



RIPE NCC
RIPE NETWORK COORDINATION CENTRE

The State of IPv4 and the Evolving Transfer Landscape

IP Reports - The Series



- **Report 1: How to Get IP Addresses for Your Network**
 - Focuses on available options to acquire IP addresses for network owners and operators
 - Available in *English, Russian, **Arabic**, Turkish*
- **Report 2: The State of IPv4 and the Evolving Transfer Landscape**
 - Focuses on IPv4 transfers in a post-exhaustion environment, alongside broader trends in availability, pricing, and usage.
 - labs.ripe.net/search/tag/ip-reports





Outline



**IPv4 Scarcity
and Its Impact
on Network
Operators**



**Inside IPv4
Transfers:
History and
Current
Dynamics**



**IPv6 Adoption
and Challenges**



**Policy and
Regulation**

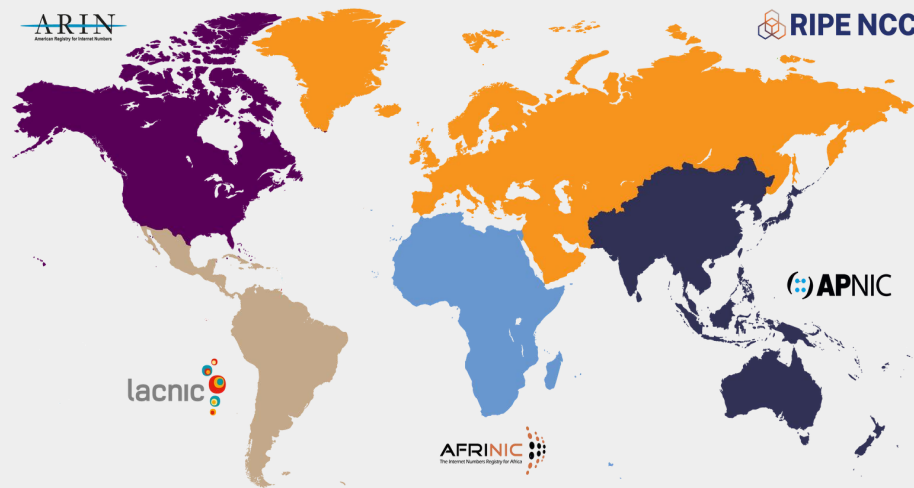


IPv4 Scarcity and Its Impact on Network Operators

IPv4 Scarcity and Its Impact on Network Operators



- An **IP address** is a critical element of our connected world
- Final **IPv4** /8 blocks (16M addresses) were allocated to the RIRs in 2011
- The RIPE NCC handed out its final /22 block in 2019
- IPv6 transition is critical to overcome the limitations of IPv4
- However, deployment remains uneven across regions



How Operators Respond to IPv4 Scarcity



- Receive from Regional Internet Registries
- Acquire them on the secondary market via **IPv4 transfers**
- Short-term solutions: renting or receiving temporary transfers
- CGNAT and similar technologies
- Network optimisation: IPAM solutions



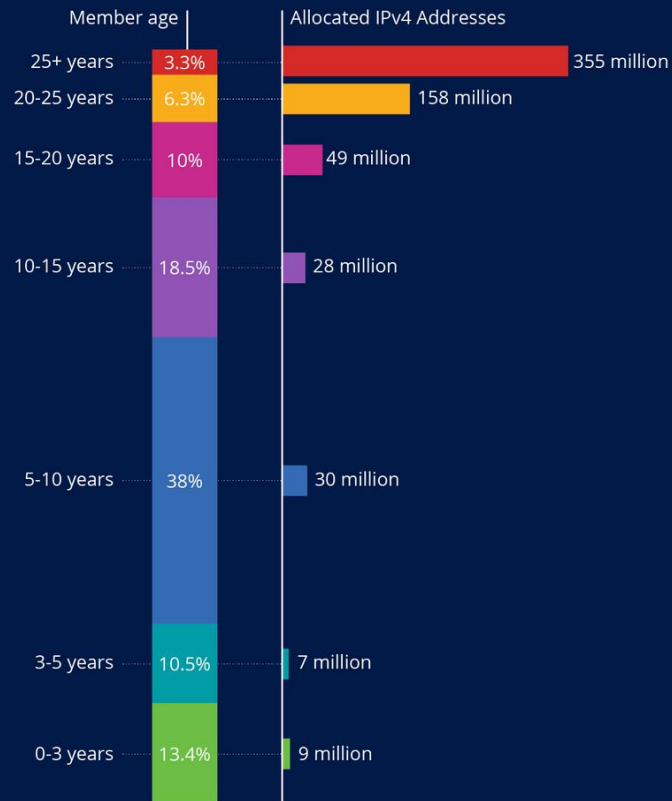
The State of IPv4 and Resource Distribution



The RIPE NCC has about 20,000 members

- Members that joined the RIPE NCC over 20 years ago have significantly more IPv4 addresses than newer members
- Those with over **25 years** of membership hold the majority of IPv4 resources
- In contrast, **newer members** (0-5 years of membership) have around 3% of allocated IPv4 space

Figure 1:
Member Age and IPv4 Resource Distribution



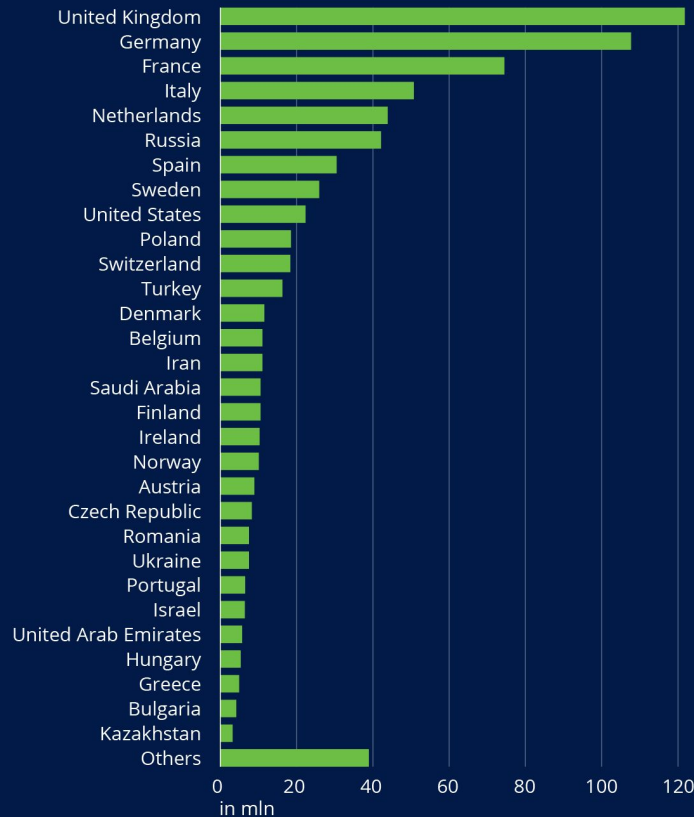
The State of IPv4 and Resource Distribution



IPv4 Distribution by countries

- The UK, Germany, France, Italy, the Netherlands and Russia hold the largest amount of IPv4 space
- This is likely due to some major operators that received large blocks of IPv4 in earlier days
- *The graph shows the IPv4 addresses per country (including Allocated, Assigned, and Legacy addresses)*

Figure 2:
Top 30 Countries with IPv4 Space



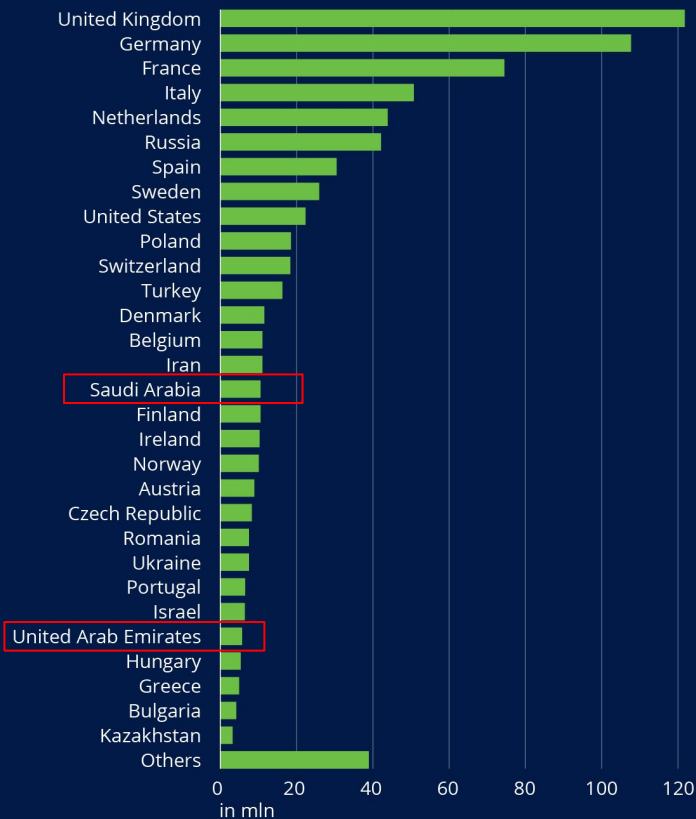
The State of IPv4 and Resource Distribution



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- *The graph shows the IPv4 addresses per country (including Allocated, Assigned, and Legacy addresses)*
- Saudi Arabia and the UAE are among the top 30 countries with IPv4 space in our service region

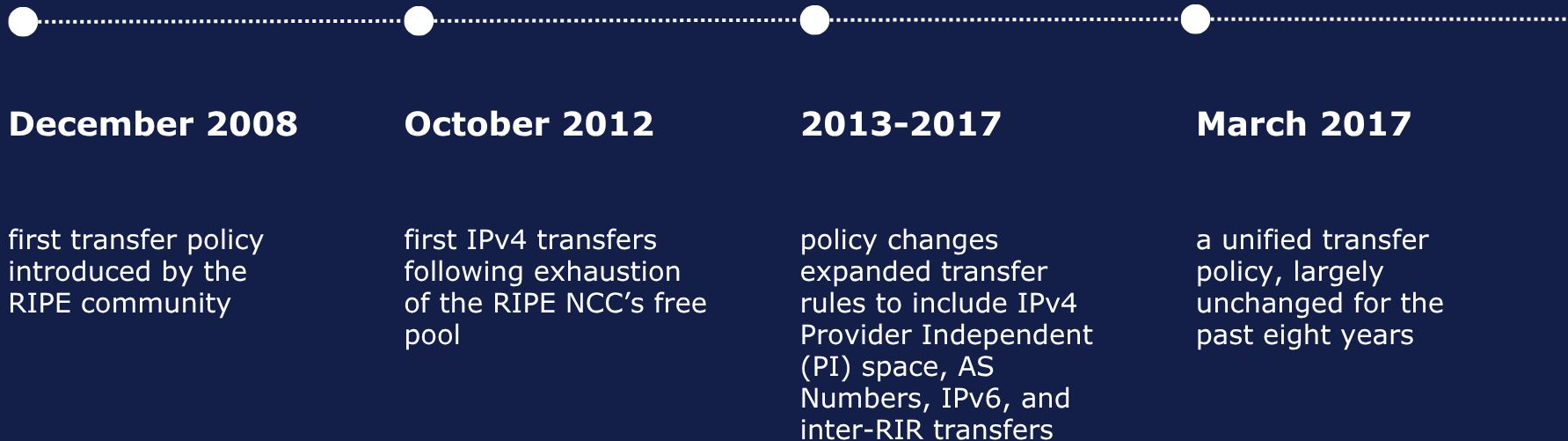
Figure 2:
Top 30 Countries with IPv4 Space





Inside IPv4 Transfers: History and Current Dynamics

The Evolution of IPv4 Transfer Policies



IPv4 Transfer Dynamics



Figure 3:
Monthly Policy IPv4 Transfers (within the RIPE NCC)



- The graph shows the number of IPv4 blocks transferred each month since the first transfer policies were set by the RIPE community
- Volumes have remained high over the past 2-3 years

IPv4 Market Value Over Time



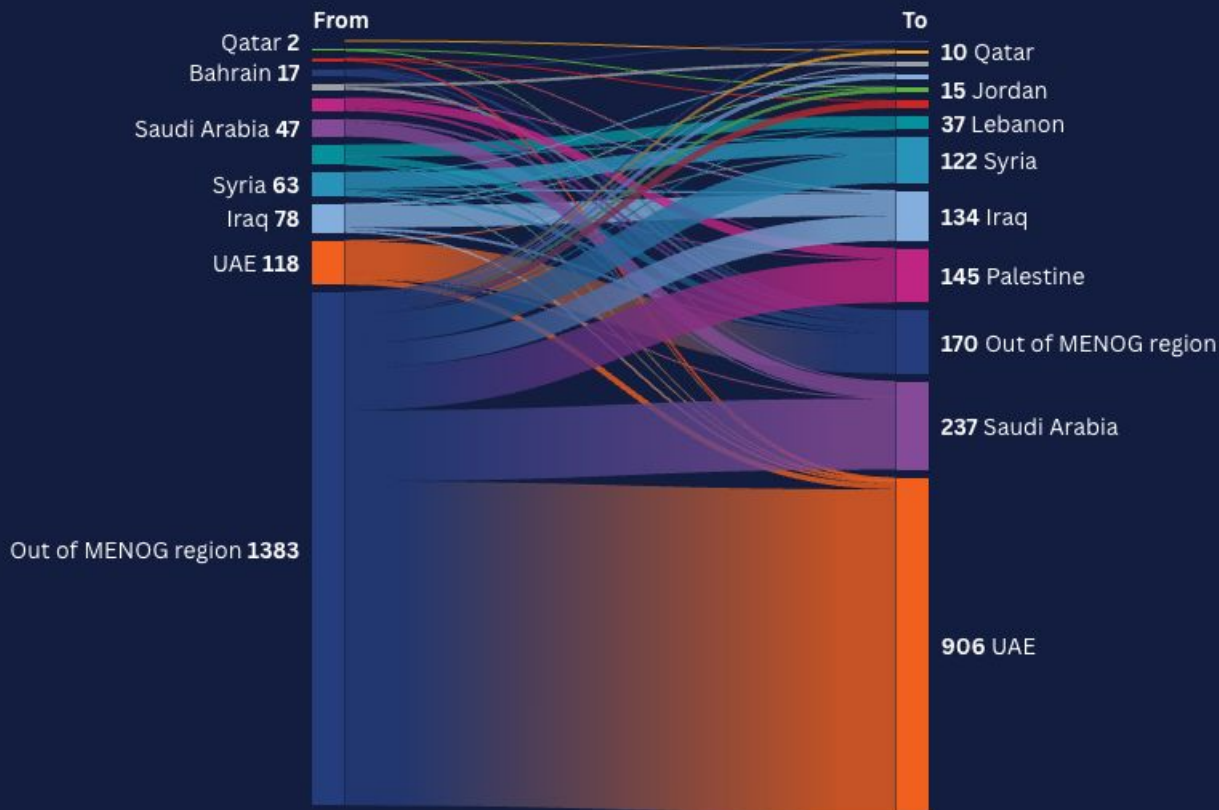
Figure 4:
Estimated Market Value vs. LIR* Costs over Time



Note: This graph shows the potential profit margin at the time an IPv4 resource was received from the RIPE NCC. The costs are based on a sign-up fee, annual fees for holding time and potential waiting time plus pro-rata fee at the moment of sign-up (excluding the potential annual redistribution). Please note that this is an estimate that people could make at the time of

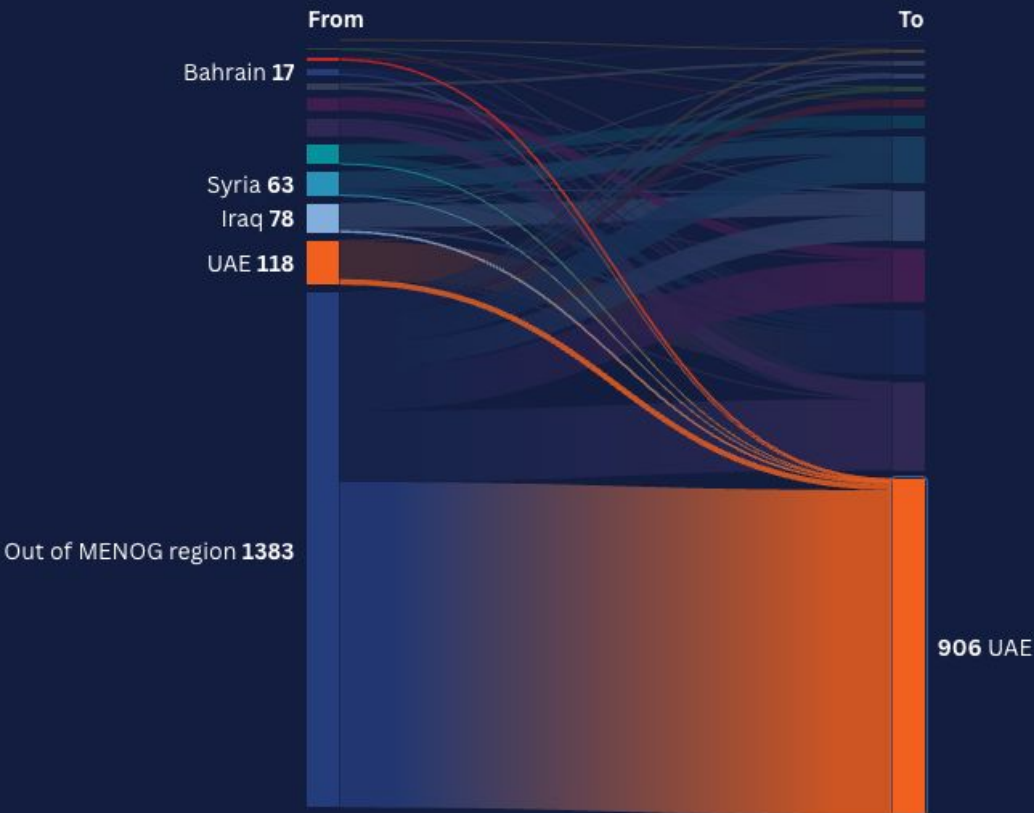
opening a Local Internet Registry* (LIR) account based on the information available at that specific period. Actual costs may vary due to changes in the annual fee and fluctuations in the IPv4 waiting list timeframe. The indicative market value was calculated using publicly available data from various sources involved in IP resource transfers.

Zooming in the Region (2013-2025)



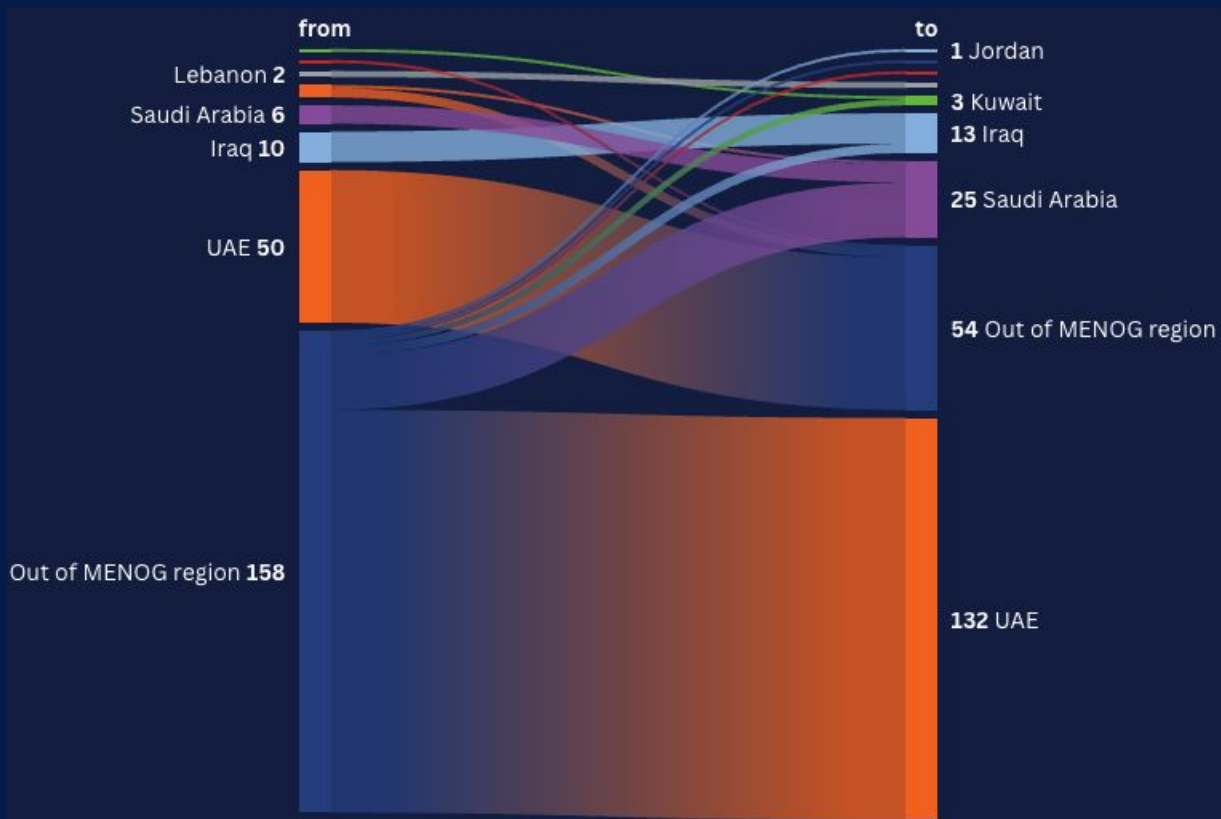
- The graph shows IPv4 **blocks** transferred during the whole policy transfer history in the MENOG region.
- Transfers from and to the countries outside the region are grouped together.

Transfers to the United Arab Emirates (2013-2025)



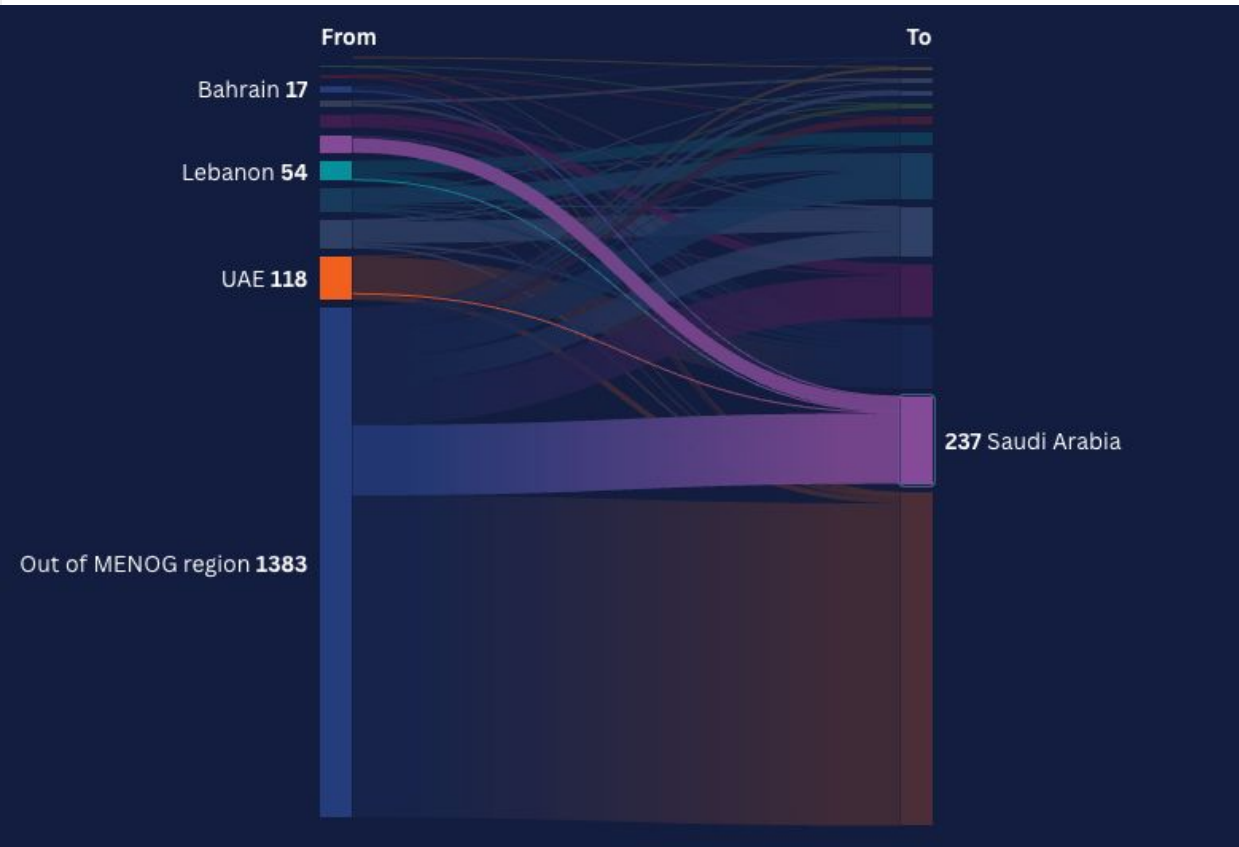
- UAE has received nearly four million IPv4 addresses from outside the region during the whole transfer history.
- About half of all IPv4 space (two million addresses) has been transferred to the UAE in the past two years.

Transfers to the United Arab Emirates in 2025



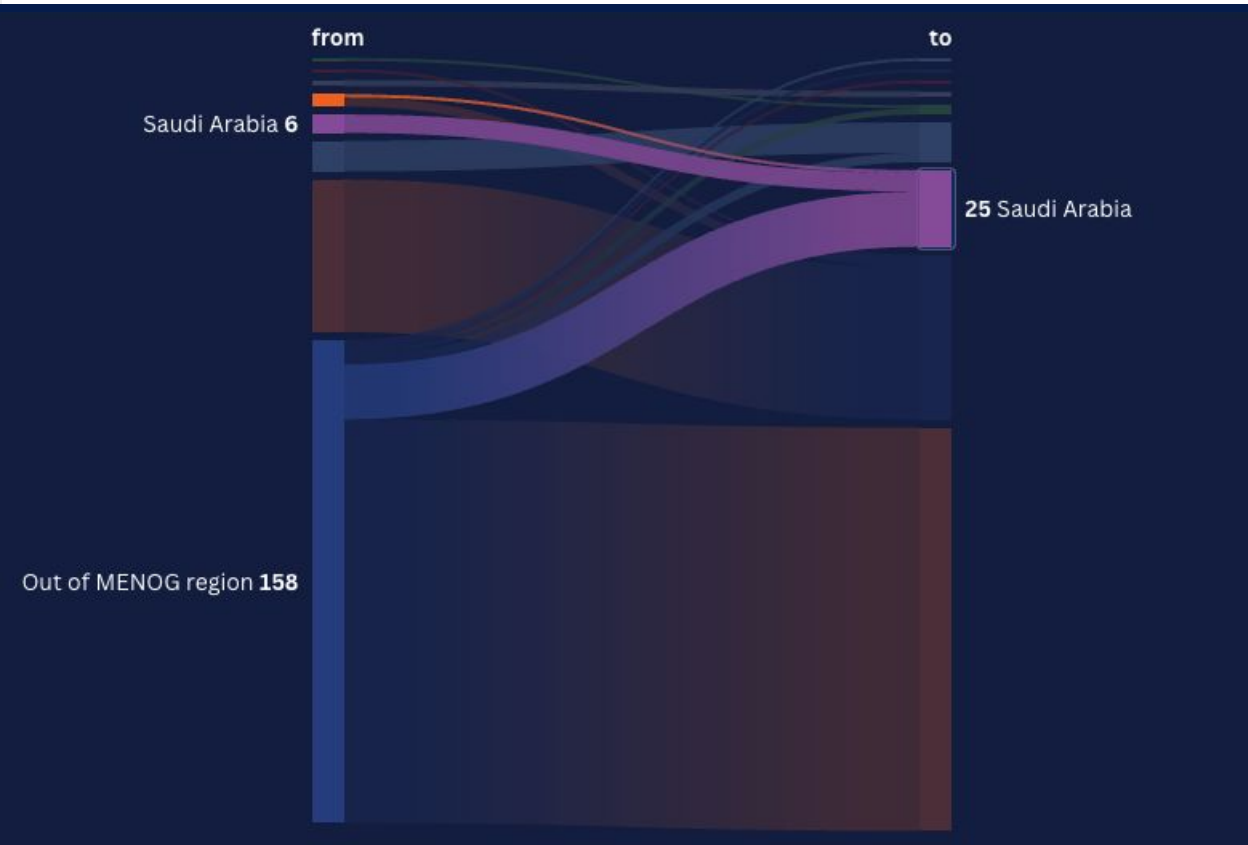
- In 2025, in particular, over 600k IPv4 addresses were transferred to the UAE from outside the region.

Transfers to Saudi Arabia (2013-2025)



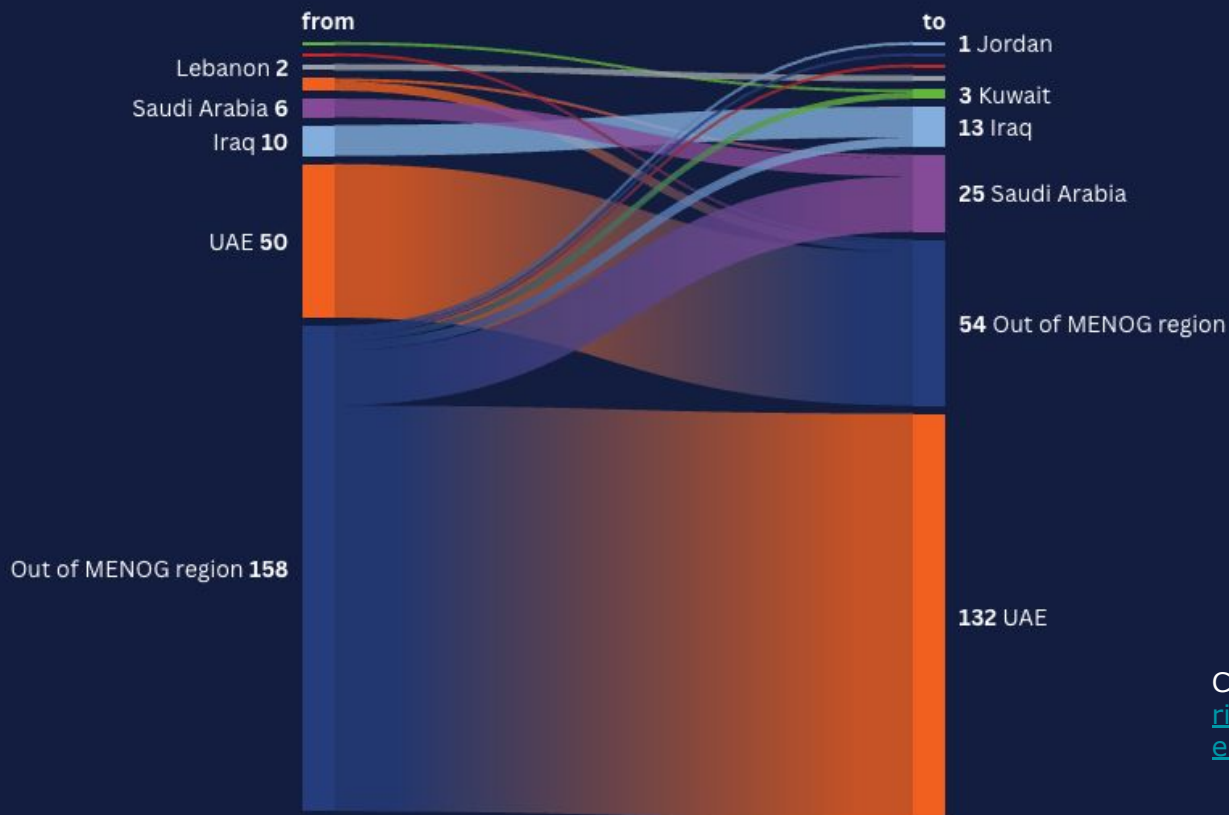
- Over four million addresses in total were transferred to Saudi Arabia during the whole period

Transfers to Saudi Arabia in 2025



- In 2025, no IPv4 addresses have been transferred from Saudi Arabia to other countries
- Collaboration between the policymakers and LIRs to preserve IPv4

Transfers in the Region in 2025



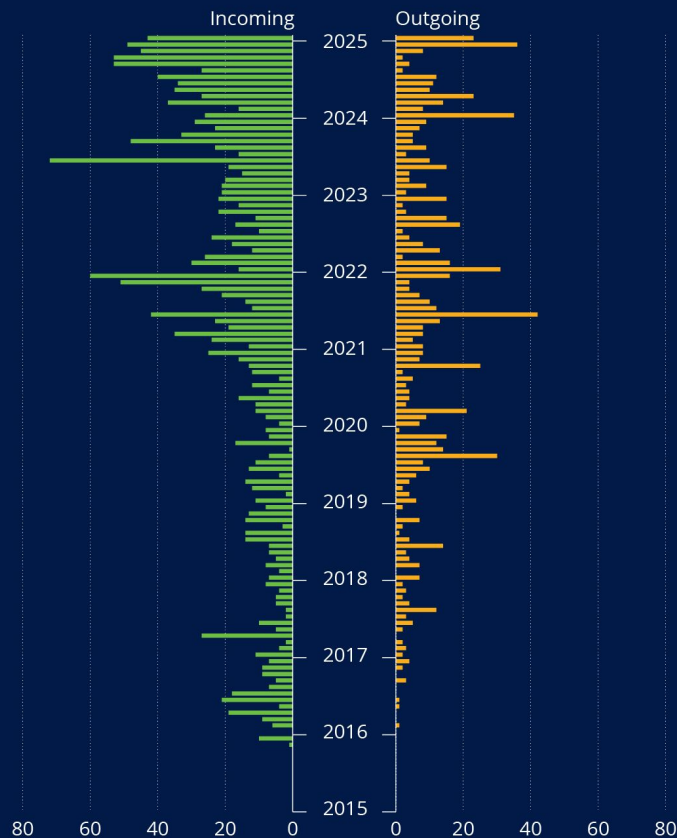
Check out the IPv4 transfers statistics at:
ripe.net/manage-ips-and-asns/resource-transfers-and-mergers/transfer-statistics/

Transfers from Other RIRs to the RIPE NCC

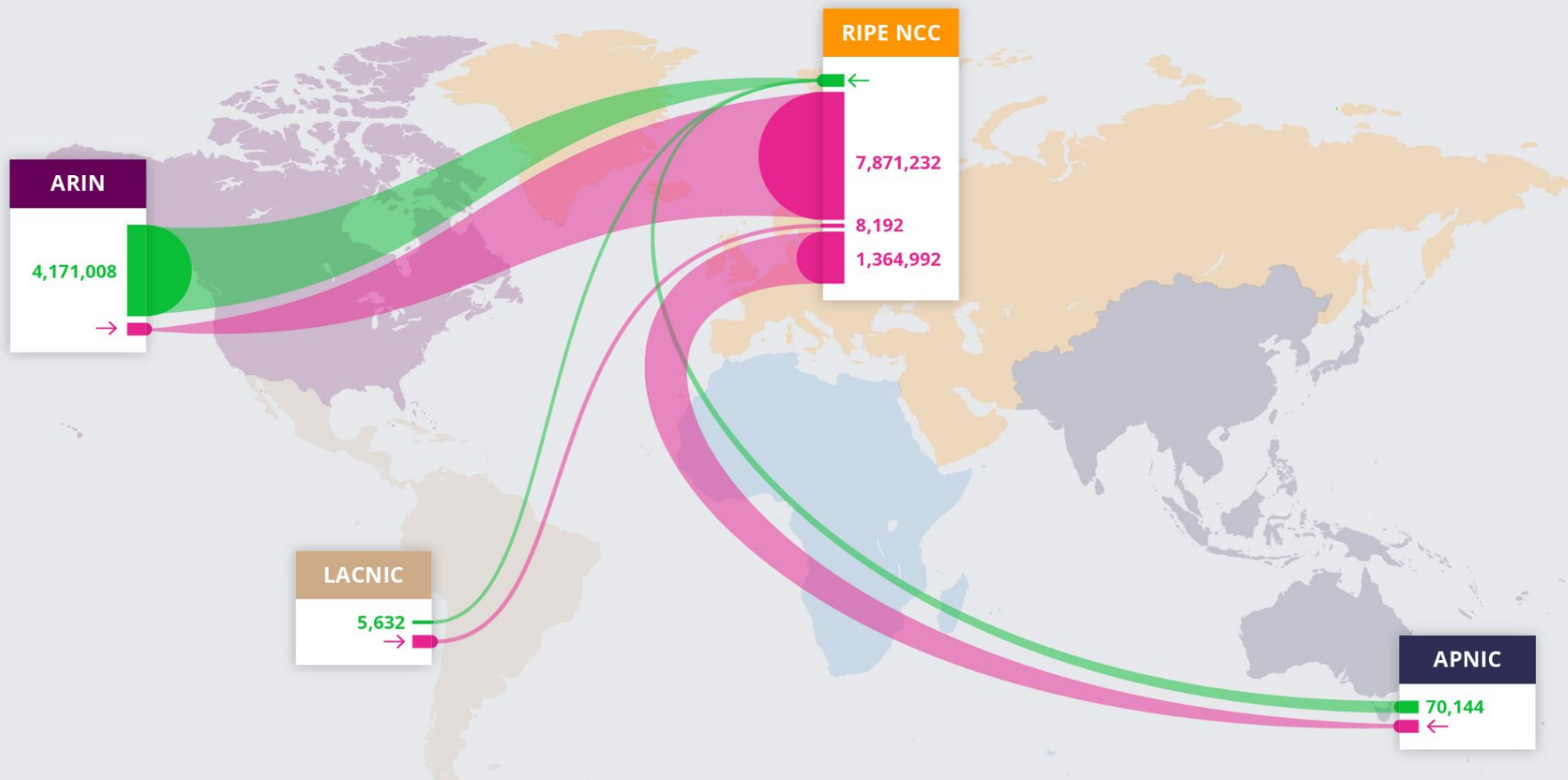


- Transfers between Regional Internet Registries were not a common practice until the end of 2015, when the first inter-RIR transfer policy reached consensus
- Overall, the number of transfers to the RIPE NCC from other RIRs (and vice versa) has been increasing, with more addresses coming into our service region than leaving it

Policy IPv4 Transfers to and from the RIPE NCC (Inter-RIR Transfers)



Inter-RIR Transfers in 2024 (IPv4 addresses)





IPv6 Adoption and Challenges



The significance of IPv6 is likely to rise but there are challenges:

- Technical complexity of dual-stack deployment
- Interoperability issues with legacy systems
- Uncertainties about customer readiness
- Prevailing sense of complacency

IPv6 Distribution Among RIPE NCC Members

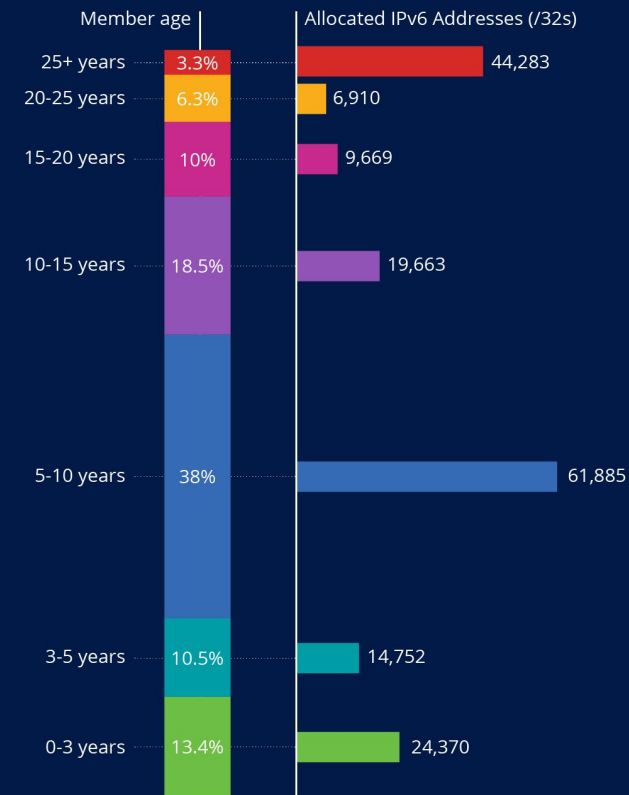


Today, most members have already received an IPv6 allocation

- Every RIPE NCC member can receive IPv6 allocation of /32 up to /29
- Members in the **5-10 year** range are the largest group (38% of total membership holding over 34% of allocations)
- Members **over 25 years** hold a substantial share of IPv6 /32 resources (over 25%)
- **Newer members** that joined after the IPv4 run-out show a preference for IPv6

Figure 7:

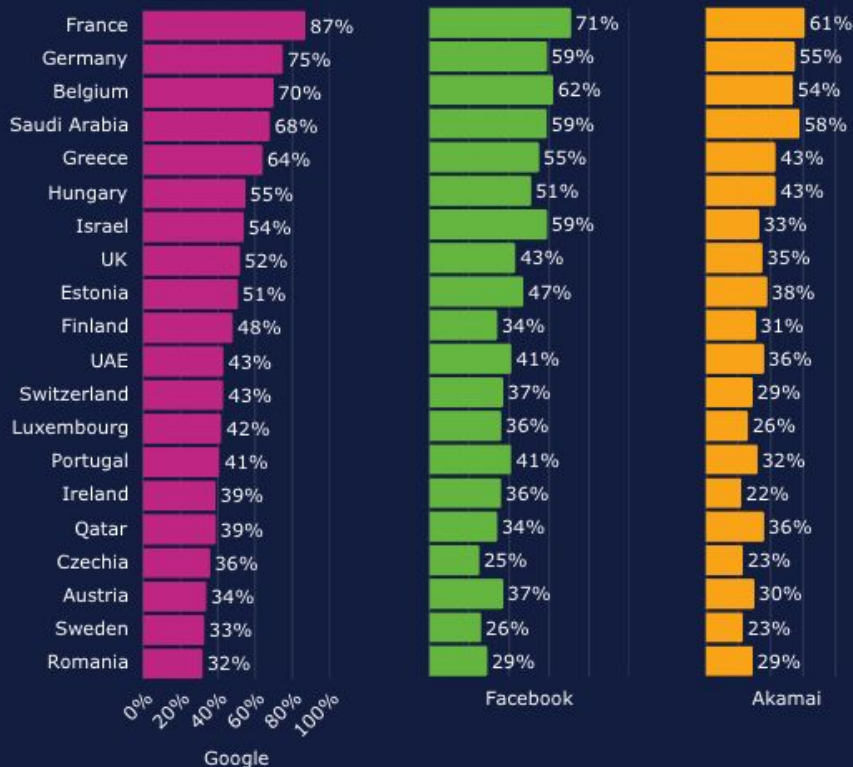
IPv6 addresses held by RIPE NCC members by age and distribution of RIPE NCC members by age



IPv6 Adoption - CDN Metrics (November 2025)



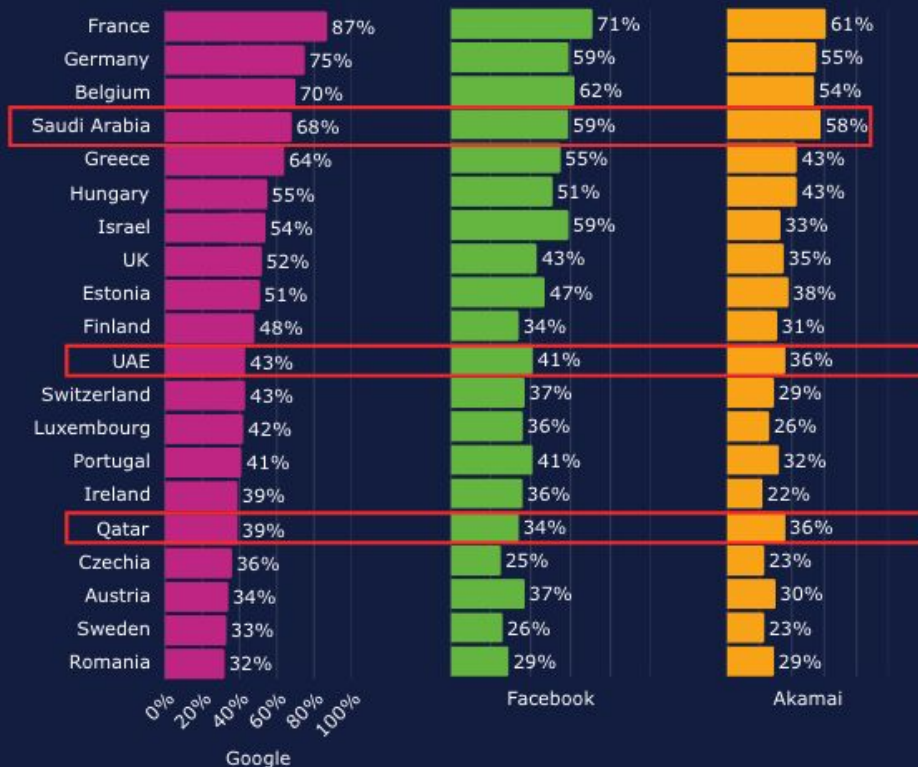
- While significant progress has been made, adoption remains uneven across the RIPE NCC service region
- *Data sources: Google, Facebook, Akamai (November 2025)*



IPv6 Adoption - CDN Metrics (November 2025)



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- *Data sources: Google, Facebook, Akamai (November 2025)*
- The UAE, Saudi Arabia and Qatar are among the top adopters across all reported sources





Policy and Regulation



- Complex legal and regulatory landscape surrounding IP address management
- IP transfers between entities often involve obligations to facilitate lawful and transparent transactions
- Importance for RIPE NCC members to maintain **accurate entries** in the RIPE Database
- While the RIPE NCC is not a regulator, it is often seen as one in the role of overseeing address space distribution (NEXOP's research)
- Some governments in the Middle East see IP addresses as strategic resources for their countries

Policy and Regulation: Key Concerns



Registry Accuracy

To ensure all entities are the rightful holders of their allocated address space, accurate registration by the RIRs is essential.



Traceability in IPv4 renting (leasing)

Some governments and law enforcement representatives are concerned about impact of IPv4 leasing on user identification.



Limitations Due to CGNAT

While CGNAT is widely used and not a major concern in itself, shared IP addresses pose problems for enforcement mechanisms, e.g. Italy's Piracy Shield.



- The current Internet addressing ecosystem is both dynamic and resilient
- We're in the final stage of IPv4's efficient use, where most of the available addresses have been redistributed
- Effective policies, regional cooperation, and innovative solutions are crucial for equitable access to IPv4 resources and a more sustainable Internet protocol ecosystem
- IPv4 cannot support continued growth indefinitely, creating an urgent need to transition to IPv6
- Read the full report at:
labs.ripe.net/media/documents/The_State_of_IPv4_Report.pdf



Questions & Comments



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THANK YOU!