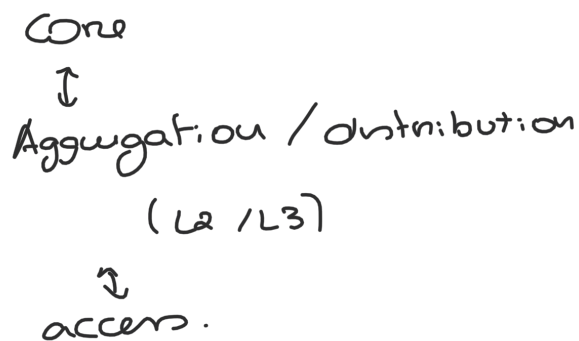


→ Datacenter CLOS topology

Usually divided in three-tier topologies:



Evolved, eliminating the need for STP to better stability and scalability.

Layer 3 moves to access layer, usually called Spine-leaf architecture.

Spine-leaf architecture:

- access layer with layer 3 is called leaf layer
- Aggregation layer that interconnects various leafs is called Spine layer.
- The IP transport between Spines and leafs is IGP (OSPF or IS-IS).

→ Virtual Extensible LAN (VXLAN)

Network virtualization that uses VLAN-like encapsulation technique to encapsulate MAC-based layer 2 ethernet layer 4 frames (UDP packets).

VLAN may be identified by a VNI field.

The original header of the layer 2 is removed and mapped to a VNI to complete the VXLAN header.

↳ VTEP (VXLAN Tunnel Endpoint)

The edge devices in a VXLAN network have VTEP and are responsible for encapsulation and decapsulation of the VXLAN header.

↳ VXLAN Flood and Learn

The multi-destination traffic is flooded over VXLAN between VTEPs to learn the host MACs behind the VTEPs.

A native flood and learn based approach is far from optimal since the broadcast domain for a VXLAN now spans L3 boundaries.

→ EVPN MP-BGP

Introduced to mitigate the flood and learn problem of VXLAN, provided by address family L2VPN EVPN.

It's a standards based technology that enables MP-BGP to be used as the control plane for VXLAN networks. Allows the creation of layer 2 virtual networks across a wide area network using MP-BGP to distribute MAC address info.

↳ BGP EVPN with VXLAN

BGP is used to announce and learn remote VTEP addresses.

VXLAN is used to transport to the specific remote VTEP where destination device is.

• EVPN Route types:

- Type 2 :- defines MAC/IP advertisement route.
 - Responsible for the distribution of MAC and IP address reachability information. (includes type of encapsulation and route target).
 - Sent when leaf learns new MAC addr.
- Type 3 :- Used to create a list of unknown unicast, multicast and broadcast packets. (defines their next-hop)
 - Provides a way to replicate multideestination traffic in unicast.
 - Carries Provider Multicast Service Interface Tunnel attribute (PMSI).
 - sent when new leaf (peer) is added.

• Layer 3 VPN over EVPN with VXLAN

Alternative to L3 VPN to MPLS VPN.

Uses Type 5: announces IP network prefixes.