



# Welcome to NANOG 87

Atlanta, GA

11-13 FEB 2023

 NANOG™

NANOG HACKATHON  
Akshat

olling Plugin

a Generic NAPALM polling plugin  
NAPALM get\_interfaces\_counters() method to pull counters  
then transform to convert interface input/output counters into rate  
NAPALM get\_neighbors() method to add neighbor related information  
Vendor plugins that inherit from the generic NAPALM  
Create device drivers  
chosen to take

# NANO<sup>G</sup><sup>®</sup>

## North American Network Operators' Group

Working together, to build the Internet of tomorrow <sup>®</sup>

NANO<sup>G</sup><sup>™</sup>

 NANO<sup>G</sup><sup>™</sup>

# What is NANOG?

- We are a community-driven nonprofit organization.
- Our roots date back to 1987, when Merit Network was tasked with re-engineering and managing the NSFNET.
- NANOG's original charter was formed in 1994.
- In 2011, the NANOG community voted for independence from Merit Network.
- NANOG was the first, and is still the largest, Network Operators' Group.

# What does NANOG do?

- Conferences that showcase innovative, educational content that aims to drive new solutions to the networking community's greatest challenges.
- Mentoring the next generation of networking professionals.
- Empowering those supporting Internet access in underserved communities across North America.
- Actively encouraging diversity, inclusion, and collaboration within our community.

# Our community

**13,000+** industry professionals and students.

**1,000+** attend NANOG conferences.

**200+** are first-time attendees.

**20+** countries around the world represented.

A photograph of two men sitting at a table, looking at a laptop screen. The man on the left has a beard and glasses, wearing a maroon polo shirt. The man on the right has glasses and is wearing a light blue button-down shirt. They appear to be in a collaborative work environment. The image is overlaid with a semi-transparent dark blue filter.

# Network Operators' Groups

Come for the opportunities, stay for the community.

# What's a NOG?

- Community organizations committed to supporting local and regional Internet professionals.
- Guided by the principle of an open exchange of knowledge and expertise.
- Formed by network operators, engineers, and other experts in the Internet community.
- Efforts that improve the quality and availability of the Internet within their regions.

# What's special about NOGs?

- They're driven by individuals, not corporations – all are equal.
- They're educational – technical presentations are available to all.
- They're local – designed to focus on the needs within their communities.
- They're neutral – non-commercial, and non-political.



# How can you benefit from NOGs?

- Learn current best practices from experienced industry professionals.
- Obtain knowledge and training on the latest Internet technologies.
- Discuss current issues and challenges faced by the community.
- Form strategic business relationships.
- Form crucial peering arrangements.

# NANOG Resources

- NANOG Mailing List:  
<https://mailman.nanog.org/mailman/listinfo/nanog>
- Conference presentations + tutorials:  
<https://www.youtube.com/user/TeamNANOG/>
- Outreach:  
<https://www.nanog.org/outreach/>
- Articles:  
<https://www.nanog.org/stories/>

# Industry Job Facts

- 383,000 people are employed in the field of network operations.
- Yet there are currently 30,863 unfilled network engineering jobs on indeed.com.
- It will increase by an additional 19,000+ each year.
- The industry competes with 700,000 open tech jobs.

A photograph of a man in a white shirt standing and speaking to a group of people seated at tables in a conference room. The man is wearing a yellow lanyard. In the background, other people are visible, including one wearing a blue t-shirt with "#fiberiscom" on the back. The scene is dimly lit, typical of an indoor event.

# NANOG Governance

How NANOG is run

# Board of Directors



Leslie Daigle  
Board Chair



Vincent Celindro  
Vice Chair



David Siegel  
Treasurer



Cat Gurinsky  
Secretary/ PC Chair



Michael Costello  
Board Member



Steve Feldman  
Board Member



Tina Morris  
Board Member



Edward McNair  
Member/Exec Director

# Staff



Edward McNair  
Executive Director



Darriex "Dé" Harvey  
Meeting + Events  
Director



Valerie Wittkop  
Program Director



Claudia Bristol  
Controller + HR



Leigh Brooks  
Senior Designer



Elizabeth Drolet  
Marketing Content  
Creator



Shawn Winstead  
Bus. Development  
Specialist



Greg Newman  
Software Craftsperson

# NANOG Committees

- Program Committee (standing)
- Elections Committee
- Audit Committee
- Compensation Committee
- Mentorship Committee
- Education Committee
- Scholarship Committee

NANOG 75  
29th-31st Oct 2023



### Framework – GitHub/Jenkins/Ansible

- Initially deployed for Open Networking (Cumulus)
- Playbooks stored in GitHub for version control, change MGMT, and code/peer review
- Playbooks run from Jenkins for centralization, security, auditing, logs, etc. (logs all jobs and results to Splunk)
- Ansible and associated plugins/modules installed on Jenkins server

```
graph TD; GitHub[GitHub] --> Jenkins[Jenkins/Ansible]; Jenkins --> Splunk[Splunk]; Jenkins -- EAPI/CLI --> Arista[Arista]; Jenkins -- SSH --> Cumulus[Cumulus]; Jenkins -- Nitro API --> Citrix[Citrix];
```

# Program Committee

The "Heart" of the NANOG Experience



# Program Committee

- The Program is the very heart of NANOG.
- Made up of industry professionals, the PC is selected by the board.
- The PC self organizes and selects its own leadership.
- The PC reviews and selects talks submitted by NANOG's community to curate a program of the highest possible quality and relevance.

# Program Committee Updates

- In an effort to better serve our community, the PC has several sub-committees:
  - Keynote Speakers
  - Women in Tech
  - Moderators
  - Lightning Talks
  - Tutorials & Tracks
  - Hackathon
- This allows committee members with various types of expertise to focus their knowledge on specific areas important to the development of NANOG programming.

# Get involved on a broader scale

Participating on a broader scale helps ensure our future generations will get to enjoy the same benefits you have.

Ways to get involved at NANOG:

- **Vote:** Become a member to help shape NANOG's future.
- **Mentor:** The next generation of network engineers.
- **Teach:** The best way to reinforce your knowledge is to teach others.
- **Present:** Share your knowledge and experience with others.
- **Evaluate:** Serve on the Program Committee to help shape the NANOG program.
- **Sponsor:** Support NANOG's education and outreach programs, meetings and events.



# Outreach

Empowering people, and inspiring change.

# What's NANOG Outreach?

Education is central to NANOG's mission. Through outreach to colleges and universities, affiliate NOGs, and more remote tech communities, we're able to provide greater access to NANOG's tools, resources, and educational programming, which is designed and taught by industry professionals committed to the ongoing advancement of the Internet in North America.

# What is our focus?

NANOG Outreach programs are focused on three distinct areas of need:

- Industry education for networking professionals.
- Educational and career development for college + graduate students.
- Training within underserved regions of North America.

A photograph of three young adults standing outdoors on a university campus. On the left is a young woman with curly brown hair wearing a dark green sleeveless top. In the center is a young man with short dark hair wearing a blue denim button-down shirt. On the right is a young woman with long, wavy blonde hair wearing a white sleeveless top with a black collar and tie. They are all smiling and looking towards the camera. The background shows a grassy area, trees, and a modern building with large windows.

# NANOG College Programs

Scholarship winners • NCI

# NANOG 2021 Scholarships Recipients

## Abha Ahuja Scholarship – \$10,000

- Emma Beeler, University of Alaska Fairbanks. Major: Electrical Engineering.
- Lyndsey Tribbitt, University of Florida. Major: Computer Science.

## John Postel Scholarship – \$10,000

- Jon Cowart, Penn State University Park. Major: Electrical Engineering.
- Brandon Staple, University of Colorado Denver. Major: Computer Science.



# NANOG College Immersion (NCI)

- NCI was designed to give educators the opportunity to sponsor up to 5 students at a NANOG conference.
- At NANOG 85:
  - Howard University: 3 students + 1 professor
- At NANOG 86:
  - University of Colorado - Boulder: 5 students + 1 professor

A woman with glasses and a blue quilted jacket is standing at a podium, smiling and speaking into a microphone. She is the central focus of the image. In the background, a group of people are seated at tables, some looking towards her. The setting appears to be a conference or meeting room. The overall lighting is dim, with the woman's face and the microphone area being the brightest parts of the image.

# New Programs for 2022

Educational Program + Mentorship Program

# Educational Program

- Vendor-neutral courses developed and taught by knowledgeable Internet professionals.
- All courses are vetted by a committee of industry professionals; to assure that all content is relevant to current industry working standards.
- The courses are designed to aid students, junior engineers and career professionals advance their skills in a competitive marketplace.

# Mentorship Program

- Key to building the "Internet of tomorrow" is to engage and inspire those who will build tomorrow's Internet.
- Mentorship is an essential component of professional development.
- Mentees in our program will have the opportunity to be guided by seasoned industry professionals.
- Mentors and mentees will be paired at NANOG conferences, create a personalized mentorship program to help the mentee achieve their goals.

# NANOG Ombuds

Confidential  
support for our  
community

[ombuds@nanog.org](mailto:ombuds@nanog.org)





# NANOG 87 Atlanta

Program Highlights

# Elad Nafshi

**Monday's Keynote Presentation**

**"The Future is Now: Delivering the Next  
Generation Brilliant Network"**

**Today at 10:15 am EST**





# Michael Bailey

**Tuesday's Keynote Presentation**

**"Professor, School of Cybersecurity and Privacy at the Georgia Institute of Technology"**

**Tuesday at 10:15 am EST**

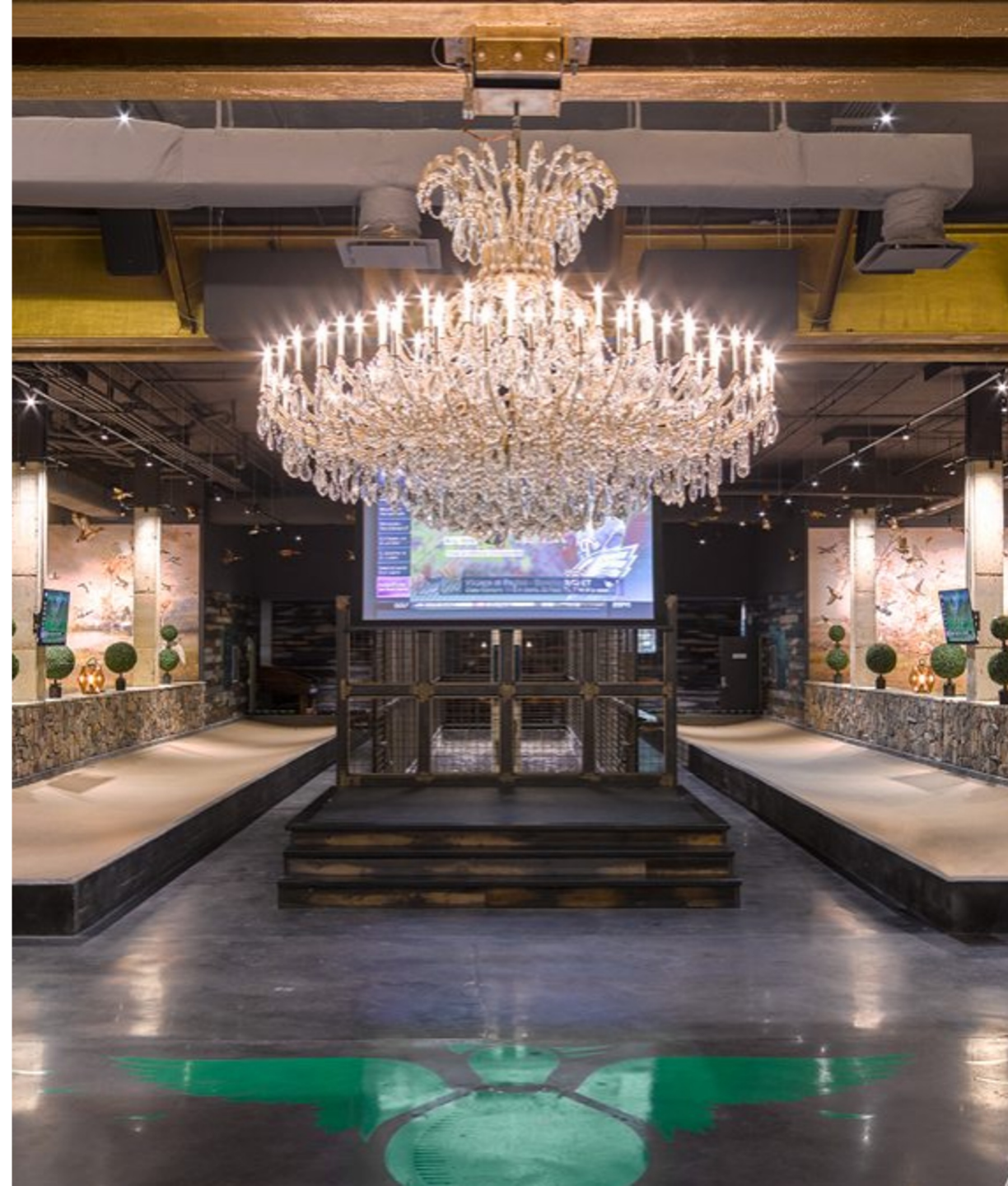


# The Painted Duck

Monday's Social Event

976 Brady Avenue  
Atlanta, GA 30318

Tonight at 7:00pm - 10:00pm EST





# Beer 'n Gear

**See the latest Gear + Services**

**Tuesday 6:00pm to 8:00pm EST**

# Velvet Underground at the Hard Rock Cafe

**Tuesday's Social Event**

**215 Peachtree Street NE  
Atlanta, GA 30318**

**Tuesday at 8:00pm - 10:00pm EST**



A photograph of three people, two men and one woman, sitting around a laptop. They are all smiling and looking towards the camera. The man on the left has a beard and is wearing a dark hoodie. The man in the middle is wearing a plaid shirt. The woman on the right is wearing a dark hoodie. The background is slightly blurred, showing other people and what appears to be a hackathon environment.

# Thank you

We hope you'll join us in building the Internet of tomorrow.