



**TMA Conference 2022**

**Proceedings of the 6th Network Traffic  
Measurement and Analysis Conference**

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# 1 CHAIR'S WELCOME

The vision for next generation communication systems sets an extraordinarily high bar for networks. These are expected to become general-purpose platforms, and connect a plethora of extremely heterogeneous terminals, all while catering to a surging demand for bandwidth and to diverse applications. Emerging paradigms based on the softwarization, virtualization, cloudification of the network infrastructures are fostering exciting changes in the ways we build and manage such systems. In particular, they force us to re-think traffic measurement and analysis across the whole stack, from the physical layer up to applications in the Cloud.

The Network Traffic Measurement and Analysis Conference, **TMA Conference**, focuses on improving the practice or application of network measurements across the entire network stack up to application layers, with an emphasis on new areas of network communication such as Network Function Virtualization, Software-Defined Networks, Cloud Services, Data Centers or Content Distribution Networks, to support innovative services and applications. 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.

**TMA Conference 2022 accepted 10 technical papers out of 28**, 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 Cybersecurity and Integrity, Performance and Quality of Experience, Traffic Fingerprinting and Probing, and Optimization of Network Measurement approaches and systems.

TMA Conference 2022 also hosted the **10th TMA PhD school**, started back in 2010 and recognized as the most important PhD school in network measurement and analysis topics today. The conference featured four exciting talks from recognized researchers and practitioners in network measurements and data analysis, including:

**Impactful Measurement Research Costs Time and Nerves  
Lessons from Internet Security**

Matthias Wählisch (Freie Universität Berlin)

**Intangible Information Networks – Measurements and Analysis**

Doina Bucur (University of Twente)

**Towards Digital Sovereignty in the Age of Hyper-giants**

Vaibhav Bajpai (CISPA Helmholtz Centre for Information Security)

**Taming the Data Divide to Enable AI-driven Networks**

Alessandro Finamore (Huawei Technologies France)

TMA Conference 2022 delivered a **best paper award** (*Active TLS Stack Fingerprinting: Characterizing TLS Server Deployments at Scale*, by M. Sosnowski, J. Zirngibl, P. Sattler, G. Carle, C. Grohnfeldt, M. Russo, and D. Sgandurra), and top papers from the main conference were invited for **fast tracking at the IEEE Transactions on Network and Service Management journal**.

**TMA Conference 2022 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.

**Roya Ensafi**  
University of Michigan

**Andra Lutu**  
Telefonica Research

**Anna Sperotto**  
University of Twente

**Roland van Rijswijk-Deij**  
University of Twente

TMA Conference 2022 program chairs and general chairs.

## 2 TMA CONFERENCE 2022 ORGANIZATION

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### 3 TMA CONFERENCE TECHNICAL PROGRAM

#### Session 1: Security and Integrity (chair: Pedro Casas)

- **The Race to the Vulnerable: Measuring the Log4j Shell Incident**  
*R. Hiesgen, M. Nawrocki, T.C. Schmidt, M. Wählisch*
- **Domain Name Lifetimes: Baseline and Threats**  
*A. Affinito, R. Sommesse, G. Akiwate, S. Savage, KC Claffy, G.M. Voelker, A. Botta, M. Jonker*
- **Network Path Integrity Verification using Deterministic Delay Measurements**  
*A. Arouna, S. Bjørnstad, S. Jørgen Ryan, T. Dreibholz, S. Rind, A. Elmokashfi*

#### Session 2: Performance and Experience (chair: Cristel Pelsser)

- **X-Ray Goggles for the ISP: Improving in-Network Web and App QoE Monitoring with Deep Learning**  
*P. Casas, S. Wassermann, M. Seufert, N. Wehner, O. Dinica, T. Hossfeld*
- **Analyzing the Influence of Resource Prioritization on HTTP/3 HOL Blocking and Performance**  
*C. Sander, I. Kunze, K. Wehrle*

#### Session 3: Fingerprinting and Probing (chair: Idilio Drago)

- **Active TLS Stack Fingerprinting: Characterizing TLS Server Deployments at Scale**  
*M. Sosnowski, J. Zirngibl, P. Sattler, G. Carle, C. Grohnfeldt, M. Russo, D. Sgandurra*
- **Twitch Chat Fingerprinting**  
*D. Hasselquist, C. Vestlund, N. Johansson, N. Carlsson*

## Session 4: Measurement Optimization (chair: Ralph Holz)

- **Swift and Accurate End-to-End Throughput Measurements for High-Speed Networks**

*M. Arifuzzaman, E. Arslan*

- **Metis: Better Atlas Vantage Point Selection for Everyone**

*M. Appel, E. Aben, R. Fontugne*

- **Domain Parking: Largely Present, Rarely Considered!**

*J. Zirngibl, S. Deusch, P. Sattler, J. Aulbach, G. Carle, M. Jonker*