TMA Conference 2020

Proceedings of the 4th Network Traffic Measurement and Analysis Conference

Berlin, Germany, June 10-11, 2020

Contents

1 CHAIR'S WELCOME

We are very excited to welcome you to the fourth edition of the Network Traffic Measurement and Analysis Conference (TMA Conference 2020)! The surging demand for higher bandwidth and lower latency, alongside the increasing heterogeneity of services, poses substantial new challenges in networking, distributed systems and the web. Emerging paradigms based on the softwarization, virtualization, and cloudification of infrastructures are fostering exciting changes in the ways we build and manage such systems. In particular, they force us to re-think system measurements and analysis across the whole stack, from the physical layer up to applications in the cloud.

TMA Conference aims at being a highly selective venue for the presentation of early-stage and mature research – as well as controversial work – on all aspects of network measurements and analysis. Contributions presenting concepts, experiences, and results in the collection, processing, analysis and visualization of network measurements across the entire network stack is in scope. The TMA conference has a strong tradition of open and lively interaction among scientists and engineers in academia and industry, and serves as a premier forum to exchange ideas, and present advances over the state-of-the-art.

While TMA 2020 will be in a format very different from what we had envisioned when we started to plan for the event, we are very happy to invite you to an online version of TMA 2020. Thanks to generous sponsorship, conference attendance will be entirely free.

We have an excellent technical program lined up. **TMA 2020 accepted 18 technical papers out of 54 (33% acceptance)** 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 papers are organized into six technical sessions covering Transport, Security, Access Networks & Routing, Web, Telemetry & Analysis, and Mobile. The conference further features an exciting **keynote talk on Privacy and Security Threats in Social Network Ad Targeting and Delivery by Prof. Alan Mislove** (Northeastern University). In place of a poster session, the program also offers the opportunity to learn about new ideas and ongoing measurement work in a lightning talks session, featuring **8 lightning talks**.

TMA 2020 will present three different awards to the best contributions, including a **best paper award**, a **best open dataset award**, and a **best lightning talk award**. Authors of selected top TMA 2020 papers will be invited to submit an extended version of their paper to IEEE Transactions on Network and Service Management for fast-track processing.

Once again a very warm welcome to TMA 2020. We hope you will enjoy the conference and we look forward to see you online!

Georgios Smaragdakis
TU Berlin

Anja Feldmann
Max-Planck-Institute for Informatics

Anna Brunstrom
Karlstad University

Gareth Tyson
Queen Mary University of London

TMA Conference 2020 general chair and program chairs.

2 TMA CONFERENCE 2020 ORGANIZATION

General Chairs

    Georgios Smaragdakis, *TU Berlin, Germany*

    Anja Feldmann, *Max Planck Institute for Informatics, Germany*

Program Chairs

    Anna Brunstrom, *Karlstadt University, Sweden*

    Gareth Tyson, *Queen Mary University of London, UK*

Program Committee

    Andra Lutu, *Telefonica Research (Spain)*

    Andres Garcia Saavedra, *NEC Laboratories Europe (Germany)*

    Anna Maria Mandalari, *Imperial College London (UK)*

    Antonio Pescapè, *University of Napoli (Italy)*

    Aravindh Raman, *King's College London (UK)*

    Benoit Donnet, *Université de Liège (Belgium)*

    Chadi Barakat, *Inria (France)*

    Cristel Pelsser, *University of Strasbourg (France)*

    Cristian Lumezanu, *NEC Laboratories America (US)*

    Daphné Tuncer, *Imperial College London (UK)*

    Felix Cuadrado, *Universidad Politecnica de Madrid (Spain)*

    Ian Marsh, *RISE-SICS (Sweden)*

    Ignacio Castro, *Queen Mary University of London (UK)*

    Isabelle Chrisment, *Loria (France)*

    Jeremy Blackburn, *Binghamton University (US)*

    Joachim Fabini, *TU Wien (Austria)*

    John Rula, *Akamai (US)*

    Kenjiro Cho, *IIJ Research Lab (Japan)*

    Lisandro Granville, *Federal University of Rio Grande do Sul (Brazil)*

    Maciej Korczynski, *Grenoble Institute of Technology (France)*

    Marco Fiore, *CNRS (France)*

    Matthew Luckie, *University of Waikato (New Zealand)*

Matthias Wählisch, *Freie Universität Berlin (Germany)*

Mehmet Gunes, *University of Nevada-Reno (US)*

Kleomenis Katevas, *Telefonica Research (Spain)*

Nicolas Kuhn, *CNES (France)*

Olaf Maennel, *Tallinn University of Technology (Estonia)*

Oliver Hohlfeld, *Brandenburg University of Technology (Germany)*

Özgü Alay, *Simula Metropolitan (Norway)*

Paul Patras, *University of Edinburgh (UK)*

Philipp Richter, *Akamai/MIT (US)*

Philippe Owezarski, *LAAS-CNRS (France)*

Ralph Holz, *University of Sydney (Australia)*

Ram Durairajan, *University of Oregon (US)*

Roland van Rijswijk-Deij, *University of Twente and NLnet Labs (Netherlands)*

Ruben Cuevas, *UC3M (Spain)*

Simone Ferlin, *Ericsson (Sweden)*

Solange Lima, *University of Minho (Portugal)*

Taejoong Chung, *Rochester Institute of Technology (US)*

Vaibhav Bajpai, *TU Munich (Germany)*

Xenofontas Dimitropoulos, *FORTH (Greece)*

Zubair Shafiq, *University of Iowa (US)*

Steering Committee

Alessio Botta, *University of Napoli Federico II (Italy)*

Christian Callegari, *CNIT (Italy)*

Niklas Carlsson, *Linköping University (Sweden)*

Pedro Casas, *AIT Austrian Institute of Technology (Austria)*

Amogh Dhamdhere, *Amazon Web Services (USA)*

Idilio Drago, *Politecnico di Torino (Italy)*

Marco Fiore, *CNR (Italy)*

Cristel Pelsser, *University of Strasbourg (France)*

Ramin Sadre, *Université catholique de Louvain (Belgium)*

Stefano Secci, *CNAM (France)*

Anna Sperotto, *University of Twente (The Netherlands)*

Nur Zincir-Heywood, *Dalhousie University (Canada)*

3 TMA TECHNICAL PROGRAM

3.1 TMA Conference Program

Session 1: Transport

Debogonising 2a10::/12: Analysis of One Week's Visibility of a New /12
Stephen D. Strowes (RIPE NCC), Emile Aben (RIPE NCC), Rene Wilhelm (RIPE NCC), Florian Obser (RIPE NCC), Riccardo Stagni (RIPE NCC), Agustìn Formoso (RIPE NCC)

Overcoming the Sorrows of the Young UDP Options
Raffaele Zullo (University of Aberdeen), Tom Jones (University of Aberdeen), Gorry Fairhurst (University of Aberdeen)

Inspector Gadget: A Framework for Inferring TCP Congestion Control Algorithms and Protocol Configurations
Sishuai Gong (Purdue University), Usama Naseer (Brown University), Theophilus Benson (Brown University)

Session 2: Security

A Retrospective Analysis of User Exposure to (Illicit) Cryptocurrency Mining on the Web
Ralph Holz (University of Twente), Diego Perino (Telefonica Research), Matteo Varvello (Brave Software Inc.), Johanna Amann (ICSI), Andrea Continella (UCSB), Nate Evans (University of Denver), Ilias Leontiadis (Samsung), Chris Natoli (University of Sydney), Quirin Scheitle (TU Munich)

From Defensive Registration to Subdomain Protection: Evaluation of Email Anti-Spoofing Schemes for High-Profile Domains
Sourena Maroofi (Univ. Grenoble Alpes, CNRS, Grenoble INP, LIG), Maciej Korczynski (Univ. Grenoble Alpes, CNRS, Grenoble INP, LIG), Andrzej Duda (Univ. Grenoble Alpes, CNRS, Grenoble INP, LIG)

Watching the Watchers: Nonce-based Inverse Surveillance to Remotely Detect Monitoring
Laura Roberts (Princeton University), David Plonka (Akamai Technologies)

Session 3: Access Networks & Routing

Sanitizing a View of Consumer Broadband in the United States
Arun Dunna (University of Massachusetts Amherst), Zachary Bischof (IIJ Re-

search Lab), Romain Fontugne (IIJ Research Lab)

Characteristics of Metro Fiber Deployments in the US
Paul Barford (University of Wisconsin–Madison), Ramakrishnan Durairajan (University of Oregon), Matthew Hall (University of Oregon), Sathiya Kumaran Mani (Microsoft)

Anatomy of Multipath BGP Deployment in a Large ISP Network
Jie Li (University College London), Vasileios Giotsas (Lancaster University), Shi Zhou (University College London)

Bidirectional Anycast/Unicast Probing (BAUP): Optimizing CDN Anycast
Lan Wei (University of Southern California/ ISI), Marcel Flores (Verizon Digital Media Services), Harkeerat Bedi (Verizon Digital Media Services), John Heidemann (University of Southern California/ ISI)

Session 4: Web

Characterizing CNAME Cloaking-based Tracking on the Web
Ha Dao (The Graduate University for Advanced Studies Tokyo, Japan), Kensuke Fukuda (NII/Sokendai)

A Deeper Look at Web Content Availability and Consistency over HTTP/S
Muhammad Talha Paracha (Northeastern University), Balakrishnan Chandrasekara (Max-Planck-Institute for Informatics), David Choffnes (Northeastern University), Dave Levin (University of Maryland, College Park)

Clash of the Trackers: Measuring the Evolution of the Online Tracking Ecosystem
Konstantinos Solomos (University of Illinois at Chicago), Panagiotis Ilia (University of Illinois at Chicago), Nicolas Kourtellis (Telefonica Research)

Session 5: Telemetry & Analysis

On the Practicality of Learning Models for Network Telemetry
Soheil Jamshidi (University of Oregon), Zayd Hammoudeh (University of Oregon), Ramakrishnan Durairajan (University of Oregon), Daniel lowd (University of Oregon) Reza Rejaie (University of Oregon), Walter Willinger (Niksun Inc.)

Classification-assisted Query Processing for Network Telemetry
Gioacchino Tangari (Macquarie University), Marinos Charalambides (Univer-

sity College London), Daphne Tuncer (Imperial College London), Clara Grazian (University of New South Wales), George Pavlou (University College London)

Automatic Learning coupled with Interpretability: MBDA in Action
Jose Camacho (Universidad de Granada), Rasmus Bro (University of Copenhagen), David Kotz (Dartmouth College)

Session 6: Mobile

On the Utility of Coarse-grained Mobile Network Telemetry in Detecting Performance Degradation
Georgios Patounas (Simula Metropolitan Center for Digital Engineering), Andres Gonzalez (Telenor Research), Ahmed Elmokashfi (Simula Metropolitan Center for Digital Engineering)

Need for Mobile Speed: A Historical Study of Mobile Web Performance
Javad Nejati (Stony Brook University), Meng Luo (Stony Brook University), Nick Nikiforakis (Stony Brook University), Aruna Balasubramanian (Stony Brook University)