

Computer Science Seminar Series, 2013

National Capital Region

Towards Power-Efficient Internet Streaming to Mobile Devices

Speaker: Prof. Songqing Chen

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1:00PM- 2:00PM, NVC 325

Abstract

Mobile devices, such as smartphones and tablets, are increasingly used for watching streaming videos. Today, more than 50% of the data consumed by mobile devices is video streaming traffic. However, a significant drawback of mobile video streaming is the constraint imposed by limited on-device batteries. Watching streaming videos is particularly power-intensive because it involves continuous delivery of a large amount of data.

In this talk, I will present our research for minimizing battery power consumption during mobile video streaming. We ran a series of experiments measuring the effectiveness of 802.11 PSM in various Internet streaming services. These experiments revealed that unique characteristics of P2P traffic often prevent the wireless interface from switching into power saving mode. To overcome these challenges, we built BlueStreaming, a system that can intelligently leverage Bluetooth to transmit P2P control traffic. Another factor that affects mobile device power consumption is the total amount of data received over the wireless interface. In experiments measuring traffic to iOS devices, we discovered that iPhone users receive a significant amount of redundant traffic when accessing streaming services such as YouTube. This redundant traffic not only leads to more battery power consumption but also can incur data-plan fees. We designed and implemented a system called CStreamer that minimizes the redundant traffic by circumventing inefficiencies in HTTP-based streaming.

Biography



Songqing Chen is an Associate Professor in the Department of Computer Science at George Mason University. He is interested in various aspects of distributed systems. Recently, he has been working on Internet content delivery systems, system security, Internet measurement and modeling, and high performance computing. He is a recipient of the NSF CAREER Award and the AFOSR YIP Award. More information about his work can be found at: <https://www.cs.gmu.edu/~sqchen>