

## Eric R. Keller

<https://eric-keller.github.io/>

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### RESEARCH INTEREST

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I design and build secure and reliable networked systems using a cross-layer approach that draws from networking, operating systems, distributed systems, and computer architecture. My research has been enabling and capitalizing on a more dynamic and programmable computing and network infrastructure, via such technologies as virtualization and software-defined networking (among many), and targeting infrastructures such as cloud based services and artificial intelligence / machine learning.

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### EDUCATION

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**Ph. D., Princeton University**, Electrical Engineering, 2011

Award: Intel PhD Fellowship (2010-2011)  
Advisor: Jennifer Rexford  
Dissertation: Refactoring Router Software to Minimize Disruption

**M.S., University of Massachusetts-Amherst**, Electrical and Computer Engineering, 2005

Advisor: Russell Tessier  
Thesis: Programming Model for Network Processing on an FPGA

**B.S., Virginia Tech**, Computer Engineering, 1999

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### Work History

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**Navera, Inc., Founder and CTO (2025-present)**

Focused on solving the AI Infrastructure challenges that we, as founders, saw in interactions with hundreds of companies, resulting in the ability to build Cloud-Native AI & Data Pipelines in Minutes.

**University of Colorado, Professor ('12-'19 Assistant, '19-'25 Associate, '25-pres Full)**

**Associate Chair of the Professional and Online Masters Programs (2024-pres)**

Graduated 11 PhD students and currently advising 5 PhD students. While at CU, published at top tier networking, systems, and security conferences, such as NSDI, USENIX ATC, NDSS, Eurosys (best student paper), ACSAC, ANCS, ICDCS (distinguished paper), and SoCC.

**Stateless, Inc., Founder and CTO (2016-2025)**

Formed out of research at Univ. of Colorado. Raised \$20M+ from investors, and received NSF SBIR Phase I (\$225k), Phase II (\$750k), and supplement (\$690k) grants. Reached several million ARR, but market conditions resulted in the decision to dissolve the company.

**University of Pennsylvania, Post-doctoral researcher (2011-2012)**

With Jonathan Smith.

**Xilinx, Inc, Software Engineer (1999-2006)**

Worked on advanced product development, where my team would propose new products, create prototypes, and build initial use cases. Highlights: Part of team pioneering run time reconfiguration tools, and Domain Specific Tool for Networking on FPGAs – both led to productization.

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## Awards

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**Distinguished Paper ICDCS 2024**  
**CRA Future Leader (2024)**  
**Best Paper IEEE SDN-NFV (2021)**  
**Best Student Paper Eurosys (2018)**  
**NSF CAREER (2017)**  
**Best Paper ACM SDN-NFV Security (2016)**

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## Advising

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### Current (as Advisor):

Bashayer Alharbi – PhD CS, expected 2027  
Shirin Ebadi – PhD ECEE, expected 2028  
Sara Daneshvar (co-advise with Shiv Mishra) – PhD CS, expected 2029  
Victor Jiminez (co-advise with Tamara Lehman) – PhD CS, expected 2030  
Richard Thompson – PhD CS, expected 2030

### Past (as Thesis Advisor):

#### PhD

Erika Hunhoff – PhD (2025) CS, First Job: AMD  
Maziyar Nazari – PhD (2025) CS, First Job: Meta  
Karl Olson – PhD (2024) CS, First Job: Instructor, United States Military Academy  
Sepideh Goodarzy (co-advise with Rick Han) – PhD (2022) CS, First Job: Google  
Greg Cusack – PhD (2022) ECEE, First Job: Solana.  
Marcelo Abbranches – PhD (2022) ECEE, First Job: CGU (Brazil)  
Mohammad Hashemi – PhD (2021) CS, First Job: Data Scientist at Illumina  
Azzam Alsaudis – PhD (2020) CS, First Job: Professor at King Saud Univ.  
Oliver Michel – PhD (2019), CS, First Job: Post-doc at Univ. of Vienna  
Aimee Coughlin – PhD (2018), ECEE. First Job: Security Engineer at Facebook  
Murad Kablan, PhD (2017), CS, First Job: CEO and co-founder Stateless

#### MS

Edgar Gonzalez Quevedo, MS (2017) (visiting from UPC), First Job: Security Evaluator at Applus  
Anurag Dubey, MS (2017) ECEE, First Job: Software engineer at Xilinx  
Ali Ismail – M.S., (5/2015), ECEE, First Job: Embedded System Engineer at Synchroness  
Ryan Hand – M.S.(4/2014), CS, First Job: Faculty at United States Military Academy  
Matthew Monaco –M.S.(4/2014), CS, First Job: Google

#### BS

Victor Santiago – B.S., UPC (Europe-Colorado Mobility Program) Sept-Feb 2026  
Victor Jiminez (with Tamara Lehman) – B.S., UPC (Europe-Colorado Mobility Program) Jan-July 2025  
Albert Vilardell Barnosell (with Tamara Lehman) – B.S., UPC (Europe-Colorado Mobility Program) Jan-July 2022

### Non-thesis

(active members of my research group, through independent studies, discovery learning apprenticeships, or other)

**MS (non-thesis):** , , Kelly Kaoudis (2015), Bharat Nallan (2017), Prerit Oberai (2019), Swaminathan Sriram (2022), Evan Braun (2022), George Nsude (2022). Varsha Natarajan (2022), Gaurav Roy (2022), Chethan Kavaraganahalli Prasanna (2022), Akshay Abhyankar (2022), Sreeram Ganesan (2022-23), Sachin Sharma (2022-23), Rajeev Menon (2022), Akshay Abhayankar (2023), Chethan Prasanna (2023), Varsha Natarajan (2023), Gaurav Roy (2023), Venkatesh VLNP (2023), Dwight Browne (2023), Tarun Annapareddy (Fa23,Sp24), Rohan Eswara (Fa23,Sp24), Naveena Ganesan (Sp24, Sp25), Pawan Subramanian (Fa23,Sp24), Abijith Ramachandran (Sp24,Fa24), Kushal Nagarajan (Fa24, Sp25), Arnib Farooqui (Sp24,Fa24), Sailesh Dwivedy (Fa24, Sp25), Aditya Thaker (Fa24, Sp25), Tilak Singh (Fa24, Sp25), Samhitha Sannidhi (Sp25), Deeptanshu Sankhwar (Sp25, Fa25), Manan Doshi (Sp25),

[Updated: Dec 2025]

Pavan Appana (Sp25, Fa25), Aayush Gupta (Sp25), Nishchal Shetty (Sp25, Fa25), Disha Gundecha (Fa25), Sohan Kshirsagar (Fa25)

### **BS (non-thesis):**

Alex Tsankov (DLA AY 2014-15), Sean Lambert (DLA AY 2015-16), Ji-hoon Kim (DLA AY 2015-16), Yiming Wang (DLA AY 2016-17), Jeffery Lim (DLA AY 2016-17), Pranav Subramanian (DLA AY 2021-22), Strydr Silverberg (SPUR 2024) (community college), Aryan Choudhary (SPUR 2024) (community college), Justin Costa (SPUR 2024), Kira Cenderelli (SPUR 2024), Grayson Hubbell (SPUR 2024)  
CS Senior Project Team in 2013-14 AY: Brian McWilliams, Scott Pledger, Alexandro Simion, Matthew Peck.  
ITP Capstone Team in 2013-14 AY: Srinivas Lakshminarayan, Shankar Shivram, Siddharth Bali, Rohith Vardha

### **On Committee:**

**PhD Acting Chair:** Rahil Gandotra, ITP 2020. Dewang Gadia, ITP, 2020.

**PhD Committee:** Bryan Dixon (12/2012), Andy Sayler (4/2016), Ehab Ababneh (2017), Ning Gao (2018), Blake Caldwell (2018), Eric Goodman (2019), Kashyap Thimmaraju (2019 – TU Berlin), Sergey Frolov (2020), Ian Martiny (2022), Jason Schnitzer (2022), Jack Wampler (2023), Zaid Al-Ali (2023), Sandesh Sathyanarayana (2023), Ali Tariq (2024), Taeho Kim (2024).

**MS Committee:** Matthew Phillips (7/2015), Andy Sayler (12/2013), Amit Gupta (4/2013), Dylan Fox (2021)

**Prelim:** as Chair: Aimee Coughlin (Apr 2014), Murad Kablan (Dec 2014), Oliver Michel (Dec 2016), Azzam Alsudais (April 2018), Mohammad Hashemi (April 2018), Greg Cusack (2020), Marcelo Abranches (2020), Karl Olson (2021), Maziyar Nazari (2021), Dwight Browne (2021), committee: Andy Sayler (Apr 2014), Ehab Ababneh (Oct 2014), Ning Gao (Nov, 2014), Blake Caldwell (May 2015), Zaid Al-Ali (April 2018), Jack Wampler (2021), Ali Tariq (2021).

**Senior Thesis Committee:** Peter Klipfel (CS) (2014), Alexey Yermakov (CS) (2023)

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## **Funding**

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Title: CNS Core: Small: Transparent Network Acceleration

Source of Support: National Science Foundation

Award: \$604,728.00 (total)

\$302,364 (Keller share)

Role: PI (w/ Tamara Lehman: Univ. of Colorado)

Period Covered: 5/2023 - 4/2026

Title: NSF Convergence Accelerator Track G: 5G Hidden Operations through Securing Traffic (GHOST) Phase 2

Source of Support: National Science Foundation

Award: \$4,983,234.00 (total)

\$ 196,573 (Keller share)

(multi-institutional -- sub-contract to Federated Wireless – Salvador D'Itri as PI there)

Role: co-PI (w/ Keith Gremban, Alexandra Siegel, Tamara Lehman, Salvador D'Itri)

Period Covered: 9/2023 – 8/2025

Title: Title: NSF Convergence: 5G Hidden Operations through Securing Traffic (GHOST)

Source of Support: National Science Foundation

Award: \$749,186 (total)

\$90,000 (Keller share)

(multi-institutional - sub-contract to Federated Wireless – Salvador D'Itri as PI there)

Role: co-PI (w/ Keith Gremban, Alexandra Siegel, Tamara Lehman, Salvador D'Itri)

Period Covered: 8/2022 – 7/2024

Title: "CAREER: Stateless Network Functions: Building a Better Network Through Disaggregation"

Source of Support: National Science Foundation

Award Amount: \$627,999 (total, and Keller share)

[Updated: Dec 2025]

Role: sole PI

Period Covered: 7/2017 – 6/2023

Title: “SDI-CSCS: Collaborative Research: S2OS: Enabling Infrastructure-Wide Programmable Security with SDI”

Source of Support: National Science Foundation and VMWare

Award Amount: \$3M (total award)

\$599,489 (Keller share)

(multi-institutional w/ Guofei Gu: Texas A&M, Hongxin Hu: Univ. of Buffalo, Zhiqiang Lin: Ohio St, Don

Porter: University of North Carolina)

Role: co-PI

Period Covered: 9/2017 – 8/2021

Title: “I-Corps: Elastic Network Infrastructure”

Source of Support: National Science Foundation

Award Amount: \$50,000 (total, and Keller share)

Role: sole PI

Period Covered: 12/1/16 – 5/31/18

Title: “TWC: Medium: Collaborative: Active Security”

Source of Support: National Science Foundation

Award Amount: \$1.2M (total)

\$ 746,537. (Keller share)

(multi-institutional w/ Jonathan Smith: Univ. of Pennsylvania, Adam Aviv: US Naval Academy)

Role: PI

Period Covered: 09/01/14-08/31/18

Title: “XPS: SDA: Elasticizing the Linux Operating System for the Cloud”

Source of Support: National Science Foundation (NSF)

Award Amount: \$749,992. (total award)

\$374,996 (Keller share)

Role: co-PI (w/ Richard Han: Univ. of Colorado)

Period Covered: 09/01/13-08/31/17 (extended to 8/2019)

Title: “NeTS: Small: Liquid Networking”

Source of Support: National Science Foundation (NSF)

Award Amount: \$500,000. (total, and Keller share)

Role: sole PI

Period Covered: 10/01/13-9/30/16 (extended to 9/2017)

Title: gift from Xilinx

Source of Support: Xilinx

Award Amount: \$15,000. (total, and Keller share)

Role: sole PI

Granted: 09/2012

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## TEACHING

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- Coursera – introduced a specialization “Network Systems: Principles in Practice Specialization” as part of University of Colorado, MS-CS and MS-ECE.
  - Network Systems Foundations (launched End 2023)
  - Network Principles in Practice: Linux Networking (launched Mid 2024)
  - Network Principles in Practice: Cloud Networking (launched Mid 2024)
- University of Colorado: ECEN 5003/4003: Embedded AI (Fall 2025)
- University of Colorado: ECEN 5773: Developing the Industrial Internet of Things (Spring 2025)

[Updated: Dec 2025]

- University of Colorado: CSCI 5253 / 4253 / ECEN 5033 – Datacenter Scale Computing (Fall 2023, Fall 2024)
- University of Colorado: ECEN 3593 / CSCI 4593 – Computer Organization (Spring 2022, Spring 2023, Spring 2024)
- University of Colorado: ECEN 5033 – SpTp DevOps in the Cloud (Fall 2018, Fall 2021)
- University of Colorado: ECEN 3350 – Programming Digital Systems (Spring 2016, Spring 2017, Spring 2018, Spring 2019)
- University of Colorado: ECEN 1310 – Intro to Programming for Engineers (Spring 2015)
- University of Colorado: ECEN / CSCI SpTp - Advanced Computer and Networked System Security (Fall 2013, Fall 2014, Fall 2017).
- University of Colorado: ECEN / CSCI SpTp - Advanced Network Systems (Spring 2013, Spring 2014, Fall 2015, Fall 2016, Fall 2022).
- University of Colorado: ECEN 5013: Software-defined networking (Fall 2012)
- Teaching assistant for Princeton COS 109, “Computers in our world”
- Guest lecturer in Princeton COS 561 “Advanced computer networks”, University of Colorado ECEN5743 Software Engineering of Distributed Systems, University of Colorado CSCI 5023: Network Systems
- On-Leave from Univ. of Colorado AY 2019-2020, AY 2020-21

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## Publications

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### ARTICLES

(In my field, conferences are the preferred publication venue, but journal articles are still competitive with a rigorous review process)

#### **Doomed to Repeat with IPv6? Characterization of NAT-centric Security in SOHO Routers**

K Olson, J Wampler, E Keller

ACM Computing Surveys, Volume 55, Issue 14s, July 2023

#### **Detecting Unseen Anomalies in Network Systems by Leveraging Neural Networks**

Mohammad J. Hashemi, Eric Keller, Saeid Tizpaz-Niari

IEEE Transactions on Network and Service Management (TNSM), Vol. 19, No. 3, Sept. 2022

#### **Software Packet-Level Network Analytics at Cloud Scale**

Oliver Michel, John Sonchack, Greg Cusack, Maziyar Nazari, Eric Keller, Jonathan M Smith

IEEE TRANSACTIONS ON NETWORK AND SERVICE MANAGEMENT 18(1):597-610. Mar 2021

#### **Scalable Network Virtualization in Software-Defined Networks**

Dmitry Drutskoy, Eric Keller, Jennifer Rexford

in IEEE Internet Computing, March/April 2013.

#### **Rehoming edge links for better traffic engineering**

Eric Keller, Michael Schapira, Jennifer Rexford. ACM SIGCOMM Computer Communication Review Volume 42 Issue 2, April 2012

### HIGHLY COMPETITIVE CONFERENCES

(Determined by a historical reputation, generally speaking <25% acceptance rate, with many being <20%.)

#### **THORN-ML: Transparent Hardware Offloaded Resilient Networks for RDMA based Distributed ML Workloads**

Maziyar Nazari, Daniel Noland, Giulio Sidoretti, Erika Hunhoff, Tamara Silbergleit Lehman, Eric Keller

In ACM Symposium on Cloud Computing (SoCC), 2025 (~~25~~/~~67~~=~~27~~%)

[Updated: Dec 2025]

**DND-Db: A Democratized Network Data Database for Tailored Routing and Security Campaigns**

Karl Olson, Bashayer Alharbi, Gregory Cusack, Eric Keller

IEEE Network Operations and Management Symposium (NOMS), May, 2025. (~25%)

**Efficiency, Expressivity, and Extensibility in a Close-to-Metal NPU Programming Interface**

Erika Hunhoff, Joseph Melber, Kristof Denolf, Andra Bisca, Samuel Bayliss, Stephen Neuendorffer, Jeff Fifield, Jack Lo, Pranathi Vasireddy, Phil James-Roxby, Eric Keller

IEEE 33rd Annual International Symposium on Field-Programmable Custom Computing Machines (FCCM), 2025 (~19%)

**LinuxFP: Transparently Accelerating Linux Networking**

M. Abranches, E. Hunhoff, R. Eswara, O. Michel, and E. Keller.

In IEEE International Conference on Distributed Computing Systems (ICDCS), 2024 (121/552=21.9%)  
(awarded Distinguished Paper)

**Escra: Event-driven, Sub-second Container Resource Allocation**

Greg Cusack, Maziyar Nazari, Sepideh Goodarzy, Erika Hunhoff, Prerit Oberai, Eric Keller, Eric Rozner, and Rick Han

IEEE International Conference on Distributed Computing Systems (ICDCS), July 2022. (114/573=19%)

**StepNet: A Compositional Framework with Reduced Querying for Homing Complex Network Services**

Azzam Alsudais A, Shankar P Narayanan, Bharath Balasubramanian, Zhe Huang, Eric Keller

IFIP/IEEE International Symposium on Integrated Network Management (IM), May 2021 (46/236 =19%)

**FluidMem: Full Flexible and Fast Memory Disaggregation for the Cloud**

Blake Caldwell, Youngbin Im, Sepideh Goodarzy, Sangtae Ha, Richard Han, Eric Keller, Eric Rozner

IEEE International Conference on Distributed Computing Systems (ICDCS), Nov. 2020. (104/584=18%)

**FOCUS: Scalable Search Over Highly Dynamic Geo-distributed State**

Azzam Alsudais, Mohammad Hashemi, Zhe Huang, Bharath Balasubramanian, Shankaranarayanan Puzhavakath Narayanan, Eric Keller, and Kaustubh Joshi

IEEE International Conference on Distributed Computing Systems (ICDCS), July, 2019. (est 20%)

**Breaking the Trust Dependence on Third Party Processes for Reconfigurable Secure Hardware**

Aimee Coughlin, Greg Cusack, Jack Wampler, Eric Keller, Eric Wustrow

ACM/SIGDA International Symposium on Field-Programmable Gate Arrays (FPGA) (full paper), Feb, 2019. (24 full + 6 short / 139 submissions= 17% full, 21% overall)

**Scaling Hardware Accelerated Network Monitoring to Concurrent and Dynamic Queries With \*Flow**

John Sonchack, Oliver Michel, Adam J. Aviv, Eric Keller, Jonathan M. Smith

USENIX Annual Technical Conference (ATC), July, 2018 (79/378 = 20%)

**Turboflow: information rich flow record generation on commodity switches**

John Sonchack, Adam J. Aviv, Eric Keller, and Jonathan M. Smith

Thirteenth EuroSys Conference (EuroSys '18), April, 2018. (43/262 = 16%)

(awarded best student paper)

**Stateless Network Functions: Breaking the Tight Coupling of State and Processing**

Murad Kablan, Azzam Alsudais, and Eric Keller, Franck Le

USENIX Symp. on Networked Systems Design and Implementation (NSDI), Mar. 2017 (46/255 = 18%)

**Timing-based reconnaissance and defense in software-defined networks**

John Sonchack, Anurag Dubey, Adam J Aviv, Jonathan M Smith, Eric Keller

Proceedings of the 32nd Annual Conference on Computer Security Applications (ACSAC), Dec 2016.

[Updated: Dec 2025]

(48 / 210 = 22%)

**Apps with hardware: enabling run-time architectural customization in smart phones**

Aimee Coughlin, Ali Ismail, Eric Keller

USENIX Annual Technical Conference (USENIX ATC), June 2016. (47 / 266 = 17%)

**Enabling Practical Software-defined Networking Security Applications with OFX**

John Sonchack, Adam J. Aviv, Eric Keller, Jonathan M. Smith

In Proc. Network and Distributed System Security Symposium (NDSS). February, 2016. (60 / 390 = 15%)

**Transparent, Live Migration of a Software-Defined Network**

Soudeh Ghorbani, Cole Schlesinger, Matthew Monaco, Eric Keller, Matthew Caesar, Jennifer Rexford, David Walker

ACM Symposium on Cloud Computing (SoCC). Nov., 2014 (29/119, 24%)

**Eliminating the Hypervisor Attack Surface for a More Secure Cloud**

Jakub Szefer, Eric Keller, Jennifer Rexford, and Ruby B. Lee

In Proc. ACM Conf. on Computer and Communications Security (CCS). Oct., 2011. (60/429, 14%)

**NoHype: Virtualized cloud infrastructure without the virtualization**

Eric Keller, Jakub Szefer, Jennifer Rexford, and Ruby B. Lee

In Proc. International Symposium on Computer Architecture (ISCA). July, 2010. (44/245, 18%)

**Seamless BGP Migration with Router Grafting**

Eric Keller, Jennifer Rexford, and Jacobus van der Merwe

In Proc. Networked Systems Design and Implementation (NSDI). Apr., 2010. (29/175, 16%)

**Virtually Eliminating Router Bugs**

Eric Keller, Minlan Yu, Matthew Caesar, and Jennifer Rexford

In Proc. Conference on emerging Networking EXperiments and Technologies (CoNEXT). Dec., 2009. (29/170, 17%)

**Better by a HAIR: Hardware-Amenable Internet Routing**

Firat Kiyak, Brent Mochizuki, Eric Keller, and Matthew Caesar

In Proc. IEEE International Conference on Network Protocols (ICNP). Oct., 2009. (36/198, 18%)

**Virtual Routers on the Move: Live Router Migration as a Network-Management Primitive**

Yi Wang, Eric Keller, Brian Biskeborn, Jacobus van der Merwe, Jennifer Rexford

In Proc. ACM SIGCOMM. Aug., 2008. (35/288, 12%)

**MEDIUM COMPETITIVE CONFERENCES**

(Journal equivalent papers at venues that generally have 30-35% acceptance rate and undergo a rigorous review process)

**Optimizing Machine Learning Inference Serving Systems: A Survey**

Shirin Ebadi, Eric Keller

IEEE International Conference on Artificial Intelligence, Computer, Data Sciences and Applications (ICDSA), Feb, 2026 (est 35%)

**Container Data Item: An Abstract Datatype for Efficient Container-based Edge Computing**

Md Rezwanaur Rahman, Shirin Ebadi, Adarsh Srinivasan, Varsha Natarajan, Tarun Annapareddy, Eric Keller and Shivakant Mishra

IEEE International Conference on Computing, Networking and Communications (ICNC), Feb. 2026 (27%)

[Updated: Dec 2025]

**Capturing and Predicting User Frustration to Support a Smart Operating System**

Sepideh Goodarzy, Eric Keller, Mazyar Nazari, Eric Rozner, Richard Han, Mark Dras, Young Choon Lee, Deborah Richards

Companion Proceedings of the 28th ACM International Conference on Intelligent User Interfaces (IUI), March 2023. (est. 30%)

**Optimizing and Extending Serverless Platforms: A Survey**

Mazyar Nazari, Sepideh Goodarzy, Shivakant Mishra, Eric Rozner, Eric Keller

International Conference on Software Defined Systems (SDS). December 6-9, 2021 (est. 35%)

**Efficient Network Monitoring Applications in the Kernel with eBPF and XDP**

Marcelo Abranches, Oliver Michel, Eric Keller, Stefan Schmid

IEEE Conference on Network Functions Virtualization and Software-Defined Networking (IEEE NFV-SDN 2021), Nov. 2021. (est. 35%)

**(awarded Best Paper)**

**SmartOS: towards automated learning and user-adaptive resource allocation in operating systems  
Aug 2021**

ACM SIGOPS Asia-Pacific Workshop on Systems (APSys), Aug 2021.

Sepideh Goodarzy, Mazyar Nazari, Richard Han, Eric Keller, Eric Rozner (20/43 = 46%)

**Resource Management in Cloud Computing Using Machine Learning: A Survey**

Sepideh Goodarzy, Mazyar Nazari, Richard Han, Eric Keller, Eric Rozner

IEEE International Conference On Machine Learning And Applications. Dec., 2020. (est 25%)

**General Domain Adaptation Through Proportional Progressive Pseudo Labeling**

Mohammad J. Hashemi, Eric Keller

IEEE International Conference on Big Data (BigData), Dec. 2020 (83reg,88short/535=31%)

**A Userspace Transport Stack Doesn't Have to Mean Losing Linux Processing**

Marcelo Abranches, Eric Keller

IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN 2020), Nov. 2020. (est 35%)

**Enhancing Robustness Against Adversarial Examples in Network Intrusion Detection Systems**

Mohammad J. Hashemi, Eric Keller

IEEE Conference on Network Function Virtualization and Software Defined Networks (NFV-SDN 2020), Nov. 2020. (est 35%)

**Network Defragmentation in Virtualized Data Centers**

Oliver Michel, Eric Keller, Fernando Ramos

Sixth IEEE International Conference on Software Defined Systems (SDS), June, 2019. (est 35%)

**Augmenting cloud architectures to support decentralized applications**

Aimee Coughlin, Kelly Kaoudis, Eric Keller

IFIP/IEEE Symp. on Integrated Network and Service Management (IM), May, 2017 (44/154 = 29%)

**SDN in Wide-Area Networks: A Survey**

Oliver Michel, Eric Keller

International Conference on Software Defined Systems(SDS), May, 2017 (est. 35%)

**Policy Routing using Process-Level Identifiers**

Oliver Michel, Eric Keller

In Proc. IEEE International Symposium on Software Defined Systems (SDS). April, 2016. (est. 35%)

**WASP: A Software-Defined Communication Layer for Hybrid Wireless Networks**



[Updated: Dec 2025]

**Murad Kaplan, Chenyu Zheng, Matthew Monaco, Eric Keller, Douglas Sicker**

in ACM/IEEE Symposium on Architectures for Networking and Communications Systems (ANCS). Oct., 2014  
(est. 35%)

**Software-Defined Energy Communication Networks: From Substation Automation to Future Smart Grids**

Adam Cahn, Juan Hoyos, Matthew Hulse, Eric Keller

in IEEE Conf. on Smart Grid Communications (SmartGridComm), Oct., 2013. (135/334 = 40%)

**Programming a Hyper-Programmable Architectures for Networked Systems**

Eric Keller and Gordon Brebner

In Proc. International Conference on Field-Programmable Technology (FPT). Dec., 2004. (34/122, 27%)

**Hyper-Programmable Architectures for Adaptable Networked Systems**

Gordon Brebner, Phil James-Roxby, Eric Keller, Chidamber Kulkarni

In Proc. IEEE Conf. on Application-specific Systems, Architectures and Processors (ASAP). Sept., 2004.

**Software Decelerators**

Eric Keller, Gordon Brebner, Phil James-Roxby

In Proc. 13th International Field Programmable Logic and Applications Conference (FPL). Sept., 2003. (~30%)

**A Self-Reconfiguring Platform**

Brandon Blodget, Philip James-Roxby, Eric Keller, Scott McMillan, Prasanna Sundararajan

In Proc. 13th International Field Programmable Logic and Applications Conference (FPL). Sept., 2003. (~30%)

**Gene Matching Using JBits**

Steven A. Guccione and Eric Keller

In Proc. 12th International Field-Programmable Logic and Applications Conference (FPL). Sept., 2002. (~30%)

**An FPGA Wire Data-Base for Run-Time Routers**

Eric Keller and Scott McMillan

In Proc. Military and Aerospace Applications of Programmable Logic Devices (MAPLD). Sept., 2002.

**Building Asynchronous Circuits With JBits**

Eric Keller

In Proc. 11th International Field-Programmable Logic and Applications Conference (FPL). Aug., 2001. (~30%)

**Run-Time Reconfigurable 2D Discrete Wavelet Transform Using JBits**

Jonathan Ballagh, Peter Athanas, and Eric Keller

In Proc. Reconfigurable Technology: FPGAs for Computing and Applications II. Aug., 2001.

**Dynamic Circuit Specialization of a CORDIC Processor**

Eric Keller

In Proc. Reconfigurable Technology: FPGAs for Computing and Applications II. Nov., 2000.

## WORKSHOPS

(These are typically 6 pages with novel ideas, preliminary prototype and evaluation. note: some workshops, such as HotNets, are highly competitive)

**Enabling Security Research Through Efficient Partial Deployment Topology Configuration and Validation**

Bashayer Alharbi, Karl Olson, Eric Keller

IEEE International Workshop on Computer and Networking Experimental Research using Testbeds (CNERT), May 2023 (est. 40%)

**Getting back what was lost in the era of high-speed software packet processing**

Marcelo Abranches, Oliver Michel, Eric Keller

[Updated: Dec 2025]

ACM Workshop on Hot Topics in Networks (HotNets), Nov. 2022. (32/104=30%)

**Infinity: A Scalable Infrastructure for In-Network Applications**

Marcelo Abranches, Karl Olson, Eric Keller

IFIP/IEEE FlexNGIA workshop (co-located with IFIP/IEEE International Symposium on Integrated Network Management (IM)), May 2021

**Towards Evaluation of NIDSs in Adversarial Setting**

Mohammad Hashemi, Greg Cusack, Eric Keller

3rd ACM CoNEXT Workshop on Big DATA, Machine Learning and Artificial Intelligence for Data Communication Networks (Big-DAMA), Dec, 2019.

**Shimmy: Shared Memory Channels for High Performance Inter-Container Communication**

Marcelo Abranches, Sepideh Goodarzy, Mazyar Nazari, Shivakant Mishra, Eric Keller

USENIX Workshop on Hot Topics in Edge Computing (HotEdge), July, 2019. (22/39 = 56%)

**PIQ: Persistent Interactive Queries for Network Analytics**

Oliver Michel, John Sonchack, Eric Keller, Jonathan M. Smith

ACM Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Sec), March, 2019.

**Stochastic Substitute Training: A General Approach to Craft Adversarial Examples against Defenses which Obfuscate Gradients**

Mohammad Hashemi, Greg Cusack, Eric Keller

ACM Workshop on Artificial Intelligence and Security (AISec), Oct., 2018. (9/32 = 28%)

**Packet-Level Analytics in Software without Compromises**

Oliver Michel, John Sonchack, Eric Keller, Jonathan M. Smith

USENIX Workshop on Hot Topics in Cloud Computing (HotCloud), July 2018 (22/63 = 35%)

**NodeFinder: Scalable Search over Highly Dynamic Geo-distributed State**

Azzam Alsudais, Zhe Huang, Bharath Balasubramanian, Shankaranarayanan Puzhavakath Narayanan, Eric Keller, Kaustubh Joshi

USENIX Workshop on Hot Topics in Cloud Computing (HotCloud), July 2018 (22/63 = 35%)

**Making Serverless Computing More Serverless**

Zaid Al-Ali, Sepideh Goodarzy, Ethan Hunter, Sangtae Ha, Richard Han, Eric Keller, Eric Rozner

International Workshop on Serverless Computing (WoSC), July, 2018

**Machine Learning-Based Detection of Ransomware Using SDN**

Greg Cusack, Oliver Michel, Eric Keller.

ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Sec). March, 2018 (est. 35%)

Building a Security OS With Software Defined Infrastructure

Guofei Gu, Hongxin Hu, Eric Keller, Zhiqiang Lin, Donald E. Porter

ACM Asia-Pacific Workshop on Systems (APSys). Sept. 2017

**Hey Network, Can You Understand Me?**

Azzam Alsudais, Eric Keller

IEEE Workshop on Software-Driven Flexible and Agile Networking (SWFAN), May, 2017. (est. 35%)

**CommunityGuard: A Crowdsourced Home Cyber-Security System**

Chase E. Steward, Anne Maria Vasu, Eric Keller

ACM International Workshop on Security in Software Defined Networks and Network Function Virtualization (SDN-NFV Security), March 2017 (est. 35%)

[Updated: Dec 2025]

### **Trusted Click: Overcoming Security issues of NFV in the Cloud**

Aimee Coughlin, Eric Keller, Eric Wustrow

ACM International Workshop on Security in Software Defined Networks and Network Function Virtualization (SDN-NFV Security), March 2017 (est. 35%)

### **QoX: quality of service and consumption in the cloud**

Murad Kablan, Eric Keller, Hani Jamjoom

USENIX Workshop on Hot Topics in Cloud Computing (HotCloud), June 2016. (21 / 68 30%)

### **Timing SDN Control Planes to Infer Network Configurations**

John Sonchack, Adam J. Aviv, Eric Keller

In Proc. ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Security). March, 2016. (est. 35%)

### **Taking the Surprise out of Changes to a Bro Setup**

Matthew Monaco, Alexander Tsankov, Eric Keller

In Proc. ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization (SDN-NFV Security). March, 2016. (est. 35%)

**(awarded best paper)**

### **Stateless Network Functions**

Murad Kablan, Blake Caldwell, Hani Jamjoom, Eric Keller

In Proc. Workshop on Hot Topics in Middleboxes and Network Function Virtualization (HotMiddlebox), Aug. 2015 (12/32, 37%)

### **ClosedFlow: OpenFlow-like Control over Proprietary Devices**

Ryan Hand, Eric Keller

in ACM Workshop on Hot topics in SDN (HotSDN), as Full paper. Aug., 2014 (16 / 116 = 14%, additional 17 accepted as short)

### **Applying Operating System Principles to SDN Controller Design**

Matthew Monaco, Oliver Michel, Eric Keller

in ACM Workshop on Hot Topics in Networks (HotNets), Nov., 2013. (26/110 = 24%)

### **Active Security**

Ryan Hand, Michael Ton, Eric Keller

in ACM Workshop on Hot Topics in Networks (HotNets), Nov., 2013. (26/110 = 24%)

### **Jobber: Automating Inter-Tenant Trust in The Cloud**

Andy Saylor, Eric Keller, Dirk Grunwald

in Workshop on Hot Topics in Cloud Computing (HotCloud), June, 2013. (21/74 = 28%)

### **Towards Elastic Operating Systems**

Amit Gupta, Ehab Ababneh, Richard Han, Eric Keller

in Hot Topics in Operating Systems (HotOS), June, 2013. (27/92 = 29%)

### **Live migration of an entire network (and its hosts)**

Eric Keller, Soudeh Ghorbani, Matt Caesar, Jennifer Rexford

October 2012 In Proc. HotNets. (23/120, 19%)

### **Virtual switching without a hypervisor for a more secure cloud**

Xin Jin, Eric Keller, Jennifer Rexford

April 2012 Proceedings of Hot ICE. (10/20, 50%)

### **The 'Platform as a Service' model for networking**

[Updated: Dec 2025]

Eric Keller and Jennifer Rexford  
In Proc. INM/WREN workshop. Apr., 2010.

**Accountability in hosted virtual networks**

Eric Keller, Ruby Lee, and Jennifer Rexford  
In Proc. Workshop on Virtualized Infrastructure Systems and Architectures (VISA). Aug., 2009.

**Virtualizing the Data Plane Through Source Code Merging**

Eric Keller and Evan Green  
In Proc. PRESTO workshop. Aug., 2008.

**Java Debug Hardware Models using JBits**

Jonathan Ballagh, Peter Athanas, and Eric Keller  
In Proc. 8th Reconfigurable Architectures Workshop (RAW 2001). May, 2001.

**JRoute: A Run-Time Routing API for FPGA Hardware**

Eric Keller  
In Proc. 7th Reconfigurable Architectures Workshop (RAW 2000). May, 2000.

**POSTERS / TECH REPORTS**

**An Operating System for Disaggregation with Coherence**

Erika Hunhoff, Gerd Zellweger, Eric Keller  
(poster)USENIX Symposium on Operating Systems Design and Implementation (OSDI), June 2023

**(Poster) Federating Trust: Network Orchestration for Cross-boundary Zero Trust.**

Karl Olson, Eric Keller.  
In ACM SIGCOMM (Poster), Aug 2021.

**(poster) Stateless TCP**

Marcelo Abranches, Eric Keller  
The 15th International Conference on emerging Networking EXperiments and Technologies (CoNEXT), Dec, 2019.

**(poster) Efficient Microservices with Elastic Containers**

Greg Cusack, Maziyar Nazari, Sepideh Goodarzy, Prerit Oberai, Eric Rozner, Eric Keller  
The 15th International Conference on emerging Networking EXperiments and Technologies (CoNEXT), Dec, 2019.

**(poster) Scalable Hardware-Accelerated Network Analytics**

Oliver Michel, John Sonchack, Adam J. Aviv, Eric Keller  
USENIX Symposium on Networked Systems Design and Implementation (NSDI). April, 2018

**(poster) Machine Learning-Based Fingerprinting of Network Traffic Using Programmable Forwarding Engines**

Greg Cusack, Oliver Michel, Eric Keller  
Network and Distributed System Security Symposium (NDSS). February, 2018.  
**(won best technical poster)**

**FluidMem: Memory as a Service for the Datacenter**

Blake Caldwell, Youngbin Im, Sangtae Ha, Richard Han, and Eric Keller  
Tech Report, arXiv:1707.07780 [cs.OS]. July 2017

**(poster) TurboFlow: Accelerating Flow Collection on Commodity Switches**

John Sonchack, Adam J. Aviv, Eric Keller, Jonathan M. Smith  
USENIX Symposium on Networked Systems Design and Implementation (NSDI), March 2017

[Updated: Dec 2025]

**(poster) Colocation in Stateless Network Functions**

Anurag Dubey, Murad Kablan, Eric Keller

USENIX Symposium on Networked Systems Design and Implementation (NSDI), March 2017

**(Poster) Defragmenting the Cloud**

Oliver Michel, Eric Keller

USENIX Network System Design and Implementation (NSDI), March 2016

**(Poster) CoCaching in Named Data Networking**

Azzam Alsudais, Eric Keller

USENIX Network System Design and Implementation (NSDI), March 2016

**(Poster) Mitigating Network Resource Abuses and DDoS attacks with Client Puzzle based Software-Defined Networks**

Zhang Liu, Eric Keller, Sangtae Ha

USENIX Network System Design and Implementation (NSDI), March 2016

**(Poster) OFX: Enabling OpenFlow Extensions for Switch-Level Security Applications.**

John Sonchack, Adam J. Aviv, Eric Keller, Jonathan M. Smith

In Proc. ACM SIGSAC Conference on Computer and Communications Security (CCS), 2015.

**(poster) Stateless Network Functions**

Murad Kablan, Blake Caldwell, Hani Jamjoon, Eric Keller

at USENIX Symp. on Networked Systems Design and Implementation (NSDI), May., 2015.

**(poster) Mobile Applications with Reconfigurable Hardware**

Aimee Coughlin, Ali Ismail, Eric Keller.

USENIX Symposium on Operating System Design and Implementation (OSDI), October 2014.

**(poster) Extending the Software-defined Network Boundary**

Oliver Michel, Aimee Coughlin, Eric Keller

at ACM SIGCOMM. Aug., 2014

**(poster) Making the Live Network the Honeypot**

Aimee Coughlin, Oliver Michel, Eric Keller, and Adam J. Aviv.

at USENIX Symp. on Networked Systems Design and Implementation (NSDI), Apr., 2014.

**(poster/demo) Applying Operating System Principles to SDN Controller Design**

Oliver Michel, Matthew Monaco, Eric Keller.

The 18th GENI Engineering Conference, Oct., 2013.

**(poster) WASP: A Centrally Managed Communication Layer for Smart Phone Networks**

Murad Kaplan , Chenyu Zheng, Eric Keller

in USENIX Symposium on Networked Systems Design and Implementation (NSDI), May, 2013.

**(poster) yanc: Yet Another Network Controller**

Matthew Monaco , Eric Keller

in USENIX Symposium on Networked Systems Design and Implementation (NSDI), May, 2013.

**(poster) Jobber: Automating Inter-Tenant Trust in The Cloud**

Andy Sayler, Eric Keller

in USENIX Symposium on Networked Systems Design and Implementation (NSDI), May, 2013.

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SERVICE

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Department / College:

Jan 2024 – pres: Associate Chair for Professional and Online Programs  
2025-26 AY: (chair) Professional Masters Program and Online Committee  
Co-Chair Search Comm for multiple Teaching Faculty in (1) Comp, Eng. and (2) Quantum Eng.  
Ad-hoc committee for Tenure Review cases (Tamara Lehman and Joe Izraelevitz)  
2024-25 AY: (chair) Professional Masters Program and Online Committee  
Chair Teaching Faculty in Computer Engineering, VLSI, Embedded Systems Search (hired Tina Smilkstein)  
2023-24 AY: (chair) Professional Masters Program and Online Committee  
Chair Reappointment ad-hoc committee (For Tamara Lehman)  
2022-23 AY: Strategic Planning Committee, Executive Committee,  
co-chair Computer Engineering Faculty Search,  
ECEE Teaching Faculty search (Spring 2022),  
Chair Tenure and Promotion ad-hoc Committee (for Eric Wustrow)  
2021-22 AY: Strategic Planning Committee, Executive Committee.  
2018-19 AY: Computer Engineering Faculty Search Committee (hired Tamara Lehman, Joe Izraelevitz)  
2017-18 AY: Executive Committee (Fall) / GradComm (Spring)  
2016-17 AY: Executive Committee (ExComm)  
2015-16 AY: Executive Committee (ExComm)  
2014-15 AY: Faculty Search Committee (hired Eric Wustrow)  
Spring 2014: Strategic Vision Committee

Organizing Committee:

2026: co-General Chair, SIGCOMM (My proposal for Denver as site was selected)  
2018: TPC co-Chair CNERT, Treasurer ANCS  
2015: co-Chair CoNEXT Student Workshop, ANCS Publicity Chair

Technical Program Committee (year of conference):

2026: NSDI  
2025: NSDI, INFOCOM, ICNP  
2024: ICNP, INFOCOM, NOMS  
2023: ICNP, NOMS  
2022: ICNP, NOMS, SOSR, FFSPIN  
2021: IM, ICNP, SoCC, ANCS, SPIN  
2020: CoNEXT, SOSR, SPIN  
2019: ICNP, ANCS, ICDCS, WoSC, SDN-NFV Security  
2018: ICNP, CoNEXT, SDN-NFV Security, ANCS  
2017: IM, SDN-NFV Security, ANCS, ICDCS, SOSR, ICNP, SWFAN  
2016: SDN-NFV Security, NOMS, HotMiddleBox, ICNP, IEEE NFV-SDN, CAN  
2015: ICNP, ANCS, EWSDN, PLVNET, IEEE NFV-SDN  
2014: CNERT, ANCS, HotSDN, HotCloud, ICCCN (SDN Track), EWSDN, SDN-NGA, SIGCOMM  
Poster/Demo, Infocomm Poster/Demo, SDN-AA,  
2013: ANCS, HotSDN, EWSDN, SIGCOMM Poster/Demo  
2010: NetFPGA Developers Workshop  
2009: NetFPGA Developers Workshop

Reviewer:

2023: ToN, TNSM, CSI  
2022: CCR  
2021: ToN  
[missed tracking but reviews for several journals 2018-2020]  
2017: COMNET, CSUR  
2016: CCR, TNSM  
2015: ToN, COSE, Sensors, CCR  
2014: Internet Computing, TRETs, ToN, TNSM, CCR

[Updated: Dec 2025]

2013: Internet Computing, TRETs, TNMS, ToN  
2012: COMNET, ToN, CCR  
2011: ToN

Panelist:

2024: NSF Virtual  
2023: NSF virtual  
2022: NSF virtual (2 panels)  
2021: NSF Virtual  
2020: NSF virtual  
2019: NSF in person  
2018: NSF ad-hoc  
2017: NSF in person  
2016: NSF in person  
2015: NSF in person, NSF virtual  
2014: NSF in person, NSF ad-hoc

CSI = Computer Standards & Interfaces

SPIN = ACM SIGCOMM Workshop on Secure Programmable Network Infrastructure

Internet Computing = IEEE Internet Computing

ToN = IEEE Transactions on Networking

TRETs = ACM Transactions on Reconfigurable Technology and Systems

TNSM = IEEE Transactions on Network and Service Management

CCR = ACM SIGCOMM Computer Communication Review

COSE = Elsevier Computers & Security Journal

Sensors = MDPI Sensors Journal

SIGCOMM = The flagship annual conference of the ACM Special Interest Group on Data Communication (SIGCOMM) on the applications, technologies, architectures, and protocols for computer communication

ICNP = IEEE International Conference on Network Protocols

ANCS = ACM/IEEE Symposium on Architectures for Networking and Communications Systems

NFV-SDN = IEEE Conference on Network Functions Virtualization and Software-defined Networking

EWSDN = European Workshop on Software Defined Networks

HotSDN = ACM SIGCOMM Workshop on Hot Topics in Software Defined Networking

HotCloud = USENIX Workshop on Hot Topics in Cloud Computing

ICCCN = IEEE International Conference on Computer Communication and Networks

CNERT = International Workshop on Computer and Networking Experimental Research using Testbeds

SDN-NGA = International Workshop on Software Defined Networks for a New Generation of Applications and Services

SDN-AA = IEEE Workshop on SDN Architecture and Applications 2014 (SDN-AA)

PVLNET = workshop on PL and verification for networking

NOMS = IEEE/IFIP Network Operations and Management Symposium

IM = IFIP/IEEE International Symposium on Integrated Network Management

CAN = ACM Cloud Assisted Networking

SOSR = ACM Symposium on Software-defined Networking Research

WoSC = Workshop on Serverless Computing

SDN-NFV Security = ACM International Workshop on Security in Software Defined Networks & Network Function Virtualization

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## INVITED TALKS

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Transparent Network Acceleration

- Google Networking Research Summit, Oct. 2023.

Event-driven, Sub-second Container Resource Allocation

[Updated: Dec 2025]

- VMWare (SDI-CSCS PI Meeting), July 2021

#### Distributed Containers

- VMWare (SDI-CSCS PI Meeting), July 2020

#### Cloud-scale Packet-level Network Analytics in Software

- VMWare (SDI-CSCS PI Meeting), July 2019

#### From Academic to Founder Stateless

- Panel at FCCM. April 2018.

#### Packet-Level Network Analytics without Compromises (presented by Oliver Michel)

- work covers collaboration between Oliver Michel, Eric Keller, John Sonchack, Adam J. Aviv, and Jonathan M. Smith
- 73rd North American Network Operators Group Conference (NANOG 73), July 2018

#### Building a better network through disaggregation

- IETF NFVRG (2017)
- GENI Regional Workshop (KEYNOTE) (2017)

#### Stateless Network Functions

- Broadband Internet Technical Advisory Group (BITAG) (2016)

#### Software-Defined: The Power of Centralized Control

- Xilinx (2013)

#### CloudBase: Enabling a dynamically deployable wireless infrastructure

- Microsoft Research (2012)

#### Secure Virtualization for Dependable Cloud Services

- Georgetown University, University of Maryland, Boston University, University of Colorado, Indiana University, Battelle (2012)

#### NoHype: Virtualized Cloud Infrastructure without the Virtualization

- University of Pennsylvania (2011), IBM, (2010).

#### Dynamic Infrastructure for Dependable Cloud Services

- University of Maryland, Northeastern University, Bell Labs, University of Delaware (2011), Rutgers (2010)

#### Refactoring Router Software to Minimize Disruption

(Earlier title: Migrating and Grafting Routers to Accommodate Change)

- Georgetown University (2011), University of North Carolina, Rutgers University, University of Pennsylvania, North Carolina State University, Duke University, Bell Labs (2010)

#### Accountability in Hosted Virtual Networks

- Microsoft Research, AT&T Research (2009).

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## PATENTS

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- 11,429,407 – 8/30/2022 – “Apparatus, Method, And System To Dynamically Deploy Wireless Infrastructure”
- 10,425,348 – 9/24/2019 – “Stateless Network Functions” Exclusive License Agreement to Stateless, Inc



- 8,806,032 – 8/12/2014 – “Methods and apparatus to migrate border gateway protocol sessions between routers”
- 8,284,772 – 10/9/2012 – “Method for scheduling a network packet processor”
- 8,065,130 – 11/22/2011 – “Method for message processing on a programmable logic device”
- 8,032,874 – 10/4/2011 – “Generation of executable threads having source code specs. that describe network packets”
- 7,990,867 – 8/2/2011 – “Pipeline for processing network packets”
- 7,823,162 – 10/26/2010 – “Thread circuits and a broadcast channel in programmable logic”
- 7,792,117 – 9/7/2010 – “Method for simulating a processor of network packets”
- 7,788,402 – 8/31/2010 – “Circuit for modification of a network packet by insertion or removal of a data segment”
- 7,784,014 – 8/24/2010 – “Generation of a specification of a network packet processor”
- 7,770,179 – 8/3/2010 – “Method and apparatus for multithreading on a programmable logic device”
- 7,698,449 – 4/13/2010 – “Method and apparatus for configuring a processor embedded in an integrated circuit for use as a logic element”
- 7,689,726 – 3/30/2010 – “Bootable integrated circuit device for readback encoding of configuration data”
- 7,653,895 – 1/26/2010 – “Memory arrangement for message processing by a plurality of threads”
- 7,574,680 – 8/11/2009 – “Method and apparatus for application-specific programmable memory architecture and interconnection network on a chip”
- 7,552,042 – 6/23/2009 – “Method for message processing on a programmable logic device”
- 7,386,826 – 6/10/2008 – “Using redundant routing to reduce susceptibility to single event upsets in PLD designs”
- 7,328,335 – 2/5/2008 – “Bootable programmable logic device for internal decoding of encoded configuration data”
- 7,228,520 – 6/5/2007 – “Method and apparatus for a programmable interface of a soft platform on a programmable logic device”
- 7,227,378 – 6/5/2007 – “Reconfiguration of a programmable logic device using internal control”
- 7,185,309 – 2/27/2007 – “Method and apparatus for application-specific programmable memory architecture and interconnection network on a chip”
- 7,131,077 – 10/31/2006 – “Using an embedded processor to implement a finite state machine”
- 7,111,215 – 9/19/2006 – “Methods of reducing the susceptibility of PLD designs to single event upsets”
- 7,076,596 – 7/11/2006 – “Method of and apparatus for enabling a hardware module to interact with a data structure”
- 7,028,283 – 4/11/2006 – “Method of using a hardware library in a programmable logic device”
- 7,010,664 – 3/7/2006 – “Configurable address generator and circuit using same”
- 6,920,627 – 7/19/2005 – “Reconfiguration of a programmable logic device using internal control”
- 6,883,147 – 4/19/2005 – “Method and system for generating a circuit design including a peripheral component connected to a bus”
- 6,725,441 – 4/20/2004 – “Method and apparatus for defining and modifying connections between logic cores implemented on programmable logic devices”
- 6,487,709 – 11/26/2002 – “Run-Time Routing for Programmable Logic Devices”