

# LISA: A Linked Slow-Start Algorithm for MPTCP

## draft-barik-mptcp-lisa-01

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Multipath TCP @96th IETF Meeting  
Berlin, Germany  
20<sup>th</sup> July 2016



[ **simula** . research laboratory ]

# What is new?

- A paper<sup>1</sup> published.
- A patch file on <http://heim.ifi.uio.no/runabk/lisa/>
- Updated by draft-barik-mptcp-lisa-01
- Presented in IETF94, Yokohama, Japan.

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<sup>1</sup>Runa Barik, Michael Welzl, Simone Ferlin and Ozgu Alay, “*LISA: A Linked Slow-Start Algorithm for MPTCP*”, in IEEE ICC’16

- MPTCP-LISA is very simple; it is just an update to the very first slow-start of new MPTCP subflows.
  - When a new subflow joins, we find one available subflow that could give a part of its *cwnd* to the new subflow.
  - If there is no subflow, assign the default values based on RFC 3390 and RFC 6928.
- The goal is to reduce temporary aggressiveness, and losses at the end of slow-start.

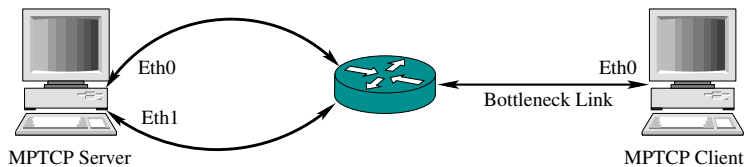
## Feedback from IETF94:

- Slowing down slow start will reduce retransmissions, does not work in large delay-bw environments.
- See graphs relating to BDP.
- Current parameters are unrealistic.

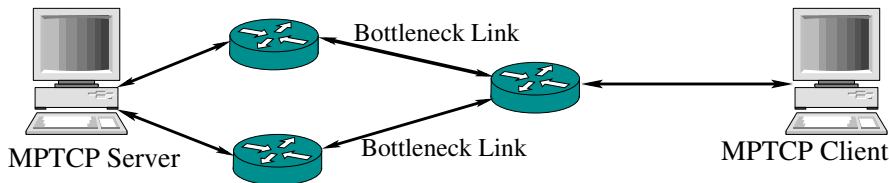
## What is now?

- Performance of LISA in Shared and Non-Shared Bottleneck, varying:
  - Number of subflows
  - RTT
  - Bandwidth
- LISA behavior for a large transfer

# Topology

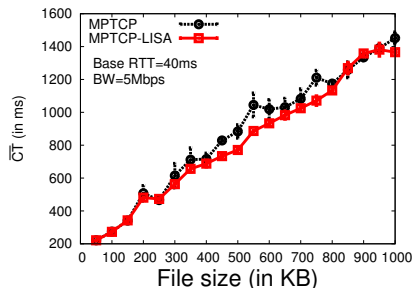


(a) Shared bottleneck

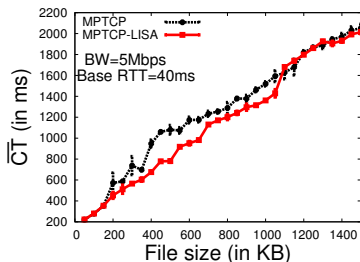


(b) Non-Shared bottleneck

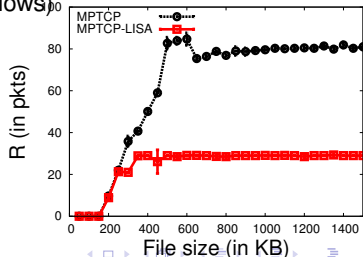
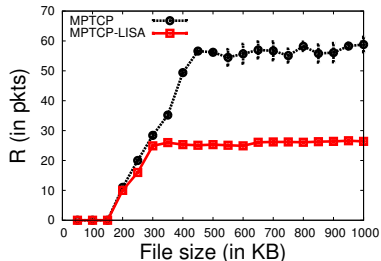
# Shared Bottleneck: Number of subflows



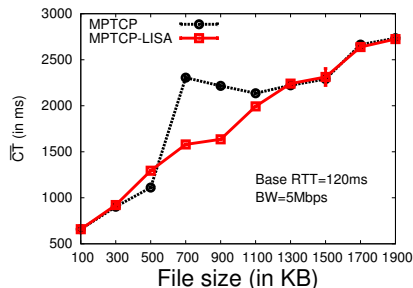
(c) Mean-completion time (2 subflows)



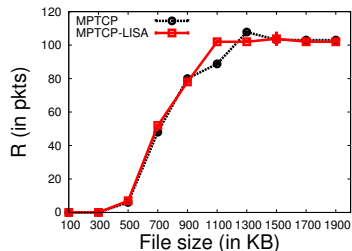
(d) Mean-completion time (4 subflows)



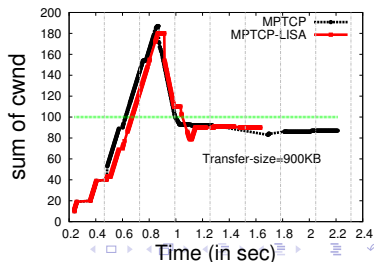
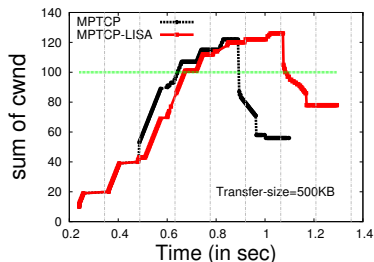
# Shared Bottleneck: RTT



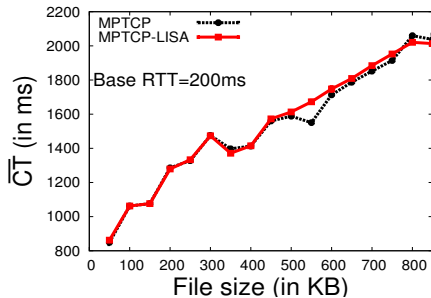
(a) Mean-completion time



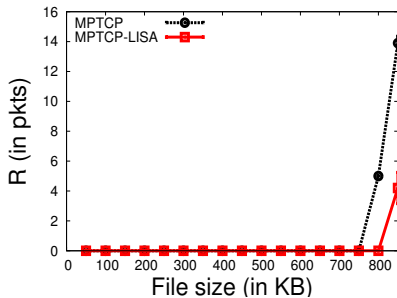
(b) Retransmissions



# Shared Bottleneck: RTT



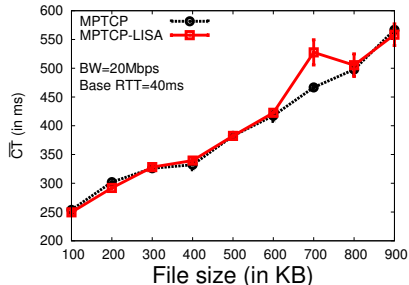
(a) Mean completion time



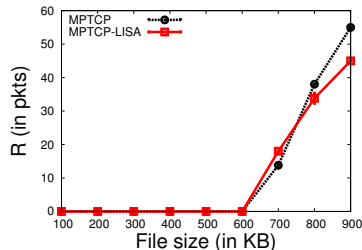
(b) Retransmissions



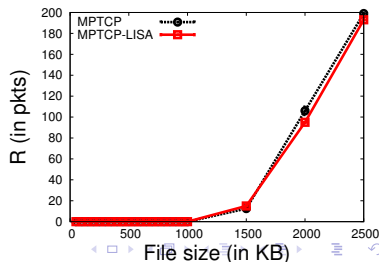
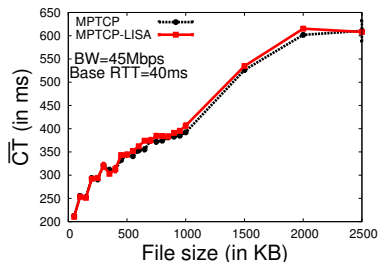
# Shared Bottleneck: Bandwidth



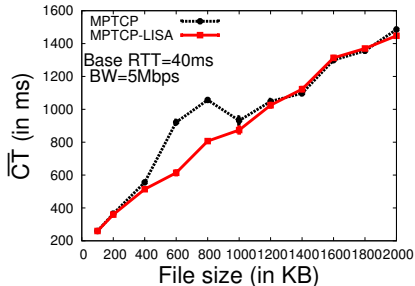
(c) Mean completion time



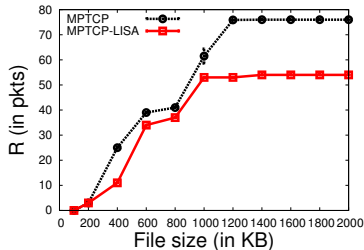
(d) Retransmissions



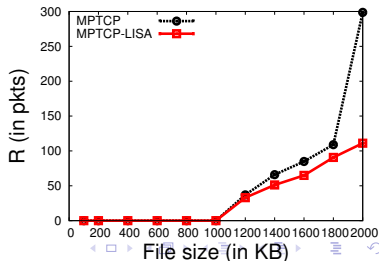
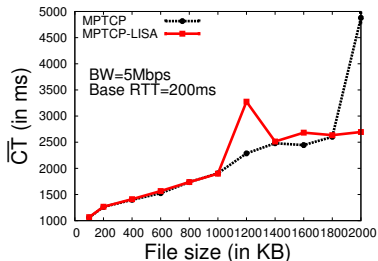
# Non-Shared Bottleneck: RTT



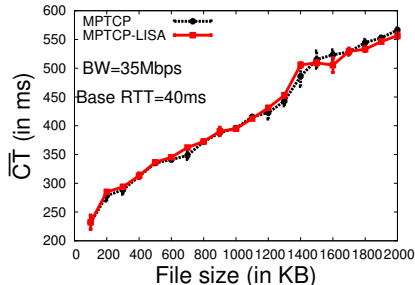
(a) Mean completion time



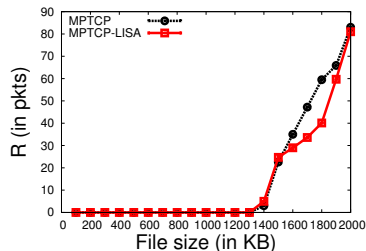
(b) Retransmissions



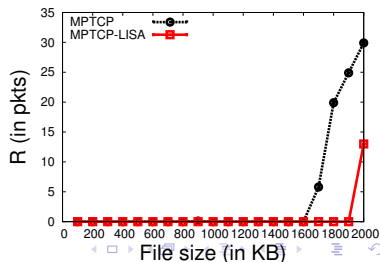
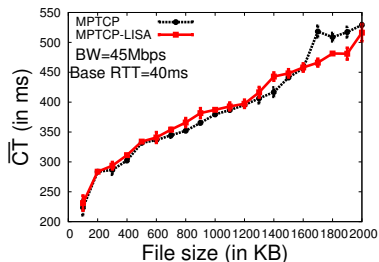
# Non-Shared Bottleneck: Bandwidth



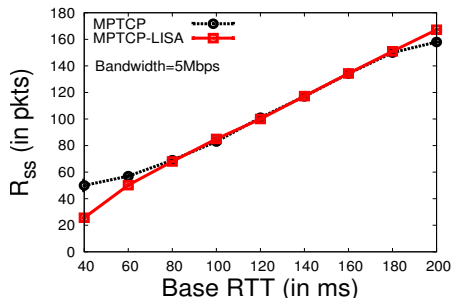
(a) Mean completion time



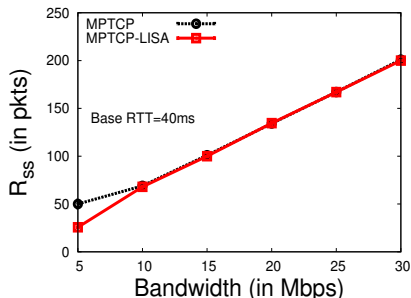
(b) Retransmissions



# Shared Bottleneck: Large transfer



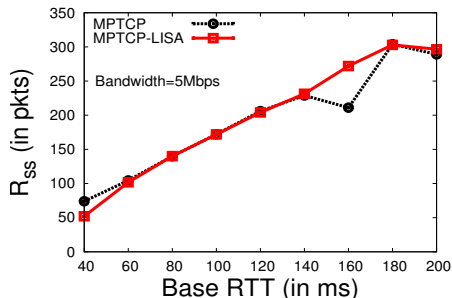
(a) Vary RTT



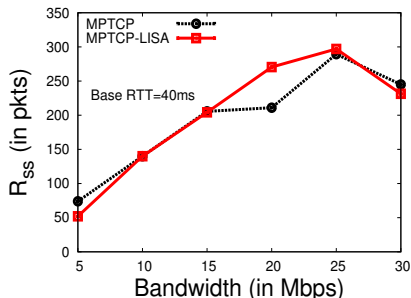
(b) Vary Bandwidth

Number of Retransmissions at the end of SS

# Non-Shared Bottleneck: Large transfer



(a) Vary RTT

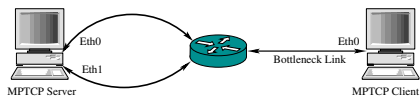


(b) Vary Bandwidth

Number of Retransmissions at the end of SS

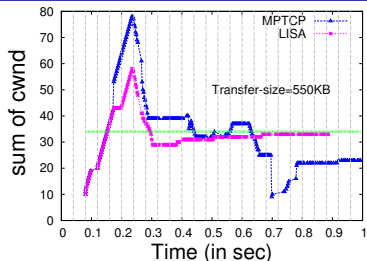
Thank you!

# LISA in Shared Bottleneck

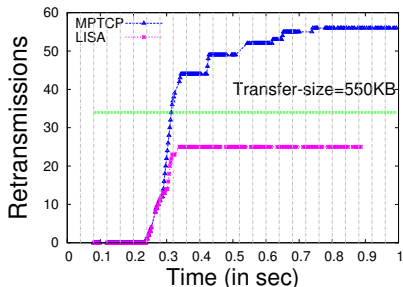


(a) Shared bottleneck

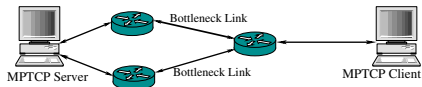
- LISA behaves less aggressive than MPTCP



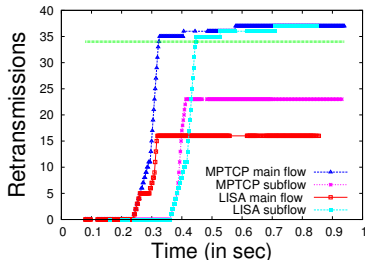
(b) Total cwnd



# LISA in Non-Shared Bottleneck



(a) Non-Shared bottleneck



(b) Retransmissions

