Faculty of Computer Science 2005-2006 Seminar Series

Traffic-Engineering Based Routing and Channel Allocation in Wired and Wireless Networks

By

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Traffic engineering (TE) in packet networks improves the network performance by providing support for congestion management, higher bandwidth utilization (or throughput), and QoS. There are two ways to provide congestion management, either by avoiding congestion before routing packet flows or by eliminating congestion after routing packet flows. Congestion can be eliminated by capacity re-planning, however in wired networks periodic capacity planning is not possible. Therefore, wired networks rely on congestion avoidance by using explicit path support in MPLS. This talk presents a fuzzy logic based TE routing algorithm to calculate these explicit paths that outperforms the well-known widest shortest path (WSP) algorithm and minimum interference routing algorithm (MIRA). The talk also covers a TE solution in broadband fixed wireless networks with directed (or physical) mesh topologies. The solution approach exploits the fact that in wireless networks, it is possible to perform capacity re-planning by re-allocating the frequency channels to links in a network. Unlike wired networks, wireless networks do not require any infrastructure upgrade to support channel reallocation in a short scale of time. The proposed solution is based on a distributed dynamic channel allocation algorithm that is capable of finding a solution at the time of network initialization and also dynamically fine tunes the channel allocation to eliminate congestion to provide traffic engineering. The proposed solution is highly scalable and hence is suitable for large networks.

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STUDENTS ARE ENCOURAGED TO ATTEND

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