

Distribute SRv6 Locator by DHCP

draft-ietf-spring-dhc-distribute-srv6-locator-dhcp-04

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IETF-121

Background & Solution

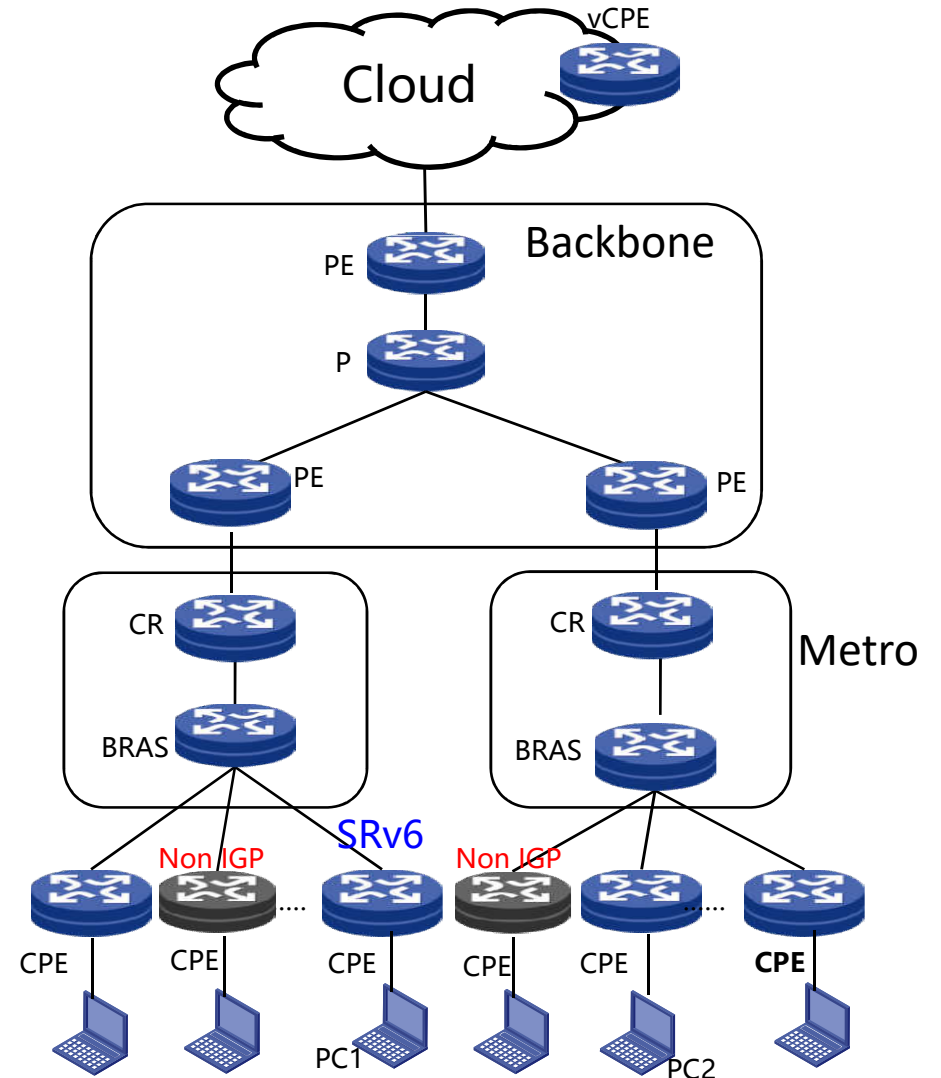
❑ CPEs in Telecom IP Network

- Deploy SRv6
- Large scale (50K+)
- Wide geographical distribution
- High mobility
- Some CPEs do not deploy IGP

❑ Solution

Assign locators to SRv6 endpoints through DHCPv6 server, and specify the subnet prefix of locators and the length of Func , Args and Common Block.

- Simplify configuration of SRv6 Locators
- Dynamically learn SRv6 locator subnet routes



Proposal

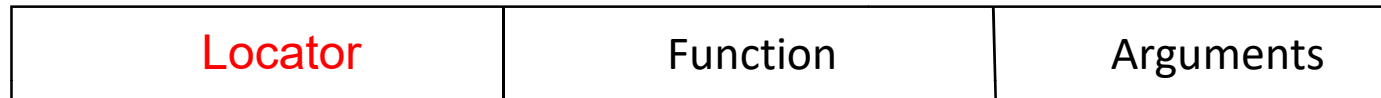
Treat SRv6 locator as the prefix in prefix pool.

1. DHCPv6 server allocates SRv6 locator as the prefix, and specify the length of Common Block, Func and Args of locator for the SRv6 endpoint.
2. Follow DHCPv6 Prefix Delegation(PD) process.
3. After the locator assigned successfully, BRAS dynamically issues the locator subnet route locally and distributes the locator subnet route.
4. When releasing the locator prefix, BRAS deletes the locator subnet route.

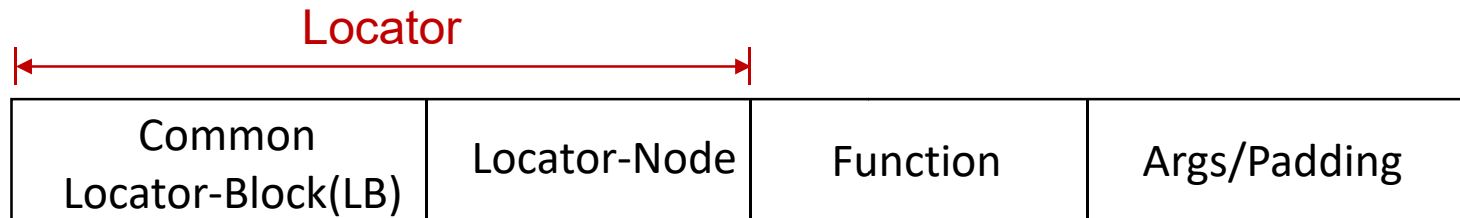
BRAS enables DHCPv6 PD server or DHCPv6 relay agent service.

SRv6 SID Format

SRv6 SID defined in [RFC8986]:



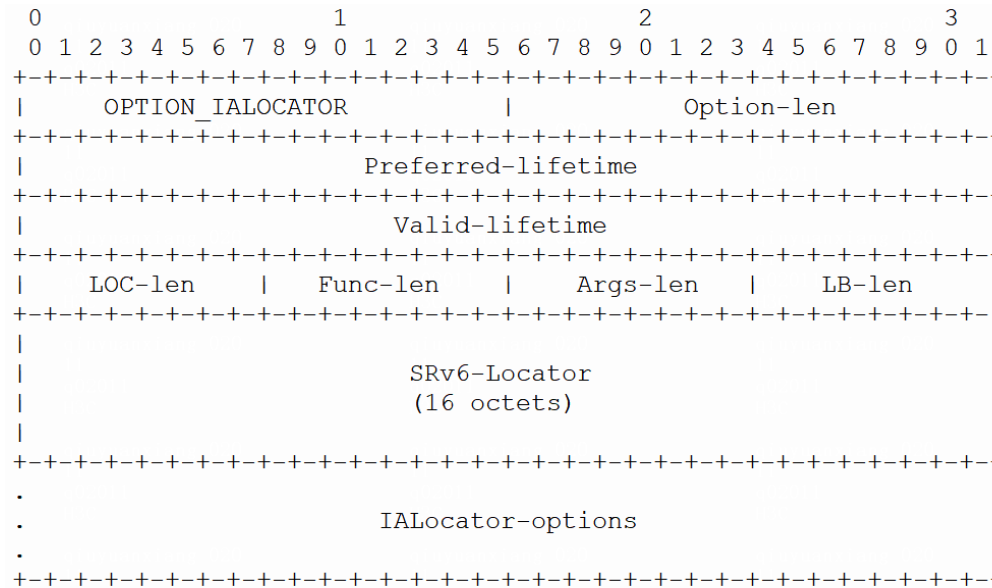
Compressed SRv6 SID defined in [draft-ietf-spring-srv6-srh-compression]:



DHCPv6 Option Extension

Define IA SRv6 Locator option :

- Encapsulated in the IA_SRV6_LOCATOR-options field of an IA_SRV6_LOCATOR option .
- Used to specify a SRv6 locator associated with an IA_SRV6_LOCATOR.

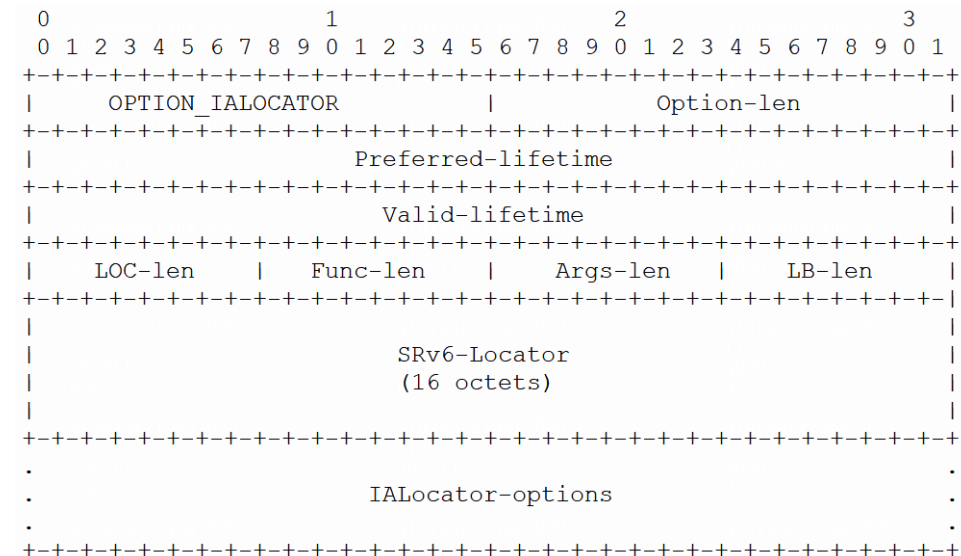
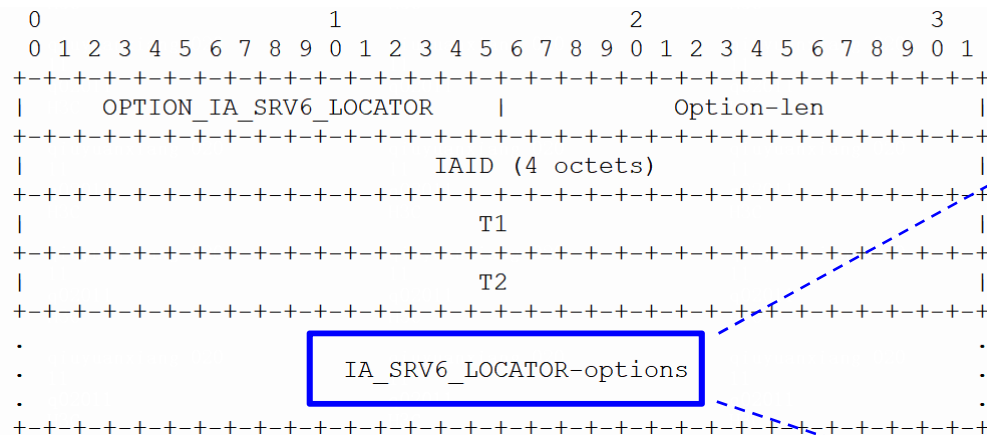


- **LOC-len:** The locator (LOC) length of SRv6 SID in bits.
- **Func-len:** The function (FUNCT) length of SRv6 SID in bits.
- **Args-len:** The arguments (ARG) length of SRv6 SID in bits.
- **LB-len:** The Locator Block length of SRv6 SID in bits.
- **SRv6-locator:** A SRv6 locator prefix.
- **IALocator-options:** Options associated with this SRv6 locator.

For compressible SID, the length of Locator Node is LOC-len minus LB-len.

Encapsulation Format

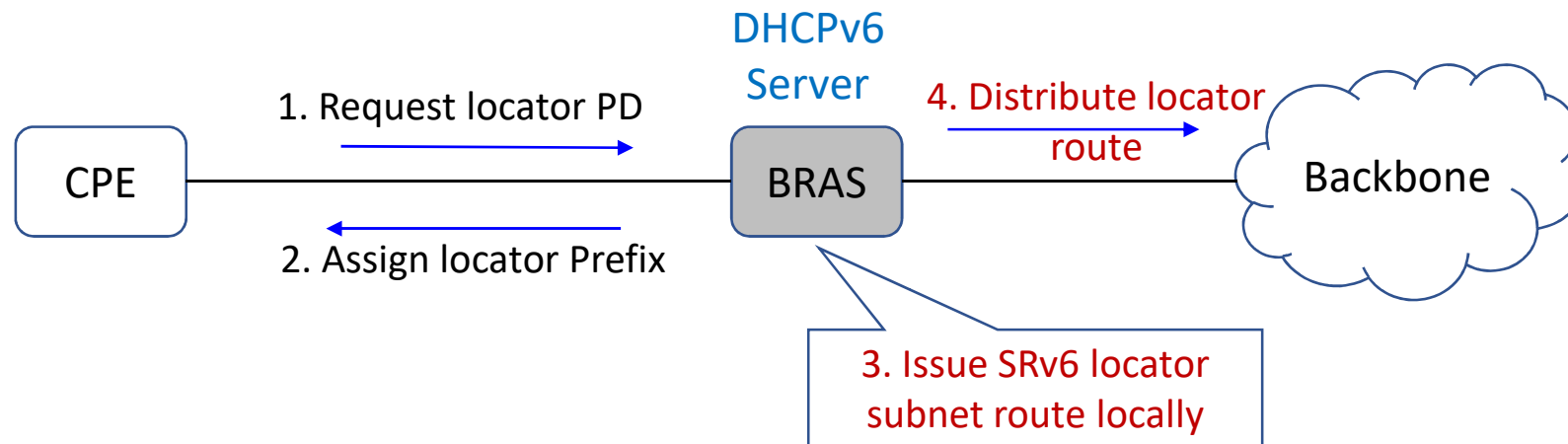
- An IA SRv6 Locator option may appear only in an IA_SRV6_LOCATOR option.
- More than one IA SRv6 Locator option can appear in a single IA_SRV6_LOCATOR option.



Scenario 1: BRAS as DHCPv6 PD Server

DHCPv6 Server behavior:

1. Allocate locator subnet prefix from prefix pool.
2. Generate the locator subnet route locally.
3. Distribute the locator subnet route to other IPv6 node.

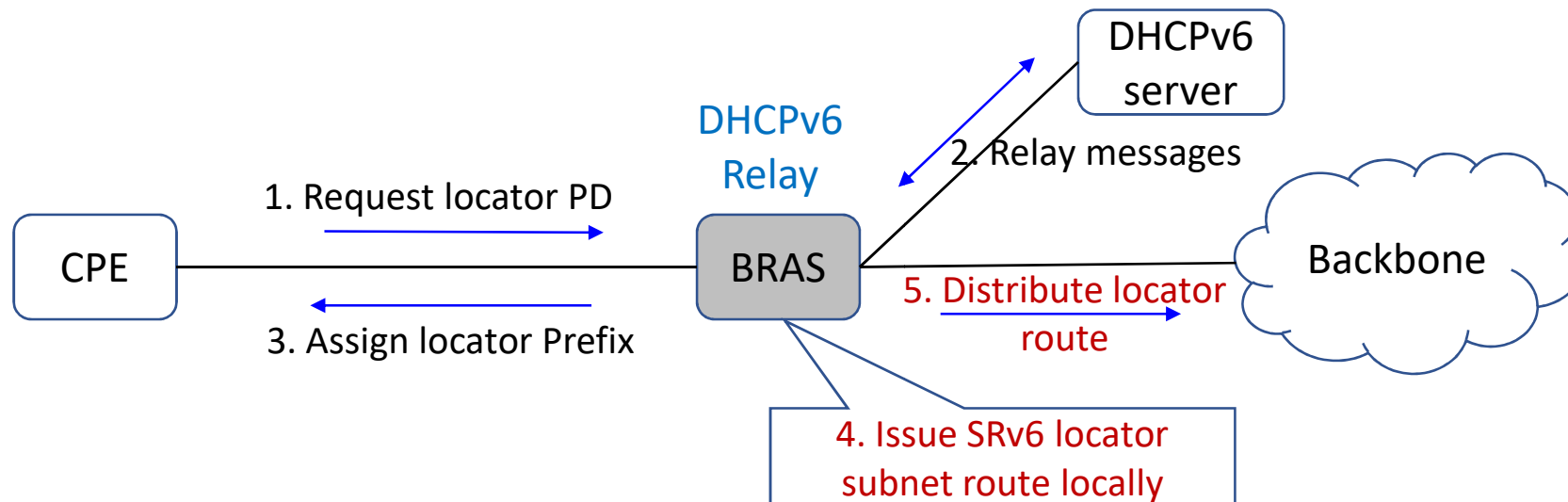


Scenario 2: BRAS as DHCPv6 Relay Agent

First hop DHCPv6 relay agent behavior:

1. Relay DHCPv6 PD allocation messages.
2. Generate the locator subnet route locally.
3. Distribute the locator prefix routes to other IPv6 node.

The non first hop DHCPv6 relay normally processes DHCPv6 PD messages according to RFC8415.



Running Code

Lab Interop-test Status

Hardware devices and software implementations which have passed interoperability tests hosted by China Mobile in 2024:

- H3C CR16000, CR19000 series routers of implementation of Distribute SRv6 Locator by DHCP.
- Raisecom's RaizSec-VNF RaizSec-VNF Series SD-WAN Gateway implementation of Distribute SRv6 Locator by DHCP

Status

- Version-02: Updated the draft to Version 02 based on Alvaro Retana's comments. Thank you, Alvaro, for your detailed and comprehensive review.
- Version-03: Added the type value for the IANA application.
- Version-04: Included the vendor implementation section.

Ready for WG LC. Requesting WG LC.

Thanks!