



# UMass Lowell Computer Science Colloquium Announcement

**Speaker:** Prof. Bing Wang, University of Connecticut  
**Date & Time:** Wednesday, May 2, 2007, 3:00pm--4:00pm  
**Place:** Olsen 311, Refreshments are served at 2:40pm

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## Constructing Transport Services in Multipath Environments: An Application-Level Approach on top of TCP

Multipath is ubiquitous in the current Internet infrastructure. Using multipath may provide higher throughput, shorter latency, better security to applications. However, TCP, the current predominant transport protocol, is designed to run over a single path between a single source-destination pair. Furthermore, its design goal is simply to send as much as allowed by the network, satisfying certain fairness constraints. Therefore, there is a need to construct transport services, taking advantages of the ubiquitous multipath and matching the diverse requirements of the applications.

In this talk, we focus on an application-level approach to constructing multipath transport services, using TCP as a basic building block. This approach does not require any change to TCP and hence is easy to deploy. Furthermore, it directly utilizes the functionalities in TCP (e.g., reliability, congestion control) and avoids building repetitive functionalities in individual applications. We exemplify this approach using two transport services. The first service is to maximize the aggregate throughput of multiple sources in an overlay network, where each source sends data over  $k$  overlay paths to its destination. The second service is to stream a video over multiple paths from a source to the destination with the goal to minimize the number of late packets. Using these two examples, we demonstrate that diverse multipath transport services can be constructed by adding a simple control loop at the application-level, on top of TCP.

### *Bio:*

Bing Wang received her B.S. degree in Computer Science from Nanjing University of Science & Technology, China in 1994, and M.S. degree in Computer Engineering from Institute of Computing Technology, Chinese Academy of Sciences in 1997. She then received M.S. degrees in Computer Science and Applied Mathematics, and a Ph.D. in Computer Science from the University of Massachusetts, Amherst in 2000, 2004, and 2005 respectively. Afterwards, she joined the Computer Science & Engineering Department at the University of Connecticut as an assistant professor. Her research interests are in Computer Networks, Multimedia, and Distributed Systems. More specifically, she is interested in topics on Internet technologies and applications, wireless and sensor networks, overlay networks, content distribution, network management and measurement, network modeling and performance evaluation. She is a member of ACM, ACM SIGCOMM, IEEE, IEEE Computer Society, and IEEE Communications Society.