THIRD WORKSHOP ON THE FUTURE OF INTERNET TRANSPORT
21 JUNE 2021

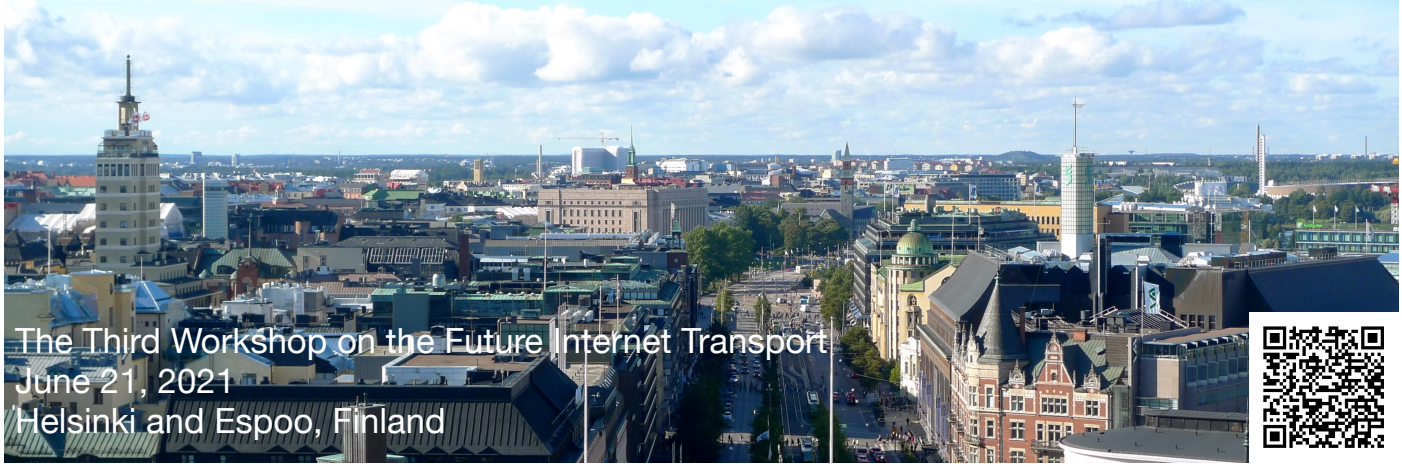
Over the last several decades the Internet has been enriched with novel communication technologies for both fixed and mobile networks providing steadily increasing data rates and lower transfer delays. At the same time, the internet research community has strived to further the development of transport protocols that are able to leverage these new communication technologies, however, this endeavor has been fraught with difficulties, e.g., a widespread use of middleboxes which often drop packets from protocols other than TCP or UDP; an almost universally used socket API that many times unnecessarily limits the communication between the application and transport layers; and, the fact that transport protocols are often part of the operating system kernel, making the introduction of new protocols or protocol features a slow process. In spite of these difficulties, a number of steps have been taken in the past recent years to move the development of internet transport protocols forward:(1) IETF's Transport Services working group (TAPS) and several industry stakeholders' efforts to introduce platform- and protocol-independent transport layer APIs, e.g., Apple's Network.framework, the IETF TAPS API, and the NEAT API; (2) new transport protocols being deployed on the wire that uses UDP as a substrate, e.g., Google's QUIC protocol, to get around middleboxes; (3) new congestion control mechanisms other than TCP NewReno and Cubic, e.g., Google's BBR, and finally (4) HTTP/3 that is an effort to port HTTP/2 over QUIC. This has coincided with the introduction of new network technologies such as 5G, and a network softwarization movement using virtualization and containerization techniques, e.g., Software- Defined Networking (SDN) and Network Function Virtualization (NFV). Still, with a seemingly never ending stream of new communication technologies combined with more stringent application requirements, it is not hard to foresee a need for a continued improvement of already deployed transport protocols, as well as research and development of new transport protocols and protocol features e.g.,transport protocols for high-capacity, low-latency mobile networks, e.g., transport protocols for V2X, cloud gaming, Industry 4.0, and high-fidelity AR/VR/XR communication;

- Transport protocols for high-capacity, low-latency mobile networks, e.g., transport protocols for V2X, cloud gaming, Industry 4.0, and high-fidelity AR/VR/XR communication;
- Transport-protocol solutions for multipath communication, e.g., 3GPPs ATSSS multipath solution to offload mobile traffic to Wi-Fi;
- Transport protocols that meet the needs of future, more interactive and immersive Web applications, e.g., the development of the QUIC protocol and the BBR congestion-control mechanism;
- Transport protocols, not least userland transport protocols such as QUIC, in virtual environments;
- SDN and cross-layer transport solutions;
- New transport-layer APIs that meet the need of tomorrow's internet applications;
- Transport-layer security mechanisms, e.g., to address the conflicting requirements of securing sensitive data while at the same time provide legitimate access to enterprise proxies and firewalls; and,
- In-network solutions to assist transport protocols in fixed and wireless networks.

Topics of Interest

Topics of interest include, but are not limited to, the following:

- Solutions to the Internet transport layer ossification (e.g., QUIC, TAPS).
- Scalable, deployable, extensible and flexible transport protocol and service solutions for future networks (e.g., in 5G, Wi-Fi6, vehicular networks).
- New transport protocols, services and requirements (including extensions to, or evaluations of, e.g., QUIC, SCTP, RTMFP, MPTCP).
- Middlebox traversal techniques and signalling (e.g., ICE, STUN, TURN, UDP encapsulation).



Topics of Interest cont'd

- Service oriented and expressive transport APIs and Berkeley socket API extensions.
- Multipath transports and intelligent multipath resource utilization and scheduling.
- Transport protocols for data-center networks with implications on the Internet (e.g., DCTCP).
- Transport protocol interactions with the network, e.g., to better interoperate with Wi-Fi, cellular or satellite networks.
- TCP/UDP/IP extensions for richer transport services .
- Opportunistic use of QoS mechanisms (e.g., DSCP usage in WebRTC).
- Less-than-best-effort transport protocols and services.
- Transport selection mechanisms (e.g., happy-eyeballing).
- Transport layer security (e.g., TLS 1.3).
- Web-based transport services (e.g., HTTP/2 and HTTP/3).
- Novel congestion control schemes (e.g. coupled, delay-based, ECN based, Bottleneck Bandwidth and RTT based (e.g., BBR), model based).
- Design and performance of transport protocols in userland.
- Transport protocols and solutions for multimedia traffic (e.g., WebRTC, MPRTP, RTMFP).
- Standardization of transport protocols and services (e.g., IETF TAPS).
- Transport protocols performance in the virtualized and containerized environment.
- Performance of transport protocols in cloud/edge environments and with latency sensitive and bandwidth-hungry applications (e.g. AR/VR in automotive).
- Novel Internet transport architectures.

Important Dates

Paper submission deadline: ~~26 March, 2021~~ 31 March, 2021

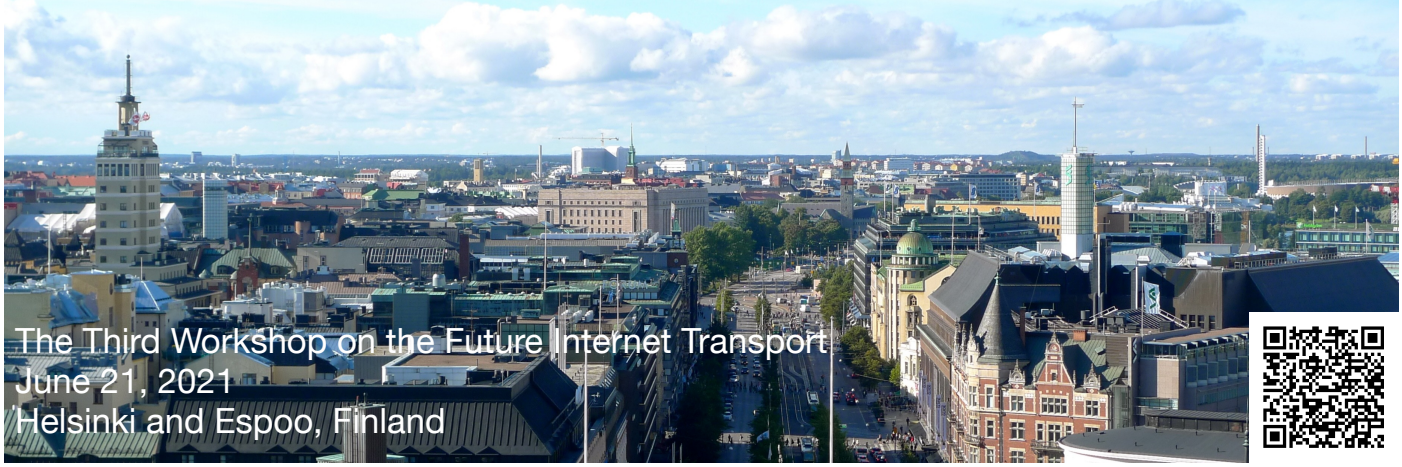
Paper acceptance notification: 23 April, 2021

Camera ready:: 7 May 2021

Workshop: 21 June 2021

Paper format and submission instructions

Submitted papers should be unpublished work and they should not be under review by any other conference or journal. They must be no more than 6 pages (IEEE two-column format, 10pt) in total including references and figures. Papers will be reviewed single-blind. Accepted papers will appear in the symposium proceedings published by IFIP and submitted to IEEE Xplore Digital Library. At least one author of each accepted paper is required to register and present the work in the workshop.



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