RIPE NCC
RIPE NETWORK COORDINATION CENTRE

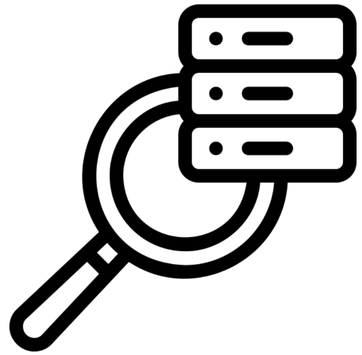
The RIS Project

Unleashing the power of BGP data

Jelena Ćosić | RIPE NCC Days Sofia | June 2023

Once upon a time…

- **We gather a lot of data!**
- **After a year of war in Ukraine, we wanted to see**
  - What has changed?
  - What was affected?
- **So we dived into some datasets…**
  - Like RIS, AS Hegemony, RIR stats….
- **… and discovered some interesting facts!**



The Facts

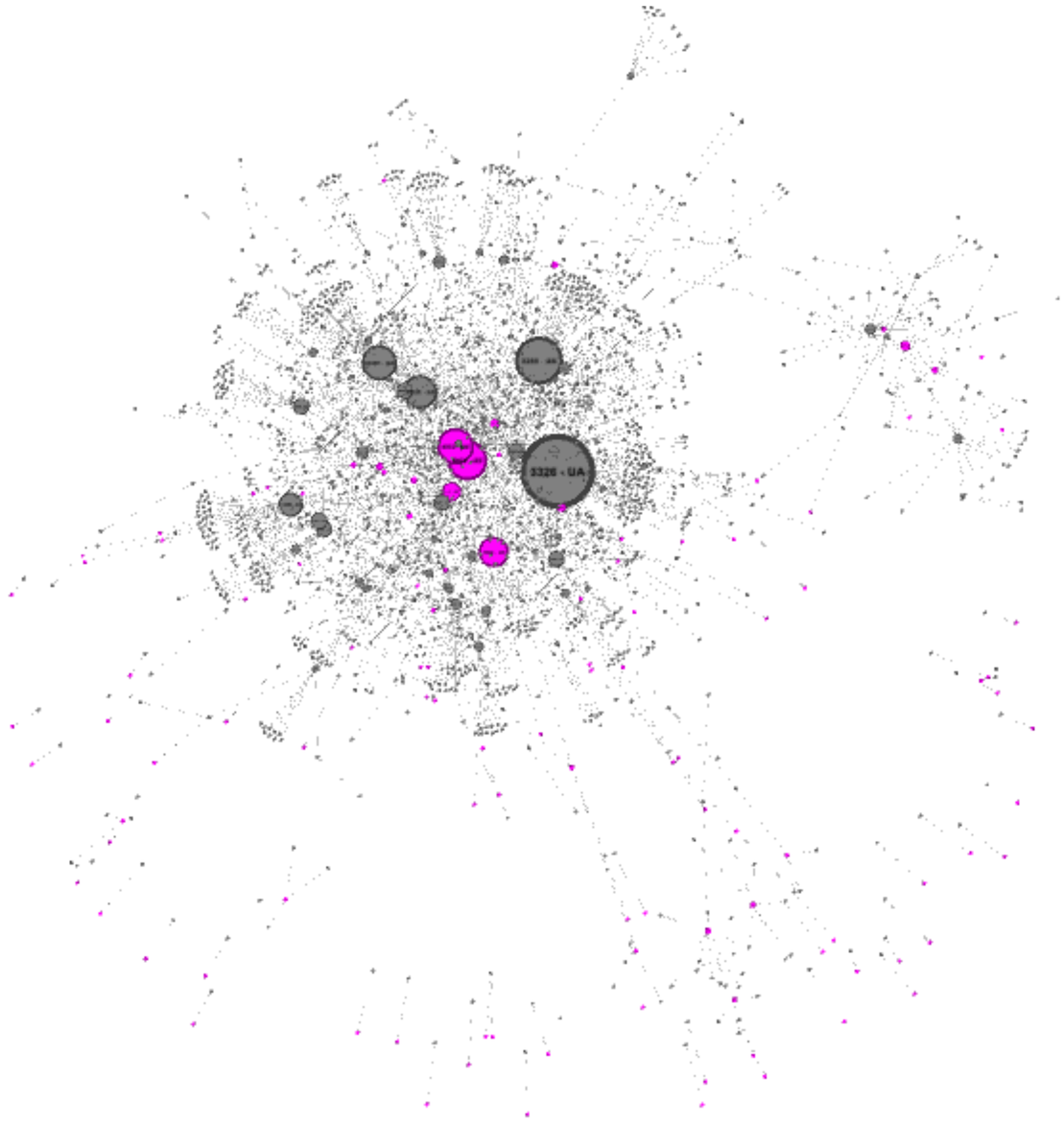
	2022-01-01	2023-04-01	Diff
Number of UA ASNs	1781	1677	-110 (-6.2%)
Foreign upstream ASNs	112	99	-13 (-12%)
Country of Registration for Foreign upstream ASNs (Top 5)	RU 48 US 10 NL 8 GB 8 PL 6	RU 21 US 13 PL 10 NL 9 DE 7	
Domestic links	2055	1936	-119 (-5.8%)
Intl. upstream links	662	600	-62 (-9.4%)

The Ukrainian Internet 2022-01-01

Grey nodes
Ukraine-registered networks

Pink nodes
Foreign-registered networks

The size of the nodes is based on the number of direct incoming links



The Ukrainian Internet 2022-01-01 vs 2023-04-01

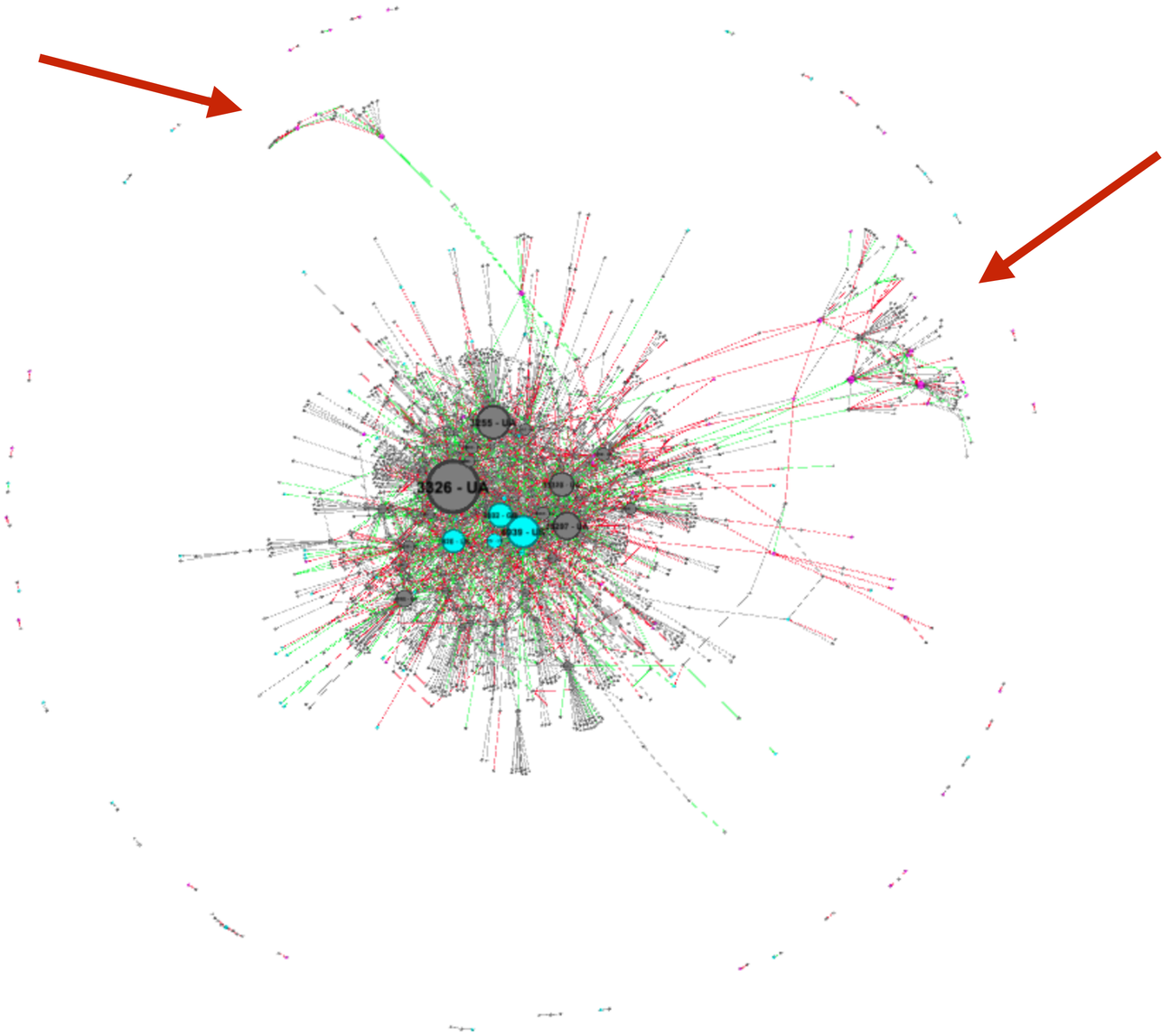
Grey nodes
Ukraine-registered networks

Blue nodes
Foreign-registered networks

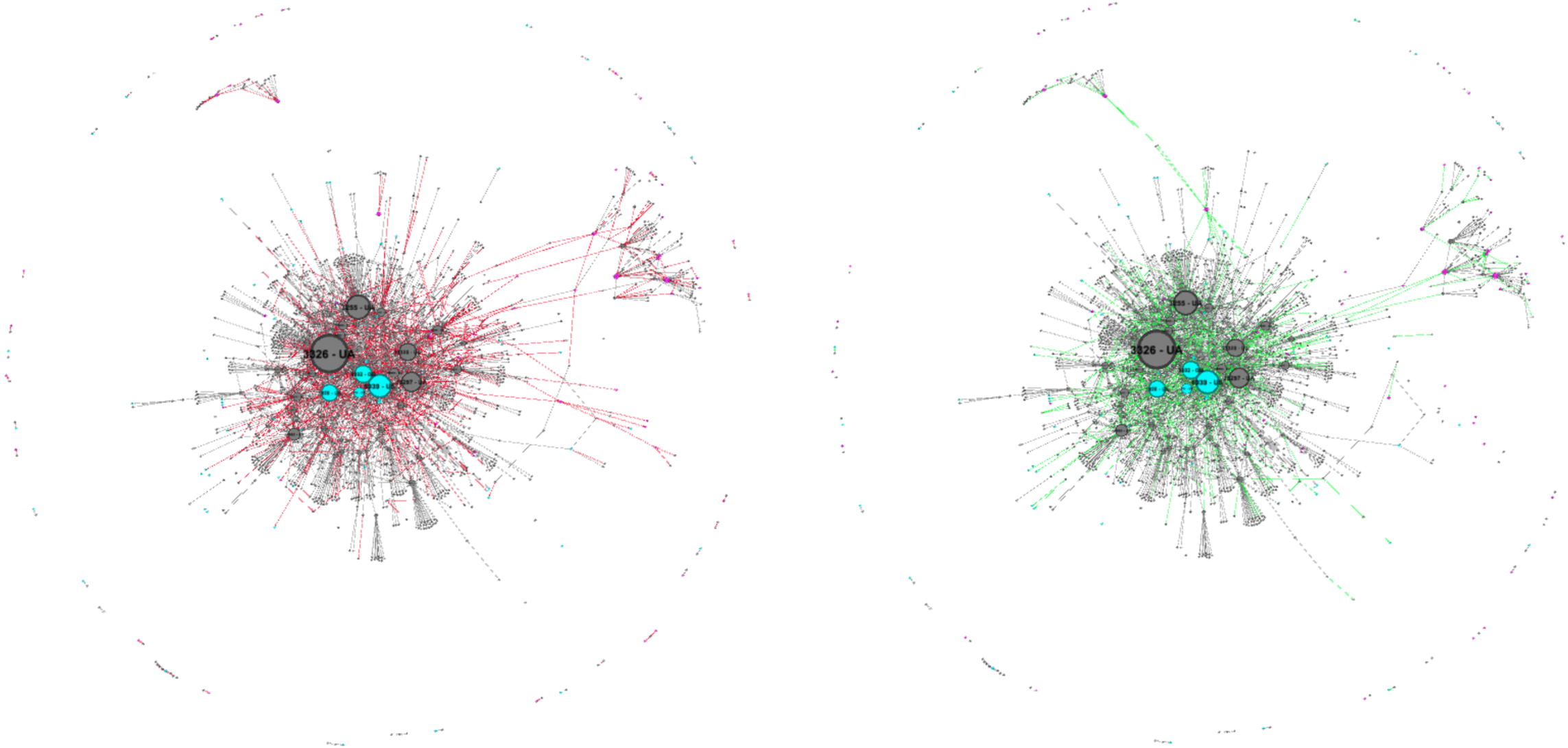
Red lines
Lost links

Green lines
New links

Grey lines:
Stable



Lost Links vs New Links



The Turkish Internet 2022

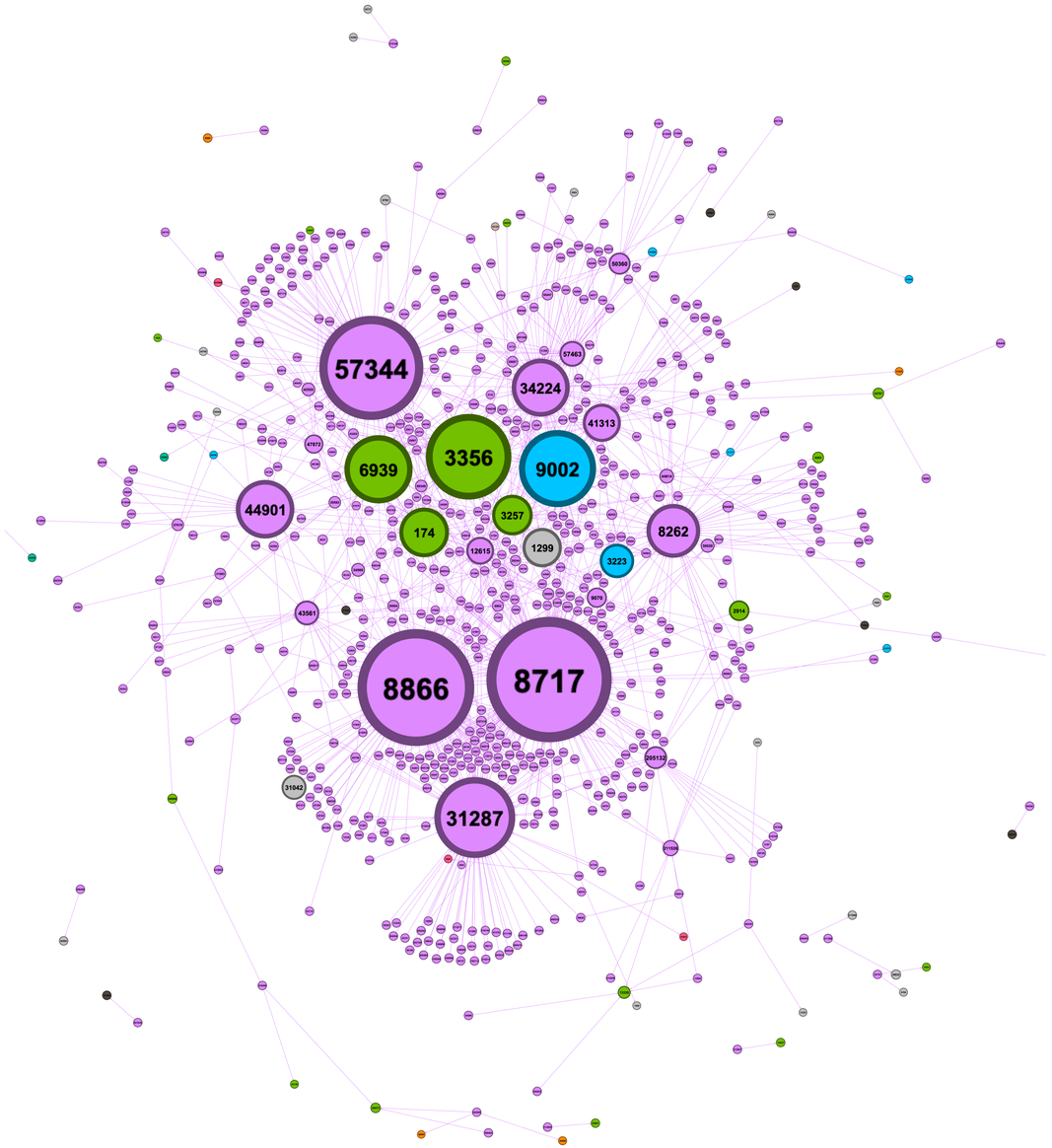
- Much simpler structure
- Relatively large dependency on a few networks

The Bulgarian Internet 2023

Purple nodes
Bulgarian-registered networks

Blue nodes
Foreign-registered networks

Green nodes
Tier 1/Transit networks



What is RIS?

What is RIS?

- RIS is a routing data collection platform
- Collecting BGP data since 1999
- Up-to-date routing information, as opposed to information in databases and routing registries, such as:
  - What is being announced
  - Which prefixes are seen and where
  - Which ones are not seen

THANK YOU TO OUR COMMUNITY

22 collectors

1500+ global peers

Why we collect BGP data

- The Internet routing system doesn’t have in-built security mechanisms
- Security by visibility

  Better visibility = greater security = lower risk of a BGP hijack

Who is RIS for?

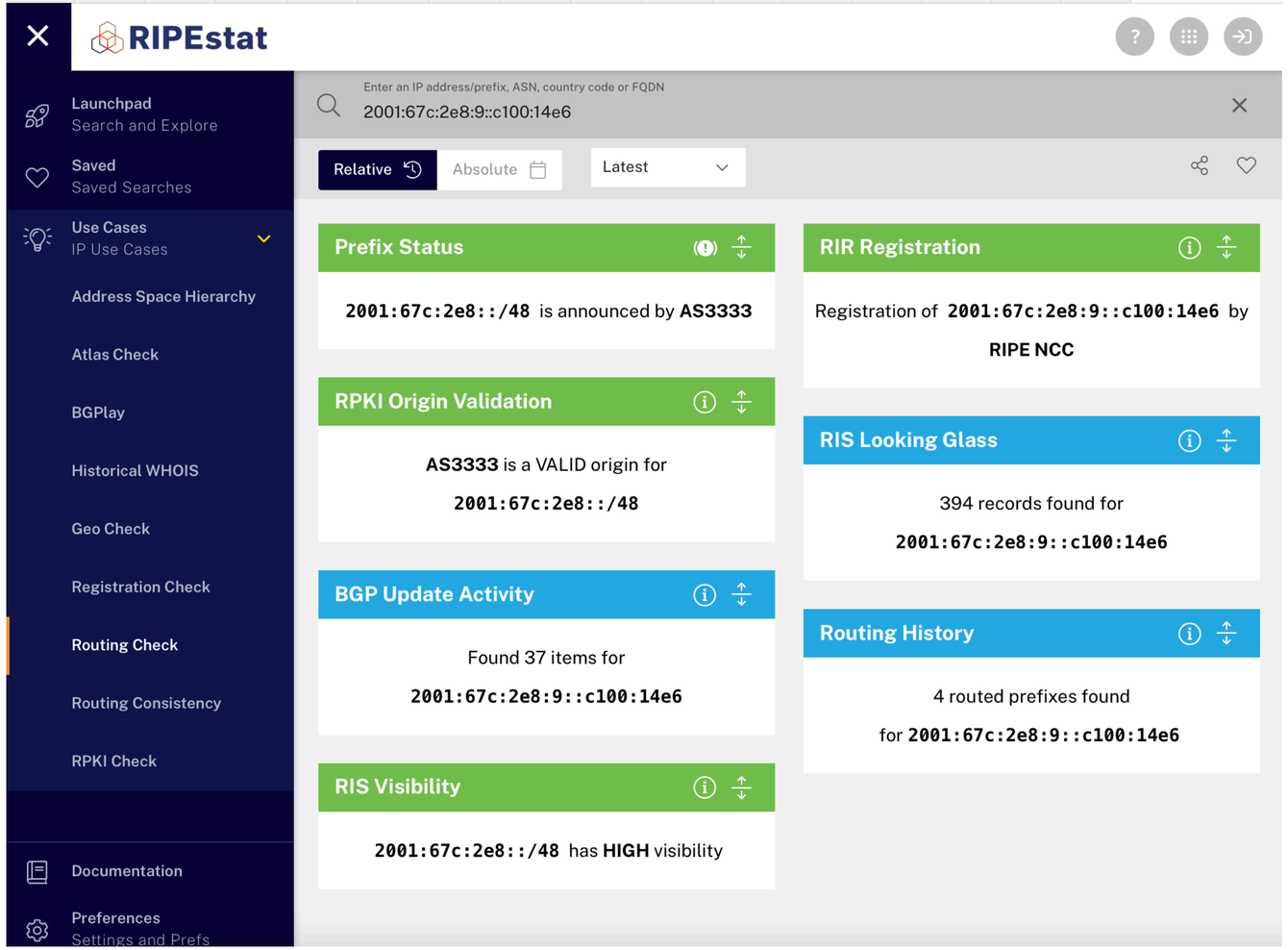
- Network operators, policy makers
  - To check specific routing incidents
  - To troubleshoot Internet routing
  - To develop future plans based on routing trends

- Researchers
  - To investigate notable events occurring in the Internet (i.e. network disruptions in specific countries, Facebook outage, etc)

How can you use RIS?

- Available as:
  - Raw data
  - Live stream (RIS Live)
  - Whois query interface (RISwhois)

- Visualisations available in RIPEstat



More tools to use RIS

- Others have developed tools based on RIS data
- bgp.he.net
  - This service uses RIS data and provides a dashboard with various aspects of the Internet routing system.
- BGPalerter
  - This software monitors RIS data in near real-time to detect route hijacks and other incidents.
- https://ihr.iijlab.net/ihr/en-us/ (Internet Health Report) / CAIDA IODA
  - These research projects uses RIS data to build experimental views using Internet routing data.

RIS Collectors

Collector	Location	IXP	Deployed	Removed	Collector	Location	IXP	Deployed	
RRC00	Amsterdam	Multi-hop	1999		RRC13	Moscow	MSK-IX	2005	
RRC01	London	LINX	2000		RRC14	Palo Alto	PAIX	2005	
RRC02	Paris	SFINX	2001	2008	RRC15	Sao Paulo	PTT-Metro SP	2006	
RRC03	Amsterdam	AMS-IX	2001		RRC16	Miami	NOTA	2008	
RRC04	Geneva	CIXP	2001		RRC18	Barcelona	CATNIX	2015	
RRC05	Vienna	VIX	2001		RRC19	Johannesburg	NAPAfrica JB	2016	
RRC06	Tokyo	DIX-IE	2001		RRC20	Zurich	SwissIX	2015	
RRC07	Stockholm	Netnod	2002		RRC21	Paris	FranceIX	2015	
RRC08	San Jose	MAE-West	2002	2004	RRC22	Bucharest	InterLAN	2017	
RRC09	Zurich	TIX	2003	2004	RRC23	Singapore	Equinix SG	2017	
RRC10	Milan	MIX	2003		RRC24	Montevideo	LACNIC multi-hop	2019	
RRC11	New York	NYIIX	2004		RRC25	Amsterdam	RIPE multi-hop	2021	
RRC12	Frankfurt	DE-CIX	2004						

Questions

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References

- **RIPE RIS**
  - https://www.ripe.net/analyse/internet-measurements/routing-information-service-ris/routing-information-service-ris
- **The Resilience of the Internet in Ukraine - One Year**
  - https://labs.ripe.net/author/emileaben/the-resilience-of-the-internet-in-ukraine-one-year-on/
- **AS Hegemony**
  - https://labs.ripe.net/author/romain_fontugne/as-hegemony-measuring-as-interdependence/