

Transport Layer

Issues, Optimizations, and Solutions

Just to level-set on a few things

We're not redesigning TCP here

We're focused on end-to-end transport topics

Middleboxes are in scope, but explicit signaling is not (that was yesterday, right?)

Overarching ideas

“Why the Internet Only Just Works”, Mark Handley, 2006

<http://www0.cs.ucl.ac.uk/staff/M.Handley/papers/only-just-works.pdf>

“Changing core Internet protocols is hard!”

“Tussle in Cyberspace: Defining Tomorrow’s Internet”, Dave Clark et. al., 2002

<http://david.choffnes.com/classes/cs4700fa14/papers/tussle.pdf>

“You are arguing with people who also have legitimate interests”

What's the problem with wireless for transport protocols?

From the IETF PILC working group, in the late 1990s

Low bit rates, high error rates, long delays, variable delays, asymmetry

Problems we've tripped over since PILC

We stopped hoping NATs would go away

We've seen network devices with enormous buffers ("bufferbloat")

We've seen considerable peer-to-peer traffic, not just client-server

What I hope we spend the session understanding

How have people tried to fix these problems on wireless networks?

What's the “chicken and egg” problem of getting transport solutions deployed?

How does encryption break these solutions?

Are the wireless problems of the past also the wireless problems of the future?

What do we do now?

“Game on!”