IPv4 IPv6 Only PE Design & ALL SAFI Supported

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Updates

- Added section on SRv6 uSID applicability VPN overlay stitching
- Types SAFI (SAFI with Route Types) are data plane agnostic due to the IPv4 and IPv6 NLRI being in the data plane field and not directly in the NLRI and thus are not applicable to IPv4 Only PE Design & IPv6 Only PE Design
- Updates on testing - Juniper & Nokia are 100% completed all testing
- Cisco is planning to complete very soon
- Huawei testing waiting on ETA for completion
- Arista – no progress and will remove from draft
IPv6-Only PE Design Testing update / IPv4-Only PE Design Testing Update:

Vendors: Cisco, Juniper, Nokia, Arista, Huawei

Hardware Platforms, Router Code Revision & Testing Updates:
Vendors: Cisco, Juniper, Nokia, Arista, Huawei
Code & Platform chosen for testing platform by Vender

**Cisco:** Edge Router- XR ASR 9910 IOS XR 7.4.1, Core Router- NCS 6000 7.2.2, CRS-X 6.7.4
**Update:** Testing in progress. **Plan to be completed Fall 2024**
**Vendor specific knob for forwarding IPv4 packets without IPv4 address** configured on interface which is required for IPv6-Only PE design.

**Juniper:** Edge Router- MX platform MX480, MX960, Core Router- PTX Platform PTX5000, PTC10K8 (JUNOS and EVO) Release 20.4R2
**Update:** All unicast testing is completed – **Testing is 100% completed**
**Vendor specific knob exists for forwarding IPv4 packets without IPv4 address** configured on interface which is required for IPv4-Only PE design & IPv6-Only PE design.

**Nokia:** Edge and Core-7750 Service Router, Release R21
**Update:** All unicast testing is completed – **Testing is 100% completed**
**Vendor specific knob exists for forwarding IPv4 packets without IPv4 address** configured on interface which is required for IPv6-Only PE design.

**Huawei:** Edge and Core-VRPv8, Release VRP-V800R020C10
**Update:** Huawei supports RFC 5549 & RFC 8950 and all 12 test cases confirmed supported with R&D team. **Requesting ETA for completion**
**Vendor specific knob exists for forwarding IPv4 packets without IPv4 address** configured on interface which is required for IPv6-Only PE design.

**Arista:** No ETA (Removing from draft)
Typed NLRI Update Section

Below is a list of Typed NLRI SAFI

● MCAST VPN [RFC 6513 / RFC 6514]
● MCAST VPLS [RFC 7117]
● EVPN [RFC 7432]  
● BGP-LS [RFC 7752]
● CAR (Color Aware Routing) [draft-ietf-idr-bgp-car-10]

**Typed NLRI have the following format:**

MP BGP AFI/SAFI
-----------------
IPv4 / IPv6
NLRI can be both carried
in the Data field of the NLRI
Making it - Data Plane Transport
independent
(RFC 8950 still comes into
play for next hop encoding)

Route Type Specific (NLRI Data Field)
**Typed Data Plane agnostic**

**Non Typed NLRI have the following format:**

(Example: IP VPN RFC 4364)

MP BGP AFI/SAFI
-----------------
IPv4 / IPv6
NLRI is carried
directly in NLRI and thus is
Data Plane Transport
dependent
(RFC 8950 comes into play
For next hop encoding)

For Non Typed SAFI the NLRI data is encoded
directly into the NLRI
**Non Typed is Data Plane dependent**
SRv6 Compression (C-SID Next SID Endpoint Behavior Test cases Section)

SRv6 uSID Test Scenario’s:

#1 SRv6 Core – Global Table Inter-AS PE-PE (4PE) - SRv6 Enabled on Inter-AS PE’s

Mirror of test #9 IPv6 Core Global Table Inter-AS 4PE but now with SRv6 enabled
Test #9 Global table Option B (4PE) for Unicast

#2 SRv6 Core – Global Table Inter-AS PE-PE (4PE) - SRv6 Disabled on Inter-AS PE’s

Mirror of test #9 IPv6 Core Global Table Inter-AS 4PE but now with SRv6 disabled
Test #9 Global table Option B (4PE) for Unicast

#3 SRv6 Core – IP VPN Inter-AS PE-PE - SRv6 Enabled on Inter-AS PE’s (eBGP Next Hop Unchanged)

Mirror of test #11 IPv6 IP VPN Inter-AS but now with SRv6 enabled
Test #11 L3 VPN Inter AS Option B (Unicast)

#4 SRv6 Core – IP VPN Inter-AS PE-PE - SRv6 Disabled on Inter-AS PE’s (eBGP Next Hop Unchanged)

Mirror of test #11 IPv6 IP VPN Inter-AS but now with SRv6 disabled
Test #11 L3 VPN Inter AS Option B (Unicast)
POC Testing almost finished
Planning for Fall WGLC
Thank You!
SRv6 Global w/ IPv6 Only PE (4PE) (Inter-AS PE is SRv6 Aware)
IPv6-Only PE Design “IPv6-Only Core” – Inter-AS Option B – 4PE (Test #9)
SRv6 Global w/ IPv6 Only PE (4PE) (Inter-AS PE is SRv6 Unaware)
IPv6-Only PE Design “IPv6-Only Core” – Inter-AS Option B – 4PE (Test #9)
Test #3 SRv6 uSID IP VPN w/ SRv6 Aware Inter-AS PE

SRv6-VPN w/ IPv6 Only PE (Inter-AS PE is SRv6 Aware)
IPv6-Only PE Design “IPv6-Only Core” – Inter-AS Option B (Test #11)

AFI/SAFI tested:
SAFI = 1 - Unicast
SAFI = 128 - VPN

IPv6-Only PE Design
IPv6-Only Core – Inter-AS Option B (Test #11)
Test #4 SRv6 uSID IP VPN w/ SRv6 Unaware Inter-AS PE

SRv6-VPN w/ IPv6 Only PE (Inter-AS PE is SRv6 Aware)
IPv6-Only PE Design “IPv6-Only Core” – Inter-AS Option B (Test #11)

AFI/Safi tested:
SAFI = 1 - Unicast
SAFI = 128 - VPN