



Annual Report
2023

Services Working Group

RIPE 88

Hans Petter Holen | May | RIPE 88

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Inside the RIPE NCC

WELCOME TO THE 2023 RIPE NCC ANNUAL REPORT

In 2023, our members sent us a clear signal by voting not to increase membership fees at the May 2023 General Meeting. This forced us to reconsider the way we do things and to optimise processes where necessary. We realigned ourselves with members' expectations and managed to spend only 37.3 million euros out of a budget of 40 million euros.

At the same time, we reorganised our technical departments, making us more agile, streamlining internal processes and improving response times. This year also saw significant changes in the management team, with Felipe Victolla Silveira becoming our new Chief Technology Officer and James Kennedy taking on parts of Felipe's former role as Chief Registry Officer.

We have also paid particular attention to strengthening our security processes by implementing a new architecture for RIPE NCC Access, improving the resilience of the Registry software and exploring ways to improve the overall resilience of RPKI. We also worked on a vulnerability management framework, improved cloud security and internal security awareness.

**Cost savings
37,3M vs Budget 40M**

**Reorganised Technical
Department**

Strengthen Security

Sanctions Compliance

Registry (RIR) system and the multi-stakeholder approach, organising multiple roundtables and bilateral meetings with governments and regulators to discuss Internet governance matters. In line with our belief that Internet number resources should not be subject to

and analysis with various government officials and regulators to help them make informed decisions about technical policy.

Regarding Learning & Development, the key focus of our curriculum development team

continued to work on sanctions. In this area, we confirmed to us that we introduced into our policy on Internet governance that we could lift from a number of members over time, we have encouraged members by granting

and information-technology new data-driven tools (e.g. RIPEstat, RIS) and podcasts. Topics include Internet interconnectivity, the future of the Internet and we collaborated with Wired, by sharing our data and we shared our data



HANS PETTER HOLEN
MANAGING DIRECTOR



ONDŘEJ FILIP
CHAIR OF THE
EXECUTIVE BOARD

was to improve the quality and user experience of our learning experiences, while keeping an eye on ensuring efficiency. We expanded our offering by increasing the number of in-person courses delivered and switched to a better and more widely available exam provider for our RIPE NCC Certified Professionals programme. With these efforts, we hope to better support our members and help them operate more efficiently.

In 2023, we also saw significant changes taking place even from our members and help us improve. We responded, and we saw an increase in the number of members connected to NCC's service community and that three-quarters of our members were satisfied with NCC's Executive Director's work with members.

Despite the difficulties, the number of wars and active conflicts in our service area at the time of writing, along with continuing difficult economic conditions due to rising costs, we are proud of what we achieved in 2023 and feel we are well-prepared for 2024. We're also pleased that we were able to stay within budget while keeping our most important asset intact - our dedicated

staff who are working with you to help shape the future of the Internet.

STRATEGIC OBJECTIVES/HIGHLIGHTS

Be resilient in the face of political, legislative and regulatory changes that have the potential

- Deployed monitoring and fallback RRDp infrastructure outside AS3333.

Be a centre of excellence for data, measurements and tools that provide insight on the Internet and its Operations

- Increased focus on publishing data-driven stories

1	Support an open, inclusive and engaged RIPE community
2	Operate a trusted, efficient, accurate and resilient Registry
3	Enable our members and community to operate one secure, stable and resilient global Internet
4	Maintain a stable organisation with a robust governance structure
5	Attract engaged, competent and diverse staff

Secure Internet number resources by **developing and operating a resilient, externally auditable and secure Resource Certification**

Trust Anchor and promote RPKI usage

- Explored ways to improve the overall resilience of RPKI.
- Achieved full coverage of the critical parts of our application with end-to-end and API tests.

ISO/IEC 27001 framework.

- Developed a vulnerability management framework, made cloud security enhancements and ran an internal security awareness programme.

Maintain a healthy organisational culture with engaged staff aligned with the organisational values

- Internal reorganisation of technical departments made us a bit more agile and aligned.
- James joined as Chief Registry Officer and Fel took over as Chief Technology Officer.

Other points

- **Charging Scheme Consultation**

- 2024 Charging Schemes consultation. Vote to maintain the 2023 Charging Scheme. Save money where possible (37.3M spent vs 40M budgeted).

- **RIPE NCC 2023 Survey**

- Ratings of satisfaction have remained largely unchanged from 2019, with 92% continuing to rate the quality of the RIPE NCC's service delivery as either good or excellent.
- The Net Promoter Score (NPS) for the RIPE NCC is +43. This is a very positive score, with results showing that over half of respondents (54%) are extremely likely to speak highly of the RIPE NCC to others.
- Around three-quarters are satisfied with the RIPE NCC's Executive Board leadership, engagement with members, general meetings and information.

- **Outreach**

- Organised RIPE 86 in Rotterdam and RIPE 87 in Rome, as well as four regional meetings

Charging Scheme Consultations:

No Change Vote

Survey

Service Quality: 92%

NPS 43

RIPE NCC EXECUTIVE BOARD



FROM LEFT TO RIGHT: **JOB SNIJDERS** (MEMBER), **ONDŘEJ FILIP** (CHAIR), **RAYMOND JETTEN** (TREASURER), **MARIA HÄLL** (MEMBER), **REMCO VAN MOOK** (MEMBER), **HARALD A. SUMMA** (MEMBER), **PIOTR STRZYŻEWSKI** (SECRETARY)

RIPE NCC MANAGEMENT



TOP ROW, FROM LEFT TO RIGHT: **SIMON-JAN HAYTINK** (CHIEF FINANCIAL OFFICER), **ELEONORA PETRIDOU** (CHIEF INFORMATION SECURITY OFFICER), **HISHAM IBRAHIM** (CHIEF COMMUNITY OFFICER), **CAROLIEN VOS** (CHIEF HUMAN RESOURCES OFFICER), **FELIPE VICTOLLA SILVEIRA** (CHIEF TECHNOLOGY OFFICER)

BOTTOM ROW, FROM LEFT TO RIGHT: **JAMES KENNEDY** (CHIEF REGISTRY OFFICER), **ATHINA FRAGKOULI** (CHIEF LEGAL OFFICER), **DANIELLA COUTINHO** (SENIOR EXECUTIVE ASSISTANT TO THE MANAGING DIRECTOR), **HANS PETTER HOLEN** (MANAGING DIRECTOR)



HIGHLIGHTS OF THE YEAR



MEMBERSHIP OVERVIEW

All numbers are as of 31 December 2023. Please note that one member can hold more than one LIR.

20,077

Total number of active members

21,568

Total number of active LIRs

967

New LIRs

119

Member countries

15,281

Members with an IPv6 allocation

TOP 10

MEMBERS BY COUNTRY

DE	2,220
GB	2,031
RU	1,489
FR	1,248
NL	1,151
IT	1,138
ES	954
CH	713
PL	676
TR	543

TOP 10

NEW MEMBERS BY COUNTRY

GB	78
DE	65
IR	41
NL	41
RU	40
FR	38
IT	31
TR	27
ES	26
US	23

TOP 10

LIRS BY COUNTRY

DE	2,325
GB	2,160
RU	1,671
FR	1,349
NL	1,258
IT	1,193
ES	1,009
CH	744
PL	711
IR	639

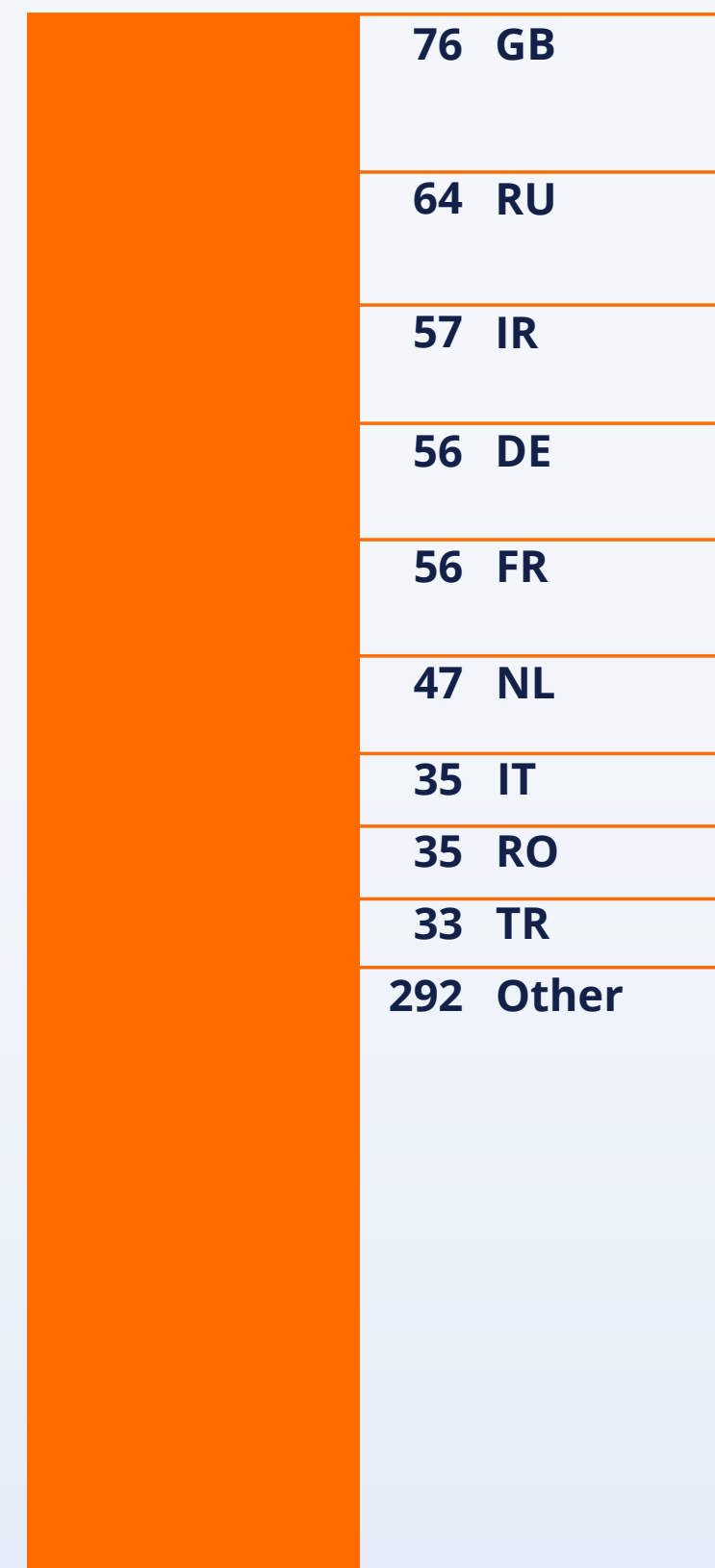


The Registry

INTERNET NUMBER RESOURCES OVERVIEW

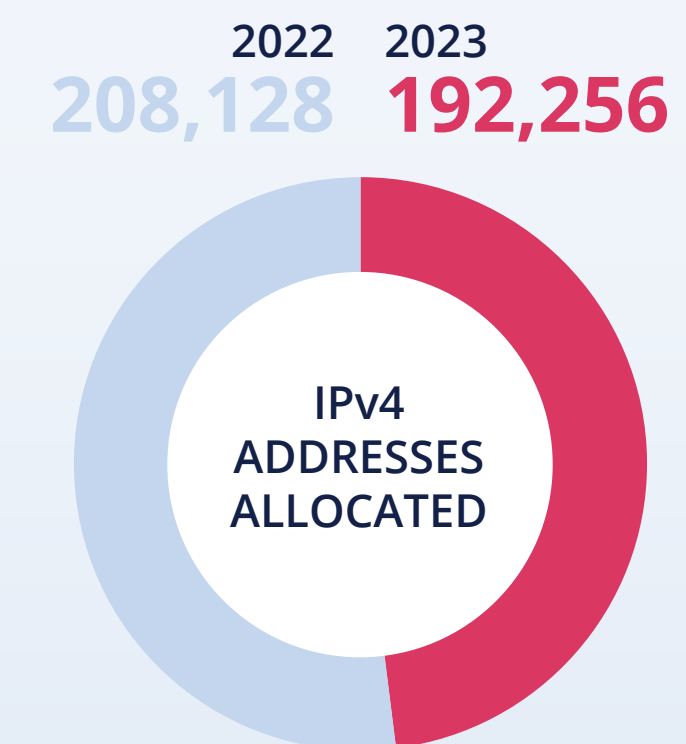
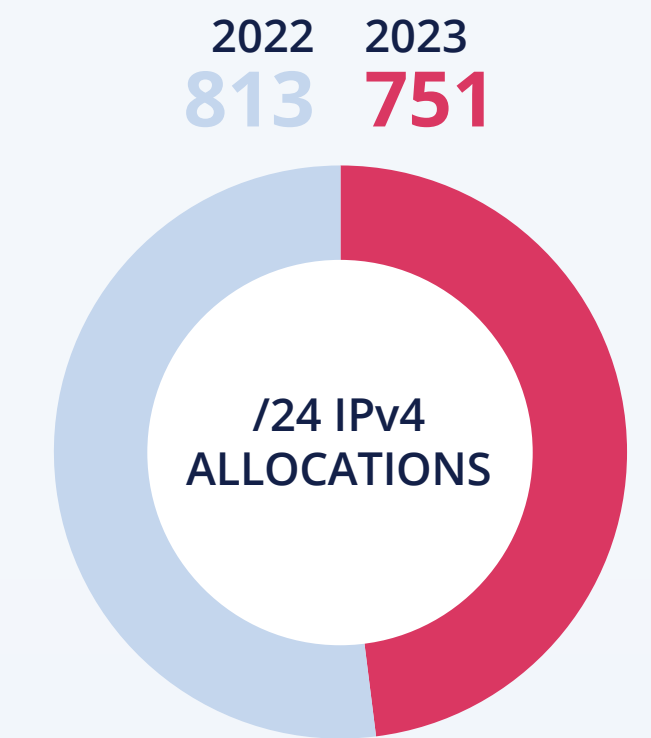
All numbers are as of 31 December 2023.

IPv4 /24 ALLOCATIONS BY COUNTRY



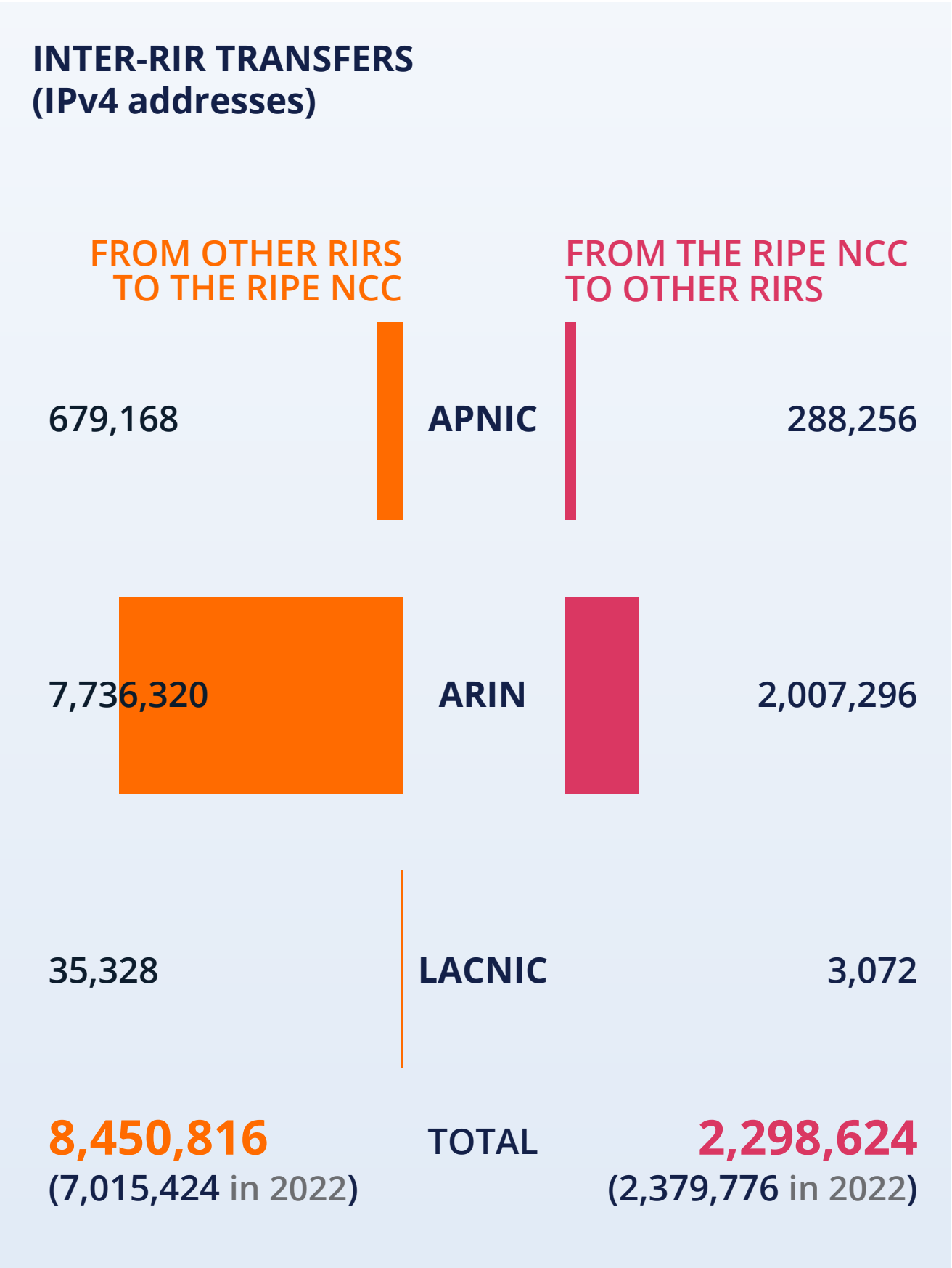
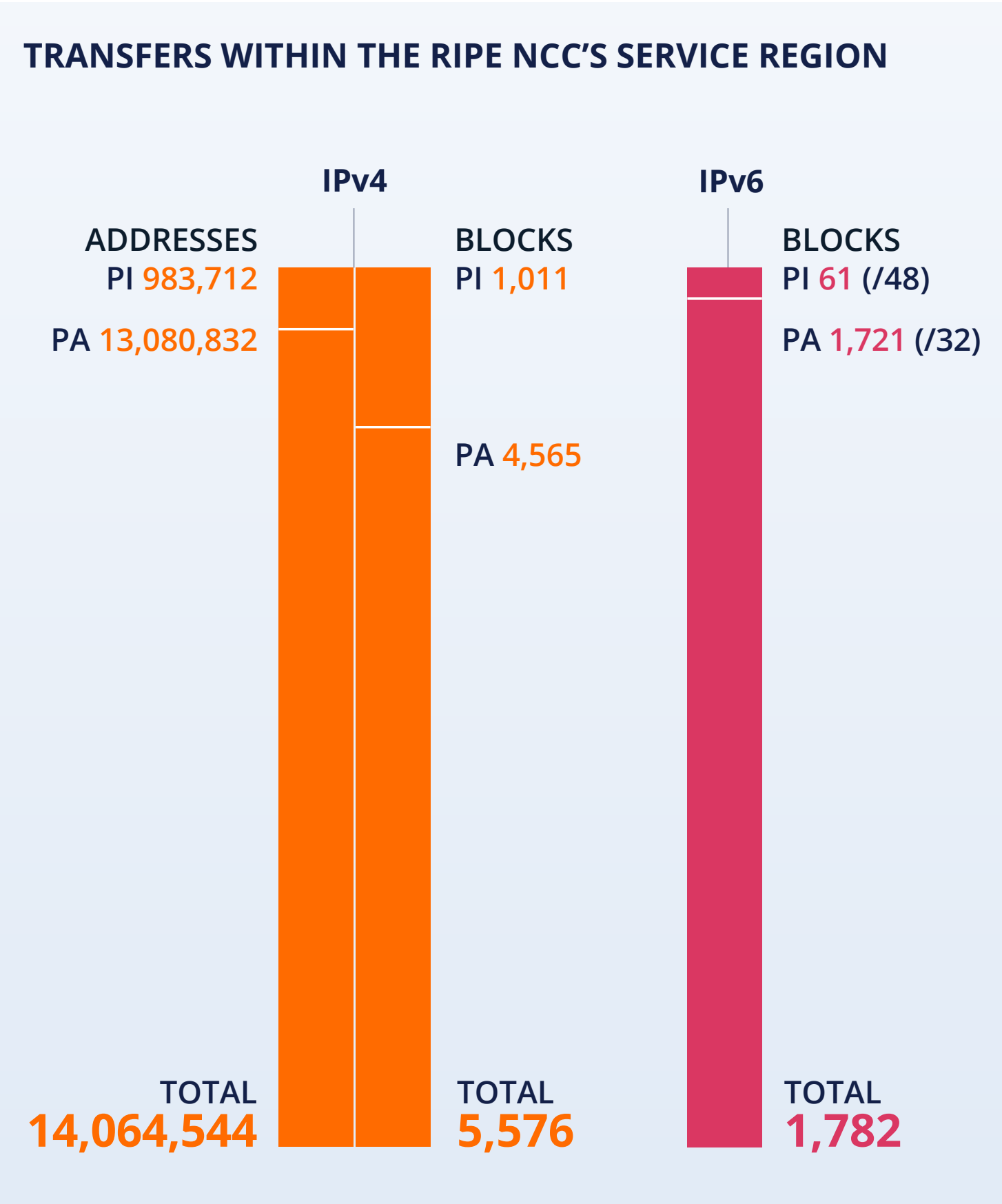
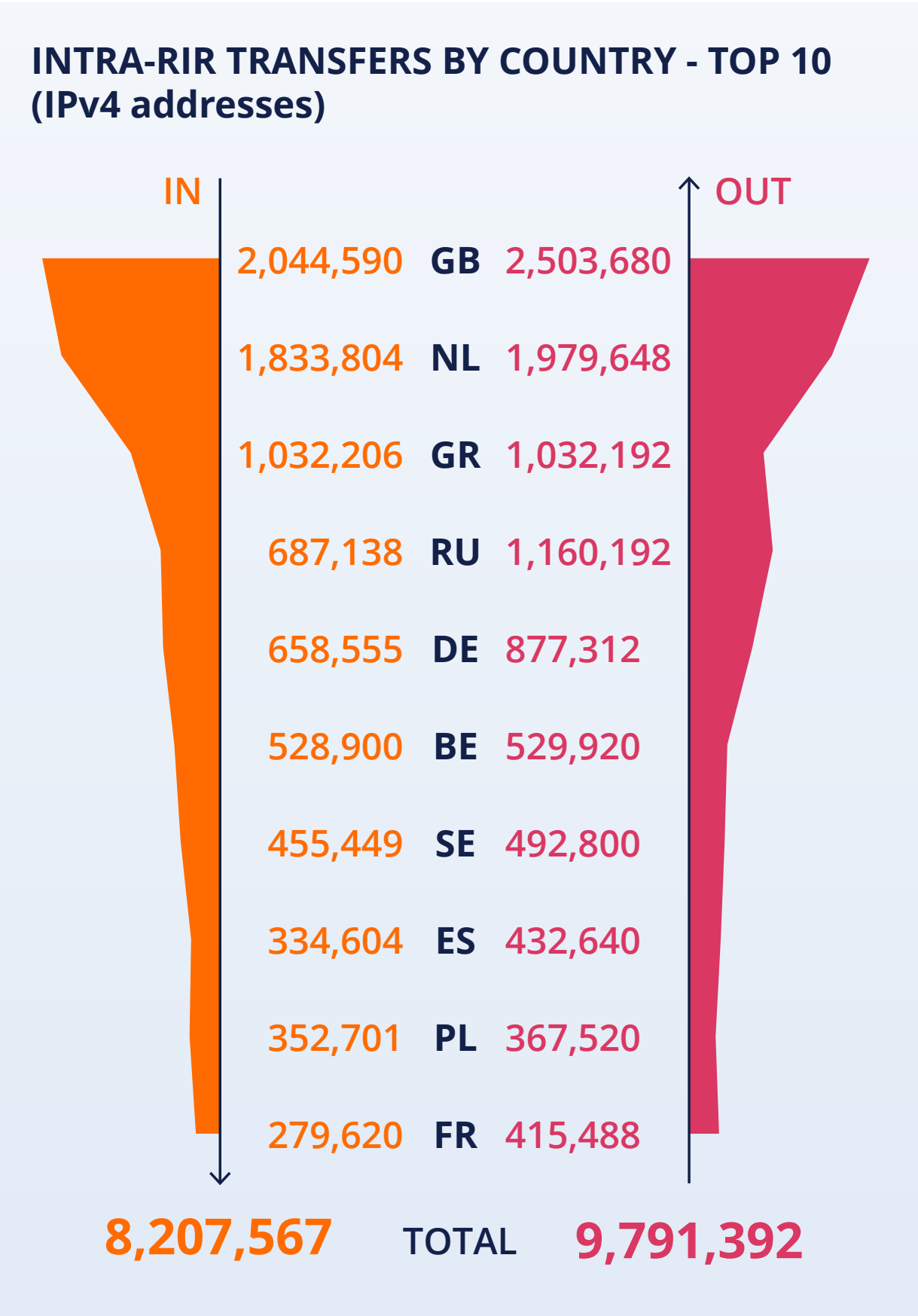
ALLOCATIONS AND ASSIGNMENTS

IPv6 1,219	0 IPv6 anycast assignments
	0 IPv6 temporary assignments
	25 IPv6 assignments to IXPs
	76 IPv6 allocation extensions
	227 IPv6 PI assignments
	891 IPv6 allocations
IPv4 795	13 IPv4 temporary assignments
	31 IPv4 assignments to IXPs
	751 /24 allocations
ASNs 2,309	0 temporary 32-bit assignments
	1 temporary 16-bit assignments
	446 16-bit assignments
	1,862 32-bit assignments



TRANSFERS OVERVIEW

Here is an overview of resource transfers between the RIPE NCC and other RIRs, and within the RIPE NCC service region. The figures below include policy transfers and other changes that move resources, such as mergers and acquisitions.



RIPE REGISTRY ACCOUNTABILITY

ASSISTED REGISTRY CHECKS (ARCs)

Assisted Registry Checks are how we help members ensure their data is accurate and up to date. We provide personalised support over a call or in person at events to help members correct any inconsistencies. Our goal is to constantly strengthen the quality of data in the registry. During an ARC, among other things, we check an LIR's legal name, address and contacts, IPv4 and IPv6 resources registered, and whether their BGP announcements are consistent with the Routing Registry.

[READ MORE](#)

ABUSE-C: VALIDATION

In 2023, we continued to implement the Abuse Contact (abuse-c) management policy and validated 84,868 email addresses. 649 of those required manual intervention.

[READ MORE](#)

IN 2023

2,340 ARCs completed

149,228

abuse-c ROLE objects created and/or updated

84,868

email addresses validated

84,219

validated using automated process

649

required manual intervention

REPORTS AND INVESTIGATIONS

REPORTS RECEIVED VIA THE ABUSE FORM

TOTAL
416

ABUSE-C VALIDATION INVESTIGATIONS

TOTAL
2,503

910 LIR resources

853 LIR

740 End Users

SECURITY INCIDENTS

Security incidents are detected on the basis of audits performed, alerts from our network intrusion detection system and external reports.

INFORMATION SECURITY INCIDENTS

IN 2023

- 0** Crisis (Priority 1)
- 0** Major Incident (Priority 2)
- 2** Unexpected Incidents (Priority 3)
- 1** Incident (Priority 4)

INFORMATION SECURITY REPORTS

We encourage the reporting of vulnerabilities in line with our Responsible Disclosure Policy.

IN 2023

- 516** Security-related reports received
- 95** Reports were relevant

[READ MORE](#)

HIJACK INVESTIGATIONS

IN 2023

- 201** Hijack investigations
- 12** Due diligence warnings
- 8** Disputed transfers

RIPE DATABASE UPDATES

Here are some of the updates we made to the RIPE Database in 2023:

IMPLEMENTED

NWI-12 “NRTMv4” server-side

NWI-14 “Protecting References to Objects in the RIPE Database”

NWI-19 “AS-SET for RIPE-NONAUTH source”

Support of greylisted responses in abuse-c email validation

Support for HTTP basic authentication in Whois REST API

Support of Client Certificate Authentication in Whois REST API

IMPROVED

Removed NWI-13 prefix validation on “geofeed:” attribute

Made the RIPE Database web application open source

Migrated the RIPE Database documentation to its own website

Switched Full Text Search engine to Elasticsearch

Improved Full Text Search API and documentation

Unlocked resources (set default maintainer on 438 ASSIGNED PA and 13 LEGACY resources)

RDAP improvements

Cleanup of “remarks:” attributes

RPKI

RPKI is a certification system that network operators can use to establish that they are the legitimate holders of specific IP resources.

As such, it plays an important role in BGP security, since it allows network operators to determine the authenticity of BGP announcements and route accordingly. As a Certification Authority, the RIPE NCC issues these certificates to resource holders and guarantees their authenticity.

[READ MORE](#)

IN 2023

We achieved full coverage of the critical parts of our application with end-to-end and API tests.

We deployed monitoring and fallback RRDp infrastructure outside AS3333.

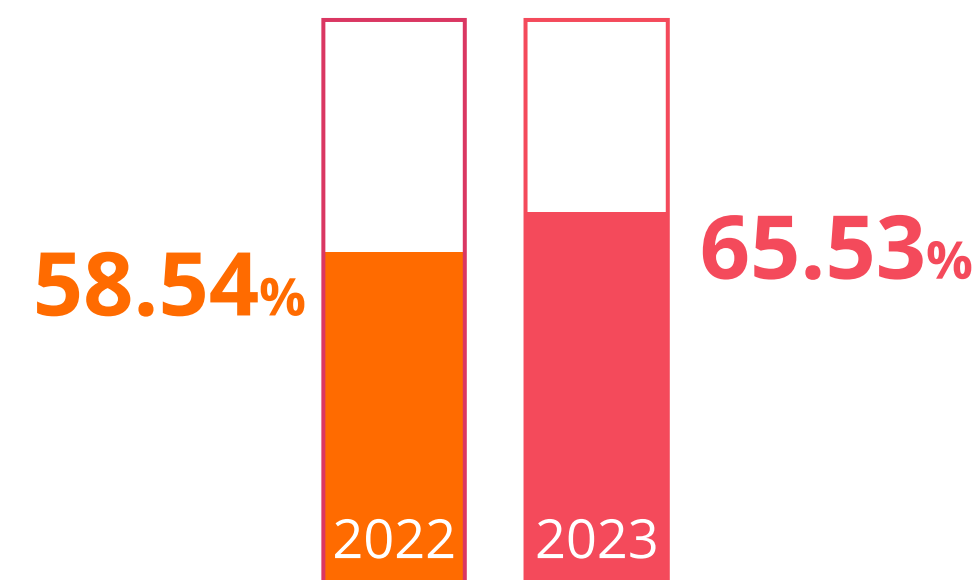
We increased our rsync capacity by building and deploying rsync infrastructure that uses RRDp as a source of truth.

We migrated all our virtual machine infrastructure to a newer operating system.

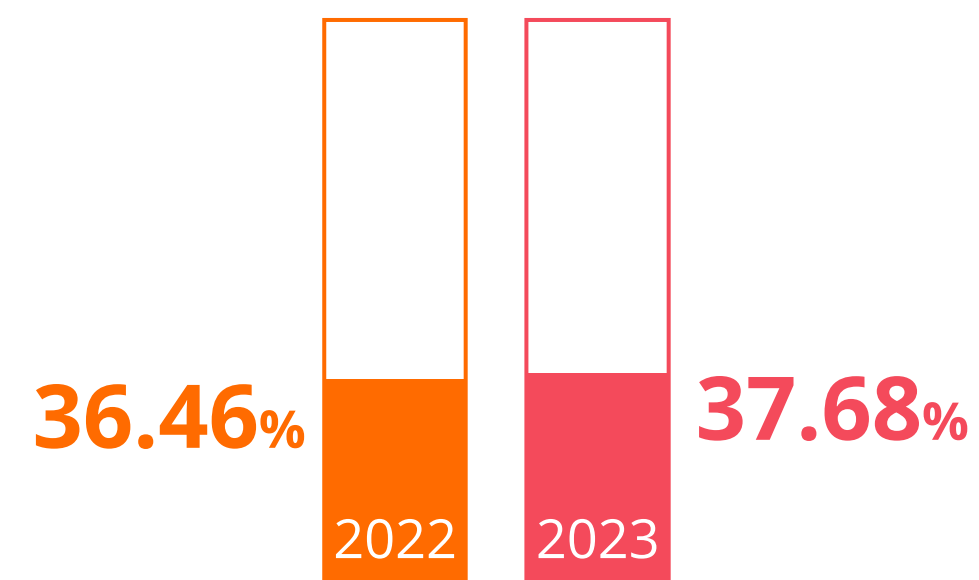
We built a new RPKI dashboard based on user feedback that is now undergoing user tests.

We prepared and tested a migration to new online HSMs (to be deployed in Q1 2024).

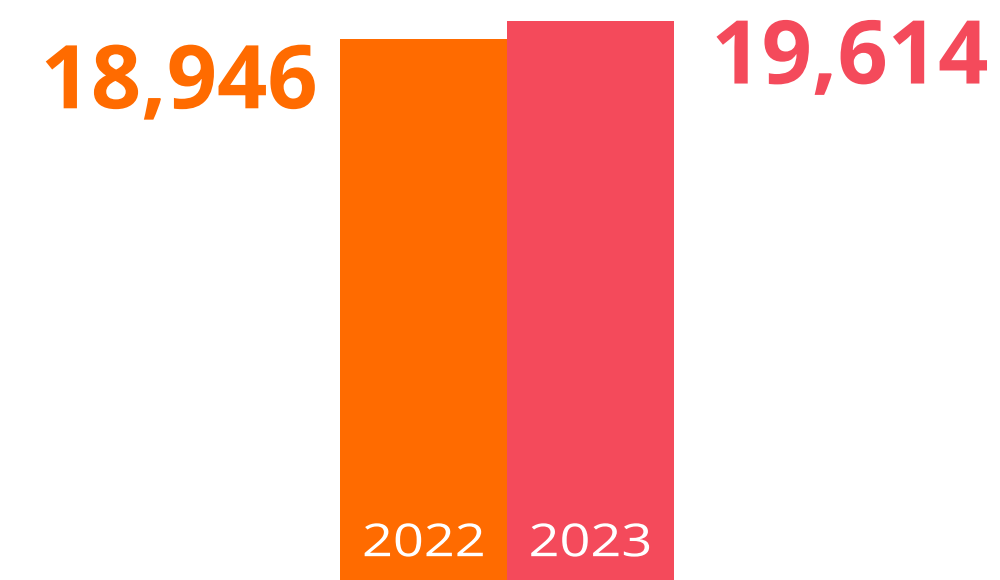
ROA COVERAGE - IPv4



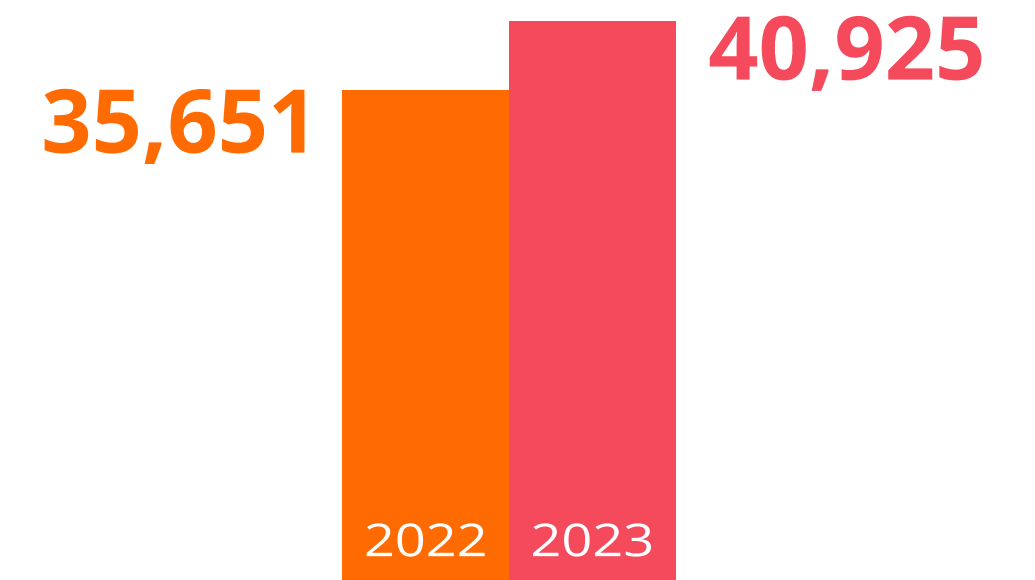
ROA COVERAGE - IPv6



RPKI CERTIFICATES



ROAs

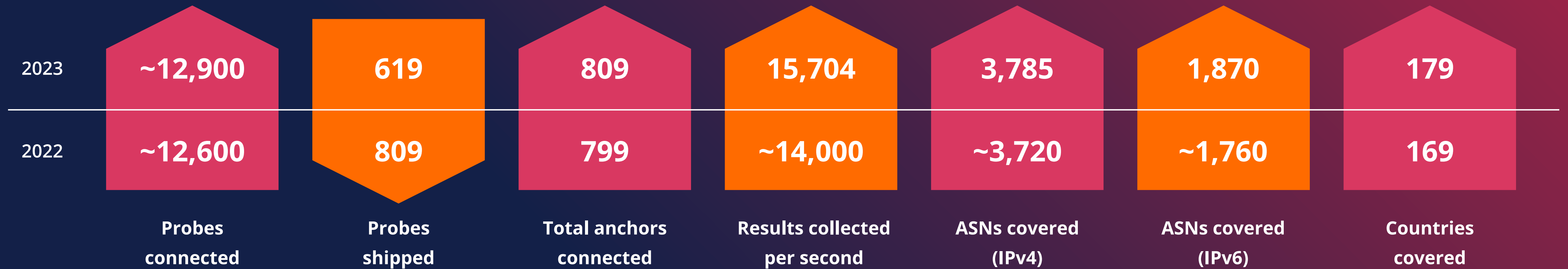




Information Services



RIPE ATLAS PROBES AND ANCHORS



RIPE ATLAS

RIPE Atlas is a leading Internet active measurement network that collects unique data, providing both live and historical information about networks' reliability, reachability and connectivity.

In 2023, the network continued growing modestly with a combination of hardware and software probes, as well as increased coverage of ASNs and countries. Work on the probe firmware packaging, as well as on the infrastructure development efforts, continued throughout the year. In particular, we implemented a number of service quality improvements, and we made progress on stabilising and renewing the results storage backend. We expect this work

to lead to a more stable and cost-effective system in 2024. The user interface went through a number of modernisations and visible changes, and we expect that further major improvements will be released throughout 2024 as well.

[READ MORE](#)

DNS AND K-ROOT

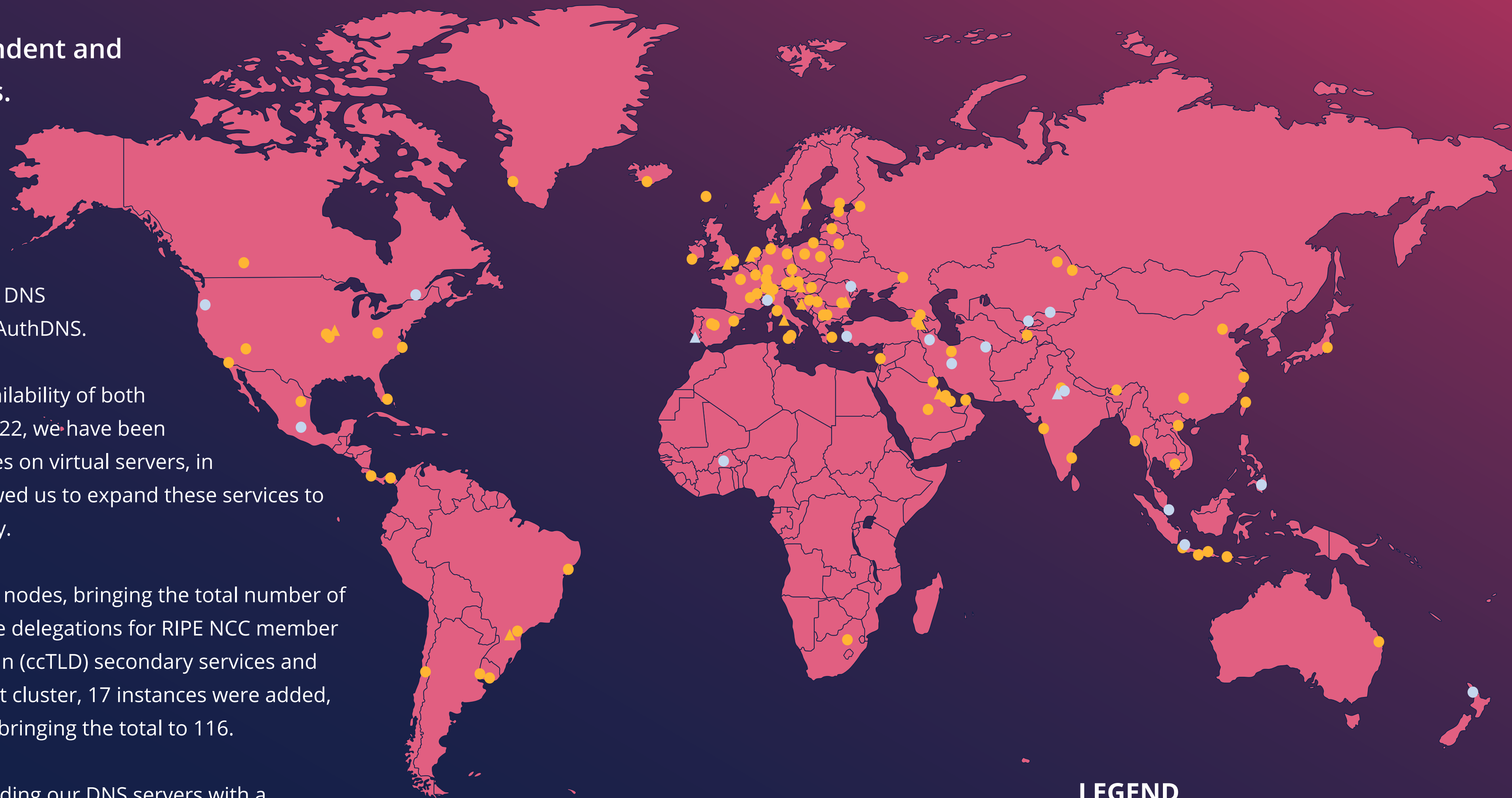
The RIPE NCC runs two independent and equally important DNS services.

The first is K-root, one of the 13 Internet root name servers. The K-root service is provided by a set of distributed nodes using IPv4 and IPv6 anycast. The second is a DNS service for RIPE NCC zones, reverse DNS and secondary DNS, which we refer to as AuthDNS.

We continue to improve resiliency and availability of both services by adding hosted nodes. Since 2022, we have been accepting applications to run these services on virtual servers, in addition to dedicated hardware. This allowed us to expand these services to areas that were less well-served previously.

In 2023, we brought up two new AuthDNS nodes, bringing the total number of nodes to 16. These serve zones for reverse delegations for RIPE NCC member allocations, country code Top-Level Domain (ccTLD) secondary services and RIPE NCC authoritative zones. In the K-root cluster, 17 instances were added, while one instance was decommissioned, bringing the total to 116.

Towards the end of 2023, we began upgrading our DNS servers with a more up-to-date operating system, as well as improving the configuration management and statistics gathering. We upgraded seven servers, with the rest to follow in 2024.



LEGEND

- ▲ AuthDNS
- Existing
- K-Root
- New



RIPEstat

RIPEstat provides users with essential information on IP address space and Autonomous System Numbers (ASNs) along with related statistics on specific hostnames and countries.

HIGHLIGHTS

Release of the updated Widget API

Return of the M-Lab widgets

End-to-end testing of classic UI

Improved service monitoring

[READ MORE](#)

RIS

Our Routing Information Service (RIS) uses a globally distributed set of Remote Route Collectors (RRCs), usually located at Internet Exchange Points, to collect and store Internet routing data.

IN 2023

We focused on adding peers in regions where we didn't have many to improve the results.

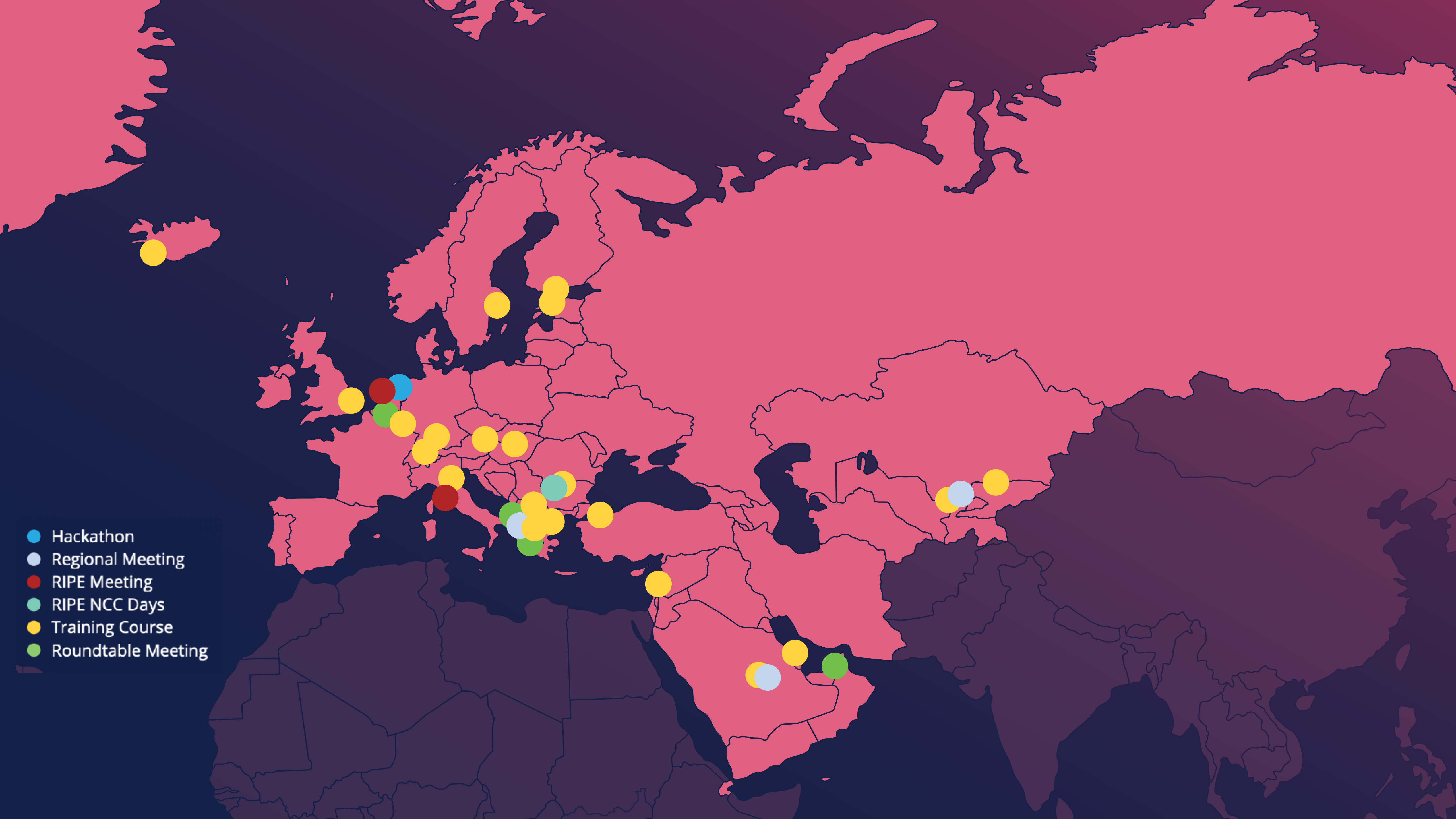
We improved the timeliness of MRT dump files by switching them to a new pipeline.

We revamped our beaconing set-up to allow users to build visualisations more easily and better expose insights.

[READ MORE](#)



Community and Engagement



- Hackathon
- Regional Meeting
- RIPE Meeting
- RIPE NCC Days
- Training Course
- Roundtable Meeting

IN-PERSON TRAINING AND WEBINARS

In 2023, we increased the amount of in-person training courses to what is going to be the regular amount after the pandemic: around 40 courses in 20 locations. We also delivered the same amount of webinars, between 40 and 45.

We looked for ways to improve our learning experiences with our improved user feedback mechanisms and took action to make sure they stay relevant and useful. We also identified efficiencies in training delivery and costs, such as cost-sharing models for hosted workshops, something we will work to do more often in the future.

[READ MORE](#)

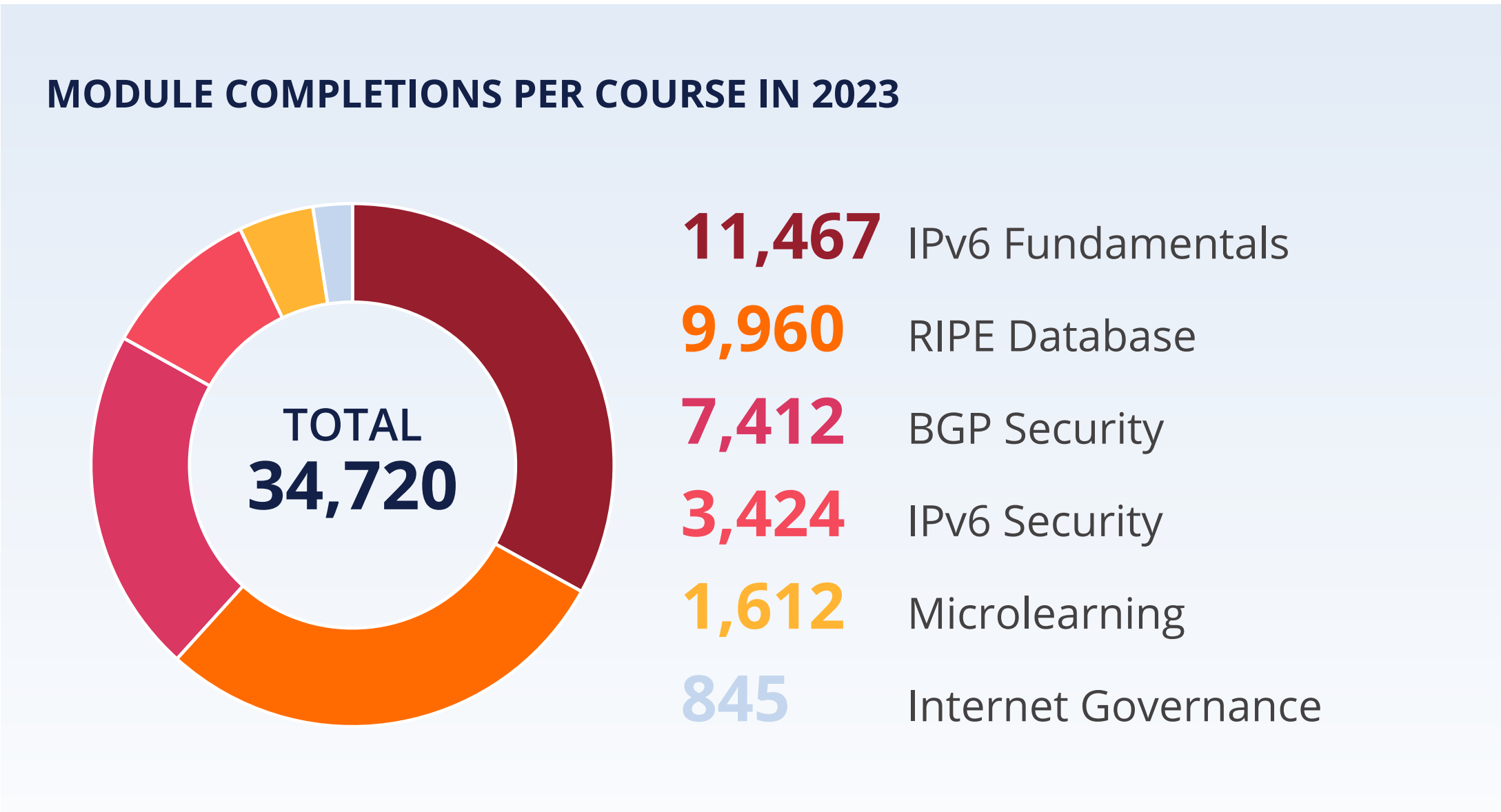


RIPE NCC ACADEMY

The RIPE NCC Academy is our free online learning platform that offers self-paced e-learning courses to anyone who is interested. It now has over 100 e-learning modules on a diverse range of topics such as IPv6 Fundamentals, IPv6 Security, RIPE Database, BGP Security and Internet Governance.

In 2023, the key focus of our curriculum development team was to improve the quality and user experience of our learning experiences. We conducted assessment interviews, actively seeking input from RIPE NCC members and the community. This ensures that the content remains relevant, addressing the diverse needs of learners and contributing to the ongoing success of online learning initiatives.

[READ MORE](#)



RIPE NCC CERTIFIED PROFESSIONALS

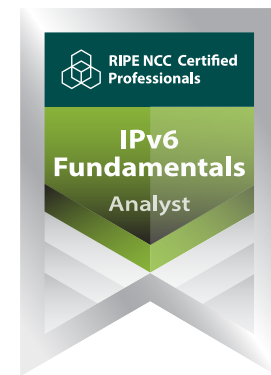
A RIPE NCC certification validates expertise in the fields of IP address management, IPv6 technologies and network security.

RIPE NCC Certified Professionals earn a digital badge that can easily be verified by any third party, like your employer or customers. We currently offer four certifications:

RIPE Database Associate



IPv6 Fundamentals - Analyst



IPv6 Security Expert



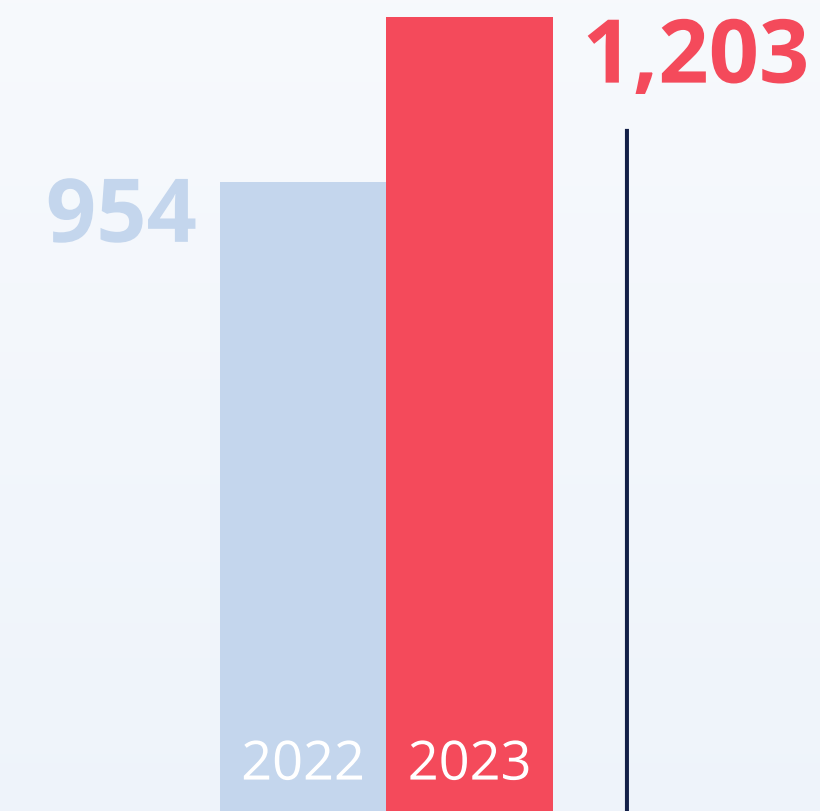
BGP Security Associate



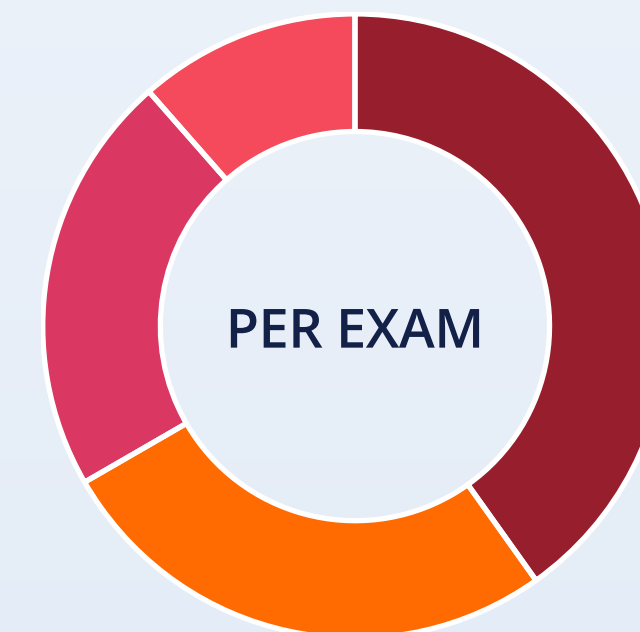
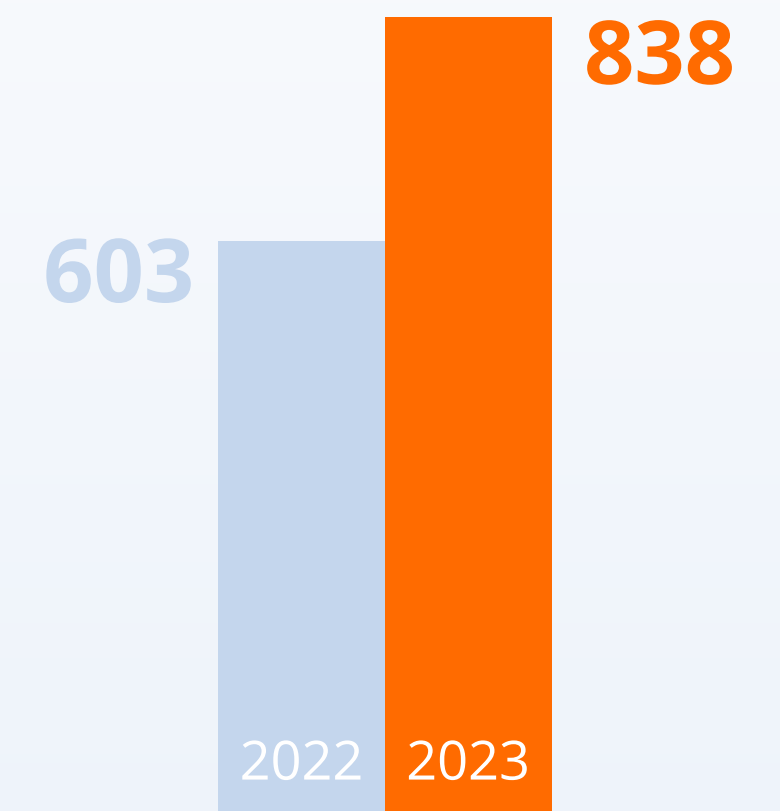
In 2023, we transferred our exam platform to a new provider. This improved the candidate experience by allowing us to make adjustments on the fly. It also made our platform accessible to all members in our service region. We also streamlined our onboarding and proctoring system, which is now managed and controlled by RIPE NCC staff. Finally, we worked on better integration between the Certified Professionals programme and the RIPE NCC Academy to better prepare candidates.

[READ MORE](#)

TOTAL EXAMS COMPLETED



TOTAL BADGES AWARDED



- 483** BGP Security
- 319** IPv6 Fundamentals
- 263** RIPE Database
- 138** IPv6 Security

POLICY DEVELOPMENT

Policies implemented by the RIPE NCC emerge from an open, transparent, community-led development process. Here is an overview of the policies discussed in 2023. The data shown reflects the status of that policy and participation as of 31 December 2023.

In 2023, four policy proposals were submitted.

Three proposals were accepted following discussion:

- 2023-01 “Reducing IXP IPv4 assignment default size to a /26” (Address Policy Working Group) modified the default size of IPv4 assignments for IXPs from a /24 to a /26 and clarified the return of the assignments previously issued for their IXP peering LAN.
- 2023-02 “Minimum Size for IPv4 Temporary Assignments” (Address Policy Working Group) set the minimum size for a temporary IPv4 assignment to a /24 while still allowing for a smaller assignment if requested by the End User. It also allowed routing requirements to justify the request for more than a /24 for research purposes.
- 2023-03 “Voluntary Transfer Lock” (RIPE NCC Services Working Group) allowed the holders of resources registered with the RIPE NCC to inform the RIPE NCC which of these resources must not be transferred for a certain amount of time.

One proposal is still under discussion:

- 2023-04 “Add AGGREGATED-BY-LIR status for IPv4 PA assignments”, submitted to the Address Policy Working Group, suggested introducing the AGGREGATED-BY-LIR status for IPv4 PA assignments to reduce LIR efforts in registration and maintenance. This status is already implemented in the IPv6 policy.

Following various discussions, RIPE community members volunteered to work on:

- Reviewing the RIPE IPv6 allocations and assignments policy.

[READ MORE](#)

HIGHLIGHTS

4 Policy proposals submitted for discussion

85+ People who participated in discussions

24 From how many countries

3 Policy proposals accepted

0 Policy proposals withdrawn

1 Ongoing proposals

PUBLIC AUTHORITY ENGAGEMENT

Our Roundtable Meetings offer governments and regulators the opportunity to discuss governance issues relevant to the RIPE NCC and the RIPE community while gaining a deeper understanding of complex technical topics.

In 2023, we held four Roundtable Meetings: one in Western Europe, one in the Middle East and two in South-East Europe. Representatives attending these events discussed a variety of issues including developing digital infrastructure, creating sustainable Internet policies, upcoming digital policy and regulations, the effects of sanctions and the risk of Internet fragmentation. These meetings highlight the importance of digital cooperation between the technical community and the public sector.

In 2023, we sponsored several Internet governance events, including the global IGF and regional/national events (EuroDIG, SEEDIG, CAIGF and those in Moldova, Kyrgyzstan, Serbia, Croatia, Kazakhstan, Armenia and Belarus).

PUBLIC POLICY CONSULTATIONS

We contribute to various consultations led by different governmental and inter-governmental organisations involved in Internet governance and public policymaking that have the potential to impact our operations or those of our members and the RIPE community. These organisations include the various individual governments and regulators throughout our service region, such as the European Commission as well as EU member states, the International Telecommunication Union (ITU) and ITU Arab Regional Office, the Internet Governance Forum (IGF), the Organisation

for Economic Co-operation and Development (OECD),

Roundtables
Middle East
South-East Europe
Western Europe

Public Policy Consultations

Internet Governance events

for Economic Co-operation and Development (OECD), GDC consultation with the RIPE community and with government representatives and regulators at our South East Europe Roundtable Meeting. We also responded to the Dutch Ministry of Foreign Affairs regarding their Pre-consultation about the Modernisation of the Dutch Sanctions System to share our concerns about the consequences of sanctions and compliance on our operations.

In August 2023, Russia enacted legislation forbidding foreign NGOs that are not registered in the country. We have been investigating its potential impact on the RIPE NCC and our members and have been consulting various stakeholders and experts to get more information on this law and its implications. This is an area where we have a great number of members including natural and legal persons, as well as state organisations. In the past, we contributed to initiatives such as the Arab Digital Agenda, the Arab Cybersecurity Strategy and the Arab Council to help shape a future-ready Internet. We maintain an active presence within the Arab community, working on the Arab Digital Agenda and the Arab Council on Internet-related issues and routinely participating in events such as the Arab IGF and Arab High-Level Meeting. The Council of Arab Information and Communication Technology Ministers incorporated the outcomes of our government roundtable discussions into their strategic foundations, marking a significant milestone of regional collaboration. Regardless of the particular issue, we always champion a multistakeholder approach to Internet governance and is focused on protecting the Internet's core technical functions, the role of the global RIR system, and the technical community's role in operating the technical layers of the Internet.

[READ MORE](#)

SUPPORTING THE COMMUNITY

RIPE FELLOWSHIP

Through the RIPE Fellowship, we aim to increase diversity in the RIPE community by supporting those from underrepresented regions, minority backgrounds, or those who require funding to attend a RIPE Meeting. Fellowships are open to those living or working in the RIPE NCC service region, and studying or working in Internet technology or related topics of interest to the RIPE community.

- SEE 11: **6** Fellowships awarded
- RIPE 86: **15** Fellowships awarded
- CAPIF 2: **15** Fellowships awarded
- MENOG 23: **3** Fellowships awarded
- RIPE 87: **6** Fellowships awarded

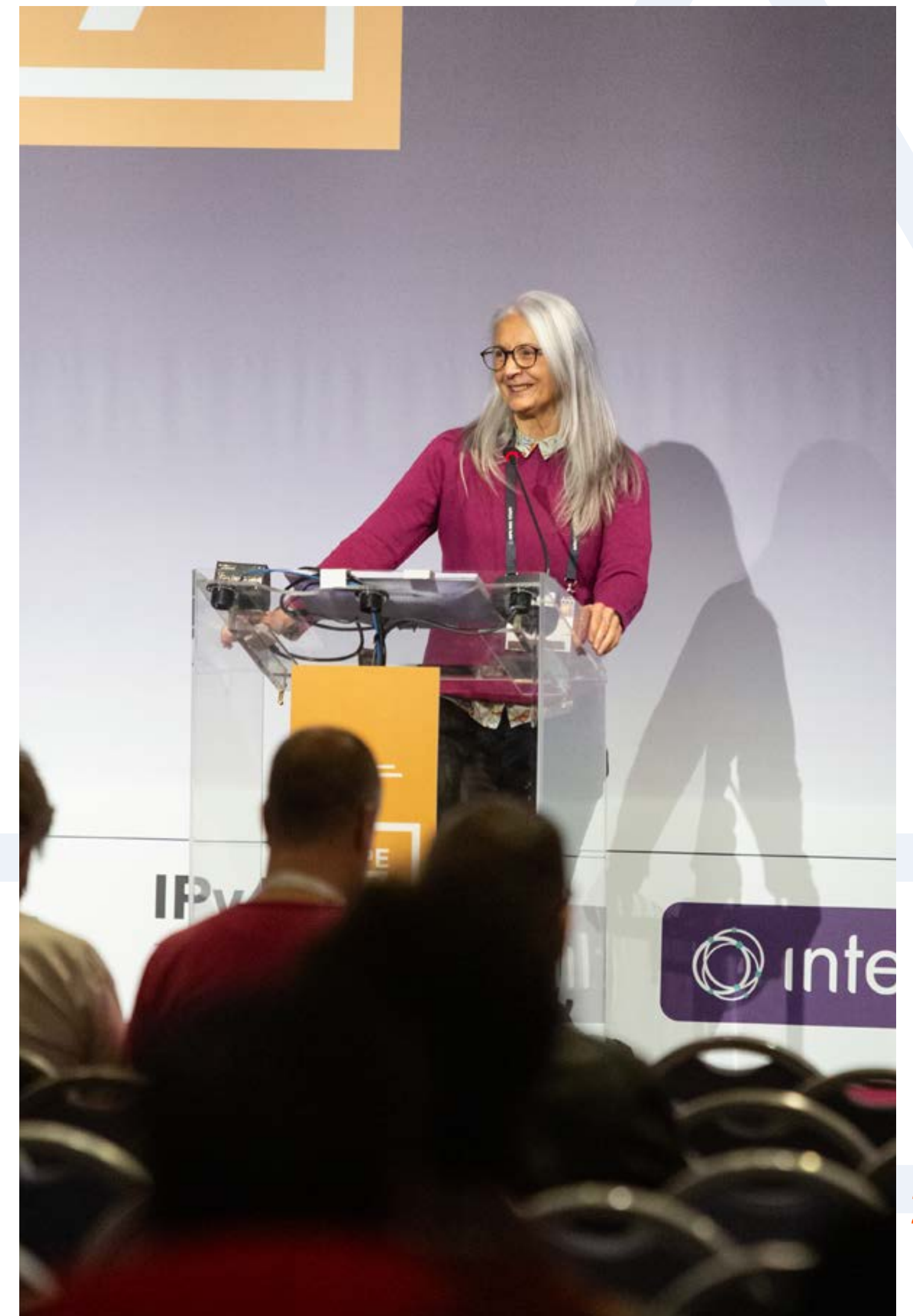
[READ MORE](#)

RACI

The RIPE Academic Cooperation Initiative helps members of the academic community connect with and present to the RIPE community at RIPE Meetings and RIPE NCC Regional Meetings.

- SEE 11: **3** RACI attendees
- RIPE 86: **8** RACI attendees
- RIPE NCC Days Sofia: **1** RACI attendee
- RIPE 87: **6** RACI attendees

[READ MORE](#)



OPEN HOUSE EVENTS

An Open House event features a diverse array of engaging formats, including presentations, panel discussions, expert Q&A sessions, and open mic opportunities for participant interaction. These events, true to their name, are free to attend and open to anyone who is interested. Through a series of focused gatherings, we aim to provide in-depth insights into pressing topics, such as the state of the Internet in Ukraine.

Furthermore, we dedicate space for community involvement and feedback, such as through discussions on IPmap and our country reports. This year, we placed a special emphasis on the Community Projects Fund, fostering a collaborative environment for communal initiatives and development. Additionally, our sessions served as a platform to dissect and debate our Activity Plan and Budget and Charging Scheme, ensuring transparency and community-driven refinement.

For broader accessibility and future reference, we record these sessions and publish them online.

[READ MORE](#)

TOP 10 OPEN HOUSE SESSIONS OF 2023

Internet in Ukraine	
Internet Country Report: Central Europe	
RIPE IPmap and Infrastructure Geolocation	
Community Projects Fund Recipient Updates Series	
Internet in Norway	
Meet the Executive Board Candidates	
Internet in Poland	
Draft Activity Plan and Budget 2024	
Requirements and Expectations for Board Members and Candidates	
Charging Scheme 2024 Consultation	

NOGS AND REGIONAL EVENTS

In 2023, we presented at the following NOGs:

DKNOG **BHNOG** **HRNOG** **KZNOG** **ITNOG** **CSNOG** **ESNOG** **NetMcr** **PLNOG** **SwiNOG** **nog.fi** **TJ-KOC**

Baykal NOG **SiNOG** **NLNOG** **RONOG** **NONOG** **UKNOF** **HUNOG** **GRNOG** **LUNOG** **RSNOG**

Out-of-Region NOGs **PhNOG** **IDNOG** **NANOG** **SAFNOG** **AONOG**

Sponsored and Presented at **Presented at**

SEE 11

SEE 11 took place in Split, Croatia from 4-5 April 2023. The meeting saw 127 attendees from 19 different countries, including 56 newcomers.

The meeting discussed the Internet in South East Europe and featured a panel discussion on the evolution of the telecommunications market in the region so far and predictions for the future.

Other key topics were IPv6, cybersecurity, updates on networking in Ukraine and the first NOG meeting in Bosnia and Herzegovina.

[READ MORE](#)

MENOG 23

MENOG 23 took place in Riyadh, Saudi Arabia from 11-12 October 2023. 217 attendees joined in from 25 different countries, with 80 newcomers.

The event featured panel discussions on building Internet communities, the importance of Internet exchange points and the role of Saudi Arabia as a digital hub.

Also discussed at the meeting were RPKI, peering and Internet measurement tools.

[READ MORE](#)



CAPIF 2

CAPIF 2 took place in Tashkent, Uzbekistan from 19-20 September 2023. There were 225 attendees from 19 different countries.

The meeting focused on the importance of peering and interconnection in Central Asia. There were presentations from representatives of major ISPs and IXPs in the region. There were also presentations on useful Internet measurements and tools. IPv6 and RPKI were also discussed.

The meeting also saw the launch ceremony for the first K-root server in Uzbekistan.

[READ MORE](#)



RIPE NCC DAYS SOFIA

RIPE NCC Days Sofia took place in Sofia, Bulgaria from 27-28 June 2023. There were 124 attendees from eight different countries.

Key topics at the meeting were routing security, IPv6 and Internet measurement tools. There

[READ MORE](#)



was also a presentation on trends in the telecommunications market in South East Europe and on the history of the Internet in Bulgaria.

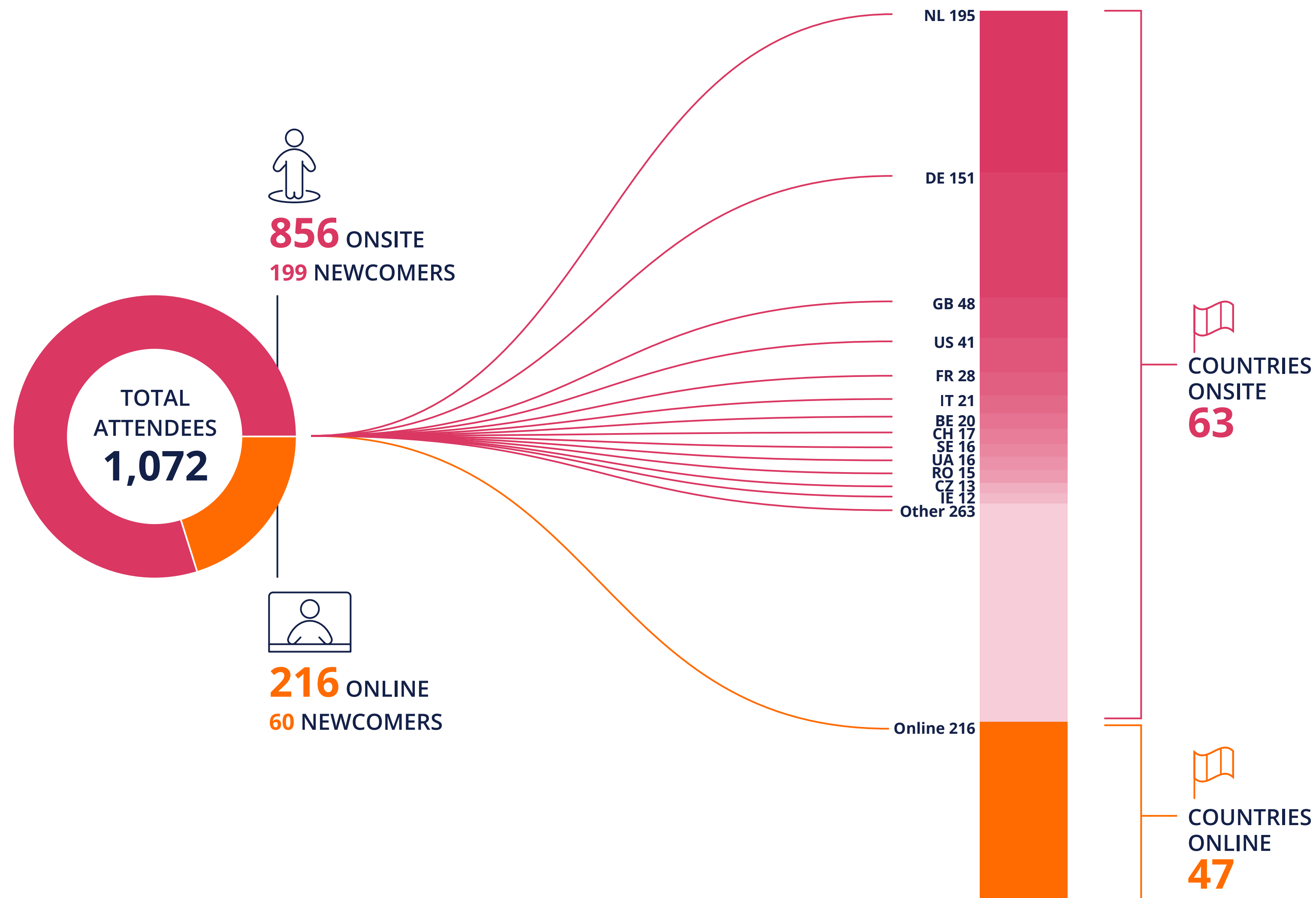
[READ MORE](#)

INTERNET MEASUREMENT DAYS

In 2023, we held two Internet Measurement Days. One took place in Bishkek, Kyrgyzstan on 30 May 2023, with 89 attendees. The other took place in Chisinau, Moldova on 20 November 2023, with 72 attendees.

[READ MORE](#)

RIPE 86 - ROTTERDAM, THE NETHERLANDS



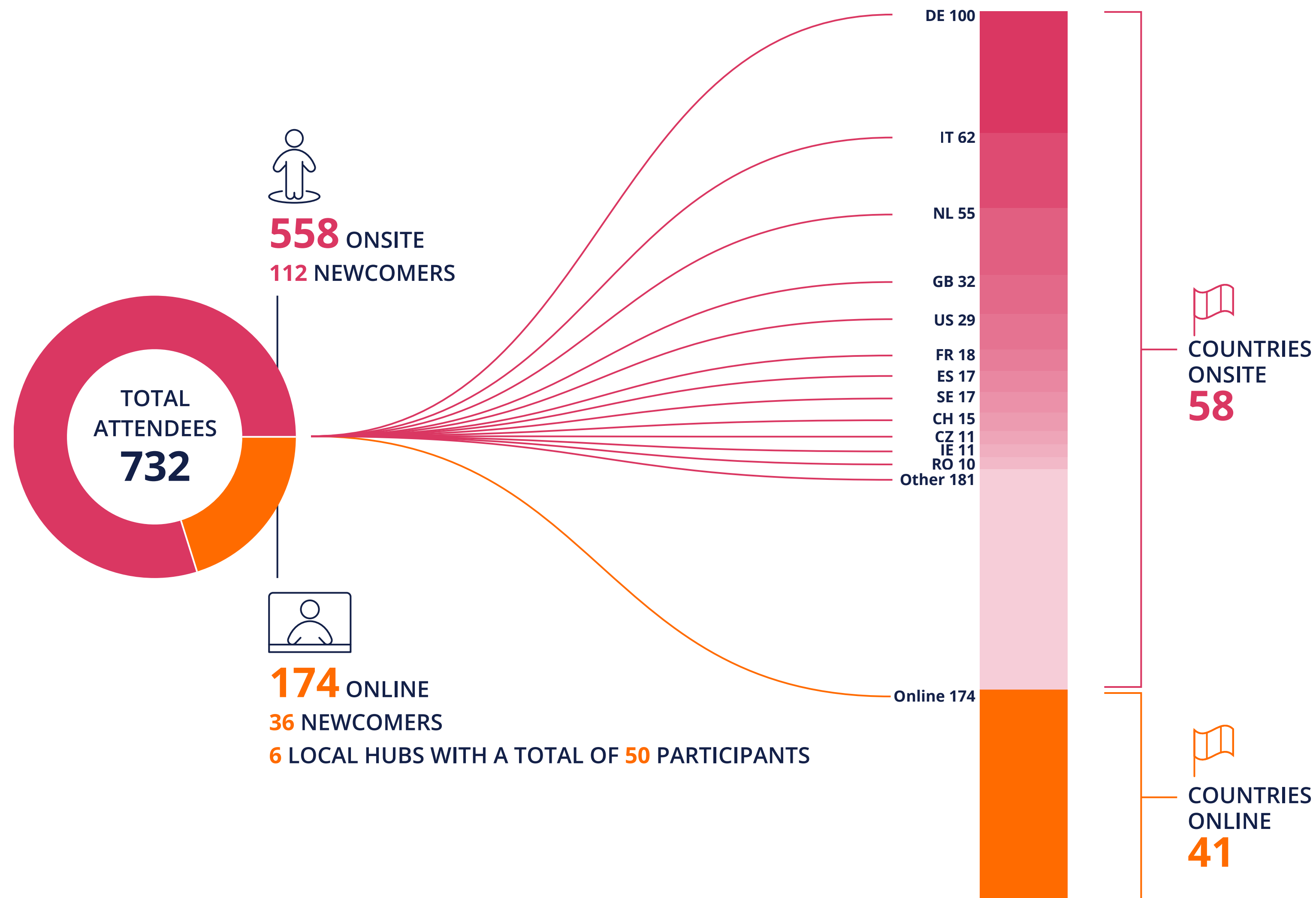
HIGHLIGHTS

- Highest number of onsite attendees ever
- Reached the milestone of 20,000 RPKI certificates
- New RIPE Code of Conduct Team
- Diversity in Tech session focusing on youth involvement



[READ MORE](#)

RIPE 87 - ROME, ITALY



[READ MORE](#)

HIGHLIGHTS

Randy Bush was presented with the Rob Blokzijl Award for his contributions to the Internet in the RIPE NCC service region and beyond

Presented the results of the RIPE NCC Survey 2023

Local hubs were offered for the first time, in Bruges, Kyiv, Glasgow, Sanaa, Tallinn and Amsterdam

Attendees celebrated our IPv6-only meeting network



THE COMMUNITY PROJECTS FUND

Through the RIPE NCC Community Projects Fund, we aim to support projects of value to the operation, resilience and sustainability of the Internet, with a focus on tools and services benefitting the technical community in our service region.

There's no shortage of creative solutions in our community, and this fund gives innovators the chance to work on their project for 'the Good of the Internet'.

The RIPE NCC Community Projects Fund opened its call for applications in March 2023. The application period was open for just over 12 weeks, and 54 applications from 26 different countries were submitted to the Selection Committee.

[READ MORE](#)

PROJECTS FUNDED IN 2023

measurement.network: Organising active measurements
Tobias Fiebig

SubZero: Monitoring the deployment impact of the submarine cable system
Ioana Livadariu

Designing the next generation of public BGP route collection infrastructures
Fondation Université de Strasbourg

Community Canary: One of the first community projects trying Tor's Rust implementation Arti
Blueprint for Free Speech

Anycast Discovery: Daily mapping the Anycast landscape for enhanced Internet resilience
DACS, University of Twente

Secure time for IoT devices: developing the Roughtime proposed standard
Netnod AB

RIPE LABS

RIPE Labs is an open platform for network operators, researchers, developers and others to share case studies, best practices, deployment experiences, prototypes, research and more.

We also use RIPE Labs to share ideas and ask for feedback from the community, as well as trial prototypes for our tools. In 2023, we put increased focus on producing data-driven stories to provide the community with insights into a wide variety of Internet-related topics.

Data-Driven Stories in 2023


- Unknown Attribute 28 - A Source Of Entropy in Interdomain Routing?
- Does the Internet Route Around Damage? - Edition 2023
- The Resilience of the Internet in Ukraine - One Year On
- Palestine Internet Connectivity as Seen in BGP
- Who's Waiting on the IPv4 Waiting List?
- CAPIF 2: The Road to Interconnection

The RIPE Labs Article Competition


We held two competitions in 2023, with a total of 15 entries from the community.

- RIPE Labs Article Competition Winner - RIPE 86
Intercept and Inject: DNS Response Manipulation in the Wild -
Yevheniya Nosyk
- RIPE Labs Article Competition Winner - RIPE 87
BGP Path Attribute Filtering - A Powerful Tool to Mitigate Alien Attributes -
Berislav Todorovic


THREE MOST-READ RIPE LABS ARTICLES FROM 2023

Unknown Attribute 28 - A Source Of Entropy in Interdomain Routing?
Emile Aben
 **3,968 VIEWS***

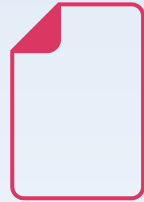
[READ MORE](#)


BGP Path Attribute Filtering - A Powerful Tool to Mitigate Alien Attributes
Berislav Todorovic
 **2,010 VIEWS**

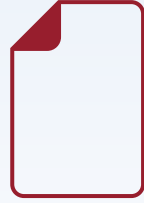
[READ MORE](#)


Does the Internet Route Around Damage? - Edition 2023
Emile Aben
 **1,059 VIEWS**

[READ MORE](#)

 **120** Articles

 **6** Podcasts

 **66** Articles (by non-staff)

 **24,295** Unique pageviews per month (average)

SURVEY 2023

In May-June 2023, we conducted a survey on the RIPE Database and their input helped us understand the challenges they are facing, and to

Key findings from the survey include satisfaction regarding the RIPE Database, especially in areas such as the RIPE Database support services. The survey also identified areas for improvement, such as membership fees and outreach efforts.

Members expressed concerns about IPv4 addresses and emphasized the need for more educational resources in facilitating the transition to IPv6 for members undertaking this transition.

Cybersecurity equally emerged as a significant concern, with respondents indicating that the RIPE NCC should enhance its efforts in supporting members to secure their

3 899 responders
10 languages
52% other than English

Value for Money 69%
RIPE DB
86%: Accurate & 89% Useful

40% Security challenges

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The survey also identified areas for improvement, such as membership fees and outreach efforts. Members expressed concerns about IPv4 addresses and emphasized the need for more educational resources in facilitating the transition to IPv6 for members undertaking this transition.

Cybersecurity equally emerged as a significant concern, with respondents indicating that the RIPE NCC should enhance its efforts in supporting members to secure their

HIGHLIGHTS

3,899 respondents

Available in 10 languages

52% of responses completed in a language other than English

Over nine in ten respondents rate the RIPE NCC's quality of service delivery as good or excellent (92%)

Net Promoter Score is strong (+43)

Perceptions of value for money have dropped (down from 76% to 69% since 2019)

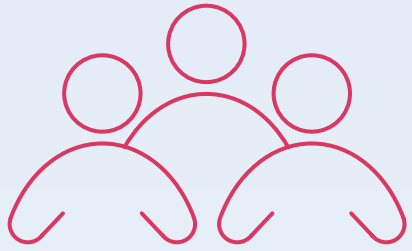
80% of respondents who used the RIPE Database over the last two years feel the information is accurate (86%) and useful (89%)

Four in ten respondents indicate that information security remains one of the main challenges in their organisation



Inside the RIPE NCC

AT THE HEART OF THE RIPE NCC

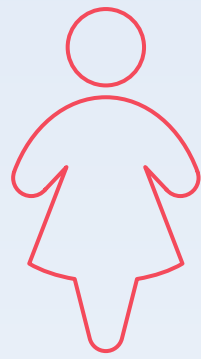


FTEs

180.7

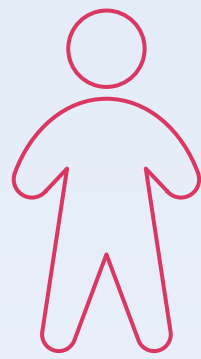
AVERAGE OVER 2023

182.3 AT THE END OF 2023



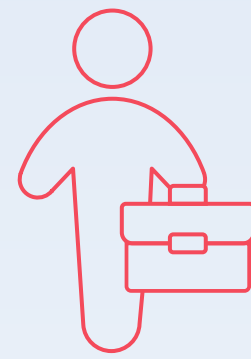
STAFF FEMALE

35%



STAFF MALE

65%

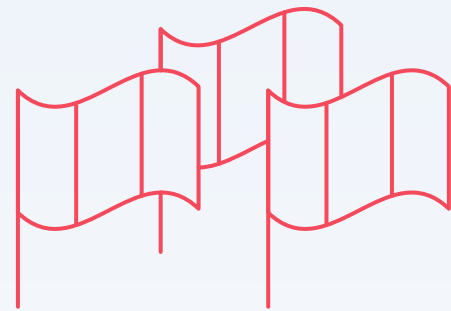


FTE CONSULTANT VIA EMPLOYER OF RECORD

1.4

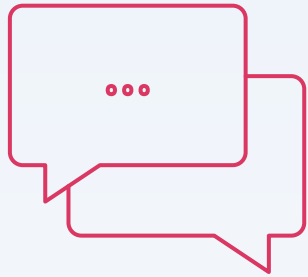
AVERAGE OVER 2023

2.8 AT THE END OF 2023



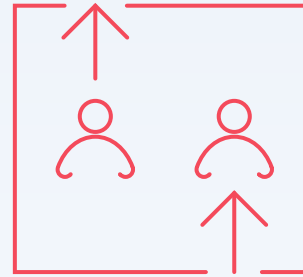
NUMBER OF STAFF NATIONALITIES

42



NUMBER OF LANGUAGES

30+



TURNOVER

6.7%

[READ MORE](#)

RIPE NCC MANAGEMENT

The RIPE NCC...
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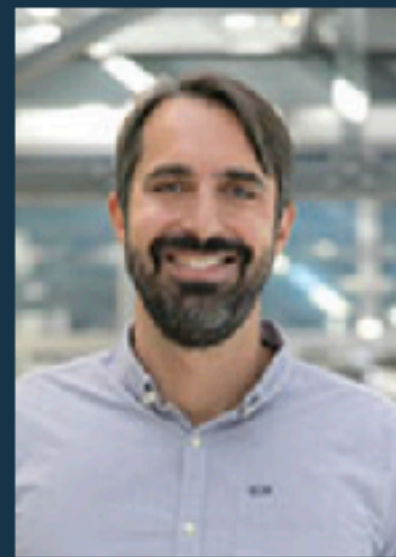
HANS PETTER
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 Resource Org...
 coordinating...
 Internet Regis

DANIELLA C
 SENIOR EXECUTIVE ASSISTANT TO THE
 MANAGING DIRECTOR
 Daniella is the Senior Executive Assistant to

Executive Team /RIPE-NCC



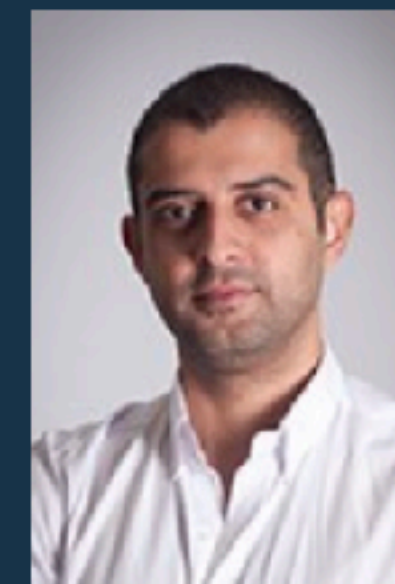
Hans Petter Holen,
CEO and Managing Director



Felipe Victolla Silveira,
Chief Technology Officer



James Kennedy
Chief Registry Officer



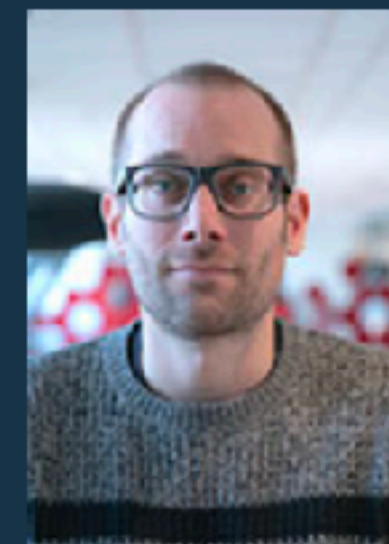
Hisham Ibrahim,
Chief Community Officer



Eleonora Petridou,
Chief Information Security Officer



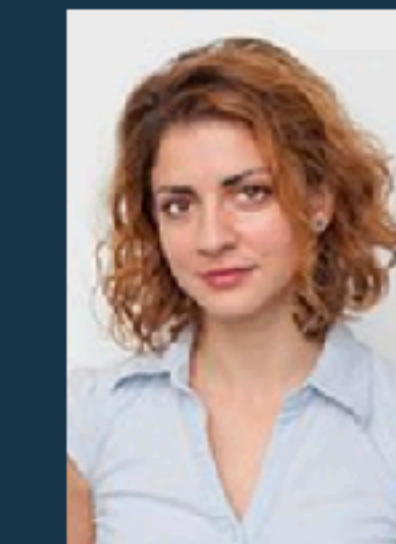
Daniella Coutinho,
Executive Assistant



Simon-Jan Haytink,
Chief Financial Officer



Carolien Vos,
Chief HR Officer



Athina Fragkouli,
Chief Legal Officer

CHIEF FINANCIAL OFFICER
 Simon-Jan is responsible for controlling and managing the RIPE NCC's financial resourc-

- RPKI
- RIPE Database
- DNS and K-Root

- RIPEstat
- RIS
- IT support

the RIPE NCC maintains necessary levels of information security and compliance with best practices and applicable regulations.

(joined in 2023)
 managing and
 and activities.

ses and ASNs
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 investigations

S OFFICER
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URITY OFFICER
 ensuring that

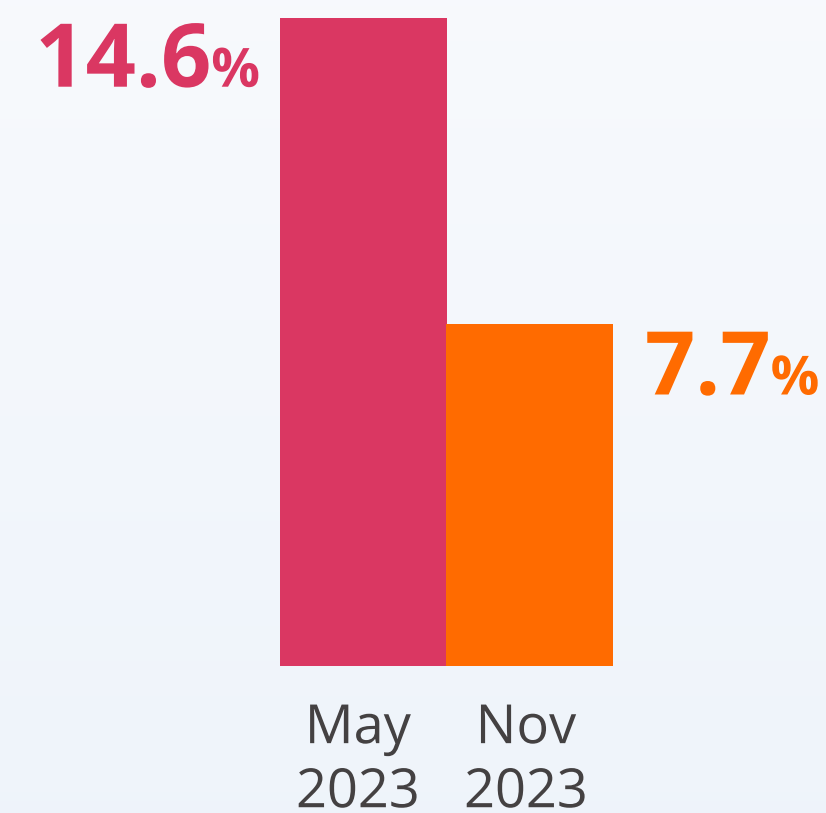
GENERAL MEETING

The RIPE NCC holds a General Meeting (GM) twice a year - in spring and in autumn. The GM is the forum at which members can discuss the operations and activities of the RIPE NCC and share their feedback. Members also vote on the charging scheme for the following year, elect representatives on the RIPE NCC Executive Board and give their feedback on our Activity Plan and Budget.

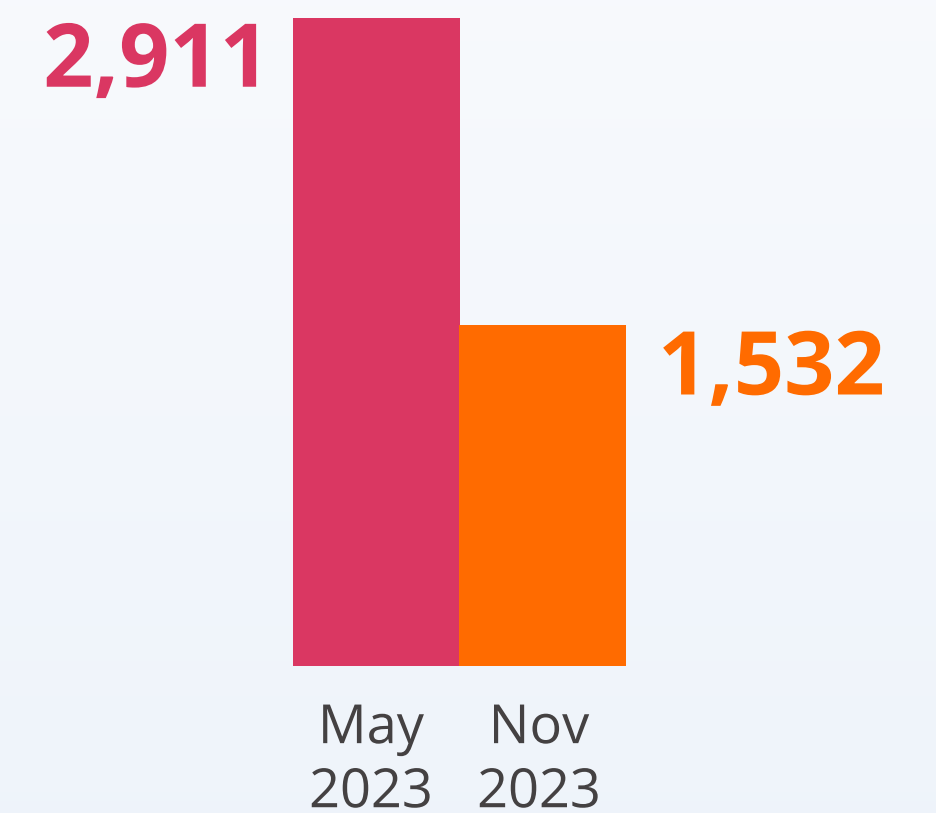
The May 2023 GM had an unusually high member turnout compared to other GMs. It had the second highest number of votes and member turnout in the last decade following the May 2020 GM. The main reasons for such a high turnout were the proposal of four charging scheme options that drew a lot of comments from the members, and an Executive Board election with three available seats. In May, members voted to retain the existing charging scheme and elected Raymond Jetten, Maria Häll and Harald A. Summa to the Executive Board. In November, members approved changes to the RIPE NCC Articles of Association to strengthen our governance.

[READ MORE](#)

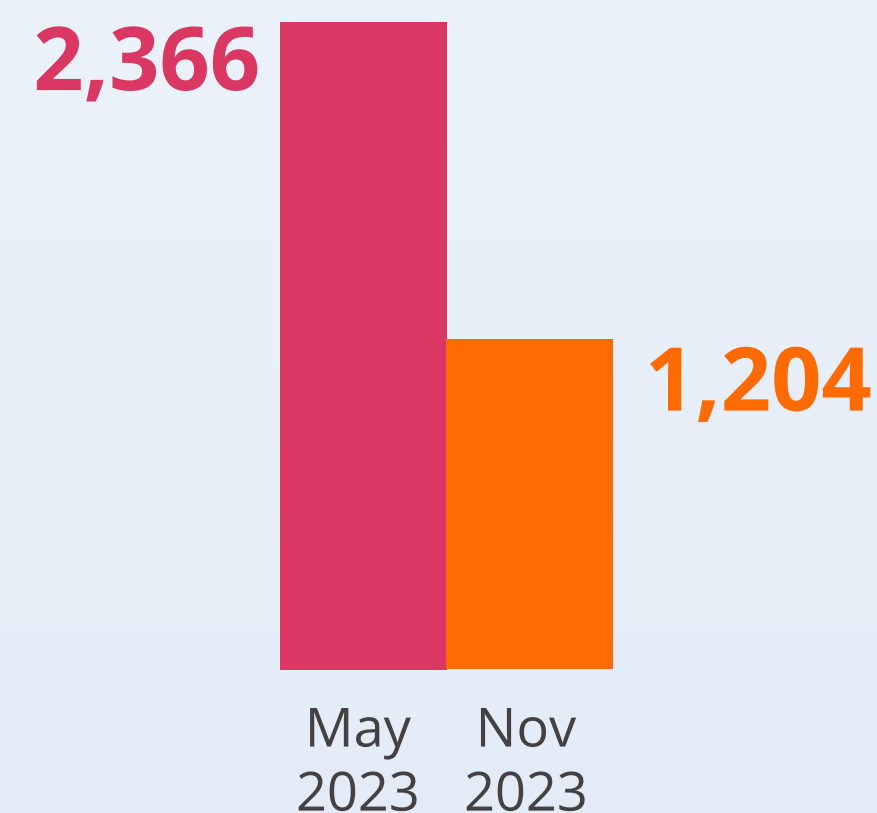
ELIGIBLE MEMBER TURNOUT



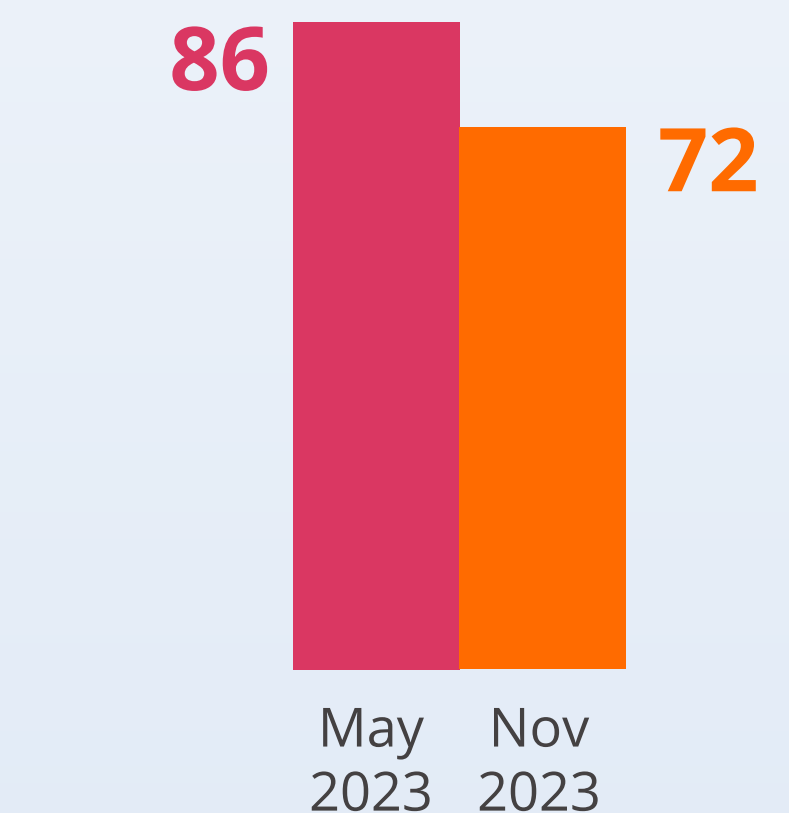
REGISTERED VOTES



CAST VOTES



NUMBER OF COUNTRIES



COMPLIANCE AND TRANSPARENCY

We aim to implement corporate governance best practices where possible. We operate under transparent organisational, management and Executive Board structures.

CORPORATE GOVERNANCE

In 2023, we amended the following RIPE NCC legal documents:

- RIPE NCC Articles of Association
- RIPE NCC Standard Service Agreement
- RIPE NCC LIR Account Agreement
- Due Diligence for the Quality of the RIPE NCC Registration Data
- Transfer of Internet Number Resources and Change of a Member's Official Legal Name
- Independent Internet Number Resources - Contractual Relationship Changes Between Sponsoring LIR and End User
- Closure of Members, Deregistration of Internet Resources and Legacy Internet Resources
- RIPE Database Terms and Conditions
- RIPE NCC Certified Professionals Terms and Conditions
- RIPE NCC Website and Publicly Available RIPE NCC Services Terms of Service
- RIPE NCC Privacy Statement

All of these documents and their previous versions are available on our website.

[READ MORE](#)

ARBITRATION CASES

In 2023, we did not have any arbitration cases.

LEA TRANSPARENCY REPORT

The RIPE NCC receives information requests from Law Enforcement Agencies (LEAs) and tries to facilitate the provision of any required publicly available information. We do not provide confidential or private information to LEAs without a court order or other legally enforceable order or request under Dutch law.

[READ MORE](#)

GDPR COMPLIANCE

In 2023, we received 11 GDPR requests in total. Nine were

from individuals requesting to delete their personal data. The other two were requests to confirm whether we are processing any personal data concerning the relevant requesters and, if yes, provide them access to their data. Upon receipt of any GDPR request and before we take any action, we ask to verify that the requester is the data subject of whom the request is about.

We complied with all requests to delete the individuals' personal data. In two cases where third parties we had engaged for the facilitation of a provision of a RIPE NCC service were processing the individuals' personal data on our behalf, we contacted these third parties and received their confirmation that they had deleted the relevant data upon our request. In one case, we received a request to delete personal data, but no personal data related to this individual was found.

Regarding the requests for access to the individual's personal data, we have complied with one of them. The other one was not completed as the requester did not respond to our authentication request.

We also had a security incident that involved the exposure of personal data from our intranet to an external service. We had our intranet's data deleted from this service and reported the incident to the Data Protection Authorities.

SANCTIONS AND MEMBER RESOURCES

Since the 2022 Russian invasion of Ukraine, the EU has passed a number of sanctions Regulations against many Russian entities and individuals. These and other previously passed sanctions Regulations have required us to invest more time and effort in screening potentially sanctioned members or End Users than in previous years. This included reviewing whether non-sanctioned members or End Users were owned or controlled by sanctioned parties.

To ensure compliance, we have invested in a sanctions third-party screening tool to automate this process; however, our manual follow-up due diligence checks still required substantial effort from us. In cases where a member or End User is found to be subject to sanctions, we are required to freeze their registered resources in the RIPE Database. However, we do not have to deregister these resources or terminate memberships.

In the sixth sanctions package against Russian entities and individuals, the EU Regulations introduced an exemption, and we confirmed with the Dutch government that this exemption also applied to Internet number resources. As a result, we were able to remove sanctions-related restrictions from 150 RIPE NCC members and End Users in

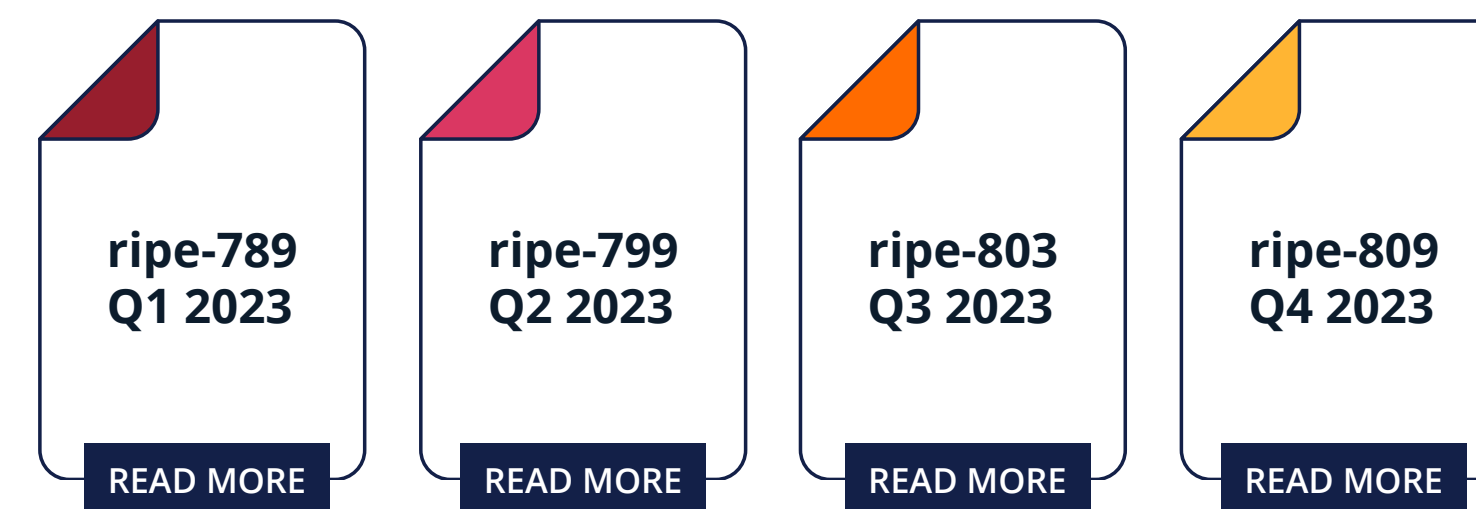
2023. We will also continue to investigate the possibility of a blanket exemption from all EU sanctions regulation for Internet number resources.

Since 2021, we have also been dealing with ongoing banking issues as many banks are hesitant to accept payments from individuals or entities in Iran and Syria. This has prevented many of our Iranian and Syrian members from being able to fulfil their financial payment obligations to us. We have therefore offered payment extensions to these members until we resolve the issues with our banks and are seeking a long-term solution to this situation.

[READ MORE](#)

QUARTERLY SANCTIONS TRANSPARENCY REPORTS

To keep members informed, we publish quarterly sanctions transparency reports on how RIPE NCC members, End Users and legacy resource holders are affected by sanctions. In 2023, we published four reports:



OVERVIEW OF COSTS PER ACTIVITY IN 2023 (in kEUR)

These figures are not part of the Financial Report and as such have not been audited by an external third party. These figures serve only as indications of the costs relating to these activities.

	Budget Operational Expense 2023	Actual Operational Expense 2023	Variance 2023	Actual Operational Expense 2022
The Registry	10,000	10,146	(146)	9,391
Registration Services	2,180	2,436	(256)	2,697
Membership Administration	1,380	1,474	(94)	1,081
Registry Accuracy and Investigations	1,350	1,298	52	1,364
LIR Portal	2,520	2,590	(70)	2,136
RPKI	1,930	1,662	268	1,555
RIPE Database	640	686	(46)	558
Information Services	7,600	7,343	257	7,068
DNS and K-Root	850	929	(79)	744
RIPE Atlas	1,400	1,336	64	1,579
RIPEstat	600	454	146	504
RIS	1,100	629	471	525
IT Support	3,650	3,995	(345)	3,716
External Engagement & Community	10,000	9,160	840	8,353
Community Building and Member Engagement	5,680	5,543	137	4,840
Community Learning and Development	1,920	1,855	65	2,128
Community Coordination and Collaboration	2,400	1,762	638	1,385
Organisational Sustainability	11,300	9,493	1,807	8,823
Facilities	2,190	1,971	219	1,648
HR	1,200	1,324	(124)	1,149
Legal	1,160	957	203	1,046
Finance	1,550	1,515	35	1,440
Information Security and Compliance	2,000	1,414	586	1,332
Office of the Managing Director	2,900	2,048	852	1,897
RIPE Chair	300	264	36	311
RIPE NCC (BEFORE BAD DEBTS AND DEPRECIATION)	38,900	36,142	2,758	33,635
Bad Debts	280	385	(105)	265
Depreciation	820	732	88	710
RIPE NCC TOTAL	40,000	37,259	2,741	34,610

OVERVIEW OF COSTS PER ACTIVITY IN 2023

For 2023, the RIPE NCC's operating expenses are under budget by 2.7 MEUR:

- The Registry: 146 kEUR over budget
- Information Services: 257 kEUR under budget
- External Engagement & Community: 840 kEUR under budget
- Organisational Sustainability: 1,807 kEUR under budget
- Bad Debts and Depreciation: 17 kEUR over budget

We are proud that we have been able to reduce costs with 2.7 MEUR, but the reasons for deciding to take this course of action are worrisome regarding our long-term financial stability. We have seen an unexpected reduction in income due to fewer new LIR accounts than budgeted and an expected decline in the number of LIR accounts overall (due to consolidation of multiple LIR accounts), combined with our inability to collect membership fees from Ultra High-Risk Countries. Additionally, there was the outcome of the May 2023 GM vote on the Charging Scheme 2024, in which the GM voted not to increase membership fees for 2024 and to reject a category-based charging scheme model. This meant a reduced budget for 2024 on top of increased costs due to inflation, which prompted an executive decision to immediately start

cutting costs to avoid a deficit for 2023 and to ensure a good starting base for 2024.

As a result, 2023 was a year focused on cost-cutting and efficiency for the RIPE NCC, while making sure we continued to deliver the level of service our members expect. This was achieved alongside rising costs due to inflation and a general trend of increasing salaries in the Dutch labour market. In 2023, the RIPE NCC conducted a benchmarking study on salary packages to ensure we conform to the market in terms of remuneration so that we can attract and retain knowledgeable and competent staff. A significant correction based on the outcome of this benchmarking study was processed in 2023. Here, we also made sure to include the effect of the extraordinary inflation of around 10% over 2022 for the Netherlands. This had a significant impact on the non-staff related operating expenses, which had to endure the bulk of the cost savings. This effect can be clearly seen in the actual versus budget results across all four budget divisions.

THE REGISTRY

These activities were over budget by 146 kEUR (1.5%). The Registry budget consists of over 70% of personnel

costs, and with that the benchmark corrections were the main factor in being over budget. This effect was offset by cost savings in consultancy (in software engineering) and information technology (compliance software in relation to sanctions).

INFORMATION SERVICES

These activities were under budget by 257 kEUR (3.4%). Personnel costs also made up the largest share of the budget, at 60%. Savings were made mainly in information technology, with cloud costs being the main contributor. These savings were offset by the steep increase in energy costs for our off-site server location. Overall, the costs reflect the change in CTO and cost-saving efforts in 2023.

EXTERNAL ENGAGEMENT & COMMUNITY

In light of the financial challenges outlined above, the External Engagement and Community teams were tasked with implementing a significant reduction in operational costs mid-year. These changes were reflected in our finances, as the External Engagement and Community activities concluded the year under budget by 840 kEUR, equating to an 8.4% decrease. This reduction was largely possible because many of these activities had a one-

off character, allowing for quicker budget adjustments. Significant savings were realised in areas such as travel, consultancy, and outreach & PR, which were the primary contributors to the cost reduction.

Despite achieving financial efficiency with all activities under budget in 2023, this came at the cost of reduced community engagement, which notably affected our ability to support national engagements within our service region—a concern voiced by our members during the November 2023 General Meeting.

ORGANISATIONAL SUSTAINABILITY

These activities were under budget by 1,807 kEUR (16%) and were therefore the most significant area of cost savings in 2023. This was helped by lower-than-budgeted office expenses, as many staff still frequently work from home. The NRO budget (which is shared with the other RIRs) was also significantly under-utilised, resulting in a cost saving for contributions. The major cost savings were in consultancy, after a conscious decision was made to scale back and prioritise in-house expertise and to not use the corporate restructuring budget.

Overall, all activities were under budget following an executive decision to cut costs in early 2023. HR is the one activity that was over budget, which is explained by an investment in leadership development throughout the RIPE NCC, the costs for which were assigned to the HR activity.

DEPRECIATION & BAD DEBTS

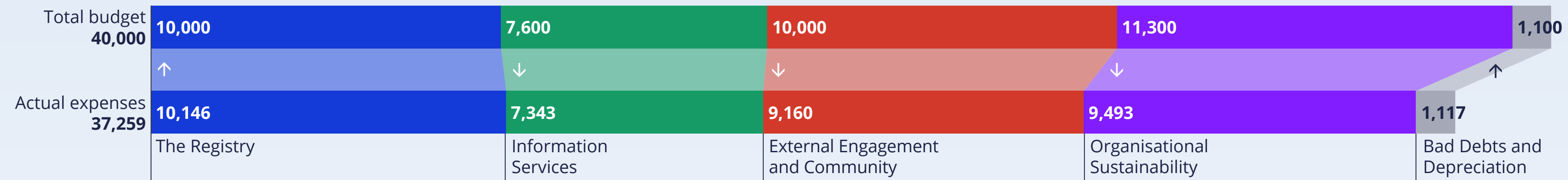
Depreciation was under budget after efforts by our new CTO to streamline costs so that we have a good strategy moving forward. As part of this, it was prudent to not fully exploit the CAPEX budget in 2023.

Bad debts were over budget, reflecting the uncertainty resulting from the payment extension we provided to our Ukrainian LIRs. We are confident and hopeful that our members in Ukraine will be able to maintain their business and pay their outstanding invoices, but we are required to reflect this uncertainty to ensure a true and fair view of our finances.

OVERVIEW OF THE RIPE NCC BUDGET AND EXPENSES 2023

Budget and Expenses (in kEUR)

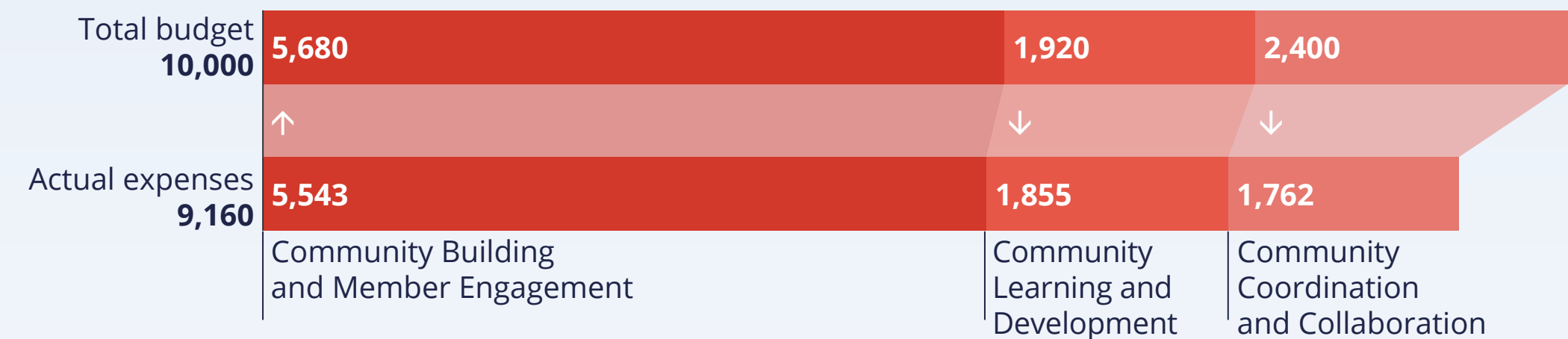
Budget Savings (in kEUR)



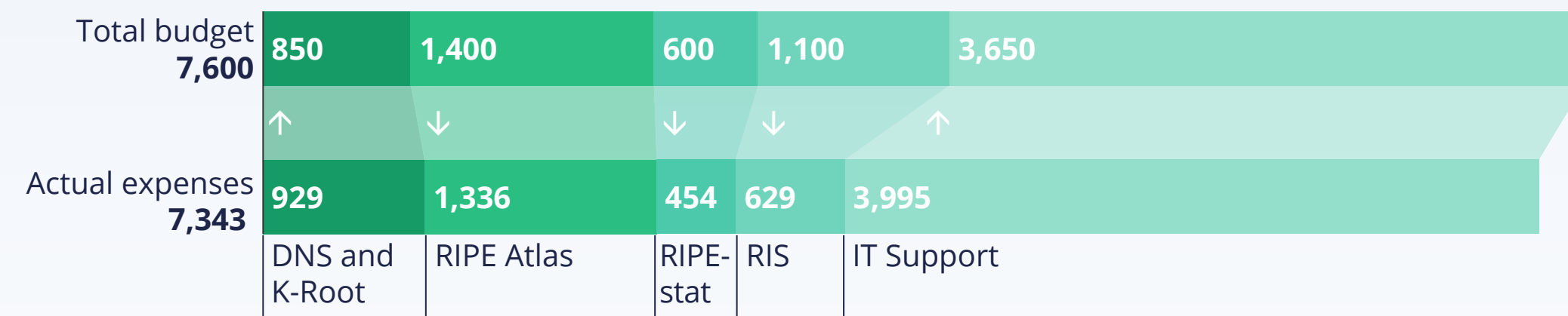
The Registry



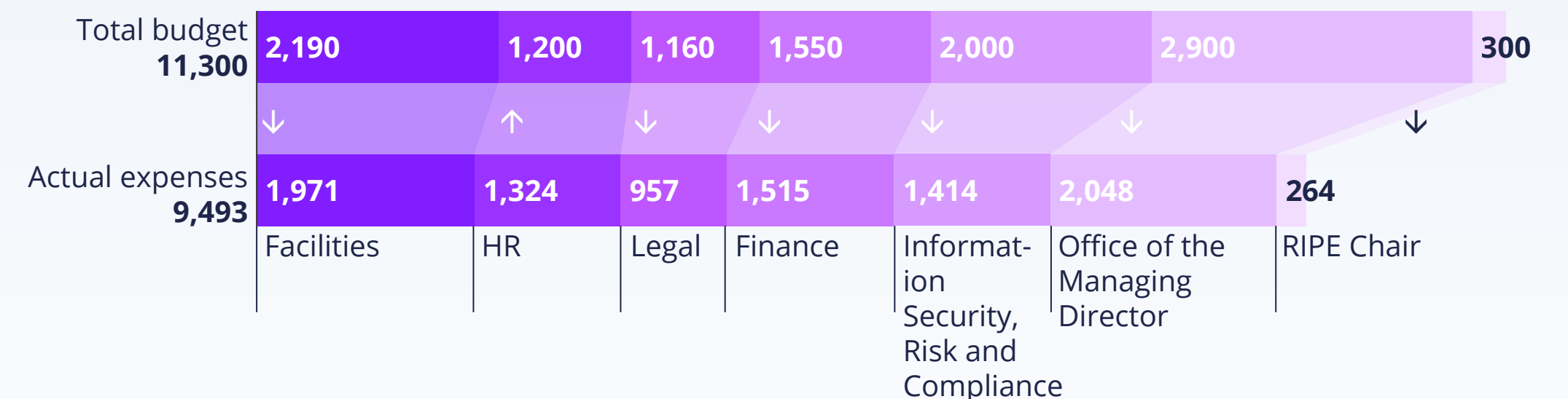
External Engagement and Community



Information Services



Organisational Sustainability





RIPE NCC
RIPE NETWORK COORDINATION CENTRE

WWW.RIPE.NET