

The Internet Landscape in Southeast Europe

Desiree Miloshevic | 5 April 2023 | SEE Roundtable Meeting

As Seen by the RIPE NCC



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

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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

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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

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





2020



Figure 2: IPv4 address holdings by country

	303,360	Albania
80'		Bosnia and Herzegovina
		Croatia
	183,040	Kosovo
	197,632	Montenegro
703,4		North Macedonia
		Serbia
		Slovenia

01,024

2,

2,197,504

,488



ł



Figure 5:



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



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:
 - 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

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35% of SEE respondents said IPv6 was main technical challenge (second to network













Width of line indicates number of paths



Farthest location reached by a path

Size of circle indicates number of paths with this location as their farthest point





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

RIS route collectors 6,097

1,191	Telekom Srbija (RS)
531	Hrvatski Telekom (HR)
551	
363	Telekom Slovenije (SI)
359	Serbia Broadband (RS)
339	Serbia Broauband (KS)
317	Makedonski Telekom (MK)
236	ALBtelecom (AL)
225	Telenor_doo_AS (RS)
199	TELEKOM-SRPSKE-AS (BA) 500theast Europe 6,097
187	Serbian Open Exchange (RS)
	Telemach (SI)
	Telecom d.d. Sarajevo (BA)
	T-2 (SI)
131	Orion Telekom (RS)
111	A1HR (HR)
	BeotelNet (RS)
	Albanian Telecommunications Union (AL)
	NEOTEL (MK)
	SOFTNET (SI) blizoo (MK)
12	ISKON Internet (HR)

92 Other Southeast European ASNs 1,220





Routing Security 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%

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• RPKI (Routing Public Key Infrastructure) uptake quite high in SEE

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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