

An update on rLEDBAT

ICCRG, IETF 109

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Credits to Marcelo Bagnulo and Alberto Garcia-Martinez, UC3M

rLEDBAT

- rLEDBAT brings benefits of LEDBAT++ to the receive side of the transport connection
- Use the flow control mechanism to throttle the peer
 - TCP receive window tuning
 - Don't shrink advertised window
- Why is this important?
 - Software updates use CDNs – most CDNs don't have LEDBAT(++) support
 - Proxies can prevent effective use of send LEDBAT on end-to-end path
 - Enforce receiver driven preference because it has more information about priority of traffic
- <https://tools.ietf.org/html/draft-irtf-iccr-g-rledbat-01>

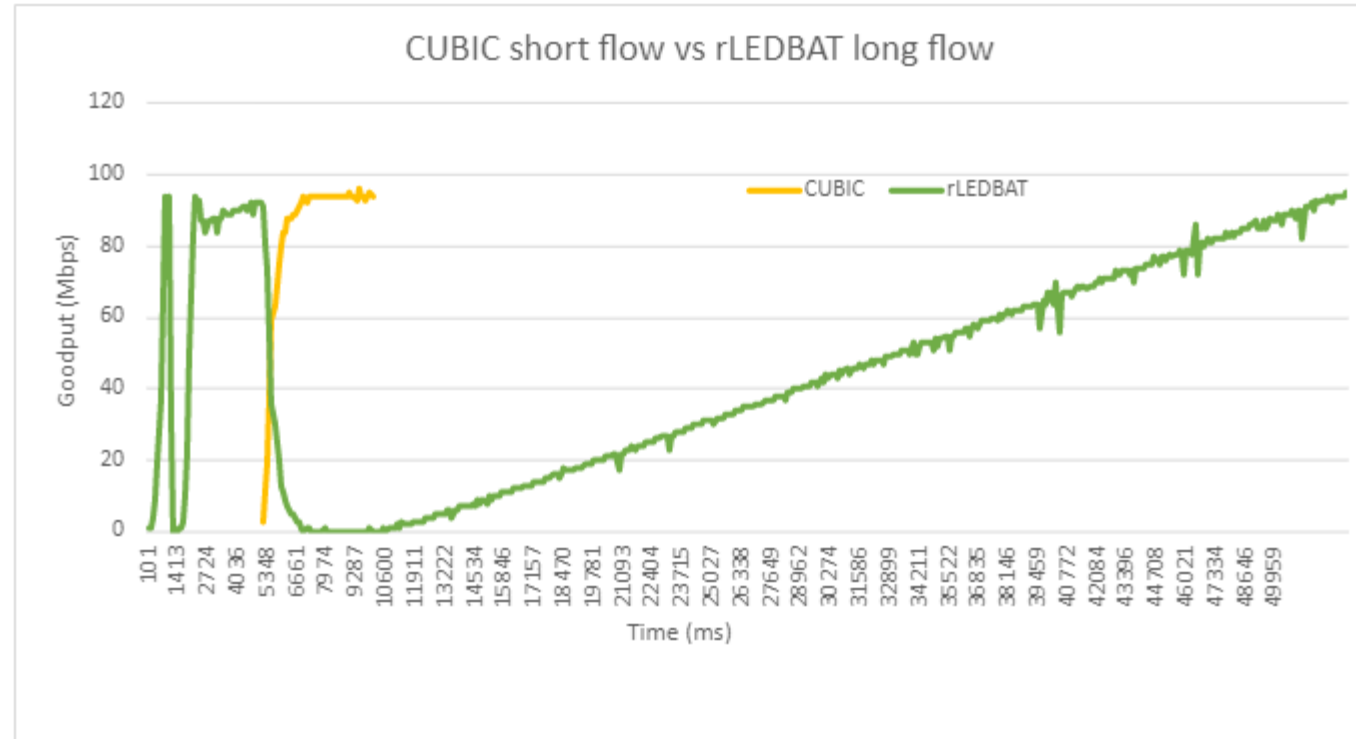
rLEDBAT in Windows

- Based on rLEDBAT draft
- Implemented for TCP
- The same (private) API enables both LEDBAT++ and rLEDBAT
- Includes all the additional mechanisms of LEDBAT++
 - Round trip latency measurements
 - Slower than Reno cwnd increase with adaptive gain factor
 - Multiplicative cwnd decrease with adaptive reduction factor
 - Modified slow start
 - Initial and periodic slowdown
- Enable TCP timestamp negotiation for 3WHS and enable rLEDBAT only if negotiation succeeds

Deviations from LEDBAT++/rLEDBAT drafts

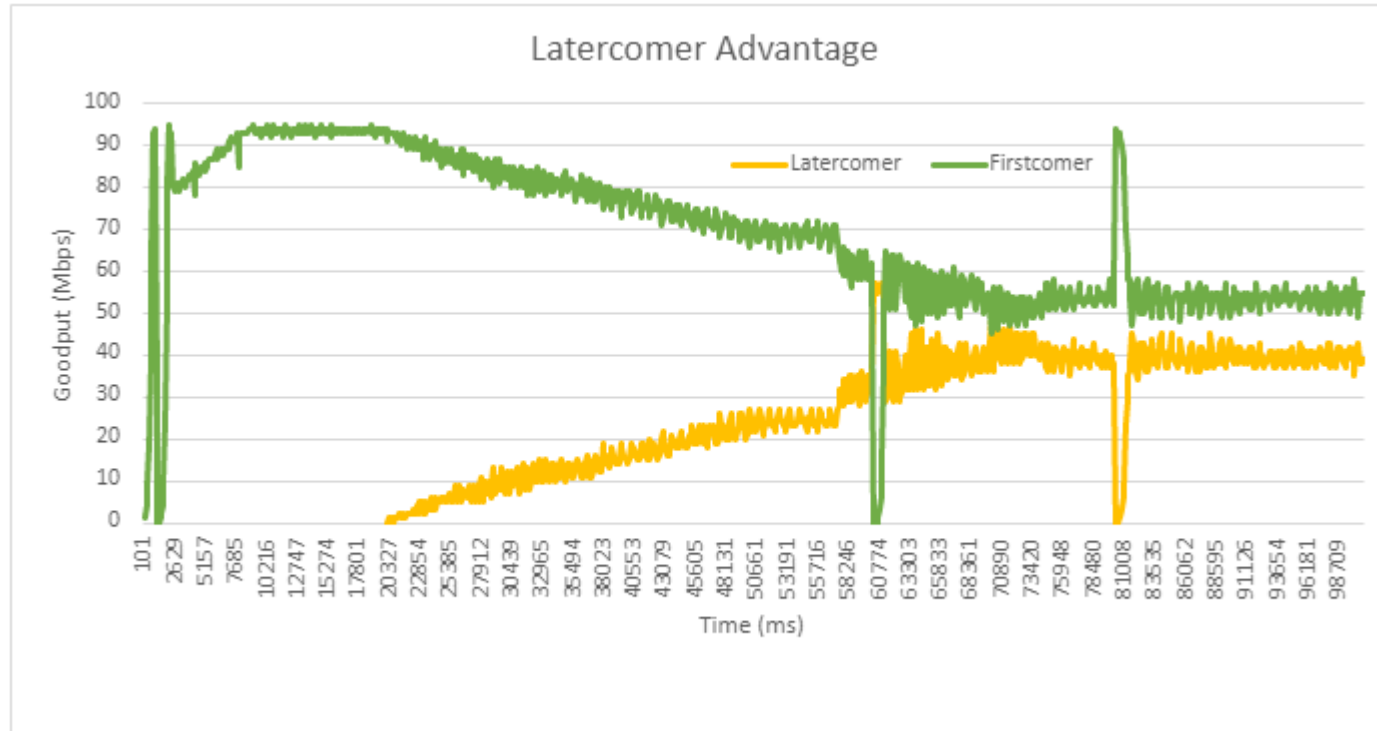
- Simplified periodic slowdown
 - One slowdown period per base delay measurement interval
- Base delay measurement interval
 - 60 seconds
- Use a target delay of 40 msec
- We will continue to fine tune these constants and update draft with recommendations

Initial lab results



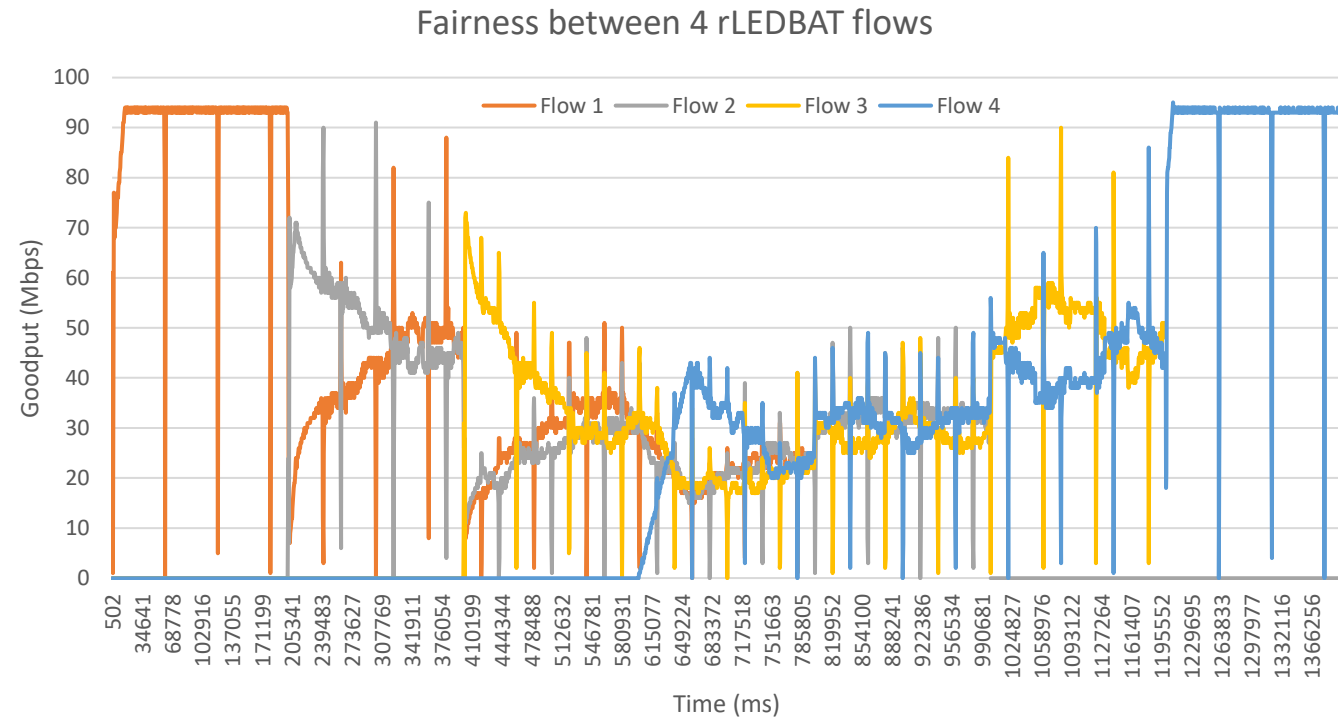
Bottleneck params: 50ms/100Mbps/1250pkt queue

Initial lab results



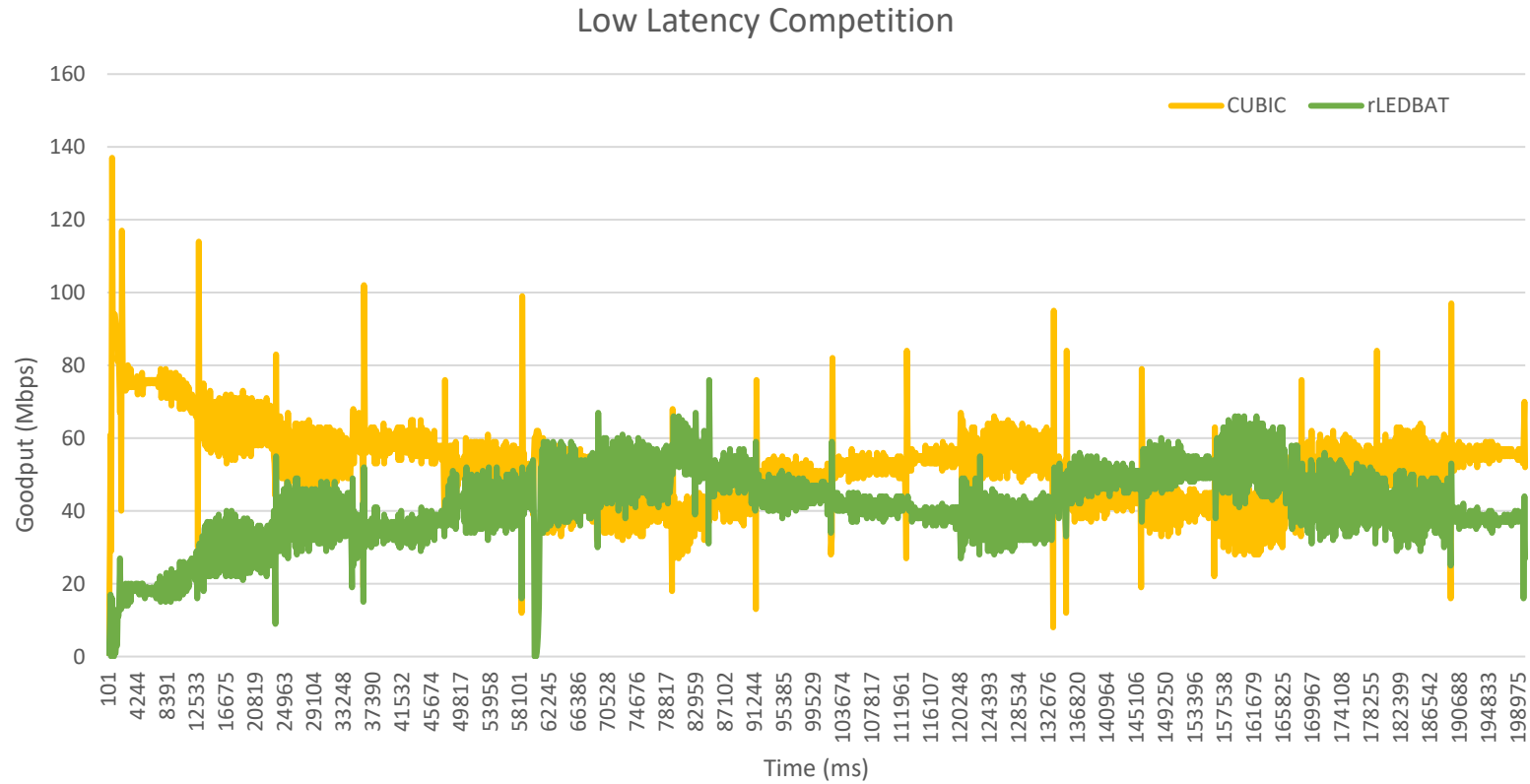
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Next Steps

- Real world measurements for a software update workload
- Constant tuning
- Dynamic TARGET
- Explore co-existence with BBRv2 (preliminary tests show problems)
- IETF drafts
 - rLEDBAT
 - Reference only LEDBAT++?
 - Update based on data and tuning
 - LEDBAT++
 - Add pseudocode
 - Make standalone