

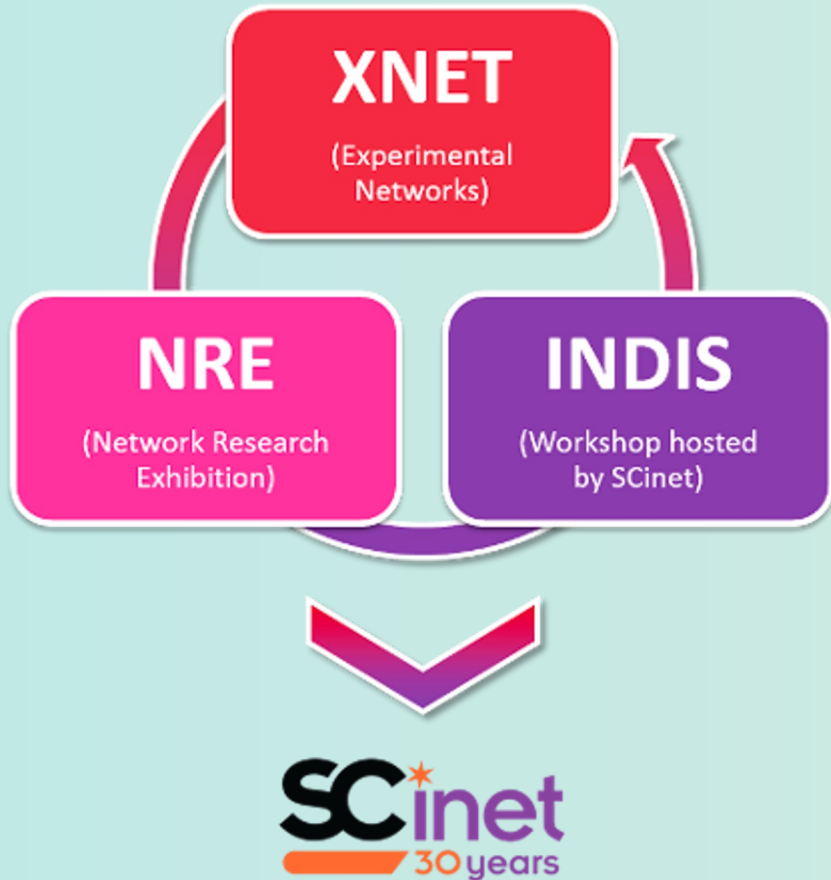


INDIS SC23 Welcome

November 12th 2023
Denver Colorado



Welcome to the 10th Edition of INDIS



Workshop Co-Organizers:

- Anu Mercian, Google, USA
- Mariam Kiran, Oak Ridge National Laboratory, USA
- Winona Snapp-Childs, Indiana University USA
- Cees de Laat, University of Amsterdam NL

+ 21 Program Committee Members from all over the world

SCinet Team Collaboration Driving the Future Innovation

Thankful to SCinet for continued support!

- **INDIS** brings together academic researchers and engineers supporting IT for Science at Universities and Institutions that participate in building SCinet.
- **INDIS** serves as the academic forum and provides a stage for SCinet to discuss state-of-the-art, cutting edge, and future network technologies with researchers and experts.
- **INDIS** provides a venue to publish results and present keynotes and (flash) talks



Contact us via: scinet-workshop@scinet.supercomputing.org

10th Celebration!



"Founding Father" in 2014

- Cees de Laat, University of Amsterdam, The Netherlands

Milestones over the Years

- **2014:** Debut of the INDIS workshop at SC14 in New Orleans
- **2015:** First panel discussion about innovations & future tech
- **2016:** INDIS becomes a full day workshop
- **2017:** Selected papers are published in a special edition of the journal Future Generation Computer Systems (FGCS)
- **2018:** INDIS proceedings are included in IEEE TCHPC
- **2019:** Technical Challenge to bridge Nets to Supercomputing
- **2020:** Introduction of the INDIS Best Paper Award
- **2022:** Bridging the gap industry-research
- **2023:** Featuring Persistent CI Testbeds with SCinet



(9:00) Introduction INDIS and SCinet

(9:10) INDIS Esteemed Guest Talk: Professor Eylem Ekici (Ohio State University)

(10:00) Coffee Break

INDIS Paper talks

(10:30) - Enhancing perfSONAR Measurement Capabilities Using P4 Programmable Data Planes

(10:50) - Experimental Study of TCP Throughput Profiles and Dynamics Over Dedicated Connections

(11:10) - Elephants Sharing the Highway – Studying TCP Fairness in Large Transfers Over High Throughput Links

(11:30) - Evaluation of SCION for User-Driven Path Control – A Usability Study

(11:50) - Throughput Optimization with a NUMA-Aware Runtime System for Efficient Scientific Data Streaming

Lightening Talks

(12:10) - Testbed Evaluation of an Attestation-Capable, Programmable Software Switch

(12:15) - Real-Time Frequency Moment Estimation on FPGA: Applications in Anomaly Detection and Weibull Flow Length Parameterization

(12:20) - Experimenting TCP Performance with Fabric

(12:25) Best Paper Bonanza

(12:30) INDIS Research Part Adjourn

The INDIS Engineering session: Tuesday 14:00 - 17:00 MST in the SCinet Theater, booth 1275

Theme: Science Cyber Infrastructure Testbeds innovations

(14:10) Introduction session on testbeds & SCinet, Cees de Laat

- (14:15) National Research Platform, Frank Wuerthwein
- (14:30) The SLICES infrastructure, Dr. Paola Grosso (UvA, EU SLICES-RI)
- (14:45) FABRIC – Networking Experiments at Scale, Ilia Baldin (RENCI)
- (15:00) Quantum-Conventional Network Testbed, Nageswara S. Rao (Oak Ridge National Laboratory (ORNL))

(15:15) Panel on testbeds and embedding in SCinet enabling persistent SCinet, Moderated by Cees De Laat

(15:40) Scientific Innovations on GCP, Dr. Anu Mercian (Google)

(16:00) Demo Presentations:

- (16:00) FABRIC - TCP experiment on FABRIC, Imtiaz Mahmud, George Papadimitriou
- (16:10) FABRIC - DYNAMOS: Dynamically Adaptive Microservice-based OS - A Middleware for Data Exchange Systems on FABRIC, Jorrit Stutterheim MSc (UvA)
- (16:20) FABRIC, ESnet, and NRP. ESnet SmartNIC based on U280 FPGA, then figured out how to also make this work on our U55C in NRP, Mohammad Fires Sada (IIT Chicago)
- (16:30) NRP - Towards Accountable Network Bandwidth Utilization via SDN, Aashay Arora (UCSD)
- (16:40) NRP - Testbed Evaluation of an Attestation-Capable, Programmable Software Switch: What is 'my' network equipment configured to do?, Nishanth Shyamkumar, Nik Sultana, Illinois Institute of Technology

(4:45 pm) Best Demo Bonanza

(5:00 pm) Future INDIS Plans, Celebrations INDIS 10th anniversary and Adjourn





SCinet Welcome: Chair Hans Addleman

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SCinet Welcome INDIS 2023 Workshop

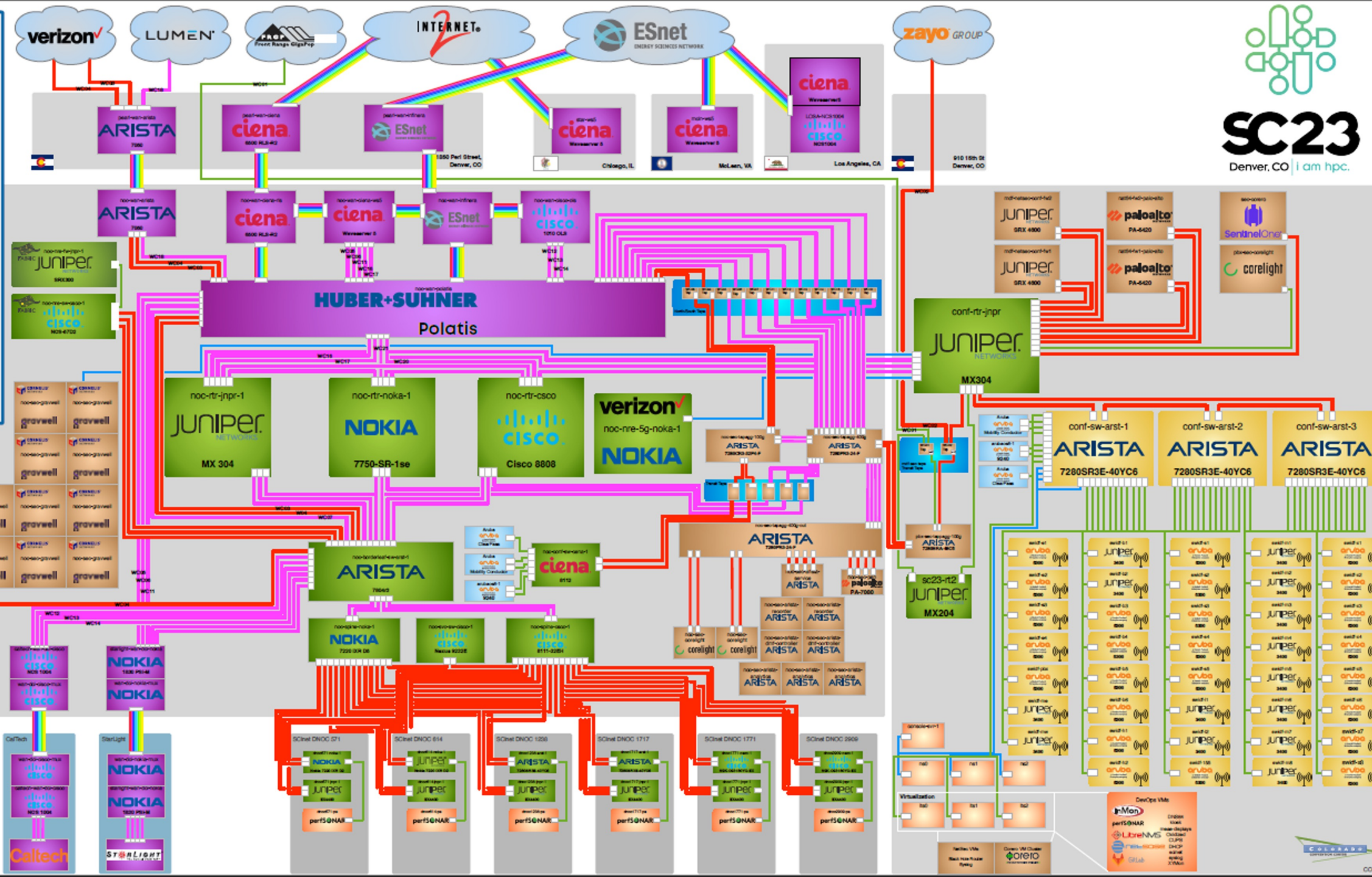
Hans Addleman
Indiana University
SC23 SCinet Chair
addlema@iu.edu

SC23 SCinet by the Numbers!

- 6.71Tbps delivered to the Colorado Convention Center
 - 16 - 400 Gbps connections
- 28.7kW power draw
- 206 SCinet Volunteers!
 - Volunteers from 9 Countries, 31 states, and 113 institutions!
- \$40.5 million in donated/loaned hardware, software, and services from 30 contributors
- 12+ miles of Fiber deployed
 - 2178+ Fiber patches

SCinet
Network Architecture
v12 - November 1st, 2023
Alexander Barnes

- 1 Gigabit Ethernet
- 10 Gigabit Ethernet
- 100 Gigabit Ethernet
- 400 Gigabit Ethernet
- 400G DCI
- Dark Fiber
- DWDM OTN
- Wi-Fi Access Point
- Routing
- WAN
- Edge
- DevOps
- Security
- Wireless

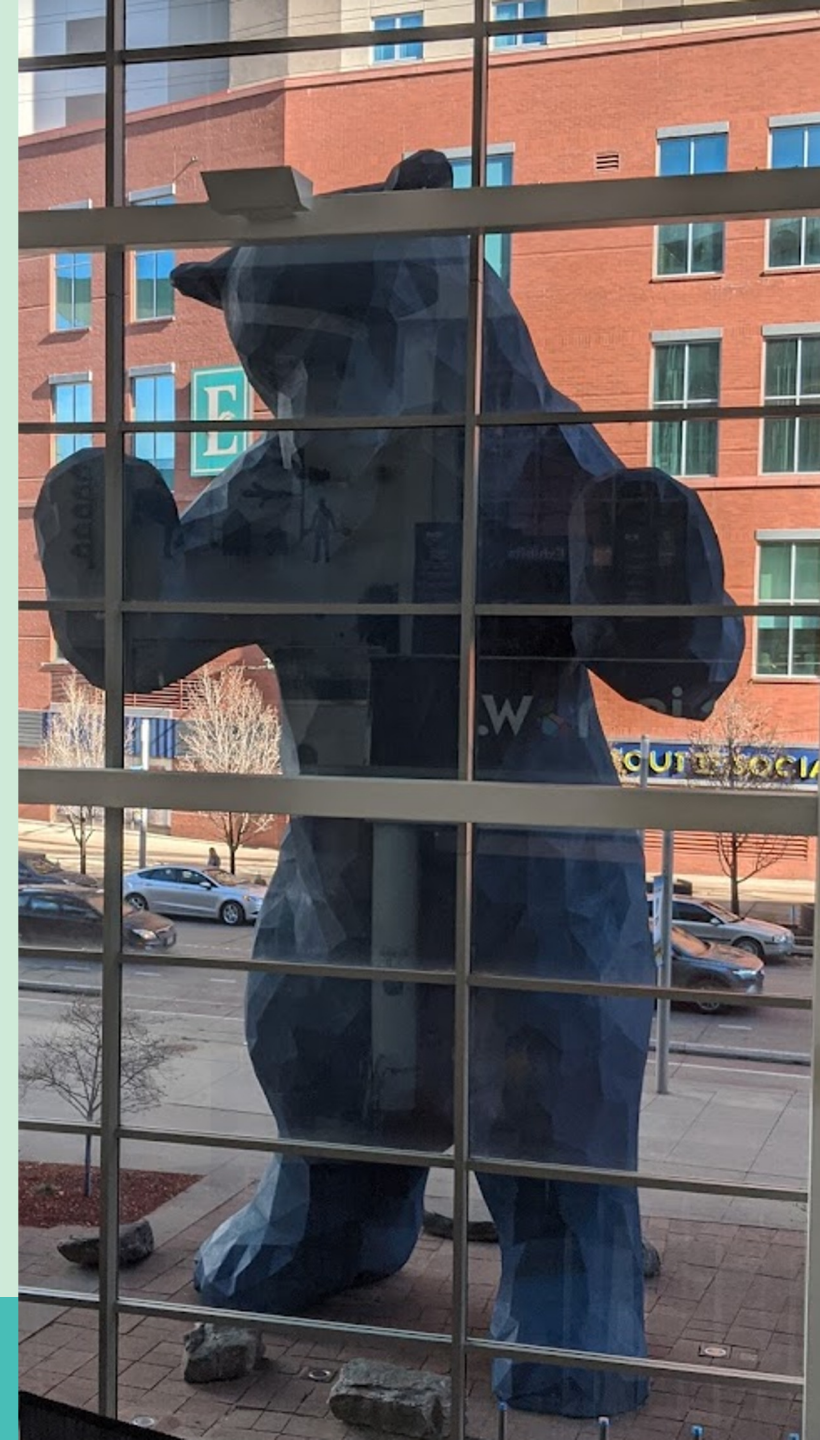


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Visualization

DevOps Vibe

Welcome to Denver and SC23!





Esteemed Speaker:

Professor Eylem Ekici (Ohio State University)

AI-EDGE: NG Networks meet Distributed Intelligence

Professor Eylem Ekici

Dr. Eylem Ekici has received his BS and MS degrees in Computer Engineering from Bogazici University, Istanbul, Turkey, in 1997 and 1998, respectively. He received his Ph.D. degree in Electrical and Computer Engineering from Georgia Institute of Technology, Atlanta, GA, in 2002. Currently, he is a professor in the Department of Electrical and Computer Engineering of The Ohio State University, Columbus, OH.

He is an Associate Editor-in-Chief of IEEE Transactions on Mobile Computing, and a former associate editor of various Top Transactions. He served as the general co-chair of ACM MobiCom 2012. He was also the TPC Co-Chair of IEEE INFOCOM 2017.

Dr. Ekici is the recipient of the 2008 and 2014 Lumley Research Award of the College of Engineering at OSU. He also received the 2016 Harrison Faculty Award for Excellence in Engineering Education. Dr. Ekici's current research interests include cognitive radio networks, vehicular communication systems, and next generation wireless systems, with a focus on algorithm design, medium access control protocols, resource management, and analysis of network architectures and protocols. He is an IEEE Fellow and a member of ACM.