

Computer Science Seminar Fall 2010
01-19-10; PGH 232; 11:00 AM

Dr. Srinivas Shakkottai, Texas A&M University

Title: Demand-Aware Content Distribution on the Internet

Abstract:

The Internet was conceived as a medium to efficiently enable point-to-point conversations. However, the main source of Internet traffic today is easily duplicable and location-independent content. Our main focus in this talk is on one aspect -- utilizing awareness of demand for a piece of content in the interest of efficient resource usage. We use the Bass model of demand evolution to compare a hybrid of peer-to-peer and a centralized client-server approach against each method acting alone. We analyze the relative performance of the schemes, both from the point of view of consumers, as well as the content provider. Our analysis is carried out in an order scaling depending on the total potential mass of customers N in the market. We show how awareness of demand can be used to attain a given average delay target with lowest possible utilization of the central server by using the hybrid scheme, and validate our results using Internet data and simulations. We will also over-view two other recent results on P2P content distribution concerning price-based load balancing, and optimal buffer management for real-time streaming.

Bio:

Srinivas Shakkottai received the M.S. (2003) and PhD (2007) degrees, both in electrical engineering, from the University of Illinois at Urbana-Champaign. He was a post-doctoral scholar at Stanford University in 2007, and is currently an assistant professor at the Dept. of ECE at Texas A&M University.

His research interests include content distribution systems, wireless ad-hoc networks, Internet economics and game theory, congestion control, and the measurement and analysis of Internet data.

Srinivas is the recipient of the National Merit Scholarship, and the Young Scientist Fellowship, (Dept. of Science and Technology, Govt. of India), and the International Programs in Engineering Fellowship at the University of Illinois. He also recently received the Defense Threat Reduction Agency (DTRA) Young Investigator Award.