

A BGP L3VPN based data-center overlay with VXLAN/NVGRE

(draft-drao-bgp-l3vpn-virtual-network-overlay)

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Problem Statement

- IP virtual network overlays are being deployed in data centers
- New encapsulations being defined – VXLAN, NVGRE
 - Supported on servers (hypervisors) and on physical devices (TORs)
 - Currently defined for Layer-2 overlay
- Customers want support for Layer-3 service
 - And leverage the same encapsulations
- BGP L3VPN – mature, widely deployed virtualization solution
 - Well-known routing and forwarding models
 - Eminently applicable to support Layer-3 services in data center
- Draft describes how BGP L3VPN can be used along with VXLAN, NVGRE like NVO encapsulations

Goals of draft

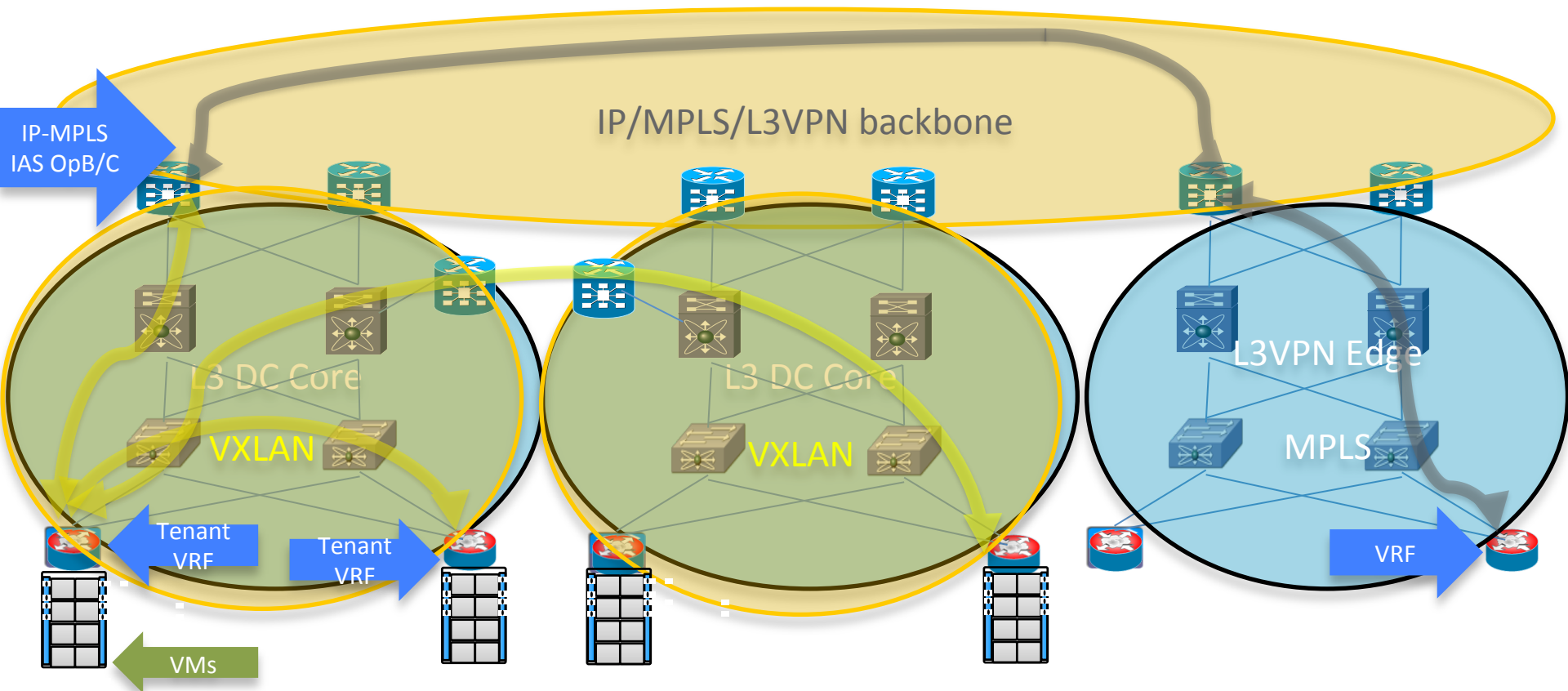
- Integrate BGP L3VPN control plane with virtual network overlay encapsulations
 - Both encapsulations support 24-bit identifier (VN-ID)
 - Identifies a tenant's virtual network
 - Drives forwarding table lookup and forwarding at edge
- Define VN-ID signaling in BGP updates
- Extend VN-ID semantics to enable more flexible and efficient interworking with an MPLS L3VPN

MPLS L3VPN Interworking

Encapsulation end-points (NVE)

Intra-DC : TOR/vPE – TOR/vPE
TOR/vPE – DC Edge Router (-MPLS)

Inter-DC: TOR/vPE – TOR/vPE
TOR/vPE – DC Edge Router (-MPLS)



BGP/L3VPN changes

- Signal virtual-network identifier in Layer-3 BGP updates
- Options
 - Define a new extended community
 - Reuse existing NLRI to signal VN-ID
- BGP VPN NLRI (safi 128) already supports label encoding
 - Encode VN-ID in label field
 - Indicate this is a VN-ID
 - Use capability to identify capable peers
- Signal encapsulation type, parameters
 - Use encaps safi attribute sub-TLV
 - VN-ID interpreted and used in conjunction with encapsulation attribute

VN-ID semantics

- VN-IDs can have local forwarding scope
 - Emulate forwarding semantics similar to MPLS VPN labels
 - DC Edge router can switch to an MPLS LSP based on VN-ID lookup
 - Allows support for seamless MPLS, IAS models

Next Steps

- -01 version will have more detailed procedures, restructured text
- Include additional interworking scenarios
- Incorporate feedback

Thank You