Seminar – Wednesday, October 14, in 132 Fluor Daniel Bldg. 3:45 p.m. – 4:45 p.m.

Holcombe Department of Electrical and Computer Engineering Seminar Series

Locality aware P2P delivery: the way to scale Internet Video

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Abstract

IPTV is one of the fast growing services. We survey the operation and the infrastructure that supports the IPTV: the data center, the Internet, and the end user, and discuss issues that affect the global scalability of IPTV. We show that the client-server model cannot support large scale IPTV delivery, and the peer assisted IPTV service without locality awareness will quickly overrun the Internet backbone when the number of subscribers increases. Peer-assisted delivery with locality is the only way to scale IPTV to the world.

We proceed to quantify the benefit of peer-assisted IPTV. Using a nine-month trace from a client-server IPTV deployment for MSN Video, we show that peer-assistance IPTV can dramatically reduce server bandwidth costs, particularly if peers prefetch content when there is spare upload capacity in the system. We further consider the impact of peer-assisted VoD on the cross-traffic among ISPs, and discuss locality aware P2P delivery framework that can improve the QoS of peer-assisted IPTV service and reduce traffic load for ISP.

Biography of Speaker

Dr. Jin Li is currently a Principal Researcher managing the Communication System team at Microsoft Research, (Redmond, WA). He received his Ph.D. in electrical engineering from Tsinghua University (Beijing, China) in 1994. From 1994 to 1996, he served as a Research Associate at the University of Southern California (USC). From 1996 to 1999, he was a Member of the Technical Staff at the Sharp Laboratories of America (SLA), (Camas, WA), and represented the interests of SLA in the JPEG2000 and MPEG4 standardization efforts. He was a Project Leader at Microsoft Research Asia (Beijing, China) from 1999 to 2000. From 2000, Dr. Li has also served as an Adjunct Professor in the Electrical Engineering Department, Tsinghua University (Beijing, China).

Dr. Li has 90+ referred conference and journal papers in a diversified research field, with interests covering audio/image/video compression, virtual environment and graphic compression, audio/video streaming, and real-time audio/video conferencing. His recent interest is in peer-to-peer applications. Dr. Li has personally built a number of P2P applications, such as P2P web hosting, P2P streaming and P2P distributed storage system. He was the driving force behind Microsoft's strategy and application development in the peer-to-peer area. He is the lead guest editor of the special section on "Peer-to-Peer Video Streaming" for IEEE Trans. on Multimedia and the guest editor of the special issue of "Advances in Peer-to-Peer Streaming Systems" for IEEE Journal on Selected Areas in Communication. He has organized a special session on "Peer-to-Peer Media Communication" for MMSP 2005, and has co-organized the workshop of "Advances in Peer-to-Peer Multimedia Streaming" in ACM Multimedia 2005, and the workshop of "Recent Advances in Peer-to-Peer Streaming" in QShine 2006. He will be the general chair for 17th International Packet Video workshop 2009, to be held in Seattle, WA. He holds 20 issued US patents, with many more pending. Dr. Li is an Area Editor for the Journal of Visual Communication and Image Representation (Academic Press) and an associate editor of P2P networking and applications. He was an associate editor of IEEE Transactions on Multimedia. He is a senior member of IEEE. He was the recipient of the 1994 Ph.D. thesis award from Tsinghua University and the 1998 Young Investigator Award from SPIE Visual Communication and Image Processing.