

L4S Status Update

draft-ietf-tsvwg-l4s-arch-10

draft-ietf-tsvwg-ecn-l4s-id-18++

draft-ietf-tsvwg-aqm-dualq-coupled-16

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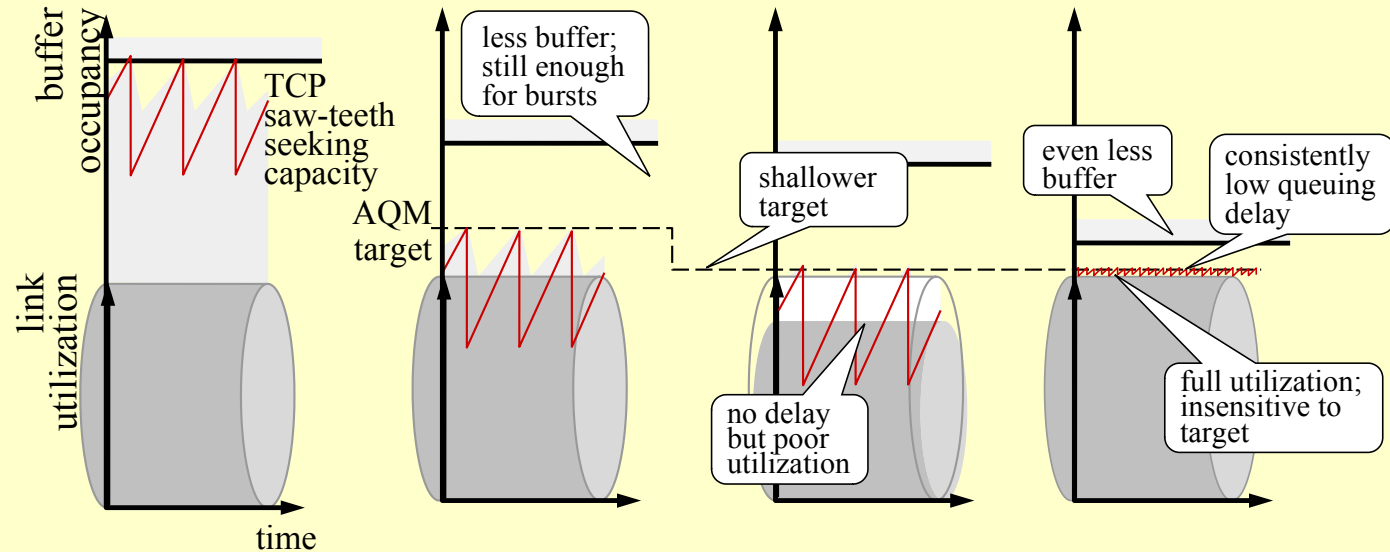
tsvwg, IETF-111, Jul 2021

Recap – L4S Motivation

- Very low queuing delay for *all* Internet applications
- including for capacity-seeking & capacity-adaptive

The trick: scalable congestion control

	(1) Today (typical)	(2) Today (at best)	(3) Unacceptable	(4) L4S
Bottleneck	Bloated drop-tail buffer	AQM	Shallower AQM	Immediate AQM
Sender CC	Classic	Classic	Classic	Scalable (tiny saw-teeth)



Recent L4S Progress

- 3GPP L4S activity:
 - Currently favour L4S 5QIs with feed back & forward rather than adding ECN bits to RLC header
 - New KTH/Ericsson paper in (VTC'21) with simulated 5G performance evaluations of L4S:
[Low Latency Low Loss Scalable Throughput in 5G Networks](#)
 - New joint Ericsson - DT white paper [Enabling time-critical applications over 5G with rate adaptation](#)
- One more cable modem certified for Low Latency DOCSIS (supports L4S)
- Nokia has more WiFi (+ soon Fixed-Wireless Access) devices supporting L4S
 - initiated several trials with operators and application providers
- Pete Heist's continuing testing & evaluation – see Greg's l4sops talk (next)
- Linux patches for AccECN TCP feedback <https://github.com/L4STeam/linux>
 - now works with all CC modules (BBRv2, DCTCP, TCP Prague, Cubic, Reno, etc)
 - enables A/B testing without changing more than one thing at a time – see tcpm talk

Draft updates: L4S Architecture

[l4s-arch-10](#) (1 Jul)

- To address Vidhi Goel's review
 - Explained how an FQ-* L4S node works
 - Fixed the numerical examples of Reno & Cubic scaling; including Cubic's Reno-Friendly mode
 - Extensive clarification, precision and improvements
 - See [list discussion](#). Thank you Vidhi.

Draft updates: ECN Protocol for L4S

ecn-l4s-id-18++ (1 Jul)

- Interaction with VPN anti-replay protection:
 - Solely VPN configuration solutions
 - Rather than VPN implementation changes - out of scope for L4S
- RFC4774 citation placed in better context
- Editorial changes, esp. consistency betw. drafts
- Non-changes:
 - Disable tunnel resequencing of IP data for L4S (e.g. L2TP)
 - No need to mention, after consulting with int-area & pals
 - No evidence that sequencing is enabled for IP data
 - Prague requirements text (§4): pretty stable since developer survey

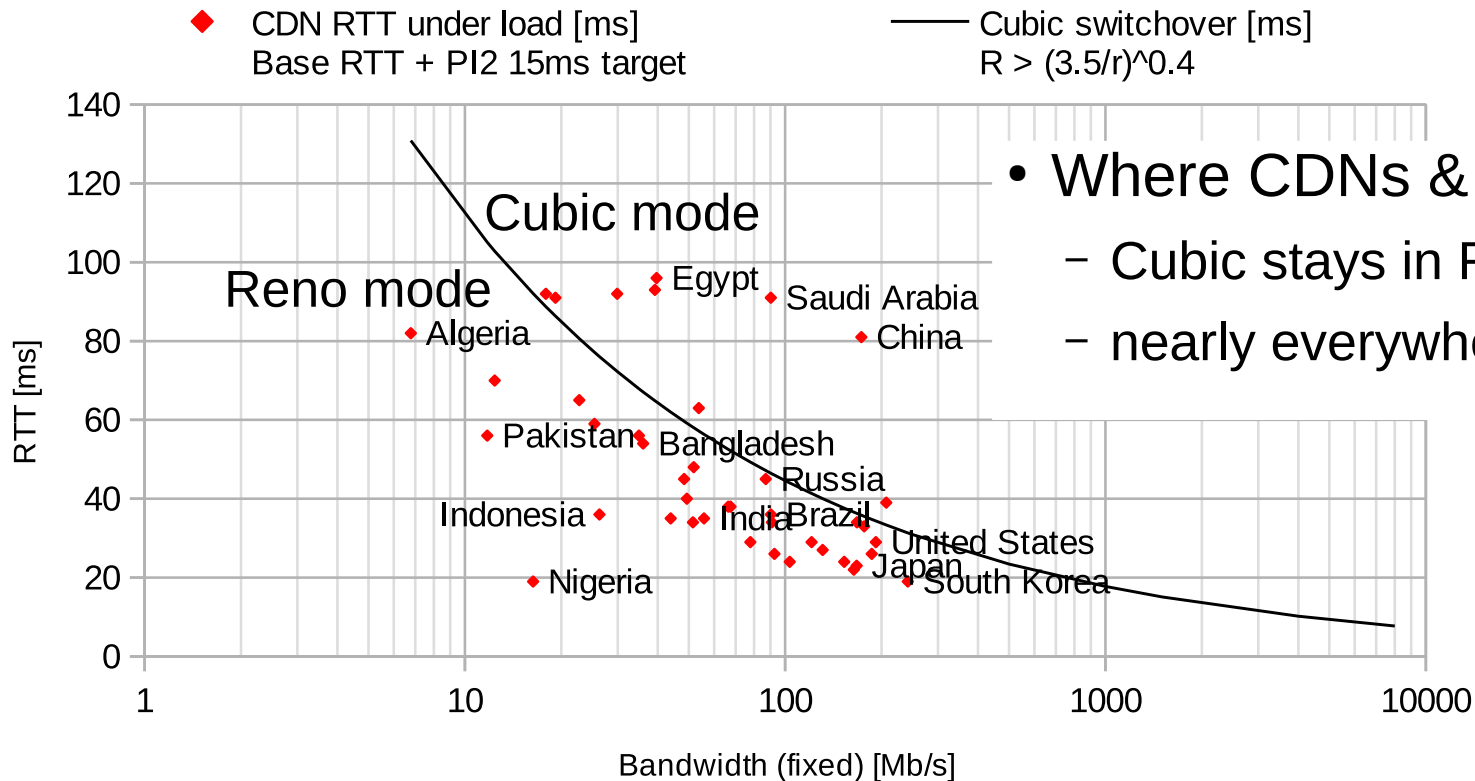
Draft updates: DualQ Coupled AQMs for L4S

[aqm-dualq-coupled-16](#) (6 Jul)

- in-depth justification for the default values of the parameters of the PI2 AQM for Classic traffic
 - To address Sebastian Möller's request
 - Summary of new [PI2 Parameters](#) paper (9pp of rationale, data and maths on default 'target')
 - Fuller justification for other parameters, Tupdate, RTT_{\max}
 - All in the DualPI2 appendix (A.1)

Interesting data point (and relevant to the 'S' in L4S)

Reno Resurgence



- Where CDNs & AQMs pull down RTT
 - Cubic stays in Reno mode
 - nearly everywhere

L4S Status Update

Thank you to all those still contributing to list discussion

Q&A → after l4sops talk

Next Steps

- Expected work in parallel to approval process:
 - Scalable CC algorithm improvements,
 - esp. flow start and integrating delay with ecn & loss metrics
 - Progressing I4sops
 - Reporting performance results from L4S experiments
 - Tracking deployment status of L4S