

{tag} International Journal of Computer Applications
Foundation of Computer Science (FCS), NY, USA

[Volume 179](#)

-
[Number 17](#)

Year of Publication: 2018

Authors:

Manmeet Kaur Arora, Karamdeep Singh, Shivinder Devra

10.5120/ijca2018916298

{bibtex}2018916298.bib{/bibtex}

Abstract

Congestion control is a preventive method associated with computer networks operated at high load conditions. The congestion is a severe issue which requires considerable attention, as internet performance is largely governed by data traffic fluctuations which are usually burst in nature. Therefore, a survey of different congestion control protocols comparing various parameters is essential to come up with new proposal to avoid congestion problem in computer networks. In this paper, we review progress made in the field of reactive and proactive congestion methodologies, which explicitly compute rates independently of congestion signal in decentralized fashion. Finally, the review brings to notice the application of various protocols along with their advantages and disadvantages.

References

1. Nagle, J., 1984. Congestion Control in TCP/IP Networks. Computer Communications, 14(4).

2. Keshav, S., 1992. Congestion control in computer networks.
3. Hoe, J.C., 1996, August. Improving the start-up behavior of a congestion control scheme for TCP. In ACM SIGCOMM Computer Communication Review (Vol. 26, No. 4, pp. 270-280). ACM.
4. Floyd, S. and Fall, K., 1999. Promoting the use of end-to-end congestion control in the Internet. *IEEE/ACM Transactions on networking*, 7(4), pp.458-472.
5. Firoiu, V. and Borden, M., 2000, March. A study of active queue management for congestion control. In INFOCOM 2000. Nineteenth Annual Joint Conference of the IEEE Computer and Communications Societies. Proceedings. IEEE (Vol. 3, pp. 1435-1444). IEEE.
6. Bansal, D. and Balakrishnan, H., 2001. Binomial congestion control algorithms. In INFOCOM 2001. Twentieth Annual Joint Conference of the IEEE Computer and Communications Societies. Proceedings. IEEE (Vol. 2, pp. 631-640). IEEE.
7. Akyildiz, I. F., Morabito, G. and Palazzo, S., 2001. TCP-Peach: a new congestion control scheme for satellite IP networks. *IEEE/ACM Transactions on Networking (ToN)*, 9(3), pp.307-321.
8. Yi, Y. and Shakkottai, S., 2007. Hop-by-hop congestion control over a wireless multi-hop network. *IEEE/ACM Transactions on Networking*, 15(1), pp.133-144.
9. Katabi, D., Handley, M. and Rohrs, C., 2002. Congestion control for high bandwidth-delay product networks. *ACM SIGCOMM computer communication review*, 32(4), pp.89-102.
10. Low, S.H., Paganini, F. and Doyle, J.C., 2002. Internet congestion control. *IEEE control systems*, 22(1), pp.28-43.
11. Kelly, F., 2003. Fairness and stability of end-to-end congestion control. *European journal of control*, 9(2-3), pp.159-176.
12. Xu, L., Harfoush, K. and Rhee, I., 2004, March. Binary increase congestion control (BIC) for fast long-distance networks. In INFOCOM 2004. Twenty-third Annual Joint Conference of the IEEE Computer and Communications Societies (Vol. 4, pp. 2514-2524). IEEE
13. Ee, C.T. and Bajcsy, R., 2004, November. Congestion control and fairness for many-to-one routing in sensor networks. In Proceedings of the 2nd international conference on Embedded networked sensor systems (pp. 148-161). ACM.
14. Chiang, M., 2005. Balancing transport and physical layers in wireless multihop networks: Jointly optimal congestion control and power control. *IEEE Journal on Selected Areas in Communications*, 23(1), pp.104-116.
15. Kohler, E., Handley, M. and Floyd, S., 2006. Datagram congestion control protocol (DCCP) (No. RFC 4340).
16. Eryilmaz, A. and Srikant, R., 2006. Joint congestion control, routing, and MAC for stability and fairness in wireless networks. *IEEE Journal on Selected Areas in Communications*, 24(8), pp.1514-1524
17. Liu, S., Başar, T. and Srikant, R., 2008. TCP-Illinois: A loss-and delay-based congestion control algorithm for high-speed networks. *Performance Evaluation*, 65(6), pp.417-440
18. Warrior, A., Janakiraman, S., Ha, S. and Rhee, I., 2009, April. DiffQ: Practical differential backlog congestion control for wireless networks. In INFOCOM 2009, IEEE (pp. 262-270). IEEE.
19. Jiang, L., Shah, D., Shin, J. and Walrand, J., 2010. Distributed random access algorithm: scheduling and congestion control. *IEEE Transactions on Information Theory*, 56(12), pp.6182-6207.
20. Tielert, T., Jiang, D., Chen, Q., Delgrossi, L. and Hartenstein, H., 2011, November.

Design methodology and evaluation of rate adaptation based congestion control for vehicle safety communications. In Vehicular Networking Conference (VNC), 2011 IEEE (pp. 116-123). IEEE.

21. Raiciu, C., Handley, M. and Wischik, D., 2011. Coupled congestion control for multipath transport protocols (No. RFC 6356).

22. Wu, H., Feng, Z., Guo, C. and Zhang, Y., 2013. ICTCP: Incast congestion control for TCP in data-center networks. IEEE/ACM transactions on networking, 21(2), pp.345-358.

23. Jan, M.A., Nanda, P., He, X. and Liu, R.P., 2014. PASCOC: Priority-based application-specific congestion control clustering protocol. Computer Networks, 74, pp.92-102.

24. Sundar, R., Hebbar, S. and Golla, V., 2015. Implementing intelligent traffic control system for congestion control, ambulance clearance, and stolen vehicle detection. IEEE Sensors Journal, 15(2), pp.1109-1113.

25. Vinodha, K. and Selvarani, R., 2016, December. Introducing novel service policies in designing protocol for congestion control mechanism. In Computer, Electrical & Communication Engineering (ICCECE), 2016 International Conference on (pp. 1-8). IEEE.

26. Bahnasy, M., Elbiaze, H. and Boughzala, B., 2017, May. HetFlow: A distributed delay-based congestion control for data centers to achieve ultra low queueing delay. In Communications (ICC), 2017 IEEE International Conference on (pp. 1-7). IEEE.

Index Terms

Computer Science

Control Systems

Keywords

Congestion control, TCP, ECN, VCS, RTT, AIMD.