# From Classic L3VPN to EVPN

Mastering Type 5 Routes in the Backbone for Distributed Routing

Samuel Tomassoni
Fernando Neiverth

lacnic
www.lacnic.net

# The Problem: The Centralized Routing Bottleneck

Legacy Architecture: L3 gateways concentrated on a "heavy" core router

"Dumb" L2 Edge: Edge switches ran EVPN-VXLAN purely as L2 transport, without routing intelligence

# Tromboning effect

## Redundant Flow

Inter-VLAN or inter-subnet traffic must travel up to the central core router and back down to the edge.

## Bandwidth Waste

This round-trip path consumes uplink bandwidth unnecessarily.

## Root Cause

This occurs because edge switches operate without routing intelligence (purely as Layer 2 transport), which ties network capacity to a single core element and undermines the efficiency of the leaf-spine model.

# The solution: Distributed edge routing

### Decentralization of Gateways

The IRB interfaces extend down to the Leaf/Edge switches.

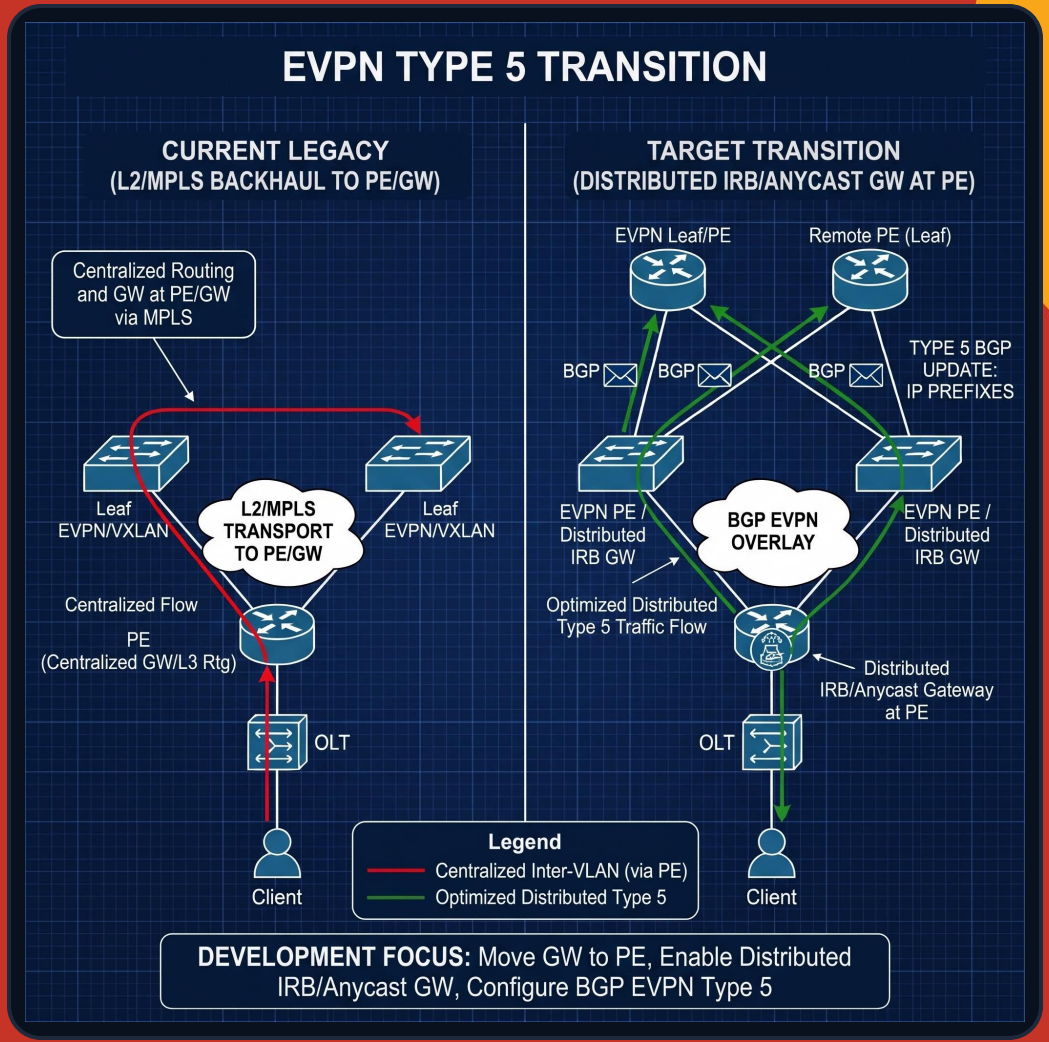
### First-Hop Routing

The packet is routed immediately at the network edge, eliminating tromboning.

### Role of EVPN Route Type 5

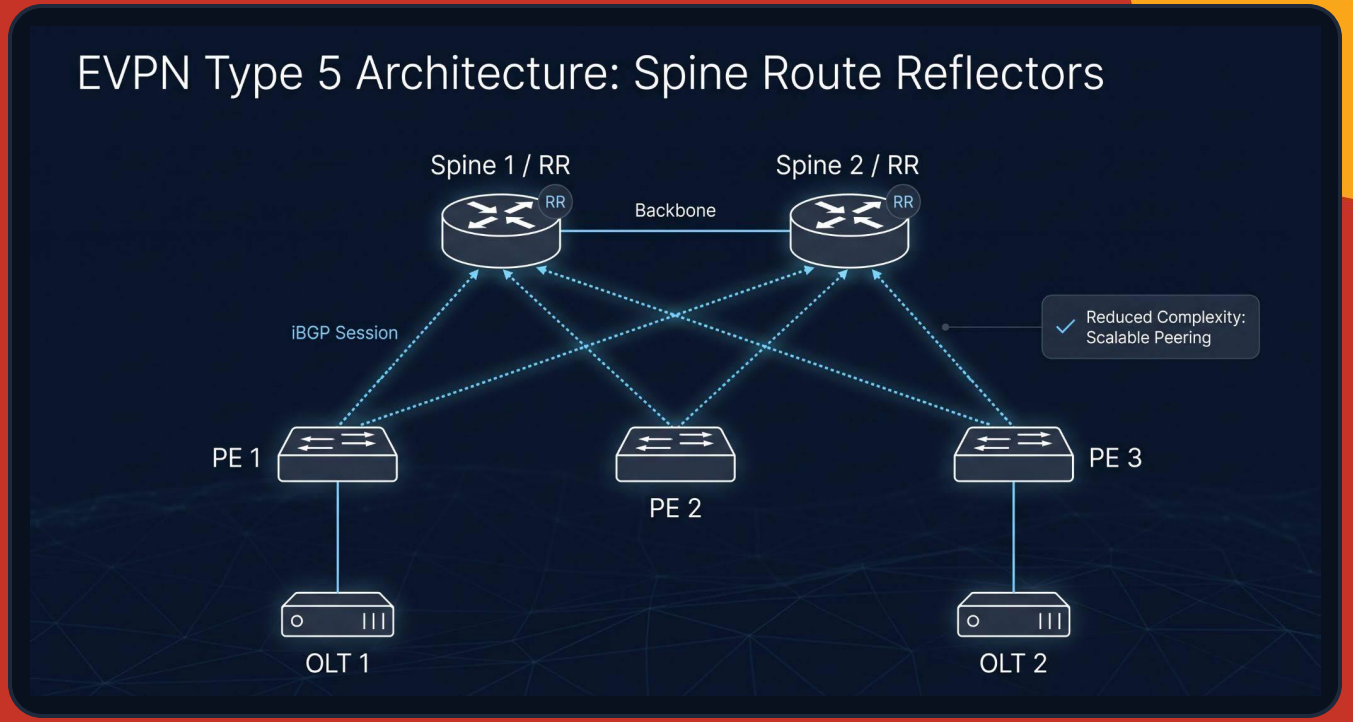
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# EVPN TYPE 5 TRANSITION




**DEVELOPMENT FOCUS:** Move GW to PE, Enable Distributed IRB/Anycast GW, Configure BGP EVPN Type 5

# Architecture ideal for the future



# Unlocking the Future of the Network

## End of Classic L3VPN

Adopting RT5 eliminates parallel MP-BGP VPNv4 stacks, delivering L2VPN and L3VPN services via the same EVPN family to simplify provisioning.

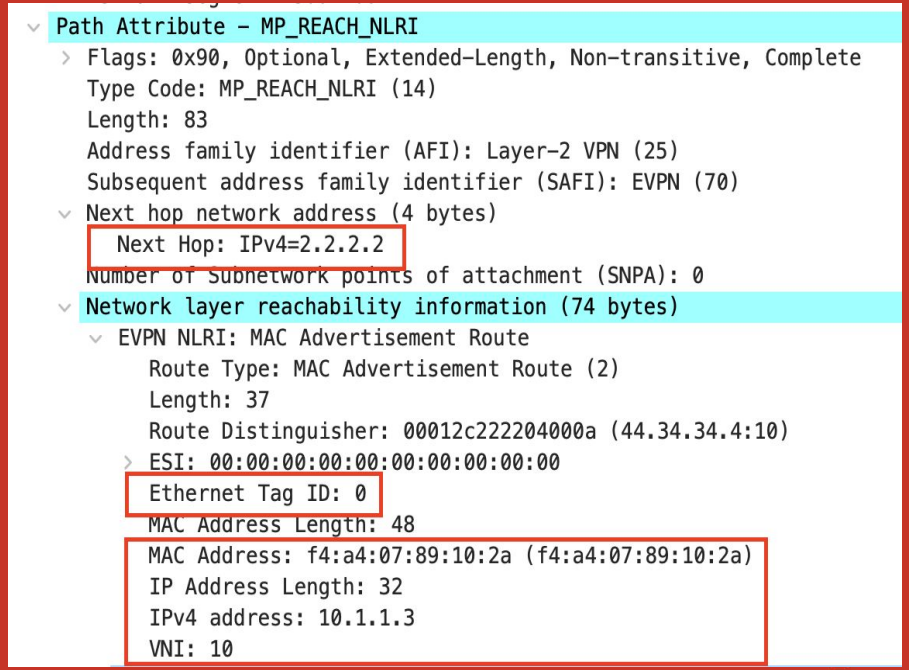
## Granular Traffic Eng.

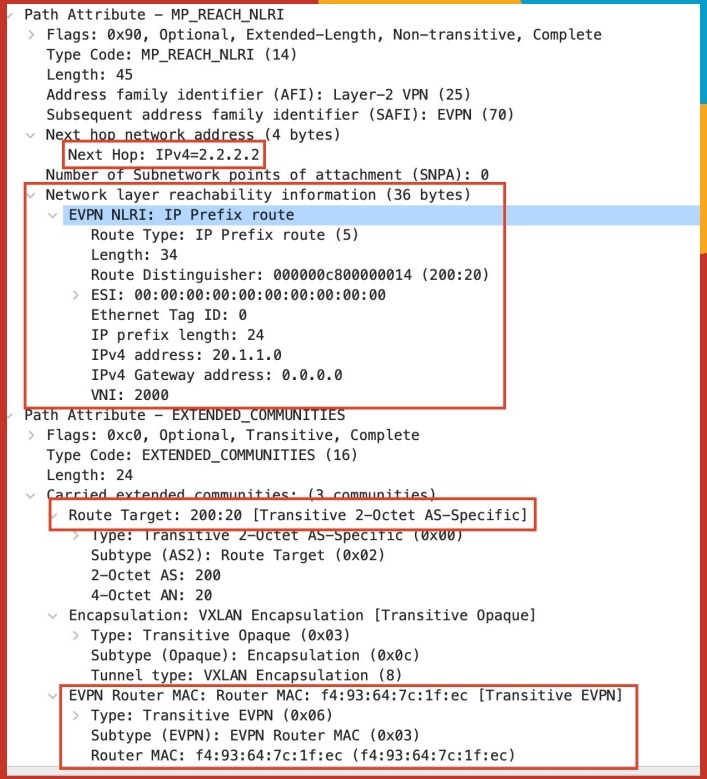
Operating at the IP Prefix (Type 5) level enables direct association of BGP Communities with edge routes for flexible inter-VRF traffic control.

## The "Tromboning" Effect

Decoupling EVPN from transport allows smooth transition from VXLAN underlay to an SRv6 backbone without refactoring edge configurations.

# Difference between EVPN Type 2 and Type 5 packets



# Estimated result based on progress

**Before**

**141,156**

Active routes in the `bgp.evpn` route table before optimization.

**After**

**+-276**

Remaining routes in the `bgp.evpn` route table after optimization.

# Results

## Extreme Control Plane Scalability

A mathematical reduction of over 99% in global BGP table occupancy, replacing more than 140,000 individual host routes (Type 2) with clean, summarized advertisements (Type 5).

## Elimination of Tromboning

First-hop routing is ensured by distributed gateways (Anycast IRB) on the PEs, confining management and BUM traffic to the network edge.

## Peering Simplification

Adopting Spines as Route Reflectors eliminates the need for full-mesh iBGP sessions, delivering a highly available and easily scalable network infrastructure.

## Underlay-Agnostic Architecture

EVPN Type 5 control plane completely decouples service delivery from transport, enabling seamless transition across VXLAN, classic MPLS, SR-MPLS, or SRv6.

# Thank you for your attention!

Samuel Tomassoni - LinkedIn

Fernando Neiverth - LinkedIn

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