

A photograph of three people smiling and posing for a photo at a social event. On the left is a man with a beard wearing a black t-shirt with a green graphic and a yellow lanyard with a NANOG badge. In the middle is a woman with curly hair wearing a dark turtleneck. On the right is a woman with long dark hair wearing a patterned scarf and a grey cardigan, also with a yellow lanyard and NANOG badge. They are all smiling warmly. The background is a dimly lit room with other people and warm lighting.

Welcome to NANOG 85

Montréal, Canada

6 – 8 JUN 2022



olling Plugin

a Generic NAPALM polling plugin
NAPALM pe_interfaces_counters method to poll counters
this transform to convert interface related counters into table
NAPALM pe_neighbors method to poll neighbor related data

NANO^G®

North American Network Operators' Group

Working together, to build the Internet of tomorrow ®



NANO^GTM

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 professional or educational setting, possibly a workshop or meeting. The background is slightly blurred, showing other people and what looks like a presentation board.

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, another man in a blue t-shirt with "#fiberiscom" on the back is visible. The room is dimly lit with warm tones.

NANOG Governance

How NANOG is run

Board of Directors



Tina Morris
Board Chair



David Siegel
Vice Chair



Vincent Celindro
Treasurer



Steve Feldman
Secretary



Benson Schliesser
Board Member



Cat Gurinsky
Program Committee Chair



Edward McNair
Member/Exec Director

NANOG Staff



Edward McNair
Executive Director



Darrioux "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

NANOG Committees

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

NANOG 75
SAN FRANCISCO



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]; Jenkins --> Smile[😊]
```

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
 - Outreach Programs
 - 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.

A woman in a red jacket and a man in a cap are looking at a laptop in a busy office setting. The woman is typing on the laptop. The man is looking at the screen. In the background, other people are working at desks with laptops. The scene is dimly lit, suggesting an indoor office environment.

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 college students standing outdoors on a grassy area. 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 ties. They are all smiling and looking towards the camera. The background shows a modern building with large windows, trees, and a few people sitting on a bench in the distance.

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) students

- NCI was designed to give educators the opportunity to sponsor up to 5 students at a NANOG conference.
- At at NANOG 84:
 - Ball State University: 4 students + 1 professor
- At NANOG 85:
 - Howard University: 3 students + 1 professor

A woman with glasses and a blue quilted jacket is speaking at a podium with a microphone. She is smiling and looking towards the audience. The background shows a blurred audience of people sitting at tables, some with laptops and water bottles. The overall scene is a professional event or conference.

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





NANOG 85 Program

Program Highlights

Join us at this
mornings
Keynote
Presentation!

Building remotely
during a pandemic.
Google's network
investments in
Africa: the Equiano
subsea cable

Sylvie LaPerrière



Featured Presentations

- Global NOG Alliance Task Force: Keep Ukraine Connected - René Fichtmüller + Jan Zorz
- Celebrating the 10th Anniversary of World IPv6 Launch - Scott Hogg
- Panel: World IPv6 Reunion Tour 2022
- Keynote: Building remotely during a pandemic. Google's network investments in Africa: the Equiano subsea cable - Sylvie LaPerrière
- Panel: Women in Executive Leadership: Challenges and Opportunities

Peering Coordination Forum

- The Peering Coordination Forum is 90-minutes in length.
- The forum provides time for attendees to meet and network with others in the peering community present at NANOG.
- The peering forum is a round-robin event that can be described as "speed dating" for network peering.

NANOG Social Event

Location: Bier Markt

Address: 1221 René-Lévesque Blvd W
Montréal, Quebec



Tonight from 7p – 10p

Sponsored by
Montreal Internet Exchange + Team Cymru

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 workshop or office environment.

Thank you

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