Asociația Națională a Internet Service Providerilor

National Internet Service Providers Association

Interconnection in Romania:

Insights from Internet Measurement Data

Peering/ transit in various countries:

LEGEND collapse

https://jedi.ripe.net/peer-to-peer/ro/2024/07/01

A network that serves end-users

A network that serves end-users and provides transit to other end-user networks within the country

A transit network or an IXP external to this country

An IXP that is identified with this country

A sizable end-user network for which we have data

A sizable end-user network for which we have no data

The full circle represents 100% of the end-users in a country.

Each network that provides connectivity to more than 1% of the end-users is represented by a colored circle segment. The length of the arc of the segment represents the percentage of the end-users in a country.
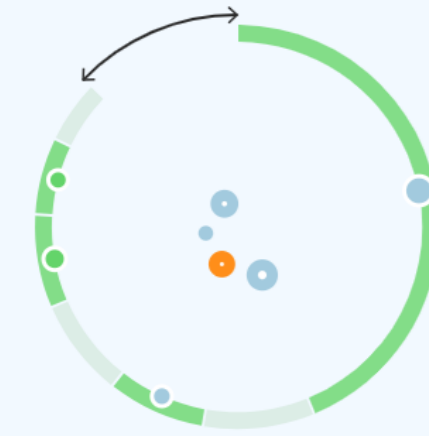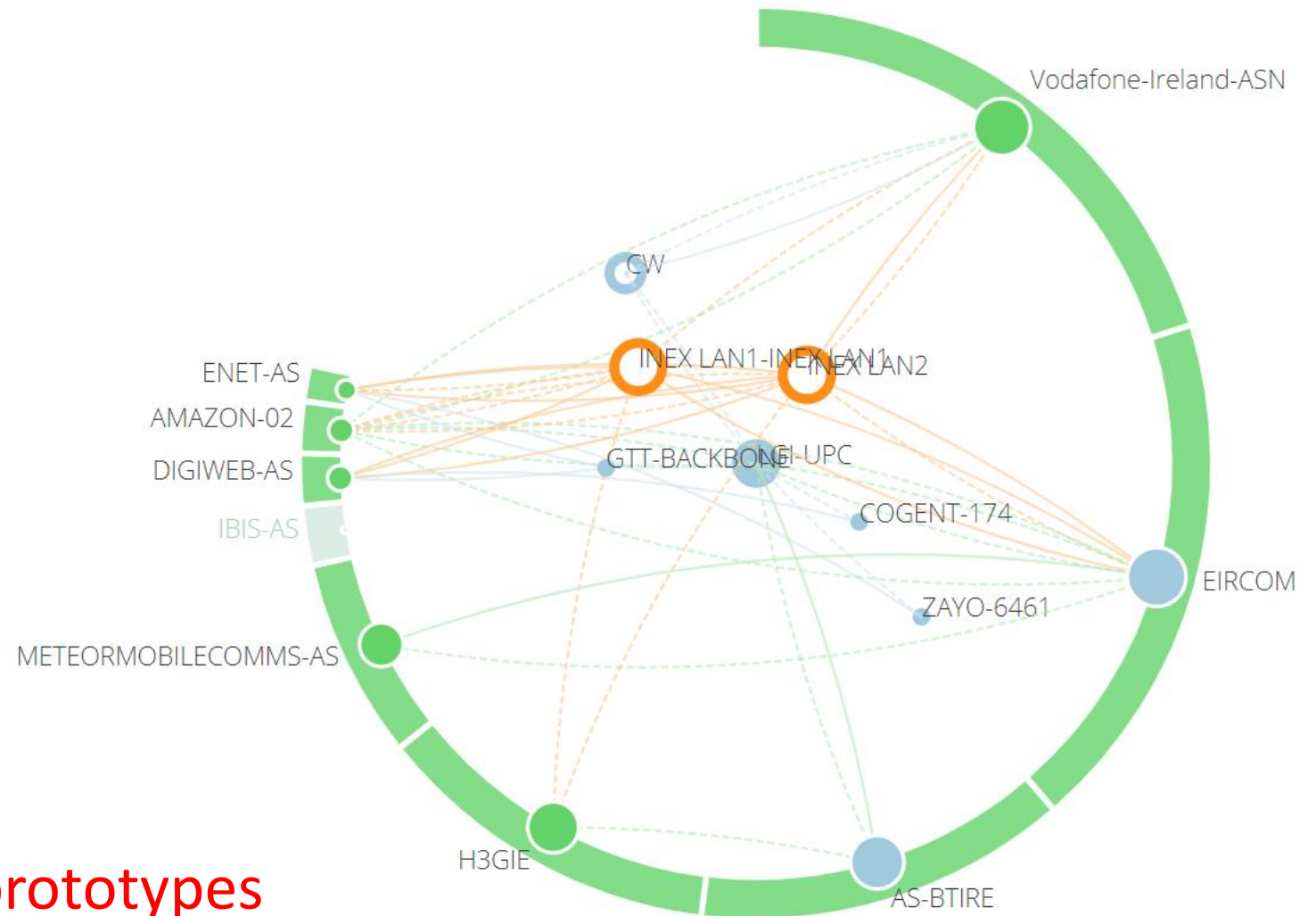
The open part of the circle represents the sum of all ASes that provide connectivity to less than 1% of the end-users in a country

Peering / interconnections / transit in various countries:

Ireland: 2 IXPs, several internal transit providers, several external transit providers, several p2p.

Main operators: excellent interconnectivity.

Disclaimer: all RIPE tools are prototypes

Peering / interconnections / transit in various countries:

Czech Republic: 2 IXPs, several external transit providers, several p2p.

Main operators: excellent interconnectivity.

Peering / interconnections / transit in various countries:

Germany: 2 IXPs, several internal transit providers, several external transit providers, several p2p.

Main operators: excellent interconnectivity.

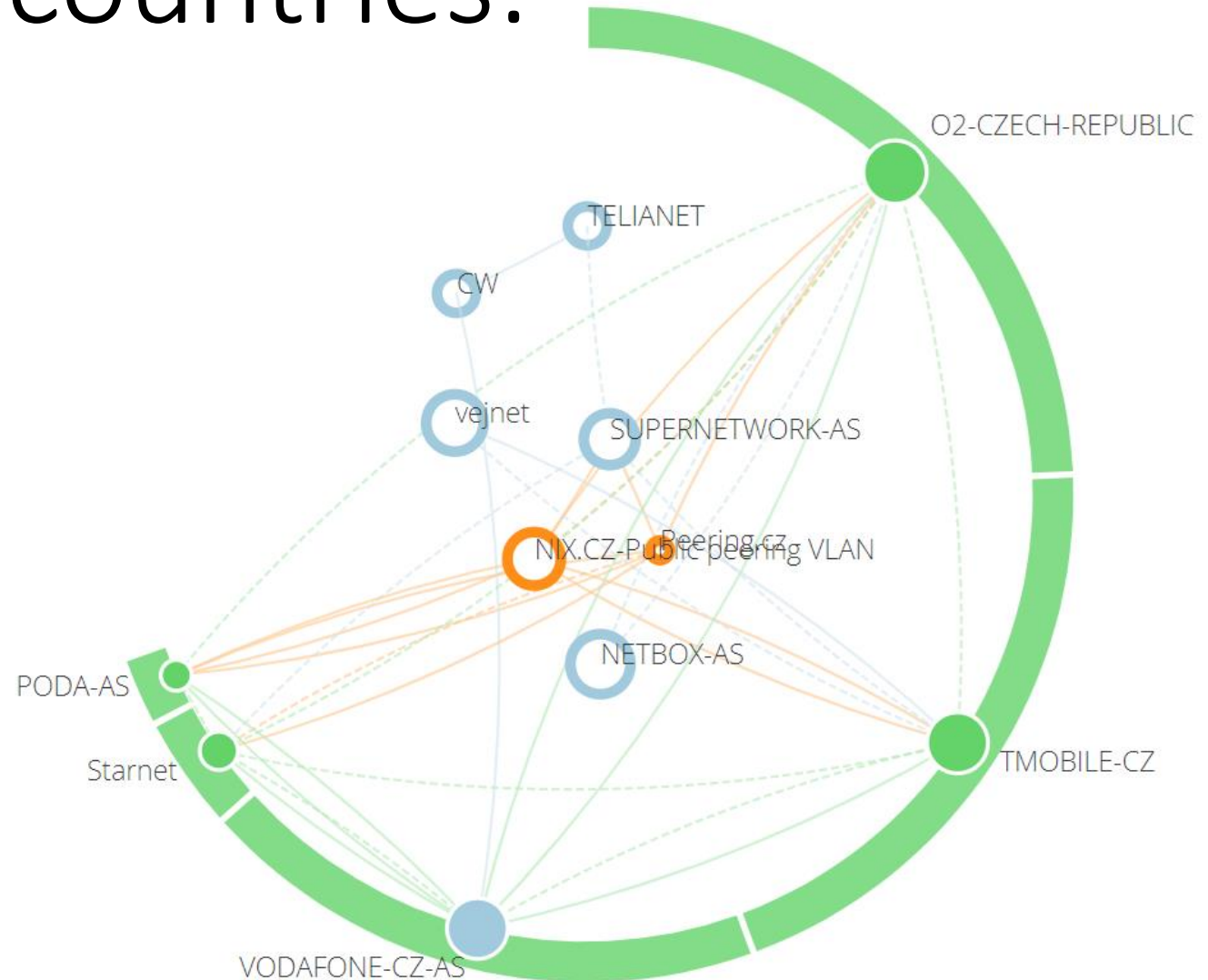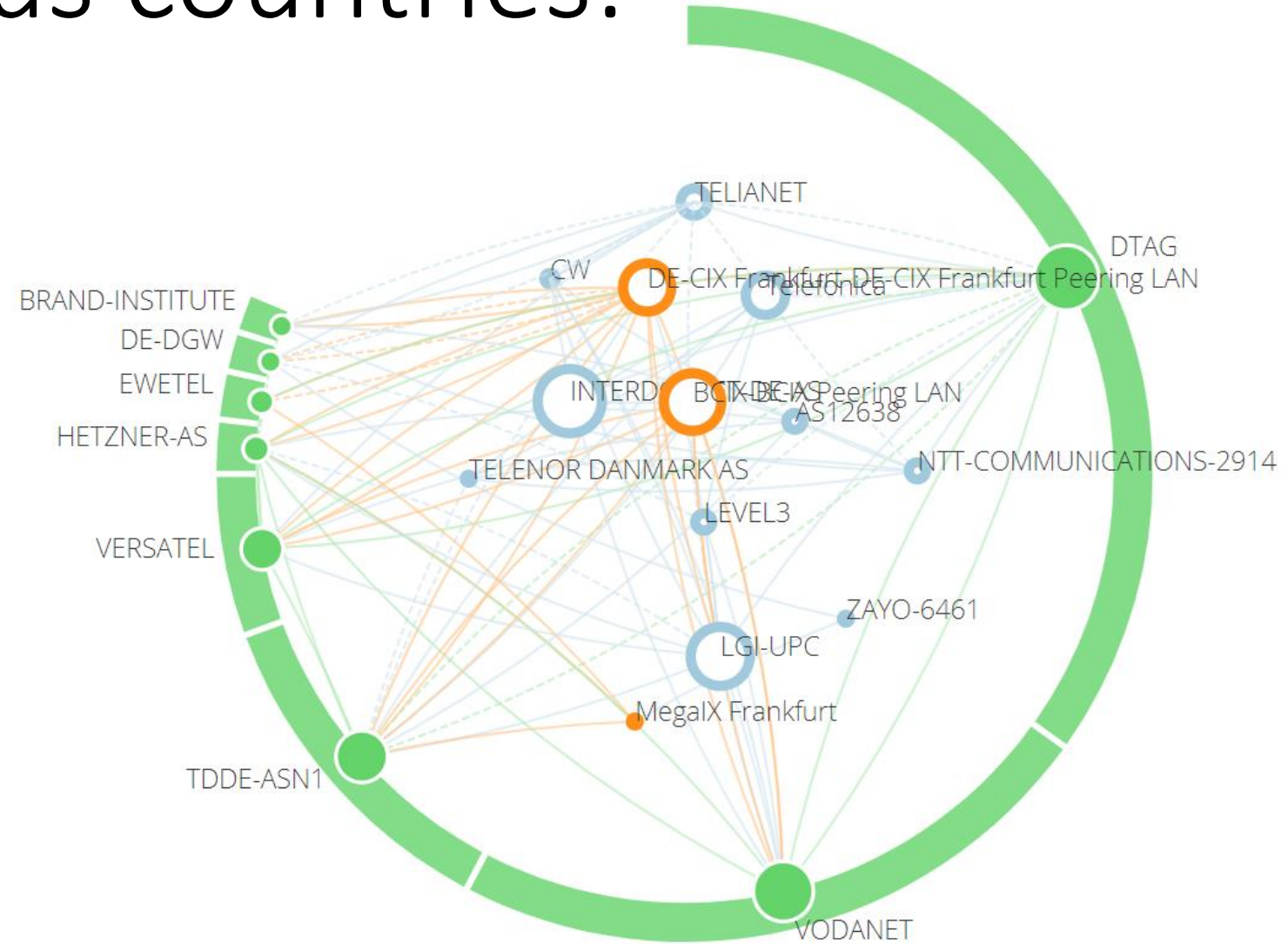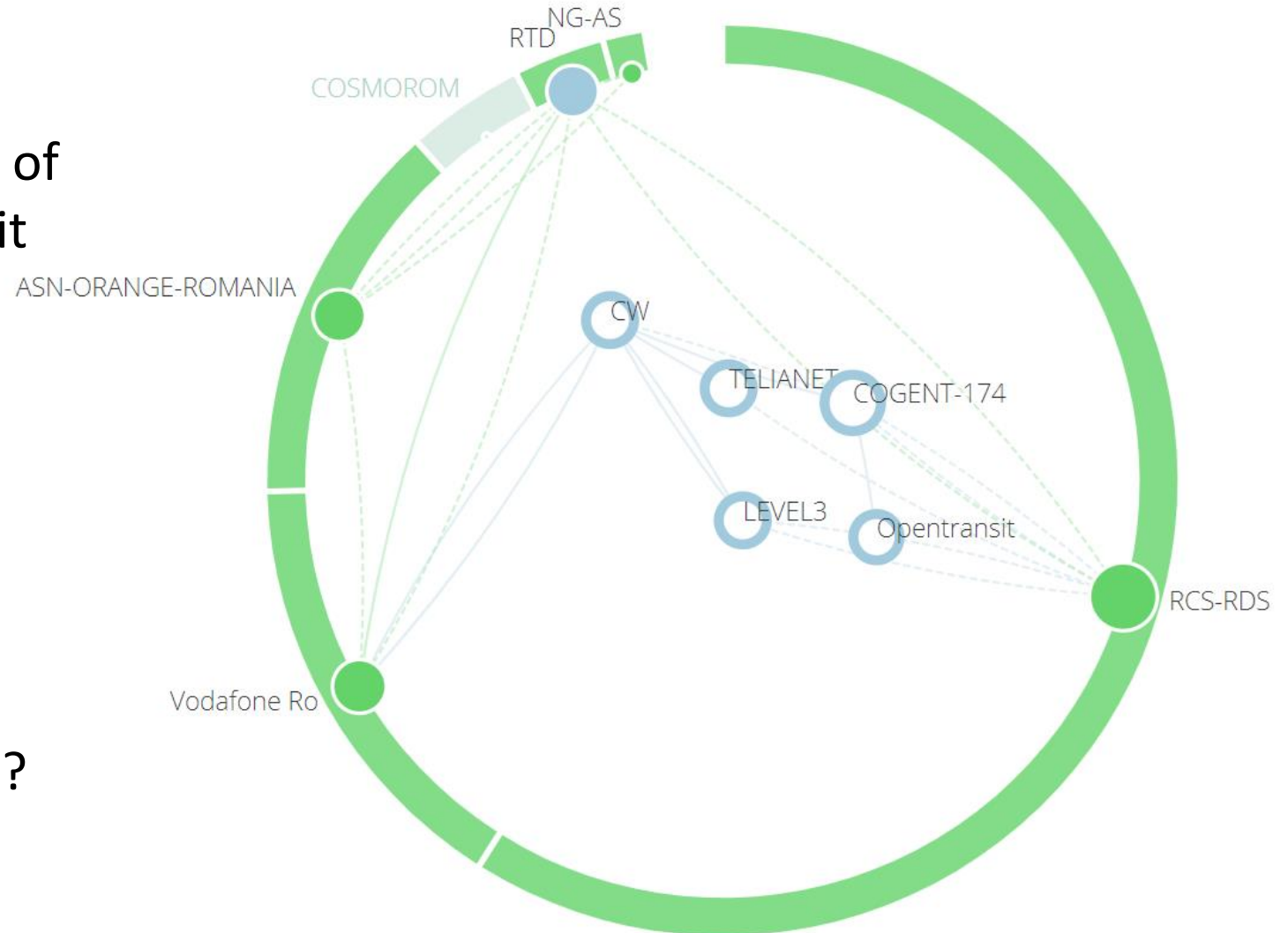# Peering / interconnections / transit in various countries:

Romania: no significant IXPs (in terms of internal traffic), several external transit providers, some p2p.

Looks like there is **one dominant** operator with **poor interconnectivity**!?

GeoPath tool:

https://jedi.ripe.net/history/2024-07-01/RO/geopath/index.html - These maps show the IPv4 paths [...] seen in traceroutes. Indirect links in traceroutes (i.e. with hops in-between without answer, or no geoloc) are shown with dotted lines, direct links with lines with long-short alternating pattern.

Ideally, most of the local traffic should stay local.

Is this the case?

Traceroute from RoNIX to hosts in the big unconnected network:

tcptraceroute mail.icemenerg.ro 25

Selected device ens160, address 185.196.13.17, port 57583 for outgoing packets
Tracing the path to mail.icemenerg.ro (193.226.127.3) on TCP port 25 (smtp), 30 hops max
1 10ines.ronix.ro (185.196.13.1) 0.737 ms 0.770 ms 0.785 ms
2 ip4-89-238-246-53.euroweb.ro (89.238.246.53) 0.683 ms 0.912 ms 0.876 ms
3 * * *
4 31.210.8.142 23.333 ms 18.043 ms 18.137 ms
5 win-b2-link.ip.twelve99.net (213.248.86.98) 18.190 ms 18.277 ms 18.389 ms
6 win-bb2-link.ip.twelve99.net (62.115.114.182) 18.260 ms 18.139 ms 18.010 ms
7 bpt-b3-link.ip.twelve99.net (62.115.124.111) 24.435 ms 24.141 ms 24.166 ms
8 62.115.176.59 31.300 ms 31.240 ms 31.379 ms
9 * * *
10 * * *
11 * * *
12 static-82-78-127-1.rdsnet.ro (82.78.127.1) 38.398 ms 38.389 ms 38.291 ms
13 static-82-78-127-53.rdsnet.ro (82.78.127.53) 50.184 ms 48.609 ms 48.602 ms
14 mail.icemenerg.ro (193.226.127.3) [open] 48.303 ms 48.540 ms 48.472 ms

... while for well connected networks, the RTT is usually a couple milliseconds and the route is only 4-5 hosts long.

Who needs increased latency, more security risks / potential points of failure and extra costs? Looks like barriers?

But is there really any dominant ISP? – RIPE traffic tools indications:

Network (ASN)	Network Name	Estimated User Population %
8708	RCS-RDS (Digi)	58.34
12302	Vodafone_Ro	15.6
8953	ASN-ORANGE-ROMANIA	14.4
35725	TELEKOMRO	4.06
9050	RTD	3.03

https://sg-pub.ripe.net/petros/population_coverage/country.html?name=RO

But is there really any dominant ISP? – ANCOM traffic data(H2 23):

Fig. III.1.7.a. *Cotele de piață[69] ale principalilor furnizori de internet fix, calculate pe baza traficului de internet fix, în perioada semestrul I 2021 – semestrul II 2023*
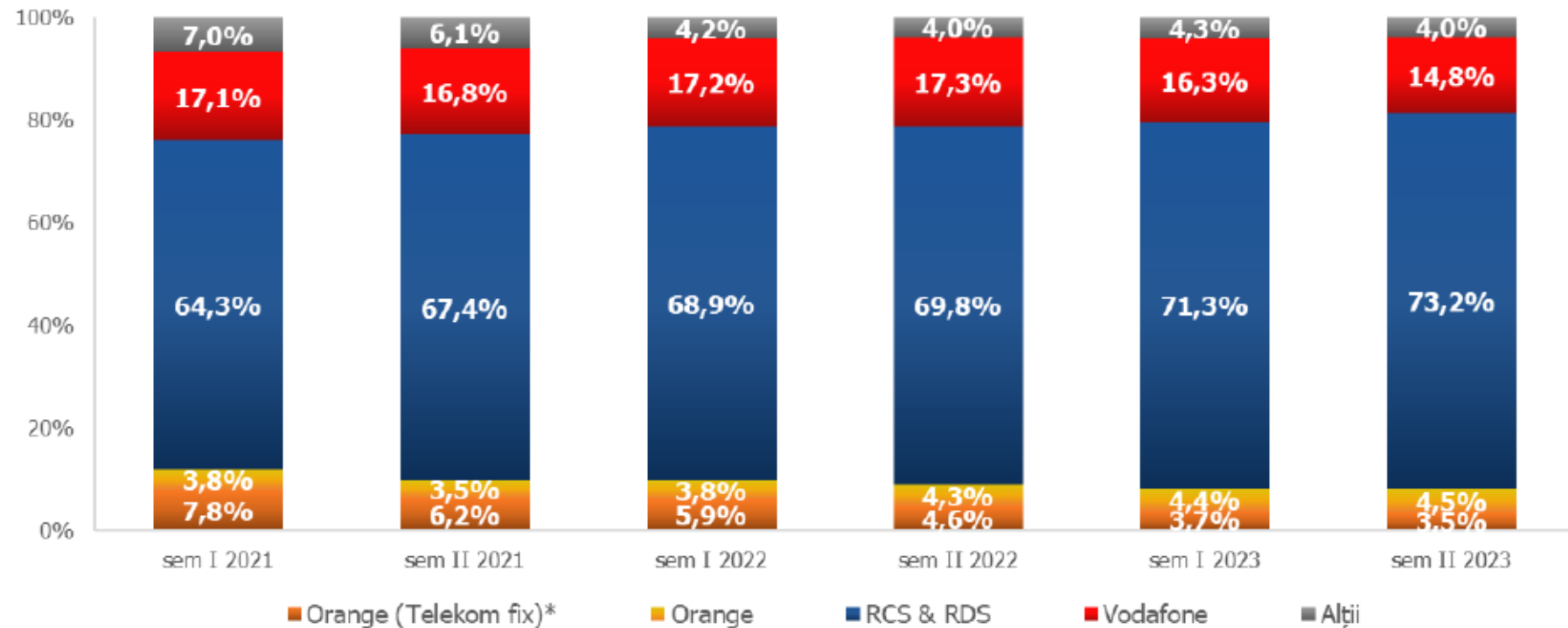
*Orange Romania Communications S.A. + Nextgen Communications S.R.L.

https://sscpds.ancom.ro/ro/communications/rapoarte-statistice

All communication services lately migrated over IP:

☑ Voice (VoIP, VoLTE);
☑ Teleconference
☑ Telepresence
☑ Telemedicine
☑ IoT – sensor-based automatic processes
☑ Etc.

IP transit can no longer substitute local interconnections.

In case of monopolistic behaviors (i.e. poor interconnection), NRAs should step in!

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Thank you!