IEEE Control Systems Society
UK&RI Chapter

TCP Congestion Control for High-Speed Networks

Professor Doug Leith

Hamilton Institute, NUI Maynooth

Currently around 95% of traffic in the internet is carried using the TCP protocol. A key feature of TCP is that it seeks to adapt the rate at which traffic is sent to the speed of a connection. This is achieved using feedback from the destination computer in the form of ACK packets, creating a tightly coupled feedback control loop for each end-to-end connection that is established. This is a distributed control task, owing to the constraints on information passing. It is also a highly nonlinear task involving switching, time-varying delays and important quantisation effects (the network functions in terms of packets). This presentation will introduce theoretical frameworks for the modelling of TCP networks and discuss recent proposals for new congestion control algorithms that scale to modern high-speed networks (e.g. current algorithms are known to perform poorly on gigabit speed links) and which adapt automatically to achieve an improved trade-off between the often conflicting requirements of responsiveness, fairness, efficiency and backward compatibility.

Date: 2pm, 16 June, 2004
Venue: LT0, Baker Building, Department of Engineering, University of Cambridge, Trumpington Street, Cambridge

Free Admission-All Welcome

For details of the IEEE Control Systems Society UK&RI Chapter, contact
james.whidborne@ieee.org
For details of the CUED Control Group Seminar programme, see
www-control.eng.cam.ac.uk/Seminars/seminars.html