IETF Hackathon
-MSR6 TE

**IETF 116**

March 25-26, 2023

Hackathon Plan

- Implemented a demo for MSR6 TE (Multicast Source Routing Traffic Engineering) and RLB (Replication through Local Bitstring) based on *P4*

- Conducted some simulations of these demos based on *real P4 switches*

- Documents

    - https://datatracker.ietf.org/doc/draft–eckert–msr6–problem–statement

    - https://datatracker.ietf.org/doc/draft–geng–msr6–traffic–engineering/02

    - https://datatracker.ietf.org/doc/draft–geng–msr6–rlb–segment/01

MSR6 TE

- MSR6 TE is a TE solution for MSR6 which leverages the benefits of source routing over IPv6 data plane to provide simplified multicast TE service in an IPv6 network.

- Without unnecessary multicast tree status and complex control plane protocols.
- Provide traffic engineering capability.
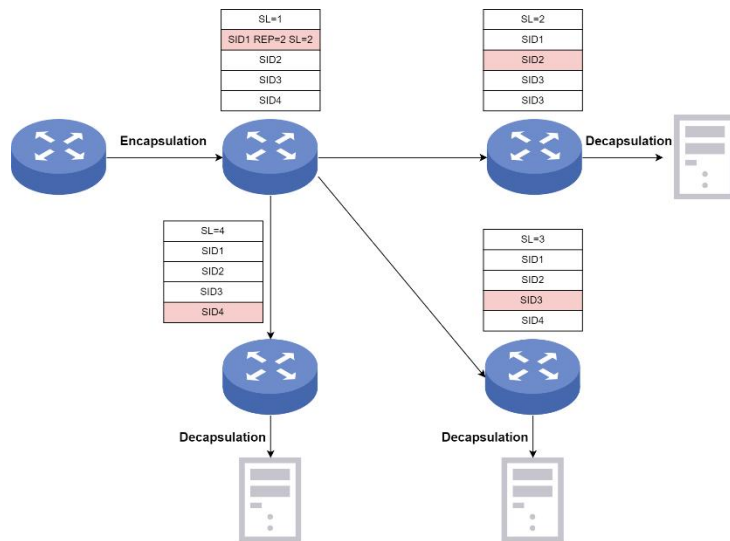
- MSR6 TE has two implementations called TE and RLB. Different from TE, RLB uses a bitstring to indicate the forward path.

Implemented Functions

- We've implemented the demo based on *P4*, and conducted some experiments based on *Tofino switches*.

- Functions in Demo
    1. **Encapsulation:** The encapsulation of MRH(Multicast Routing Header) for specified packets
    2. **Replication:** Transit Nodes read MRH, clone packets and forward packets respectively
    3. **Decapsulation:** Leaf Nodes receive MSR6 packets and decapsulate them to original format
    4. **TE:** Path switching by modifying MRH encapsulated at Ingress Node.
    5. **Video Experiment:** Video stream replication and transportation.
    6. **Infiniband Experiment:** InfiniBand packets replication and transportation.

Outcomes

- Simulation Videos:

We've uploaded the simulation videos of MSR6 TE to Youtube, you can get them through the following link and QR code.

MSR6 TE : https://youtu.be/m2L9BEwFKCA

QR code:

Future Plan

- Form a testbed with *Huawei RDMA devices.*

Simulations:

1. Test the compatibility of MSR6 TE with real RDMA devices
2. Test the performance of MSR6 TE on P4 devices

Wrap Up

Team members:

- Weihong Wu (wuweihong@bupt.edu.cn)
- Jiang Liu (liujiang@bupt.edu.cn)
- Jing Jia (jiajing@bupt.edu.cn)
- Yunyi Tang (tangyunyi0708@bupt.edu.cn)
- Yutong Zhao(zhaoyutong@bupt.edu.cn)
- Sijia Li (lisijia@bupt.edu.cn)
- Yuxin Jiang (jyxin@bupt.edu.cn)