

Anshul Kantawala

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EDUCATION

- Ph.D.** in Computer Science December 2004
(expected)
Washington University in St. Louis
Dissertation: "Improving the Performance of Internet Data Transport"
Advisor: Dr. Jonathan S. Turner
- M.S.** in Computer and Information Science May 1995
University of Pennsylvania, Philadelphia
- B.S.** in Computer Science May 1991
B.S. in Electrical Engineering
Washington University in St. Louis

RESEARCH INTEREST

Wireless and mobile networking, high-speed networking, congestion control, network management

My current research focus has been on developing and evaluating router buffer management algorithms for improving the performance of data traffic in the Internet. My expertise also covers network design and simulation, protocols for wired and wireless networks, traffic engineering and network management.

RESEARCH EXPERIENCE

Research Assistant, Dept. of CSE, Washington University September 1998 – to date

- **Buffer Management for TCP/IP Flows**
Designed, evaluated and implemented buffer management algorithms for TCP/IP flows which significantly outperform RED and Blue and minimize queueing latency. The algorithms are implemented in the Multi-Services Router (MSR) at Washington University. Also designed and evaluated new intelligent packet discard algorithms that discard packets on *arrival*, but are able to achieve performance close to the earlier policies.
- **Traffic Balancing in High-Performance Routers**
Developed and evaluated a flow distribution algorithm using a Bloom filter architecture with dynamic rebalancing. The results show that this algorithm significantly reduces the memory requirement compared to maintaining per-flow state and can achieve near optimal flow distribution.
- **Architecture for Supporting Differentiated Services in the Internet**
Developed a new framework for supporting differentiated services over the Internet. This framework supports three classes of services: real-time, statistical bandwidth and best-effort. The admission control policy for the real-time and statistical flows allows fixed delay bound guarantees to be given to QoS applications.
- **Network Management, Visualization and Control**
Developed a new API for connection management and network monitoring in ATM switches. Built a monitoring and control client application using this API for the WUGS-120 ATM switch.

Research Associate, ARL, Washington University March 1995 – August 1998

- **Distributed interactive simulations**
Developed and implemented an algorithm for supporting distributed interactive simulations over an ATM testbed. The algorithm uses ATM connection caching to significantly reduce network traffic.
- Worked on projects involving ATM signaling and network driver development under NetBSD

Research Assistant, Dept. of CIS, University of Pennsylvania September 1991 – February 1995

- Developed architecture for supporting mobile hosts on ATM networks using anticipated handoffs
- Designed and analyzed a mobile handoff protocol for real-time traffic streams
- Designed and evaluated an algorithm for call admission in a CDMA wireless network
- Designed and implemented an algorithm for foot placement on an arbitrary terrain along a given directed path

Research Assistant, ARL, Washington University July 1990 – May 1991

- Built a simulation model for the AXON Gigabit Host-Network interface

OTHER EXPERIENCE

Conference Organization, ACM SIGCOMM '99

- Developed and maintained a web interface for SIGCOMM '99 paper submission and review processes
- Helped organize SIGCOMM Program Committee meeting

Teaching, University of Pennsylvania August 1992 – May 1993

- Taught an introductory course in C programming in Spring 1993
- Was a teaching assistant for an undergraduate hardware design course in Fall 1992

Reviewing

- Reviewed papers for ACM SIGCOMM, IEEE INFOCOM and IEEE GLOBECOM conferences

PUBLICATIONS AND TALKS

Refereed Publications

- Anshul Kantawala and Jonathan Turner. "Intelligent Packet Discard Policies for Improved TCP Queue Management", *CCN 2004 Proceedings*, November 2004.
- Anshul Kantawala and Jonathan Turner. "Queue Management for Short-Lived TCP Flows in Backbone Routers", *High-Speed Networking Symposium, IEEE GLOBECOM '02*, November 2002.
- Anshul Kantawala and Jonathan Turner. "Efficient Queue Management for TCP Flows", *SPECTS 2002 Proceedings*, July 2002.
- Sumi Choi, John Dehart, Anshul Kantawala, Ralph Keller, Fred Kuhns, John Lockwood, Prashanth Pappu, Jyoti Parwatikar, W. David Richard, Ed Spitznagel, David Taylor, Jonathan Turner and Ken Wong. "Design of a High Performance Dynamically Extensible Router". *In DARPA Active Networks Conference and Exposition (DANCE)*, May 2002.
- Anshul Kantawala, Samphel Norden, Ken Wong and Guru M. Parulkar. "DiSp: An Architecture for supporting Differentiated Services in the Internet", *INET'99 Proceedings*, June 1999.

- Guru M. Parulkar, Douglas Schmidt, Eileen Kramer, Jonathan Turner and Anshul Kantawala. “An Architecture for Monitoring, Visualization and Control of Gigabit Networks”, *IEEE Network*, October 1997.
- Anshul Kantawala, Guru M. Parulkar, John DeHart and Ted Marz. “Supporting DIS Applications using ATM Multipoint Connection Caching”, *IEEE INFOCOM '97*, April 1997.
- James P.G. Sterbenz, Anshul Kantawala, Milind Buddhikot and Guru M. Parulkar. “Hardware Based Error and Flow Control in the AXON Gigabit Host-Network Interface”, *IEEE INFOCOM '92*, May 1992.

Selected Technical Reports

- Anshul Kantawala and Jonathan Turner. “Achieving per-flow Queueing Performance without a per-flow Queue”, WUCSE-2004-44, Washington University in St. Louis. Submitted to *IEEE INFOCOM '05*.
- Sergey Gorinsky, Anshul Kantawala and Jonathan Turner. “Selecting the Buffer Size for an IP Network Link”, WUCSE-2004-50, Washington University in St. Louis.

Selected Talks

- IEEE GLOBECOM, “Queue Management for Short-Lived TCP Flows in Backbone Routers”, November 2002.
- SPECTS, “Efficient Queue Management for TCP Flows”, July 2002.
- INET, “DiSp: An Architecture for supporting Differentiated Services in the Internet”, June 1999.
- IEEE INFOCOM, “Supporting DIS Applications using ATM Multipoint Connection Caching”, April 1997.

SKILLS

Languages: C, C++, Java, Pascal, Lisp, Prolog, SML, FORTRAN, SQL, CGI, 68000 assembly

Operating Systems: NetBSD, Solaris, Linux, Windows, Mac OS

Simulation Tools: ns-2, BONEs

REFERENCES

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