

Ethernet Virtual Private Networks (EVPN) for BSP

NOKIA

Amit Dhiraj Dave

Agenda

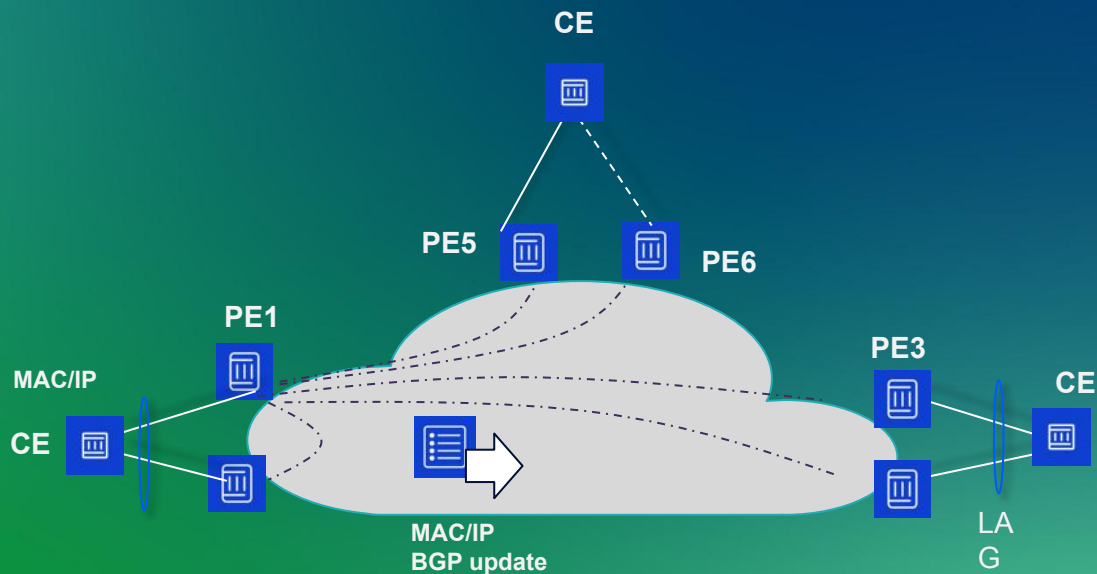
1. EVPN Overview
2. EVPN Benefits
3. EVPN Application
4. EVPN Take away

The Nokia logo is centered within a large white circle that is partially cut off by the right edge of the slide. The background of the slide is a blue-to-green gradient.

NOKIA

EVPN Overview

- Next-generation full-service bearer VPN solution
- Connect Layer 2 network over Layer 3 Network for various VPN services
- Uses BGP extensions to transmit Layer 2 or Layer 3 reachability information
- Separating the forwarding plane from the control plane



EVPN vs VPLS

A comparison

VPN Requirements	EVPN	VPLS	What difference does it make?
Optimum service label consumption	+	-	Label per-VRF as opposed to per-VRF-per-PE
All-Active Multi-homing (Flow-based Load Balancing)	+	-	VPLS only supports single-active MH
Mass-withdrawal for fast convergence	+	-	VPLS single-active MH convergence increases with scale
BUM flooding reduction/suppression	+	-	VPLS based on flood and learn
Integrated proxy-ARP/ND functions	+	-	
Near hitless host mobility	+	-	Mobility allowed in EVPN based on MAC SEQ numbers
Controlled MAC learning with policies	+	-	EVPN supports BGP import/export policies
Simplified configuration	+	-	RFC7432 allows auto-configuration of many service parameters

Why do we move to

EVPN

Superior Multi-Homing

Capabilities

Improved Security

Controlled MAC Learning (BGP)

**L2 and L3 awareness (even in L2
BDs)**

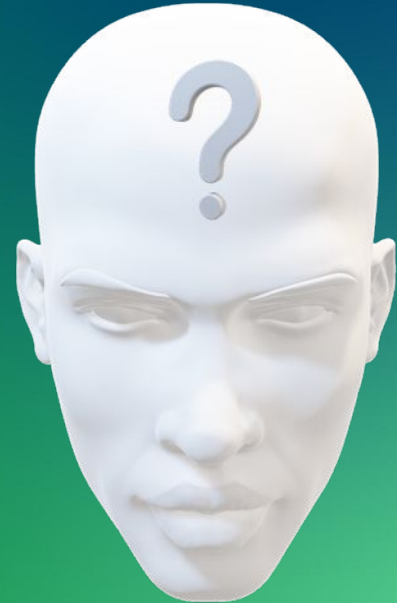
Reduced impact of BUM

Host Mobility

**L2 and L3 forwarding
integration (unicast/multicast)**

WAN and DC Integration

Universal Control Plane



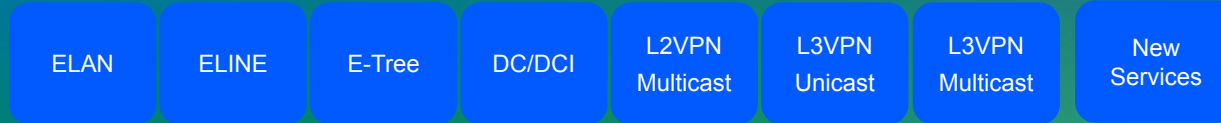
Unified Service Delivery in the New World

Different Protocols used for each Service



↑
Old World

Services



And adds new capabilities through a unified control plane framework

New World



Same Control Plane framework

EVPN Application

1

**EVPN for
ELAN, ELINE
and E-Tree**

2

**EVPN for DC/DCI
(VXLAN)**

3

**EVPN for Unicast
L3VPN**

4

Takeaways

1

EVPN for ELAN, ELINE and E-Tree

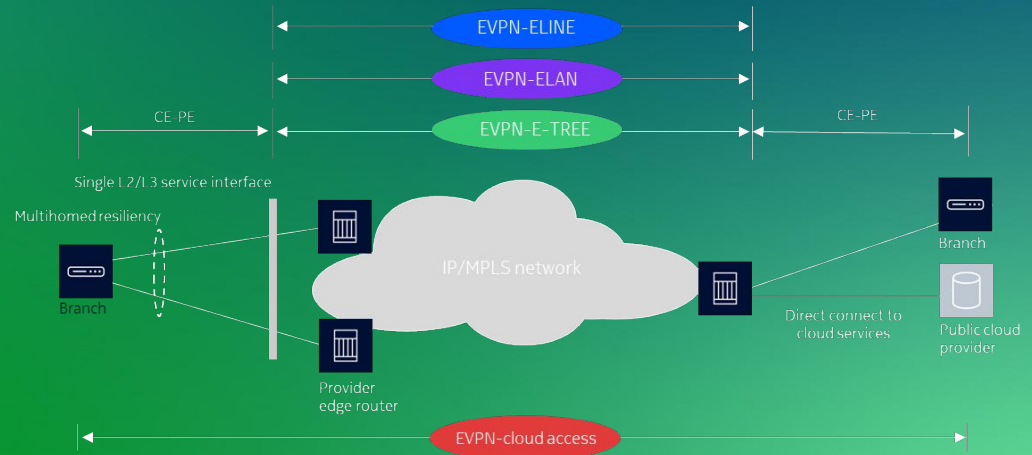
RFC7432 Basic EVPN

EVPN Multi-Homing

EVPN VPWS

EVPN-VPLS

EVPN E-Tree



2

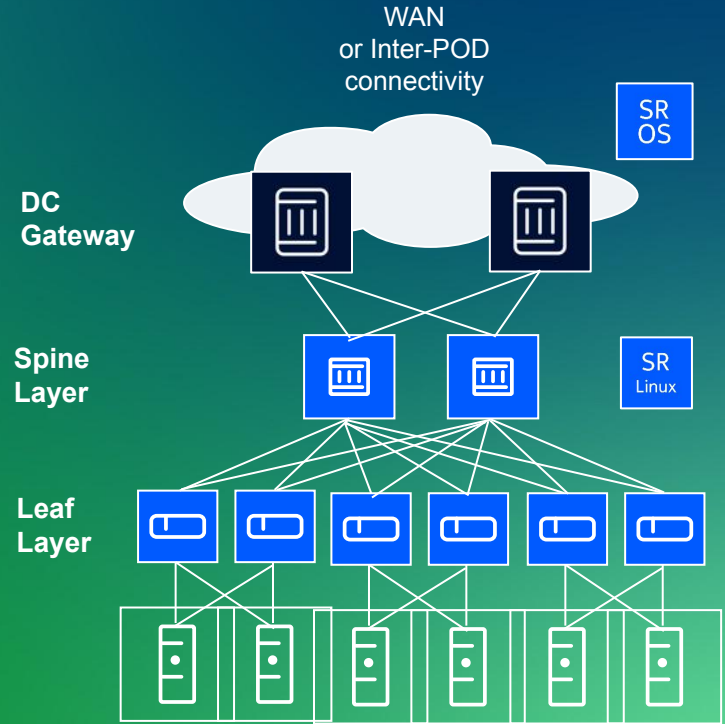
EVPN for DC/DCI (VXLAN)

EVPN for VXLAN

Local Bias for EVPN-VXLAN Multi-Homing

EVPN Assisted Replication

DCI



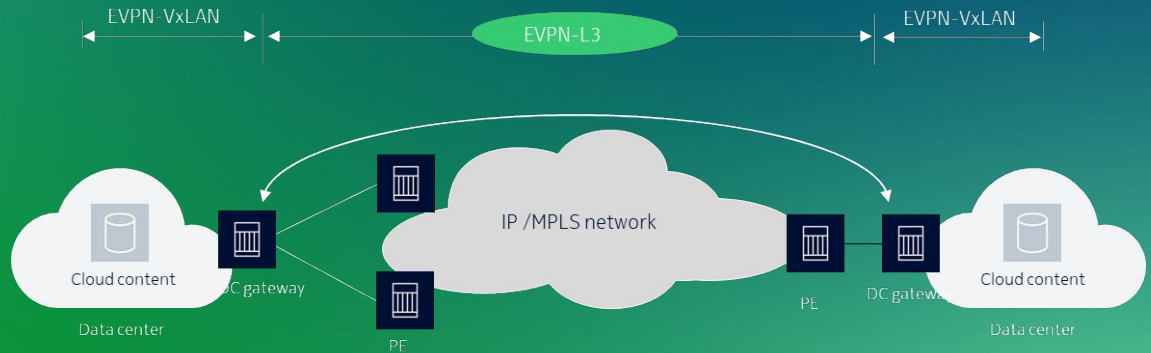
3

EVPN for Unicast L3VPN

EVPN for L3VPN

L3VPN Unicast services

L3VPN Multicast services



“50% of service providers had EVPN deployed somewhere in their network in 2022. This percentage is forecast to rise to 85 percent by the end of 2024”

https://www.nokia.com/blog/evpn-adoption-accelerates/?did=d00000001qb&utm_medium=organic

anic

Source: HIS Markit

EVPN take away

8+ vendors carried out dozens of interoperability test around the main EVPN applications and services

“24 successful EVPN test combinations addressing varieties of IETF drafts in scalability, security, protection and OAM”

EVPN is a true Multi-Vendor Technology

The image shows the cover of the EANTC White Paper 2019, titled 'Multi-Vendor Interoperability Test'. The cover features the EANTC logo at the top, the title in white text on a dark blue background, and a graphic of several blue arrows pointing upwards and to the right. To the right of the cover is a preview of the white paper's content, which includes a table and a diagram.

Observed Out of Service Time	Number of Measurements
0-5%	12
5-10%	2
10-15%	1
15-20%	1

Figure 3: EVPN Service Churn of Service Time

The white paper also includes a diagram showing a multi-vendor test environment with various vendors and their connections to a central cloud.

NOKIA