HiPNet 2021:
High-Precision, Predictable, and Low-Latency Networking
Workshop at CNSM 2021, Izmir, Turkey, 25-29 October
http://www.cnsm-conf.org/2021/workshop_HiPNet.html

Preliminary Call for Papers

New waves of networked applications continue to push the limits of what is possible with networks today. For example, Industrial Internet applications, Augmented Reality, Tactile Internet require ultra-low latency measured in single-digit milliseconds and do not tolerate no jitter at all. Economic pressures mandate increasingly cloudification of real-time applications with precision service level needs. Many of those applications are mission-critical and cannot afford any loss in connectivity or even single packets. Collectively, these applications require networking services that support high-precision and predictable service levels with associated guarantees that border on determinism. This requires a rethinking of many of the principles underlying existing "Best Effort" internetworking technology.

Various approaches are emerging to tackle those challenges. Data centers with fixed topologies and a constant number of hops rapidly replace conventional routing and more general Internet topologies. Networks are becoming more programmable to allow to custom-tailor and optimize treatment of packets and flows. Related technologies range from Service Function Chaining to Network Slicing to SDN. While 5G is making URLLC at the network edge a reality, momentum for Beyond 5G and 6G is building to push the boundaries of precision services beyond the edge and across the core. One overarching question concerns how these technologies can be harnessed and what additional approaches are needed to deliver on high-precision and predictable networking. This will involve advances over all planes of network architectures, such as programming and processing of packets in the data plane, control interfaces and ultra-low latency control loops to optimize service levels in the control-plane, high-precision measurements and telemetry with nanosecond accuracy at scale, and related platforms and algorithms in the management plane.

The workshop aims to provide a forum for researchers, students and professionals from industry and academia to discuss challenges, solution approaches, and work-in-progress to deliver, manage, and control high-precision and predictable networking services, including (Ultra) Low-Latency networks, deterministic networking, 6G, etc. The workshop welcomes papers related to disruptive concepts, innovative solutions, testbeds, experiments, etc. Topics of Interest include but are not limited to the following:

- Platforms to manage and operate high-precision networks and services, e.g. Industrial Networks, Tactile Networks, Augmented Reality (AR), cloud gaming
- Proof and validation of high-precision service level guarantees
- High-precision measurement techniques for ultra-low latency and jitter
- Service assurance for micro services, for service function chains
- Applications for Inband Network Telemetry and iOAM
- High-precision networking using service function chaining
- In-network service level tuning and optimization; predictable QoS
- Novel network programming models
- Applications of Artificial Intelligence for high-precision networking
- Time-Sensitive Networking (TSN) interconnect and wide-area TSN; IP and TSN convergence
- SDN applications for high-precision, high-performance networking
- High-precision networking over 5G
- High-Precision networking services using Fog and Edge Computing
- Deployment&operational experiences w/ Industrial Internet, Tactile Internet, networked AR, cloud gaming
- 5G optimization techniques for ensuring Low Latency
- Testbeds for High-Precision (OAI, MAGMA, etc.)
- Networking optimization for fast processing and delivery (DPDK, etc.)
- Microservices platform for ensuring High-Precision (OpenNetVM, etc.)

Submission of Papers

Authors are invited to submit original unpublished papers that are not already under review elsewhere. Submissions will be subjected to a peer-review process. Papers should be prepared in IEEE 2-column format and must not exceed 6 pages + 1 page for references. Short papers are accepted as well and must not exceed 4 pages + references.

Papers have to be submitted electronically in PDF format through the EDAS conference management system. (Submission link to follow shortly).

Authors of the best workshop papers will be invited to submit an extended version of their paper for inclusion in a related special issue in JNSM (Springer Journal of Network and System Management) that will be guest edited by the workshop organizers.

Important Dates

Paper Submission: July 31, 2021
Notification: September 7, 2021
Camera Ready: September 21, 2021
Workshop: October 25 or 29, 2021

Proceedings

Papers accepted and presented at HiPNet will be published open access on the conference Web site with IFIP copyright, and will be submitted for possible inclusion in IEEE Xplore, ACM and IFIP Digital Libraries. To be published in the Workshop Proceedings and to be eligible for publication, at least one author of an accepted paper is required to register and present the paper at the workshop. The organizer reserves the right to exclude a paper from distribution after the conference (including its removal from IEEE Xplore) if the paper is not presented at the conference.

Workshop Organizers

Raouf Boutaba (University of Waterloo, Canada)
Alexander Clemm (Futurewei, US)
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Bertrand Mathieu (Orange Labs, France)
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to be announced