Juniper® Validated Design

JVD Test Report Brief: WAN Edge with the Session Smart Router

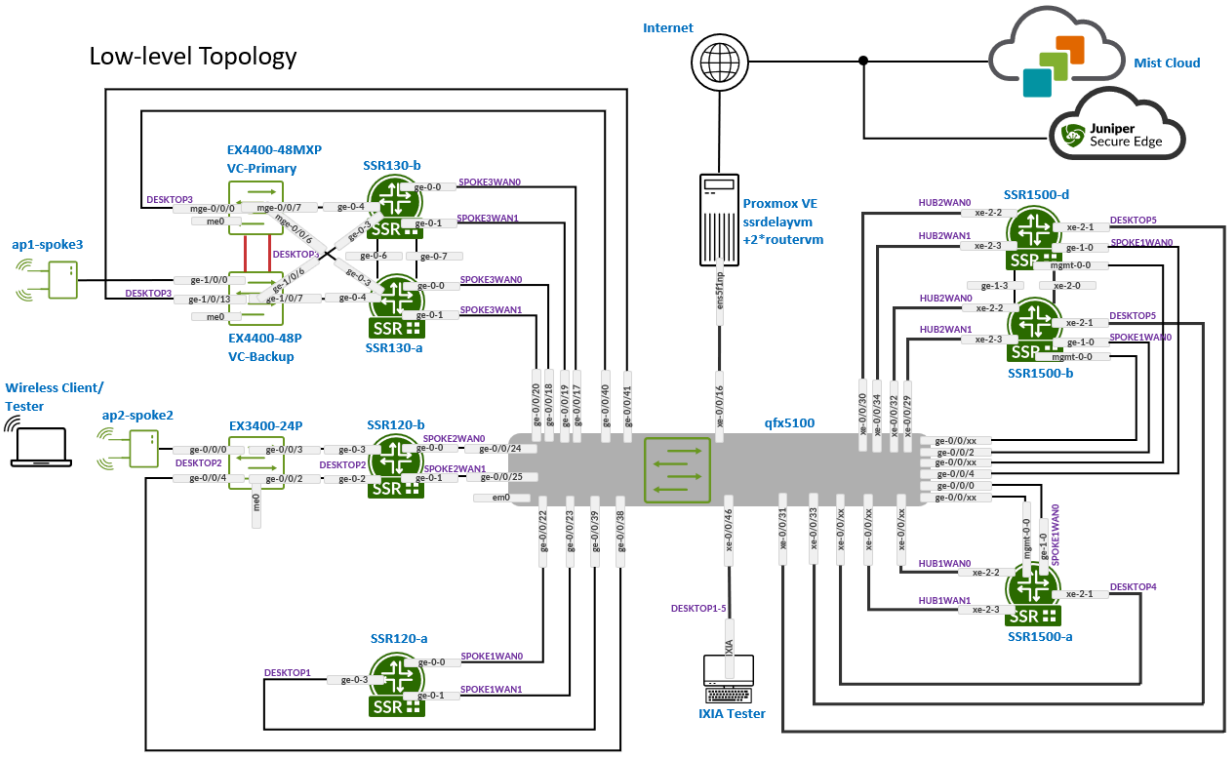
JVD-ENTWAN-EDGESSR-01-01

Introduction

This test report brief contains qualification test report data for the WAN Edge for SSR Juniper Validated Design (JVD). Juniper Mist WAN Assurance is a cloud-managed solution designed to optimize and simplify Wide Area Network (WAN) operations. It is part of Juniper Mist's AI-Native networking platform, providing high performance tunnel-free forwarding, enhanced AI operations, and automation for WAN management. The network links providing site to datacenter, cloud, and public connectivity paths are joined by WAN edge devices to form the fabric of the WAN. The WAN edges are transformed with Juniper's AI-driven SD-WAN solution and act as distributed policy enforcement points managed centrally from the cloud. Juniper Mist WAN Assurance solves many of the legacy SD-WAN solutions' security, monitoring, and troubleshooting challenges. Integrate Juniper Mist Wired Assurance, Juniper Mist Wireless Assurance, and now Juniper Mist WAN Assurance into a unified Mist AI dashboard to streamline deployment, monitoring, and troubleshooting across your network. Juniper Mist WAN Assurance securely connects branch offices with Juniper® Session Smart™ Routers as WAN edges.

Test Topology

Figure 1: Juniper Mist WAN Assurance Test Topology



Performance Data

Tables 1-4 list the platforms tested for this JVD during initial qualification. For more details on all supported platforms and OS versions, see the Validated Platforms and Software section in the JVD document.

Table 1: SSR120 Performance – CPS Method

SSR120 Performance						
CPS Method (SIGPACK: 3659)						
Test Case	**Platform**	**Parameter**	**CPS**	**Throughput**	**CPU**	**Memory**
LBO HTTP Performance	SSR120	HTTP 44KB	900 CPS	326 Mbps	26%	
LBO HTTP Performance w/ security features (IDP)	SSR120	HTTP 44KB	70 CPS	25.361 Mbps	40%	
Overlay HTTP Performance	SSR120	HTTP 44KB	1000 CPS	362.3 Mbps	25%	57%
Overlay HTTP Performance w/ security features (IDP)	SSR120	HTTP 44KB	Feature disabled			

Table 2: SSR130 Performance – CPS Method

SSR130 Performance						
CPS Method (SIGPACK: 3659)						
Test Case	**Platform**	**Parameter**	**CPS**	**Throughput**	**CPU**	**Memory**
LBO HTTP Performance	SSR130	HTTP 44KB	650 CPS	235 Mbps	40%	
LBO HTTP Performance w/ security features (IDP)	SSR130	HTTP 44KB	70 CPS	25.229 Mbps	40%	87%
Overlay HTTP Performance	SSR130	HTTP 44KB	1000 CPS	361.004 Mbps	10%	
Overlay HTTP Performance w/ security features (IDP)	SSR130	HTTP 44KB	Feature disabled			

NOTE:

1. HTTP44KB[GET+PUT] CPS Method is used for test the performance numbers.
2. SSR is in SA mode.
3. Spoke and Hub are managed/configured from Juniper Mist.
4. Ixia IxLoad is used for Traffic generator.

Single flow performance testing was conducted by downloading a 1G file via a simple web server and Linux- based client and server VMs.

Table 3: SSR120 Performance – Web-Server/Client VM Single Flow

SSR120 Performance			
Web-Server/Client VM Single Flow File Download			
Test Case	**Platform**	**Parameter**	**Throughput**
LBO HTTP Performance	SSR120	HTTP 1 GB file	840 Mbps
LBO HTTP Performance w/ security features (IDP)	SSR120	HTTP 1 GB file	795 Mbps
Overlay HTTP Performance	SSR120	HTTP 1 GB file	473 Mbps

Table 4: SSR120 Performance – Web-Server/Client VM Single Flow

SSR130 Performance			
Web-Server/Client VM Single Flow File Download			
Test Case	**Platform**	**Parameter**	**Throughput**
LBO HTTP Performance	SSR130	HTTP 1 GB file	896 Mbps
LBO HTTP Performance w/ security features (IDP)	SSR130	HTTP 1 GB file	808 Mbps
Overlay HTTP Performance	SSR130	HTTP 1 GB file	474 Mbps

Version Qualification History

This JVD has been qualified in Junos OS Release Junos 23.2R2 and SSR Firmware 6.3.3-40.r2.

High Level Features Tested

General options and features: BGP, IPv4, LLDP, LACP, LAG, VLAN (802.1q), ARP, DNS, NTP, DHCP-Server/Proxy, L2-Switches, Virtual Chassis, and access point. WAN configuration & management: Smart Session Routing, SD-WAN, HA-Cluster, Mist Cloud-based Management, and IPsec NAT-T for Cloud offload.

Tests Executed:

- Testing was performed and passed on all five major topologies:
  - Base SD-WAN topology with 3 Spokes and 2 Hubs
  - Extended topology with hub overlay and BGP peering (also with DC to DC BGP Peering)
  - High-availability hub-and-spoke using SSR chassis cluster pairs topology
  - Full-stack topology with Juniper EX Switch and Juniper Mist AP
  - Extended full-stack topology with Juniper EX Switch as Virtual Chassis and SSR HA cluster
- WAN link-related features:
  - Multiple WAN links
  - MTU
  - Auto-negotiation
  - Interface static IP

    - Interface DHCP IP
    - WAN source-NAT interface
    - WAN SLEs
    - Failover when WAN link interface was lost
- LAN link-related features:
    - VLAN tagging
    - DHCP server
    - DHCP relay
    - Multiple LANs on same interface (trunk)
    - IEEE 802.3ad LAG with active LACP
    - Using force-up option on one interface for EX Series Switch behind zero-touch provisioning (ZTP).
- VPN overlay features:
    - Spoke-to-hub overlay
    - Hub-to-spoke overlay
    - Spoke-to-spoke overlay (through hub)
    - Hub-to-hub overlays
- Traffic steering and forwarding features:
    - Central breakout at hub
    - Local breakout at spoke
    - Static route at spoke
    - BGP route at hub
    - Failover when remote peer is unavailable (SVR internal BFD to remote)
    - Failover when WAN links no longer meet SLA (latency, jitter, and packet loss)
    - Secure Edge Connector–JSE
- Application policy features:
    - Source-attached LAN
    - Source non-attached user
    - Various applications as defined in the next section
    - IDP-enabled
    - Imported organization application policies
- Applications are defined using the following parameters:
    - Applications defined by IP prefixes
    - Applications defined by protocol and port
    - Applications defined by DNS-FQDN
    - Applications defined by predefined app
    - Applications defined by app categories
- Redundancy and high availability options:
    - Two or more independent hubs with failover at spoke
    - Chassis clustered hub
    - Chassis clustered spoke
    - Hub redundancy using hub overlay

    - Interface redundancy (VRRP)
- Security features:
    - Application Tracking (AppTrack)
    - Web filtering
    - URL Subcategory
    - IDP engine service chaining
    - Secure Edge Connector
- General options and features:
    - EX Series Switch behind a Session Smart Router as WAN router
    - Juniper AP behind EX Series Switch
    - Site variables
    - Application path visibility
    - WAN edge insights

Traffic Profile

- Traffic test between clients attached to LAN-Interface of Spoke 1-3 and clients attached to LAN-Interface Of Hub1 and Hub2
- Traffic test between clients attached to LAN-Interface of Hub1 and Hub2 and clients attached to LAN-Interface Of Spoke 1-3
- Traffic test between clients attached to LAN-Interface of Spoke 1-3 and clients attached to LAN-Interface of other two spokes
- Traffic test between clients attached to LAN-Interface of Hub1 and Hub2 and Internet
- Traffic test between clients attached to LAN-Interface of Spoke 1-3 and Internet

Known Limitations

On SSR devices, LLDP neighbor messages may not be sent on bundled links. So inconsistency might be observed with neighbor discovery on bundled links). IDP for overlay or VPN traffic with Juniper Mist-managed SSR is a non-goal for this solution.

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