IRTF 2015 Activity Report

The present note provides a short overview and highlights of the activities of the different IRTF's Research Groups (RG) that held during 2015.

The IRTF Current Status

- CFRG - Crypto Forum Research Group
- GAIA - Global Access to the Internet for All Research group
- HRPC - Human Rights Protocol Considerations Research group
- ICCRG - Internet Congestion Control Research Group
- ICNRG - Information-Centric Networking Research Group
- NFVRG - Network Function Virtualisation Research Group
- NMRG - Network Management Research Group
- NWCRG - Network Coding Research Group
- SDNRG - Software Defined Networking Research Group
- T2TRG Thing-to-Thing Research group

ANRP - Applied Networking Research Prizes 2015:

The following Applied Networking Prizes have been awarded during the last year:

- At IETF-95, to Roya Ensafi for examining how the Chinese "great firewall" discovers hidden circumvention servers:
    - Roya Ensafi, David Fifield, Philipp Winter, Nick Feamster, Nicholas Weaver, and Vern Paxson. Examining How the Great Firewall Discovers Hidden Circumvention Servers. Proc. ACM Internet Measurement Conference (IMC), Tokyo, Japan, October 28-30, 2015.

- At IETF-95, to Zakir Durumeric for an empirical analysis of email delivery security:
    - Zakir Durumeric, David Adrian, Ariana Mirian, James Kasten, Elie Bursztein, Nicolas Lidzborski, Kurt Thomas, Vijay Eranti, Michael Bailey, and J. Alex Halderman. Neither Snow Nor Rain Nor MITM… An Empirical Analysis of Email Delivery Security. Proc. ACM Internet Measurement Conference (IMC), Tokyo, Japan, October 28-30, 2015.

- At IETF-94, to Xiao Sophia Wang for a systematic study of web page load times under SPDY:
    - Xiao Sophia Wang, Aruna Balasubramanian, Arvind Krishnamurthy and David Wetherall. How Speedy is SPDY? Proc. USENIX Symposium on Networked Systems Design and Implementation (NSDI), Seattle, WA, USA, April 2-4, 2014.

- At IETF-94, to Roland van Rijswijk-Deij for a detailed measurement study on a large dataset of DNSSEC-signed domains:
    - Roland van Rijswijk-Deij, Anna Sperotto, and Aiko Pras. DNSSEC and its Potential for DDoS Attacks: A Comprehensive Measurement Study. Proc. ACM Internet Measurement Conference (IMC), Vancouver, BC, Canada, November 2014.

- At IETF-93, to Haya Shulman for analyzing the deficiencies of DNS privacy approaches:
    - Haya Shulman. Pretty Bad Privacy: Pitfalls of DNS Encryption. Proc. ACM Workshop on Privacy in the Electronic Society (WPES), Scottsdale, AZ, USA, November 3, 2014.

- At IETF-93, to João Luís Sobrinho for designing a route-aggregation technique that allows filtering while respecting routing policies:
  - João Luís Sobrinho, Laurent Vanbever, Franck Le and Jennifer Rexford. Distributed Route Aggregation on the Global Network. Proc. ACM CoNEXT, Sydney, Australia, December 2-5, 2014.

CFRG Activity

The CFRG is working on collect information on current cryptographic primitives currently in use in the IETF.

GAIA Activity

The Internet Society's Global Internet User Survey 2012 reveals that a large majority of respondents believe that Internet access should be considered a basic human right. However, in the reality of today's Internet, the vision of global access to the Internet faces the challenge of a growing digital divide, i.e., a growing disparity between those with sufficient access to the Internet and those who cannot afford access to the essential services provided by the Internet.
The Global Access to the Internet for All (GAIA) is an IRTF initiative that aims:
- create increased visibility and interest among the wider community on the challenges and opportunities in enabling global Internet access, in terms of technology as well as the social and economic drivers for its adoption;
- create a shared vision among practitioners, researchers, corporations, non governmental and governmental organisations on the challenges and opportunities;
- document the costs of existing Internet Access, the breakdown of those costs (energy, manpower, licenses, bandwidth, infrastructure, transit, peering);
- develop a longer term perspective on the impact of GAIA research group findings on the standardisation efforts at the IETF.

HRPC Activity

The Human Rights Protocol Considerations Research Group in the IRTF is chartered to research whether standards and protocols can enable, strengthen or threaten human rights, as defined in the Universal Declaration of Human Rights (UDHR) and the International Covenant on Civil and Political Rights (ICCPR), specifically, but not limited to the right to freedom of expression and the right to freedom of assembly.

ICNRG Activity

The ICN RG is one of the most active RGs. Lats year the group published a first RFC providing baseline scenarios to enable performance comparisons between different approaches:

- RFC 7476 Information-Centric Networking: Baseline Scenarios (was draft-irtf-icnrg-scenarios)

There is also quite a volume of work on the CCNx implementation in particular on messages format. Furthermore, the group is starting to explore requirements and challenges in applying the ICN paradigm in the IoT (Internet of Things) context.

ICCRG Activity

The ICCRG met only twice last year. Recent activity has focused on TCP modifications for short RTTs (like in data centers) and congestion control in MultiPath TCP. There is also ongoing work on the deployment of ECN (Explicit Congestion Notification) at Internet scale.

NFVRG Activity

The group focuses on research problems associated with NFV-related topics and on bringing a research community together that can jointly address them, concentrating on problems that relate not just to networking but also to computing and storage aspects in such environments. The group has defined four near-term work items: (1) policy- based resource management, (2) analytics for visibility and orchestration, (3) VNF performance modelling to facilitate transition to NFV, and (4) service verification with regard to security and resilience. For each of these items, the goal is exploring system architecture, optimization, and open interfaces across components, through experimental results, simulations, and/or real-world implementations. So far, the group has explored several proposal and show case several NFV-related projects, but does not seem to make strong progress on the short-term objectives. The OpenMANO community is actively contributing in discussions and presentation in the research group.

NWCRG Activity

The objective of the Network Coding Research Group (NWCRG) is to research Network Coding principles and methods that can benefit Internet communication. One goal of the NWCRG is to gather the research results and posit the open questions related to Network Coding in order to develop practical applications of Network Coding that improve Internet communication. Another goal is to gather information on the existing practical implementations of Network Coding, distill common functionalities and propose a path to standardization of Network Coding-enabled communication.

SDNRG Activity

The SDN RG remains the most attended and fast pacing RG during the last year. So far, SDN RG meetings provided an interesting venue for anybody working on this field, hence, the different presentation and discussion slots were more oriented on allowing to show-case the different activities going on all over the world (from both industry and academy).

T2TRG Activity

The Thing-to-Thing Research Group (T2TRG) aims at investigating research issues in turning a true "Internet of Things" into reality, an Internet where low-resource nodes ("things", "constrained nodes") can communicate among themselves and with the wider Internet, in order to partake in permissionless innovation. This is a very recent RG and is in a preliminary phase.