Munich Internet Research Retreat 2016

ABSTRACT

This article summarises a 2 day long research retreat seminar on held in November 2016. The entire set of presentations delivered during the seminar is made publicly available at [1].

Keywords

Internet measurements, Quality of experience, Network management, Traffic engineering

1. INTRODUCTION

2. INVITED PRESENTATIONS

The invited presentations were intended as a basis for triggering discussions and identifying areas for group work.

2.1 Edge Computing considered harmful

2.2 Towards A Clean Slate – Digital Sovereignty in the Post Snowden Era

2.3 On software network management

2.4 FlexNets: Quantifying Flexibility in Communication Networks

2.5 An Accidental Internet Architecture

2.6 Measuring IPv6 Performance

2.7 Path tracing and validation of IPv4 and IPv6 siblings

2.8 SWIFT: Predictive Fast Reroute upon Remote BGP Disruptions

2.9 Open Platforms for Cyber-physical systems

2.10 Collaborative intrusion handling using the Blackboard-Pattern

3. PARALLEL GROUP WORK

The afternoon sessions were used to discuss certain topics in more depth in smaller groups. This section summarises the discussions of each group.

3.1 SDN/NFV Measurements

3.2 SDN++: Applications Perspective

The breakout session entitled SDN++ dealt with SDN from the perspective of how to apply SDN, and how to introduce improvements to SDN (thereby creating SDN++), for better meeting the identified requirements. Participants of the breakout session were Laurent Vanbevier, Artur Hecker, Wolfgang Kellerer, Edwin Cordeiro and Georg Carle, the latter also being the presenter of the results. The method of the working group was first to identify relevant application areas of SDN, then assess to which extent known SDN approaches have shortcomings (i.e., identifying the 'SDN pain areas'), and subsequently identifying promising approaches for improving SDN. The application areas of SDN were (1) establishing means for programmability of the network, which can be used for improving certain network properties, (2) management of advanced cellular networks, in particular 5G networks, for different capabilities such as network slicing, and (3) providing means to add sophisticated control functionality to corporate networks, such as adding flexible access control. Identified weaknesses of existing SDN were the fact that existing SDN southbound interfaces, in particular OpenFlow, operate on a low level of abstraction, which makes programming of the network time-consuming and error prone. Identified areas of improvement and need for further work were specifying suitable high-level interfaces and abstractions. There further is the need to develop tools that are capable of automatically translate high-level specifications to low-level configuration. A complete tool chain is required. This includes measurement tools that are capable of monitoring changes. Network programmability is beneficial for measurement tools. It is expected that SDN management tools will facilitate to deal with the programmability of networks. Furthermore, verification tools will allow to detect and prevent attempts of wrongly programming the network. These tools will form a network operating system, with tools that operate on top of the operating system functions. Another need for improvement is the development of a clear transition path from today's networks to future SDN-based networks. This includes to identify which legacy functionalities from today's networks we assume being able to depend on in SDN deployments.

3.3 QUIC

3.4 DDoS Defence beyond Centralization

3.5 Security

3.6 IoT

4. LIGHTNING TALKS

Participants were also encouraged to volunteer for a lightning talk to provide a perspective into their recent measurement research work.

5. POSTERS

Participants were also encouraged to volunteer to bring a poster to provide a perspective into their recent measurement research work.

6. CONCLUSIONS AND NEXT STEPS

Acknowledgements

7. REFERENCES

[1] Munich Internet Research Reat 2016: Materials. https://www.cm.in.tum.de/en/mir.