Scalability of SFC


Ting Ao, Greg Mirsky
Scenarios of scalability

• SFC scalability is the capability of the SFC that is resilient to scale out and scale in horizontally or vertically.

• Four scenarios of scalability
  • Join: SF can be added into an existing SFC so that the SFC has more service function
  • Redundancy: One or more SFs are added into the SFC to meet the protection or load balance
  • By-pass: Some SFs are by-passed since no need the Service function
  • Failover: Some SFs are removed because of failure

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<th>Scale out</th>
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SFC Redundancy

• SF redundancy:
  • One or more SFs are added into the SFC to meet the redundancy or load balance requirements for some certain SFs.

• SFP redundancy:
  • SFC is scaled out to two SFP paths. One SFP is redundant to another SFP, and the two SFPs are for protection or load balance.
Requirements- Data plane

• For load balance or active-active protection, a Flow ID is needed to differentiate the SFPs in a SFC.
  • Flow ID is added into the Service Path Header

```
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Service Path Identifier (SPI) | Service Index |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
| Reserved                     | Flow ID      |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

• Flow ID is added into the Context Header (draft-quinn-sfc-nsh-tlv-04)

```
+-----------------+----------------+
| TLV Class = 0x0 | C               |
| Type=0x8 | R|R|L=0x1 |
+-----------------+----------------+
| Flow ID         |
+-----------------+----------------+
```

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Requirements- Control plane

• Interfaces in control plane:
  • C1: Interface between SFC Control Plane & SFC Classifier
  • C2: Interface between SFC Control Plane & SFF

• C2 interface
  • Register Message to SFF to notify that a SF is going to be joined. Installing new entries in the SFP Forwarding Policy Table. The message contains indication that the SF is joined as a new SF or into a group.
  • De-register Message to SFF to notify that a SF is going to be removed. The message contains indication that it is removed from SFC or a group.

• C1 interface
  • Message to Classifier to notify that the SFC is redundant or LB with some SFPs as a group.
Next Steps

• Comply with draft-ietf-sfc-control-plane-08
• Update the draft and give more specific message information both in C1 and C2 interface
• Comments, questions always welcome and greatly appreciated
• Call for WG adoption