

Matthew Calder

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INFORMATION <https://mattcalder.com>

EDUCATION  **University of Southern California**. Los Angeles, California. USA

Ph.D., [Computer Science](#), 2018

- My [dissertation](#) explored the impact of content delivery network (CDN) design decisions on end-user performance. Much of this work was implemented in production within Microsoft's Azure cloud platform via the [Odin Measurement Platform](#).
- [Link to Google Scholar Publication List](#)

The University of Massachusetts. Boston, Massachusetts. USA

M.S., [Computer Science](#), 2009

B.S., [Earth and Geographic Science](#), 2007

EXPERIENCE



Engineer

March 2022 to Present

I am a member of the CDN Traffic Telemetry team where I work on data collection and analytical systems for Internet performance data.



Columbia University

Adjunct Assistant Professor

August 2020 to Dec 2023

I worked part-time at the Columbia Data Science Institute co-supervising PhD students, working on NSF grant proposals, and research related to Internet measurement systems.



Microsoft

Applied Scientist

August 2015 to January 2022

I led the [ORCAS](#) team, responsible for automated and fault-tolerant network capacity planning for [Microsoft's WAN](#), one of the largest networks on the planet. My platform was responsible for forecasting Microsoft Internet and DC-to-DC traffic demand 12-18 months in the future and generating an actionable, safe, and cost-efficient build plan.

I was previously a technical team lead in Azure Frontdoor (Microsoft's CDN) specializing in Internet measurement, systems, and analysis. I designed several Internet measurement, traffic engineering, and analytical platforms used to operate Microsoft's CDN platform. Using large scale Internet measurement systems, such as [Odin](#), as a building block, my team and I developed data-driven systems for CDN targeting, SD WAN, outage detection, and change evaluation that have greatly improved end-user performance.

Onset Computer Corporation

Software Engineer

2009 to 2012

My primary responsibility at Onset was developing and maintaining database-backed web services for customers needing regular, programmatic access to environmental sensor data. Developed RESTful and SOAP services build using Java and MySQL. I also developed several features for both [HOBOLink](#), Onset's web-based product, and [HOBOWare](#), Onset's desktop product for configuring sensor hardware products and reading out collected sensor data.

AWARDS

- Best of ACM SIGCOMM CCR, 2023: [Who Squats IPv4 Addresses?](#)
- Best Short Paper, ACM IMC, 2022: [The Best of Both Worlds: High Availability CDN Routing Without Compromising Control.](#)
- Best Paper, ACM SIGCOMM, 2021: [Seven Years in the Life of Hypergiants' Off-Nets.](#)

PROFESSIONAL ACTIVITIES

Technical Program Committee Member: IMC 2021,2023; PAM 2018,2021,2023; TMA 2021-2023; SIGCOMM Posters & Demos 2021.

NSF Panel Reviewer: 2023.

GRANTS

1. **NeTS: Medium: Scalable Crawling of the Web as Experienced by Users.** Officially recommended for funding.
2. **NSF-BSF: NeTS: Small: Making BGP work for real-time interactive applications.** Officially recommended for funding.
3. **CNS Core: Medium: A Traffic Map for the Internet.** CNS-2212479.
4. **RAPID: The Internet's resilience and response to widespread shelter-in-place.**

RECENT PUBLICATIONS

- **What's in the Dataset? Unboxing the APNIC per AS User Population Dataset.** L Salamatian, C Ardi, V Giotsas, [Matt Calder](#), E Katz-Bassett, T Arnold. IMC 2024.
- **The Central Problem with Distributed Content: Common CDN Deployments Centralize Traffic in a Risky Way.** K Vermeulen, L Salamatian, SH Kim, [Matt Calder](#), E Katz-Bassett. Hotnets 2023.
- **The Prevalence of Single Sign-On on the Web: Towards the Next Generation of Web Content Measurement.** Calvin Ardi and [Matt Calder](#). IMC 2023.
- **Who Squats IPv4 Addresses?** Loqman Salamatian, Todd Arnold, Italo Cunha, Jiangchen Zhu, Yunfan Zhang, Ethan Katz-Bassett, [Matt Calder](#). SIGCOMM CCR 04/2023.
- **The best of both worlds: high availability CDN routing without compromising control.** J Zhu, K Vermeulen, I Cunha, E Katz-Bassett, [Matt Calder](#). IMC 2022.
- **Towards client-side active measurements without application control.** P Goenka, K Zarifis, A Gupta, [Matt Calder](#). SIGCOMM CCR 03/2022.
- **Identifying Networks with Internet Users Using Public Data.** Weifan Jiang, Tao Luo, Thomas Koch, Ethan Katz-Bassett, [Matt Calder](#). IMC 2021.

- **Towards an Internet Traffic Map.** Thomas Koch, Weifan Jiang, Tao Luo, Petros Gigis, Kevin Vermeulen, Emile Aben, Matt Calder, Ethan Katz-Bassett, Georgios Smaragdakis, Narseo Vallina-Rodriguez. HotNets 2021.
- **Seven years in the Life of Hypergiants' Off-nets.** Petros Gigis, Matt Calder, Lefteris Manassakis, George Nomikos, Vasileios Kotronis, Xenofontas Dimitropoulos, Ethan Katz-Bassett, Georgios Smaragdakis. SIGCOMM 2021.
- **Anycast In Context: A Tale of Two Systems.** Thomas Koch, Ethan Katz-Bassett, John Heidemann, Matt Calder, Calvin Ardi, Ke Li. SIGCOMM 2021.
- **Cost-effective Cloud Edge Traffic Engineering with Cascara.** Rachee Singh, Sharad Agarwal, Matt Calder, Paramvir Bahl. NSDI 2021.
- **Reduce, Reuse, Recycle: Repurposing Existing Measurements to Identify Stale Traceroutes.** Vasileios Giotsas, Thomas Koch, Elverton Fazzion, talo Cunha, Matt Calder, Harsha V Madhyastha, Ethan Katz-Bassett. IMC 2020.
- **Cloud Provider Activity in the Flat Internet.** Todd Arnold, Jia He, Weifan Jiang, Matt Calder, Italo Cunha, Vasileios Giotsas, Ethan Katz-Bassett. IMC 2020.
- **(How Much) Does a Private WAN Improve Cloud Performance?** Todd Arnold, Ege Gurmericliler, Arpit Gupta, Matt Calder, Georgia Essig, Vasileios Giotsas, Ethan Katz-Bassett. INFOCOM 2020.
- **Beating BGP is Harder than we Thought.** Todd Arnold, Matt Calder, Italo Cunha, Arpit Gupta, Harsha V Madhyastha, Michael Schapira, Ethan Katz-Bassett. HotNets 2019.
- **Zooming in on Wide-area Latencies to a Global Cloud Provider.** Yuchen Jin, Sundararajan Renganathan, Ganesh Ananthanarayanan, Junchen Jiang, Venkata N Padmanabhan, Manuel Schroder, Matt Calder, Arvind Krishnamurthy. SIGCOMM 2019.