# openPenny

***An Open-Source Tool to Identify Non-Spoofed Traffic***

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(In collaboration with UCL)

RIPE NCC Open House

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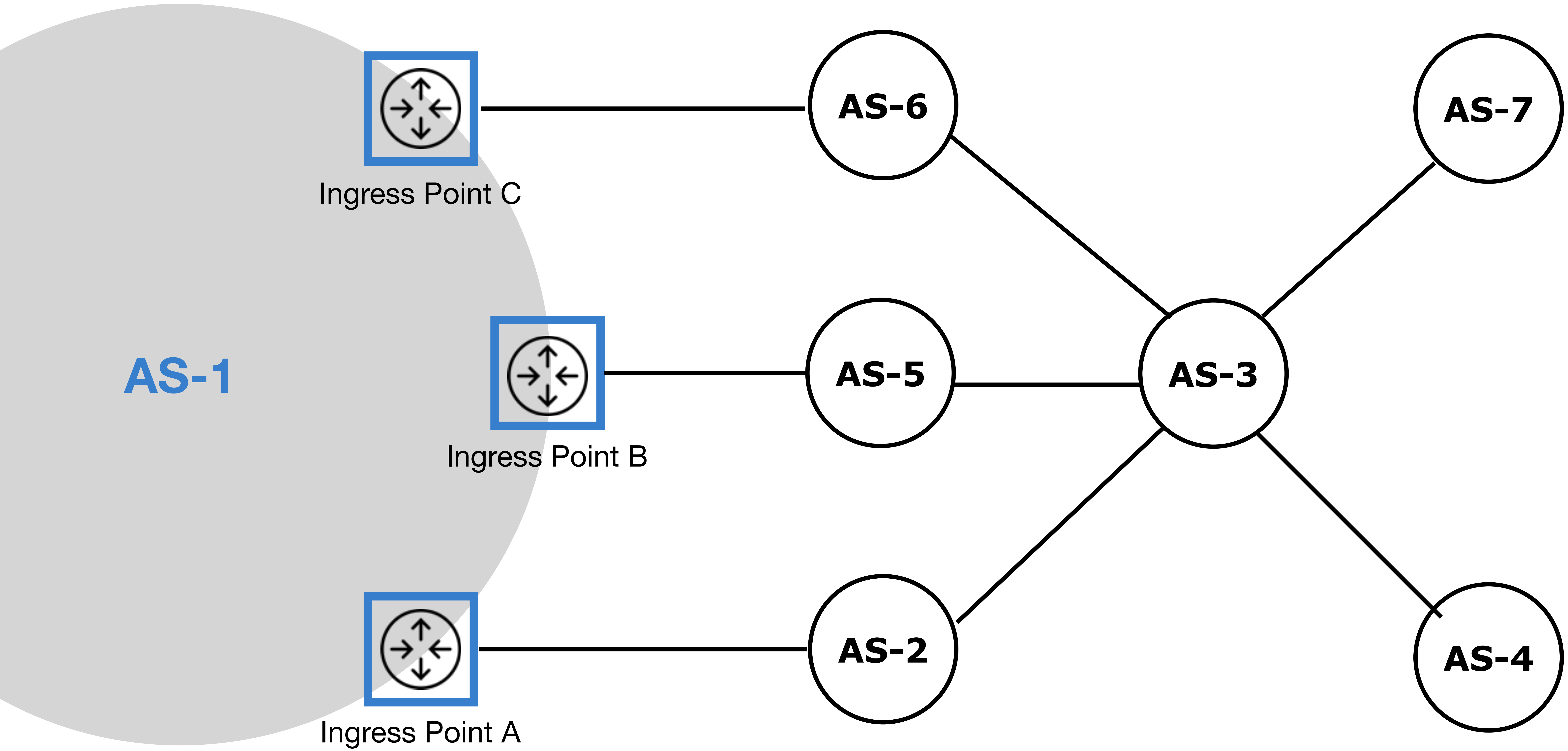
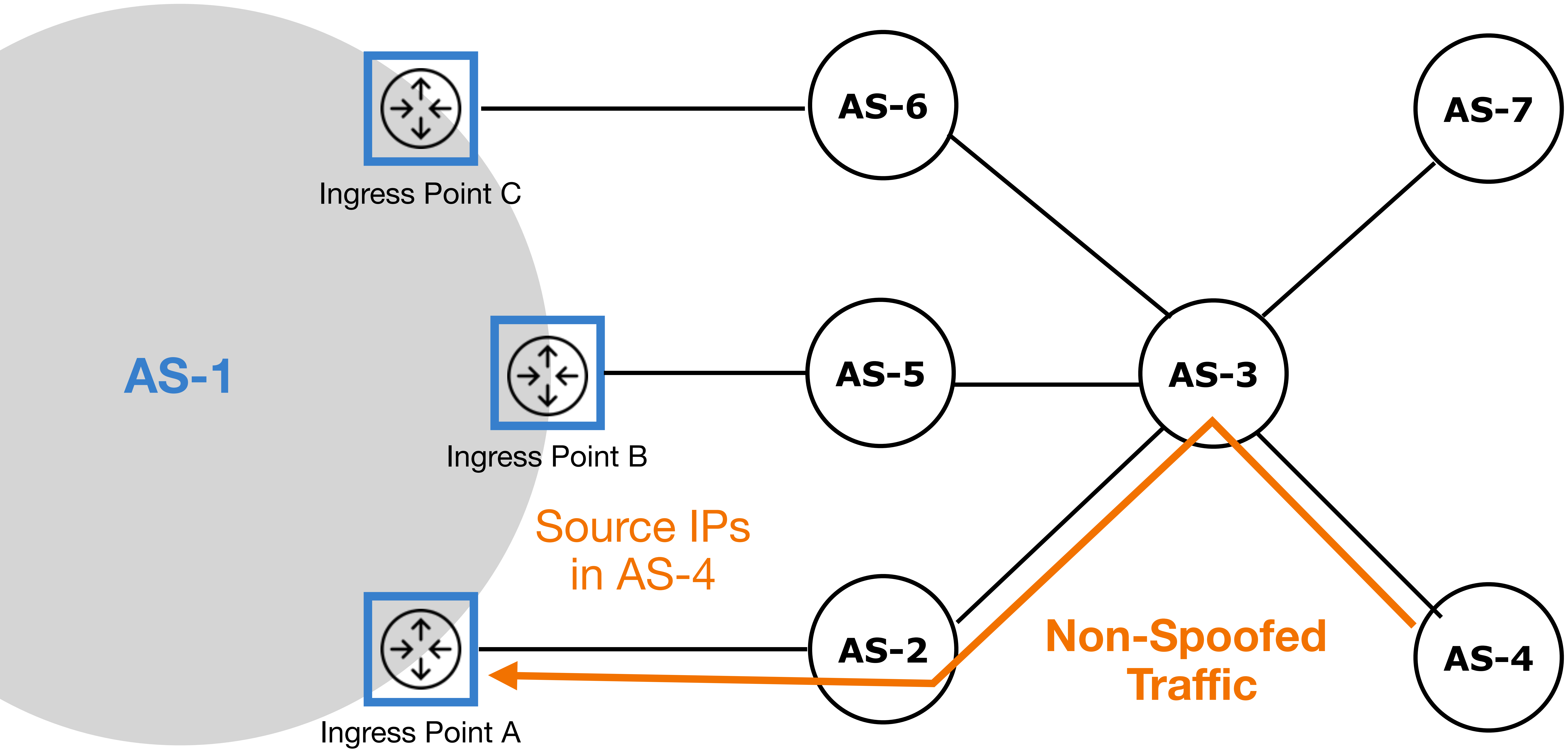
# Detecting Non-Spoofed Traffic is Important

- **Scenario: An ISP receives unexpected traffic in an ingress point.**
  - Easily detect using ACLs and packet counters.
  - However, it cannot determine whether the traffic represents a problem or is just spoofed noise.

- **ISPs lack the capability to distinguish non-spoofed traffic in real-time.**

- Detecting non-spoofed traffic at an unexpected ingress point helps identify:
  (i) misconfigurations, (ii) sub-optimal routing policies,
  (iii) commercial agreement violations and (iv) hijacks.


AS-1
Ingress Point C
Ingress Point B
Ingress Point A
AS-6
AS-5
AS-2
AS-3
AS-7
AS-4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Source IPs
in AS-4
Non-Spoofed
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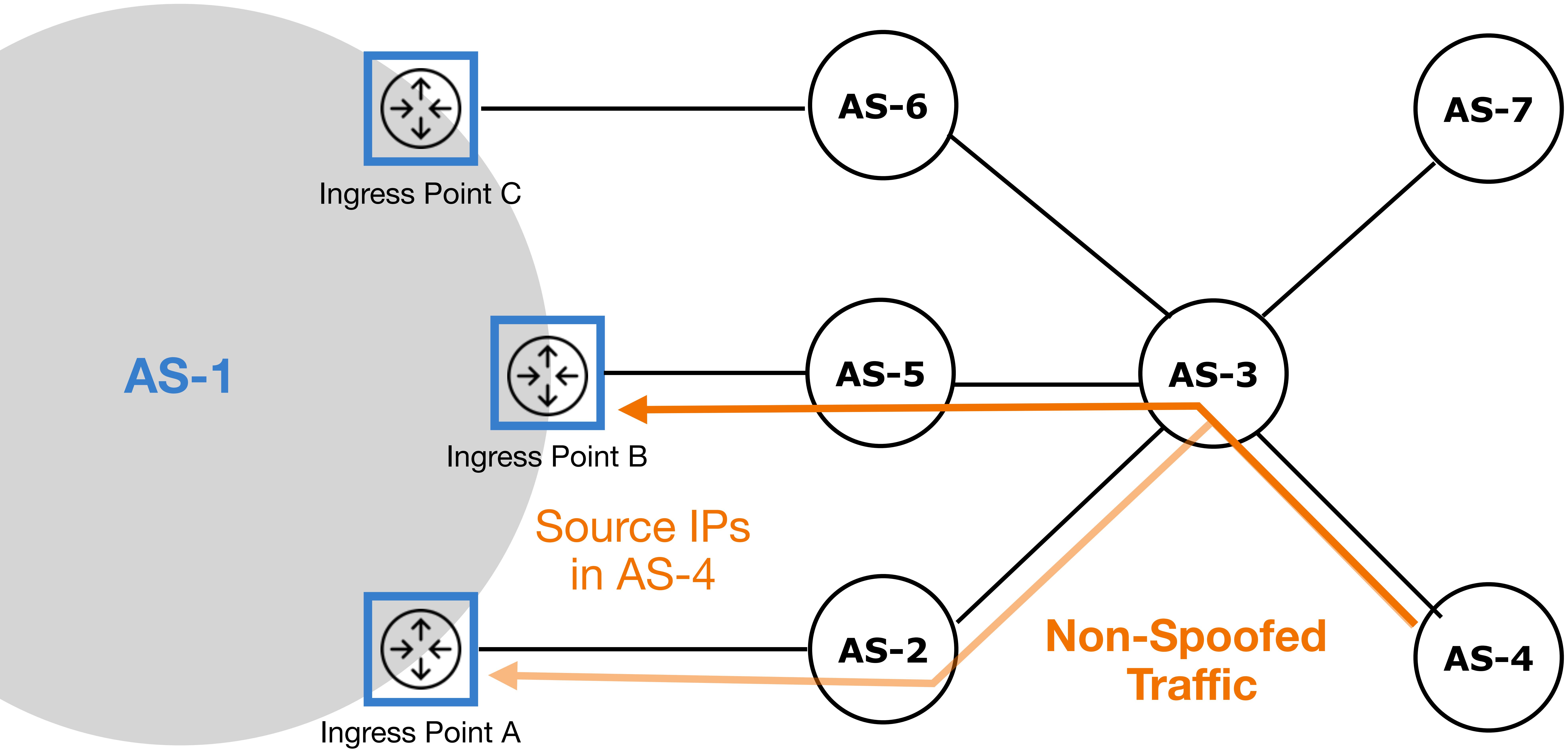
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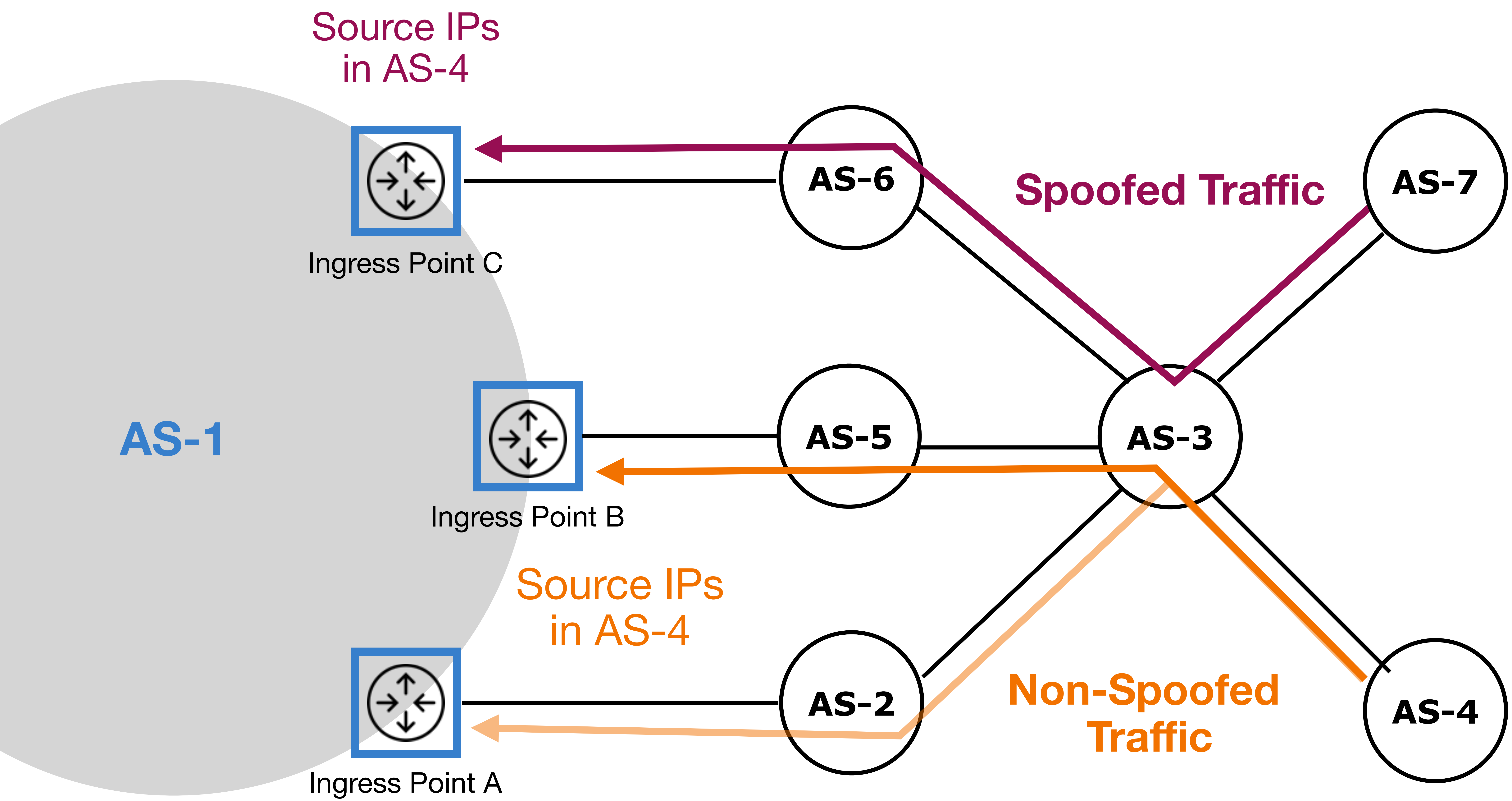
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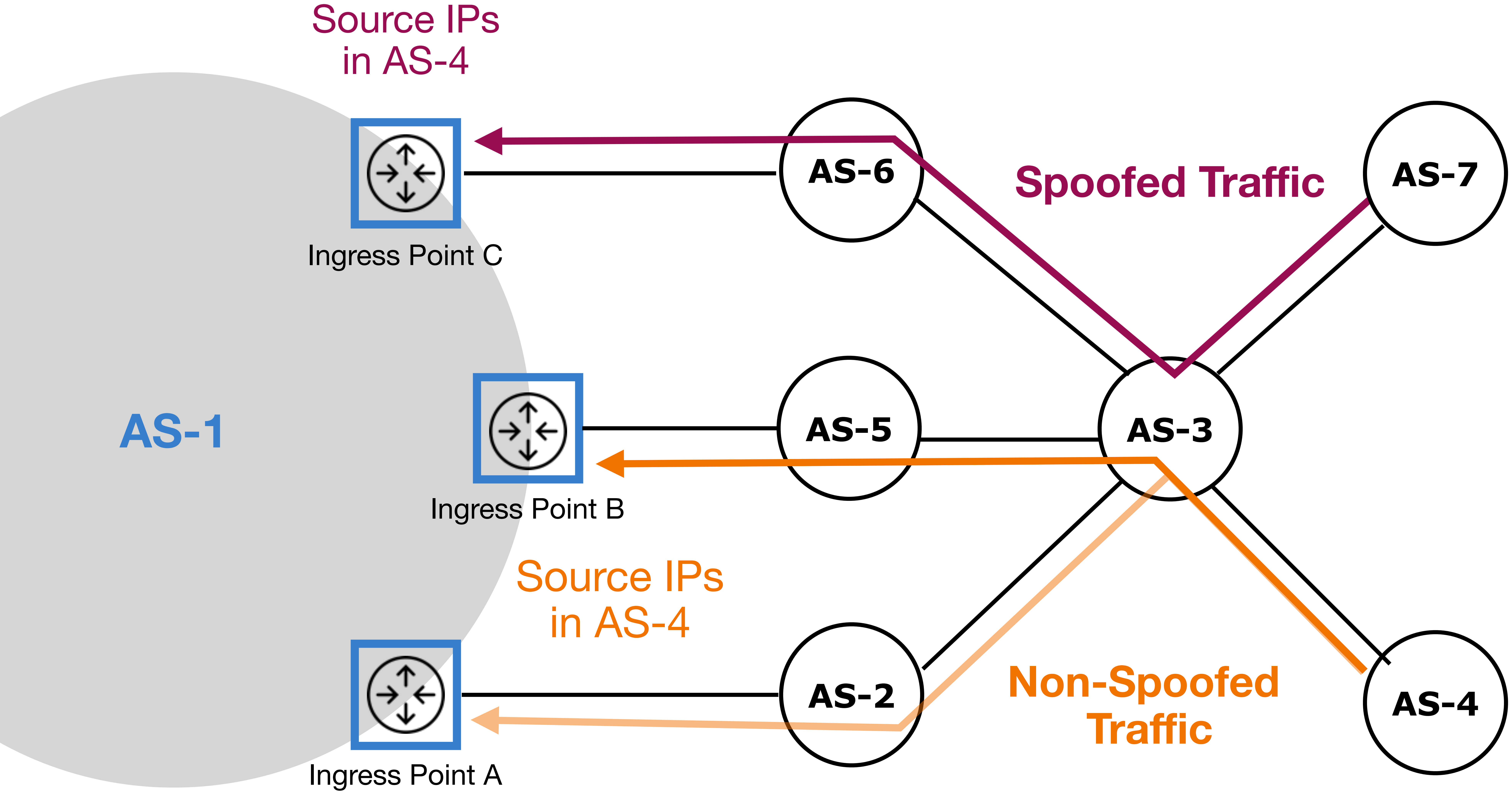

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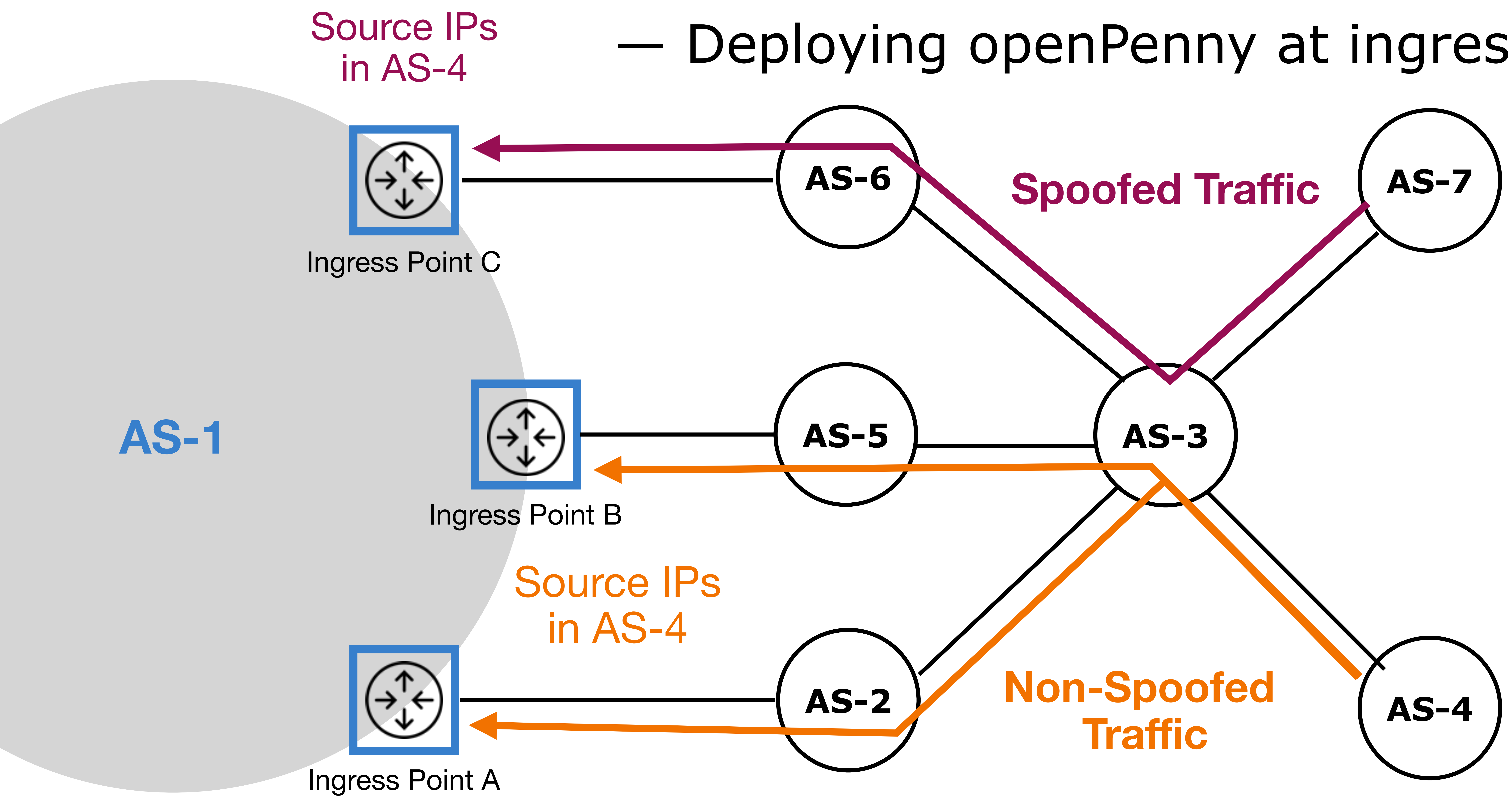

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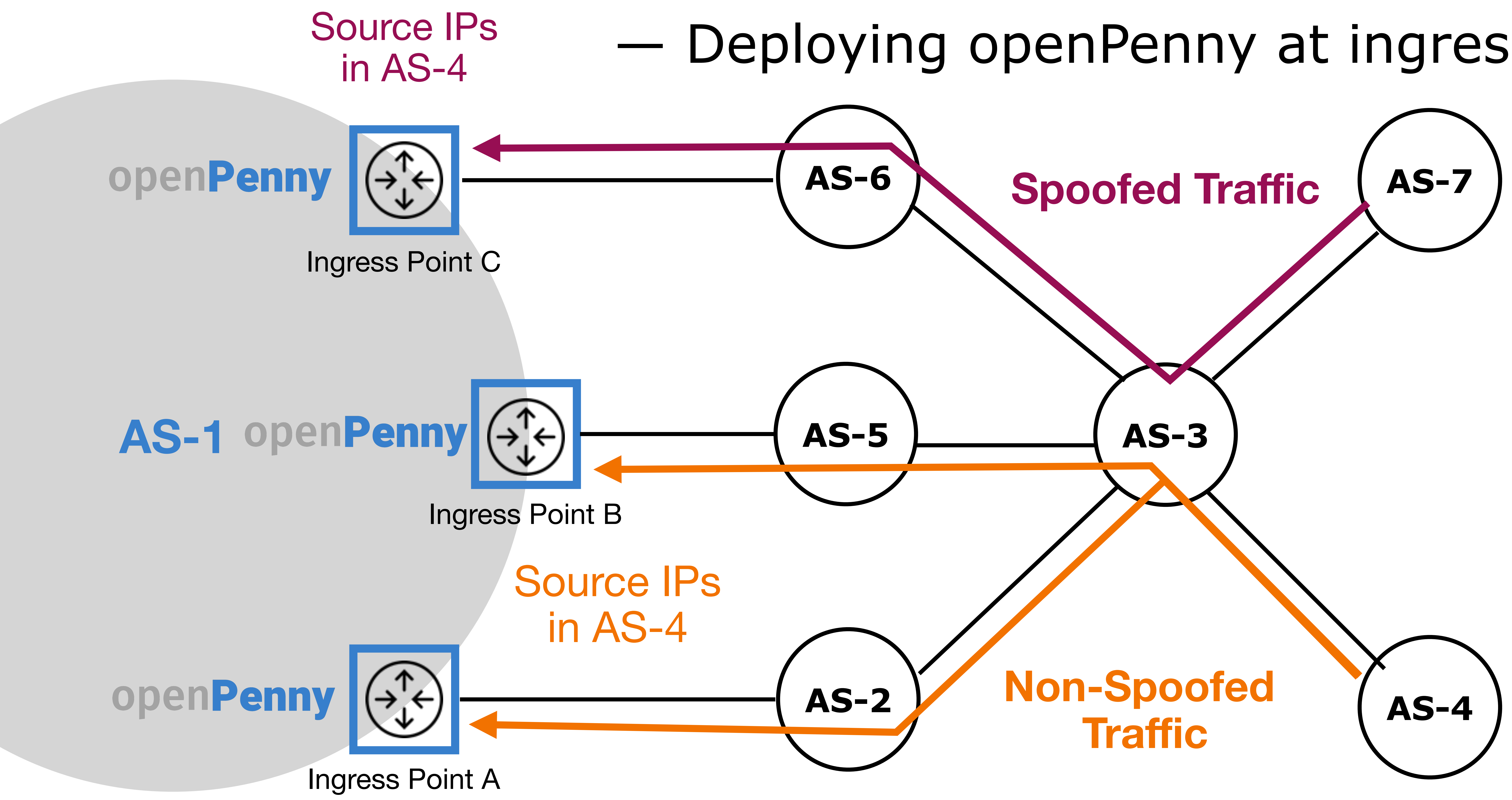

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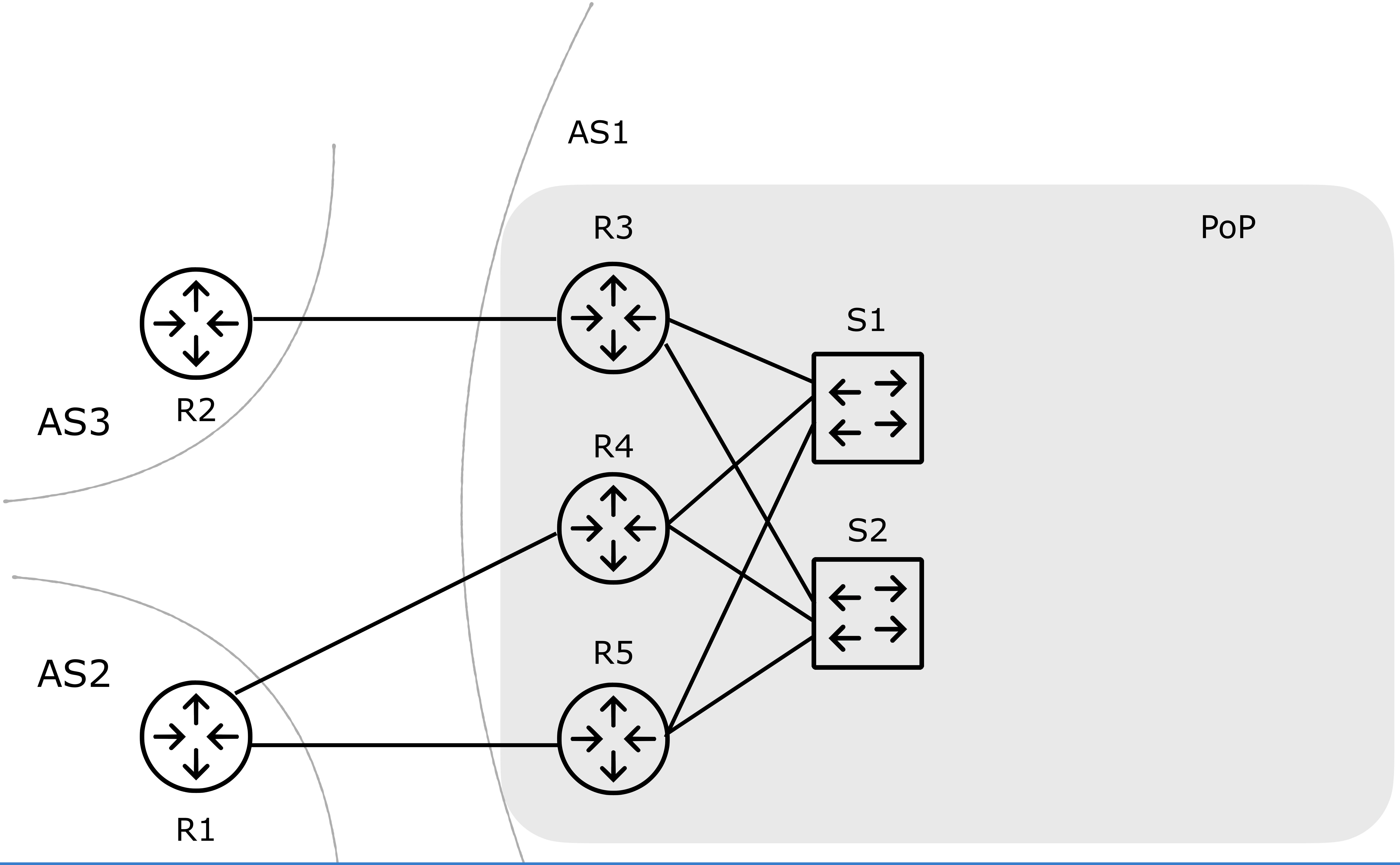

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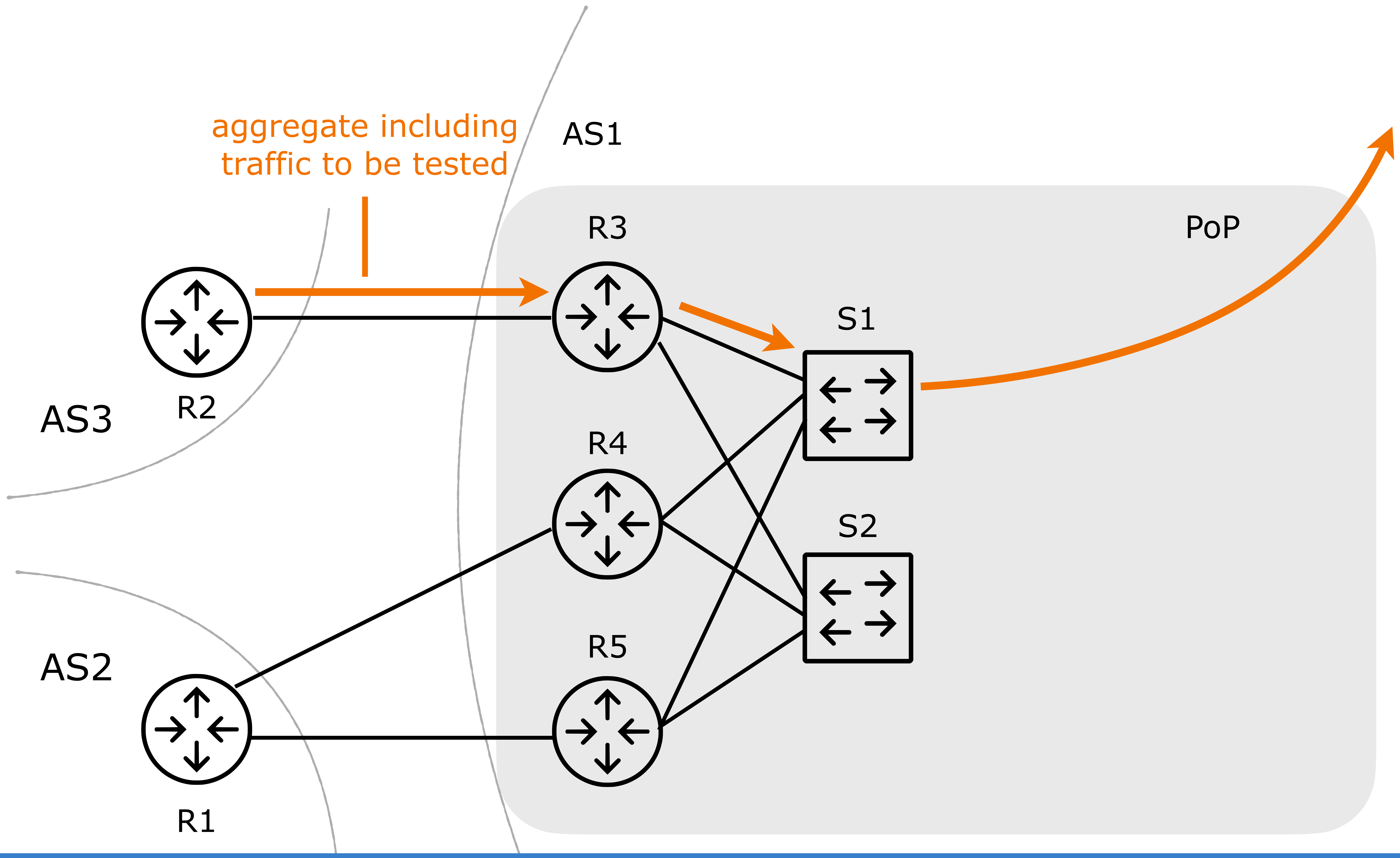

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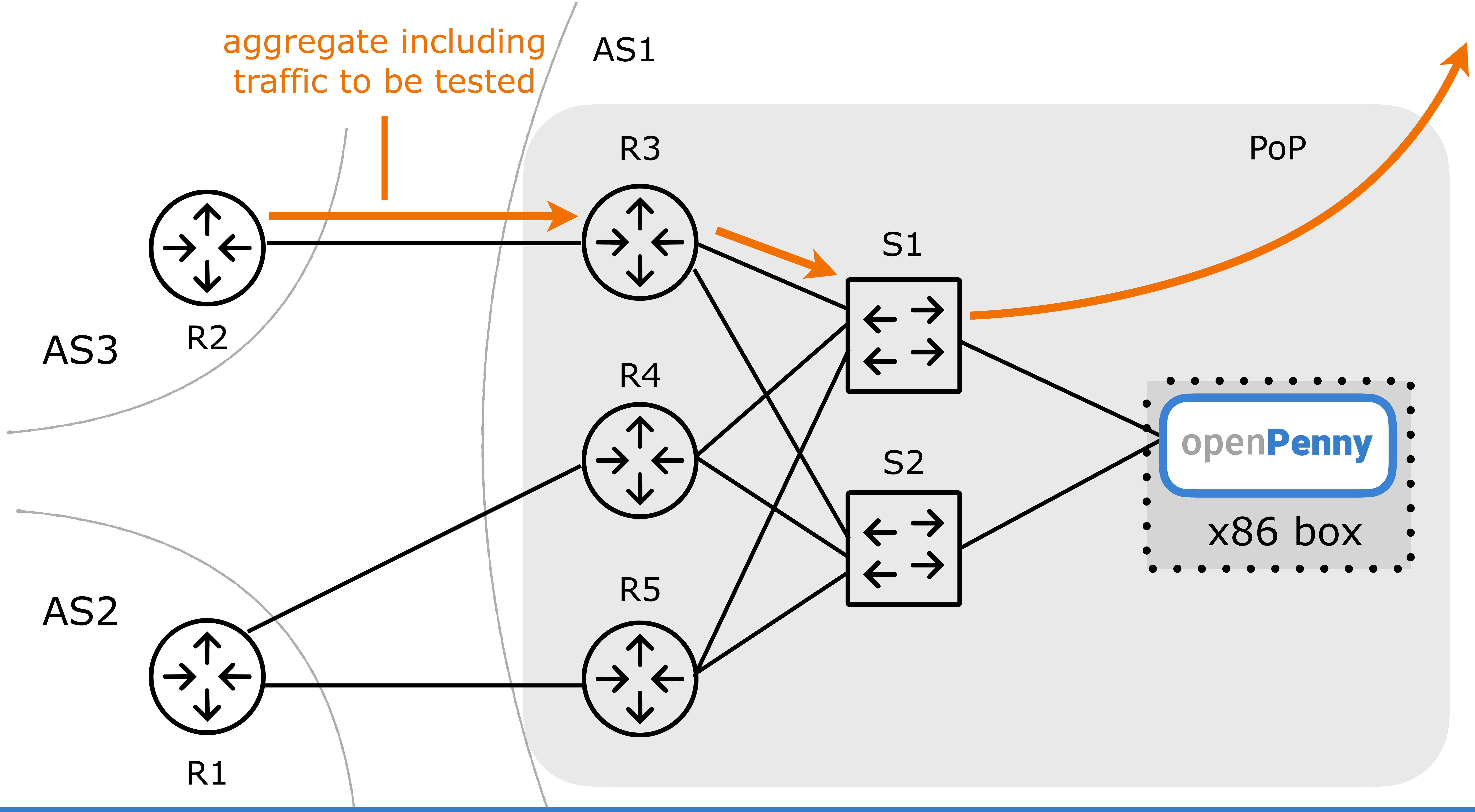

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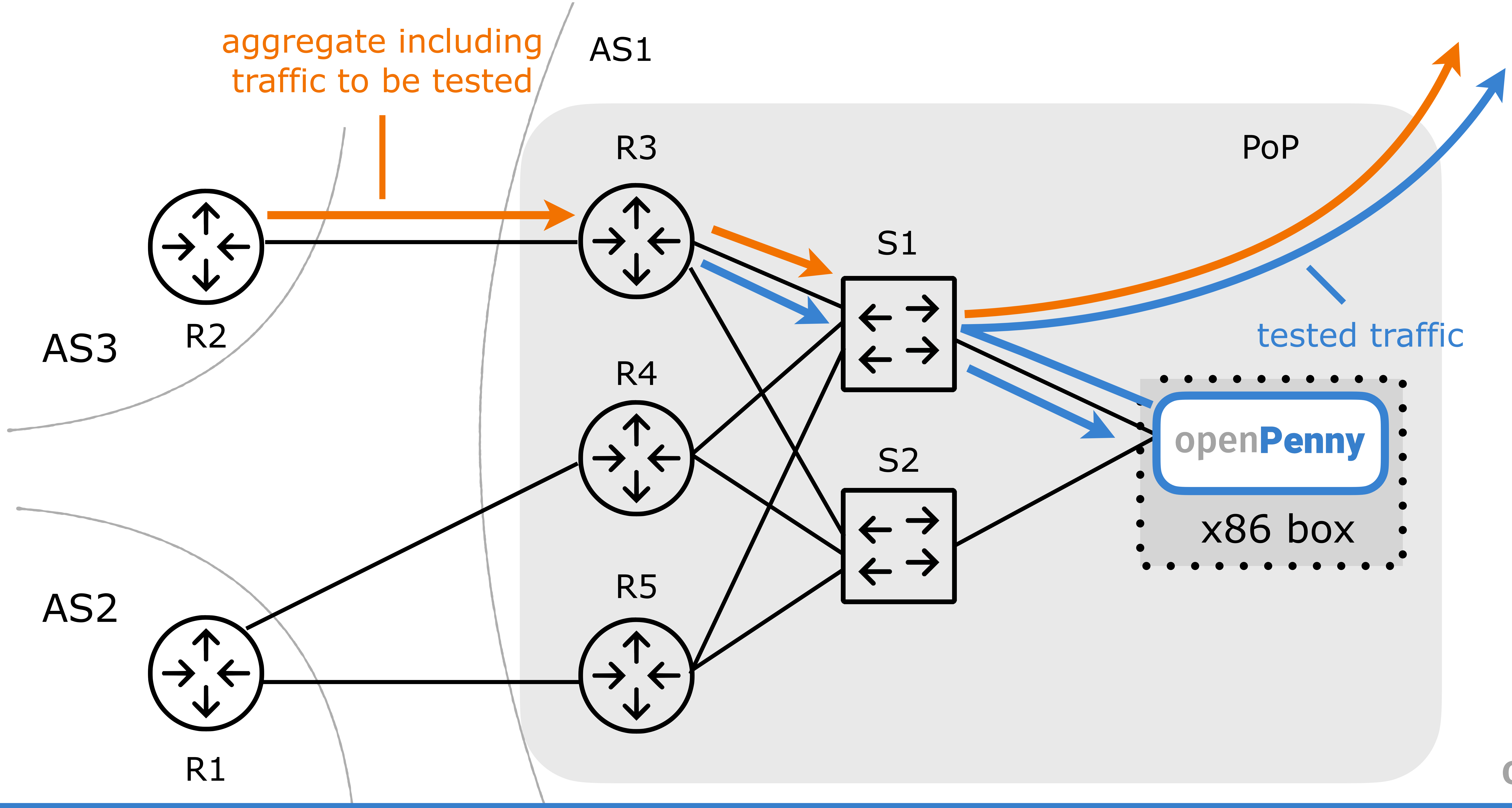

# From ***Penny*** to openPenny

What is ***Penny***?

- Checker for non-spoofed TCP flows.
- Drops a few TCP packets and checks for retransmissions.
- **Simple idea, but complex in practice:** Must handle TCP quirks, external losses, user impact, and resilience against tool-aware spoofers.

***Penny*** *ACM SIGCOMM'24.* → openPenny

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| ***Evaluation:*** | Simulations | Real traffic in a controlled lab testbed |

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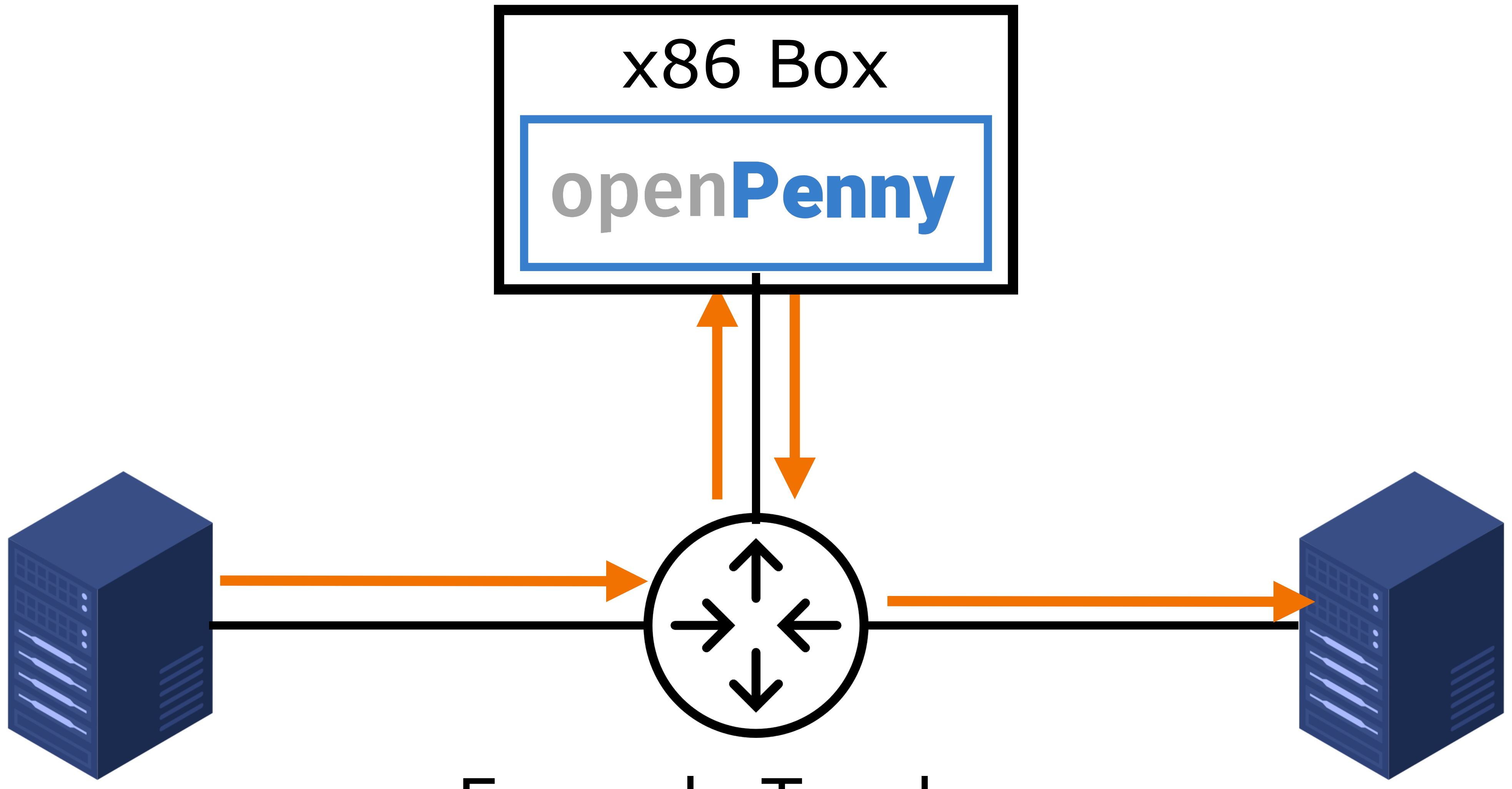
- All uses cases of Penny apply to openPenny.
  — (i) misconfigurations, (ii) sub-optimal routing policies,
  — (iii) commercial agreement violations and (iv) Hijacks.

- RIPE 89 operator feedback on Penny suggested adding a passive mode.
  - Detect route flaps and per-packet load balancing.
  - Detect abruptly interrupted TCP flows.

- To make openPenny useful for operators, we will engage them via mailing lists and meetings.
  - We will seek volunteer networks for early deployment.
  - Feel free to reach out if you're interested in running openPenny in the future.

# Experimental Testbed Lab

- Set up a testbed at UCL using real switches and routers.
- Replicate a diverse range of network settings (e.g., bandwidth, latency, and topology).
- Deployment Scenarios:
  Single vs. multi-core testing box.
- Explore the efficiency of traffic redirection techniques in commercial routers.



Example Topology

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