

Curriculum Vitae

Dan Li

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Research Interest

Internet architecture and protocols, peer-to-peer networking, data center networking and on-line social networking

Education

- Tsinghua University, Beijing, China (Sep 2005 - Dec 2007)
Degree: Ph.D
Advisor: Prof. Jianping Wu
Thesis: "Study on User Cooperation in P2P Network"
- Tsinghua University, Beijing, China (Sep 2003 - Jun 2005)
Degree: M.E
Advisor: Prof. Jianping Wu
Thesis: "Implementation and Performance Analysis of IPv6 Multicast Routing Protocol PIM-SM"
- Beijing Normal University, Beijing, China (Sep 1999 - Jun 2003)
Degree: B.S
GPA: 92.5/100 (Ranking 1st / 105)

Working Experience

- Associate researcher (Jan 2008 - Now)
Wireless & Networking Group, Microsoft Research Asia
- Visiting student (Oct 2004 - Jan 2005)
IBM China Research Laboratory
Topic: "Traffic Management in IPv4/IPv6 Co-existing Networks"
- Teaching assistant (Sep 2004 - Jan 2005, Sep 2005 - Jan 2006, Sep 2006 - Jan 2007, Mar 2007 - Jul 2007)
Department of Computer Science, Tsinghua University
Course: Principles of Computer Networks

Selected Publications

• Conferences

- [1] Chuanxiong Guo, Guohan Lu, **Dan Li**, Haitao Wu, Xuan Zhang, Yunfeng Shi, Chen Tian, Yongguang Zhang and Songwu Lu, "BCube: A High Performance, Server-centric Network Architecture for Modular Data Centers", to appear in *ACM SIGCOMM'09*, Barcelona, Spain.
- [2] **Dan Li**, Chuanxiong Guo, Haitao Wu, Kun Tan, Yongguang Zhang, Songwu Lu, "FiConn: Using Backup Port for Server Interconnection in Data Centers", *IEEE INFOCOM'09*, Rio de Janeiro, Brazil.
- [3] **Dan Li**, Jianping Wu, Yong Cui, Jiangchuan Liu, "QoS-aware Streaming in Overlay Multicast Considering Selfishness in Construction Action", *IEEE INFOCOM'07*, Anchorage, Alaska.
- [4] **Dan Li**, Jianping Wu, Yong Cui, "Truthful Streaming in Selfish DONet", *IEEE ICC'07*, Glasgow, Scotland.
- [5] **Dan Li**, Yong Cui, Ke Xu, Jianping Wu, "Segment-sending Schedule in Data-driven Overlay Network", *IEEE ICC'06*, Istanbul, Turkey.
- [6] **Dan Li**, Yong Cui, Ke Xu, Jianping Wu, "Impact of Receiver Cheating on the Stability of ALM Tree", *IEEE GLOBECOM'05*, St.Louis, Missouri.

• Journals

- [1] **Dan Li**, Jianping Wu, Yong Cui, “Defending against Buffer Map Cheating in DONet-like P2P Streaming”, to appear in *IEEE Transactions on Multimedia*.
- [2] Jianping Wu, **Dan Li**, Yong Cui, “Stability of ALM Tree under Selfish Receivers: A Simulation Study”. *Elsevier Computer Communications*, 2006, 29:2895-2903.
- [3] Zhou Hui, **Li Dan**, Wang Yongji, “Fundamental Problems with Available Bandwidth Measurement Systems”. *Journal of Software*, 2008, 19(5): 1234-1255. (In Chinese.)
- [4] **Li Dan**, Wu Jianping, Cui Yong, “Study on Selfishness in Application Layer Multicast”. *Journal of Software*, 2007, 18(3): 625-635. (In Chinese.)
- [5] **Li Dan**, Wu Jianping, Cui Yong, Xu Ke, Liu Ying, “Modeling and Improvement of PIM-SM Protocol”. *Journal of Software*, 2006, 17(2):285-294. (In Chinese.)
- [6] **Li Dan**, Wu Jianping, Cui Yong, Xu Ke, “Instability Problem of ALM Tree with Stable Members”. *Acta Electronica Sinica*, 2005, 33(11):2000-2005. (In Chinese.)
- [7] **Li Dan**, Wu Jianping, Cui Yong, Xu Ke, “Research on the Structures and Resolutions of Internet Namespaces”. *Journal of Software*, 2005, 16(8):1445-1455. (In Chinese.)

• Book Chapters

- [1] Yong Cui, **Dan Li**, Jianping Wu, “Impact of Buffer Map Cheating on the Streaming Quality of DONet”. *Springer LNCS* 4490, 817-824, 2007.
- [2] **Dan Li**, Jianping Wu, Yong Cui, Jiangechuan Liu, Ke Xu, “Trustworthy Distributed Algorithm Design to Defend Distance Cheating in Link-weighted ALM”. *Springer LNCS* 4263, 844-853, 2006.
- [3] **Dan Li**, Yong Cui, Ke Xu, Jianping Wu, “Improvement of Multicast Routing Protocol Using Petri Nets”. *Springer LNAI* 3642, 634-643, 2005.

Patents

- “A Server-centric, High Performance Network Architecture for Modular Data Centers”. US Patent, filed.
- “Scalable Interconnection of Data Center Servers Using Two Ports”. US Patent, filed.
- “Geolocation Mapping of Network Devices”. US Patent, filed.
- “Traffic Management Method in IPv4/IPv6 Co-existing Networks”. US Patent, filed.

Talks

- “FiConn: Using Backup Port for Server Interconnection in Data Centers”, presented at *INFOCOM’09*, Rio De Janeiro, Brazil, Apr 2009.
- “Mining the Web and the Internet for Accurate IP Address Geolocations”, presented at *INFOCOM’09*, Rio De Janeiro, Brazil, Apr 2009.
- “Segment-sending Schedule in Data-driven Overlay Networks”, presented at *ICC’06*, Istanbul, Turkey, Jun 2006.
- “Impact of Receiver Cheating on the Stability of ALM Trees”, presented at *GLOBECOM’05*, St.Louis, Missouri, USA, Nov 2005.

Professional Activities

- TPC Member
IEEE INFOCOM’10
- Reviewer/Referee
TON, TMM, TPDS, Computer Networks, Computer Communications, Infocom, Globecom, ICC

Projects Participated

- Data center topology design (Jun 2008 - now)

Because of the bandwidth bottleneck and single-failure-point problem of tree structure in current practice of data centers, scalable and fault-tolerant networking topologies are required to interconnect the servers.

We proposed FiConn, a topology that uses only two ports on most existing servers for interconnection. We also designed BCube, another topology specifically for shipping-container data centers.

- IP-Geolocation mapping for moderately-connected Internet regions (Jan 2008 - May 2008)

Current dynamic IP-Geolocation mapping schemes depend on strong delay- distance correlation, but we find it does not hold for moderately-connected Internet regions such as China.

For moderately-connected Internet regions, we brought forward a novel IP-Geolocation mapping scheme based on a “shortest-closest” rule.

- User selfishness in P2P networks (Dec 2005 - Dec 2007)

As selfish agents that have their own interests, P2P users may try to optimize their own utilities instead of the whole P2P network, which obeys the assumptions of most P2P protocols.

We studied the impact of user selfishness in both information collection stage and construction action stage of P2P protocols, and proposed corresponding defensive solutions.

- Dynamic non-explicit tunnel based 4over6 mesh protocol (Jul 2005 - Jun 2006)

With the rapid growth of Internet users and applications, IPv6 will replace IPv4 to provide enough IP address space. However, the transition cannot be completed in short term and IPv4 and IPv6 networks will co-exist for long time.

We put forward a scheme for the communication of IPv4 networks over the IPv6 backbone. It uses non-explicit tunnel. The system was implemented deployed in CERNET2, the world’s largest pure IPv6 network.

- Performance analysis and improvement of PIM-SM protocol (Jul 2004 - Jun 2005)

IP Multicast is an efficient one-to-many communication tool since it aggregates multiple copies of traffic traversing the same link into a single one. PIM-SM is an Intra-domain IP multicast routing protocol.

We analyzed the performance bottleneck of PIM-SM via Petri net, and made some improvement on the protocol to reduce the controlling overhead.

- Protocol stack of high-performance IPv6 router (Feb 2003 - Jun 2004)

High-performance IPv6 router is core for IPv6 backbone networks. It runs IPv6 routing protocols such as RIPNG, OSPF3, BGP4+ and PIM-SM, network management protocols such as SNMP, as well as high-speed packet forwarding engines.

I was responsible for the design and implementation of IPv6 multicast routing protocol PIM-SM, multicast membership management protocol MLD, as well as the multicast packet forwarding engine.

Honors Awarded

- Postgraduate

- Tsinghua Friendship - Nortel Outstanding Students Scholarship, 2006
- First Prize, Guanghua Scholarship, 2005
- Third Prize, Excellent Students of Tsinghua University, 2004

- Undergraduate

- Excellent Graduate Students of Beijing, 2003
- Excellent Thesis Paper of Beijing Normal University, 2003
- Baogang Outstanding Students Scholarship, 2002

- Excellent Students of Beijing, 2002
- Best Ten Students of Beijing Normal University, 2001
- High School
 - First Prize of Sichuan Province, Olympic Competition of Physics, 1998
 - First Prize of Sichuan Province, Olympic Competition of Chemistry, 1998
 - Third Prize of Sichuan Province, Olympic Competition of Mathematics, 1998

Hobbies

- Soccer
- Chinese history

References

- Dr. Jianping Wu
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- Dr. Yongguang Zhang
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