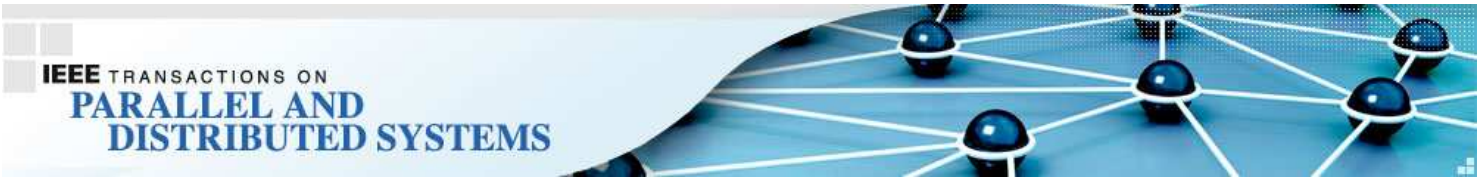

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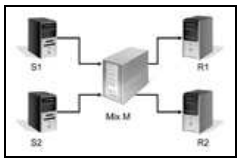
From the July 2010 Issue...

Correlation-Based Traffic Analysis Attacks on Anonymity Networks

By Ye Zhu, Xinwen Fu, Bryan Gramham, Riccardo Bettati, and Wei Zhao



In this paper, we address attacks that exploit the timing behavior of TCP and other protocols and applications in low-latency anonymity networks. Mixes have been used in many anonymous communication systems and are supposed to provide countermeasures to defeat traffic analysis attacks. In this paper, we focus on a particular class of traffic analysis attacks, flow-correlation attacks, by which an adversary attempts to analyze the network traffic and correlate the traffic of a flow over an input link with that over an output link. Two classes of correlation methods are considered, namely time-domain methods and frequency-domain methods.

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PrePrint: Strong-Incentive, High-Throughput Channel Assignment for Non-Cooperative Wireless Networks

Channel assignment is a very important topic in wireless networks. In this paper, we study FDMA channel assignment in a non-cooperative wireless network, where devices are selfish. Existing work on this problem has considered Nash Equilibrium (NE), which is not a very strong solution concept and may not guarantee a good system performance. In contrast, in this work we introduce a payment formula to ensure the existence of a Strongly Dominant Strategy Equilibrium (SDSE), a different solution concept that gives participants much stronger incentives. We show that, when the system converges to a SDSE, it also achieves global optimality in terms of system throughput. Furthermore, we extend our work to the case in which some radios have a limited tunability. We show that in such a case, nevertheless, it is generally

A word from the Editor-in-Chief, Ivan Stojmenovic

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impossible to have a similar SDSE solution; with additional assumptions on the numbers of radios and the types of channels, etc., we can again achieve a SDSE solution that guarantees optimal system throughput. Besides this extension, we also consider other extensions of our strategic game to achieve throughput fairness and to deal with possibly inconsistent information caused by players joining and leaving. Finally, we evaluate our design with simulated experiments. Numerical results verify that the system does converge to the globally optimal channel assignment with the proposed payment formula, and that the system throughput is significantly higher than that achievable with the random-based and Nash Equilibrium (NE)-based channel assignment schemes.

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