Update on SRv6 standardization activities

Written by the authors of the key SRv6 documents (SRH and Net-PGM)

1 STATUS

SRv6 standardization is well on its way and can be considered as nearly complete.

- Segment Routing architecture is RFC 8402. It defines 2 data-plane instantiations of SR: SR over MPLS (SR-MPLS) and SR over IPv6 (SRv6). SRv6 uses a new type of routing header called the SR Header (SRH)
- SPRING working group's charter and milestones are about completing SR-MPLS and SRv6 standardization
- Segment Routing Header (SRH) has been approved as Proposed Standard RFC in October 2019
- SRv6 Network Programming draft is on track with an on-going SPRING last-call request

This clearly exemplifies SRv6 maturity and its ability to meet all expressed requirements.

Surprisingly, Juniper has lately proposed an alternate solution, a.k.a "SRv6+", invoking superior benefits over existing SRv6.

The IETF Area Director has clearly indicated that SPRING working group should focus on completing the standardization of SRv6. It has also been requested that "SRv6+" be renamed as this has no relationship with the work in SPRING and 6MAN related to SRv6.

Here are a few concerns that many operators and vendors have expressed on the IETF mailing-list:

- No benefit
  - SRv6 native compression is mathematically better
- Hardware tax is significant
  - new extension headers must be supported without any leverage of the SRH eco-system
  - multiple extension headers need to be parsed instead of a single SRH
  - more lookups are required
- Scale tax is significant
  - Loss of the stateless property
  - Reinvention of label mapping resulting in well-known scale and operational problems
  - Definition of a brand-new control plane
- Open-source tax
  - Linux, FD.io, networking plugin's would need extensive work without any SRH ecosystem leverage

So far, no conclusive answers have been provided on all these open items.

This new proposal seems to be a weak re-engineering of SR MPLS for IPv6 without any added benefits but increased complexity.

Even more concerning, Juniper has not publicly demonstrated any line-rate hardware support of "SRv6+" not to mention interoperability across vendors.

As a reminder, SRv6 is already rolled out in live networks, with commercial traffic, with multiple interoperable linerate multi-Tbps hardware, with a rich open-source eco-system and with a standardization process expected to complete in the next few months.

2 APPENDIX - PUBLIC IETF REFERENCES

IETF leadership

- Martin Vigoureux (Nokia) – as Area Director for SPRING – closing the discussions on SRv6+
  https://mailarchive.ietf.org/arch/msg/spring/nQ-8cslcGSmT8BDUWAMjyQm1lRg

SRv6+ name change

- 1st request by Mach Chen (Huawei) during the SPRING working group session at IETF 105
  http://youtu.be/WuoJWecyATQ?t=4265
- 2nd request by Cheng Li (Huawei) on the SPRING mailing list
  https://mailarchive.ietf.org/arch/msg/spring/26855I76rVmxtfe3b-04WFewIK4

Operators

- Robert Raszuk (Bloomberg) on the many extensions required by CRH (IGP, BGP, OAM)
  https://mailarchive.ietf.org/arch/msg/spring/_V8dsQOeRTuK2r7Lfi77bgICqhE
- Robert Raszuk (Bloomberg) and Dirk Steinberg (Deutsche Telekom) on CRH being a poor re-engineering of SR-MPLS over IP/UDP
  Robert: https://mailarchive.ietf.org/arch/msg/spring/6bdX_gb47uFYnd6ytwFLPYxXCYo
  Dirk: https://mailarchive.ietf.org/arch/msg/spring/6Bm4nN5ah8rFb7VutexK30kRUPM
- Dan Voyer (Bell CA) reminding that SRv6 is a mature technology (deployments, long IETF work), as opposed to CRH
  https://mailarchive.ietf.org/arch/msg/spring/OB1l41EhhUu8x8XEnKaBTdczDj4

Vendors

- Zhibo Hu (Huawei) on the many advantages of SRv6
  https://mailarchive.ietf.org/arch/msg/spring/D7IFJakb5Ew2iMXUfvf1wub7arQ
- Cheng Li (Huawei) expressing concerns on the dataplane performance of CRH
  https://mailarchive.ietf.org/arch/msg/spring/XK0F40oEuZv-3ule-X5685d_6Mc
- Zafar summarizing the main issues of CRH
  https://mailarchive.ietf.org/arch/msg/spring/wFDK_Be7lEt4s191m61WdUOEzL4
- Wim Henderickx (Nokia)
  https://mailarchive.ietf.org/arch/msg/spring/nX5-1rdXKOw6ks73VYfwvn7iaI8
- Darren Dukes (Cisco)
  https://mailarchive.ietf.org/arch/msg/spring/v8UAgBGQ0yp0VBwGkZ3RwzH1MME