



THE CHINESE UNIVERSITY OF HONG KONG
Department of Information Engineering

Seminar

**Securing Web Communications:
Multipath Tor beyond Traffic Throttling**

by

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Time : 10:00am – 11:00am
Venue : Room 833, Ho Sin Hang Engineering Building
The Chinese University of Hong Kong

Abstract

Tor is one of the most popular anonymous communication systems. A major obstacle that impedes its further expansion is the large performance variance. The problem becomes worse when an increasing number of bandwidth-intensive applications, such as video streaming, contend with latency-sensitive applications, such as web browsing, for the scarce resources. Most of the existing solutions take a circuit-scheduling approach to prioritize interactive traffic over bulk traffic or completely throttle traffic from bandwidth-intensive applications. These approaches highly rely on the accurate detection of traffic types, and thus will not function as expected if the detection accuracy is low or the detection strategies are gamed maliciously. In this talk, I will present a different approach beyond traffic throttling to address the performance bottleneck problem of Tor. I will first discuss our observations and analysis on the traffic distribution in the Tor network, and introduce the multi-path Tor routing algorithm we developed to utilize the low-bandwidth Tor relays, which are intentionally excluded in the current Tor path construction. Then, I will discuss the performance of the new routing scheme based on the simulation results over the Shadow simulator and the experiment results on the live Tor network. Finally, I will present an application on top of the multi-path Tor routing to secure the Tor hidden services against traffic analysis attacks.

Biography

Fengjun Li is an Associate Professor in the Department of Electrical Engineering and Computer Science at the University of Kansas. She received her Ph.D. degree from The Pennsylvania State University in 2010 and an M.Phil. degree from the Chinese University of Hong Kong in 2004. She works in the area of computer and network security, with a focus on the security and privacy issues in applications and platforms dealing with large-scale data collection, dissemination, sharing and integration. Her recent research projects include secure data aggregation in smart grid, privacy-preserving data dissemination and machine-learning-as-a-service for IoT, social network and social media privacy analysis, Internet anonymous communications, etc. She serves on the editorial boards of International Journal on Security and JSM Computer Science & Engineering as well as technical program committees of several conferences and workshops including IEEE SmartGridComm, IEEE HISB, ACM CIKM, etc.

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