『清华信息大讲堂』第 60 讲

报告题目：	**NF-TCP: A Network Friendly TCP Variant for Background Delay-Insensitive Applications**
报 告 人：	**Prof. Dr. Xiaoming Fu**
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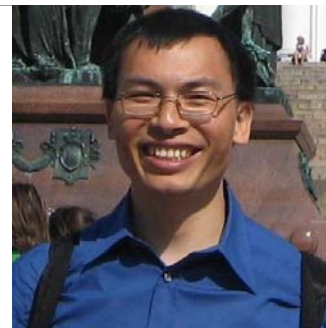
Abstract：

Delay-insensitive applications, such as P2P file sharing, generate substantial amounts of traffic and compete with other applications on an equal footing when using TCP. Further, to optimize throughput, such applications open multiple connections. This results in an unfair and potentially poor service for other applications having stringent performance objectives. In this paper, we propose NF-TCP, a TCP variant for P2P and similar background delay-insensitive applications. NF-TCP aims to be submissive to delay-sensitive applications under congestion. It is designed to be network friendly based on a fluid flow model for intermediate queues and uses explicit congestion notification (ECN) for early detection of congestion. Moreover, it exploits the measure of the available bandwidth to be able to aggressively utilize spare capacity. We implemented NF-TCP on Linux and ns-2. Our evaluations of the NF-TCP Linux implementation on ns-2 show that NF-TCP outperforms other network friendly approaches (e.g., LEDBAT, TCP-LP and RAPID). NF-TCP achieves high utilization, fair bandwidth allocation among NF-TCP flows and maintains a small average queue. Our evaluations further demonstrate that with NF-TCP, the available bandwidth can be efficiently utilized for supporting both delay-sensitive and insensitive traffic in a wide range of scenarios.

Biography:

Prof. Fu obtained his Ph.D. degree in Computer Science from Tsinghua University in 2000. After that he worked at Technical University Berlin as a full-time researcher. In 2002, he joined the faculty of the University of Göttingen, where he is currently a Full Professor and Dean for Studies of Computer Science. Prof. Fu has been a Specialist Task Force Expert at ETSI, a Visiting Scientist at the University of Cambridge, a DAAD Visiting Professor at Columbia University and a Fulbright Visiting Professor at UCLA, and holds a Changjiang Professorship at Tsinghua. He is the recipient of the University of Göttingen's Foundation Council Award for Exceptional Publications by Young Scholars (2005). He has served as chair or member of organization or program committees for ACM MOBICOM, MOBIHOC, MobiArch, HotPlanet, IEEE INFOCOM, ICNP, ICDCS, IWQoS, ICCCN, Globecom, CCW, IFIP Networking etc, and since 2008 as the secretary for the IEEE Communications Society Technical Committee on Computer Communications (TCCC). He has served as an area editor of *Computer Communications Journal (Elsevier)*, and as the leading guest editor for *IEEE Network Special Issue on Implications and Control of Middleboxes in the Internet* and *Computer Networks (Elsevier) Special Issue on Measurement-based Optimization of P2P Networking and Applications*. He is a senior member of IEEE, and a member of ACM. His research areas include architecture, protocols and applications of Internet-based communication systems.

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