

Generalized SRv6 and Generalized SRH

draft-cl-spring-generalized-srv6-np-01
draft-lc-6man-generalized-srh-00

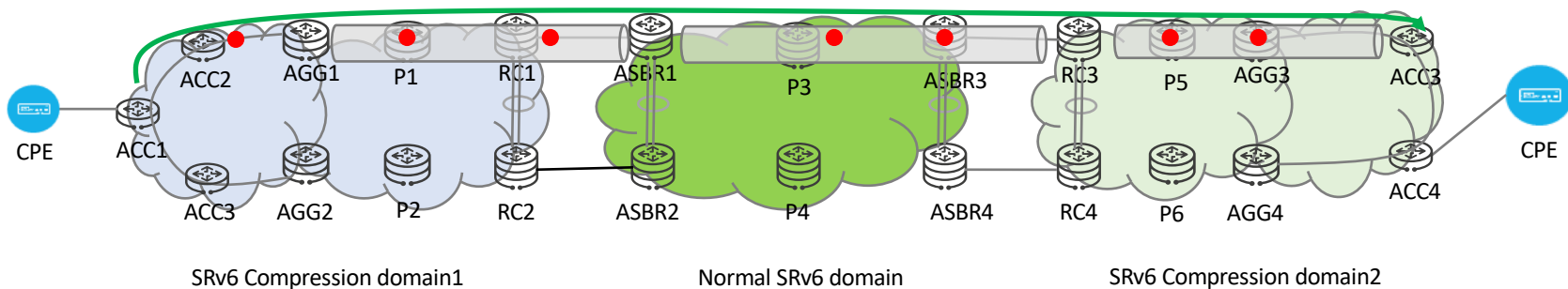
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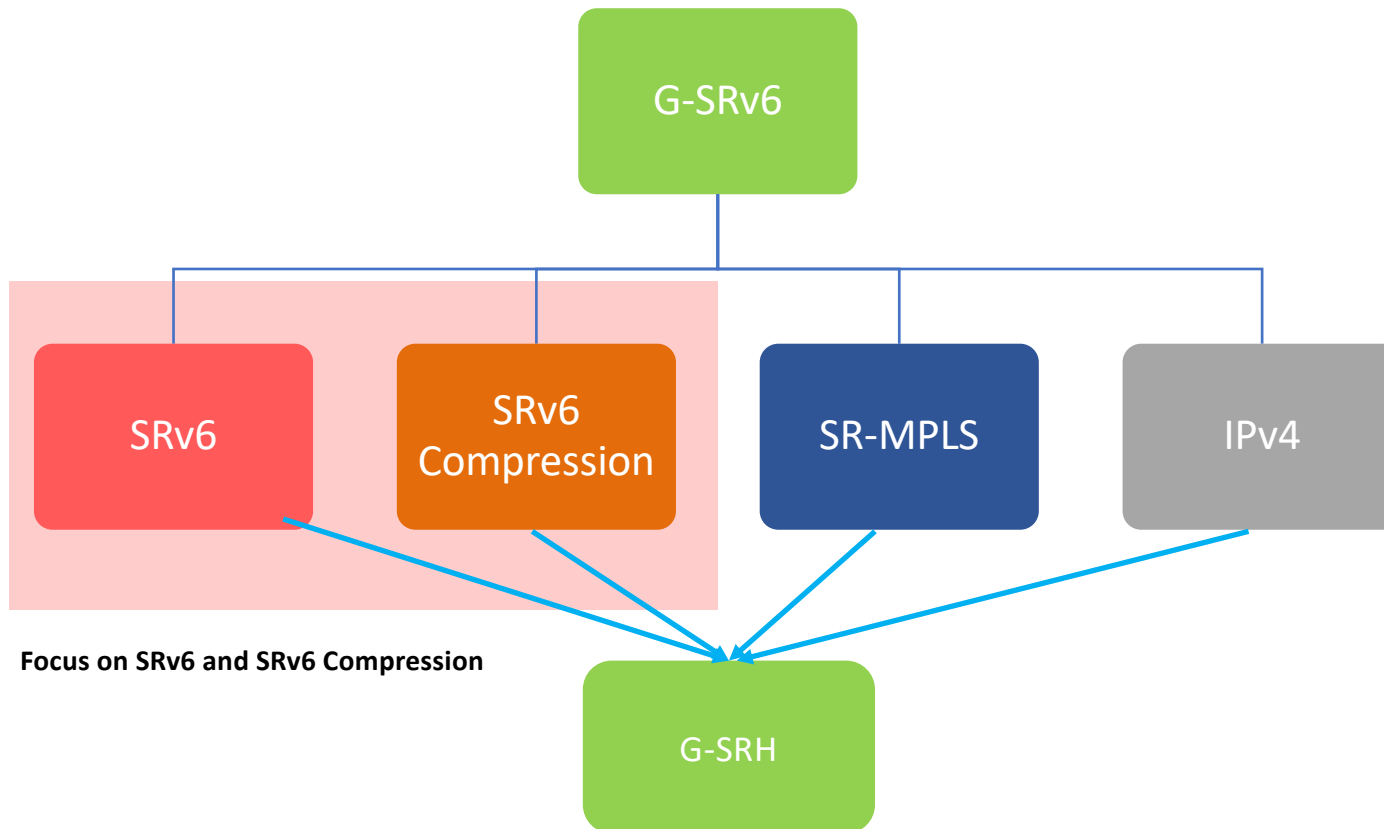
IETF#107

Why Generalized SRv6 ?

- In current SRv6 networks, the average number of SIDs for a path will be about 3-5, which is acceptable in payload efficiency and forwarding efficiency.
- However, in some scenarios like SFC, many SIDs should be used, and the overhead of SIDs in SRH will bring challenges for hardware, so SRv6 compression is needed, and it should be compatible with SRv6.
- Also, an E2E path may travel multiple domains of SRv6, compressed SRv6 domain or even SR-MPLS and IPv4 domain. There may be some requirements to explicitly encode all the forwarding instructions in a single SRH at the ingress node.



Architecture of G-SRv6

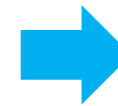


Before G-SRv6 : SRv6 Compressed SID

- A normal SRv6 SID is a 128 bits IPv6 address allocated from an address block, called SID Space.
- For the SIDs in the SID list within an SRH, they may share the common prefix, and the common prefix is redundant that can be deleted to reduce the overhead.
- Each SRv6 SID has the format shown below, we called the different part of the SRv6 SID is compressed SID(C-SID), and the SID is a Compressible SRv6 SID.
- The prefix can be managed according to the real network address planning.
- Common Prefix is included in the first SID in the IPv6 Destination address.

Locator	C-SID			
Common Prefix	Node-ID1	Func ID	Arg(opt)	Padding(opt)
Common Prefix	Node-ID2	Func ID	Arg(opt)	Padding(opt)
Common Prefix	Node-ID3	Func ID	Arg(opt)	Padding(opt)
Common Prefix	Node-ID4	Func ID	Arg(opt)	Padding(opt)
Common Prefix	Node-ID5	Func ID	Arg(opt)	Padding(opt)
Common Prefix	Node-ID6	Func ID	Arg(opt)	Padding(opt)

SRv6 SID List
16 * 6 = 96 Bytes



C-SID		
Node-ID1	Func ID	Arg(opt)
Node-ID2	Func ID	Arg(opt)
Node-ID3	Func ID	Arg(opt)
Node-ID4	Func ID	Arg(opt)
Node-ID5	Func ID	Arg(opt)
Node-ID6	Func ID	Arg(opt)

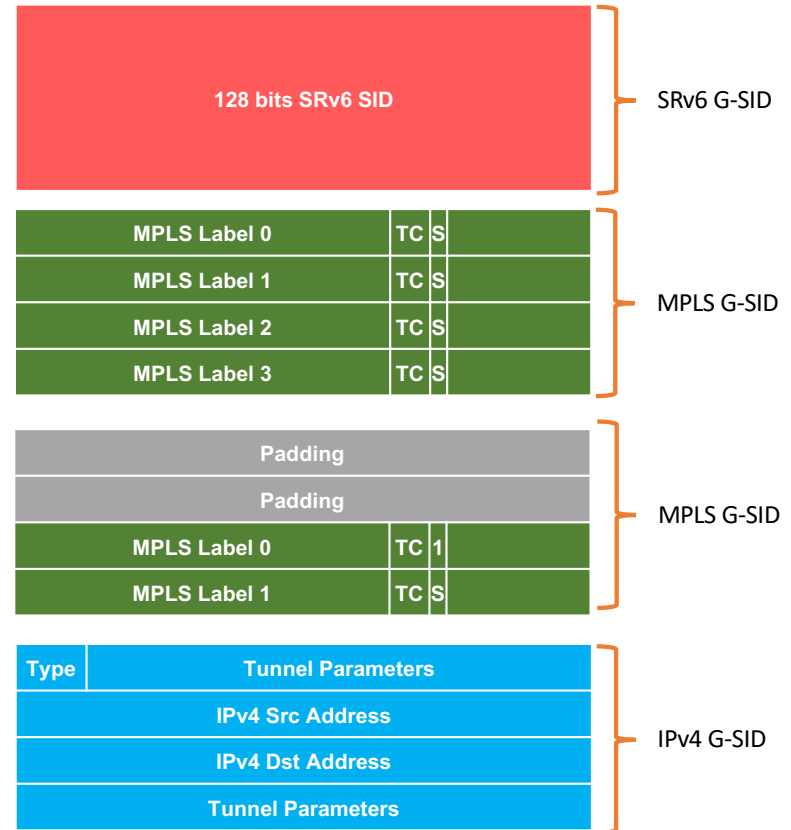
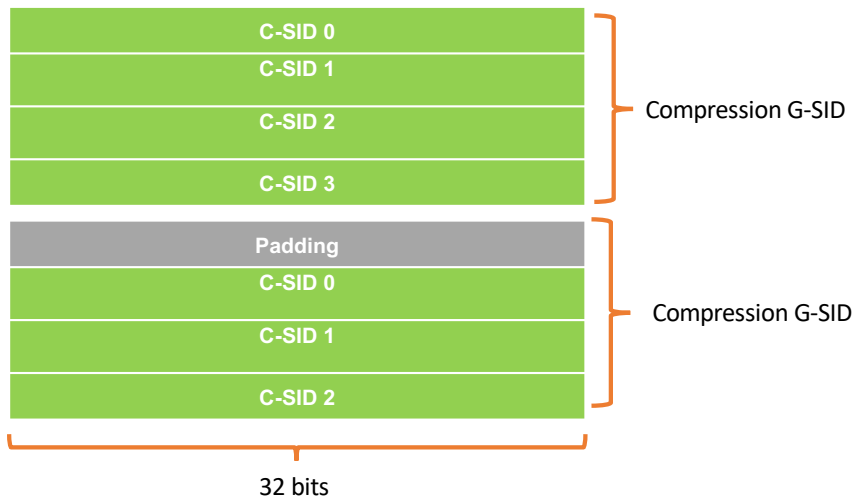
SRv6 C-SID List
4 * 6 = 24 Bytes

The first one can be removed.

G-SID : SRv6 SID, SRv6 C-SIDs, MPLS Labels, IPv4 G-SID

G-SRv6 is a 128 bit value, and it can contain:

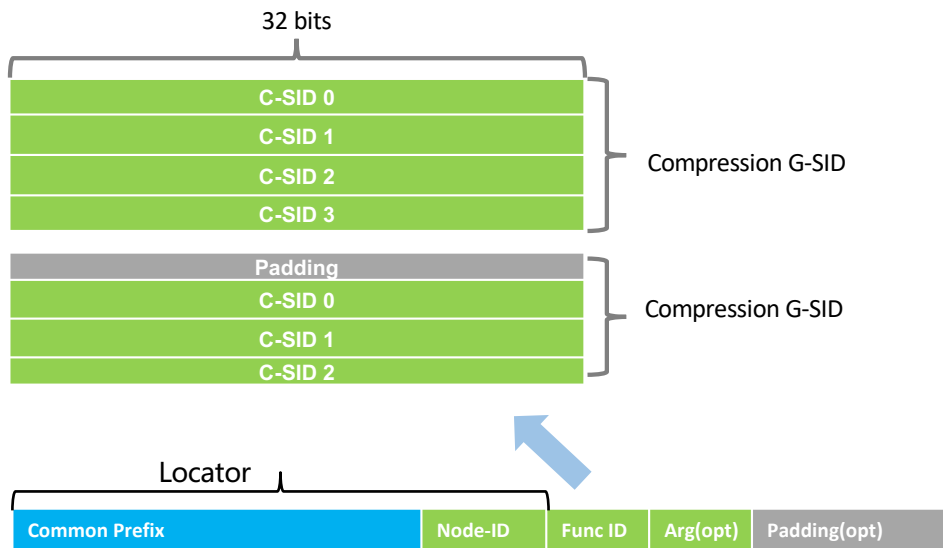
- ❑ an SRv6 SID (No change of SRv6 SID)
- ❑ a compression G-SID (4 C-SIDs at most)
- ❑ an MPLS G-SID (4 SR-MPLS SID at most)
- ❑ an IPv4 G-SID (IPv4 tunnel info)



<https://tools.ietf.org/html/draft-cl-spring-generalized-srv6-np-00>

G-SRv6 for Compression : Compatible and Scalable

- Generalized SRv6 supports to encode multiple types of Segments in an enhanced SRH. G-SRv6 is compatible with SRv6 and uSID as well.
- These Segments can be called Generalized Segment. G-SID(Generalized Segment Identifier) is a 128-bits value, and it may contain:
 - an SRv6 SID(can be a Micro SID carrier)
 - a compression G-SID(4 32 bits C-SIDs at most)



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