Free Seminar Series

NATIONAL ICT AUSTRALIA LIMITED

Efficient Internet Routing with Independent Providers

By
Dr David Wetherall
University of Washington

Monday 5th December 4:00pm
NICTA
Bay 15, Locomotive Workshop
Australian Technology Park
EVELEIGH, NSW

Abstract

A key characteristic of the Internet (and many other networked systems) is that it is made up of independent parties that act in their own interests. To provide connectivity to their customers, each ISP exchanges packets with other ISPs while minimizing its own exchange costs. It is well-known that this significantly affects paths relative to routing in a single, larger system in ways that depend on the routing protocol. For example, competitive effects in BGP (the current Internet routing protocol) are the main cause of asymmetric paths. Independent optimization further leads to less efficient paths; the loss of efficiency is known as "the price of anarchy." However, despite their prominent role, relatively little is known about how to design protocols that work well with multiple parties.

Our research is focused on assessing the effects of multiple parties in Internet routing, and understanding how to design Internet routing protocols that work well this setting. In this talk, I will give an overview of our results to date. We began our study by using measured Internet maps from an earlier project to estimate how much paths and ISP networks are inflated by competition. We found the average inflation to be quite low, but that some paths and ISPs were inflated substantially. We then looked for practical routing designs that would consistently avoid substantial inflation and the associated operational costs. I will present Wiser, a protocol based on barter between pairs of independent providers that we developed. We have simulated Wiser on our measured Internet maps and find it to provide good efficiency in nearly all cases. We have implemented Wiser to show that it is a simple extension to the BGP protocol that is used today. This is joint work with Ratul Mahajan and Tom Anderson.

About the Speaker

David Wetherall is an Associate Professor in the Department of Computer Science and Engineering at the University of Washington. He joined the faculty in 1999 after receiving his Ph.D. in computer science from MIT; he received his B.E. in electrical engineering from the University of Western Australia in 1989 and worked for QPSX afterwards. Wetherall's thesis research pioneered active networks, an architecture in which new network services can be introduced rapidly using mobile code. His research interests span the range of topics in networking and distributed systems. Wetherall received an NSF CAREER award in 2002 and became a Sloan Fellow in 2004.

Refreshments will be served

Bookings Essential

Please **RSVP** to Anne-Marie Eliseo, Industry Education Manager, by no later than Monday, 21st November, 2005:

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Seminar Venue:

Monday, 5th December, 2005 4:00pm
Followed by drinks at 5:00pm

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