

Brent E. Stephens

CONTACT INFORMATION	<i>E-mail:</i> brent@cs.utah.edu <i>Web:</i> https://www.cs.utah.edu/~brent/
RESEARCH INTERESTS	Data Center Networking, In-Network Computing, Operating Systems, Distributed Systems, RDMA, Flow Control, Transport Protocols, Virtualization, Computer Architecture
EDUCATION	Rice University , Houston, Texas USA <i>George R. Brown School of Engineering</i> Ph.D., Computer Science, Dec 2015 • Thesis Topic: “Handling Congestion and Routing Failures in Data Center Networking” • Advisors: Alan L. Cox and Scott Rixner M.S., Computer Science, May 2012 • Thesis Topic: “Designing Scalable Networks for Future Large Datacenters” • Advisors: Alan L. Cox and Scott Rixner B.S., Electrical Engineering, May 2009 • GPA in Major: 3.94/4.00
GRANTS, HONORS, AND AWARDS	NSF Award #2008273: “CNS Core: Small: Network-wide Policy Enforcement in Programmable Networks using Logical Queues.” Investigators: B. Stephens (PI), B. Vamanan. Amount: \$250,000 out of \$499,999 total over 3 years. Date: August, 2020. https://www.nsf.gov/awardsearch/showAward?AWD_ID=2008273 NSF Award #1942686: “CAREER: NIC-Accelerated Active Messaging as a Generic Replacement for RDMA.” Investigators: B. Stephens (PI). Amount: \$500,000 over 5 years. Date: February, 2020. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1942686 NSF Award #1850053: “CRII: NeTS: Rethinking Flow Control for Cloud Data Center Networks.” Investigators: B. Stephens (PI). Amount: \$175,000 over 2 years. Date: May 2019. https://www.nsf.gov/awardsearch/showAward?AWD_ID=1850053 Google Faculty Research Award, 2018. Investigators: B. Stephens (PI). Amount: \$75,000 total. IBM Ph.D. Fellowship, 2012 - 2014 Texas Instruments Fellowship, August 2009 - August 2015 Rice University: Graduated Magna Cum Laude, May 2009
PROFESSIONAL EXPERIENCE	University of Utah , Salt Lake City, Utah USA <i>Research Assistant Professor</i> August 2021 - present University of Illinois at Chicago , Chicago, Illinois USA <i>Assistant Professor</i> August 2018 - August 2021 University of Wisconsin, Madison , Madison, Wisconsin USA <i>Post-doctoral Research Associate</i> September 2015 - July 2018 Researched novel abstractions for Operating Systems and NICs to schedule network traffic. Rice University , Houston, Texas USA <i>Research Assistant</i> August 2009 - August 2015 Designed scalable Ethernet replacements and deadlock-free and fault-tolerant routing algorithms. <i>Graduate Teaching Assistant</i> August 2009 - May 2012 Given the distinction: “With approval of Dean of Engineering.” <i>Undergraduate Teaching Assistant</i> August 2006 - May 2007 Led weekly recitation sections for two different introductory computer science courses. IBM Research , Austin, TX USA <i>Research Intern</i> May 2011 – September 2011, July 2012 – September 2012, July 2013 – October 2013 • Contact: John Carter - retrac@us.ibm.com; (512) 286-5584

Intel Corporation, Hillsboro, Oregon USA
Software Development Intern

May 2008 - August 2008

ViaSat Inc., Carlsbad, California USA
Hardware Development Intern

May 2007 - August 2007

PROFESSIONAL
ACTIVITIES

NSF Review Panelist: 1 panel in 2021, 1 panel in 2019, 1 panel in 2016, and 1 panel in 2015.

Conference Program Committee Member: USENIX NSDI 2022, ACM SIGCOMM 2021, ACM CoNEXT 2021, ACM SOSR 2021, ACM/IEEE ANCS 2021, ACM SOSR 2020, ACM/IEEE ANCS 2019, USENIX ATC 2018, ACM APNet 2018.

Professional Organization Memberships: USENIX (2016 - Present), ACM (2016 - Present).

SELECTED
PUBLICATIONS

A. Sanaee, F. Shahinfar, B. E. Stephens, G. Antichi, “Backdraft: a Lossless Virtual Switch that Prevents the Slow Receiver Problem”, in *NSDI 2022*.

Y. Zhang, Y. Tan, B. E. Stephens, M. Chowdhury, “Software Multi-Tenancy in Hardware Kernel-Bypass Networks”, in *NSDI 2022*.

B. E. Stephens, D. Grassi, H. Almasi, B. Vamanan, A. Akella, “TCP is Harmful to In-Network Computing: Designing a Message-Oriented Transport Protocol (MTP)”, in *HotNets 2021*.

V. S. Thapeta, K. Shinde, M. Malekpourshahraki, D. Grassi, B. Vamanan, B. E. Stephens. “Nimble: Scalable TCP-Friendly Programmable In-Network Rate-Limiting”, in *SOSR 2021*.

J. Lin, K. Patel, B. E. Stephens, A. Sivaraman, A. Akella, “PANIC: A Programmable High-Performance NIC for Multi-tenant Networks”, in *OSDI 2020*.

Y. Le, M. Malekpourshahraki, B. Stephens, A. Akella, and M. Swift, “On the Impact of Cluster Configuration on RoCE Application Design”, in *APNet 2019. Best Paper Award*

M. Malekpourshahraki, B. Stephens, B. Vamanan, “Ether: Providing both Interactive Service and Fairness in Multi-Tenant Datacenters”, in *APNet 2019*.

B. Stephens, A. Akella, M. Swift. “Loom: Flexible and Efficient NIC Packet Scheduling.” *NSDI 2019*.

B. Stephens, A. Akella, M. Swift. “Your Programmable NIC Should be a Programmable Switch.” *HotNets 2018*.

Y. Le, B. Stephens, A. Singhvi, A. Akella, M. Swift. “RoGUE: RDMA over Generic Unconverged Ethernet.” *SoCC 2018*.

K. He, W. Qin, Q. Zhang, W. Wu, J. Yang, T. Pan, C. Hu, J. Zhang, B. Stephens, A. Akella, and Y. Zhang. “Low Latency Software Rate Limiters for Cloud Networks.” *APNet 2017*.

B. Stephens, A. Singhvi, A. Akella, and M. Swift. “Titan: Fair Packet Scheduling for Commodity Multiqueue NICs.” *USENIX ATC 2017*.

B. Stephens and A.L. Cox. “Deadlock-Free Local Fast Failover for Arbitrary Data Center Networks.” *INFOCOM 2016*.

B. Stephens, A.L. Cox, and S. Rixner. “Scalable Multi-Failure Fast Failover via Forwarding Table Compression.” *SOSR 2016*.

J. Rasley, B. Stephens, C. Dixon, E. Rozner, W. Felter, K. Agarwal, J. Carter, R. Fonseca. “Planck: Millisecond-scale Monitoring and Control for Commodity Networks.” *SIGCOMM 2014*.

B. Stephens, A.L. Cox, A. Singla, J. Carter, C. Dixon, W. Felter. “Practical DCB for Improved Data Center Networks.” *INFOCOM 2014*.

B. Stephens A.L. Cox, S. Rixner. “Plinko: Building Provably Resilient Forwarding Tables.” *HotNets 2013*.

B. Stephens, A.L. Cox, W. Felter, C. Dixon, J. Carter. “PAST: Scalable Ethernet for Data Centers.” *CoNEXT 2012*.

See Google Scholar for a complete publication list:

<https://scholar.google.com/citations?user=REpY8JMAAAAJ>