency, SDN/NFV, IoT, QoS, Cyber-security, etc.). The list of speakers included Anja Feldmann (Max Planck Institute for Informatics), Edo Liberty (AWS and Amazon AI Labs), Bruce Maggs (Aka- mai Technologies and Duke University), Felipe Huici (NEC Europe Labs), Jérémie Leguay (Huawei Technologies), Fabián Bustamante (Northwestern University), Tobias Hoßfeld (University of Würzburg), Georgios Smaragdakis (TU-Berlin and MIT), Bernhard Haslhofer (AIT’s Digital Insight Lab) and Gerardo Rubino (INRIA).

The conference featured three exciting talks from recognized researchers and practitioners in network measurements, including:
Mergeable Summaries and the Data Sketches Library
Edo Liberty (AWS and Amazon AI Labs)

Network Research and Falling Trees
Fabián Bustamante (Northwestern University)

Seeing Things: Measuring IoT, IPv6, and Privacy
David Plonka (Akamai Technologies)

To provide an educational experience by introducing students to a review process and to subsequently train the next generation of program committee (PC) members, the TMA Conference 2018 TPC ran a shadow PC, with great success and feedback from the participating members.

TMA Conference 2018 delivered a best paper award, a best open dataset award and a best demo award, in all cases providing a monetary award of EUR 500 besides the corresponding recognition. Three top papers from the main conference were invited for fast tracking at the IEEE Transactions on Network and Service Management journal.

TMA Conference 2018 has been a great success, and we hope that all attendees have enjoyed the excellent technical program and found a nice and constructive environment to discuss on new ideas and upcoming challenges to tackle within the scope of TMA.

Pedro Casas  Nur Zincir-Heywood  Amogh Dhamdhere
AIT Vienna  Dalhousie University  CAIDA UC San Diego

TMA Conference 2018 general chair and program chairs.
2 TMA CONFERENCE 2018 ORGANIZATION

General Chair
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Program Chairs
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Amogh Dhamdhere, CAIDA UC San Diego, USA

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3 MNM WORKSHOP 2018 ORGANIZATION

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Diego Lopez, Telefonica, Spain
Andra Lutu, Simula Research Laboratory, Norway
Vincenzo Mancuso, IMDEA Networks, Spain
Marco Mellia, Politecnico di Torino, Italy
David Ros, Simula Research Laboratory, Norway
Brian Trammell, ETH Zurich, Switzerland
4 TMA TECHNICAL PROGRAM

4.1 TMA Conference Program

Session 1: Traffic Analysis

eMIMIC: Estimating HTTP-based Video QoE Metrics from Encrypted Network Traffic
Tarun Mangla, Emir Halepovic, Mostafa Ammar, Ellen Zegura

FlowMon-DPDK: Parsimonious per-flow Software Monitoring at Line Rate
Tianzhu Zhang, Leonardo Linguaglossa, Massimo Gallo, Paolo Giaccone, Dario Rossi

Degree-based Outliers Detection within IP Traffic Modelled as a Link Stream
Audrey Wilmet, Tiphaine Viard, Matthieu Latapy, Robin Lamarche-Perrin

First Look at Data Center Network Conditions Through The Eyes of PTPmesh
Diana Andreea Popescu, Andrew W. Moore

Session 2: Data Analytics

Dmap: Automating Domain Name Ecosystem Measurements and Applications
Maarten Wullink, Giovane C. M. Moura, Cristian Hesselman

On the Analysis of Network Measurements through Machine Learning: the Power of the Crowd
Pedro Casas

An Artificial Arms Race: Could it Improve Mobile Malware Detectors?
Raphael Bronfman-Nadas, Nur Zincir-Haywood, John T. Jacobs

Mobile Encrypted Traffic Classification Using Deep Learning
Aceto Giuseppe, Domenico Ciunzo, Antonio Montieri, Antonio Pescapè

Session 3: Mobile Measurement

Anycast on the Move: A Look at Mobile Anycast Performance
Sarah Wassermann, John P. Rula, Fabián E. Bustamante, Pedro Casas
Measurement Analysis of TCP Congestion Control Algorithms in LTE Uplink  
Ali Parichehreh, Stefan Alfredsson, Anna Brunstrom

Measuring Mobile Network Multi-Access for Time-Critical C-ITS Applications  
Fehmi Ben Abdesslem, Henrik Abrahamsson, Bengt Ahlgren

Session 4: Content/Application Measurement

Passive Observations of a Large DNS Service: 2.5 Years in the Life of Google  
Wouter B. de Vries, Roland van Rijswijk-Deij, Pieter-Tjerk de Boer, Aiko Pras

A Wrapper for Automatic Measurements with YouTube’s Native Android App  
Michael Seufert, Bernd Zeidler, Florian Wamser, Theodoros Karagioules, Dimitrios Tsilimantos, Frank Loh, Phuoc Tran-Gia, Stefan Valentin

A Second Screen Journey to the Cup: Twitter Dynamics during the Stanley Cup Playoffs  
Daniel de Leng, Mattias Tiger, Mathias Almquist, Viktor Almquist, Niklas Carlsson

Studying the Evolution of Content Providers in the Internet Core  
Esteban Carisimo, Carlos Selmo, J. Ignacio Alvarez-Hamelin, Amogh Dhamdhere

Session 5: Hands-on Network Traffic Measurement and Analysis

Tracing Internet Path Transparency  
Mirja Kühlewind, Michael Walter, Iain R. Learmonth, Brian Trammell

Towards Provable Network Traffic Measurement and Analysis via Semi-Labeled Trace Datasets  
Milan Cermak, Tomas Jirsik, Petr Velan, Jana Komarkova, Stanislav Spacek, Martin Drasar, Tomas Plesnik

Comparison of Spectral and Energy Efficiency Metrics using Measurements in a LTE-A Network  
Sandrine Boumard, Ilkka Harjula, Teemu Kanstren, Seppo J. Rantala
Non-parametric Bootstrap Detection of Availability Service Level Objective Violations in Cloud Storage
Maurizio Naldi

Session 6: Demos

App for Dynamic Crowdsourced QoE Studies of HTTP Adaptive Streaming on Mobile Devices
Michael Seufert, Nikolas Wehner, Pedro Casas

An SDN-based Approach for QoS and Reliability in Overlay Networks
Isabel Amigo, Gabriel Gómez Sena, Marwa Chami, Pablo Belzarena

Automated VNF Testing with Gym: A Benchmarking Use Case
Raphael Vicente Rosa, Christian Esteve Rothenberg

An Intelligent Data Visualization Service Platform for Mobile Network Operators
Naz Albayrak, Engin Zeydan

Distributed Internet Paths Performance Analysis through Machine Learning
Sarah Wassermann, Pedro Casas

YouTube QoE Monitoring with YoMoApp: A Web-based Data Interface for Researchers
Florian Wamser, Nikolas Wehner, Michael Seufert, Pedro Casas, Phuoc Tran-Gia

Session 7: Inference of Network Properties

Demystifying TCP Initial Window Configurations of Content Distribution Networks
Jan Rüth, Oliver Hohlfeld

Using Crowdsourcing Marketplaces for Network Measurements: The Case of Spoofer
Qasim Lone, Mobin Javed, Maciej Korczynski, Hadi Asghari, Matthew Luckie, Michel van Eeten

Exploring usable Path MTU in the Internet
Ana Custura, Gorry Fairhurst, Iain Learmonth
4.2 MNM Workshop Program

Session 1: Network QoS and Coverage

Visualizing Mobile Coverage from Repetitive Measurements on Defined Trajectories
*Chad Jarvis, Cise Midoglu, Andra Lutu, Özgür Alay*

I’m Only Unhappy When It Rains: Forecasting Mobile QoS With Weather Conditions
*Diego Madariaga, Martín Panza, Javier Bustos-Jimenez*

Deriving Cell Load from RSRQ Measurements
*Vaclav Raida, Martin Lerch, Philipp Svoboda, Markus Rupp*

Session 2: Multipath and Application Performance

Connected Vehicles in Cellular Networks: Multi-access versus Single-access Performance
*Henrik Abrahamsson, Fehmi Ben Abdesslem, Bengt Ahlgren, Anna Brunstrom, Ian Marsh, Mats Bjorkman*

Voice-activated Applications and Multipath TCP: a Good Match?
*Viet-Hoang Tran, Hajime Tazaki, Quentin De Coninck, Olivier Bonaventure*

A Public Dataset for YouTube’s Mobile Streaming Client
*Theodoros Karagioules, Dimitrios Tsilimantos, Stefan Valentin, Florian Wamser, Bernd Zeidler, Michael Seufert, Frank Loh, Phuoc Tran-Gia*