RIPE NCC
RIPE NETWORK COORDINATION CENTRE

Technology

Highlights 2024

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Objectives 2024

- 4.4 Ensure security and compliance
- 4.1 Keep costs within budget
- 3 Provide world-class services to our members and users
- 3 Increase flow, agility and observability

Internet Measurements

Challenges with old RIPE Atlas Backend

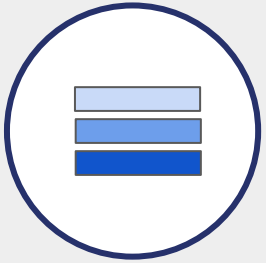
Expensive and dated solution for storing historical data

- Old cluster occupied 14 racks in our data centre
- Cluster was full and running on very old hardware
- Something needed to be done, with urgency
- Controllers backend also needed urgent modernisation

New solution

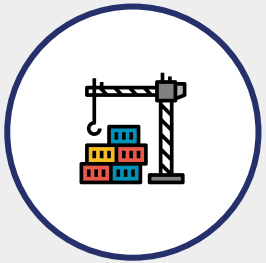
Smaller Hadoop cluster for recent data

Built using rented bare metal servers in Hetzner



AWS S3 for historical data

Historical data stored in cheap object storage



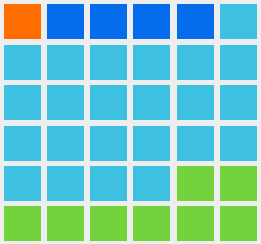
Controllers deployed in the EKS

Kubernetes cluster provided by AWS

Data centre reduction

Beginning of 2024

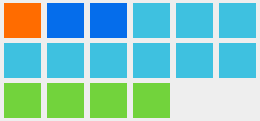
AM3



AM5

End of 2024

AM3



AM5

End of 2025-2026

AM3

NorthC

Network
Atlas / RIPEstat data sets
GII
IT

Next steps

Consolidating our Data Centre presence

- Move from AM5 to new Data Centre (NorthC)
  - Further reducing footprint from 10 to 6 racks
  - Increase geographical distance between Data Centres
- Work on new financially sustainable solution for storing RIS / RIPEstat historical data
- Goal is to have a secure and resilient Data Centre presence for our core services
  - RPKI, RIPE Database, DNS, Registry

RIPEstat and RIS

Highlights

- Planned our approach for the release of a new user interface in 2025
  - Extensive user research was done - RIPE Labs article from Antonella going in details
  - New UI launched in February - RIPE Labs article from Ties
- Completed a migration that helped with reducing the data centre footprint by consolidating datasets in a single cluster on-premises
- Added 32 new RIS Peers

Internet Infrastructure

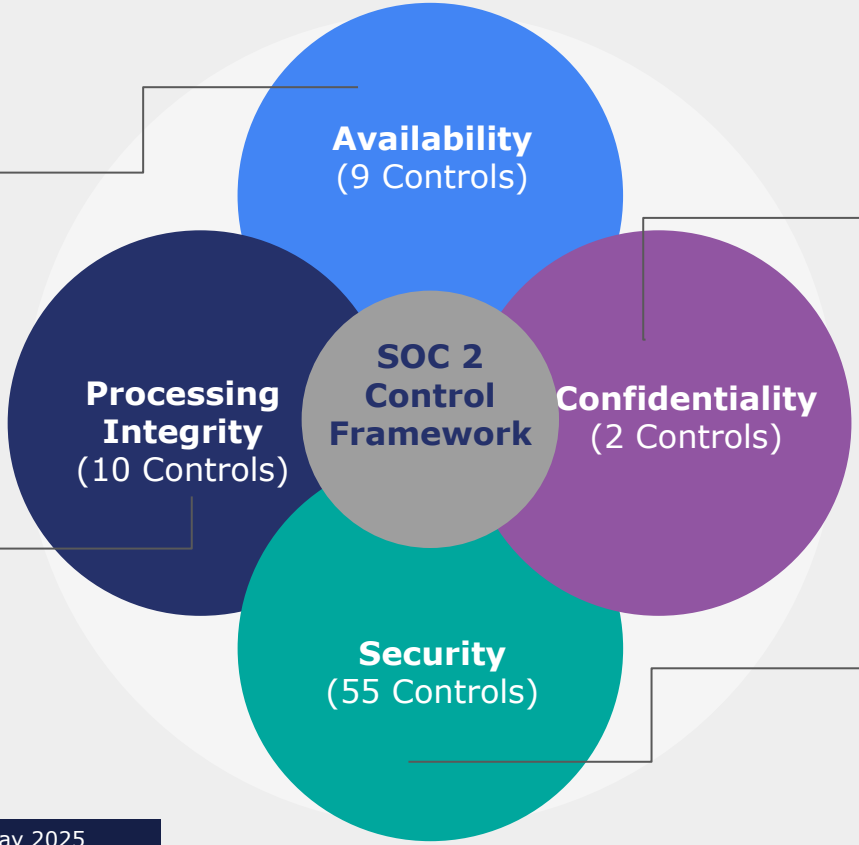
SOC 2 Type I certification obtained in August 2024

- No major deviations found during audit
- Main goal is to ensure the trust in our RPKI Trust Anchor
- This is done by having sufficient controls in place and being able to demonstrate that to the outside world
  - External auditor assesses effectiveness of our controls and produces report
- You can request a copy of the report in https://trust.ripe.net/

Overview of SOC 2 Controls

Ensures system uptime, failover readiness, disaster recovery, redundancy, backup reliability, and continuous performance monitoring.

Maintains system accuracy, completeness, and reliability through data validation, process monitoring, error detection, and audit trails.



Protects sensitive data through access controls, encryption, secure storage, data classification, policies and procedures.

Safeguards systems from threats via access controls, vulnerability management, intrusion detection, threat monitoring, and incident response.

NRO RPKI Programme

To achieve a consistent and uniformly secure, resilient and highly reliable RPKI service provision to the global Internet community

NRO RPKI Programme Objectives 2025

Improved transparency, robustness, and security of the RPKI system

NRO Trust Anchor
Robustness metrics

Increased consistency of the RPKI system user experience

Roadmap for core features (e.g. ASPA)

Improving the security of the RIPE Database

- Our goal is to phase out MD5 passwords before the end of 2025
- Last year we engaged with the community to define a solution that aims to strike the right balance between security and ease of use
- Provided API keys since the beginning of 2025
- Currently working to implement OAuth 2.0
- Removal of old MD5 hashes will only start after OAuth 2.0 is available
    - Except from inactive accounts (not used for more than a year)

DNS and K-Root

Highlights

- Improve resiliency and availability of both services by adding hosted nodes
- All nodes upgraded to a newer operating system
- Started the process to retire ns.ripe.net (completed in Jan 2025).

Cloud strategy

Current strategy

- We aim to leverage cloud technologies when they bring value to the organisation and our members
  - Improved focus for development teams, enhanced resiliency, availability, and security of our services
- We will maintain a robust on-premise infrastructure for our core services and for when the cloud doesn't provide these advantages
- Strategy Framework and Service Criticality Definitions provide us guidance on Cloud usage
  - RIPE NCC Cloud Strategy Framework v2
  - Service Criticality Ratings

Current Cloud Usage*

Service	Provider	Type
RIPE Atlas storage (recent data)	Hetzner	Rented bare metal
RIPE Atlas storage (historical data)	AWS	S3
RIPE Atlas Controllers	AWS	EKS
Research Data warehousing	Google	BigQuery
SSO Backend (Keycloak)	AWS	EKS
Productivity Tools (email, calendar, etc)	Google	Google Workspace
Meeting software	AWS	ECS

* Excludes CDNs and SaaS

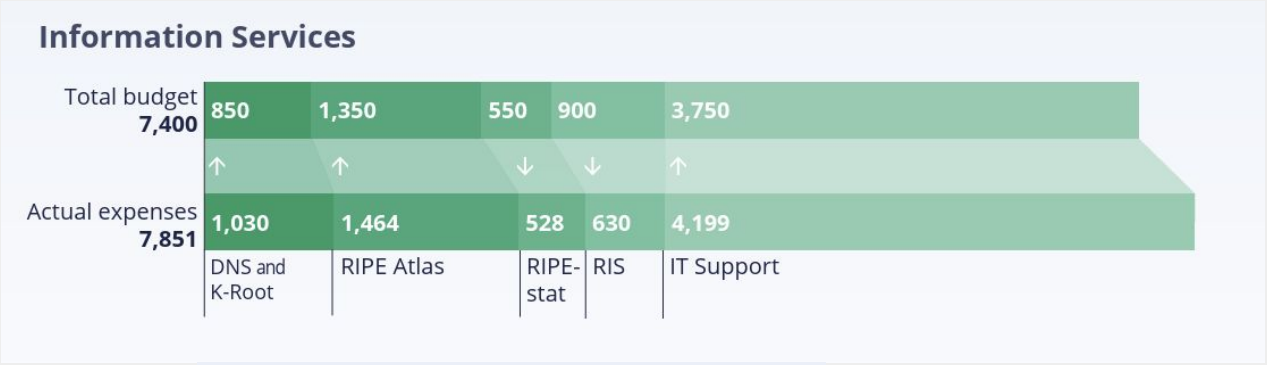
https://www.ripe.net/publications/documentation/cloud-technology-status/

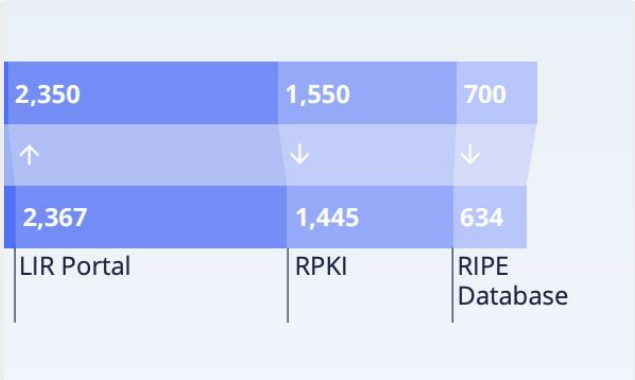
Future usage of the Cloud

- Due to the rapidly changing and seemly unstable international dynamics, we have identified an increased risk in using Cloud infrastructure
- Within that context, current strategy is being revised within the RIPE NCC
  - Exit strategies (part of Business Continuity plans)
  - Future cloud usage
- Some major deployments to Cloud (PaaS) have been put on hold
- Our strategy is shifting to rely more on-premises and less on Big Tech providers

Budget vs. Actuals

Budget Overview





Total Budget Technology: €12,000K
Actual Expenses Technology: €12.297K

Key Takeaways

Security and Compliance

Obtained SOC 2 / ISAE 3000 Type I certification

Increased security in many services

Cost effectiveness

Implemented a financially sustainable solution for storing RIPE Atlas historical data

Cloud Strategy

We are reviewing our strategy due to increased risks

Questions & Comments