RIPE NCC
RIPE NETWORK COORDINATION CENTER

Internet Landscape and Network Resiliency

In Moldova

Jelena Ćosić and Alex Semenyaka | RIPE NCC Days Chișinău | June 2025

Moldova at a Glance

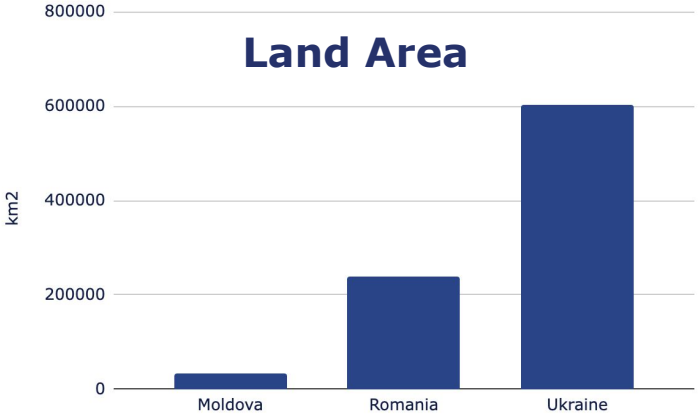
Moldova and Regional Context

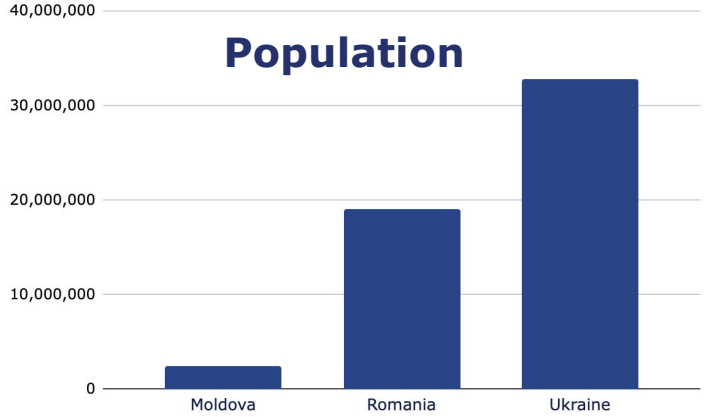
Comparative Context:

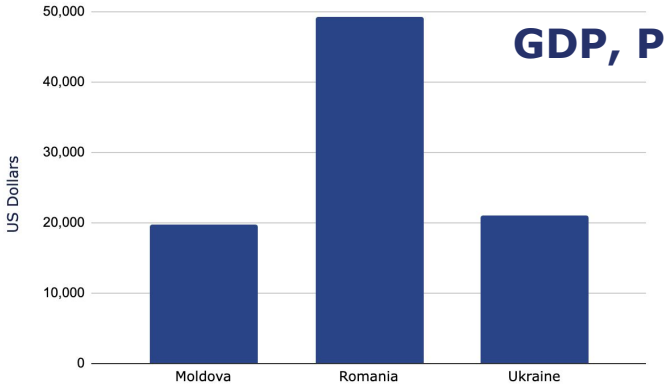
- Romania
- Ukraine

Map: Wikipedia

Basic Parameters







Data source: Wikipedia

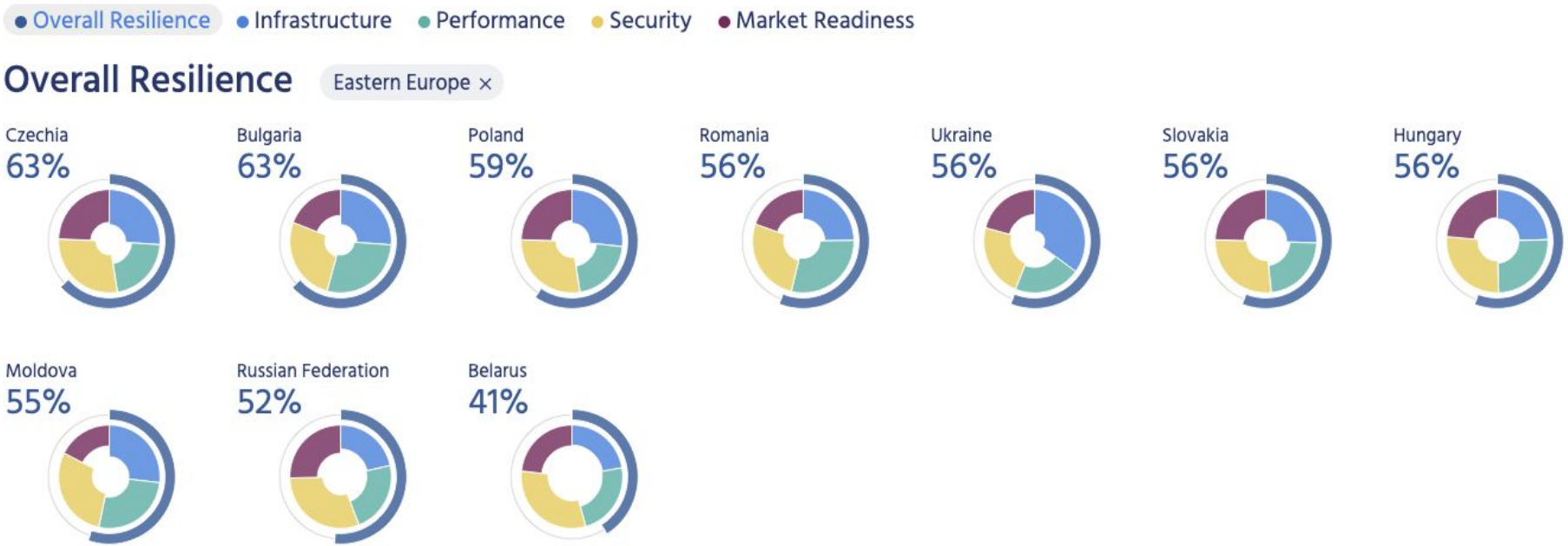
Internet Resilience

Internet resilience

[ˈɪntənɛt rɪˈzɪlɪəns] noun

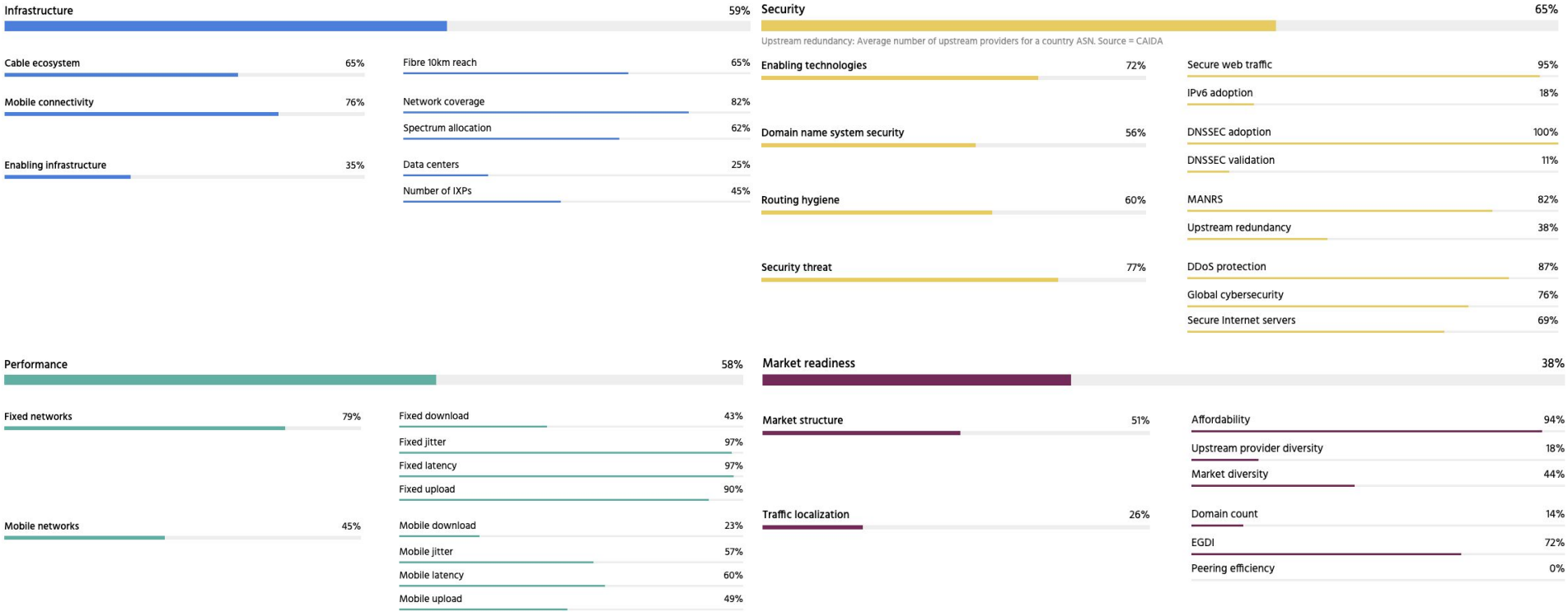
The capacity of a country or region's Internet infrastructure to maintain stable and reliable service despite disruptions.

Internet Resilience Index: Eastern Europe



Internet Society Pulse:
pulse.internetsociety.org/resilience

Internet Resilience Index: Moldova

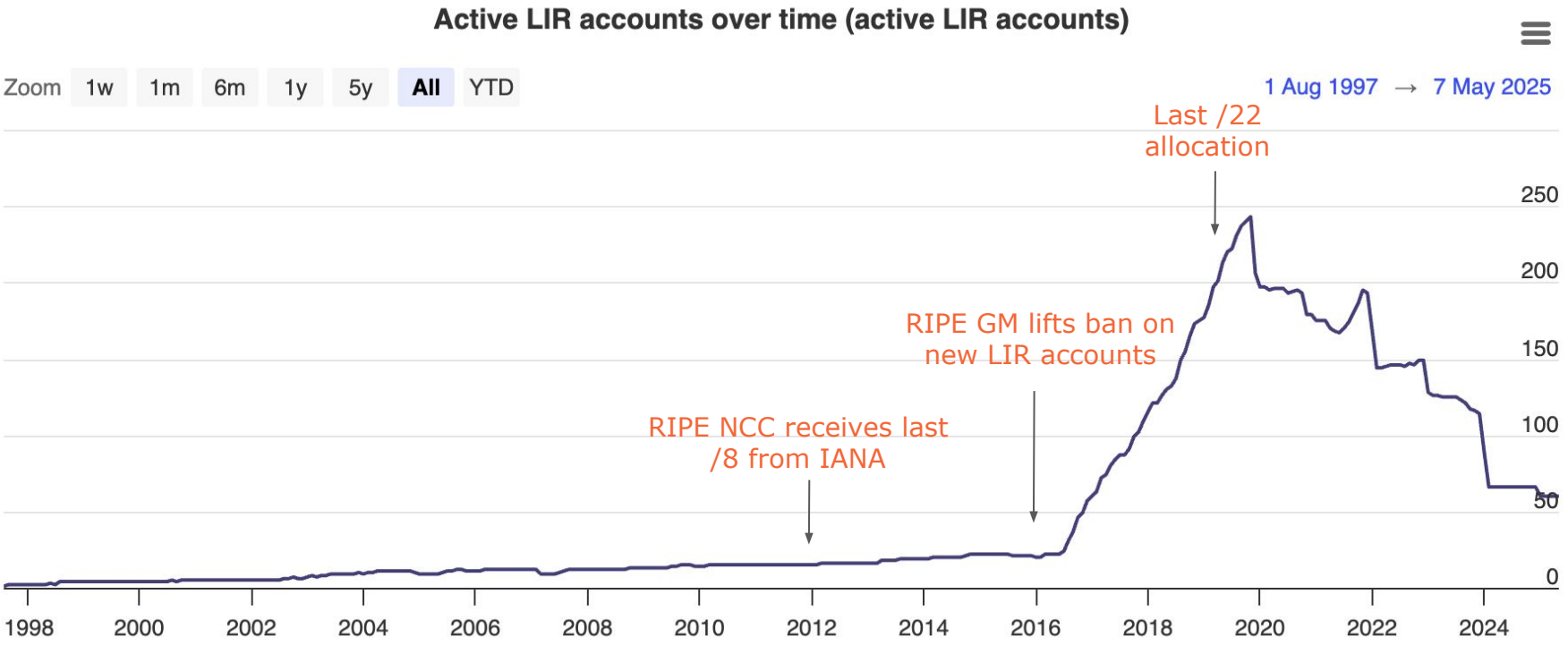


pulse.internetsociety.org/resilience

Market Readiness

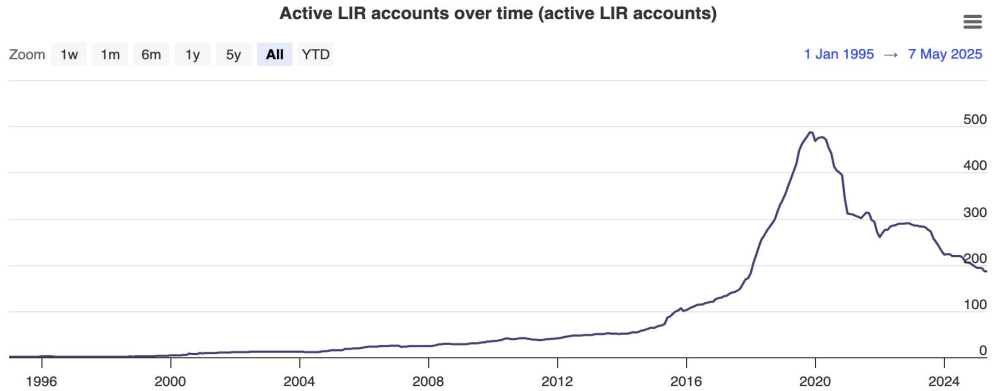
Market structure

Active LIRs: Moldova

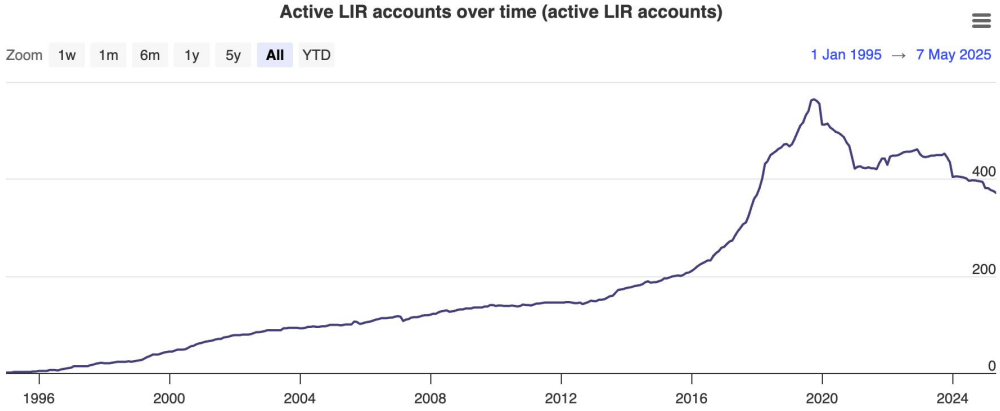


Data source: RIPE NCC

Active LIRs: Neighbours



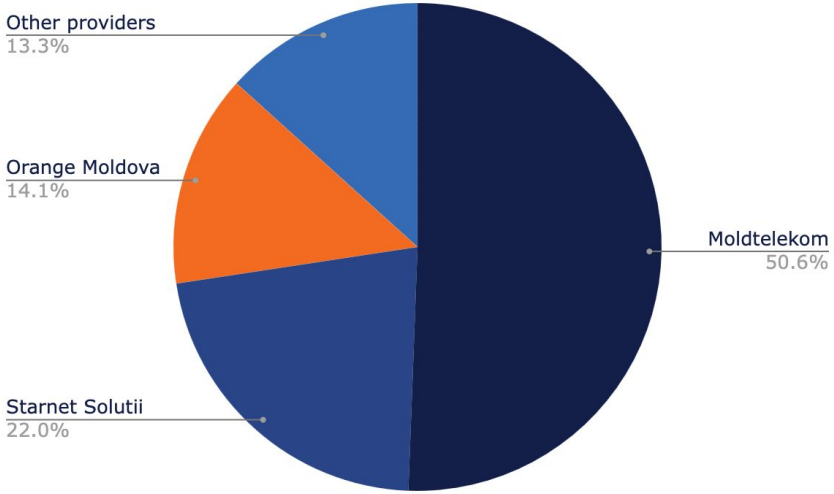
Romania



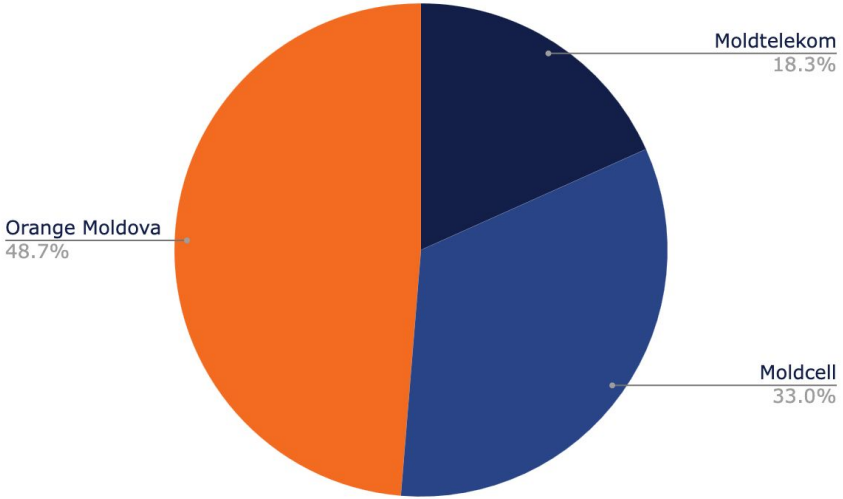
Ukraine

Data source: RIPE NCC

Market Structure: Fixed Broadband and Mobile Voice



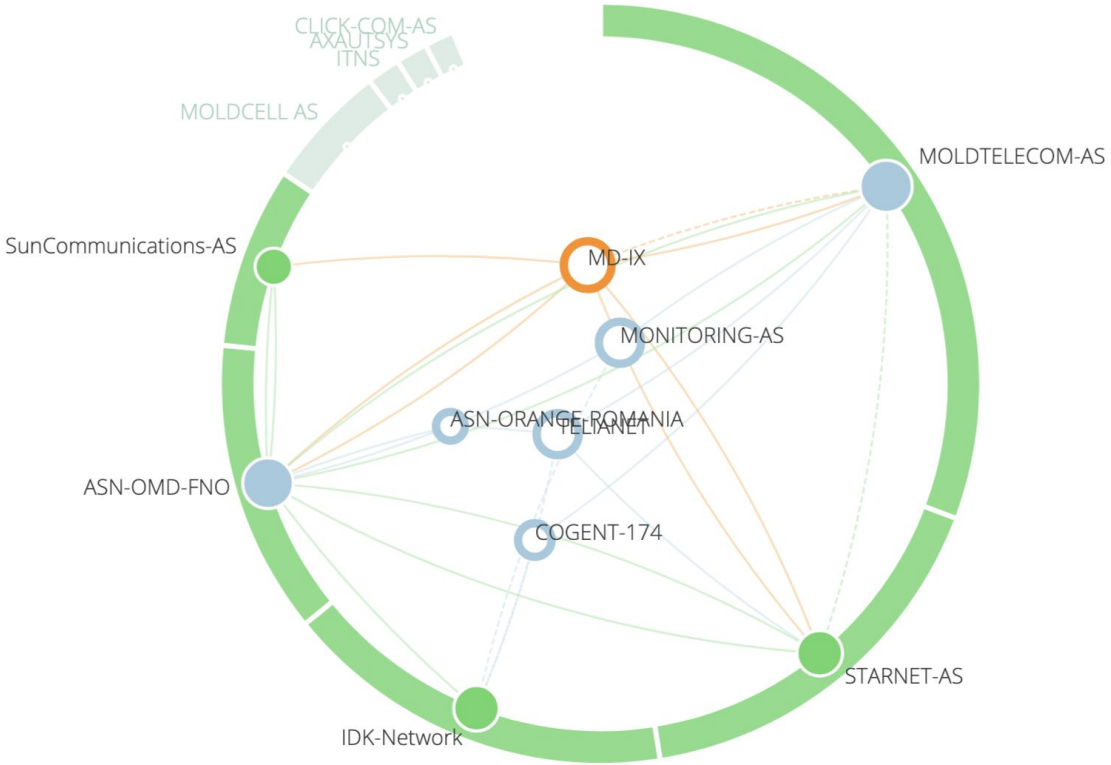
Market shares of fixed broadband providers by number of subscribers



Mobile telephony market share by total SIMs

Data source: ANRCETI 2024

Peer-to-peer Connections: Moldova

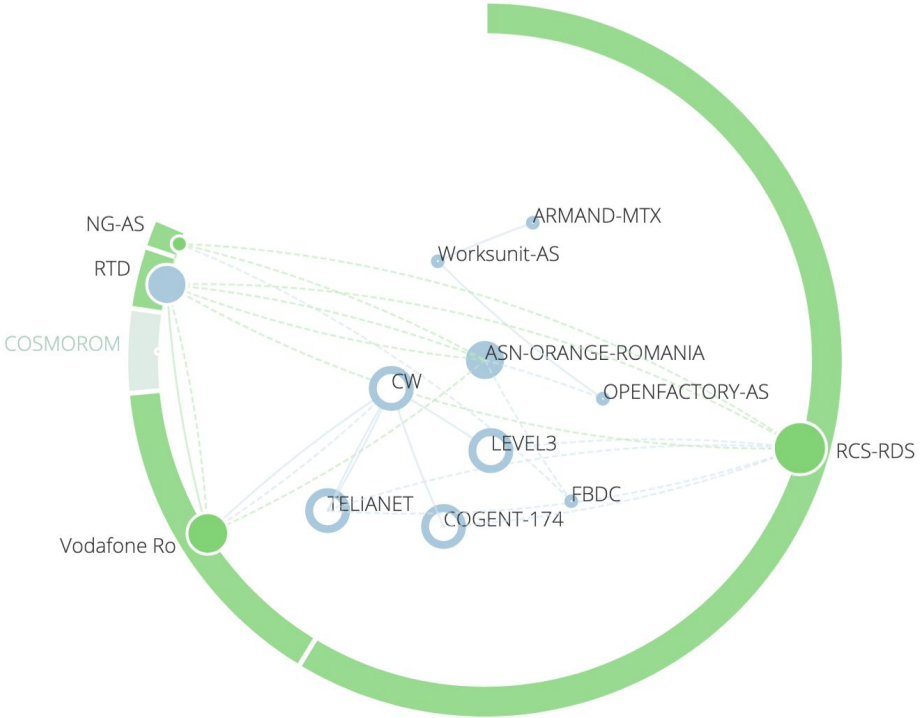


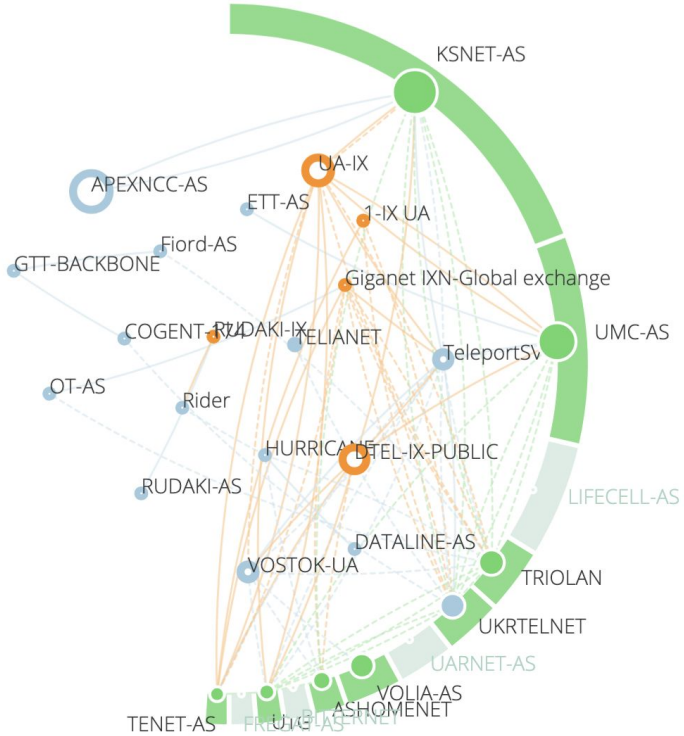
The sketch show how end-users interconnect within a country.

It illustrates the peer-to-peer fabric at a specific point in time and provides insight into how networks interconnect users.

jedi.ripe.net/peer-to-peer

Peer-to-peer Connections: Romania and Ukraine





jedi.ripe.net/peer-to-peer

Market Structure

Country	HHI score
RU	0.047
UA	0.052
BG	0.178
MD	**0.187**
RO	0.418

The Herfindahl-Hirschman Index (HHI) is an economic measure of market concentration.

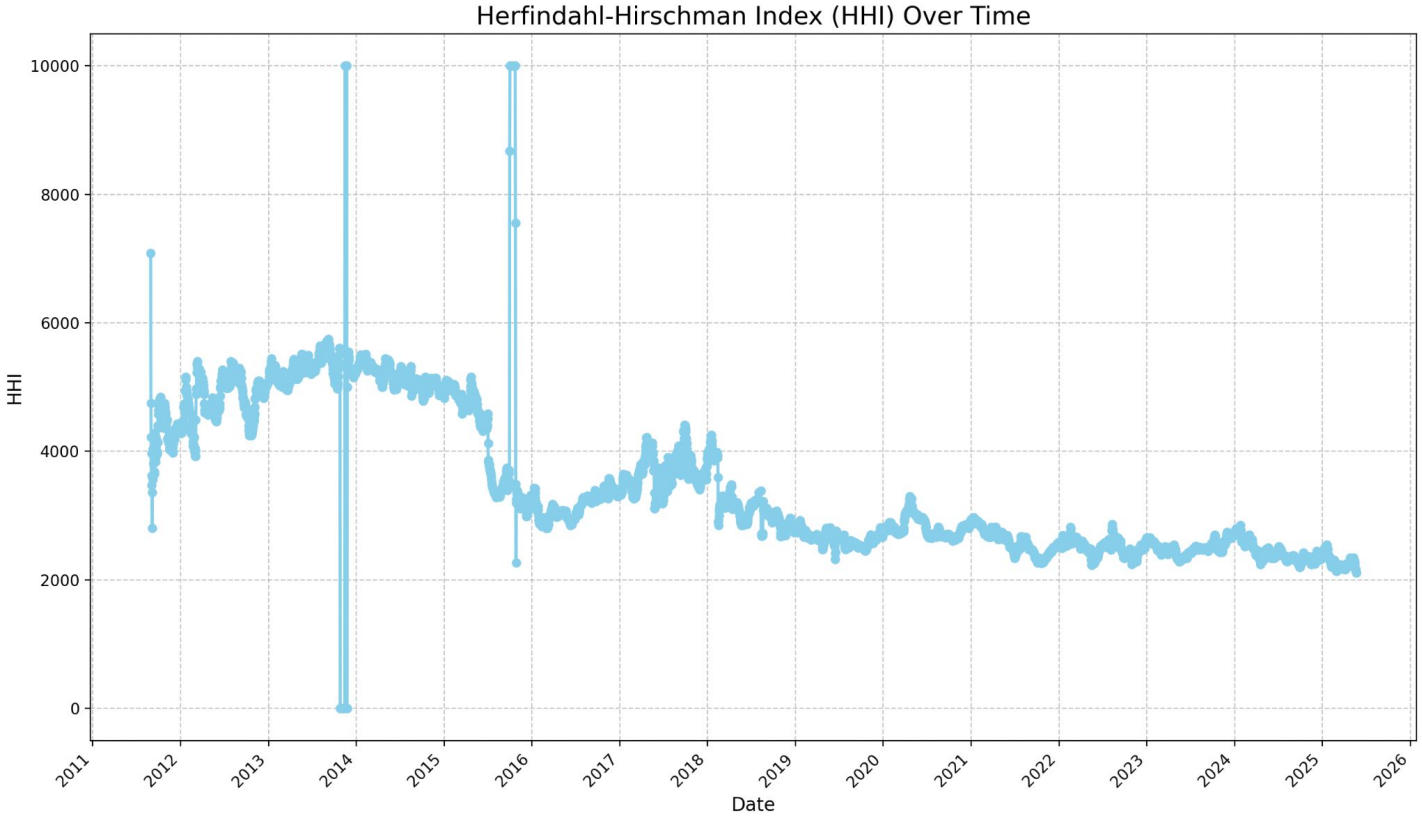
We calculate the HHI using APNIC data on networks serving users in a specific country. Only networks with over 1% of users in that country are included.

By converting percentages to fractions, we obtain an HHI ranging from 0 (no concentration) to 1 (monopoly).

- HHI < 0.1: Unconcentrated (competitive market).
- 0.1 ≤ HHI < 0.18: Moderately concentrated.
- HHI ≥ 0.18: Highly concentrated (indicative of significant market power).

Data source: APNIC

HHI: Median Value for 30 Days

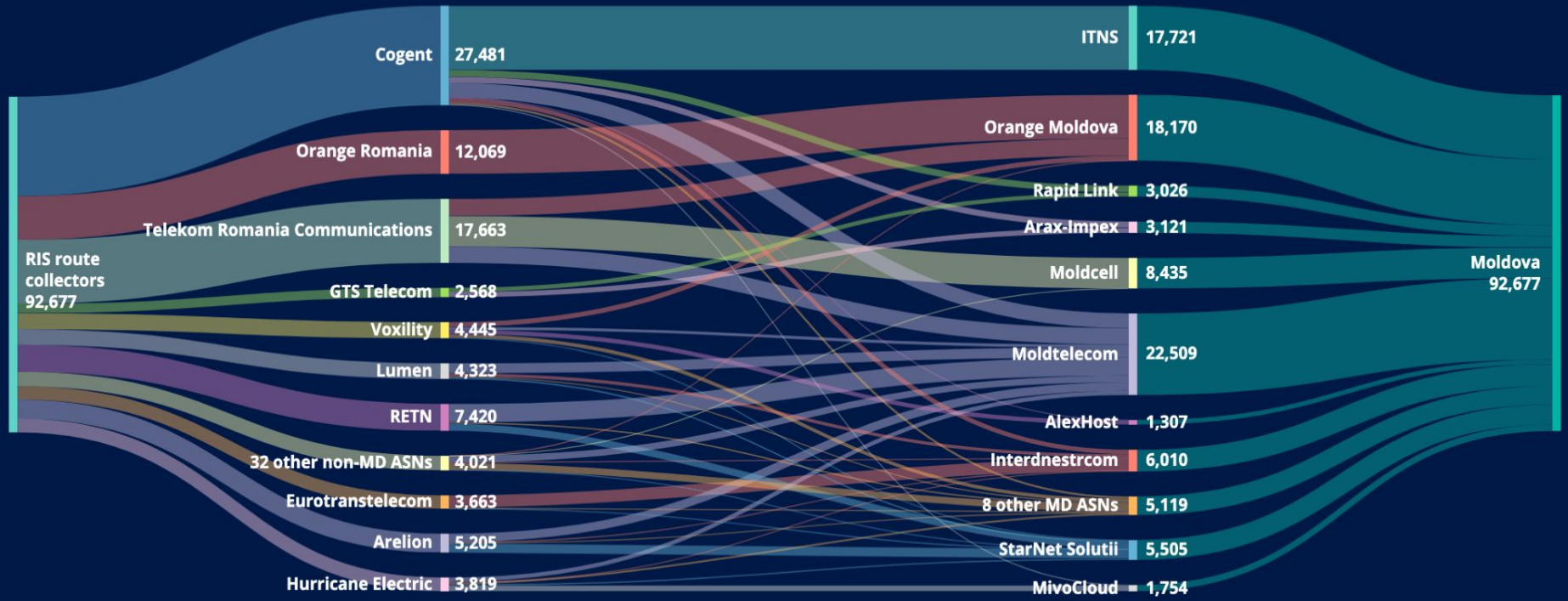


Data source: APNIC

Market Readiness

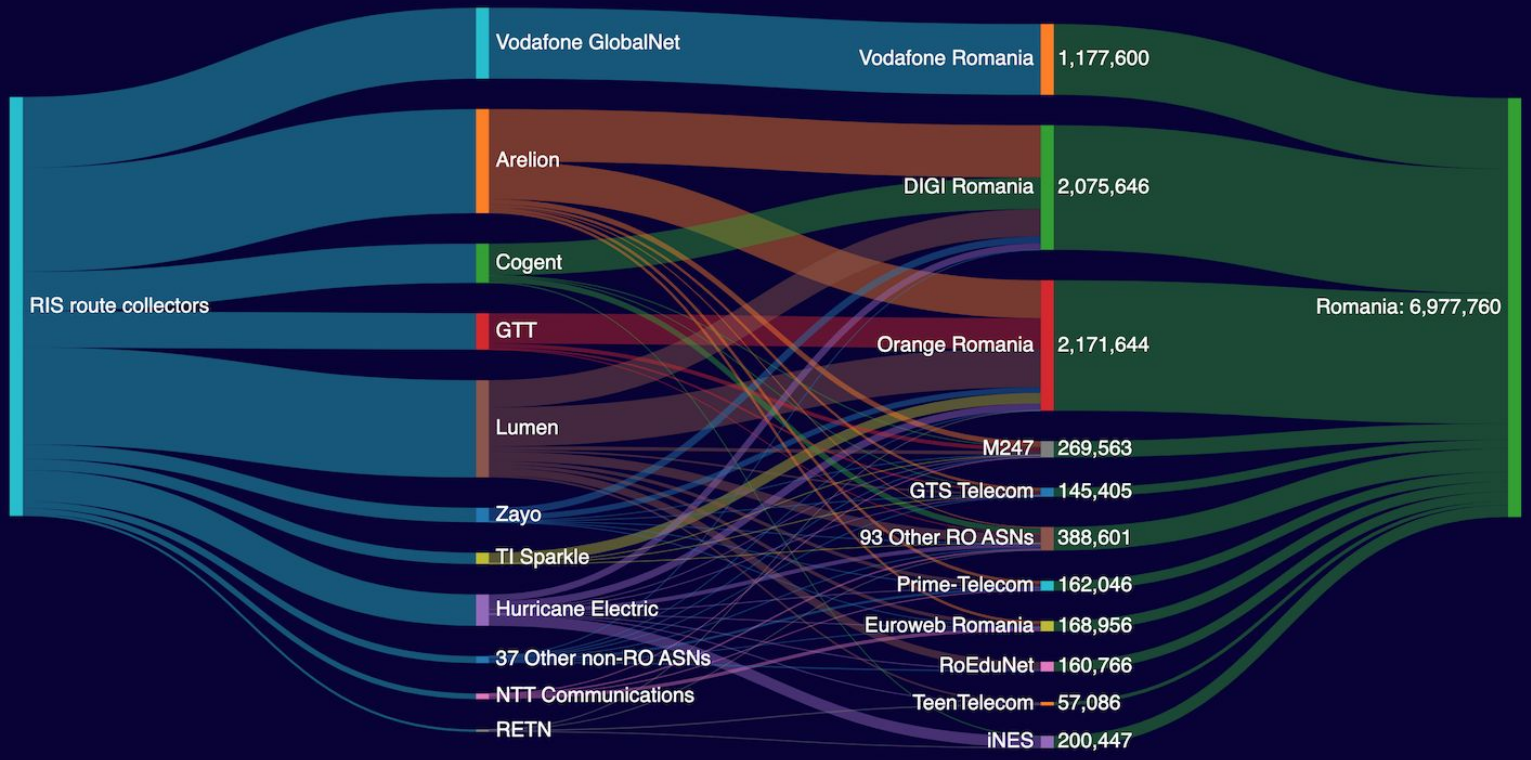
Upstream provider diversity

Upstream Operators Providing Connectivity into Moldova



Data source: RIPE RIS

Upstream Operators Providing Connectivity into Romania



Data source: RIPE RIS

Market Readiness

Traffic localisation

Peering Efficiency

RIPE Atlas measurement

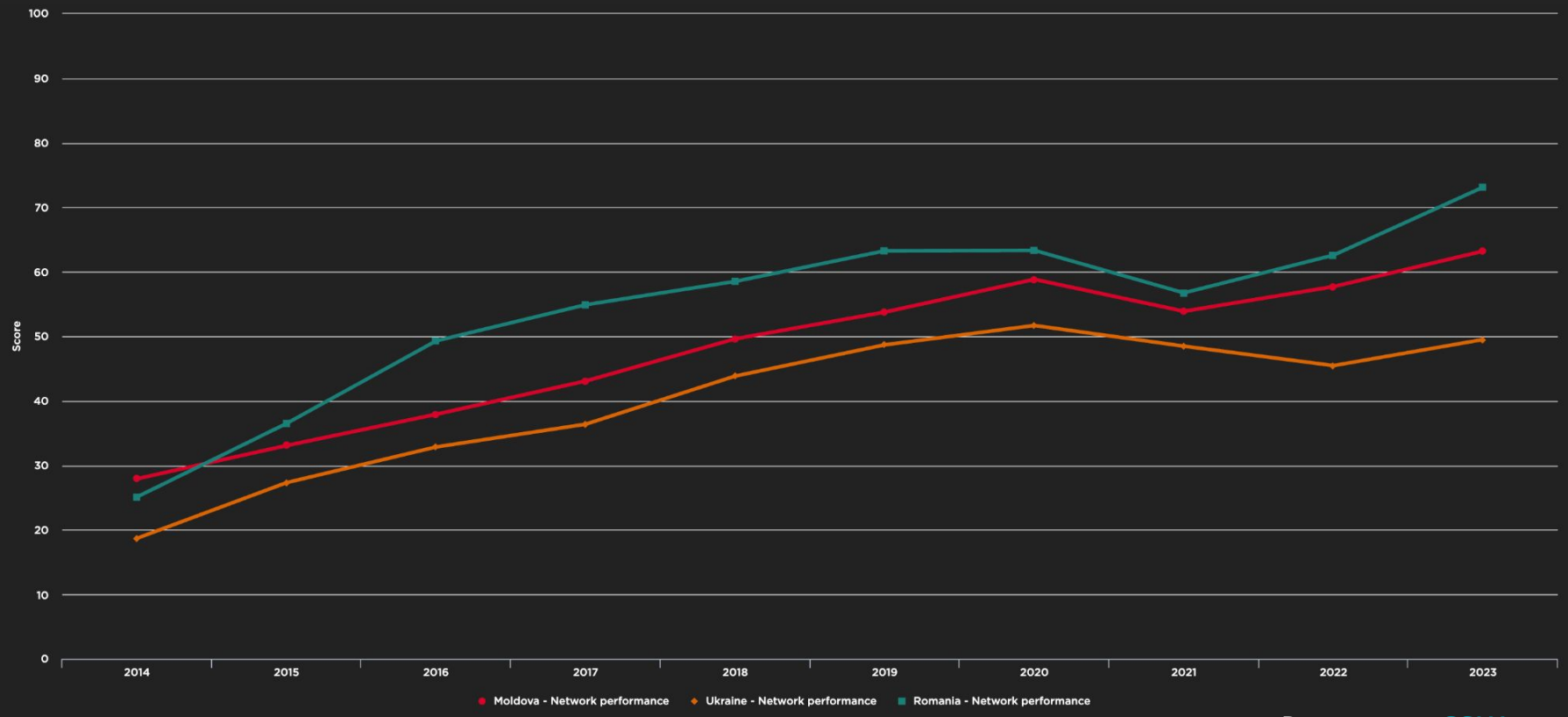
a real route between two probes:

- Two opposite sides of Moldovan-Romanian border
- 16 km in between

Performance

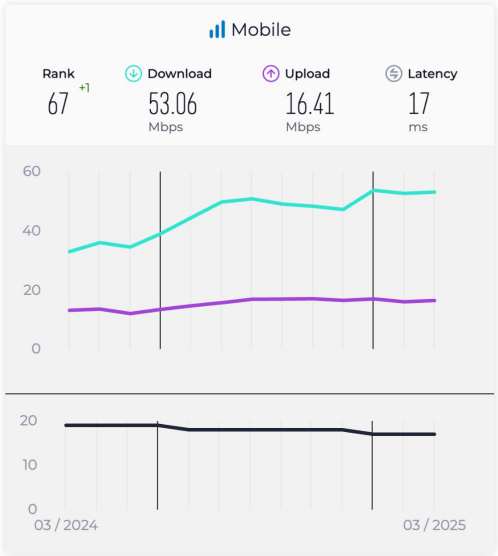
Fixed and mobile networks

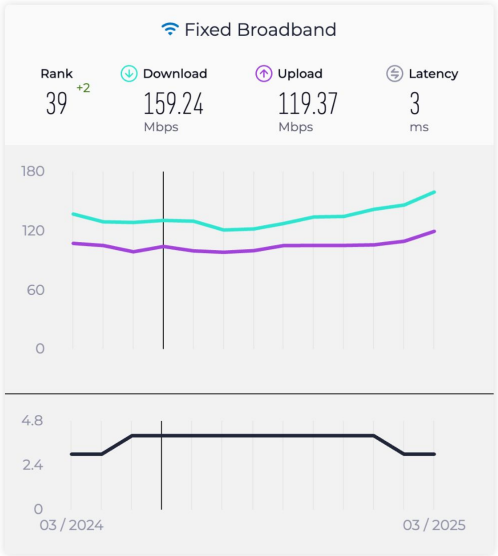
GSMA Country Analysis: Network Performance



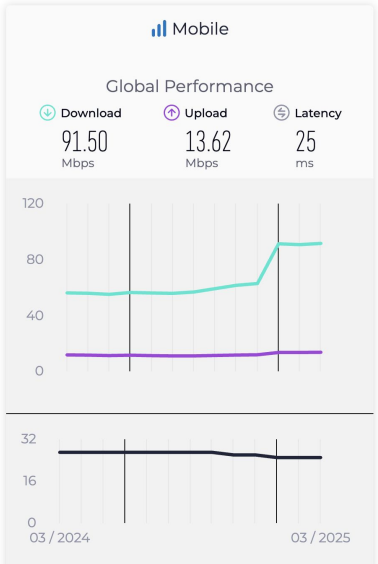
Data source: GSMA

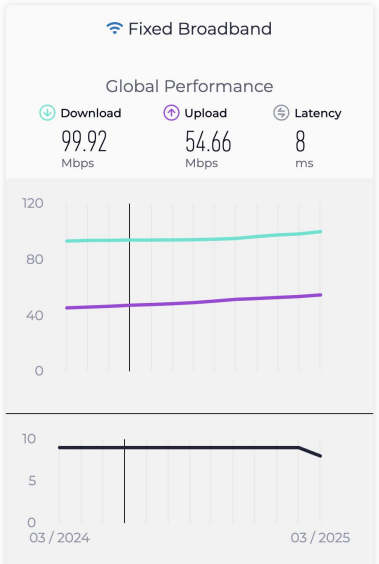
Average Internet Connection Speed





Moldova

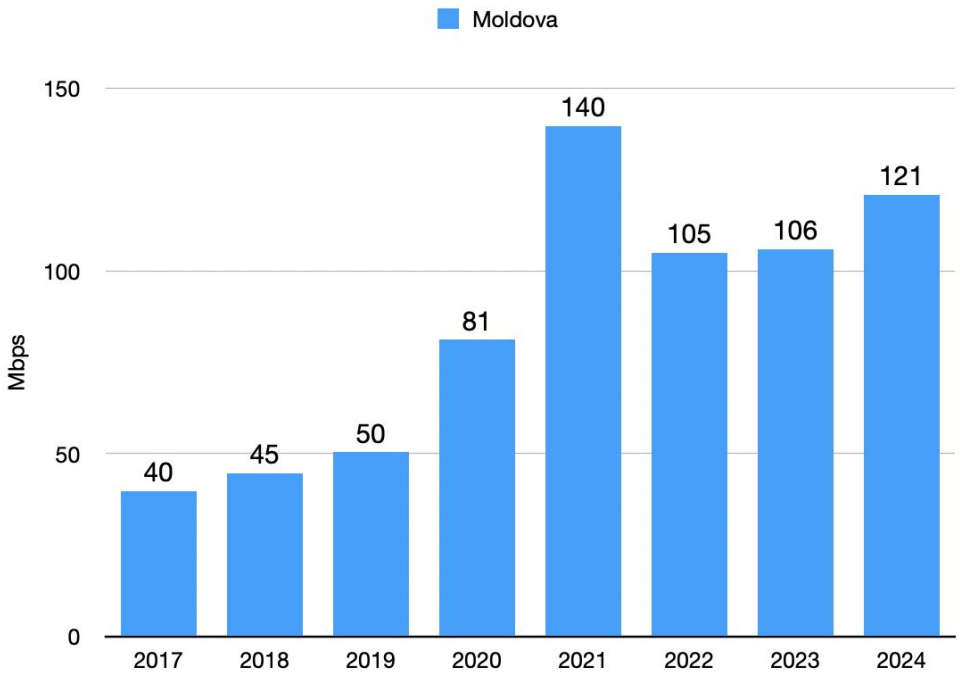




World

Data source: Ookla, March 2025

Average Internet Connection Speed (Historical)

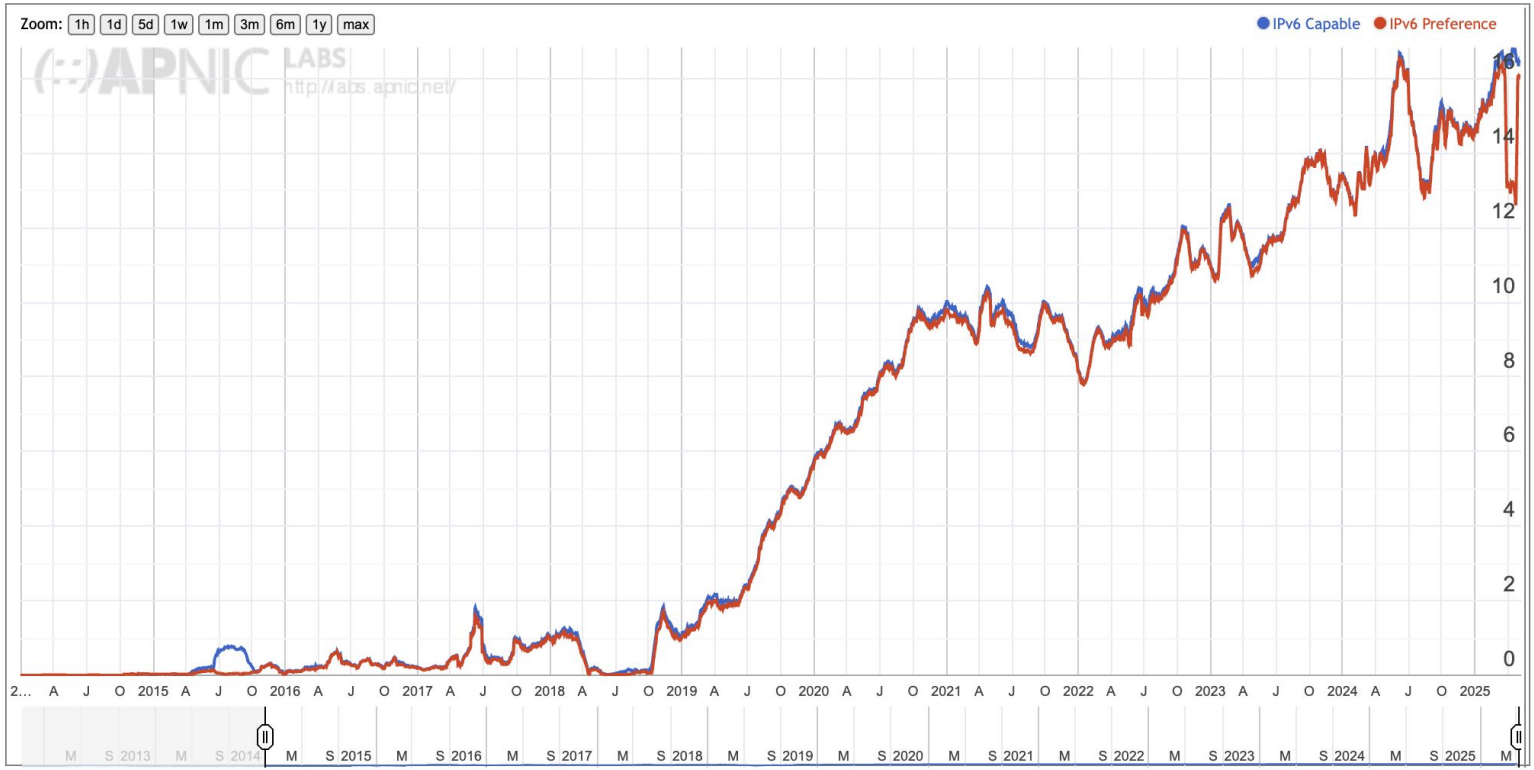


Percentage change between the most recent and the oldest reported Mbps speed by country:

- Moldova is #2 in Eastern Europe (after Poland)
- #4 amongst post-Soviet countries (Uzbekistan, Azerbaijan, Kyrgyzstan)
- #72 in the world

Data source: Ookla

Use of IPv6 in Moldova



Data source: APNIC

Infrastructure

Enabling infrastructure

National Internet Segment Reliability

IPv4

#		Country	Critical AS	Regional Outage
10	+1 ↑	Ukraine	AS3326	4.333%
49	-2 ↓	Romania	AS8708	10.265%
102	-24 ↓	Moldova (the Republic of)	AS8926	20.083%

IPv6

#		Country	Critical AS	Regional Outage
8	+1 ↑	Ukraine	AS3356	5.805%
35	-2 ↓	Romania	AS8708	12.626%
67		Moldova (the Republic of)	AS15836	21.468%

Crucial sustainability factors:

- Telecom diversification
- Increased connectivity

Market readiness defines a lot.

Data source: Qrator Labs

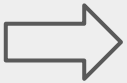
Internet Exchange Points

Country	IXPs
Moldova	2
Romania	3
Ukraine	21

Name	Country	City	Networks
MD-IX Moldova Internet Exchange	MD	Chisinau	14
KIVIX Chisinau Internet Exchange	MD	Chisinau	18

- Not exactly neutral
- Only services presented: Cloudflare, PCH, Mivocloud

- Limited cooperation
- Low awareness
- Market centralisation



- More resilient local traffic
- Better quality for local services and content
- Increased digital infrastructure independence

Data source: PeeringDB

Cable Infrastructure

- Only two external cross-border links
  - Romania
  - Ukraine
- Both geopolitical and technical risks
- No backup in case of outages or instability
- Traffic often follows inefficient routes
- IP-level diversification not supported by cable infrastructure owners

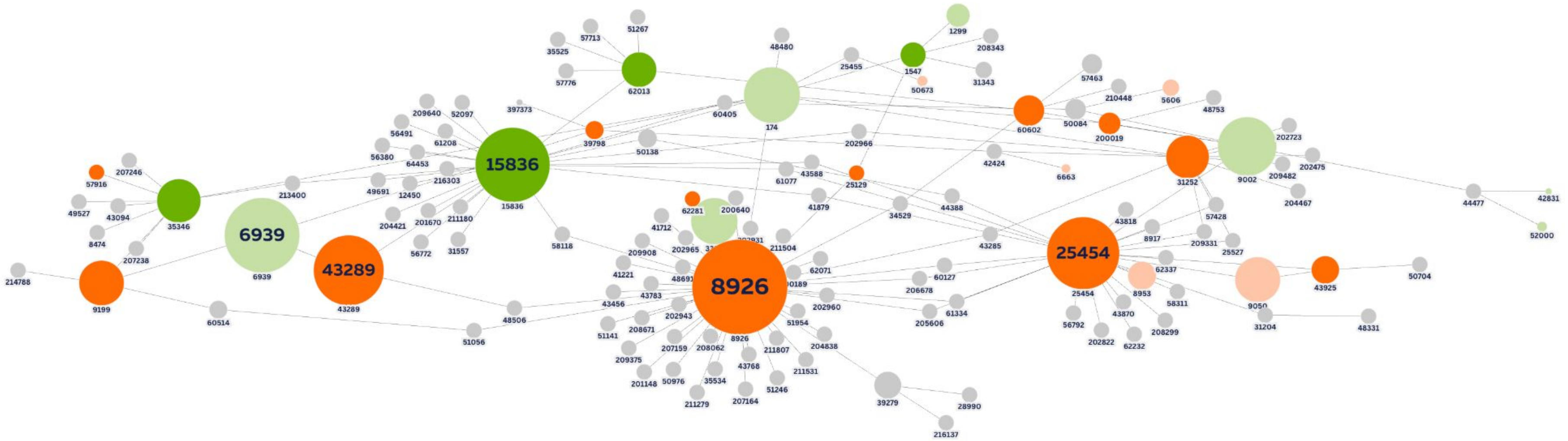
Data source: ITU

Security

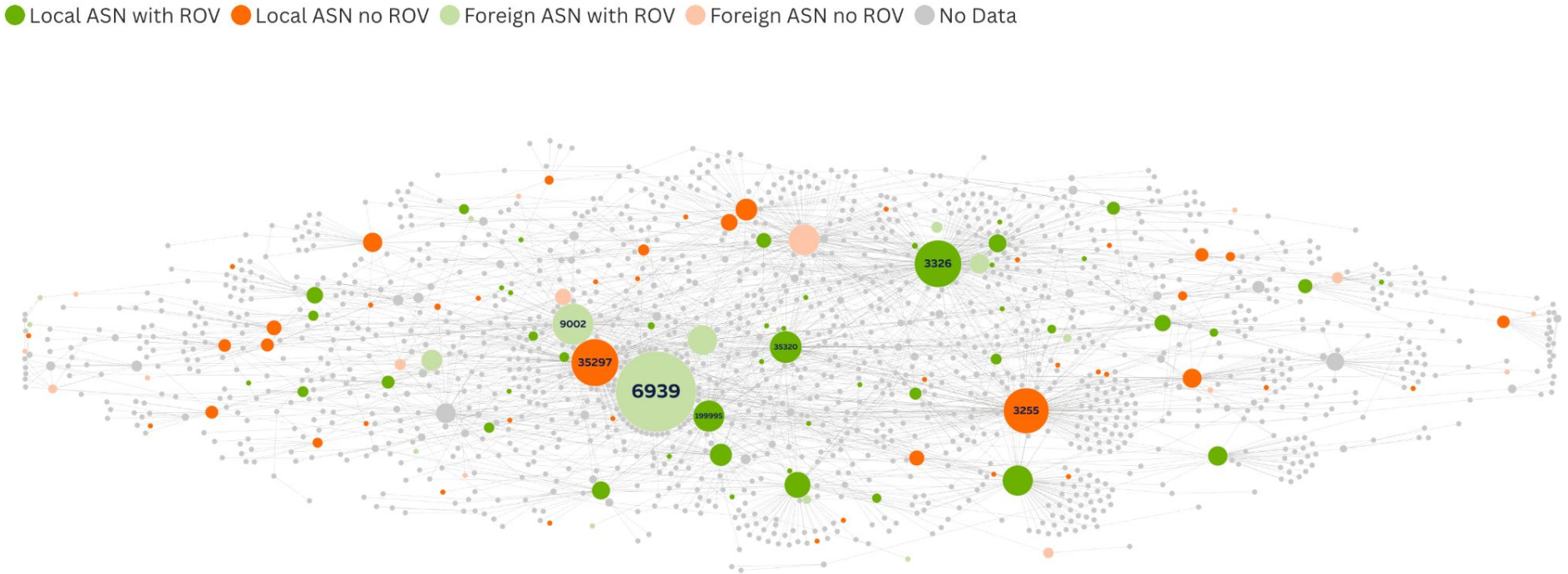
Routing Hygiene

Moldova

Local ASN with ROV · Local ASN no ROV · Foreign ASN with ROV · Foreign ASN no ROV · No Data



Ukraine


Local ASN with ROV
Local ASN no ROV
Foreign ASN with ROV
Foreign ASN no ROV
No Data
3326
9002
35297
6939
35320
199995
3255

Summary

Area	Strengths	Weaknesses	Risk
Market	Active ASes, visible growth	Low competition, sharp LIR drop	Medium
Performance	Good speeds, IPv6 progress	Fragile gains, uneven adoption	Medium
Security	Strong external routing diversity	Weak domestic interconnectivity	Medium
Infrastructure	Diverse upstreams (Tier-1s)	Only 2 physical exits, structural fragility	High

Community

“It's the people, stupid.”

The strength of a network lies not just in its infrastructure, but in the community that builds, sustains, and defends it.

Call for Action - We Need Data!

- **Help us Produce Accurate Reports:**
  - Keep your **PeeringDB** records up-to-date
  - Deploy more **RIPE Atlas Probes** and **Anchors** across the country to cover more diverse ASNs
  - Consider **peering with RIS** to contribute to increased routing security
  - Join **RIPE Community Hour** tomorrow at 14:00 - 15:30

Questions & Comments

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THANK YOU!