
nic.br
Brazilian Network
Information Center
cgi.br
Brazilian Internet
Steering Committee
registro.br
cert.br
cetic.br
ceptro.br
ceweb.br
ix.br

nic.br cgi.br | ix.br

APRICOT 2026

Jakarta, Indonesia | **02/2026**

IX.br São Paulo: Migration to SRv6 EVPN

Fábio Pessoa Nunes (fpnunes@nic.br)

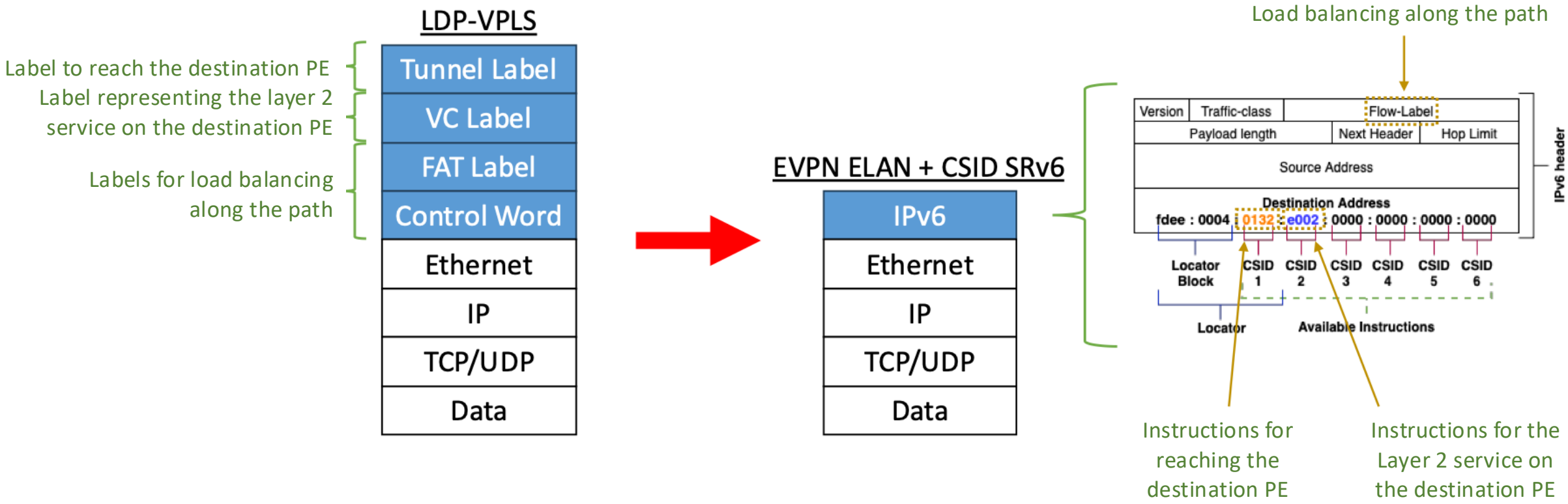
Julio Sirota (jsirota@nic.br)

ix.br nic.br cgi.br

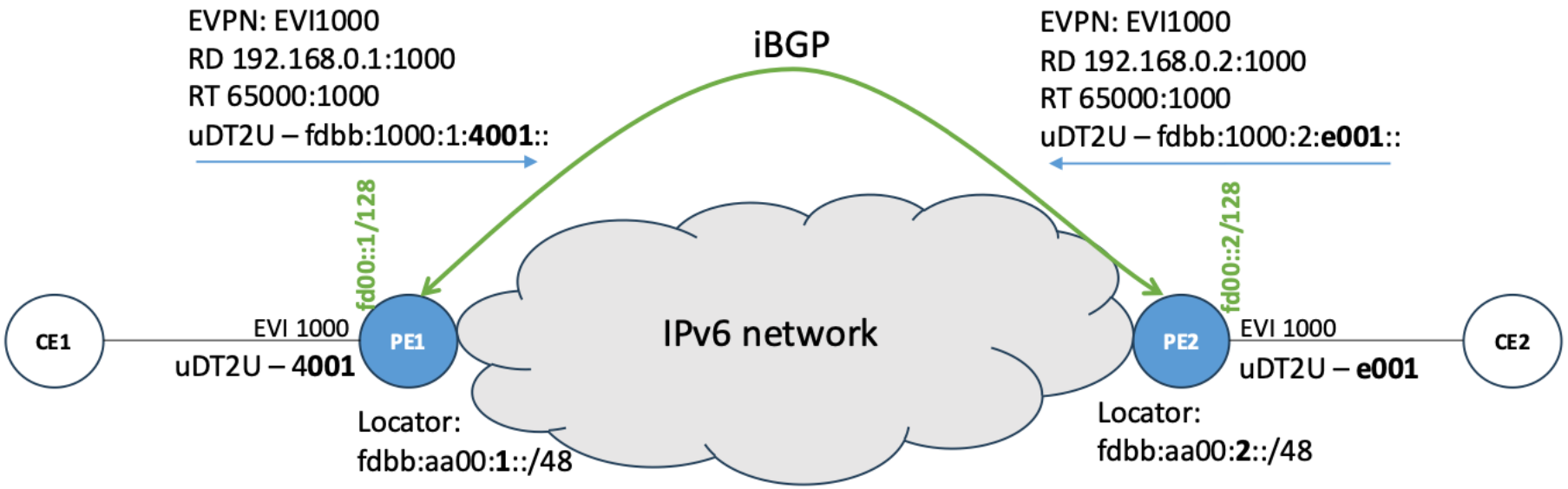
Looking back ...

- IX.br has been seeking a functional EVPN solution since 2016
- In 2024, we implemented EVPN SRv6 at IX.br Brasília with ARP/ND Proxy
- Significant reduction in ARP and Neighbor Solicitation volume
- Eliminated Unknown Unicast flood
- In 2024, IX.br São Paulo was experiencing some instability and a high volume of ARP, Neighbor Solicitation and Unknown Unicast
- NEXT OBJECTIVE: Implement EVPN SRv6 at IX.br São Paulo with ARP/ND Proxy

MPLS L2VPN vs SRv6 L2VPN

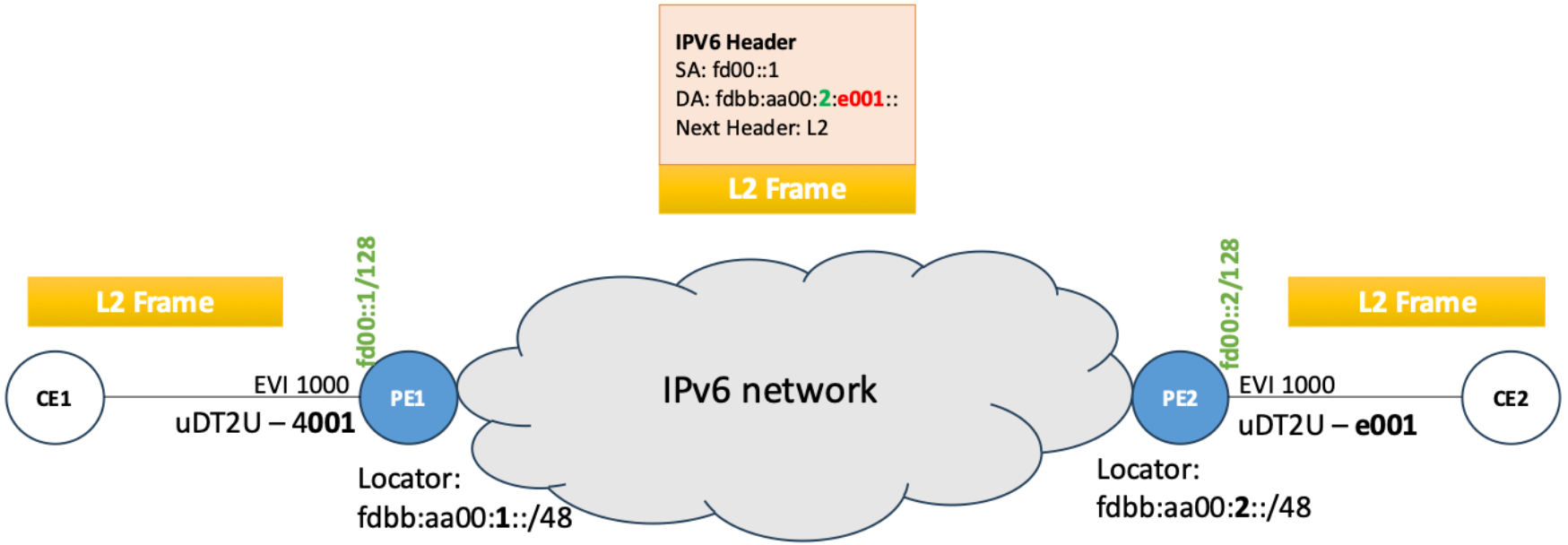


EVPN ELAN + SRv6



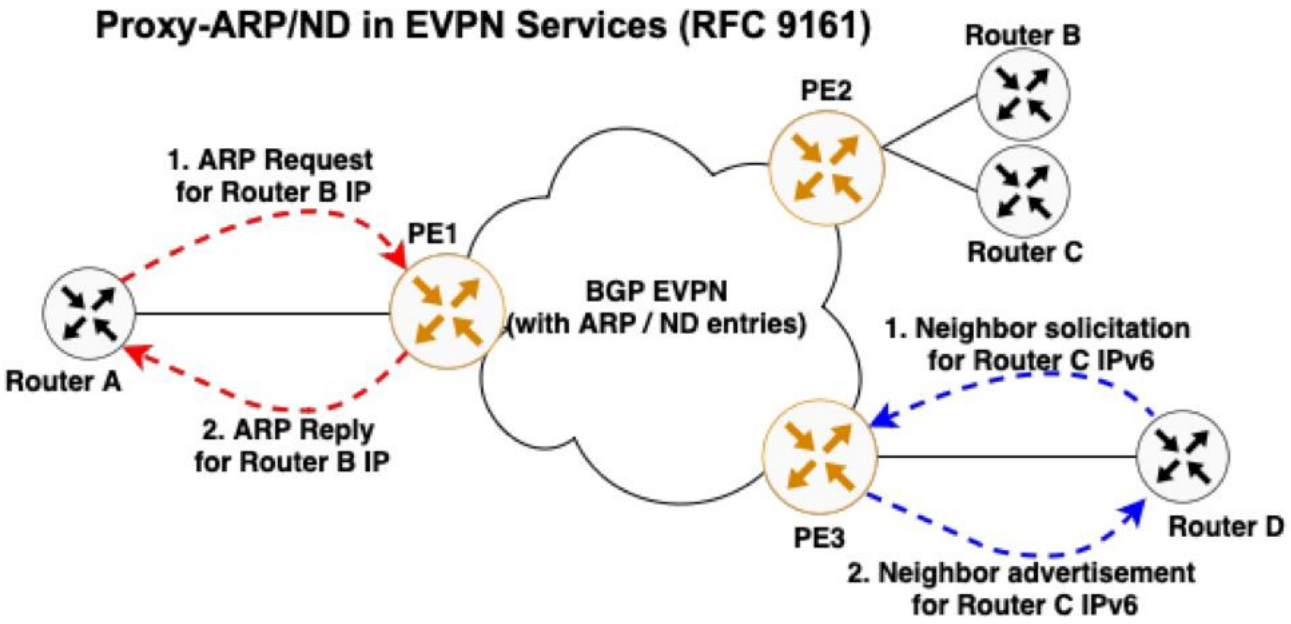
End.DT2U: Endpoint with decapsulation and L2 unicast lookup

EVPN ELAN + SRv6



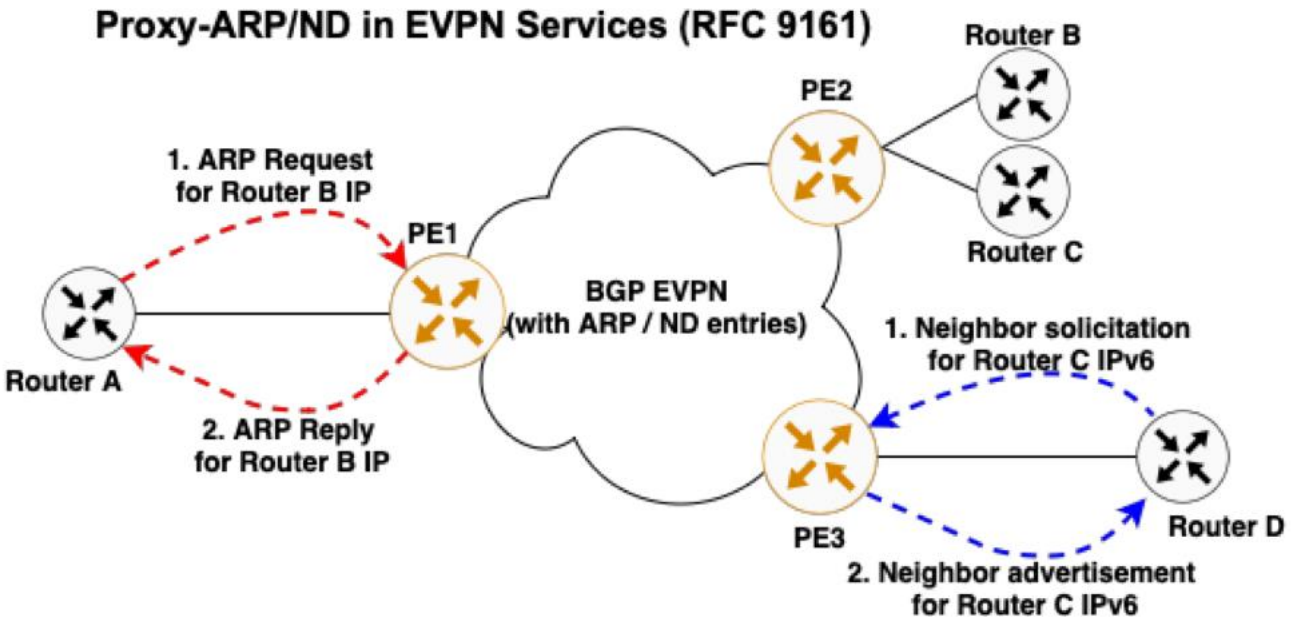
End.DT2U: Endpoint with decapsulation and L2 unicast lookup

EVPN Proxy ARP/ND



- Reduction / Elimination of ARP and Neighbor Discovery
- Static ARP/ND advertised with the “ARP/ND Extended Community with Immutable flag” (RFC9047)
- Ensures that static ARP/ND entries prevail over dynamic entries
- Prevents ARP/ND Spoofing
- Ensures that participants do not respond with ARP/ND to IPs that do not belong to them

EVPN Proxy ARP/ND



- Reduction / Elimination of ARP and Neighbor Discovery
- Static ARP/ND advertised with the “ARP/ND Extended Community with Immutable flag” (RFC9047)
- Ensures that static ARP/ND entries prevail over dynamic entries
- Prevents ARP/ND Spoofing
- Ensures that participants do not respond with ARP/ND to IPs that do not belong to them

December, 2024: IX.br São Paulo network status

- Network using VPLS with some members on layer 2 devices
- Some instabilities related to MAC address learning in VPLS peers
- Due to the nature of flood-based learning, low visibility of the network as a whole
- High volume of ARP, Neighbor Solicitation, and Unknown-unicast
- Some automations, but often limited by legacy equipment



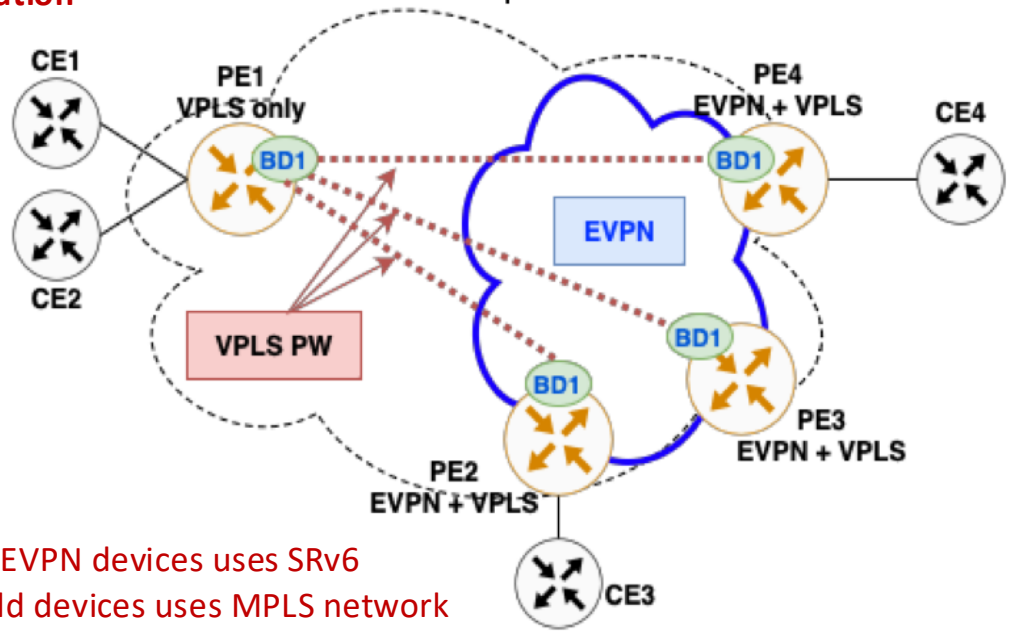
Migrating from LDP-VPLS to EVPN SRv6

The migration occurred with minimal impact on the participants

VPLS Network (LDP + OSPF) → Enable IPv6 and ISIS at the core (without SRv6) → Replacing PE routers one by one with routers with SRv6 → EVPN Network SRv6 providing L2VPN services

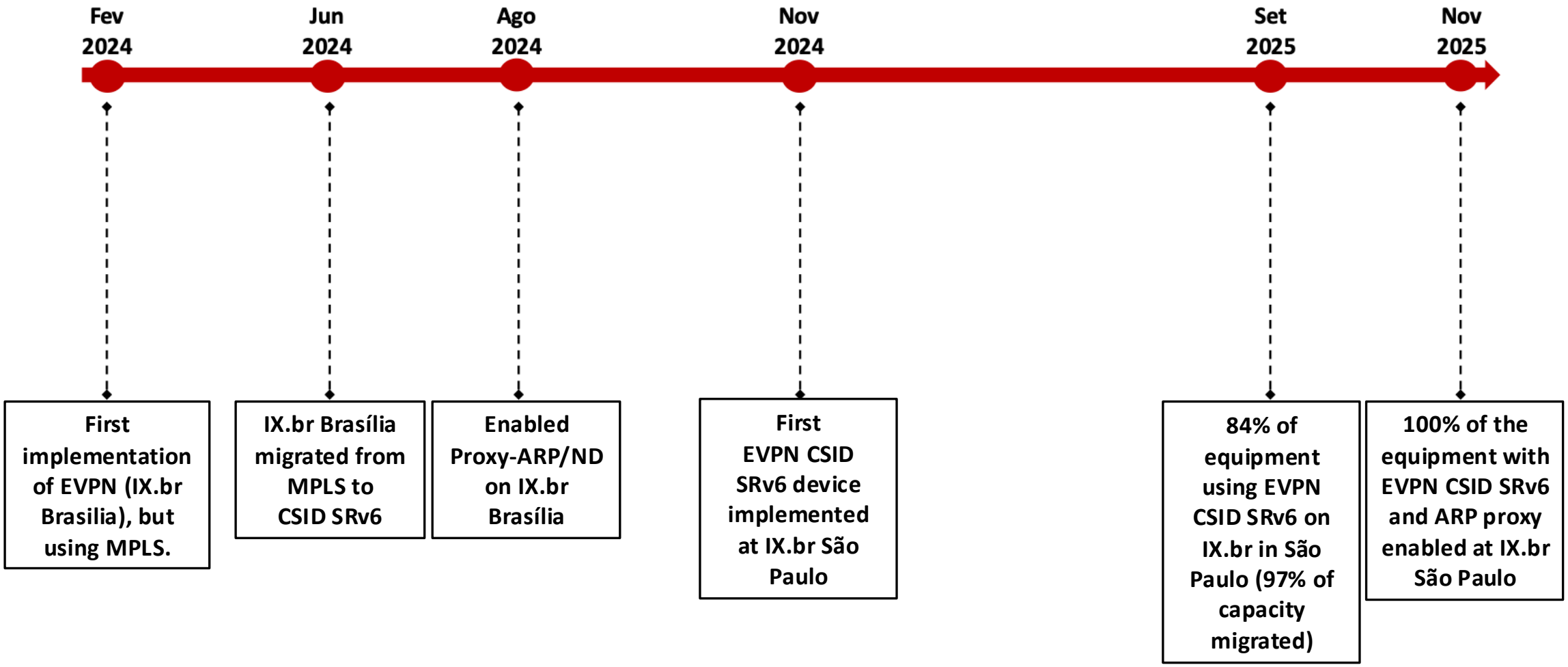
Core forwards MPLS labels and IPv6 labels during migration

Seamless migration with "VPLS and EVPN seamless integration" (RFC 8560)



Traffic between new EVPN devices uses SRv6
Traffic between new and old devices uses MPLS network
No gateway required between MPLS and EVPN

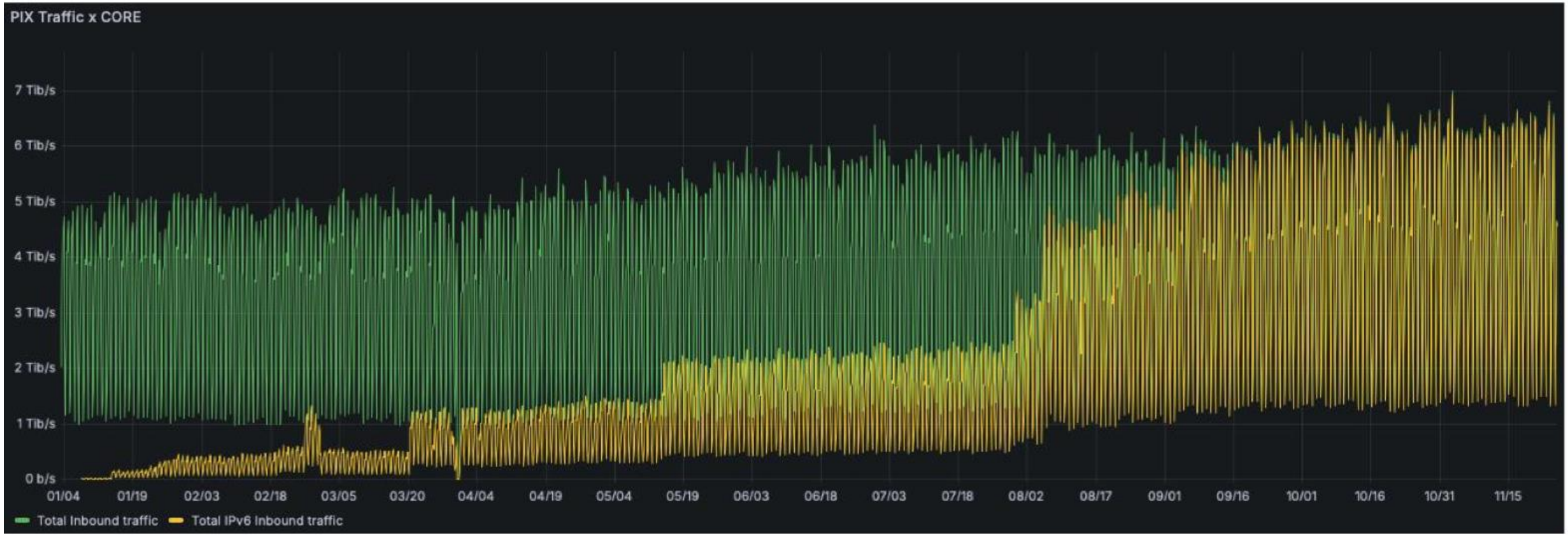
IX.br: EVPN SRv6 implementations



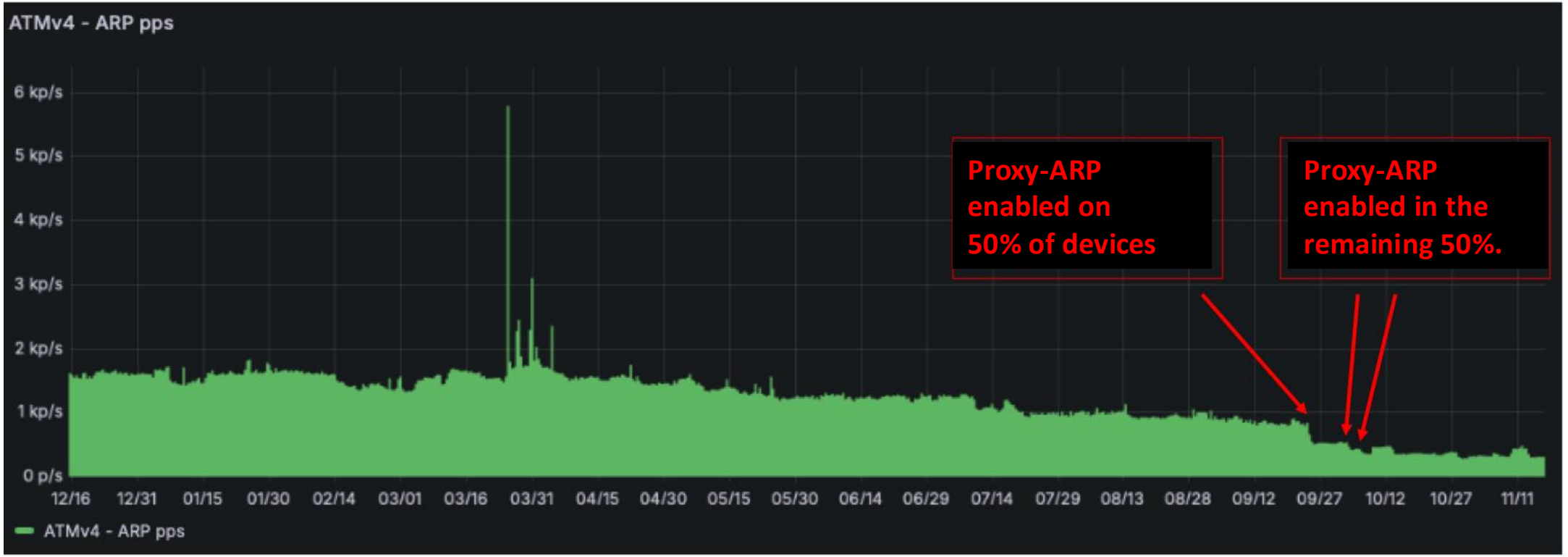
IX.br SP: Evolution of equipment replacement

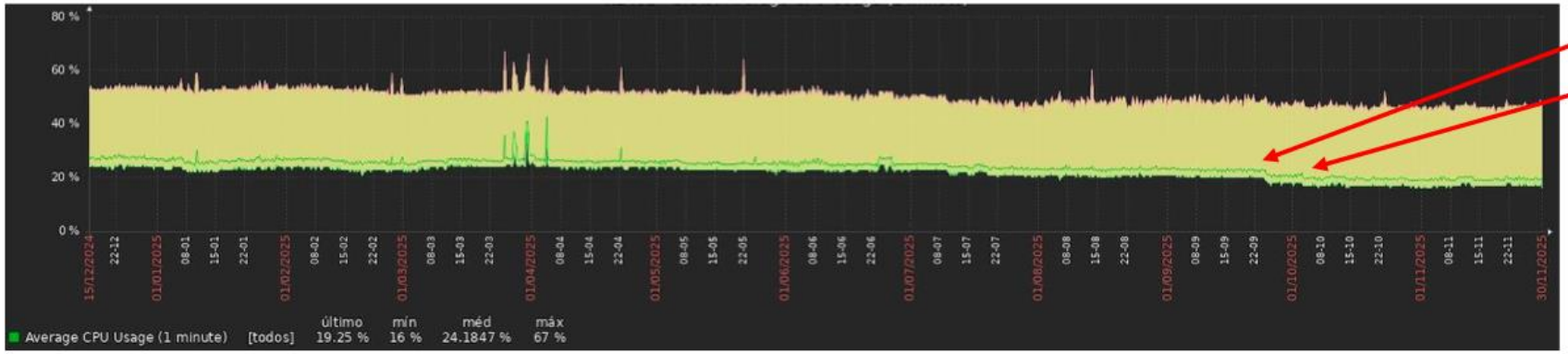


Monitoring the evolution of SRv6 traffic.



IX.br SP: PROXY-ARP





Reflection on the participant's router CPU

IX.br SP: PROXY-ARP

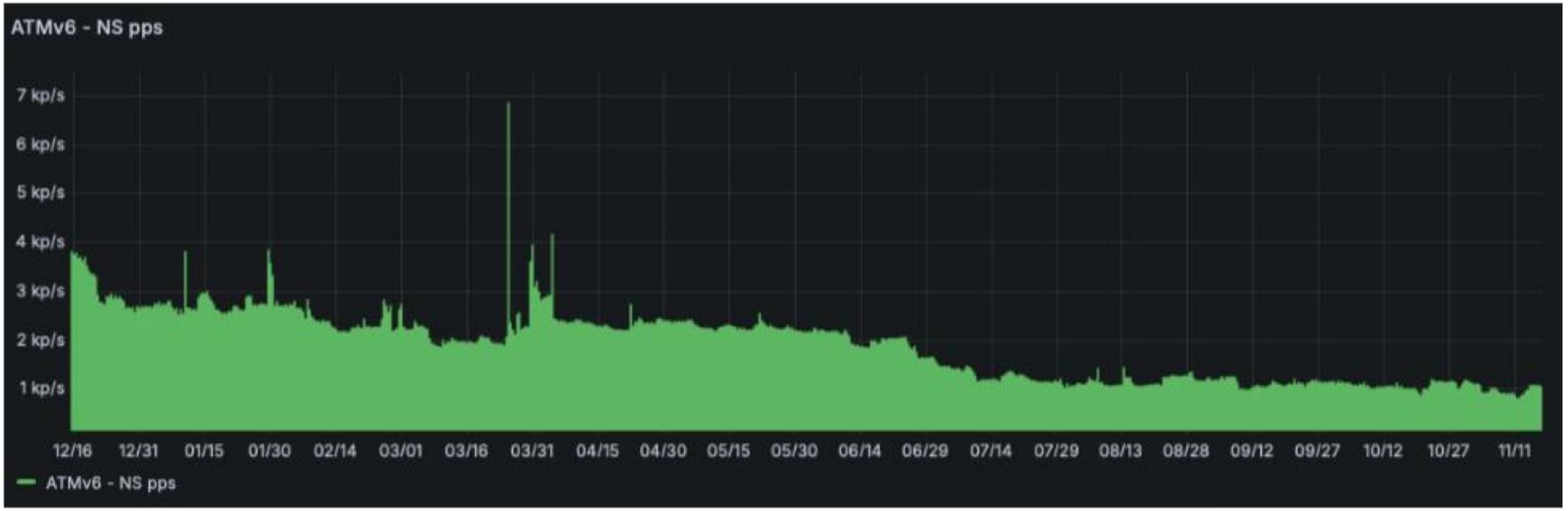
- Protections in the feature ensure that only the participant's MAC address responds for its IP address. Anti-spoofing protection.
    - There is a high volume of routers attempting to establish BGP sessions with inactive MPA IPs.
    - While the IP is not assigned, our automation places a static blackhole entry in the proxy table to avoid generating unnecessary ARPs.
- What are the remaining ARPs after the feature is activated?
    - ARPs for participants who are temporarily offline.
    - ARPs for participants who have left the network but have not yet been deactivated.
    - ARPs for addresses outside the MPA range.
    - We are evaluating in-house solutions to handle these cases.

And what about PROXY-ND?

• Unfortunately, we found 1 bug that is on the roadmap to be fixed soon by the manufacturer.

• We also found scalability limitations of the solution for the IX.br São Paulo network and are awaiting a solution from the current manufacturer.

• However, network stability, active NS monitoring and notification of participants with problems have considerably reduced the number of Neighbor Solicitations on the network.



December, 2025: IX.br São Paulo network status

• Network using 100% EVPN with IPv6 Segment Routing for production services

• **All members are directly connected to EVPN PE routers**

• Stable infrastructure with greater resilience

• Improved network visibility

• **Significant reduction** in ARP volume and addition of anti-spoofing protection

• **Reduction** in Neighbor Solicitation volume and **complete elimination** of Unknown-unicast

• Significant advancements in internal automation



Thanks !

www.ix.br

jsirota@nic.br

February, 2026

nic.br cgi.br

www.nic.br | www.cgi.br