Juniper® Validated Design

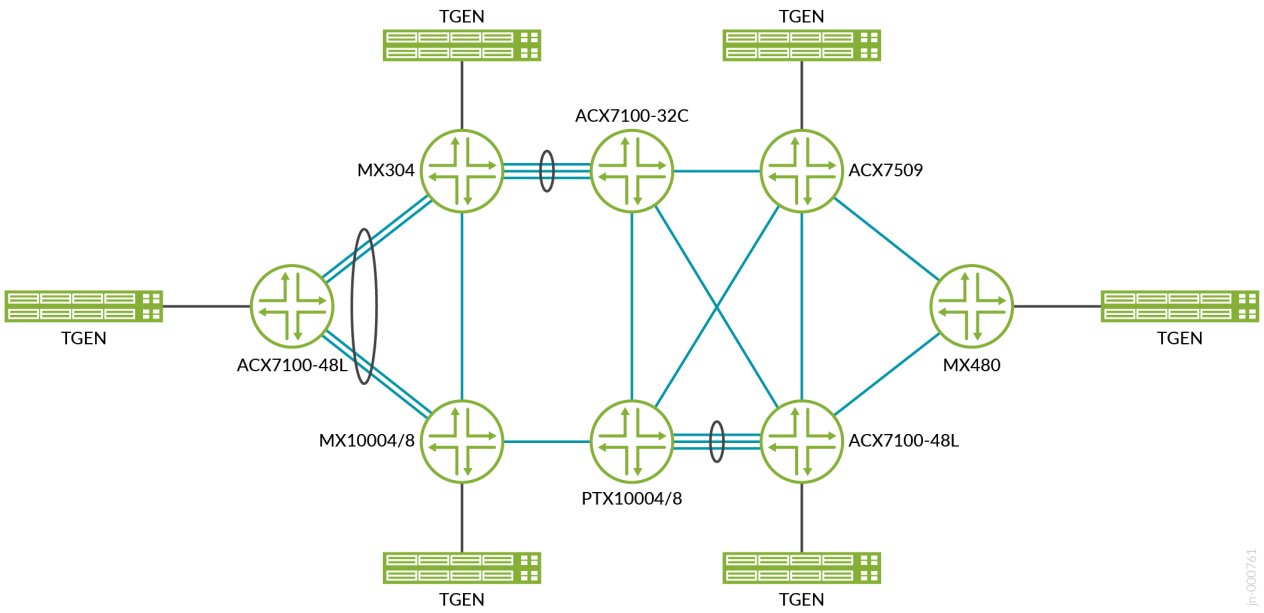
JVD Test Report Brief: Enterprise WAN Core and Edge

Introduction

This test report brief contains qualification test report data for the Enterprise WAN Core and Edge Juniper Validated Design (JVD). These tests validate the ACX7100, ACX7509 and MX304 as EWAN Edge devices and PTX10008 and PTX10003-160C as core network devices. Various services such as VPLS/L2VPN, L2CKT and L3VPN in native and hub-and-spoke deployment models have been covered along with HCoS profiles for traffic prioritization for voice, video, and data. Multicast and NGMVPN services have been used to cover the scenario of having multiple CCTV cameras as receivers.

Test Topology

Figure 1: Test Topology



Platforms Tested

Table 1 lists the tested platforms.

Role	Platform	OS
L2/L3 Edge	ACX7100-48L	Junos OS Evolved 23.2R2
L2/L3 Edge	MX480	Junos OS 23.2R2

Role	Platform	OS
Wan Edge	MX304	Junos OS 23.2R2
Wan Edge	MX10004/MX10080	Junos OS 23.2R2
Wan Edge	ACX7100-48L	Junos OS Evolved 23.2R2
Wan Edge	ACX7509	Junos OS Evolved 23.2R2
P Router	ACX7100-32C	Junos OS Evolved 23.2R2
P Router	PTX10004/PTX10008	Junos 23.2R2

Version Qualification History

This JVD has been qualified in Junos OS 23.2R2 and Junos OS Evolved 23.2R2.

Scale and Performance Data

This document might contain key performance indexes (KPIs) used in solution validation. Validated KPIs are multi-dimensional and reflect our observations in customer networks or reasonably represent solution capabilities. These numbers do not indicate the maximum scale and performance of individual tested devices. For uni-dimensional data on individual SKUs, contact your Juniper Networks representatives.

The Juniper JVD team continuously strives to enhance solution capabilities. Consequently, solution KPIs may change without prior notice. Always refer to the latest JVD test report for up-to-date solution KPIs. For the latest comprehensive test report, contact your Juniper Networks representative.

WAN Edge Feature	Scale
VPLS Instance scale	1000
L2CKT	4000
L3VPN w/ VRRP(I Group)	512
L3VPN (Hub & Spoke)	1000
Switching instances	1000
VLANS/bridge domains/VNIs	7000+
MAC addresses	50000(50/Inst)
ARP entries	50000
eBGP sessions	2000
VRF instances	2000
Multicast (*,G)/(S,G)	10300
Multicast S,G	10300
IGMPv2 snooping	10300
HQOS	94 IFLs Port/IFD
NGMVPN Instance Scale	100 wit 10000(*,G)/(S,G)

Traffic Profiles

Stream Block	Load	Packet Size
vpls_uc_L2/L3Edge1 to L2/L3 Edge2_bidirectional	85 Mbps	512
vpls_mc_L2/L3 Edge1 to L2/L3 Edge2_bidirectional	10 Mbps	1024
vpls_bc_L2/L3 Edge1 to L2/L3 Edge2_bidirectional	10 Mbps	1024
l2circuit_L2/L3 Edge1 to L2/L3 Edge2	215 Mbps	512
l2circuit_WANEdge1 to WANEdge3/WANEdge4	130 Mbps	512
l2circuit_mc_WANEdge1 to WANEdge3/WANEdge4	10 Mbps	1024
l2circuit_bc_WANEdge1 to WANEdge3/WANEdge4	10 Mbps	1024
l2circuit_mc_L2/L3 Edge1 to L2/L3 Edge2	10 Mbps	1024
l2circuit_bc_L2/L3 Edge1 to L2/L3 Edge2	10 Mbps	1024
L3VPN_Hub_spoke_WANEdge1_WANEdge3_L2/L3 Edge2_WANEdge2_bidirectional	10 Mbps	512
VRRP_L2/L3Edge1 to L2/L3 Edge2_bidirectional	50 Mbps	512
HQOS_WANEdge1_WANEdge3_bidirectional	43 Mbps	512
NGVPN_WANEdge3_WANEdge1_and_WANEdge4_WANEdge2	43 Mbps	512
Native_multicast_WANEdge3_WANEdge1_and_WANEdge4_WANEdge2	43 Mbps	512

Scenario	Convergence Time (ms)
L3VPN (Hub and Spoke) traffic convergence with Link failure (P1 Node Link Towards WANedge3)	35.28 ms
VPLS traffic convergence with Link failure (P1 Node Link Towards WANedge3)	35.63 ms
L3VPN (VRRP) traffic convergence with Link failure (P1 Node Link Towards WANedge3)	31.12 ms
L2CKT traffic convergence with Link failure (P1 Node Link Towards WANedge3)	26.39 ms
L3VPN (Hub and Spoke) traffic convergence with Link failure (WANedge3 Node Link Towards P1)	38.16 ms
VPLS traffic convergence with Link failure (WANedge3 Node Link Towards P1)	39.78 ms
L3VPN (VRRP) traffic convergence with Link failure (WANedge3 Node Link Towards P1)	33.18 ms
L2CKT traffic convergence with Link failure (WANedge3 Node Link Towards P1)	28.92 ms
L3VPN (VRRP) traffic convergence with Node failure (WANedge3 Node Failure)	2014 ms
VPLS traffic convergence with Node failure (WANedge4 Node Failure)	2114 ms
L2CKT traffic convergence with Node failure (WANedge4 Node Failure)	1694 ms
VPLS traffic convergence with link failure with WANEdge4 ae port	1.4 ms
L2CKT traffic convergence with link failure with WANEdge4 ae port	3.5 ms
L3VPN (Hub and Spoke) traffic convergence with Link failure with WANEdge4 ae port	1.87 ms
L3VPN (VRRP) traffic convergence with Link failure (WANEdge4 ae port)	1.92 ms
VPLS traffic convergence with link failure with WANEdge1 ae port	1.5 ms
L2CKT traffic convergence with link failure with WANEdge1 ae port	1.5 ms

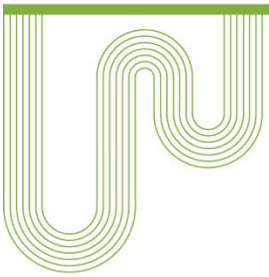
Scenario	Convergence Time (ms)
L3VPN (Hub and Spoke) traffic convergence w/ Link failure WANEdge1 ae port	0 ms
L3VPN (VRRP) traffic convergence with Link failure WANEdge1 ae port	0.58 ms

High Level Features Tested

- Q-in-Q to separate traffic from different customers throughout the service provide network.
- PIM-based multicast traffic distribution.
- LACP to combine multiple interfaces to form a single logical interface and to load balance the traffic.
- ECMP to load balance traffic over multiple paths with equal metrics.
- Multicast VPN (MVPN) to transparently interconnect private networks across the network backbone of a service provider.
- IGMP Snooping and IGMPv2.
- Quality of Service (QoS) functional mechanisms, which govern how traffic is forwarded, stored, or dropped in conjunction with congestion management and avoidance.
- CCC Encapsulation configured over CE facing PE router interfaces to carry Layer 2 circuits over an MPLS network.
- L3VPN, VPLS, and L2 Circuit.
- MPLS and LDP to forward the traffic based on labels.
- Graceful Restart.
- Bridge Domains.
- OSPF as IGP.
- IBGP and EBGP.
- BFD for fast failure detection and convergence.

Event Testing

- Restart of critical Junos OS or Junos OS Evovled processes.
- Device reboot.
- Interface up/down.
- Deletion or configuration of various configuration stanzas.
- Clearing protocol sessions.



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