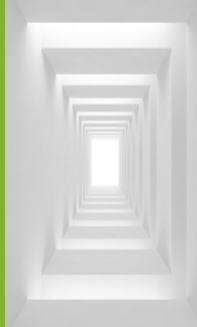


Juniper® Validated Design

JVD Test Report Brief: Campus Fabric EVPN Multihoming Using Juniper Mist™ Wired Assurance



test-report-brief-JVD-ENTWIRED-EVPNMH-02-01

Introduction

The scope of this JVD is to test EVPN multihoming with four collapsed-core (Core and Distribution collapsed into one) in enterprise campus networks. The EVPN multihoming network encompasses the collapsed-core and access layers of your topology. Campus architectures are too rigid to support the scalability and changing needs of modern large enterprises. Multichassis link aggregation group (MC-LAG) is a good example of a single-vendor technology that addresses the collapsed core deployment model. MC-LAG does not interoperate between vendors, creating lock-in, and is limited to two devices.

EVPN multihoming uses a Layer 3 IP-based underlay network and an EVPN-VXLAN overlay network between the collapsed-core Juniper switches. Broadcast, unknown unicast, and multicast (BUM) traffic, is handled natively by EVPN and eliminates the need for spanning tree protocols (STP/RSTP). A flexible overlay network based on VXLAN tunnels combined with an EVPN control plane, efficiently provides Layer 3 or Layer 2 connectivity. This standard is vendor-agnostic, so you can use the existing access layer infrastructure such as LACP without the need to retrofit this layer of your network.

This JVD will concentrate on the below network topologies provisioned through Juniper Mist™:

We tested two topologies as part of this Phase2 JVD:

- Four collapsed-core switches in a ring topology
- Four collapsed-core switches in a mesh topology

The focus of the test was to:

- Build a production-grade lab design where all fabric links are minimum 10Gbit/s
- Test with at least one WAN router attached
- Test designs with four collapses cores
- Test again with the latest recommended Junos release.
- Test Virtual Chassis with two and four members as access switches
- IPv6 underlay between collapsed-core switches
- IPv6 overlay traffic support
- Four collapsed-core switches
 - In a ring connection
 - In a full mesh
- Adding the new EX4000 Switches as VC
- EZ-LAG utilizing bridged overlay for customer migration from legacy MC-LAG having default gateways of a VLAN located on the WAN router

Test Topology

Figure 1: Four Collapsed-Core Switches Lab Topology

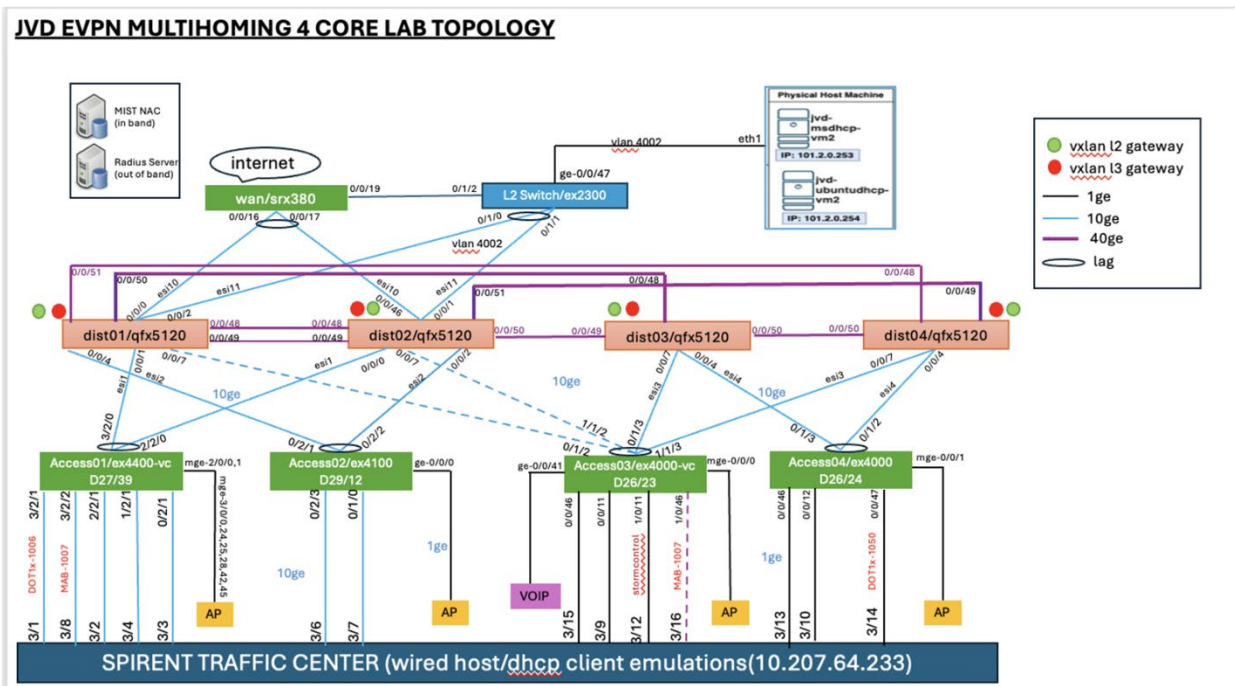


Figure 2: Four Collapsed-Core Switches Ring Topology

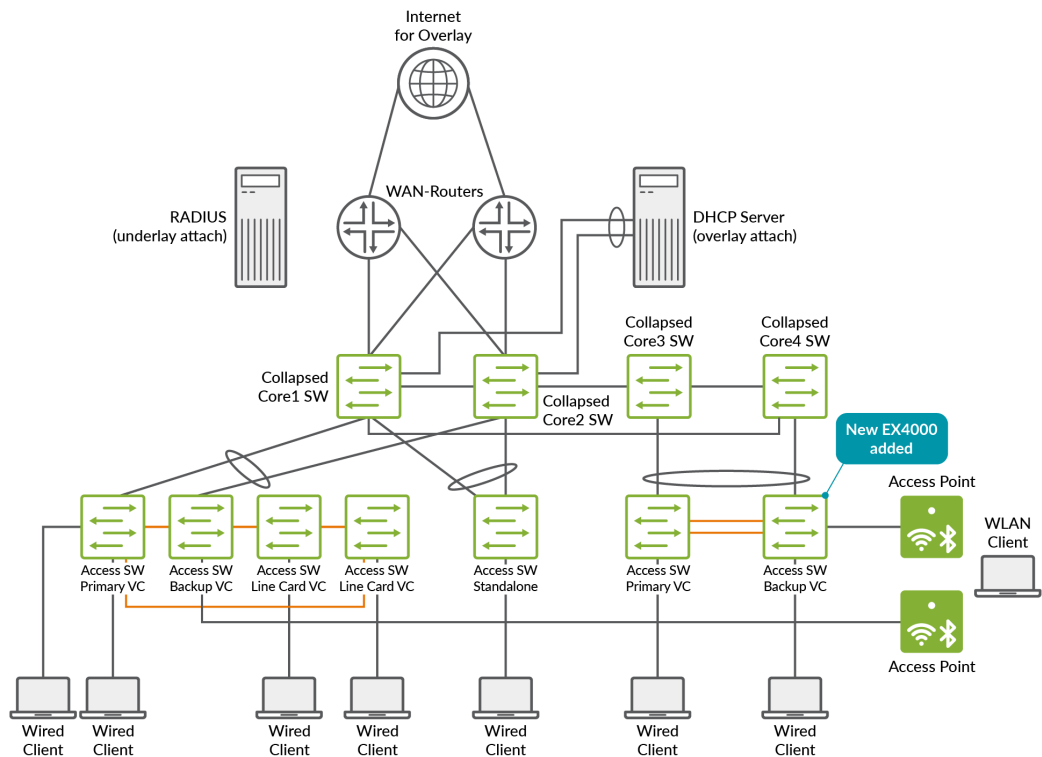
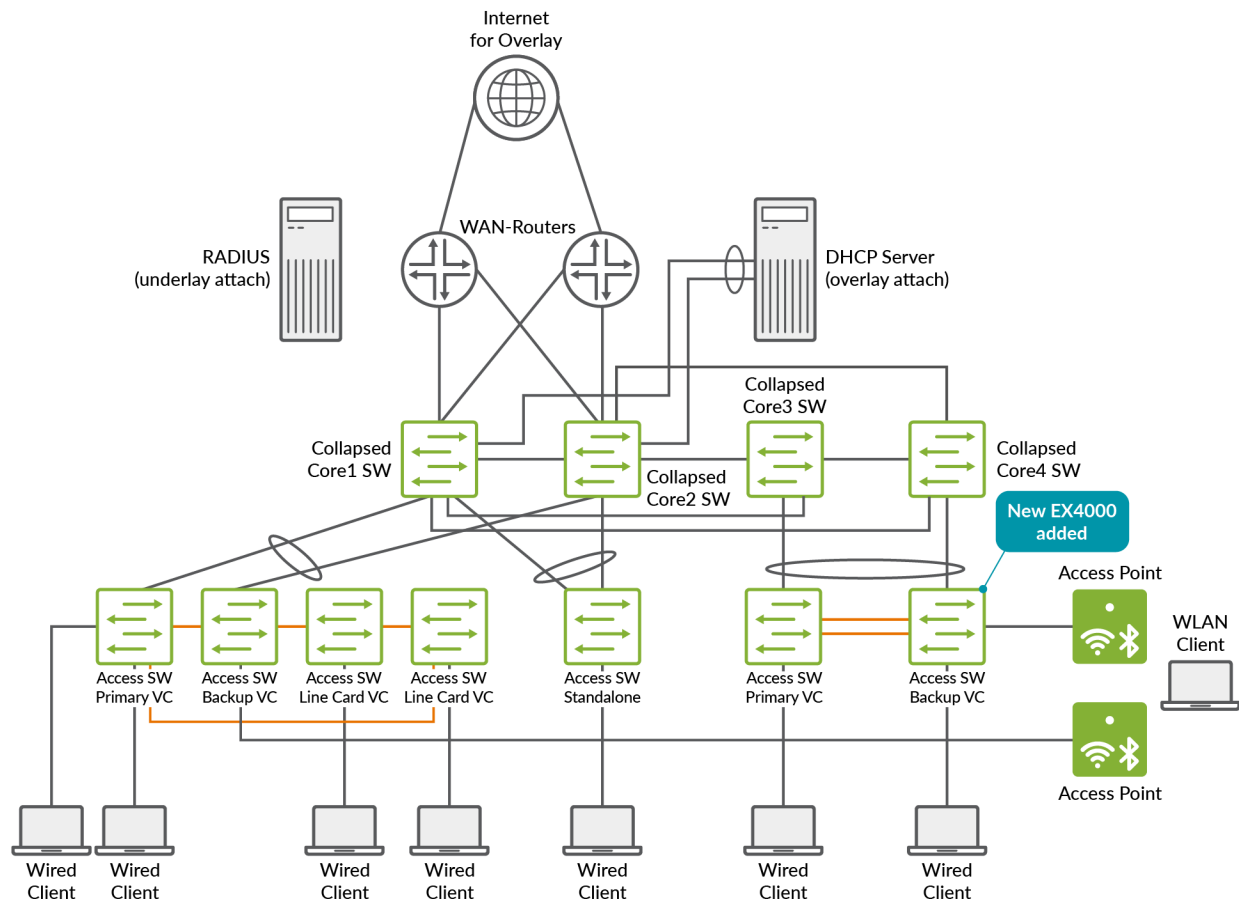


Figure 3: Four Collapsed-Core Switches Mesh Topology



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Platforms, Controllers, and Roles

Tag	Role	Model	OS	Linecard	RE	Fabric	VC	Helper/DUT	Additional Info
R0	ACCESS-Switch-1	EX4400-48P	Junos OS 24.4R2-S1	NA	NA	NA	YES	DUT	Virtual Chassis
R1	ACCESS-Switch-2	EX4100-48P	Junos OS 24.4R2-S1	NA	NA	NA	NO	DUT	
R2	ACCESS-Switch-3	EX4000	Junos OS 24.4R2.25	NA	NA	NA	YES	DUT	Virtual Chassis
R3	Collapsed CORE-Switch	QFX5120-48Y-8C	Junos OS 24.4R2-S2	NA	NA	YES	NO	DUT	

Tag	Role	Model	OS	Linecard	RE	Fabric	VC	Helper/DUT	Additional Info
R4	Collapsed CORE-Switch	QFX5120-48Y-8C	Junos OS 24.4R2-S2	NA	NA	YES	NO	DUT	
R5	Collapsed CORE-Switch	QFX5120-48Y-8C	Junos OS 24.4R2-S2	NA	NA	YES	NO	DUT	
R6	Collapsed CORE-Switch	QFX5120-48Y-8C	Junos OS 24.4R2-S2	NA	NA	YES	NO	DUT	
R7	WAN Router	SRX380	Junos OS 23.4R2-S5	NA	NA	NA	NO	Helper	External Gateway
R8	DHCP Server	Linux	UBUNTO22-DHCP-VM	NA	NA	NA	NO	Helper	DHCP Server
R9	RADIUS Server	CentOS	CentOS v 7	NA	NA	NA	NO	Helper	Dot1X Server
AP	Juniper AP	AP	Mist OS	NA	NA	NA	NO	Helper/DUT	WiFi Access Point
RT0	Traffic Generator	Spirent	Spirent OS	NA	NA	NA	NO	Helper	Wired hosts / DHCP Client

Version Qualification History

This JVD was initially qualified on Junos OS Release 24.4R2. For more details on all supported platforms and OS versions, see the Validated Platforms and Software section in the JVD document.

Scale

EVPN MH PHASE 2 with 4 Core Fully Mesh:

- Features : Scale number : Role
- Number of COLLAPSED CORE Switches Tested : 4 : COLLAPSED CORE
- Number of ACCESS Switches Tested : 4 : ACCESS
- DHCP RELAY IRBs : 10 : COLLAPSED CORE
- EVPN Type 2/5 VRFs : 10 : COLLAPSED CORE
- Remote VTEPs : 3 : COLLAPSED CORE
- VLANs : 500 : COLLAPSED CORE
- IRBs : 500 : COLLAPSED CORE

- IPv4 Hosts at Collapsed Core Switch Pair : 41k : PAIR OF COLLAPSED CORES
- IPv4 Hosts at entire Fabric : 80k : ALL COLLAPSED CORES TOGETHER
- IPv4+IPv6 Hosts at Collapsed Core Switch Pair : 18k : PAIR OF COLLAPSED CORES
- IPv4+IPv6 Hosts at entire Fabric : 36k : ALL COLLAPSED CORES TOGETHER

Performance Data

Traffic rate: 5k FPS per stream block.

High Level Features Tested

Tested features such as:

- Protect RE-Filter
- DHCP Snooping
- DHCP Relay
- Storm-Control
- MAC-Address limit with aging
- Voice VLAN
- QoS Profile

RADIUS server: server location

- Local server attached to underlay network
- Remote Mist Access Assurance via public cloud

Authentication for the following clients:

- Wired clients attached to access switches
- Wi-Fi clients using the access points

Authentication based on client:

- MAC address
- 802.1X EAP Authentication
- Dynamic Authorization Profiles
- Single VLAN assign
- Multiple VLANs assigned

Wi-Fi Access Points:

- Local attached to the access switches with PoE
- Various Wi-Fi clients
- Basic Wi-Fi roaming

Traffic Profiles

Device emulations:

- Mac + IPv4 hosts + IPv6 hosts
- Dot1x Clients
- DHCP Clients

Traffic details:

- Intra-VNI traffic between users across the access switches
- Intra-VNI traffic between users within the access switch
- Inter-VNI (same VRF) traffic between users across the access switches
- Inter-VNI (same VRF) traffic between users within the access switch
- Inter-VRF (Inter VNI) traffic between users across the access switches
- Inter-VRF (Inter VNI) traffic between users within the access switch

Known Limitations

The below additional CLI configuration is required when the Juniper Mist fabric was created before 16 February 2026. The CLI is required when doing DHCP relay on the EVPN fabric for certain Windows and MacOS clients and also to tell all IPv6 clients the subnet for local IPv6 IP addresses per router advertisement.

```
set protocols router-advertisement interface irb.1001 managed-configuration
set protocols router-advertisement interface irb.1001 other-stateful-configuration
set protocols router-advertisement interface irb.1001 prefix fd00:1234:5678:1::/64 no-autonomous
```

The below additional CLI is required when customers want to use ipv6 source guard feature. A fix is scheduled for a future version.

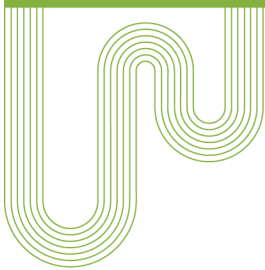
```
set vlans VLAN1001 forwarding-options dhcp-security ipv6-source-guard
```

In scaled fabrics (over 30k hosts), Switch Insights in the Juniper Mist portal is not updating the number of MAC address entries and ARP. A fix is scheduled for a future version.

The Protect-RE filter is not working as expected for ICMP and SSH services for the platform EX4000. A fix is scheduled for a future version.

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