Comparing 2 dualpi2 versions from refactoring branch - commits 4e82fd8 (introduced preserving the sign in alpha/beta computations, cbd8653 (introduced proper statistics reset) and dualpi2fixed - a version based on cbd8653 commit, replacing division by ALPHA_BETA_GRANULARITY with division by 1 << ALPHA_BETA_GRANULARITY.

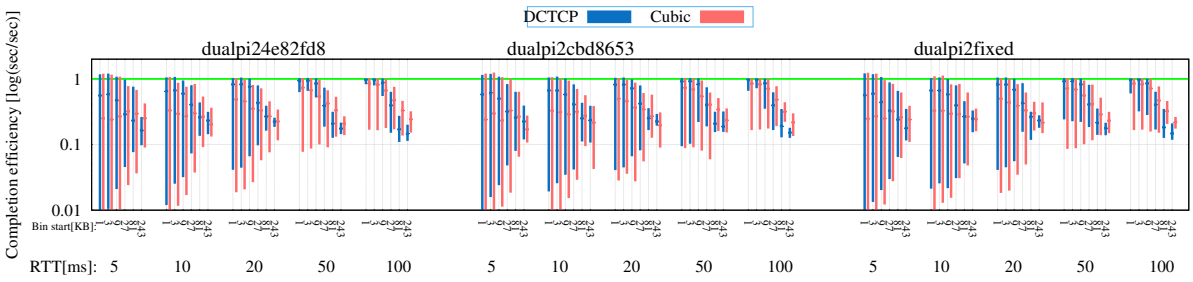
All versions use the same parameters: limit 40000p target 15.0ms tupdate 16.0ms alpha 0.156250 beta 3.195312 any_ect coupling_factor 2 drop_on_overload step_thresh 1.0ms drop_dequeue classic_protection 10%

Kernel versions: aqmnode: Linux router2 4.4.0-161-generic #189-Ubuntu SMP Tue Aug 27 08:10:16 UTC 2019 x86_64 x86_64 x86_64 GNU/Linux serverA: Linux svr17 3.19.0-51-generic #57 14.04.1-Ubuntu SMP Fri Feb 19 14:36:55 UTC 2016 x86_64 x86_64 x86_64 GNU/Linux serverB: Linux svr16 3.19.0-51-generic #57 14.04.1-Ubuntu SMP Fri Feb 19 14:36:55 UTC 2016 x86_64 x86_64 x86_64 GNU/Linux clientA: Linux svr15 3.19.0-51-generic #57 14.04.1-Ubuntu SMP Fri Feb 19 14:36:55 UTC 2016 x86_64 x86_64 x86_64 GNU/Linux clientB: Linux svr14 3.19.0-51-generic #57 14.04.1-Ubuntu SMP Fri Feb 19 14:36:55 UTC 2016 x86_64 x86_64 x86_64 GNU/Linux

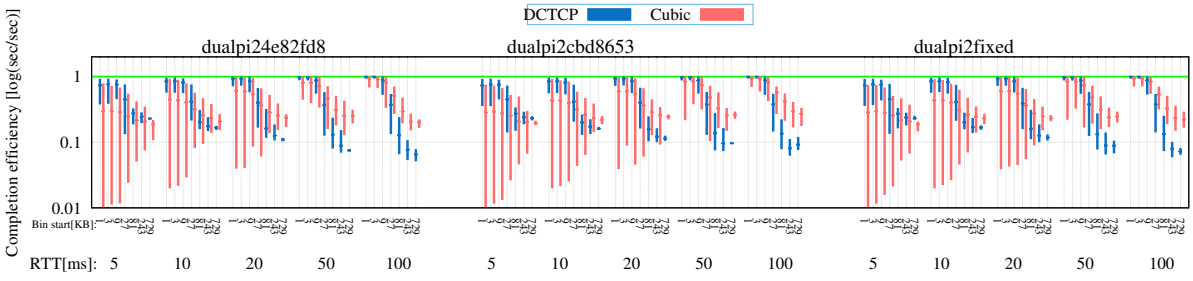
commit hash: 36acded01d7a6170681044a5c0a62c070bc95d00

Appendix A

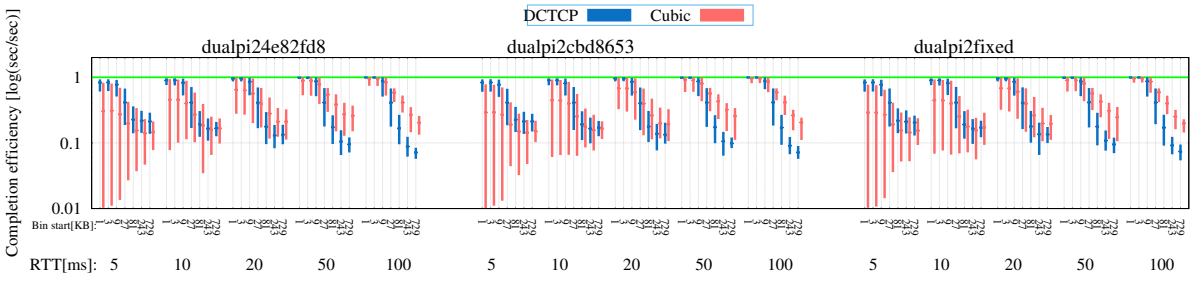
Equal RTT experiments



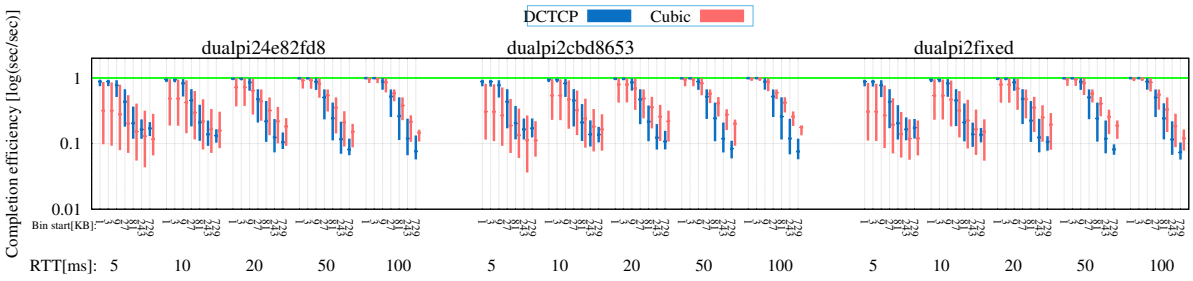
(a) 4Mbps link capacity



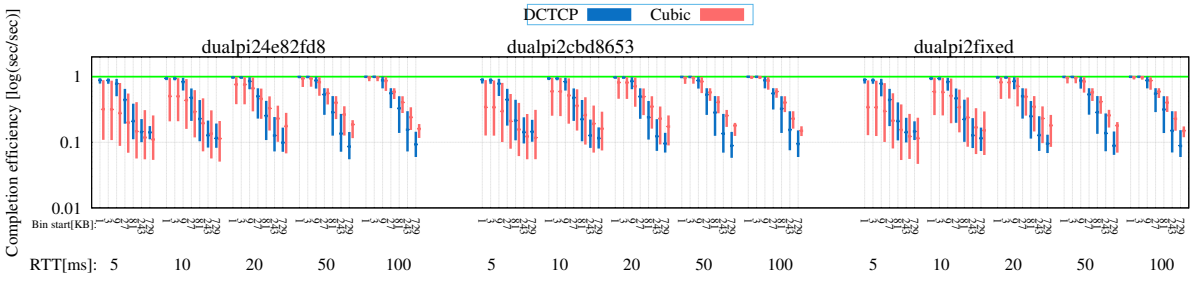
(b) 12Mbps link capacity



(c) 40Mbps link capacity



(d) 120 Mbps link capacity



(e) 200 Mbps link capacity

Figure A.1: Equal RTT (1h-1h)

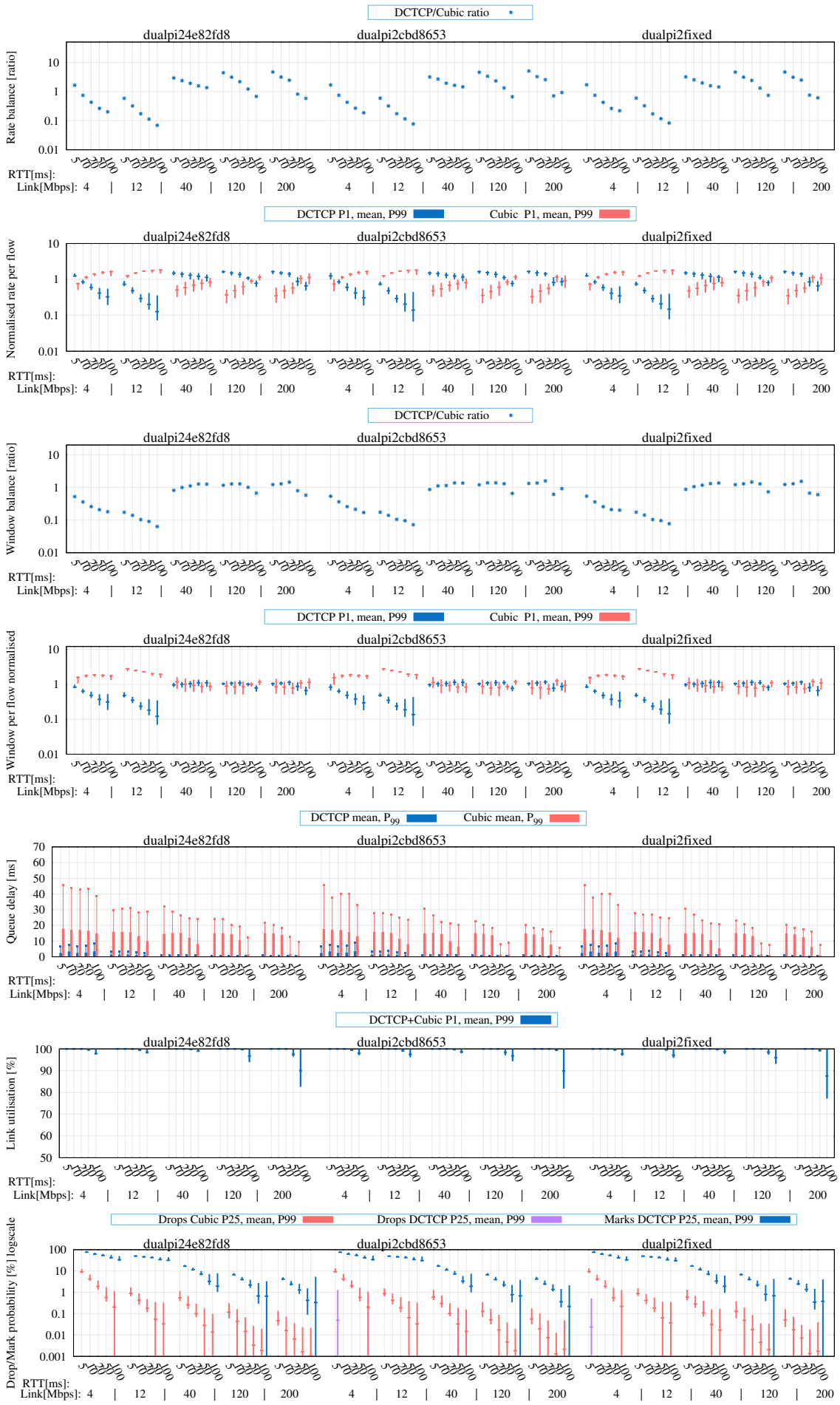


Figure A.2: Equal RTT (1-1)

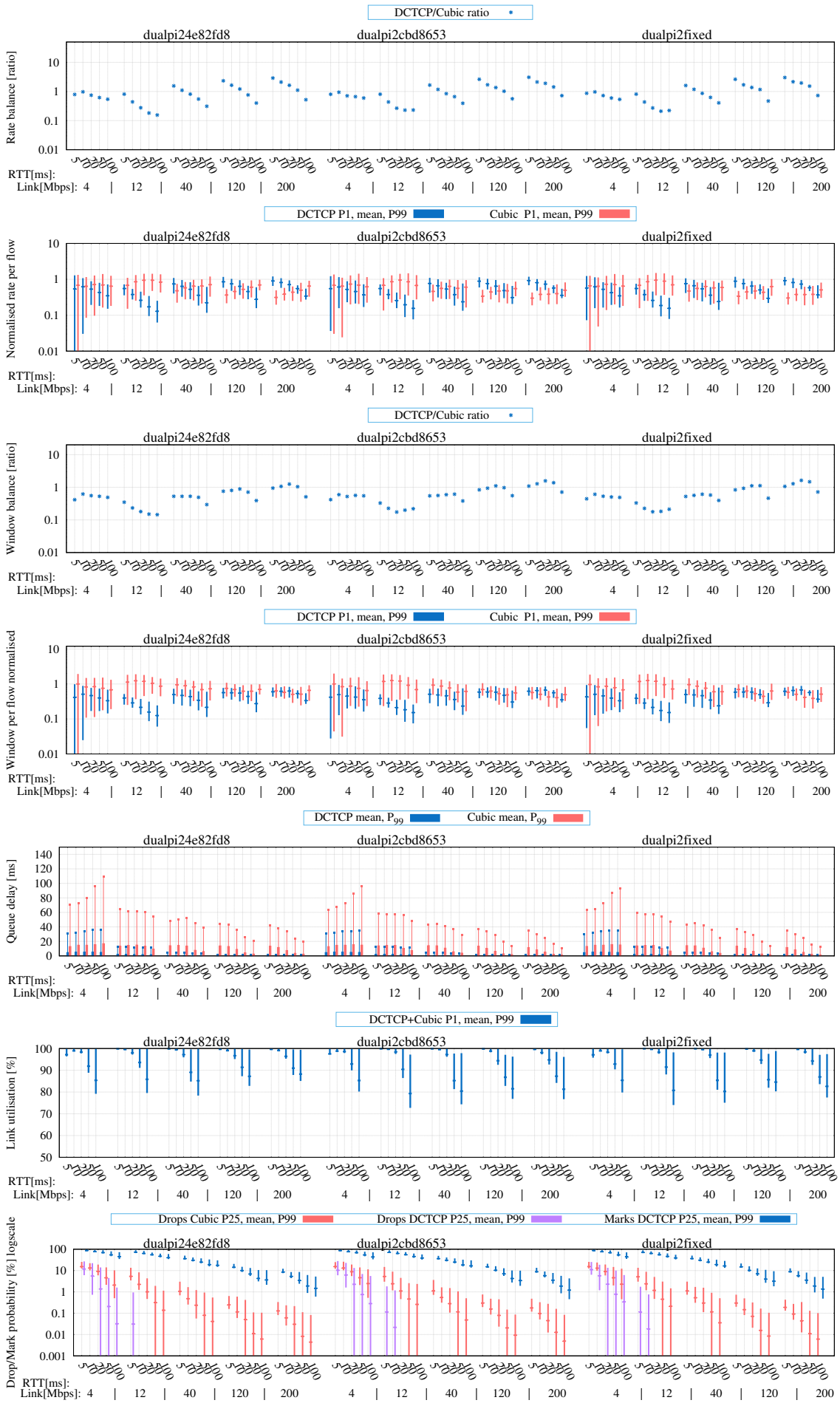


Figure A.3: Equal RTT (1h-1h)

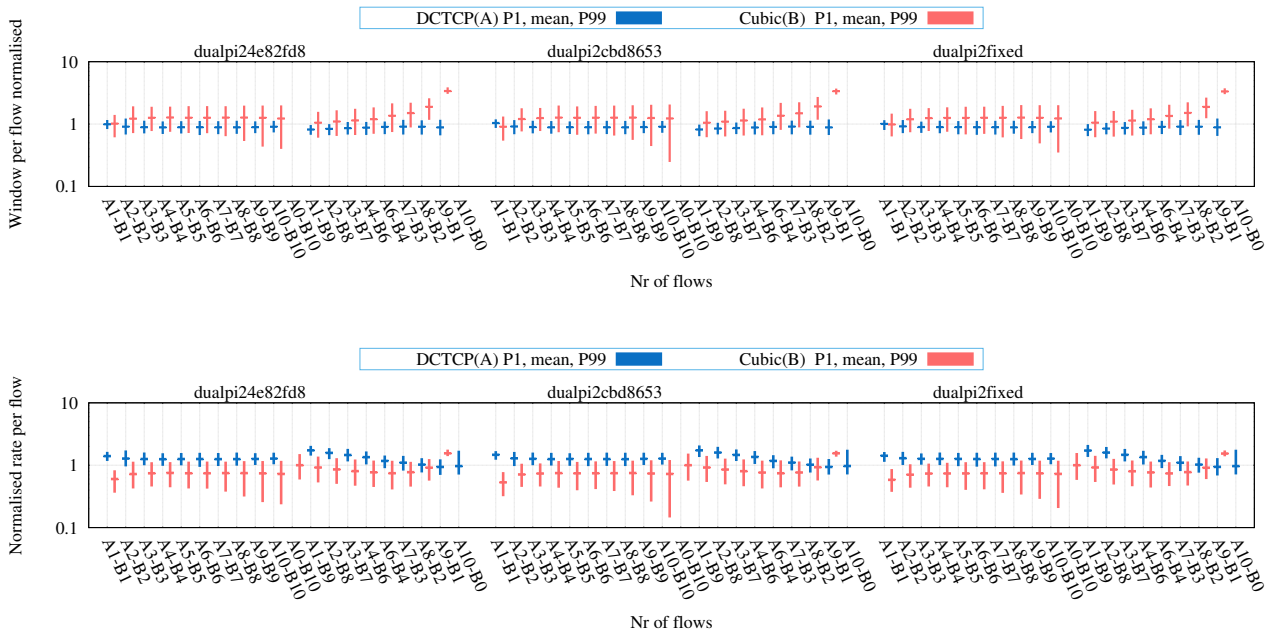


Figure A.4: Normalised rate and window size per flow. 40Mbps link capacity, 10ms RTT. Equal RTT

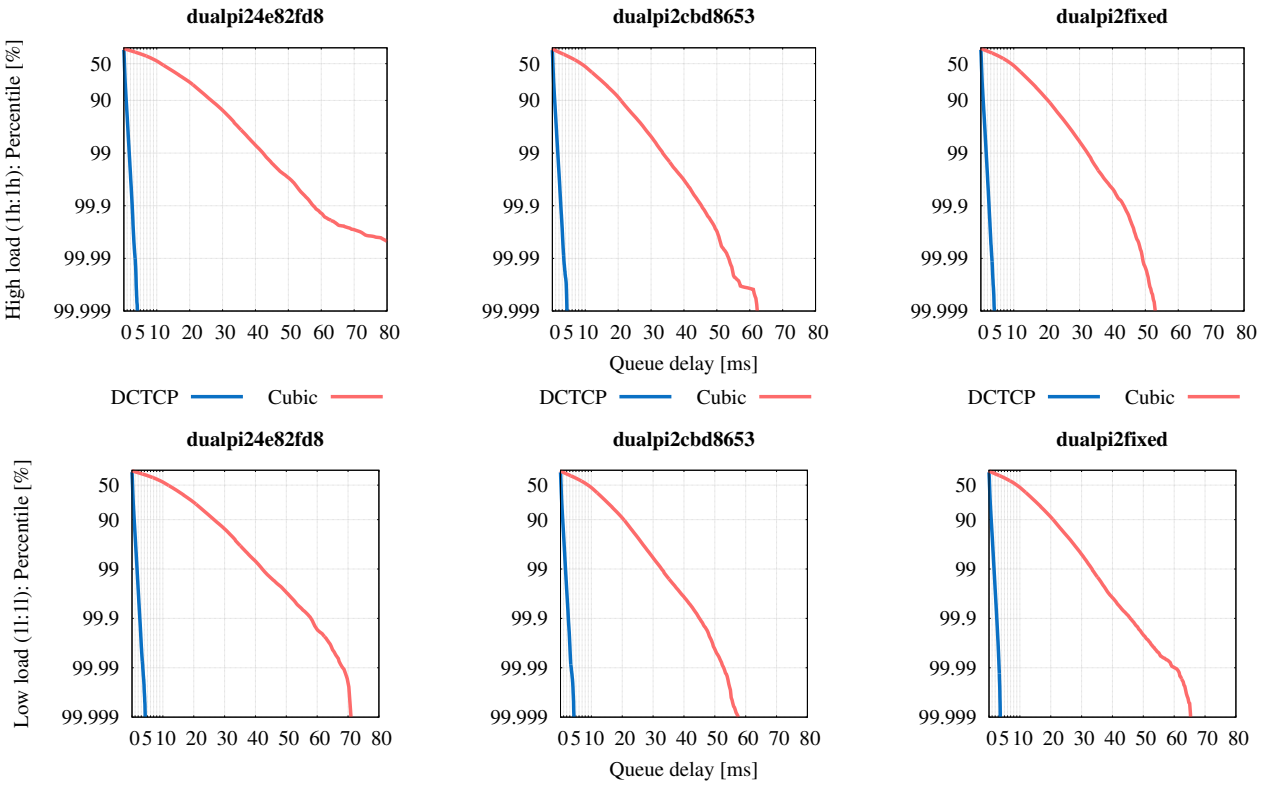


Figure A.5: Queue delay CCDF. 120Mbps link capacity, 10ms RTT. Equal RTT

Appendix B

Mixed RTT experiments

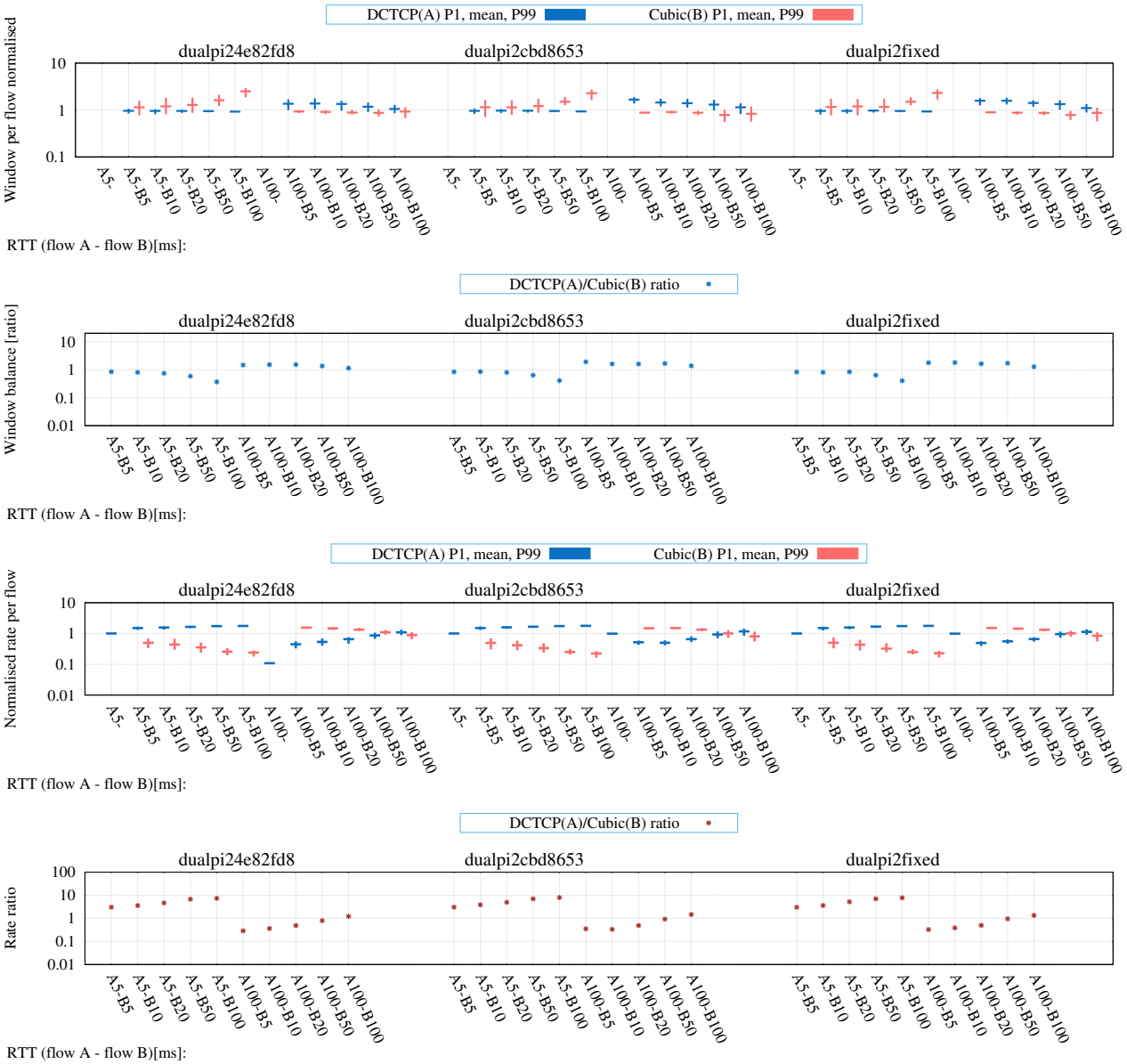


Figure B.1: 1 flow for each CC. Mixed RTT (mrtt2˙link40)

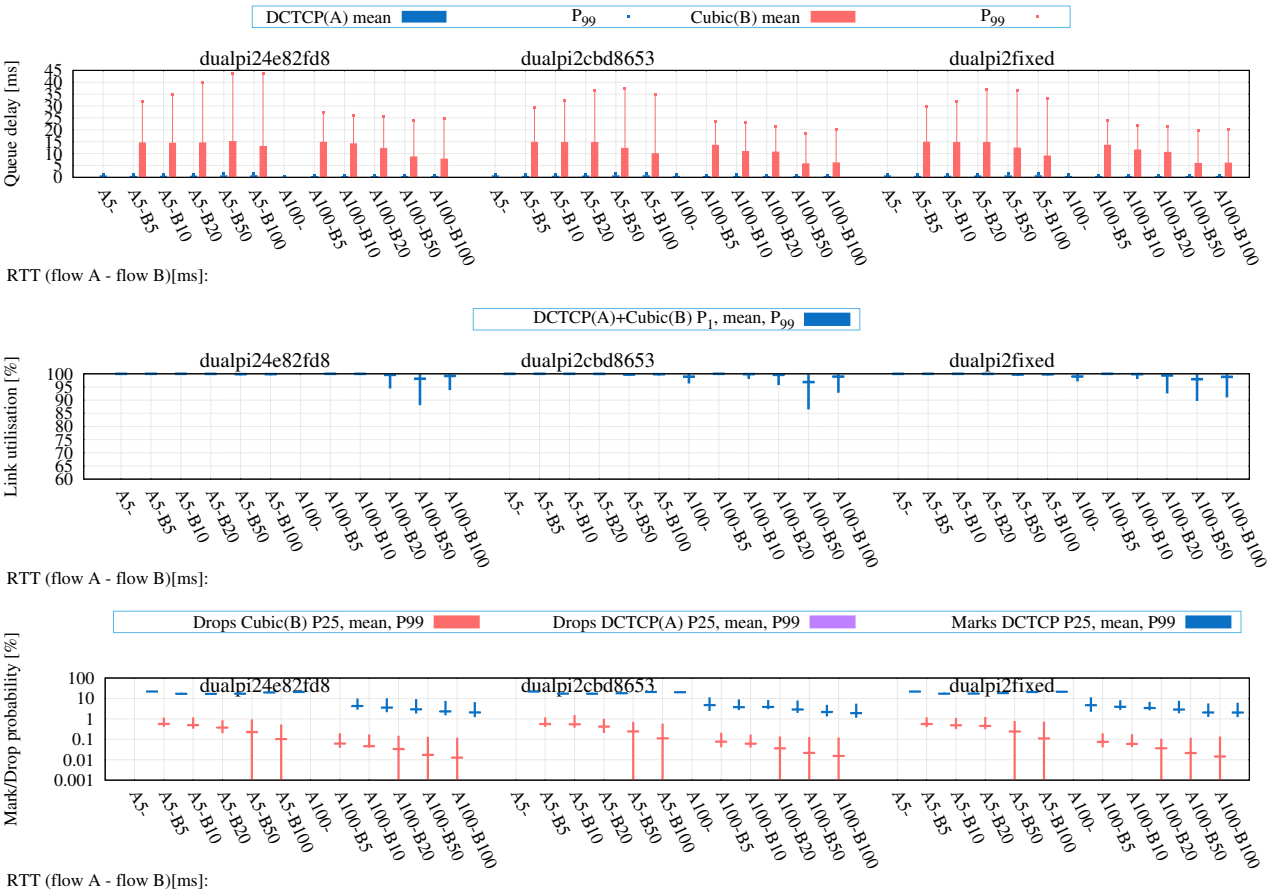


Figure B.2: 1 flow for each CC. Mixed RTT (mrtt2˙link40)

Appendix C

Overload experiments

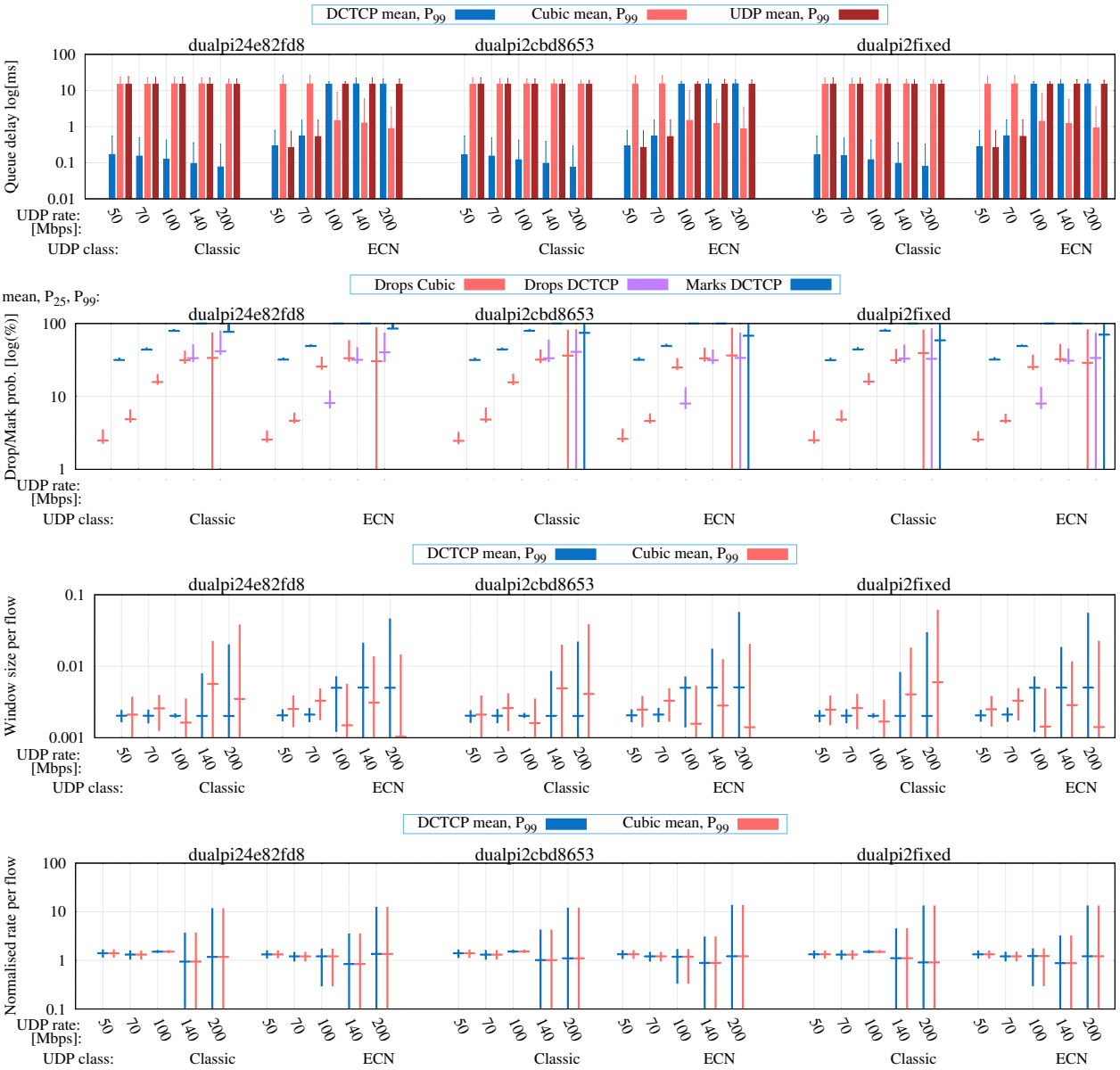


Figure C.1: Overload experiments. 1 flow for each CC