

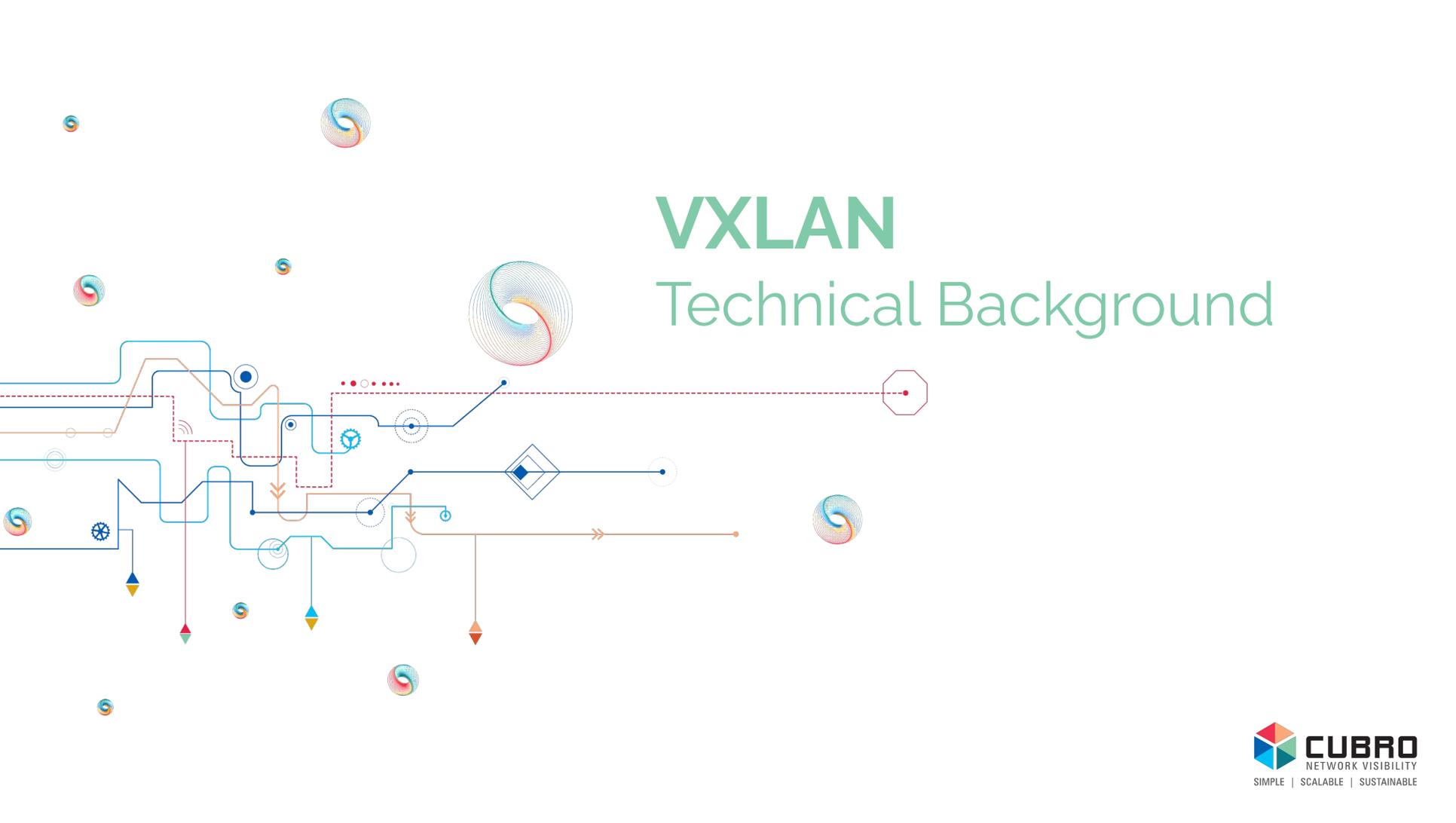
VXLAN Functionality EXA48600 & EXA32100A

APPLICATION NOTE

This presentation consists of two parts.

Part one contains technical background information about VXLAN.

Part two explains VXLAN features of the Cubro Sessionmaster EXA48600 & EXA32100A.

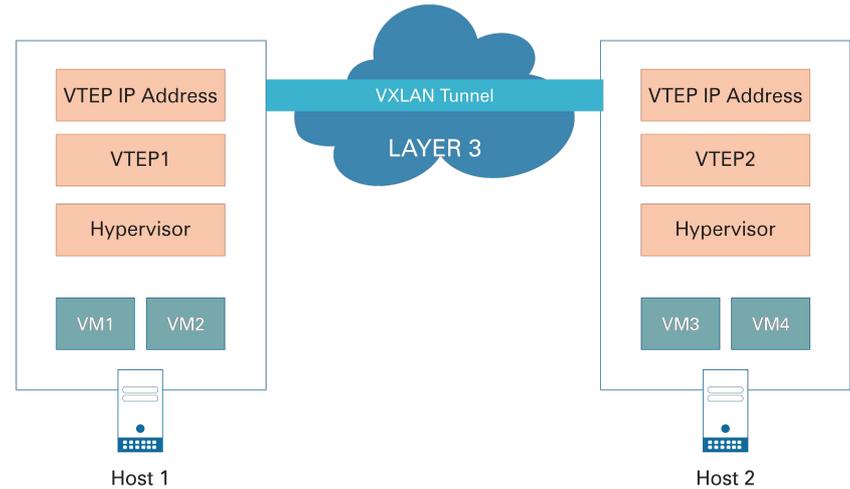


VXLAN

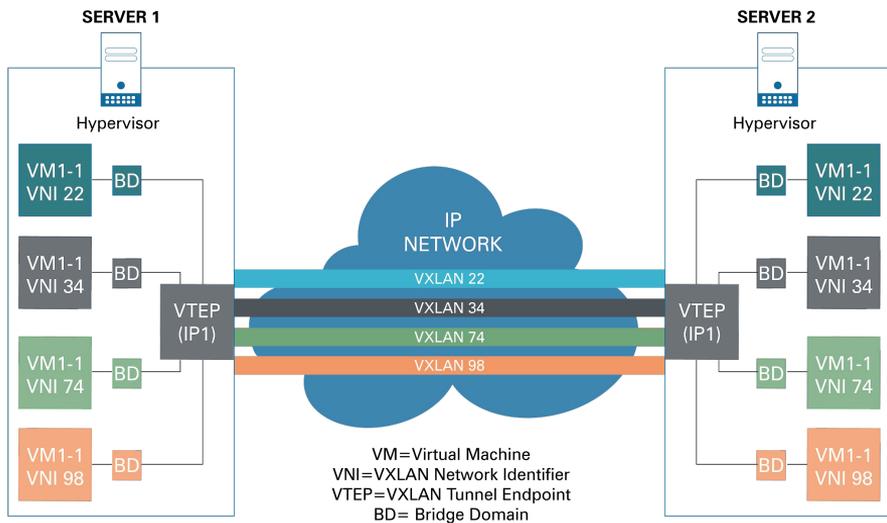
Technical Background

What is VXLAN?

- VXLAN ... Virtual Extensible Local Area Network
- VXLAN is a network virtualization technology that attempts to address the scalability problems associated with large cloud computing deployments.
- It uses a VLAN-like encapsulation technique to encapsulate layer 2 Ethernet frames within layer 4 UDP datagrams.



Where is it used?



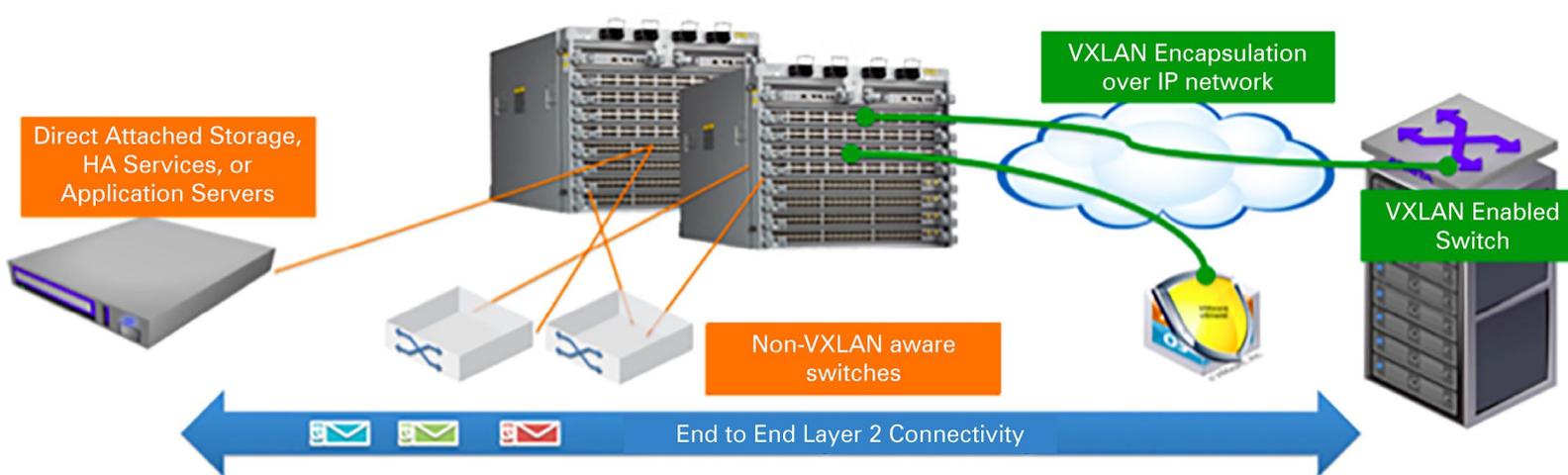
In data centers, VXLAN is the most commonly used protocol to **create overlay networks** that sit on top of the physical network, enabling the use of a virtual network of switches, routers, firewalls, load balancers, and so on.

VXLAN Use Cases

Physical to Virtual internetworking

Multi-hypervisor connectivity and integration

Multi-tenant Cloud environments

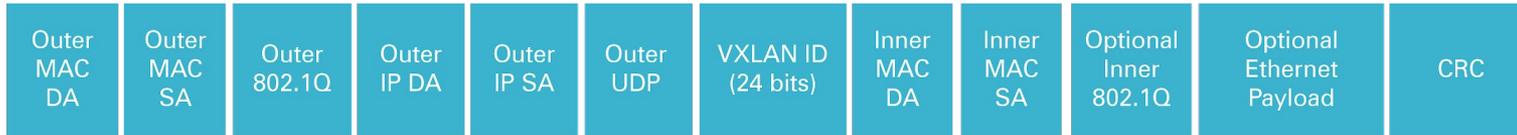


VXLAN Technical Details

Encapsulation Method, used in Data Center / Virtual Environments

- ❖ Ethernet in IP overlay network
- ❖ Entire L2 frame encapsulated in UDP
- ❖ **50 bytes** of overhead
- ❖ Include 24 bit VXLAN Identifier (VNI tag)

24 bit -> 16 M logical networks



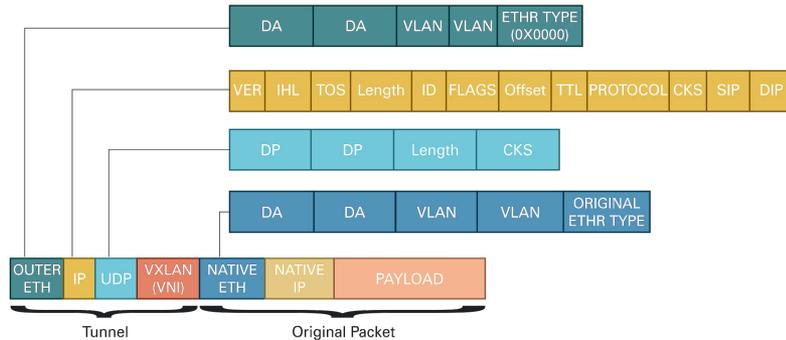
VXLAN Encapsulation

Original Ethernet Frame

VXLAN Packet View



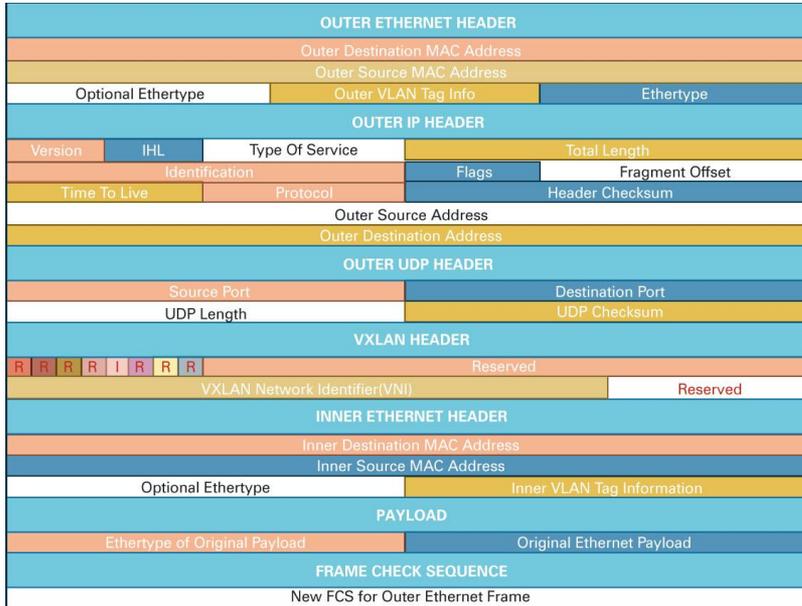
8 byte	VXLAN Header	VXLAN Flag	Reserved	VNL	Reserved	
		8	24	24	8	
8 byte	Outer UDP Header	Src Port	VXLAN Port	UDP Length	Chksum	
		16	16	16	16	
20 byte	Outer IP Header	IP Hdr Misc Data	Protocol	Hdr Chksum	Src IP	Dst IP
		72	3	16	32	32
14 byte	Outer MAC Header	Dst Add	Src Add	VLAN Type	VLAN ID	Eth Type
		48	48	16	16	16



VXLAN Header

VXLAN Header is a 8 Byte field comprising of:

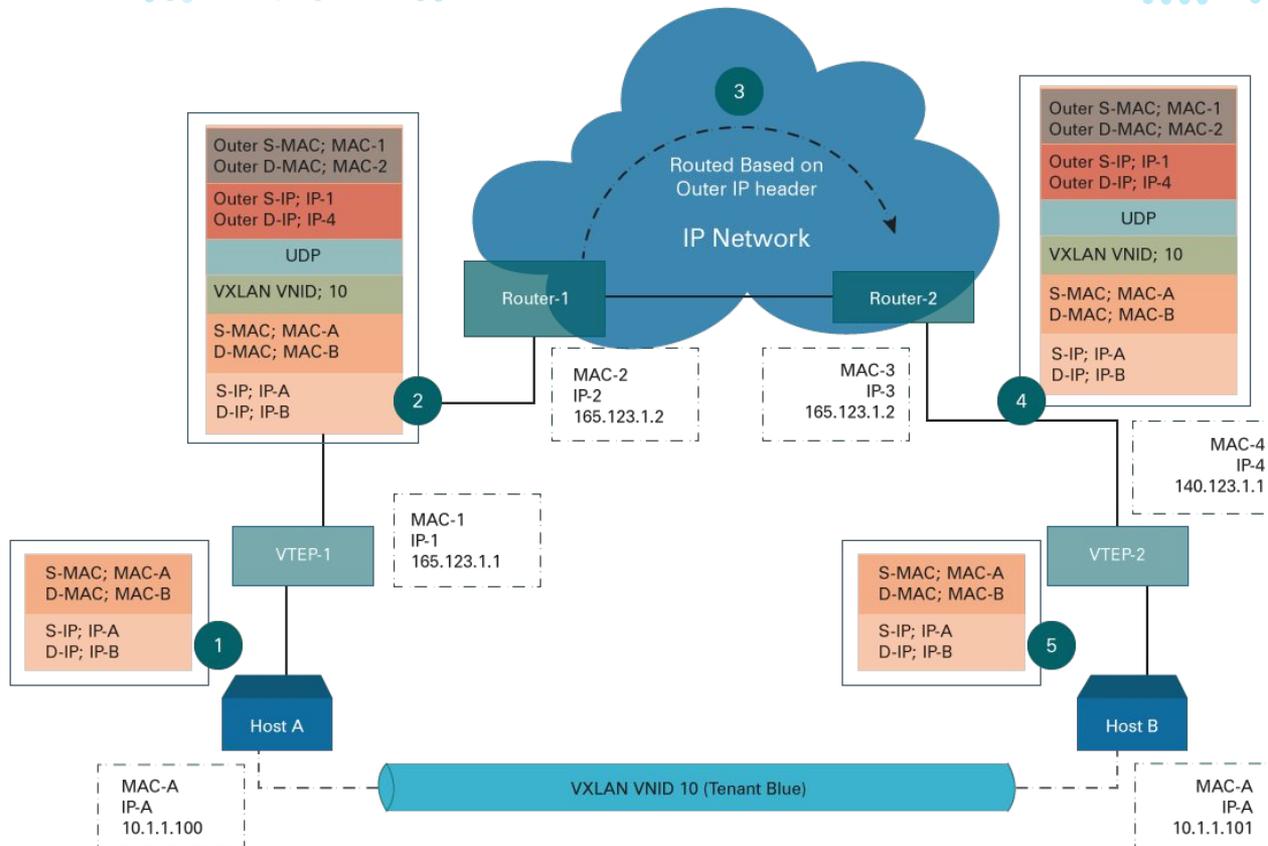
- Flags (8 Bits)
- VxLAN Network Identifier (VNI) (24 Bits)
- Reserved (24 & 8 Bits) – Always set to zero.

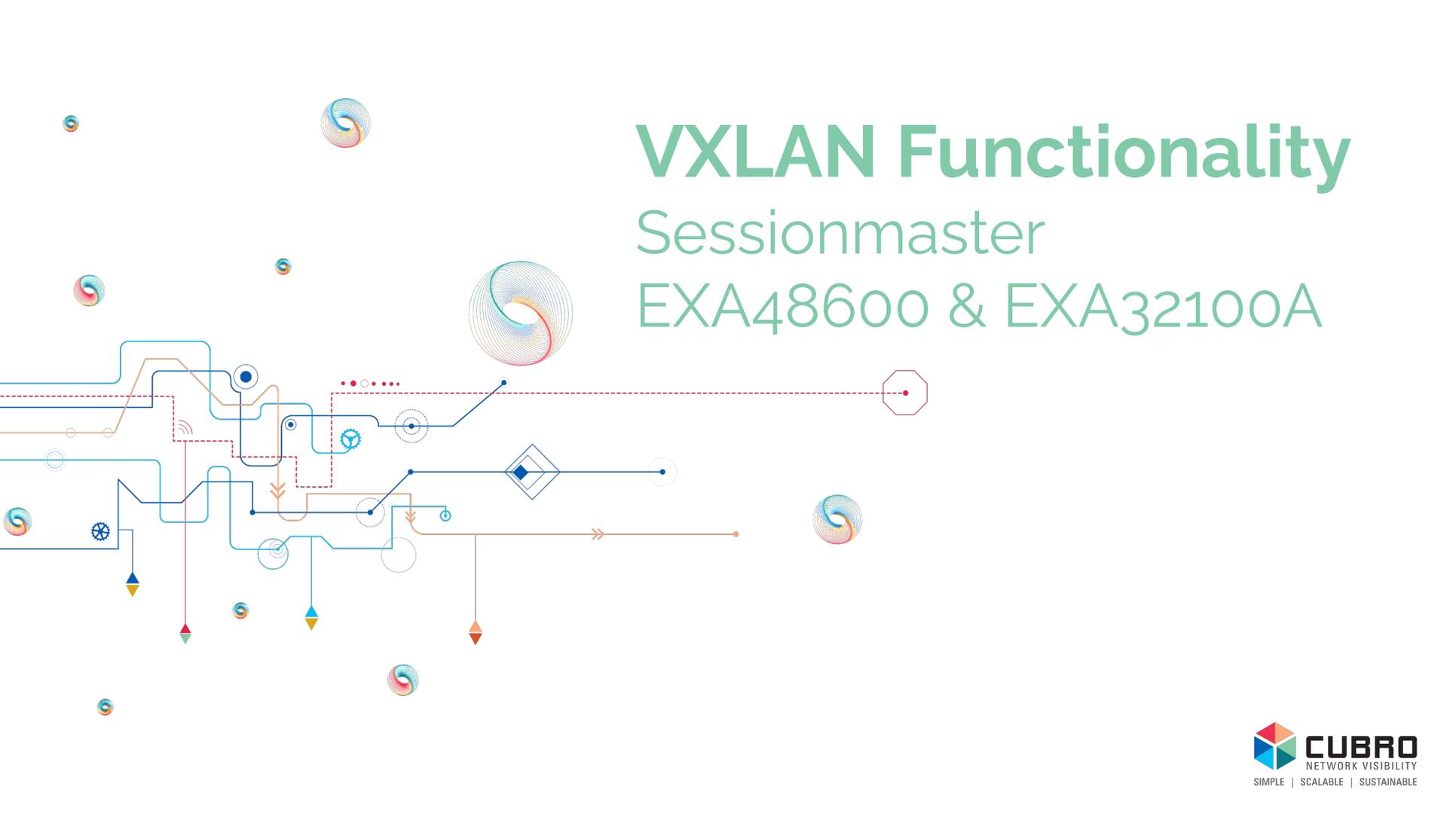


Flags (8 Bits) – I flag is set to 1 for a valid VxLAN Network ID (VNI). The remaining 7 bits (designated "R") are reserved fields and set to zero.

VxLAN Network Identifier (VNI) (24 Bits) – Used for identification of the individual VxLAN overlay network on which the communicating VMs are situated. VMs in different VxLAN overlay networks cannot communicate.

Full Picture





VXLAN Functionality

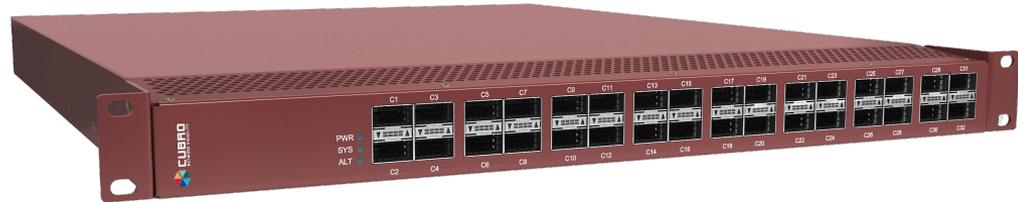
Sessionmaster

EXA48600 & EXA32100A

EXA48600 & EXA32100A

EXA48600 & EXA32100A support following VXLAN features

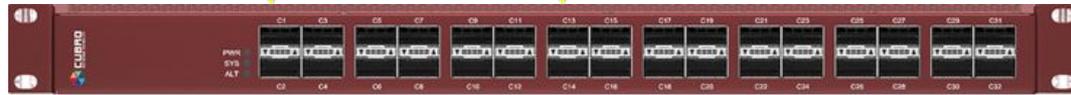
- VXLAN header removal
- Filtering on outer IP (tunnel IP)
- Filtering on VXLAN VNI
- Filtering on inner IP and/or inner layer 4 port nr.
- Filtering on VXLAN VNI and/or inner IP and/or inner layer 4 port nr.



VXLAN Header Removal



$n \times 100G$



Removes VXLAN header and aggregates traffic to single/multiple outputs.

Packet Slicing possible to further reduce output bandwidth.

$n \times 10G$ or $n \times 40G$ or

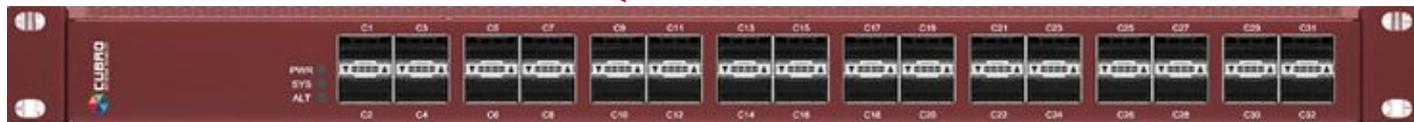
$n \times 100G$

to Monitoring

Allows to use non-VXLAN monitoring equipment



VNI and inner IP filtering

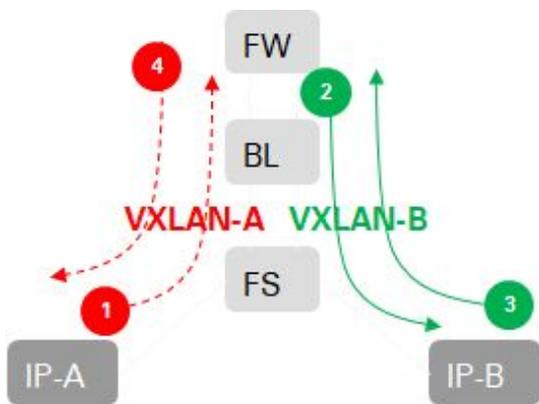


Allows simultaneous filtering on:

- VXLAN identifier
- Inner IP source and/or destination
- Inner L4 /TCP/UDP) source port and/or destination port

VNI and IP filtering – Use case

Rule	Packet #	Source IP	Dest IP	VXLAN	Action	Direction
S6a-rule	1	IP-A	IP-B	VXLAN-A	Filter - drop	Fabric à Border
	2	IP-A	IP-B	VXLAN-B	Send to Probe	Border à Fabric
	3	IP-B	IP-A	VXLAN-B	Send to Probe	Fabric à Border
	4	IP-B	IP-A	VXLAN-A	Filter - drop	Border à Fabric

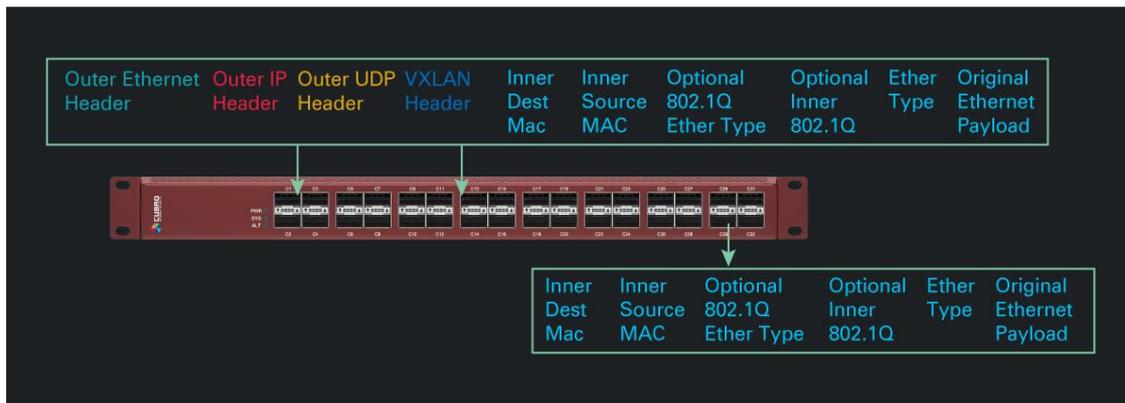


Rule: Match VXLAN VNI + Source_IP + Dest_IP

Action: Drop or send to output

Summary

- VXLAN plays an important role in virtual environments.
- Cubro Sessionmaster EXA48600 & EXA32100A are a perfect choice for this growing applications and support a full range of VXLAN features.





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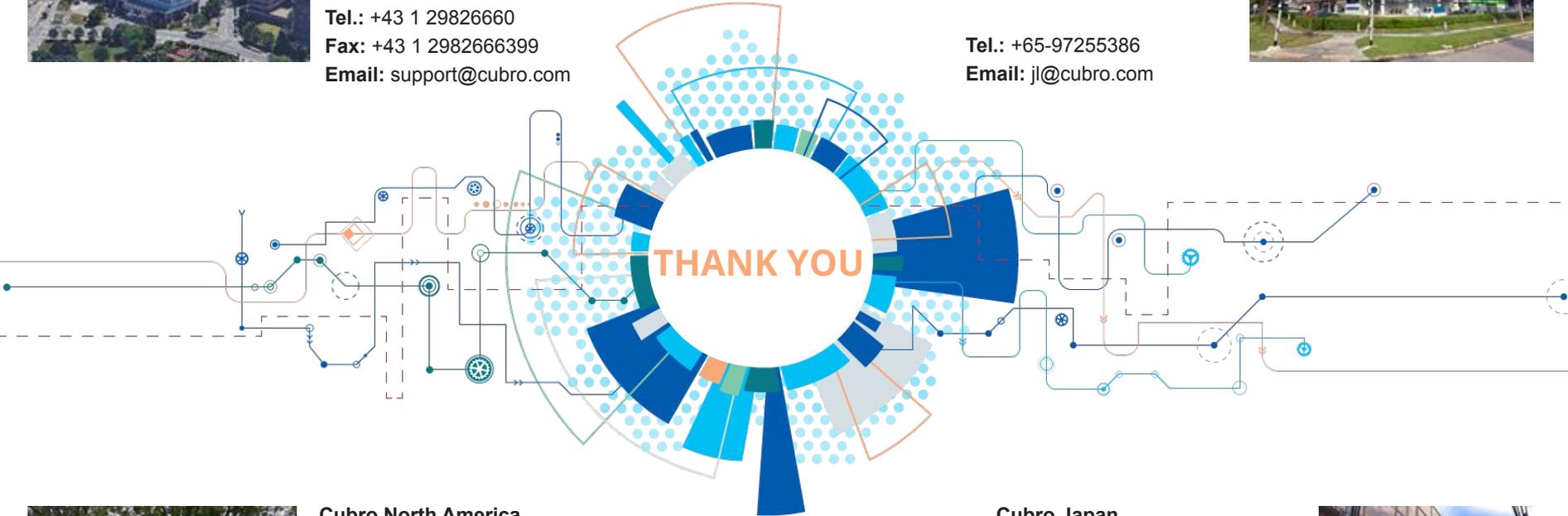
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