Special Session on Protocol Specification Techniques

Session Chair: Colin Perkins (University of Glasgow)

IETF 114 / 26 July 2022

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- **This meeting is being recorded and live streamed**

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- See RFC 7154 (Code of Conduct) and RFC 7776 (Anti-Harassment Procedures), which also apply to IRTF

Reminder: Mask Policy

- As a COVID-safety measure, in-person participants in this meeting, and in other IETF-controlled rooms, are **required** to wear an FFP2/N95 mask, KN95/KF94/FFP3 mask, or locally certified equivalent.

- The only exception is for chairs or presenters who are actively speaking

- Participants making comments or asking questions from the floor microphones are expected to remain masked.

ANRW 2022 — Applied Networking Research Workshop

The ACM/IRTF Applied Networking Research Workshop 2022 (ANRW'22) is an academic workshop that provides a forum for researchers, vendors, network operators, and the Internet standards community to present and discuss emerging results in applied networking research, and to find inspiration from topics and open problems discussed at the IETF. The workshop will consist of a mix of invited talks, submitted talks, and submitted short papers.

ANRW'22 particularly encourages the submission of results that could form the basis for future engineering work in the IETF, that could **help better specify Internet** protocols, that could change operational Internet practices, or that could influence further research and experimentation in the IRTF.

help better specify Internet protocols

- How should we describe and specify protocols?

- How can we ensure that network protocol specifications are consistent and correct?

- How can we verify that specifications are correct and validate that implementations match the specification?

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help better specify Internet
protocols

The IETF community has long used natural language – English – to describe and specify protocols, mixed with occasional formal languages such as ABNF, YANG, etc.

This session will discuss whether this is the right approach, and to what extent formal methods, structured specification languages, and natural language processing can help describe network protocols.

help better specify Internet
protocols

Some of the research that will be presented today might
eventually lead to changes in how RFCs are prepared.

The goal of today is **not** to start a conversation about the RFC series –
it's rather to start a conversation about how we specify protocols

to start a conversation about how we specify protocols

Can we usefully connect academic researchers
studying protocol specification, with engineers in the
IETF that specify protocol standards?

Agenda

Time	Topic	Speaker
15:00	Introduction and Status Update	Colin Perkins University of Glasgow
15:10	Automated Attack Synthesis by Extracting Finite State Machines From Protocol Specification Documents	Max von Hippel Northeastern University
15:40	Tools for disambiguating RFCs	Jane Yen USC
16:10	CFRG Specifications in Theory and in Practice	Chris Wood Cloudflare
16:40	Discussion	
17:00	Closing	

Notes for questions/discussion: https://notes.ietf.org/notes-ietf-114-anrw

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Discussion

- There is a long history of work on structured approaches to protocol specification, formal methods, etc.

- Recent advances in natural language processing give the possibility of extracting partial protocol descriptions from technical specifications written in English

- The talks gave a flavour of such work, and it's potential relevance to the standards community

Discussion

- To what extent is **research** on protocol specification of interest to this community?
- What research challenges exist in effective protocol specification?

- Can these techniques – or others – improve the way we specify protocols?

Next Steps

- Looking to gauge interest in potential IRTF work in this area:

  - Please talk to the speakers or the IRTF Chair if you're interested in this topic, if you know people doing research in the area, or if you're willing to contribute

  - Sign-up in the notes if you'd like to be informed of further discussion: https://notes.ietf.org/notes-ietf-114-anrw

- Thank you to the speakers!