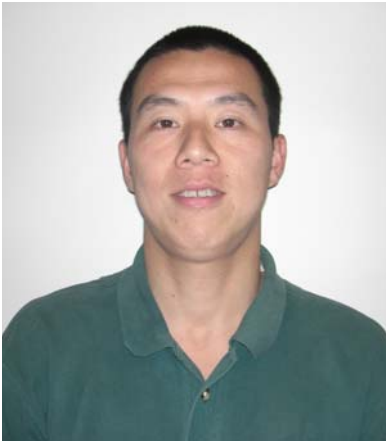


Computer Science & Electrical Engineering PhD Colloquium
Friday, Aug 29th, 2008 in FH 557 at 2:00 pm

*Analytical Models for Understanding Misbehavior
and MAC Friendliness in CSMA Networks*

Nodes using contention-based CSMA protocols are susceptible to the misbehavior of other nodes and also have little flexibility in controlling quality of service. To address the misbehavior problem, continuous-time protocols are proposed. The effects of “misbehavior” on the QoS of all nodes in the system caused by changing the cheater’s arrival rate and backoff rate are studied. In this paper, a new method for modeling the single hop and multi hop network environments is proposed. Collision probabilities are determined both by the channel utilization of the interference range, as well as the actual stage within the back-off process. The model itself is a key contribution because it is accurate over all ranges of traffic loads and models both queuing within nodes and contention for the channel.

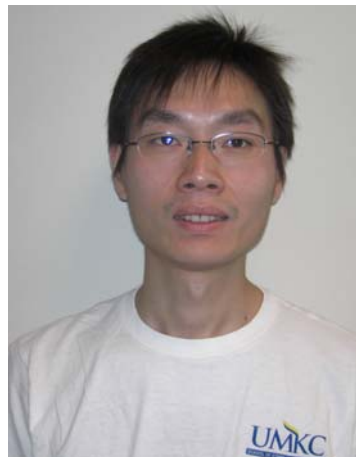


Bio: Zhefu Shi is a Ph.D. student working with Dr. Cory Beard in the School of Computing and Engineering at the University of Missouri-Kansas City. He earned his Bachelor’s in Computer Science from Tong Ji University in 1997

and Master’s in Computer Science from the University of Missouri-Kansas city in 2005. His research interests include modeling and performance analysis of telecommunication and computer networks. He has been honored with a School of Graduate Studies Dean’s Doctoral Fellowship.

*Stochastic Modeling of Request Denial in the
Presence of Latency and User-Allocation Strategy in
an Agent-Based VPN Architecture*

Agent-based virtual private networks architecture (ABVA) refers to the network service environment where a third-party provider administers remote access VPN services for organizations that do not want to maintain their own in-house VPN servers. In this presentation, we consider the problem of connecting users of an organization to an optimal VPN server location so that request denial probability is considered in the presence of latency. This environment is similar to distributed loss system, but also effected by latency. By considering a finite population, this environment can be approximately represented using the Engset model (an M/M/m/m/K system). We present a number of strategies regarding which VPN server is to be selected and the number of attempts to be tried so that request denial probability is minimized without unduly affecting latency. Through computation and analytical results, we show that the clustering with directional hunting (CDH) strategy provides the best result. However, in the heterogeneous case of users with differing data rate (traffic class), request denial observed by each class is different leading to unfair treatment. We have proposed a reserved capacity based add-on feature with CDH, which allows service classes with different data rates to be treated fairly.



Bio: Haiyang Qian is a Ph.D. student working with Dr. Deep Medhi in the School of Computing and Engineering at University of Missouri – Kansas City. His main research interests include computer networking modeling, analysis and optimization. He

received the M.S. degree in Telecommunications from Technical University of Denmark in 2006 and the bachelor degree in Communication Engineering from Nanjing University of Science and Technology, China in 2002. He has been honored with an SCE Dean’s Doctoral Fellowship.