Peering LAN 2.0

Bernhard Hahn
Head of Infrastructure
DE-CIX

Agenda

- IXP Challenges
- Migration Details
- Results

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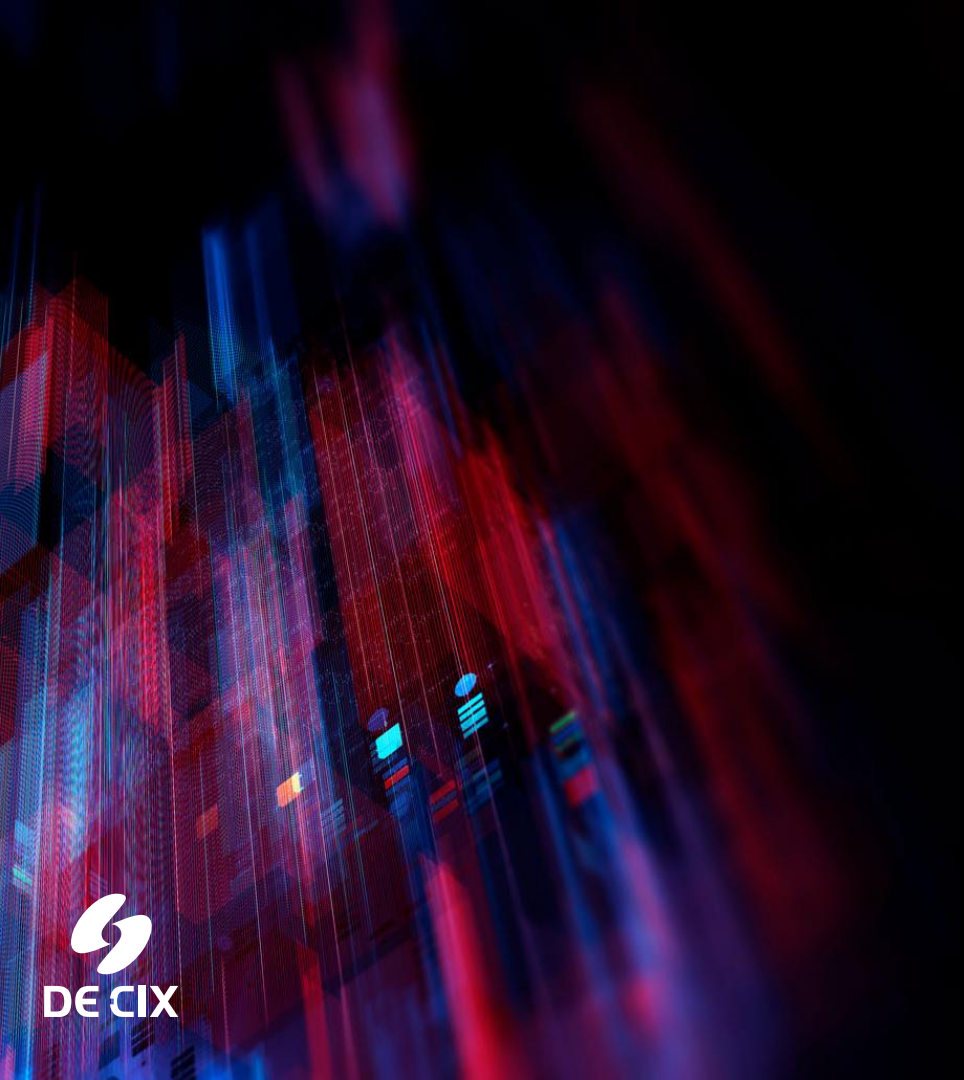

Challenges

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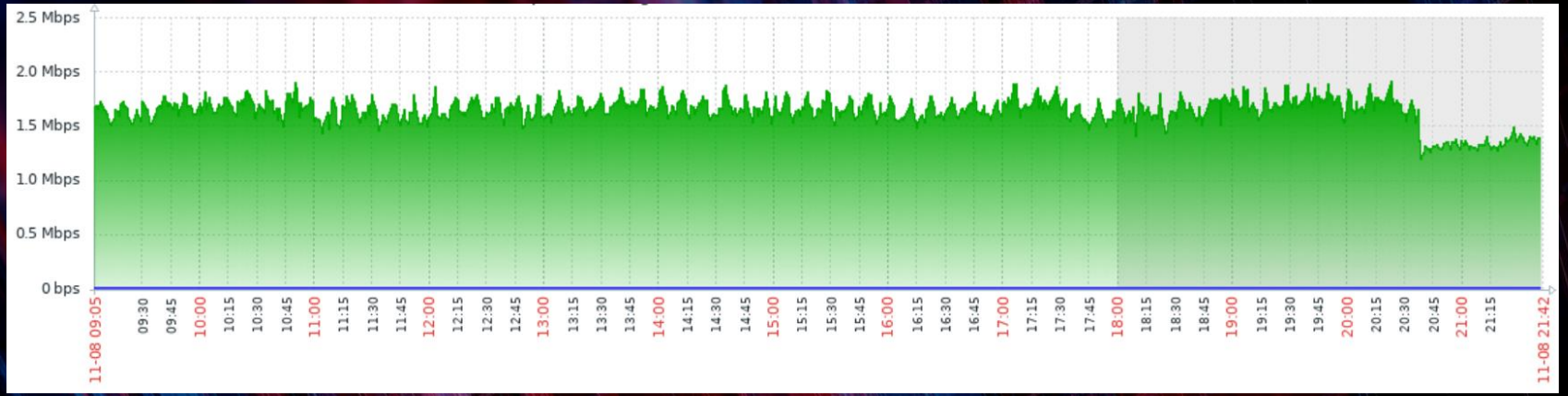

Broadcast, Unknown Unicast, Multicast Noise (BUM, sliced mirrored)

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ProxyARP/ND

A router answering to address resolution requests for addresses that do not belong to his own interfaces will start to interrupt all layer 3 based communications

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Port Security at DE-CIX

Static MAC + MAC ACLs

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Long Lasting Flows

Long Lasting Flows

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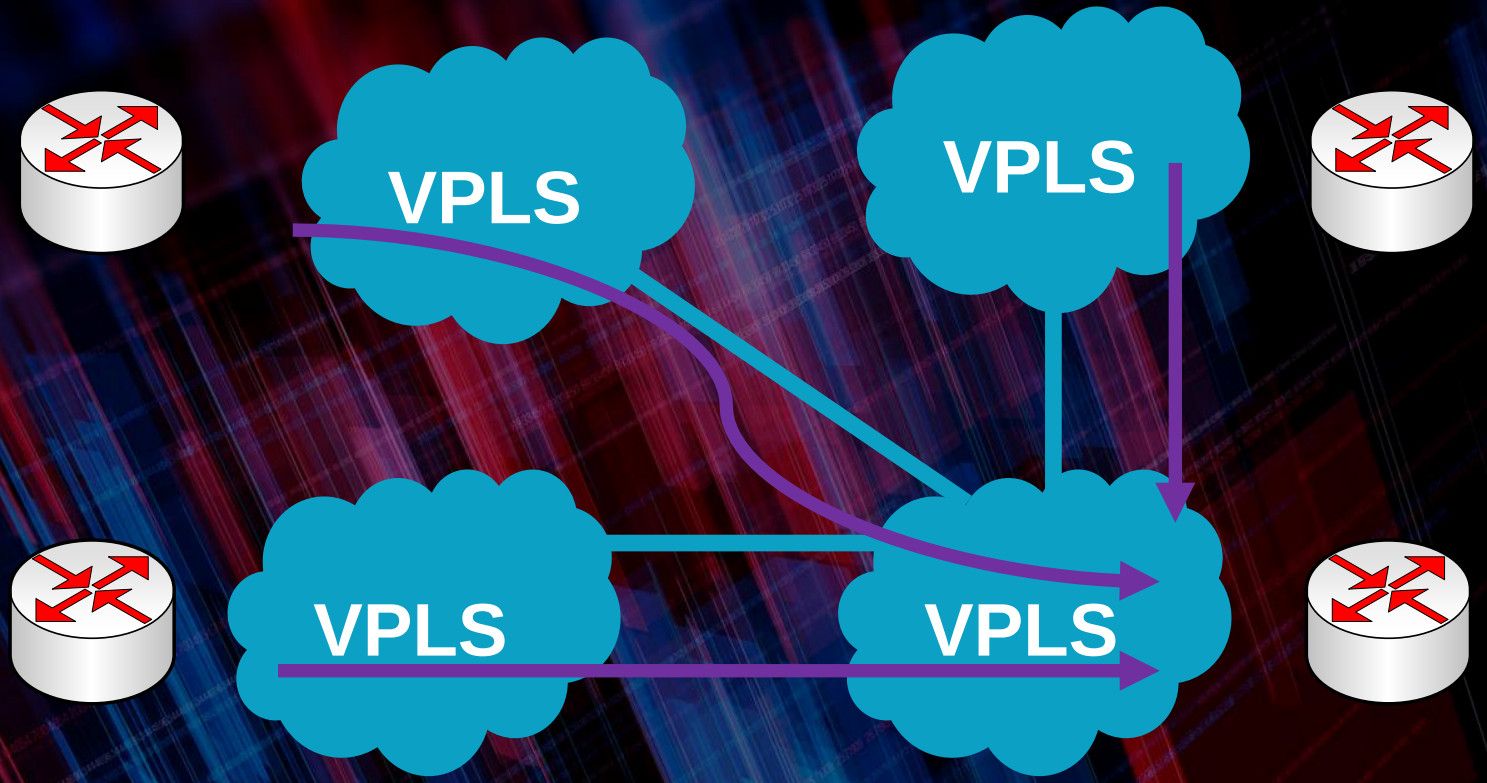
Long Lasting MACs



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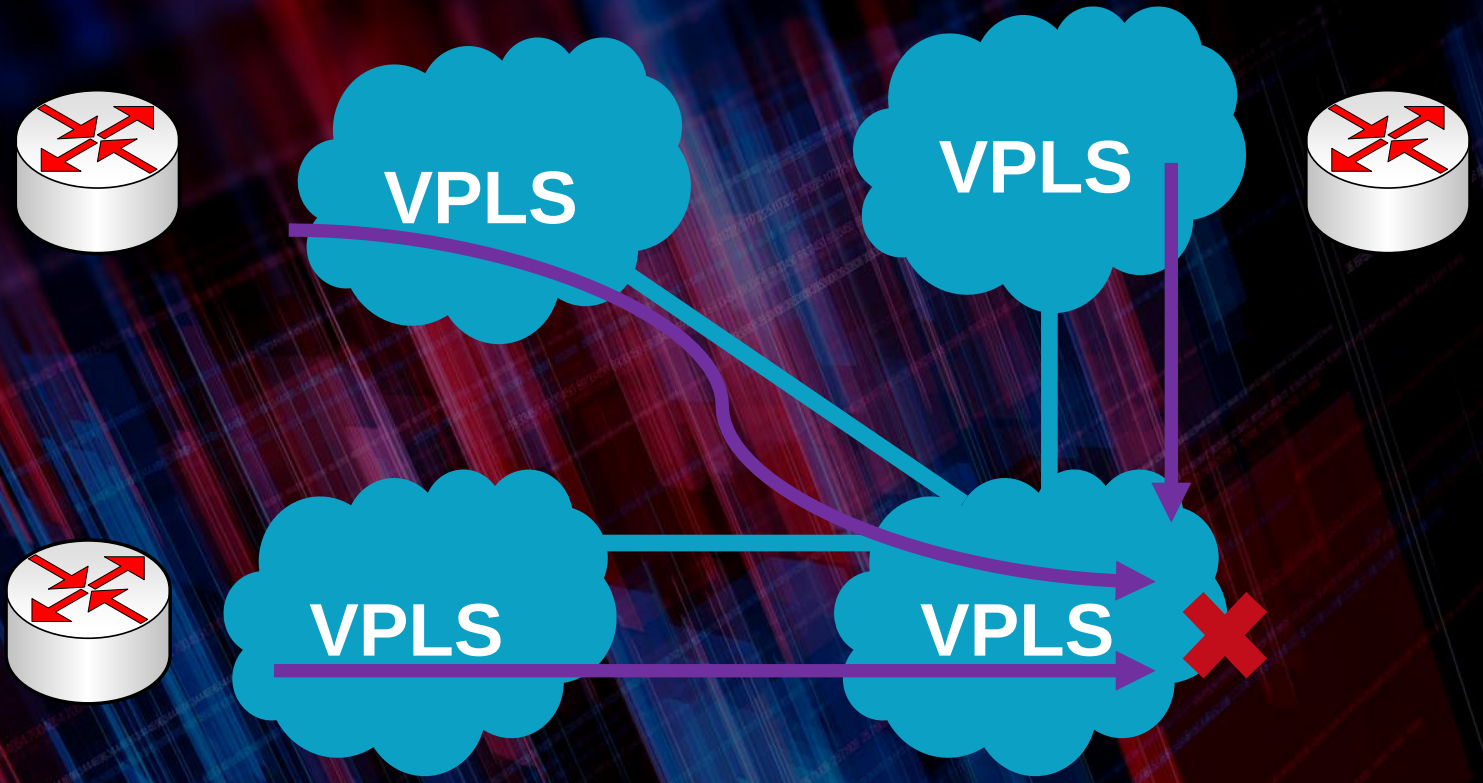
Long Lasting MACs



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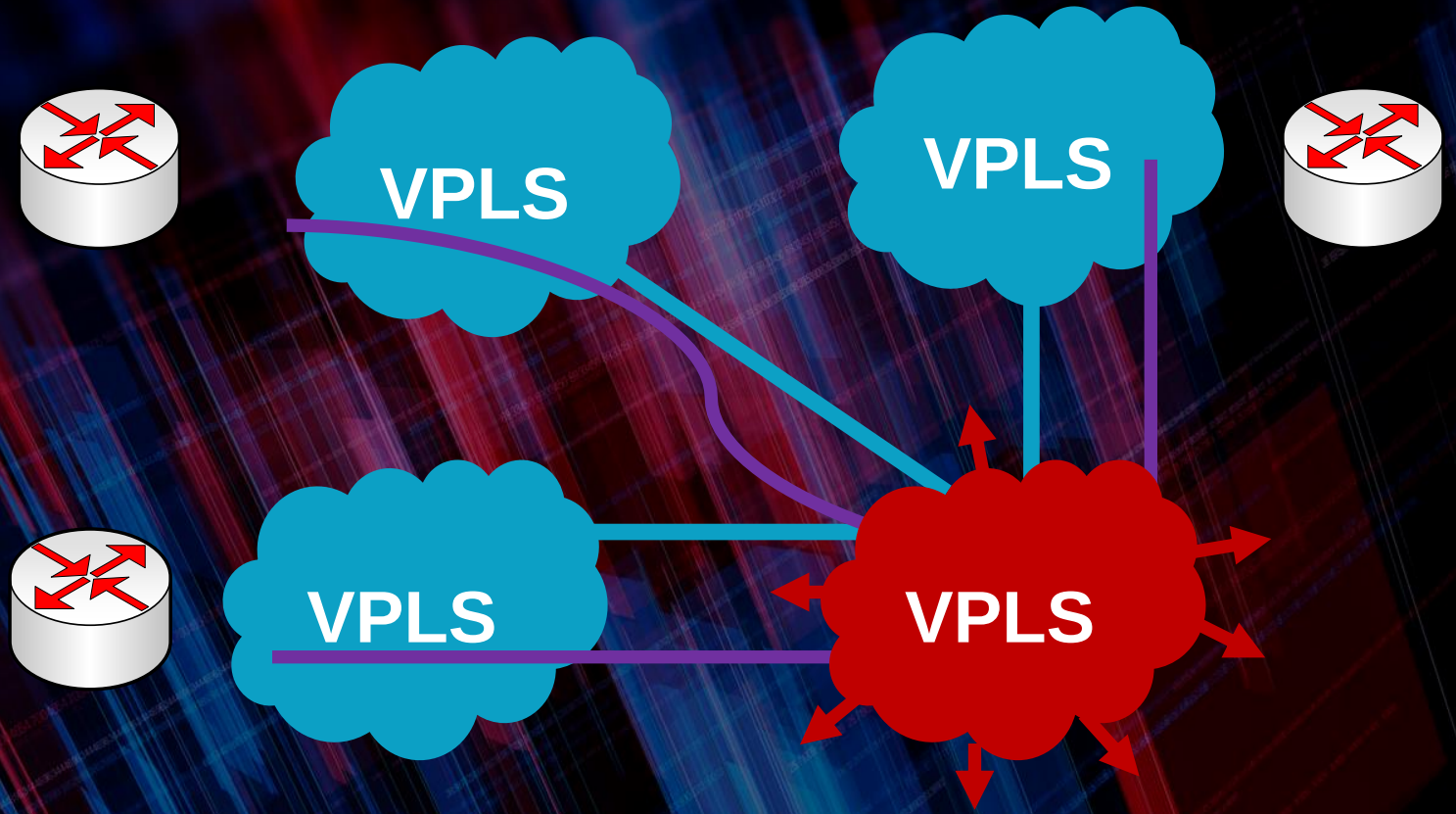
Long Lasting MACs



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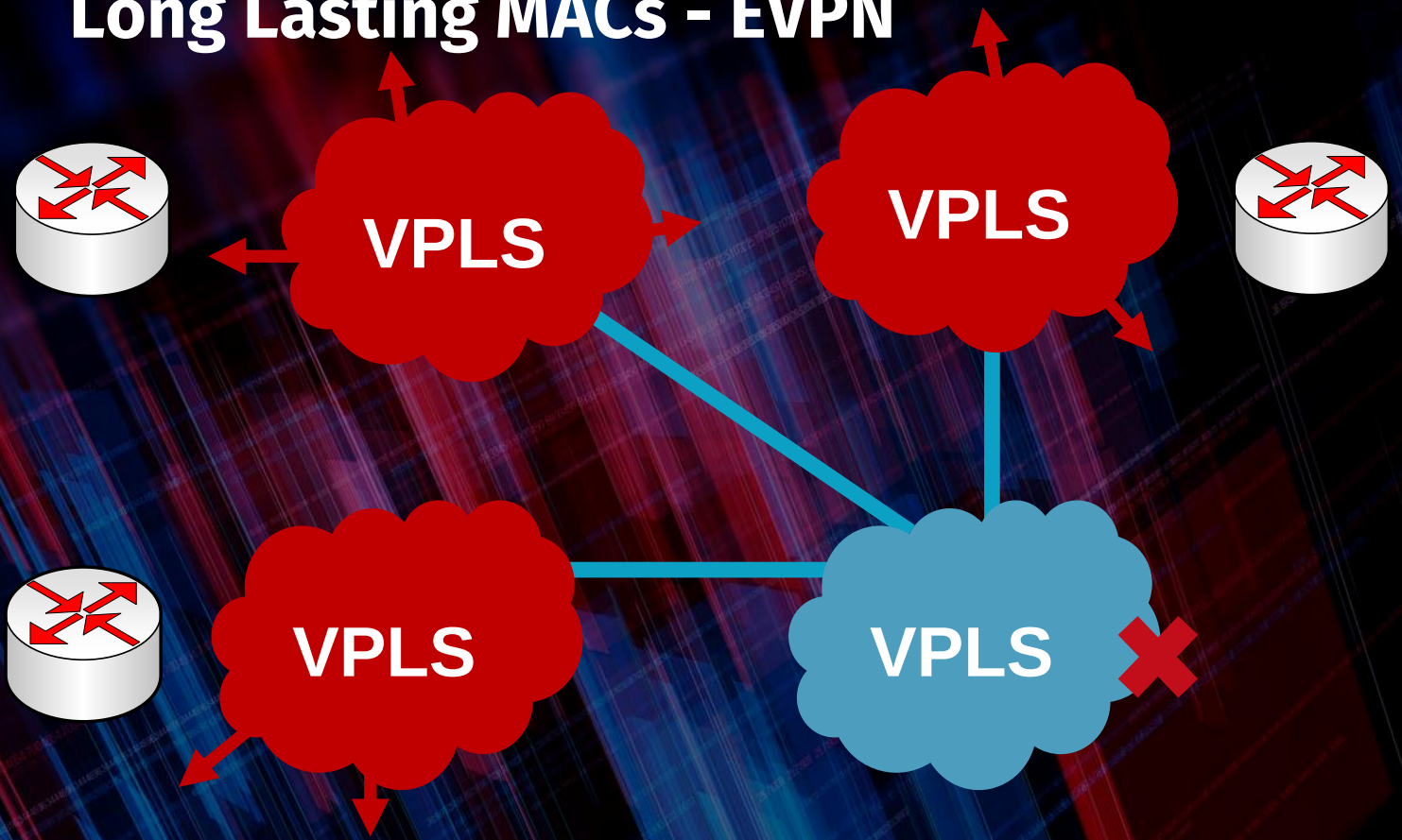
Long Lasting MACs - EVPN



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VLAN Loops

OUTAGE: Forwarding errors on Peering Platform Frankfurt (OPEN)

DE-CIX Maintenance ID: DXDB:MAINT:703

Work start: 2021-09-21 13:40 UTC

Work status: ANNOUNCED
Notification type: OPEN
Impact: Partial Disruption

Affected entities:
Site: DE-CIX Frankfurt (all devices)

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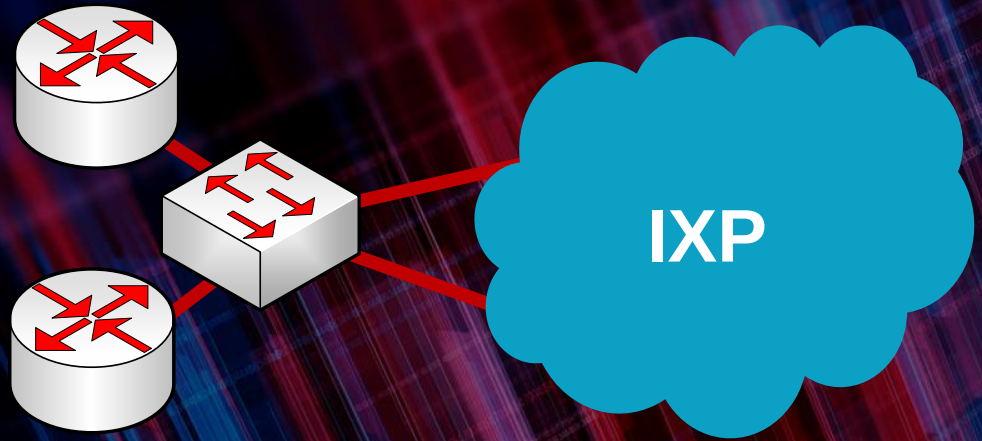
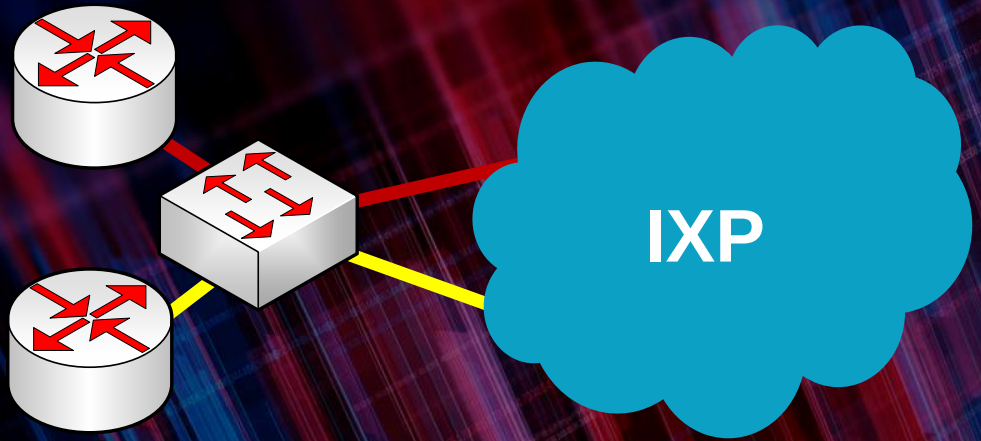
VLAN Loops



VLAN Loops



Step 1
Routers continously injecting BUM traffic

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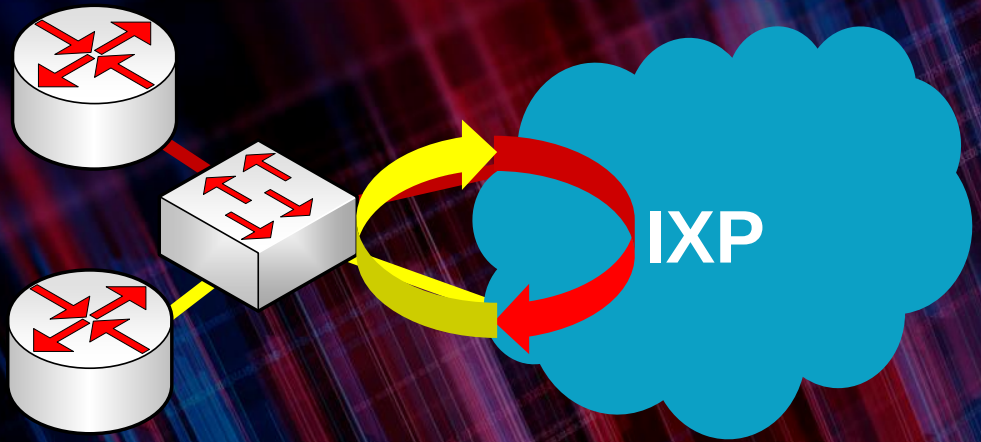
VLAN Loops



Step 1
Routers continously injecting BUM traffic

Step 2
BUM traffic in fabric circulating and increasing

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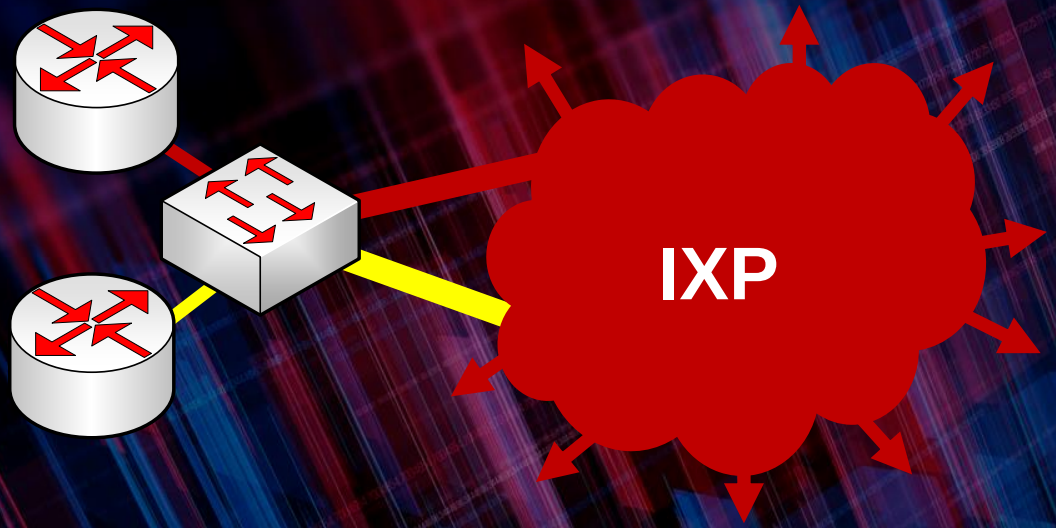
VLAN Loops



Step 1
Router continously injecting BUM traffic

Step 2
BUM traffic in fabric circulating and increasing

Step 3
BUM traffic level exceeding egress rate limit and blocking valid traffic

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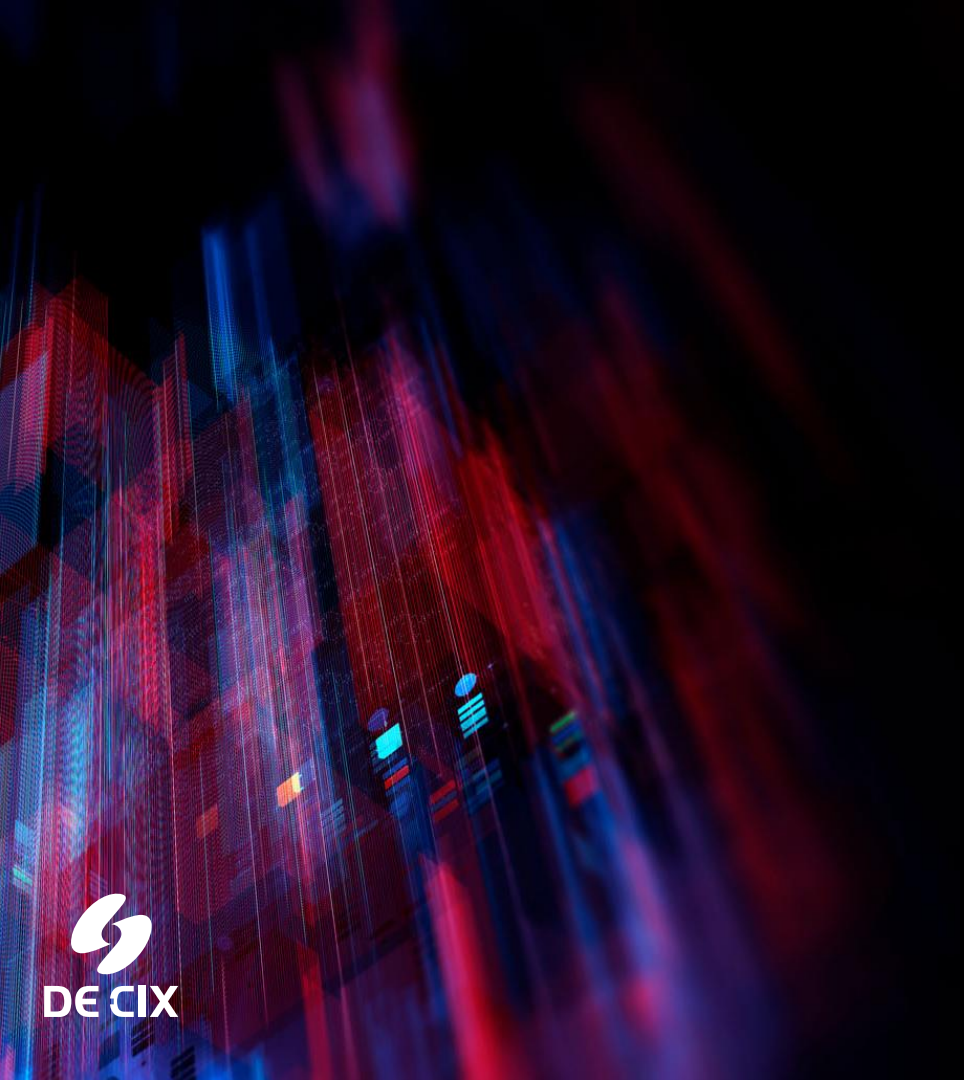
ARP/ND Agent

- RFC 9161



Migration

Migration Scenarios

Scenario	Small Steps	Reduce Complexity	Reduce Downtimes
Router by Router			
Location by Location			
Service by Service			

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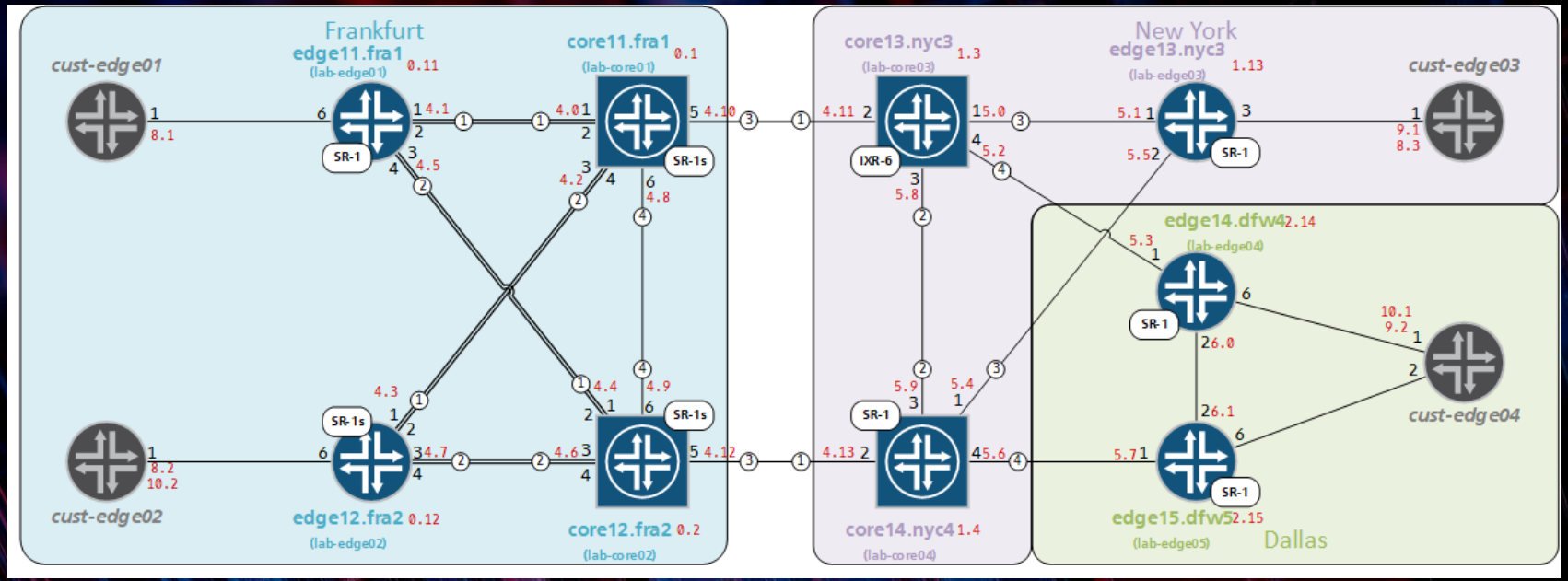
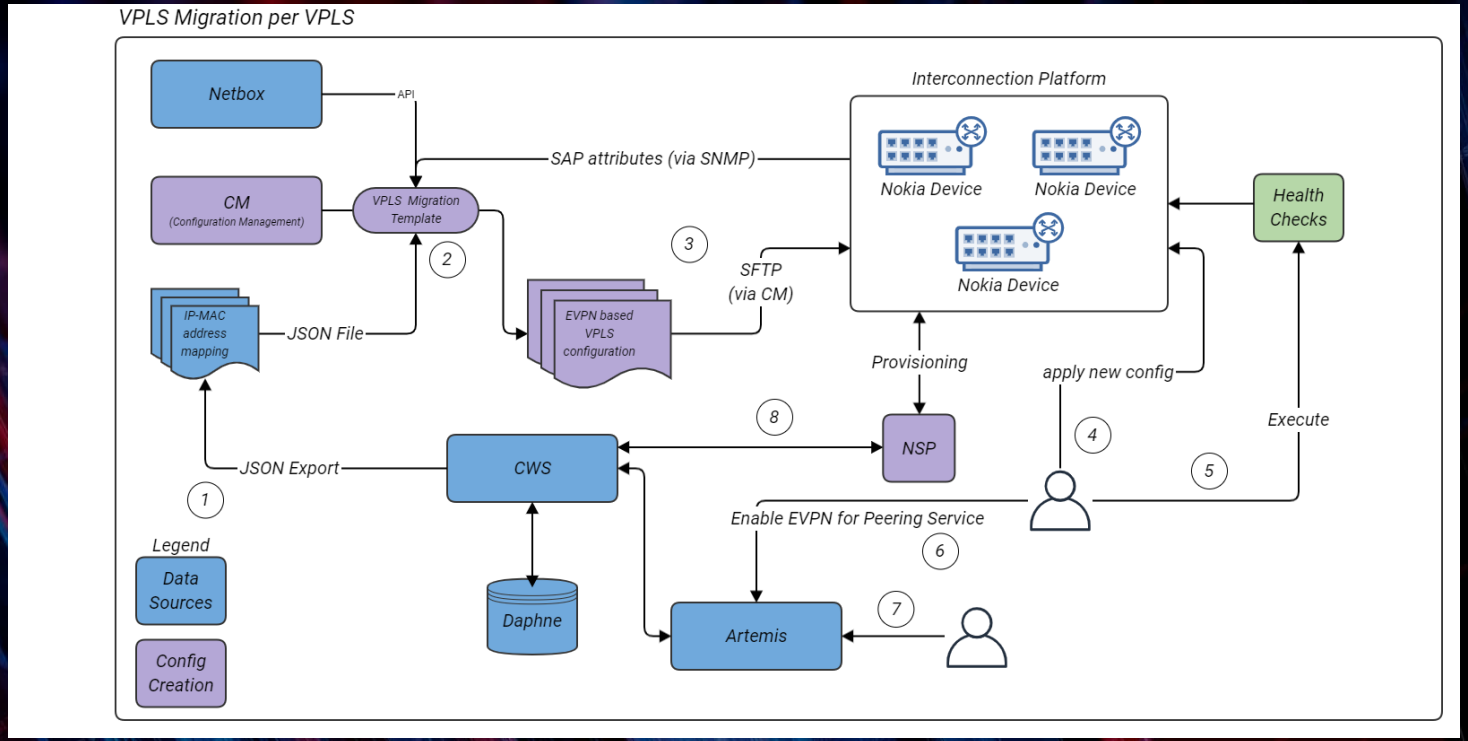
Testing - Network



Testing – Configuration Systems



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Broadcast, Unknown Unicast, Multicast Noise (BUM, sliced mirrored)

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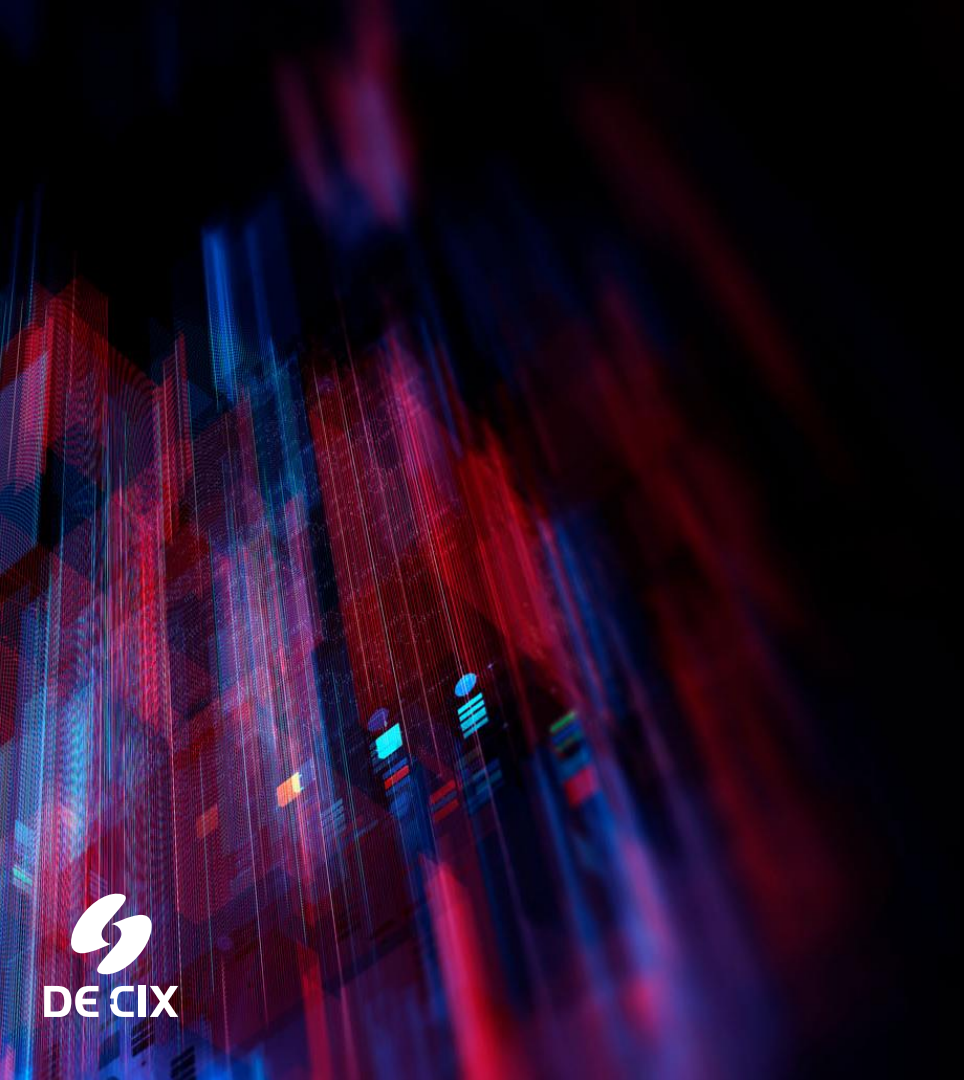

Results

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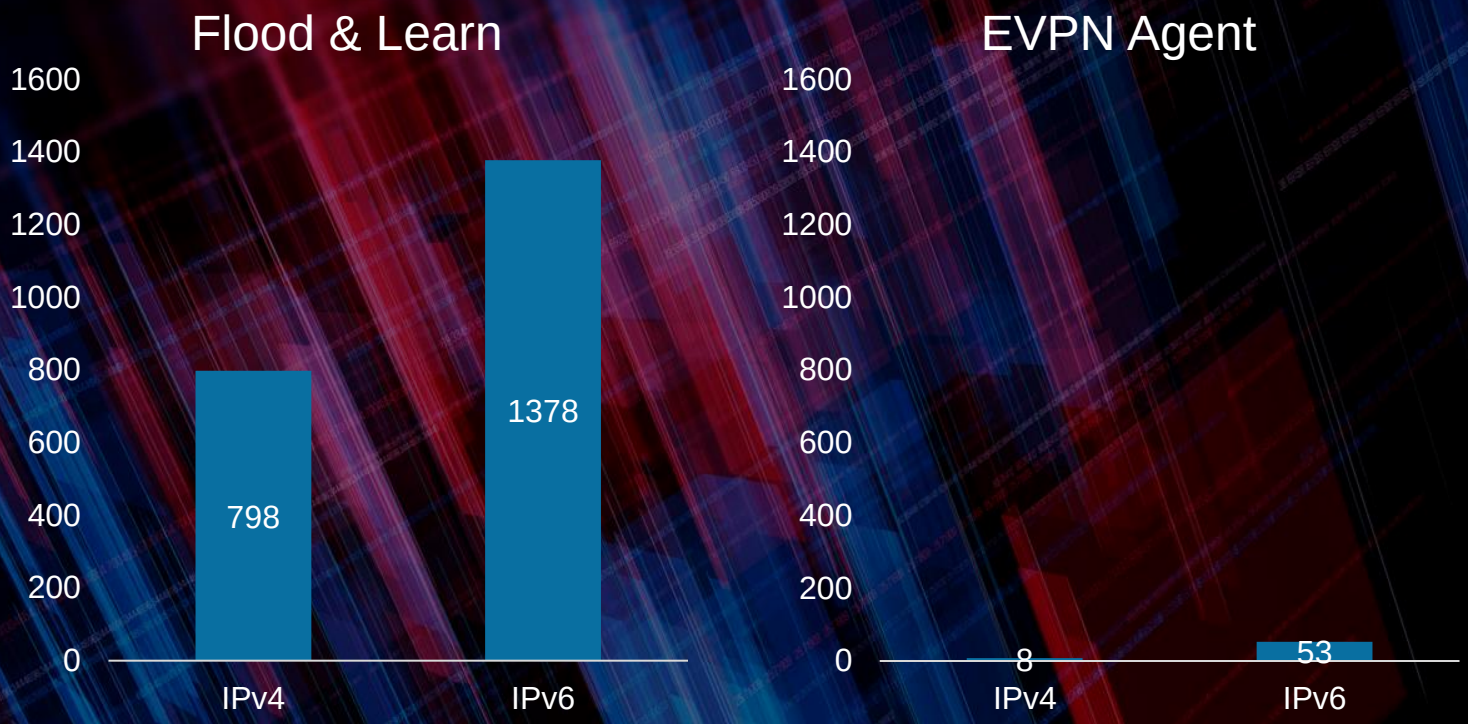
BUM traffic packets per second* by protocol



* measured on edge01.fra9 (Equinix FR7), ymmv

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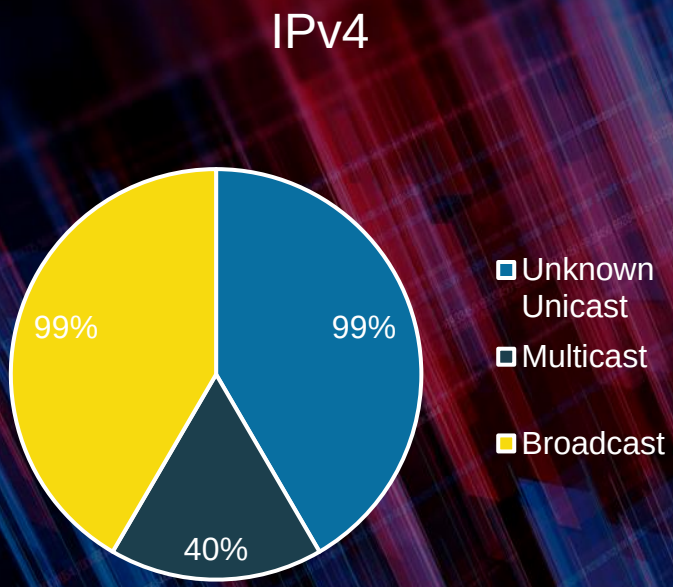
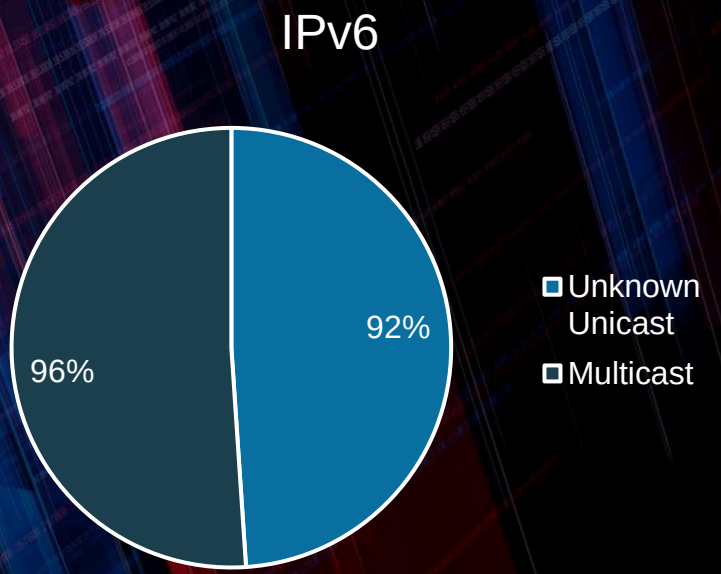
BUM traffic decrease rates compared per protocol





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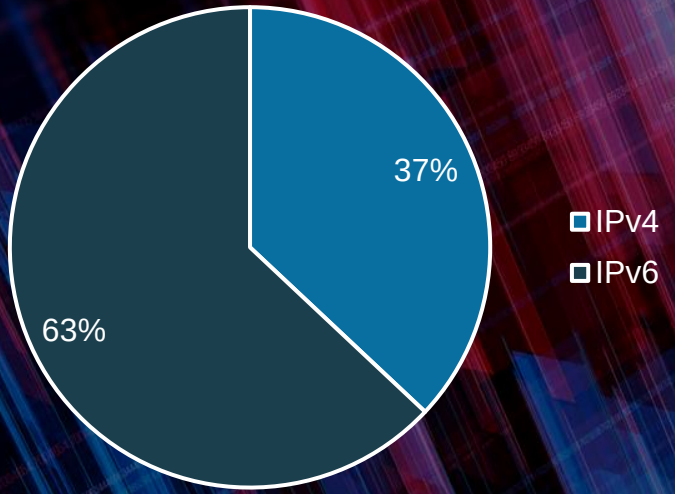
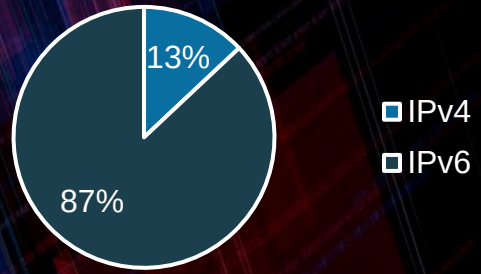
BUM traffic overall distribution by protocol

Flood & Learn



EVPN Agent



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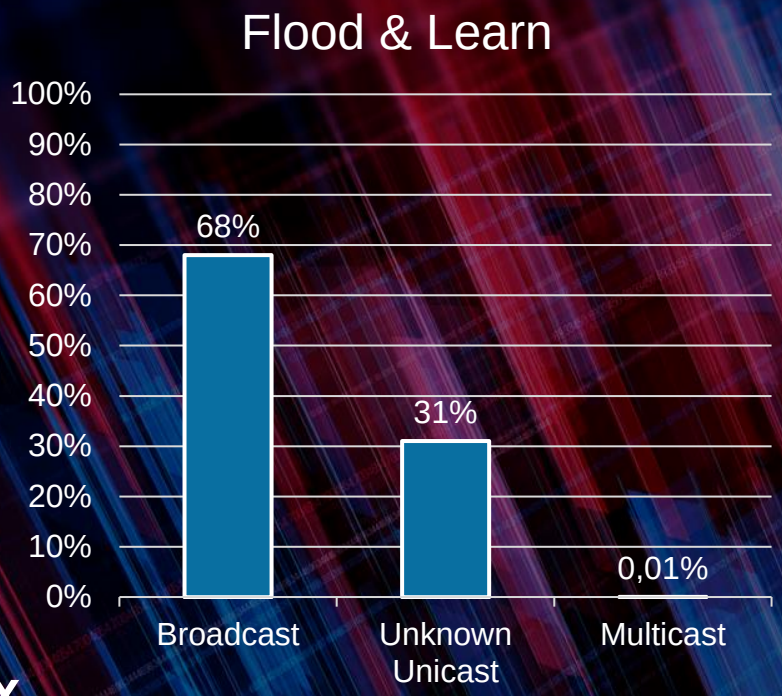
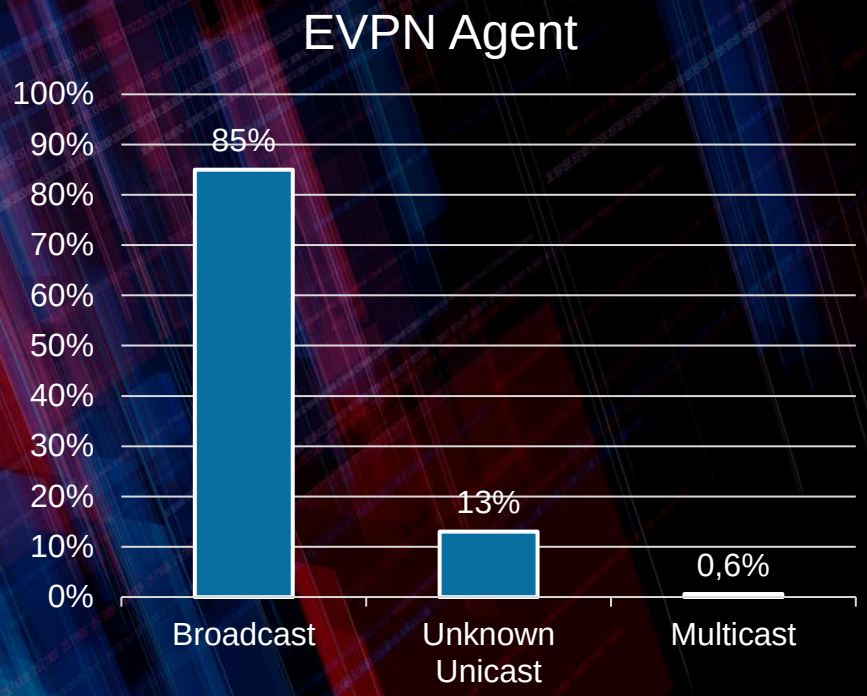
IPv4 BUM traffic distribution by frame type per technology





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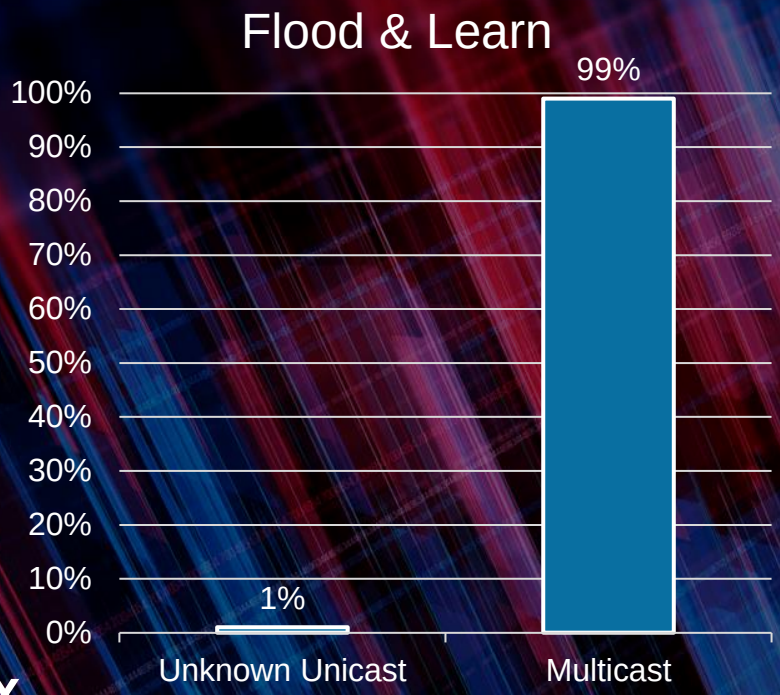
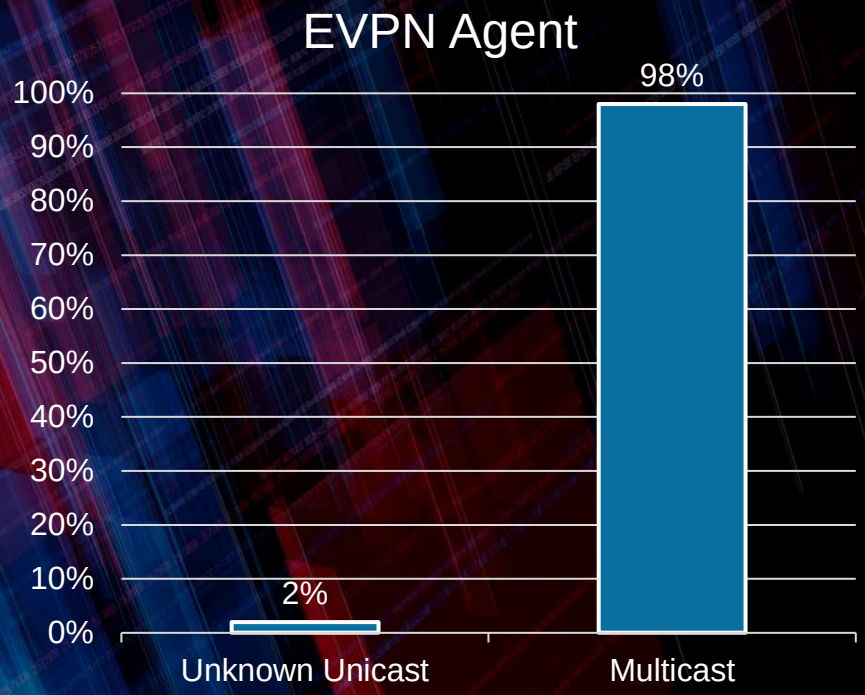
IPv6 UM traffic distribution by frame type per technology





Bugs & Accidents

- Traffic distribution with LDP entropy labels not working as expected
- IPv6 ND Agent Replies with wrong source IP Address, Software upgrade required

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Questions?
Complaints?
Comments?