

# Recent advances in Internet protocols: QUIC

## New challenges and opportunities in the transport layer.

### **Abstract:**

Internet transport protocols usually evolve slowly. Any significant evolution to TCP, the dominant transport protocol, takes years of efforts to be widely deployed. There are several factors that explain this slow evolution. QUIC, initially proposed by Google, addresses those issues and brings back innovation in the transport layer. The results obtained by Google with QUIC combined with its security features have convinced the IETF to standardize a new protocol starting from Google's initial design. While the protocol specification is currently being finalized, QUIC brings a number of challenges and opportunities.

In this tutorial, we first give an introduction to the QUIC protocol by detailing the context that lead to its inception, its principles and core mechanisms. Then we discuss the practical challenges arising from QUIC's design, ranging from its specification complexity to the system performance aspects involved in making efficient user-space transport implementations. Finally, we survey existing works from the research community to highlight the new opportunities of transport layer innovation brought by QUIC such as transport-layer Forward Erasure Correction and Multipath support.

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