



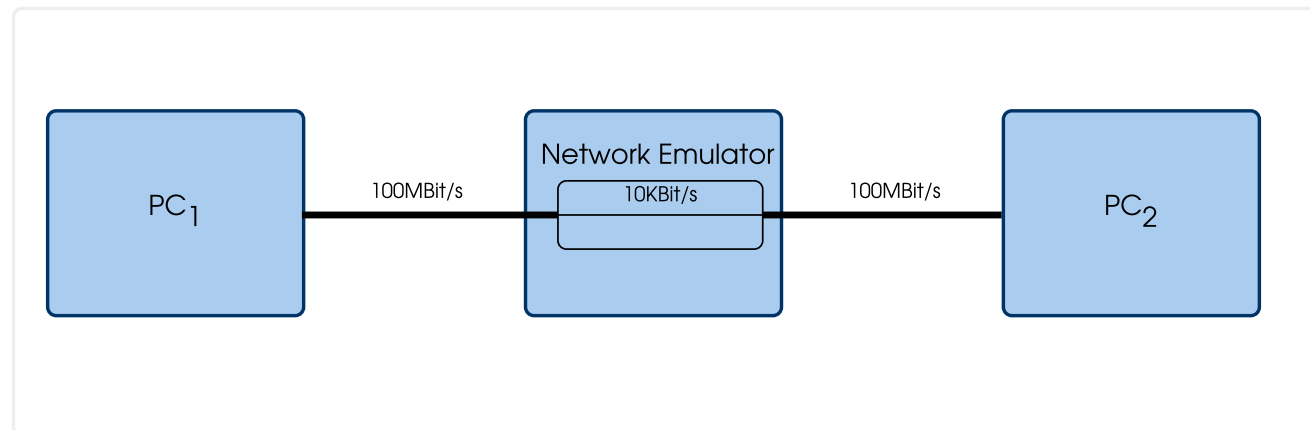
TCP IW10 in Low Bandwidth Networks

IETF 81 – Paris, France

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Protocol**Labs**
<http://www.protocollabs.com>

Emulation Setup



Scenarios

- ▶ One flow (IW3 to IW10)
- ▶ One (responsive) background flow, n short-lived flow (IW3 to IW10)

Metrics

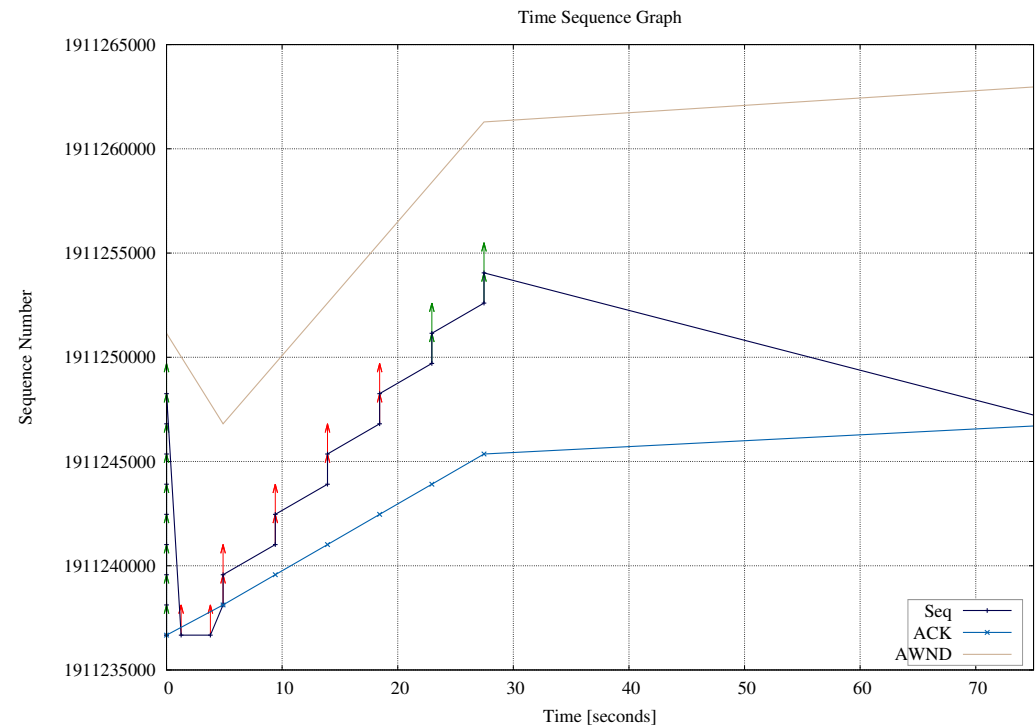
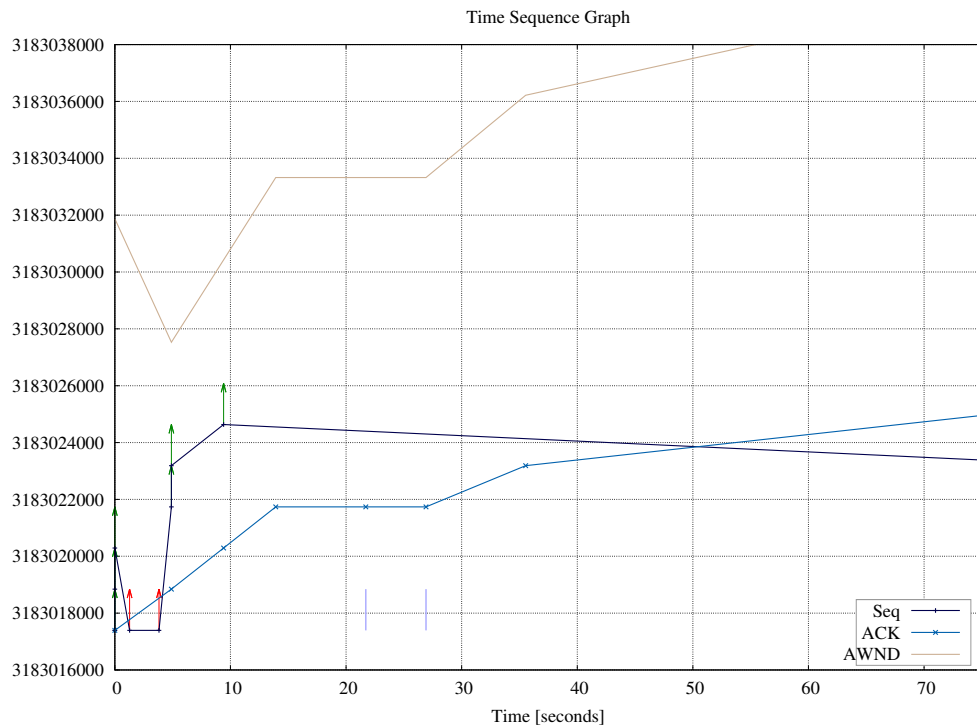
- ▶ Efficiency
 - $\frac{\text{Number of total packets}}{\text{Retransmission}}$
- ▶ Transfer time
- ▶ Queue behavior
- ▶ Fairness (Jain's fairness index)

Focus

- ▶ Bandwidth: ≤ 10000 Byte/s
 - Note: large latency comes from low bandwidth
- ▶ Queue Disc:
 - FIFO (tail drop, head drop)
 - Special AQM queues

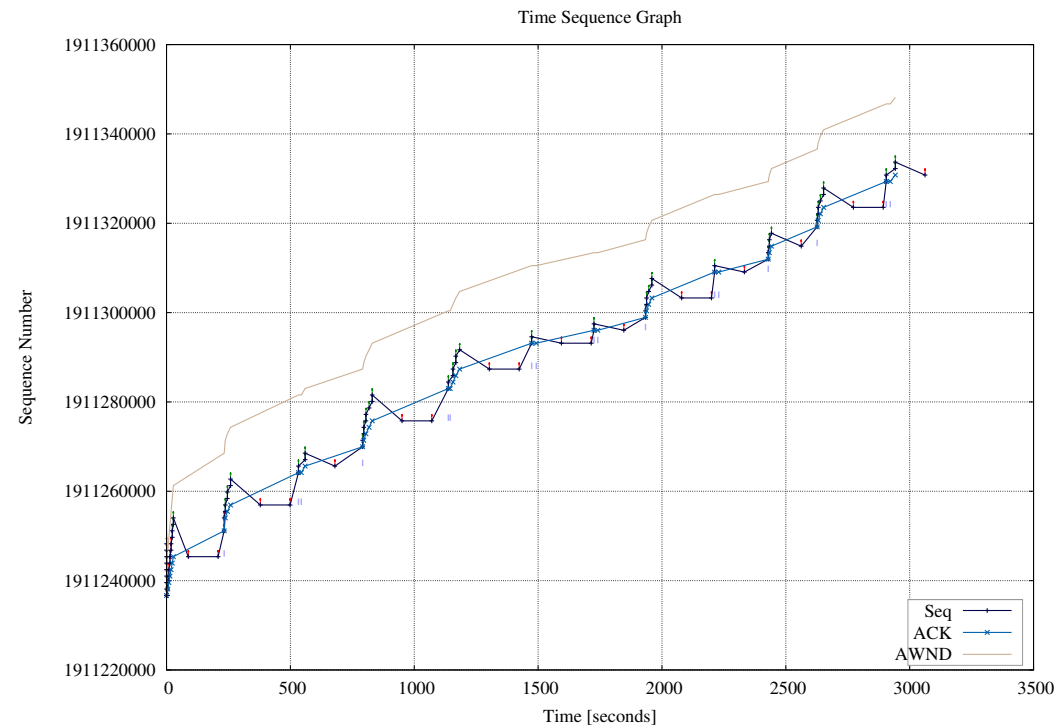
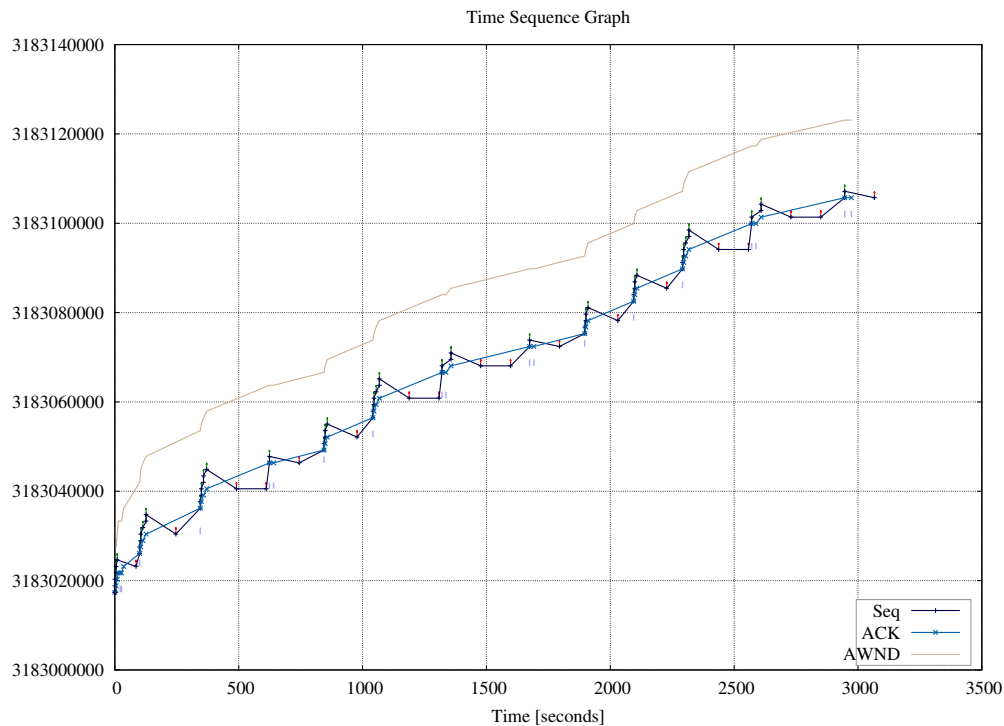
Start-Up Behaviour

- ▶ Bandwidth: 1000 Byte/s
- ▶ FIFO (tail drop)
- ▶ Queue length: ∞
- ▶ 100 kbyte bulk transfer



Whole Picture

- ▶ Bandwidth: 1000 Byte/s
- ▶ FIFO (tail drop)
- ▶ Queue length: ∞
- ▶ 100 kbyte bulk transfer



Summary

- ▶ We did not observe „major“ negative impact of IW10
- ▶ We do not believe that the IW should be a function of time

Thank You!



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