

# Generalized SRH

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draft-1c-6man-generalized-srh-00

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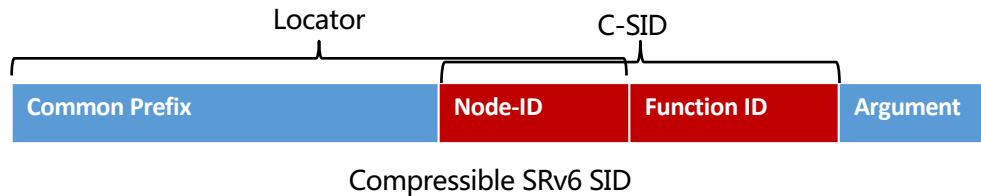
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IETF#107

# Generalized SRH for Compression

## G-SRv6 for Compression

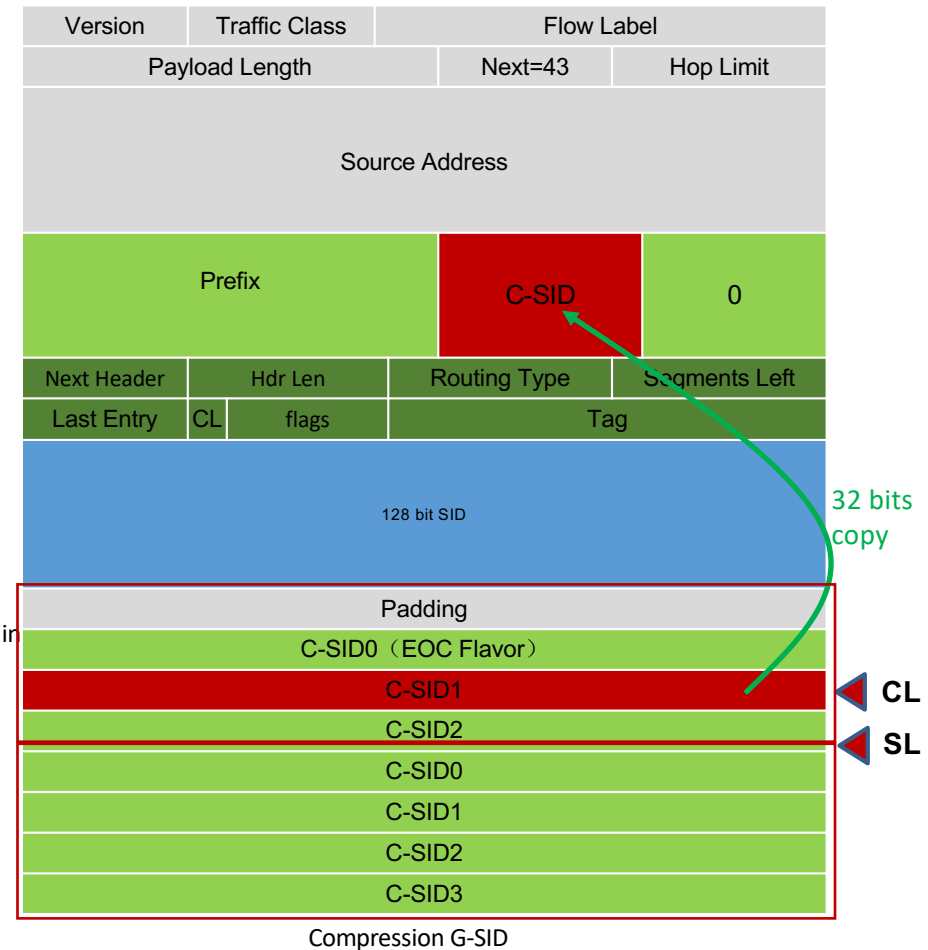
- Compressible SRv6 SID indicates C-SID processing



- CL (Compressed SID left) indicates the location of C-SID within the G-SID
  - Update C-SID from SRH[SL][CL] to IPv6 DA[CP: CP+32]
  - EOC Flavor indicates the end of the compression C-SIDs.

## Advantages

1. Less overhead: A common prefix for a sub-path instead of per SID
2. Smooth upgrade/Incremental deployment: support to encode 128 SRv6 SIDs and C-SIDs in a single G-SRH
3. Compatible with SRH: CL is ignored at normal SRv6 nodes
4. Hardware Friendly: No index mapping table, Exact match
5. Address saving & easy to deploy: No burning all addresses in the block.
6. Control Plane Friendly: easy extensions



<https://tools.ietf.org/html/draft-ic-6man-generalized-srh-00>

# Pseudo code: No extra IO, clean code

Version	Traffic Class	Flow Label	
Payload Length		Next=43	Hop Limit
Source Address			
Prefix		C-SID	0
Next Header	Hdr Len	Routing Type	Segments Left
Last Entry	CL	flags	Tag
128 bit SID			
C-SID	C-SID	C-SID(EOC Flavor)	0
Prefix		C-SID	0
128 SID			
C-SID	C-SID	C-SID(EOC Flavor)	0
C-SID	C-SID	C-SID	C-SID
Payload			

**if ipv6 DA hits Compressible LOCAL SID and SL>0// C-SID processing**

if CL = 0

SL --; CL =3;

DA[CP..CP+31] = SRH[SL][CL] ;

else

//Not the last C-SID in G-SID.

CL --;

DA[CP..CP+31] = SRH[SL][CL]

Forward the packet to the new DA;

**if ipv6 DA hits Compressible LOCAL SID with EOC Flavor and SL>0**

SL --

CL = 0

DA = SRH[SL]

Forward the packet to the new DA

**Else**

SRv6 Processing

PS. For easy understanding , the length of a row is 128bit for SID list

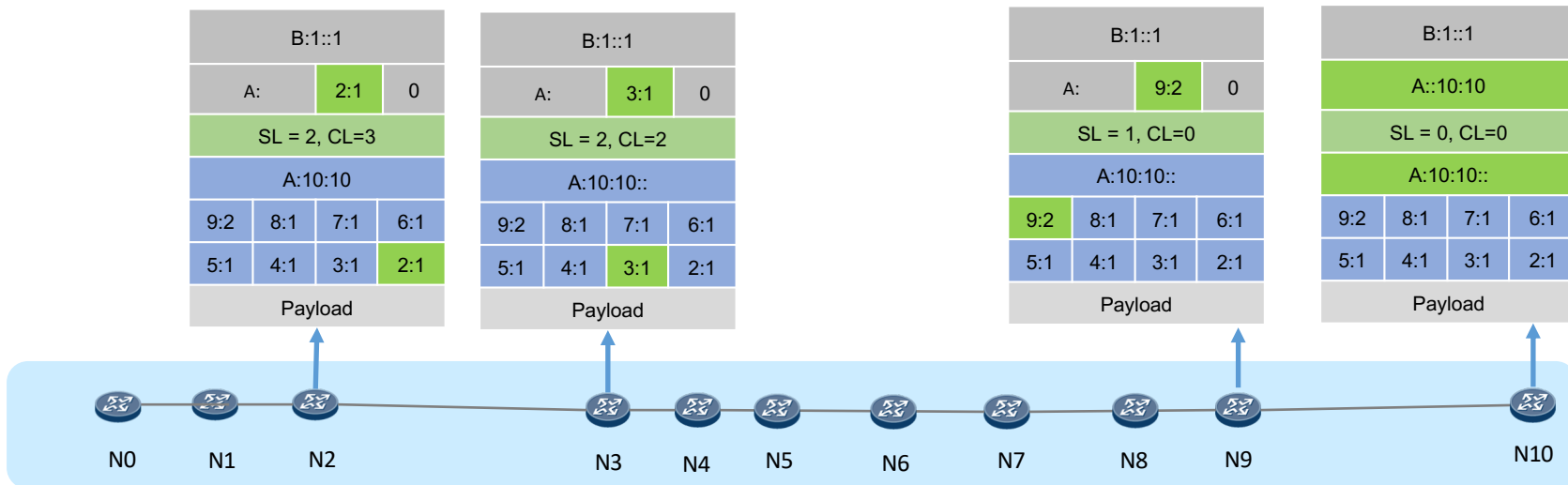
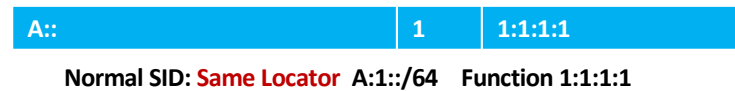
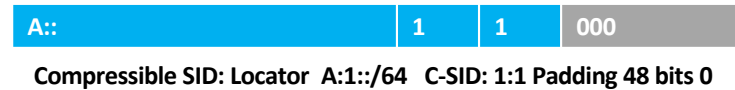
# C-SID List + 128 VPN SID , 64 CP + 32 C-SID+32 Padding

## SID List: 10 SIDs:

- A:1:1::, A:2:1::, A:3:1::, A:4:1::, A:5:1::, A:6:1:: , A:7:1::, A:8:1:: are Compressible End.X SIDs
- A:9:2:: is an Compressible End.X SID with EOC flavor)
- A:10:10:: is an End.DT4 VPN SID

Initialization: SL=3, CL=0, Reduced mode. 10 \* 128 bits to 3 \* 128 bits including a 128bit VPN SID. 70% overhead off.

**Compressible SRv6 SID and normal SRv6 SID use the same Locator, no new route is created!**



# Benefits

- **G-SRv6 is fully compatible with SRv6,**
  - **Compatible with SRv6 and SRH**
  - **No new address consumption:** allocated SIDs from the Locator/ allocated to the node.
  - **No new route creation:** share the same locator with the normal SRv6 SID.
  - **No Control plane modification:** Controller can install the SR policy with 128 bit G-SIDs, endpoint nodes understand the COC Flavor behaviors, Compression disable SRv6 nodes are unaware of Compression.
  - **No Security policy modifications.**
- **G-SRv6 has less overhead**
  - Each compression sub-path has only one common prefix, instead of for each 128 bits.
- **G-SRv6 has efficient address consumption**
  - It is **not** required to allocate a short common prefix for better compression.
- **G-SRv6 supports incremental deployments, which can be deployed on demand.**

# Next Step

- Comments are welcome!

Thank you

