Generalized SRH

draft-lc-6man-generalized-srh-00

Presenter: Zhenbin Li/Weiqiang Cheng
Zhenbin Li/Weiqiang Cheng/Cheng Li
Chongfeng Xie/Cong Li/Hui Tian/Feng Zhao
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

Pseudo code: No extra IO, clean code

```
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;
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: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