RIPE NCC
RIPE NETWORK COORDINATION CENTRE

The Internet Landscape in Southeast Europe

As Seen by the RIPE NCC

Desiree Miloshevic | 5 April 2023 | SEE Roundtable Meeting

RIPE NCC

- One of five Regional Internet Registries in the world
- Also provide a number of technical services and tools:
  - K-root
  - RIPE Atlas
  - RIPEstat
  - RIS
- Involved in public policy discussions and Internet governance

RIPE NCC Internet Country Reports

- Showcase RIPE NCC data and measurement platforms
- Bring value to local technical communities
- Support Internet development throughout service region
- Inform public policymaking

RIPE NCC Internet Country Report

- Southeast Europe report published in 2020

  https://labs.ripe.net/country-reports/

- Covers Albania, Bosnia and Herzegovina, Croatia, Kosovo, Montenegro, North Macedonia, Serbia and Slovenia

Highlights

- IPv4 shortage in region
- Most IPv4 transfers stay within region
- IPv6 capability very low throughout region
- Routing is generally efficient
- Moderate diversity in international connectivity

Figure 1:
Growth in the number of Local Internet Registries over time

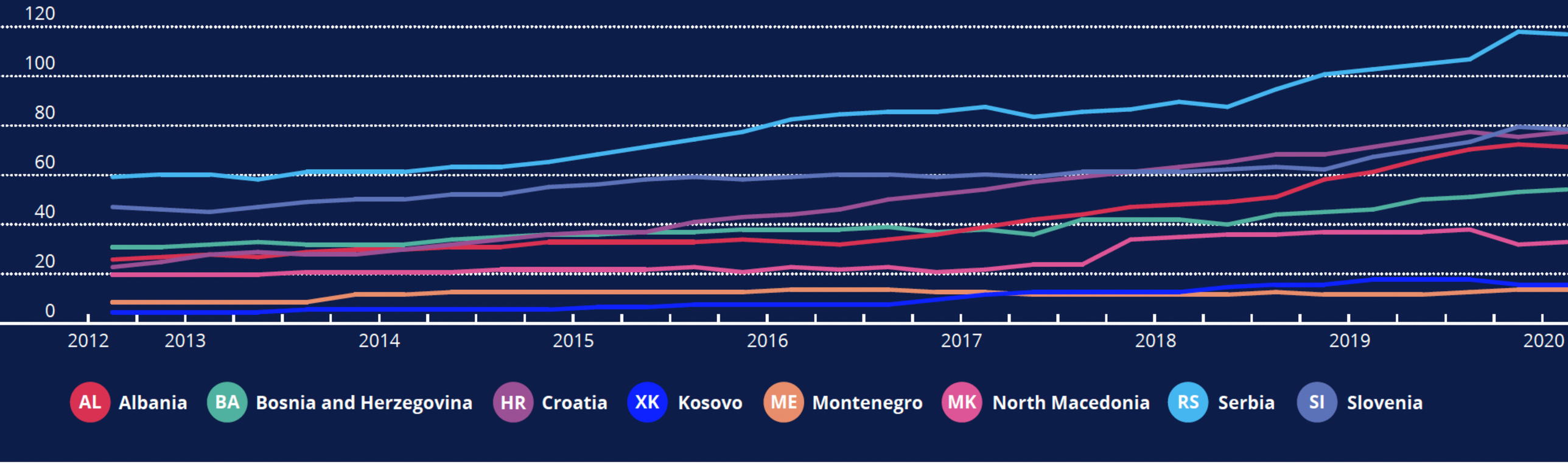


Figure 2:
IPv4 address holdings by country

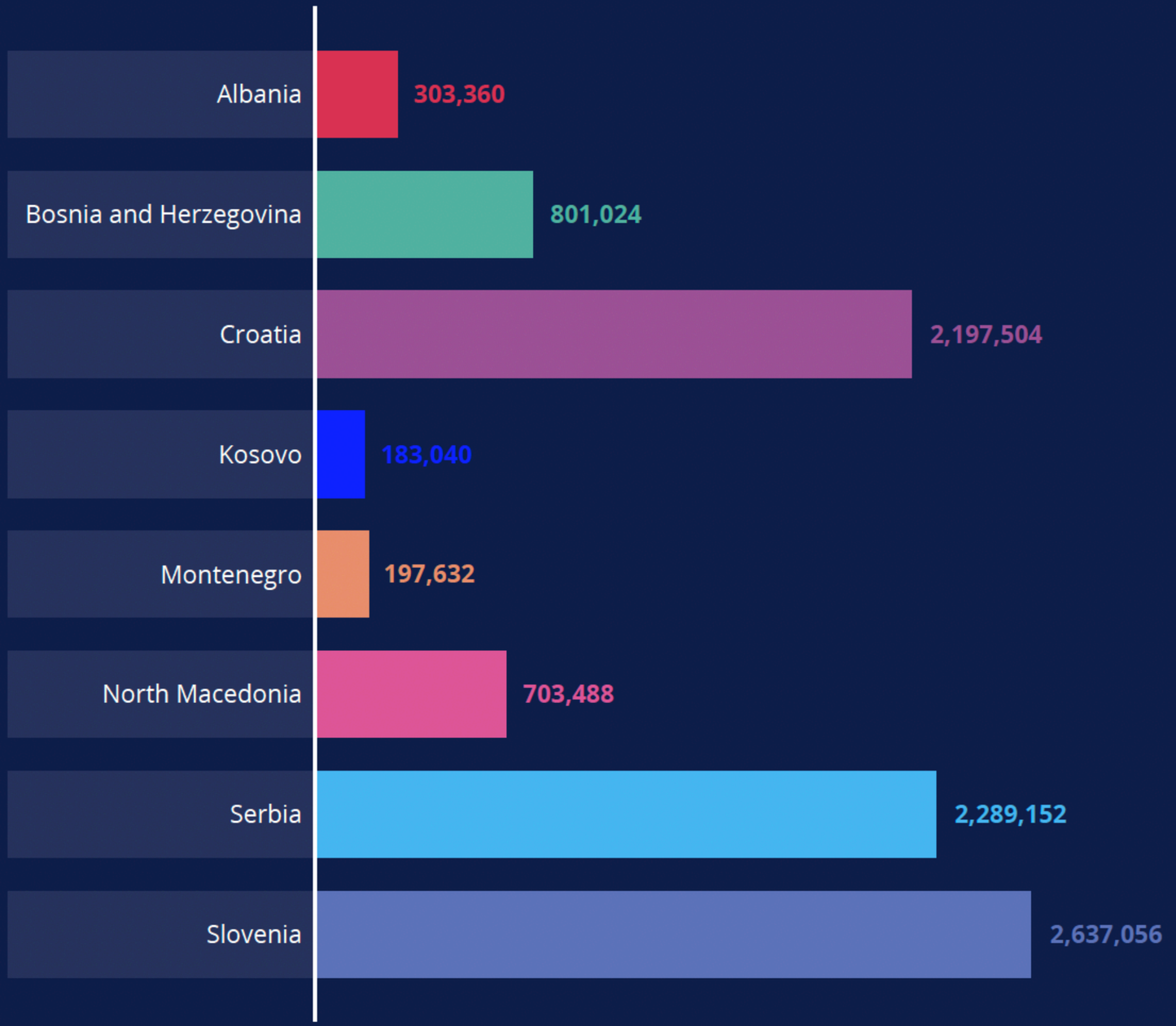
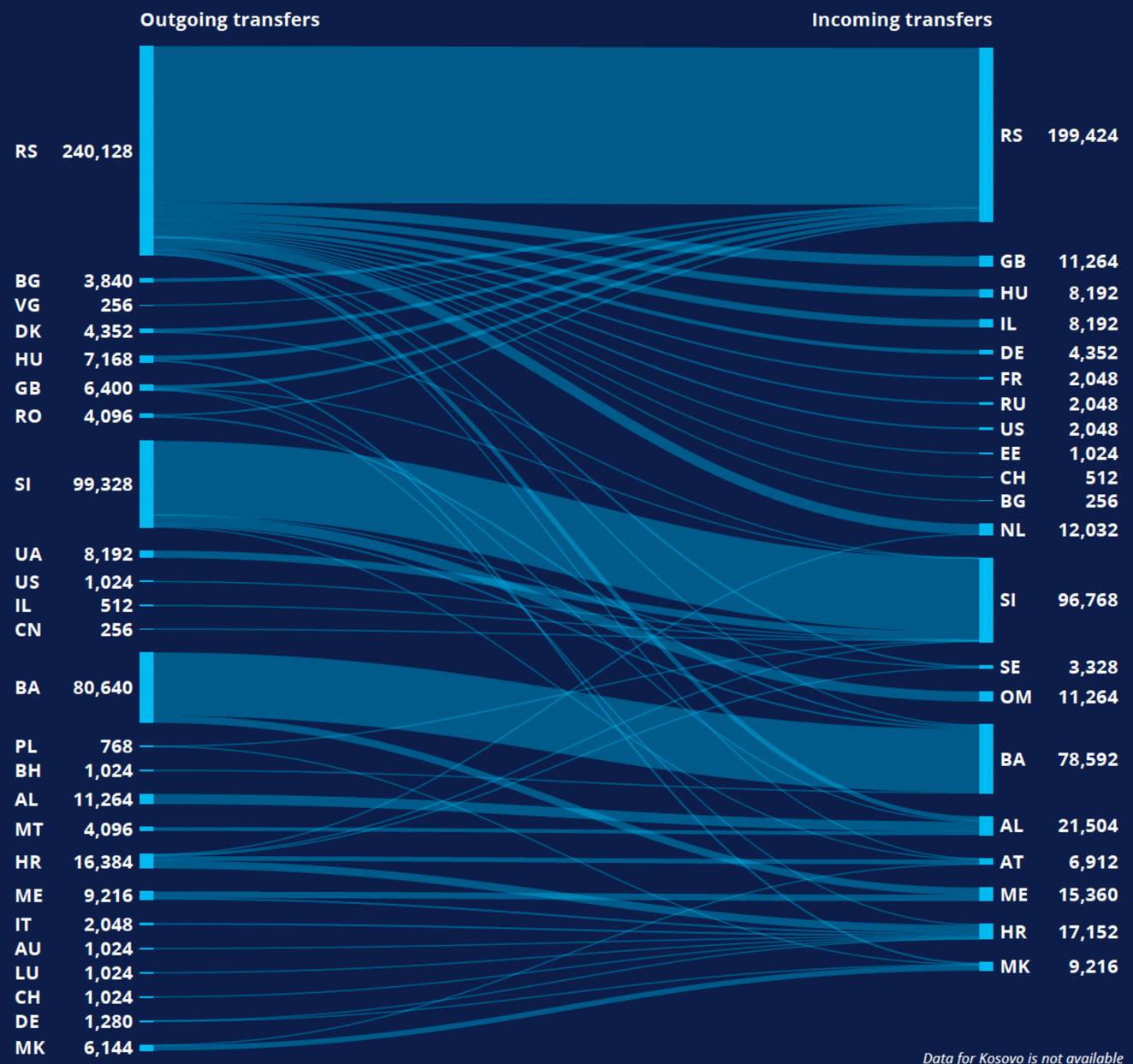


Figure 5:
IPv4 transfers within, into and out of Southeast Europe between April 2013 and February 2020



Data for Kosovo is not available

IPv6 in SEE

- Very low IPv6 capability rates compared to much of Europe
  - At the time of the report in 2020, ranged from 0-12% across region
- Not much change since:
  - Albania: 6-8%
  - Bosnia and Herzegovina: 8-11%
  - Croatia: 3-5%
  - Montenegro: <1%
  - North Macedonia: <1%
  - Serbia: 5-7%
  - Slovenia: 12-14%

IPv6 challenges

- According to RIPE NCC Survey 2019:
  - 35% of SEE respondents said IPv6 was main technical challenge (second to network security)
  - 57% of SEE respondents said they would need more IPv4 in coming 2-3 years
  - 20% of SEE respondents said they had fully deployed IPv6
- IPv6 remains the only sustainable solution for future growth
  - NAT (address sharing) has its limits
  - 5G, IoT, smart cities and emerging technologies require IP addresses
  - Governments and regulators, ISPs, IXPs, network operator groups (NOGs) all have a role to play

Figure 9:
K-root locations reached from within Southeast Europe (IPv4)

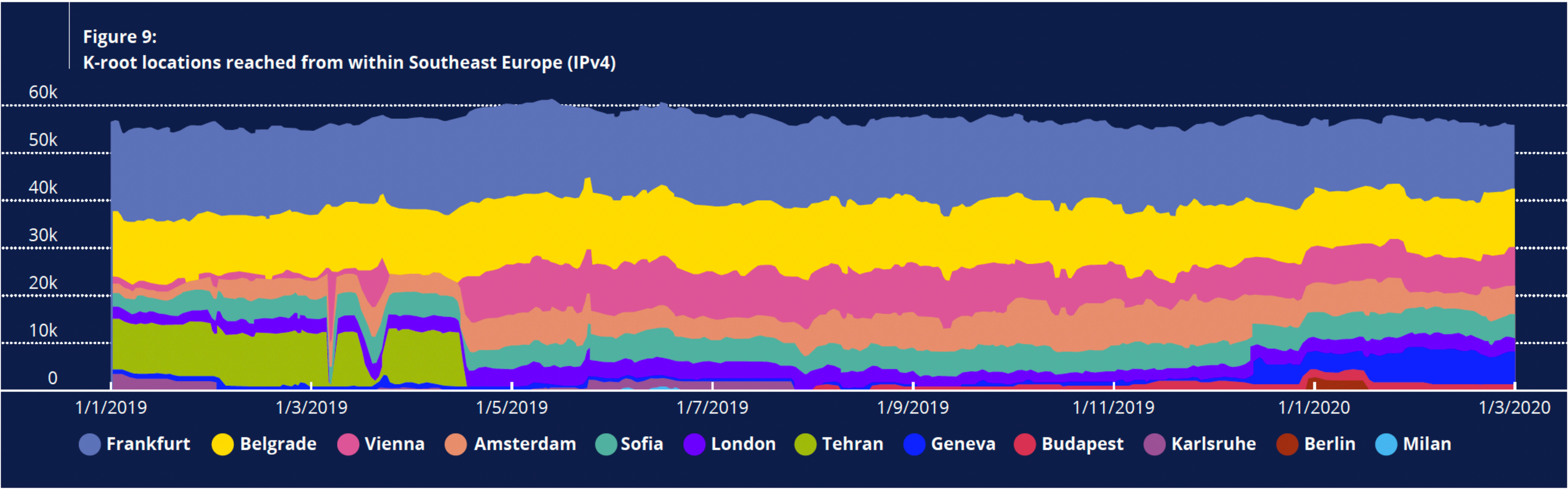


Figure 13:
Out-of-region traffic paths

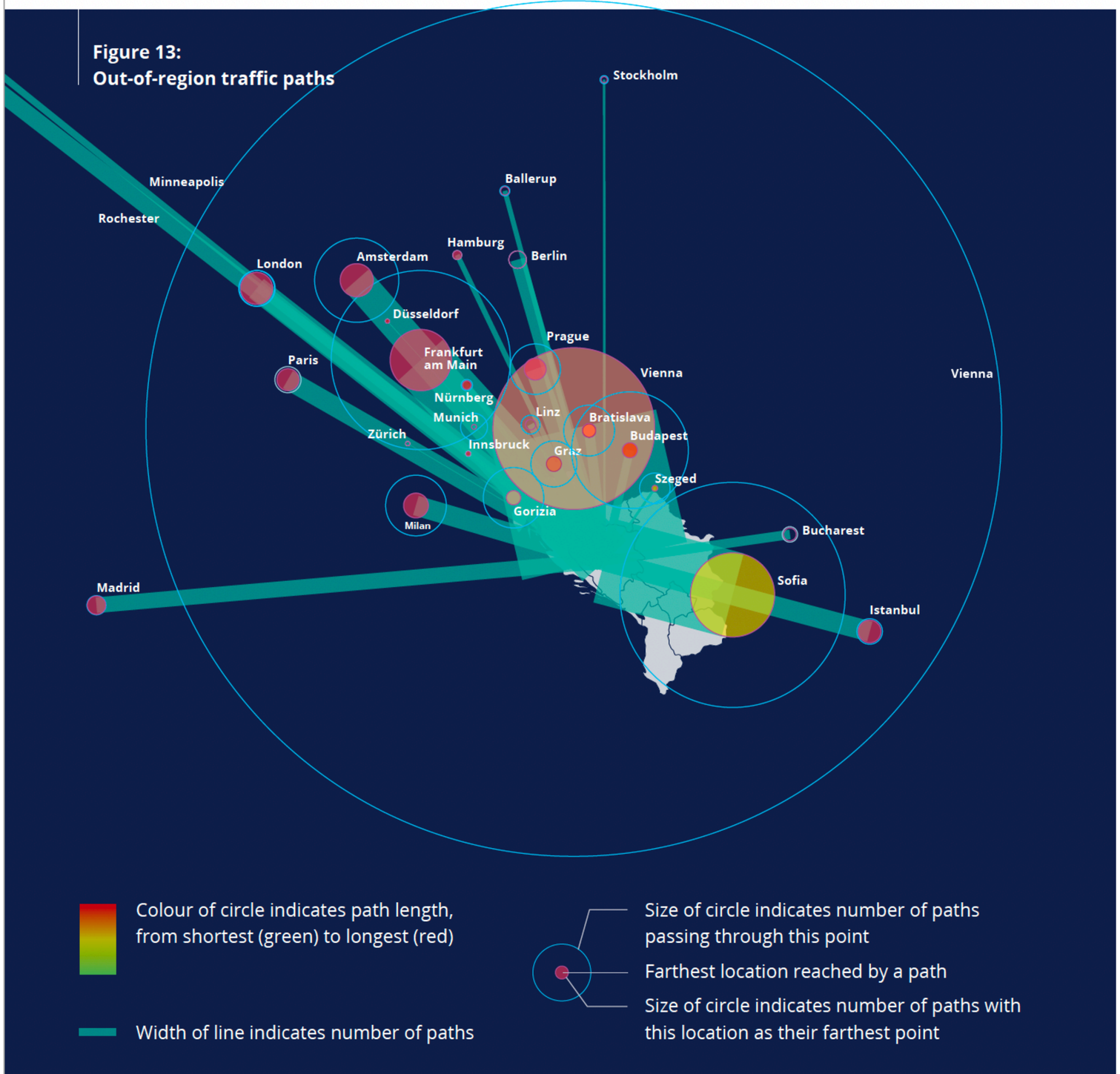
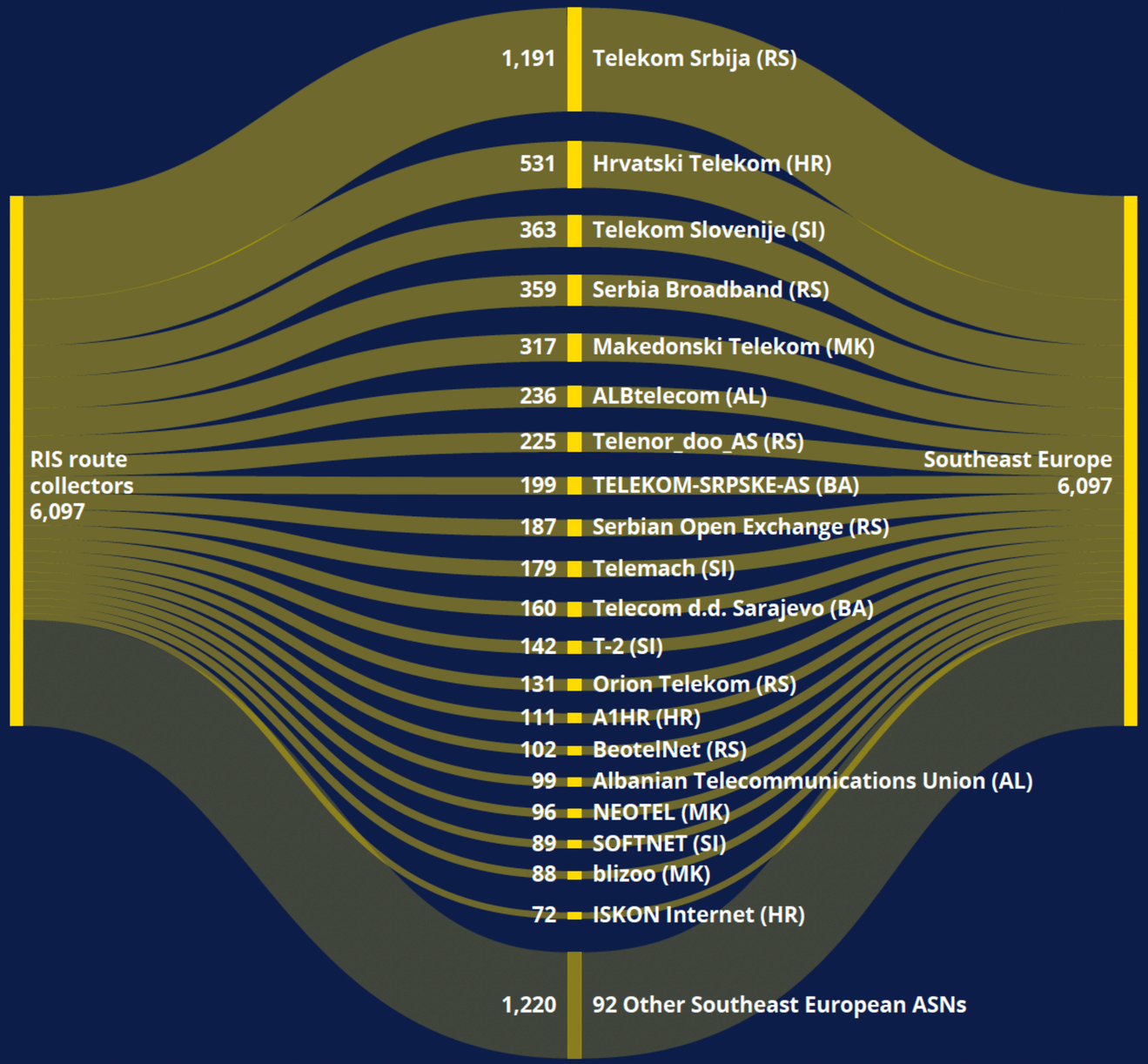


Figure 15:
Providers announcing Southeast European prefixes as seen by RIS route collectors



Routing Security in SEE

- RPKI (Routing Public Key Infrastructure) uptake quite high in SEE
- Current amount of IPv4 space covered by ROAs:
  - Albania: 91%
  - Bosnia and Herzegovina: 82%
  - Croatia: 24%
  - Montenegro: 77%
  - North Macedonia: 26%
  - Serbia: 83%
  - Slovenia: 92%

A few parting thoughts…

- These reports are always evolving
- Please get in touch and tell us what is useful

  ppig@ripe.net
- We can provide data and training on many topics
- Lots of interesting articles on RIPE Labs

  https://labs.ripe.net

Questions

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