RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Introduction To…

GREEN TECH HACKATHON
10 - 11 December Amsterdam 2024

Vesna Manojlovic

BECHA@ripe.net

Starting with gratitude

- **Big thanks to:**

  - Programme Committee / Orga Team

  - RIPE NCC Colleagues

  - Local Hubs!

  - Speakers on 3-12-2024!

- **… and of course ALL OF YOU: THE PARTICIPANTS!!!**

  - and to your families who are giving you support to prepare, work, have fun, travel & recover :)

Orga Team

- Noelle Starliper, Events Coordinator, RIPE NCC

- Michael Oghia, ICT sustainability advocate (Digital infrastructure liaison)

- Mallory Knodel, CTO, Center for Democracy and Technology
  (Digital Rights and standardisation bodies liaison)

- Shane Kerr, Software Developer, IBM (FLOSS and DNS liaison)

- Claudia Borges, Green Computing Advocate (Artists, Hackers and Activists liaison)

- Chris Buckridge, Consultant (Internet Governance communities liaison)

- Catalina Mueller, Visiting Lecturer Esslingen University (Online Facilitator)

- Vesna Manojlović, Community Builder, RIPE NCC (NOGs and academia liaison)

What is a Hackathon?

- Hack-a-thon = hacking marathon

hacker: n.

[originally, someone who makes furniture with an axe]

1. A person who enjoys exploring the details of programmable systems and how to stretch their capabilities, as opposed to most users, who prefer to learn only the minimum necessary. RFC1392, the *Internet Users' Glossary*, usefully amplifies this as: A person who delights in having an intimate understanding of the internal workings of a system, computers and computer networks in particular.

- "Ours" are different from the "usual"; we are:

  - Cooperative, collaborative, non-competitive

  - Non-commercial: no monetary rewards

  - Producing & **using FLOSS** (free/libre open source software)

RIPE ATLAS HACKATHON:
MOST FUN I HAD AT RIPE SINCE CANALS FROZE

RIPE NCC HACKATHONS
SO SHARING, VERY FUN, WOW

Previous RIPE NCC Hackathons

- RIPE Atlas DataViz (March 2015, Amsterdam)

- RIPE Atlas Tools for Operators (October 2015, Bucharest)

- RIPE Atlas Interfaces (April 2016, Copenhagen)

- IXP Tools (October 2016, Madrid)

- IXP Tools Code-Sprint (April 2017, Amsterdam)

- DNS Measurements (April 2017, Amsterdam)

- Version6 (November 2017, Copenhagen)

- Network Operators Tools (June 2018, Dublin)

- (first) Quantum Internet Hackathon (October 2018, Amsterdam)

- RPKI Deployathon (March 2019, Amsterdam)

- IoT Hackathon (October 2019, Rotterdam)

- Pan-European Quantum Internet Hackathon (2019)
    - https://labs.ripe.net/author/becha/results-of-the-pan-european-quantum-internet-hackathon/

- Virtual Hackathon (March - May 2020)
    - https://labs.ripe.net/author/becha/report-from-the-first-virtual-ripe-ncc-hackathon/

- RIPE Atlas SW Probes Deployathon (2020)
    - https://labs.ripe.net/author/becha/report-from-the-ripe-atlas-software-probes-deployathon/

- Quantum Internet Hackathon 2022
    - https://labs.ripe.net/author/anastasiya-pak/your-quantum-internet-hackathon-report-for-2022/

- DNS Hackathon 2023
    - https://labs.ripe.net/author/becha/connected-to-port-53-a-report-from-the-dns-hackathon-2023/

General Goals for Our Hackathons

- Since 2014:

  - Bringing together network operators, students, researchers, designers, software developers hackers…

  - Combining creative skills

  - Getting feedback about services

  - Contributing useful tools for the community

  - Making new connections

  - Having fun!

- *https://labs.ripe.net/author/becha/hackathons-are-awesome/*

- Aligned with Strategic Goals:

  - *"Support the innovation and evolution of the Internet"*

  - *"Support an open, inclusive & engaged RIPE Community"*

  - *"Be a centre of excellence for data, measurements and tools that provide insight on the Internet and its operations."*

  - *"Increase adoption of routing security best practices"*

Specific "Green Tech" Goals / Criteria

- Selected projects should aim to reach following goals:

  - Reducing harmful environmental impact of "digital tech"

  - Considering full lifecycle environmental impact (all scopes)

  - Focusing on Internet infrastructure ; other "layers" are less significant (but acceptable)

- Stretch Goals

  - Reparations & solidarity: giving back to the most affected / marginalized communities

  - Promoting actions that benefit all living beings and the planet, beyond human-centrism

Cooperation, not Competition!

- Showcasing & celebrating **all achievements** at the closing session

- All results will be promoted at next events & at RIPE Labs

- Several projects will be awarded symbolic prizes for:

  - "Most Innovative Solution" / "Best Team Work" / "Most Complete Presentation" / "Potential to Develop Further after the Hackathon" & …

Desired Outcomes

- Not only new software tools!

  - Also: patches / bug fixes for existing tools; "greening"; adding documentation

- Data analysis, research papers, IETF drafts, BCP documents…

- Art, design, solar-punk stories, hardware hacks…

- Non-product oriented:

  - Partnerships, Mentoring, Cross-Connections

  - Facilitating access to funding

  - Opportunities for presenting the projects at events

Some of the Proposed Projects

- develop best-practice documentation around tuning a Linux system for low power usage

- code and documentation to run BIND with "ecofloc" for energy measurements

- investigating permacomputing and degrowth approaches to internet infrastructure

- algorithm for real-time traffic flow adjustments to reduce energy consumption

- solar powered e-paper sign post display

- Wikimedia based documentation in form of Wikidata, media pages, knowledge graph

- contribute to "beyond carbon" IETF draft (e.g. water used by data centers …)

- decrease e-waste by building solar batteryless devices which rely on ambient energy for their operation and use hybrid supercapacitors for electricity storage

Contributing to IETF / IRTF / IAB

- https://datatracker.ietf.org/group/eimpact/about/

- https://datatracker.ietf.org/group/green/about/

- https://www.irtf.org/gaia.html

- https://wiki.techinc.nl/Sustainability#IETF_documents

  - https://datatracker.ietf.org/doc/draft-almprs-sustainability-insights/

  - https://datatracker.ietf.org/doc/draft-eckert-ietf-and-energy-overview/

  - https://datatracker.ietf.org/doc/html/draft-cparsk-eimpact-sustainability-considerations-07

"Amsterdam Vision on AI"

How do we not want to look at the development of AI?	How do we want to look at the development of AI??
Technology central	Human central
Technology is neutral	Technology is value-loaded
Everything must be done in the most efficient way possible	Public values are central to the city
Technology defines you	Technology in which you decide
With technology, you can solve anything	Systemic problems are amplified by technology
AI getting smarter than humans	AI can never replace human intelligence

https://www.amsterdam.nl/innovatie/amsterdamse-visie-ai/

Inspirational Talks, Intro Webinar

- "Making digital sustainability sustainable", by Hannah Smith

- ">Juice Sucking Servers< , and how you can make them more efficient", by Axel Roast

- "Green Tech Digital Innovation Competition accompanying research", by Dr. Stefanie Kunkel

- Mini-report: https://github.com/user-attachments/files/18039757/webinar-summary-landscape-green-tech-hackathon-xs.pdf

Is it to get to these kind of goals?

Digital exists to regenerate society

Backwards compatibility forever

We only need one device for life

CREATIVE PRACTICE COMPETENCY FRAMEWORK

We need to make more space for stories and play in our work.

Play

Digital sustainability

Power

nodejs   PHP   java   swift

Watt

90

67.5

45

22.5

0

0   300   600   900   1500   3000   6000   9000

concurrent requests
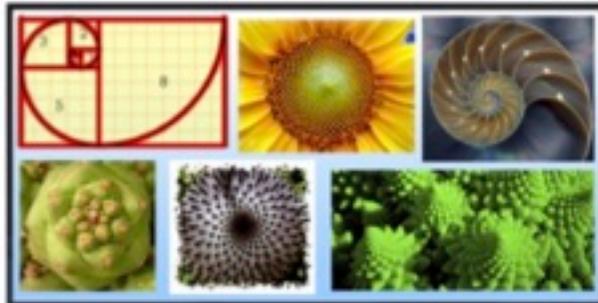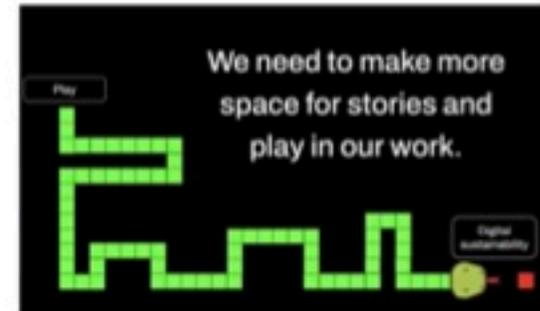
Acknowledgements

- full Docker container code at : https://gitlab.com/axelfuhr.serverbench
- java benchmark: Gerard de Leeuw (ColoClue)
- php help: Jelle Luteijn (ColoClue)
- https://tech.phlux.us/Juice-Sucking-Servers/ (#1, #2, #3)

@axelfo@hari.social

@axel.amsterdam

GreenTech

„Green" - Facets of environmental sustainability
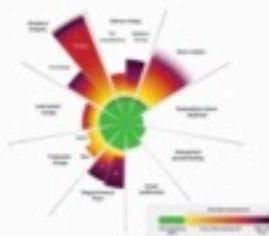
Status of „planetary boundaries"
Source: Richardson et al. (2023)

GreenTech

Two types of environmental effects of digitalisation

Source: Adapted from Berkhout & Hertin (2001) & Erdmann et al. (2004)

Measures for each layer

1. **IT Services**: e.g., change default settings for customers to energy-saving modes
2. **Software**: e.g., use energy-efficient programming languages and prevent hardware obsolescence
3. **Data centres**: e.g., use environmentally certified data centre operators
4. **Networks**: e.g., choose efficient and parsimonious transmission networks
5. **Hardware**: e.g., use refurbished hardware

GreenTech

Hackathon Logistics
ONLINE

Communication Channels

- Chat Room : https://matrix.to/#/#green-tech-hackathon-2024:matrix.org
- Zoom : https://ripe.zoom.us/j/96001948149?pwd=gunQbNYlZtSpaiOKbNPoyHvPiF6lfm.1

- Document Store:
  - GitHub : https://github.com/RIPE-Atlas-Community/Green-Tech
  - Etherpad : https://etherpad.servus.at/p/GreenTechHackathonDecember2024-keep

- https://labs.ripe.net/author/becha/announcing-the-green-tech-hackathon/
- https://labs.ripe.net/author/becha/approaching-the-green-tech-hackathon/

Supporting Roles

- Logistics / Admin : **Noelle**

- Facilitators : on-line : **Catalina, Mallory**

- Local Hubs Hosts: **Andy&Christian**, Dublin; **Fontas:** Heraklion; **Desiree,** Belgrade; **Urban,** Ljubljana

- Facilitators : in person : in Amsterdam (& online)

  - **Chris, Claudia, Michael, Shane, Vesna**

- *PC/Jurors: (all facilitators)*

Logistics - Agenda: Day One (UTC-2)

- *Greek & Irish Local Hubs are one hour ahead/behind!*

- **09:00**-10:00 Registration, Logistics, Goals

- 10:00-11:00 introductions of people & projects
  - 11:00 - 11:30 forming of teams

- 11:30 - 17:30 Working on projects

- 17:30-**18:00** Wrap up / Stand-up:
  - Retrospective / review of progress / feedback / wishes for the next day

Logistics - Agenda: Day Two

- **09:00**-12:00 Hacking continues

- **12:00-13:00 Lunch**

- 13:00-17:00 Hacking finalizes & Presentation preparations

- 17:00-18:00 Project presentations (& awards)
  - *MAYBE WE'LL START EARLIER?!?! ————————> TBD*

Hackathon Content

Content - Practical Goals and Process

- Goal:

  - Presentation-ready "result" by 5PM on Wednesday!

  - For your SW project: working prototype (no need to have the beta or alfa release)

- Upload results / slides to GitHub or Etherpad

- Prepare final presentation / demo

  - not longer then 5 minutes!

Presentation : 5 slides, 5 minutes!

- **What**

  - project name

  - results (document, code, visuals?)

- **Why**

  - what did you want to achieve / solve

- **How**

  - what did you learn? what went well?

- **Who**

  - team members

- **Where next?**

Team Work

- Form teams of 3-8 people

- Choose interdisciplinary team members / most diverse possible

  - Choose one (or more) spokesperson(s), for the standup& for the final presentation

  - Divide roles: a time-keeper, a coder, a researcher, a documentation writer, an illustrator…

- Practically:

  - Take one of the available desks

  - Make up a **name** for the team and/or project

  - Make a time-plan for the work on the project; consider available time!

  - Divide the tasks into modules that can be parallelized

Best Behaviour

- **Cooperation & Team-Work**

  - get to know each other; be constructive; cooperate

  - the goal is to contribute, not to compete nor to win

- **Code of Conduct** (ripe.net/coc)

  - be tolerant & respectful; encourage exchange of ideas

  - do NOT be demeaning, intimidating or harming

  - if you feel hurt or offended, speak to organisers

  - respect wishes for privacy while taking photos (**GDPR!**)

Projects Pitches = Numbers Game!

- There is ~50 participants!
  - ~25 in Amsterdam, 3-5 in each of 2-3 local hubs (5-15), ~10 online

- There is 10-15 proposed project **ideas**

- Recommended team size is 3-8 people (5-6 on average)

- Recommended number of **chosen projects: <8**
  - 5 in Amsterdam, 1 in each Local Hub, 1-2 online (or hybrid!)

- Each project presentation will be 5 minutes max
  - 8x5minutes = 42 :)

Content - Criteria & Awards

- Jury will review the results/presentations, & award prizes

- Prizes are symbolic, and mostly sweet

- Summary of results will be presented at future events

Content

Available Data Sources

- RIPE Atlas data credits
- https://wiki.techinc.nl/Sustainability

Projects Proposals

- (See GitHub or Miro)

Available at FabLab (thanks, Waag!)

- Machines https://fablab.waag.org/
- Inventory: https://inventory.fabcloud.io/

Continuity is Crucial

- Paradox: Most hackathon work is done **outside** hackathons!

  - Results will be published on GitHub, to make it available for the community

  - … there will be more hackathons & other events (IETF = 3 times/year!)

- In the meantime

  - You can join the mailing list: hackathon-list@lists.ripe.net or forum.ripe.net

  - You can contribute further code improvements on GitHub

  - You can keep informed on RIPE Labs: labs.ripe.net/hackathons

- Join us at other events

- Other communities: *https://wiki.techinc.nl/Sustainability#Communities*

Prior Green Tech Topics

- e-impact IAB Workshop 2022

- Continuing from 2023:

  - DNS Hackathon: Greenish DNS project

  - Quantum Internet Hackathon: Research paper recommendation : making Quantum Hardware & Quantum Software more energy efficient & Cooperate with existing standardization bodies

- Green Tech Open House: October 2024

  - https://www.ripe.net/meetings/open-house/green-tech-and-sustainability-in-internet-technologies-2-oct-2024/

Next RIPE NCC Events

- DNS Hackathon : 15-16. March, Stockholm

  - (NETNOD, DNS-OARC, RIPE NCC)

- SEE-13 meeting, 7-8 April, Sofia : ripe.net/see-13

- RIPE90.ripe.net , May, Lisbon

  - RIPE91, October, Bucharest

- Calendar

- RIPE NCC is supporting newcomers through:

  - Academic Cooperation: ripe.net/raci

 - Fellowship programme: ripe.net/fellowship

Green Tech Events

- 1-2 february 2025, Brussels OFFDEM https://oxygen.offdem.net/pub/call-for-presence

- 12-14 March 2025 ; TU Dortmund University, CfP: A Climate of (De-)Civilization? Shifting Dynamics between Nature and Society https://us.sowi.tu-dortmund.de/en/reasearch/veranstaltungen/conference-a-climate-of-de-civilization/

- 15-16. March 2025, Bangkok, IETF Hackathon

- 8-12 June 2025 , Montreal, GreenNet 2025 Workshop https://icc2025.ieee-icc.org/program/workshops/ws11-fourth-international-workshop-green-and-sustainable-networking

- 17-18 June 2025, GreenTech Forum Brussels is the new Tech & Sustainability event: Maison de la Poste, Brussels, Belgium https://www.greentech-forum-brussels.com

- 24 - 27 June 2025 , Oslo, DeGrowth conferencehttps://isee-degrowth2025.no/calls-and-registration/call-for-special-sessions

- 19-25 July 2025, Madrid, IETF https://www.ietf.org/meeting/123/

- 20-28 July 2025, Finland; Nordic University Summer Session "Organizing for exnovation" https://www.nsuweb.org/

- Computing Within Limits https://computingwithinlimits.org/

Hackathon Logistics
AMSTERDAM

Powered by Stroopwafels!
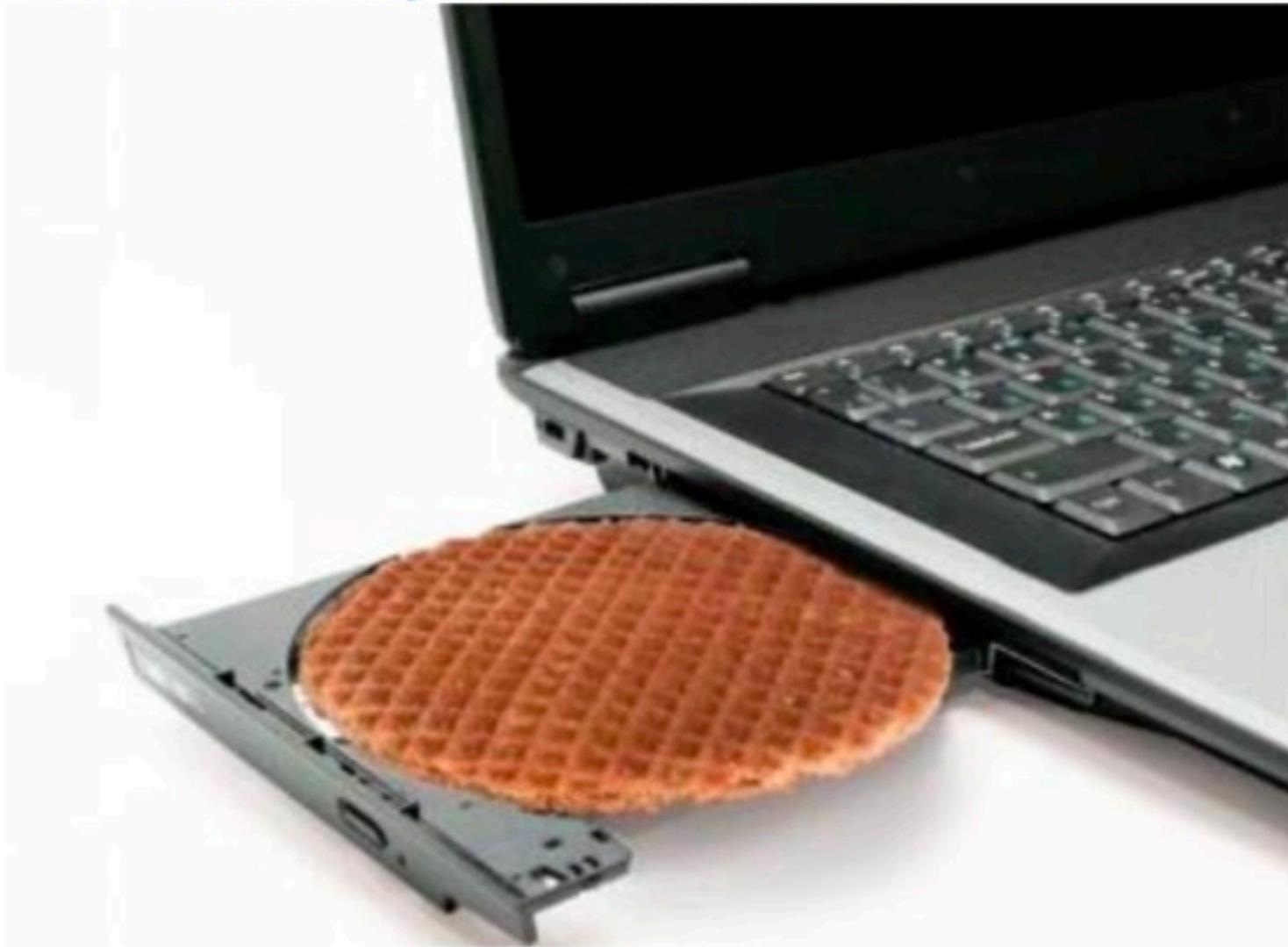
Logistics - What To Bring

- Bring your own:
  - power plugs (European / or converter)
  - charger for your laptop & phone
  - extension cord (if you have many devices / exotic plugs)

- Bring to share:
  - stickers for the "stickers exchange"!
  - zines!
  - Books to "show" or "exchange"
  - something sweet from your country (optional!)

#hackathon tradition: laptop stickers collections : colorful activism through design & puns #RIPE86

Logistics - Location

- Venue Address: <u>VolksHotel.nl</u>

- How to get there using public transport: <u>gvb.nl</u>

  - Vesna's number: **only** in case of emergency : +3162128191 Signal/Viber/SMS

- Rooms: Truus & Fransje + one side room/cabin

Logistics - food & drinks

- All day in the room:
  - Snacks, tea/coffee, soft-drinks
  - Special Coffee => Bar
- Lunch both days: provided
- Dinner Day One: Provided
  - *SocialHub (across the street)*
- Dinner Day Two
  - NOT provided
  - Only BORREL! *(In "Cafe" / VolksHotel)*
- Keep the space clean

☑ **QUESTION: Special Dietary Needs?!?**

☑ **QUESTION: ARE YOU JOINING??**
☑ **QUESTION: ARE YOU JOINING??**

Drinks & Foods Agenda: (UTC-2)

Day One

- **09:00**-10:00 Registration, Coffee, Logistics, Goals

- **13:00-14:00 Lunch (in shifts!)**

- 18:00-21:00 Dinner at Social Hub

Day Two

- **09:00 Morning tea/coffee**
- **12:00-13:00 Lunch**
- **18:00 Borrel**

What to Do in Amsterdam

- Light Festival *https://amsterdamlightfestival.com/en*

- Spa's *https://wiki.techinc.nl/User:Becha/spa*
- Nature Walks
- Wednesday evening: Hackerspace visit: TechInc.nl

- Friday evening: HackLab visit: LAGlab.nl
- Saturday & Sunday, Utrecht: *https://bakonline.org/en/making+public/program/climate+propagandas+congregation/*

Questions ?

Ending with gratitude

- **Big thanks to:**
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  - RIPE NCC Colleagues
  - Local Hubs!
  - Speakers on 3-12-2024!

- **… and of course ALL OF YOU: THE PARTICIPANTS!!!**
  - & visitors!!

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  - RIPE91, October, Bucharest

- Calendar

- RIPE NCC is supporting newcomers through:

  - Academic Cooperation: ripe.net/raci

  - Fellowship programme: ripe.net/fellowship

Stay in Touch!

- 18:00 - 21:00 Borrel

- Wednesday evening: Hackerspace visit: TechInc.nl

- Matrix: https://matrix.to/#/#green-tech-hackathon-2024:matrix.org

- Hackathons Calendar & Mailing list: https://www.ripe.net/meetings/hackathons/

- forum.ripe.net

- @ripencc@mastodon.social