WP4: Standardisation, Dissemination & Exploitation

Diego R. Lopez (TID)

mami

measurement and architecture for a middleboxed internet

measurement | architecture | experimentation

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WP4: Tasks and Objectives

- Standardisation
  - Key aspect, but change in focus (as explained in WP3)
- Publications, Workshop and Conference Activities
- Exploitation and Innovation Management
  - Connected with ongoing initiatives of the industrial partners
- Public Communication Activities

WP4 Tasks and Partners

Partner	PM	T4.1 Standardization	T4.2 Publications, Workshop and Conference Activities	T4.3 Exploitation and Innovation Management	T4.4 Academic Exploitation	T4.5 Public Communication Activities	T4.6 Middlebox Observatory Web Site Development and Maintenance
1. ETH	10	✓	✓		✓	✓	✓
2. TID	8	✓	✓	✓		✓	
3. ULg	2		✓		✓		
4. UoA	8	✓	✓		✓		
5. ZHAW	4		✓		✓	✓	✓
6. SRL	2		✓		✓		
7. Nokia	8	✓	✓	✓			

Standardisation Targets
IETF and IRTF

- **IETF**
  - Transport: TAPS, QUIC, tcpm, tsvwg, and contributions to TLS
  - I2NSF: Interface for security function management
  - Automated trust and security: ACME
- **IRTF**
  - PANRG: Bringing path awareness to transport and application layer protocols
  - MAPRG: Measurement collection, processing and access
  - NFVRG: VNF deployment. Trust models and network-application communication

Standardisation Targets
ETSI, IEEE, and 5G

- **ETSI**
  - TC CYBER: Multi-context trust and security mechanisms
  - NFV IFA and EVE: Management and orchestration for MAMI-enhanced VNFs
  - NFV SEC: Multi-context trust and security mechanisms
  - MEC: MAMI-enhanced VNFs as part of mobile edge (fog computing) deployments
  - NGP: Middlebox-friendly transport, transport-friendly middleboxes
- **IEEE**
  - Monitoring the Encrypted Traffic Inspection WG
- **5G**: As part of the network support for new applications

Standardisation Activities on MCP

- PLUS BoF at IETF 96 (July 2016)
  - The PLUS Working Group (WG) was not created
- Applying explicit signalling mechanism developed in MAMI for protocol design in existing IETF working groups, e.g. measurability in QUIC
  - Editors of two working group documents on the applicability and the manageability of QUIC
  - Individual submission introducing the PLUS transport-independent state machine
  - Contribution to tsvwg as input for discussion on increased deployment of encryption on all layers to support future Internet evolution
- Building awareness in ETSI
  - Periodic reports to NFV plenaries
  - Contributions to TC CYBER on the applicability of MCP:
    - They have adopted the “MCP” name, though purpose is not exactly the same

Standardisation Activities on MCP Documents

- IETF
  - draft-ietf-quic-manageability
  - draft-ietf-quic-applicability
  - draft-fairhurst-tsvwg-transport-encrypt
  - draft-ietf-tcpm-accurate-ecn
  - draft-trammell-plus-statefulness
  - draft-you-tsvwg-latency-loss-tradeoff
  - draft-trammell-plus-spec
  - draft-trammell-plus-abstract-mech
  - draft-trammell-privsec-defeating-tcpip-meta
- ETSI CYBER
  - DTS/CYBER-0027-1

Standardisation Activities on Measurement

- Measurement and Analysis for Protocols (MAP) RG
  - Created on the project's initiative
  - Provide research evidence on Internet measurement to inform protocol engineering and practice in the IETF
- TSVWG and QUIC
  - Specific considerations on the need to incorporate measurability considerations in protocol design
- I2NSF WG
  - Capability model for security functions
  - Suitable to be combined with middlebox characterization
  - Flexible standard for middlebox classification
- Building awareness in ETSI NFV
  - Report on measurement results to the TST WG
  - Use cases related to support for ad-hoc measurement

Standardisation Activities on Transport Interfaces and Security

- Interoperability of the MAMI FTL (Flexible Transport Layer) with the TAPS facility
  - First RFC produced by the project
- Consolidation of the STAR approach within the ACME WG
  - Automated management of *delegated* certificates
  - In the spirit of the original LURK proposal
- Monitoring multi-context security activities
  - Including recent discussion in the TLS WG
- Contributing and monitoring other bodies
  - ETSI NFV SEC
  - ETSI TC CYBER
  - IEEE ETI WG

Standardisation Activities on Transport Interfaces and Security - Documents

- RFC 8095
- draft-trammell-taps-post-sockets
- draft-kuehlewind-crypto-sep
- draft-ietf-acme-star
- draft-sheffer-acme-star-request
- draft-mavrogiannopoulos-tls-cid

Publications and Workshops

- Twelve different publications and conference participations
  - IEEE Internet Computing, EUCNC, ANRW, ITC, SIGCOMM CCR, IEEE/IFIP CNSM…
- Joint workshop with the MONROE project (MS6)
  - Mobile Network Measurements (MNM)
  - In conjunction with the TMA Conference 2017, in Dublin/Maynooth
  - http://tma.ifip.org/workshops/mnm17-workshop/
- Small and focused workshop in Zurich
  - By invitation only
  - Discussion of a new sockets API
  - Leading to input provided to the IETF TAPS WG
  - Direct collaboration with the NEAT project

Industrial Exploitation
TID

- TID working to apply results to services provided by Telefonica Business Units
  - Utilizing and contributing to measurement data in the MAMI PTO
  - Applying the MCP to NFV and cloud-based services in the Telefonica portfolio
- MCP-based signalling to be applied to UNICA, Telefonica's NFVI
  - Apply the service differentiation function of MCP in Niji to improve user experience
    - Niji is a Telefonica anonymization and optimisation service being deployed on UNICA
  - Support for policy-based management in vHE (virtualised Home Environments)
    - The virtualised home environment is the first commercial NFV pilot
  - Considering the support for measurement facilities deployed on the NFVI

Industrial Exploitation
Nokia

- Nokia investigates to integrate MAMI results into the Velocix product line
  - CDN, mABR, and Personalisation Platform
  - Enhanced cooperation with the mobile network, better QoE, and expanded personalisation functionality for OTT video delivery
- Initial experiments in the radio segments, both for eNodeB and terminal equipment
  - Verify the hypothesis that explicit packet markings are beneficial
  - Evaluate energy and scheduling efficiency

Industrial Contacts and Dissemination

- Active collaboration with GSMA
  - In the framework of GSMA's POP Internet WG
  - Experiments to evaluate the application of LoLa (Loss vs Latency) classification schemes in mobile networks
  - Chairing the Content Classification project , focusing on defining and executing the "1-bit Experiment"
  - Will eventually translate in a public report and the availability of open-source software
  - Alignment of observatory data collection and access
  - Two-way coordination on other MCP-related initiatives
- Introducing MAMI at the SDN World Congress
  - The Hague, October 2016 - https://www.layer123.com/sdn
  - Introduce the project goals, and first results in connection with the Software Network concepts

Academic Exploitation

- ETH Zurich
  - Multiple students theses on continues measurement/PTO, PATHspider tracebox, and low-latency
  - Doctoral student on MCP implementation and explicit protocol support of passive measurement
- ZHAW
  - Bachelor and project theses on Linux kernel development with new protocols and observatory
  - Teaching: PLUS principles as an example of tradeoffs between privacy and manageability
- University of Aberdeen
  - MAMI results as input for teaching and postgraduate education
  - basis to stimulate future develop closer relationships with key industry players
- Simula Research Laboratory
  - Expanding the network of research partners and leveraging results/experience in future projects
- University of Liege
  - Teaching for master student courses on measuring middleboxes interference and modelling

Software

- MAMI code hosted on github.com: https://github.com/mamiproject
  - 46 repos
- PATHspider releases (through software distribution systems)
  - PATHspider 1.0.0 and 1.0.1, at the Python Package Index - https://pypi.python.org/
  - PATHspider 1.0.1, at Debian Operating System - https://www.debian.org/
  - 2.0.0 is coming soon!
- Regular participation in IETF Hackathons

Communication Actions

- The MAMI domains and website
  - https://mami-project.eu/
    - 32 blog post in total, 20 new since July 2016;
    - Up-to-date list of publications and other documents in standardization
    - https://observatory.mami-project.eu/ (the MAMI PTO)
      - Available since May 2016
  - https://pathspider.net/
- The MAMI Twitter account - @mamiproject
  - 151followers
  - 233 tweets since June 2016
- Active coordination with the FIRE Dissemination WG

The Coming WP4 Path

- Continuous focus on standardization
  - Technical contributions to create and influence new standards, especially within IETF/IRTF: QUIC, TSVWG, TAPS…
  - Input into PANRG and MAPRG to bring awareness of research results in the IETF
  - Specific inputs into SDOs and industry groups on mechanisms for middlebox-cooperative protocols: ETSI NFV, ETSI TC CYBER, IEEE ETI WG and GSMA Internet WG
    - Planed Industry workshop collocated with IETF-101 in London in March (**MS9**)
- Continue building awareness in the research and scientific community
  - Focus on PTO and measurements performed by various tools such as PATHspider and tracebox
  - Planed PhD Summer School at TMA‘18 in June in Vienna (**MS11**)
- Identification of key application(s) for the MCP and exploitation of project results
  - Current products and services
  - Bring results and tools into Software Network practice and lifecycle management
  - Further explore direct collaboration in measurements and the PTO itself