VyOS Networks

SOLUTION BRIEF

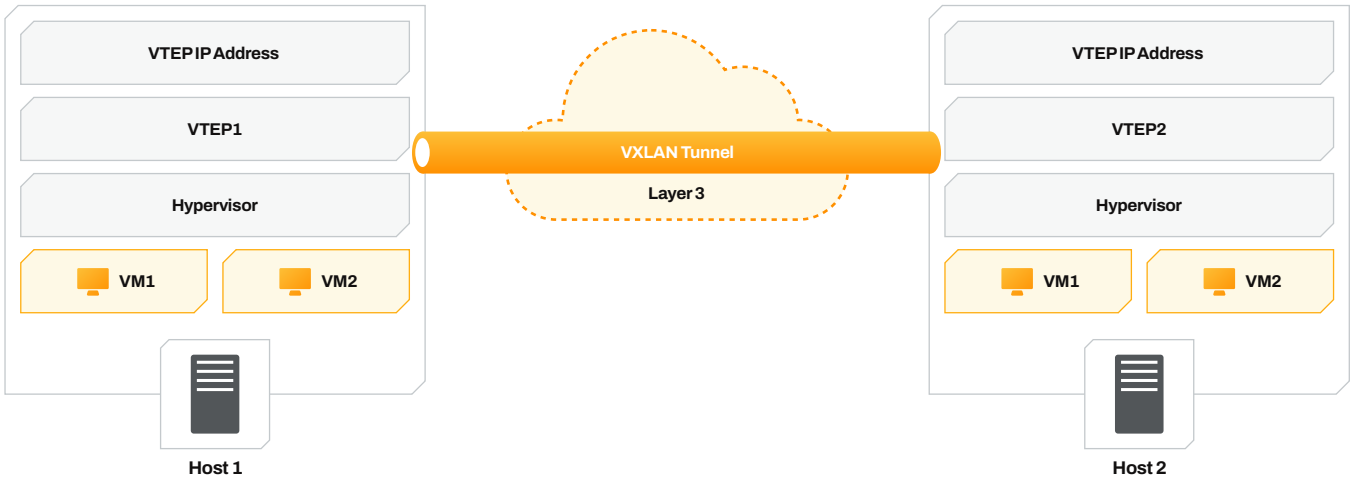
EVPN-VXLAN FOR DATA CENTERS

The Foundation for Scalable, Agile, and Cloud-Ready Network Fabrics

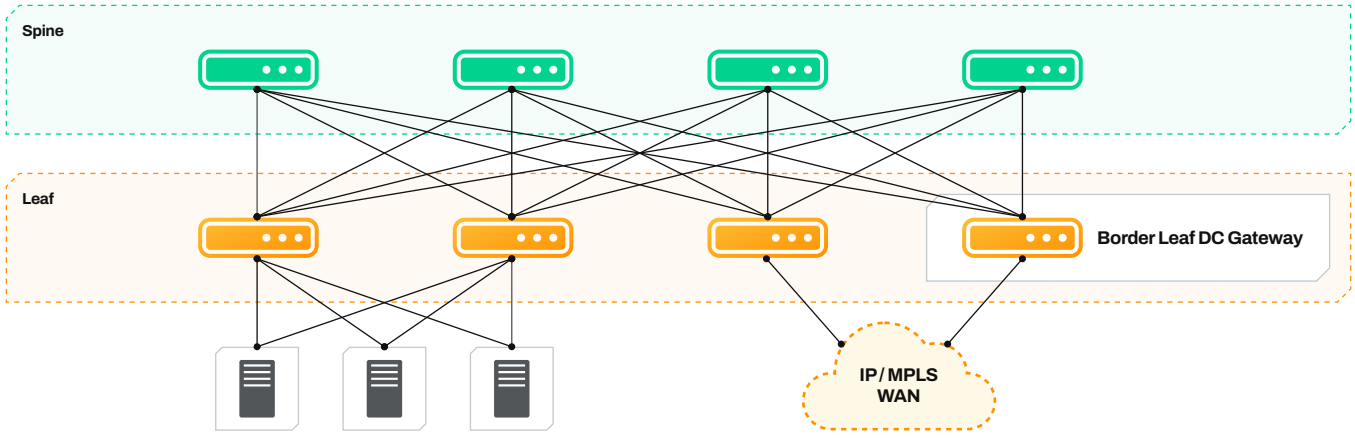
Overview

EVPN-VXLAN (Ethernet VPN with Virtual Extensible LAN) has become the de facto standard for modern data center and cloud networking. By combining the flexibility of VXLAN overlays with the intelligence of the EVPN control plane, this architecture delivers scalable, multi-tenant Layer 2 and Layer 3 connectivity across distributed environments.

It enables operators to design programmable, resilient, and automation-ready network fabrics, essential for supporting cloud-native workloads, virtualization, and hybrid or multi-cloud deployments.



EVPN-VXLAN for Data Centers



Key Benefits

Scalable L2-over-L3 Fabric

Decouple the logical Layer 2 network from the physical Layer 3 topology, allowing seamless east-west traffic and large-scale data center expansion without the limitations of traditional VLANs.

Massive Multi-Tenancy

Support thousands of tenants or isolated services using VXLAN Network Identifiers (VNIs) and BGP EVPN route types, ideal for enterprises, service providers, and cloud operators.

Workload Mobility & Elasticity

Enable VM and container mobility across racks or sites without IP address changes, ensuring service continuity and simplifying disaster recovery or active-active site architectures.

Integrated L2 & L3 Services

With Integrated Routing and Bridging (IRB), EVPN-VXLAN offers both L2 bridging and L3 routing at the edge, optimizing latency and simplifying network design.

Efficient Traffic Handling

BGP EVPN's control-plane-based MAC and ARP learning replaces flooding with deterministic updates —boosting efficiency and reducing CPU and bandwidth consumption.

High Availability & Resilience

Leverage active-active multihoming, fast convergence, and loop prevention for uninterrupted operations, even during link or node failures.

Automation & SDN Readiness

Integrate seamlessly with automation tools such as Ansible or Terraform, and SDN controllers to streamline provisioning, reduce manual errors, and enable Infrastructure-as-Code.

Hybrid & Multi-Cloud Integration

Extend overlay networks between private and public clouds with VXLAN tunnels, simplifying hybrid connectivity and accelerating cloud adoption.

EVPN-VXLAN vs. Traditional Data Center Networks

Feature	Traditional L2/L3 Network	EVPN-VXLAN Fabric
Scalability	Limited to ~4K VLANs	Supports 16 million VNIs
L2 Extension	Spanning Tree Protocol (STP), loops possible	VXLAN over L3 underlay, loop-free
Traffic Learning	Flood-and-learn	Control-plane (BGP EVPN)
Multi-Tenancy	Complex (VRFs + VLANs)	Simplified (EVPN routes + VNIs)
Workload Mobility	Disruptive L3 changes	Seamless with distributed gateway
High Availability	Active/standby links only	Active/active multihoming
Automation	Manual CLI-driven	Fully automatable (SDN / IaC)
Hybrid Cloud Integration	Limited manual setup	Native overlay extension

Conclusion

EVPN-VXLAN transforms traditional data centers into **cloud-ready fabrics**, agile, programmable, and highly available. By leveraging EVPN's control-plane intelligence with VXLAN's scalable encapsulation, network teams can unify L2/L3 services, streamline automation, and deliver the flexibility and performance required by next-generation applications.

EVPN-VXLAN isn't just an evolution, it's the **new baseline for modern, software-defined data center networking**.

sales@vyos.io
vyos.io

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