SFC Trace Issue Analysis and Solutions

IETF 94 Yokohama

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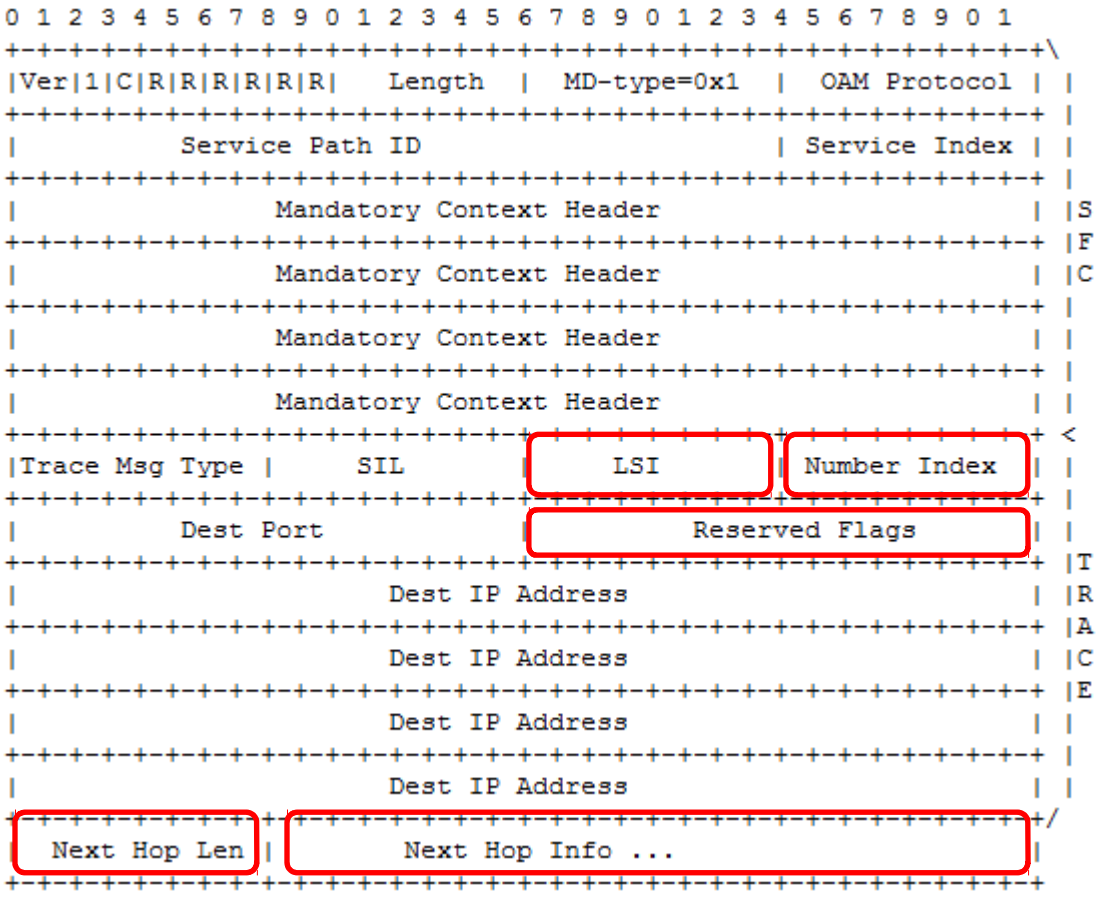
Requirements on SFC trace

- Contained in sfc-oam-framework
  - Ability to trigger action from every transit device on the tested l ayer towards an SF or through an SFC, using TTL (Time To Li ve) or other means.
  - Ability to trigger every transit device to generate response with OAM code(s) on the tested layer towards an SF or through an SFC, using TTL or other means.
  - Ability to discover and traverse ECMP paths within an SFC.
  - Ability to skip un-supported SF's while tracing SF's in an SFC.

Issues of current solution

- Un-supported SFs
- Reporting SFF information
- ECMP support
- How to send report message to OAM cont roller
- More command parameters
- TTL-agnostic solutions

Trace header



- LSI: last service index, used t o record the service index of t he last service function proces sed the packet
- Number Index: number of hop s the packet has traversed, de fault value is 0
- Reserved flags: can be used t o indicate the function blocks t hat need to send reports, whet her uses ECMP, etc.
- Next Hop Len & Info: records i nformation of the next hop

Un-supported SFs

- move all the trace logic to SFF, make no a ssumption that the SF supports trace

- the SFF will provide information of the SF, if the SF supports trace, it can modify/repl ace the SFF’s provided information

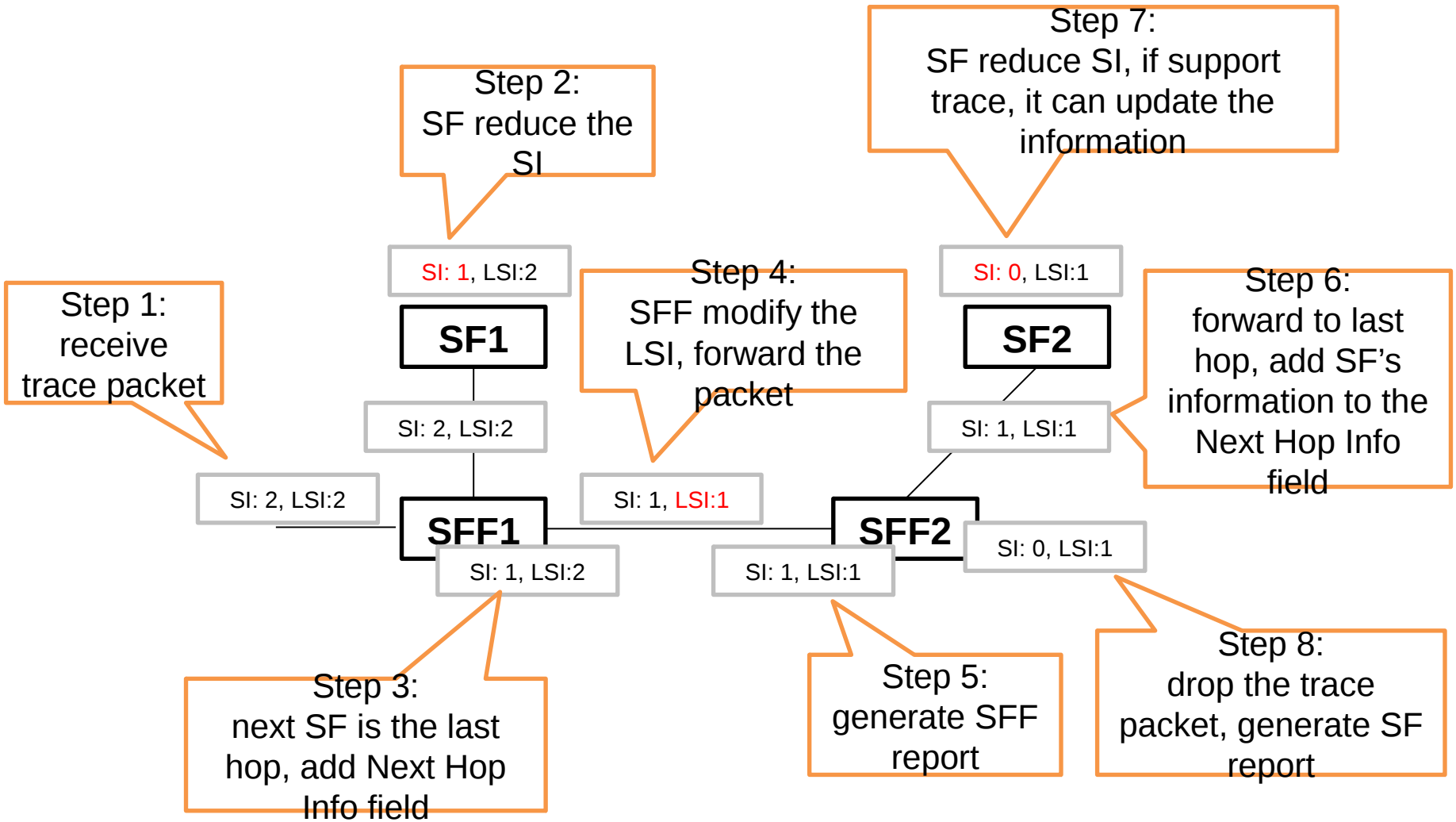
Reporting SFF information

- Report information of SFFs to form a complete view of the SFP, similar to the process illustrated in the un-supported SFs section

  - Following the traditional traceroute (TTL-like) design, only SFF s between the last and second-to-last hops send reports
    - comparing LSI/SI with SIL (1 greater than SIL)
    - the reports will be ordered by number index on OAM controller

  - Report the identification of the SFF, e.g., name, IP address, et c.

Solution Illustration

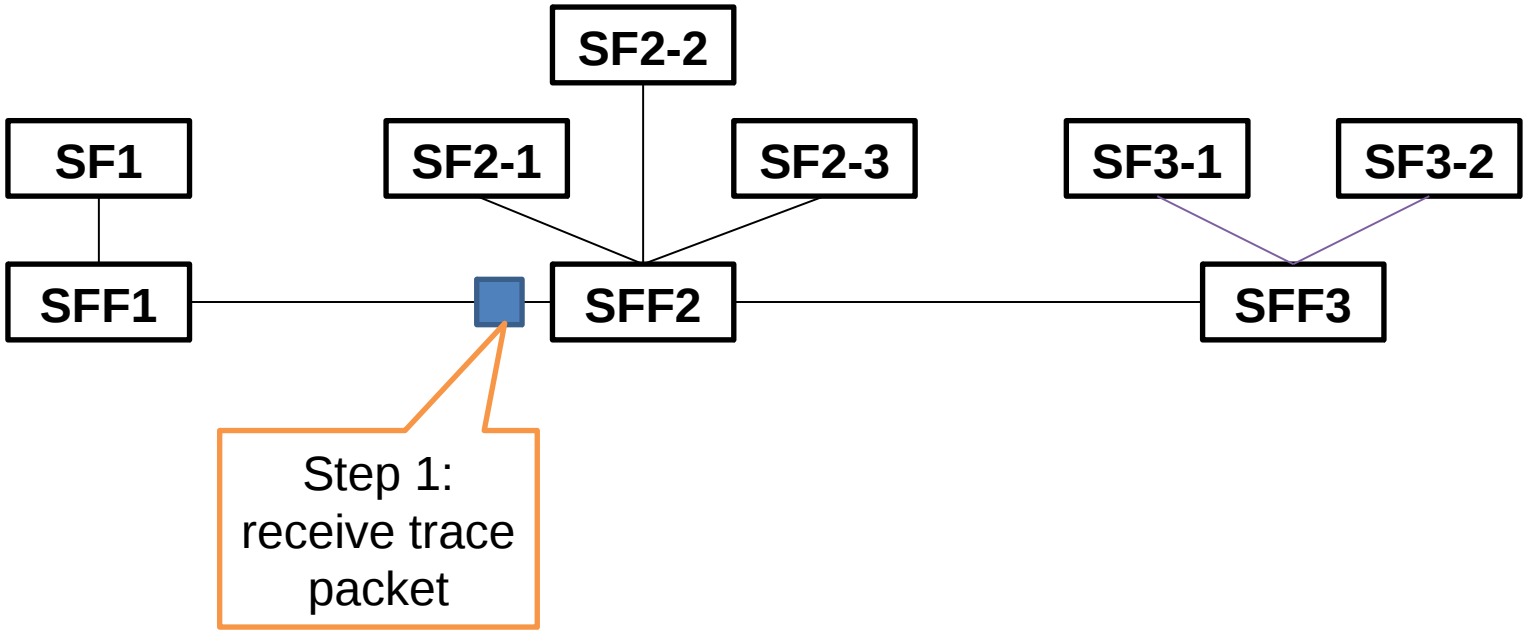


ECMP support

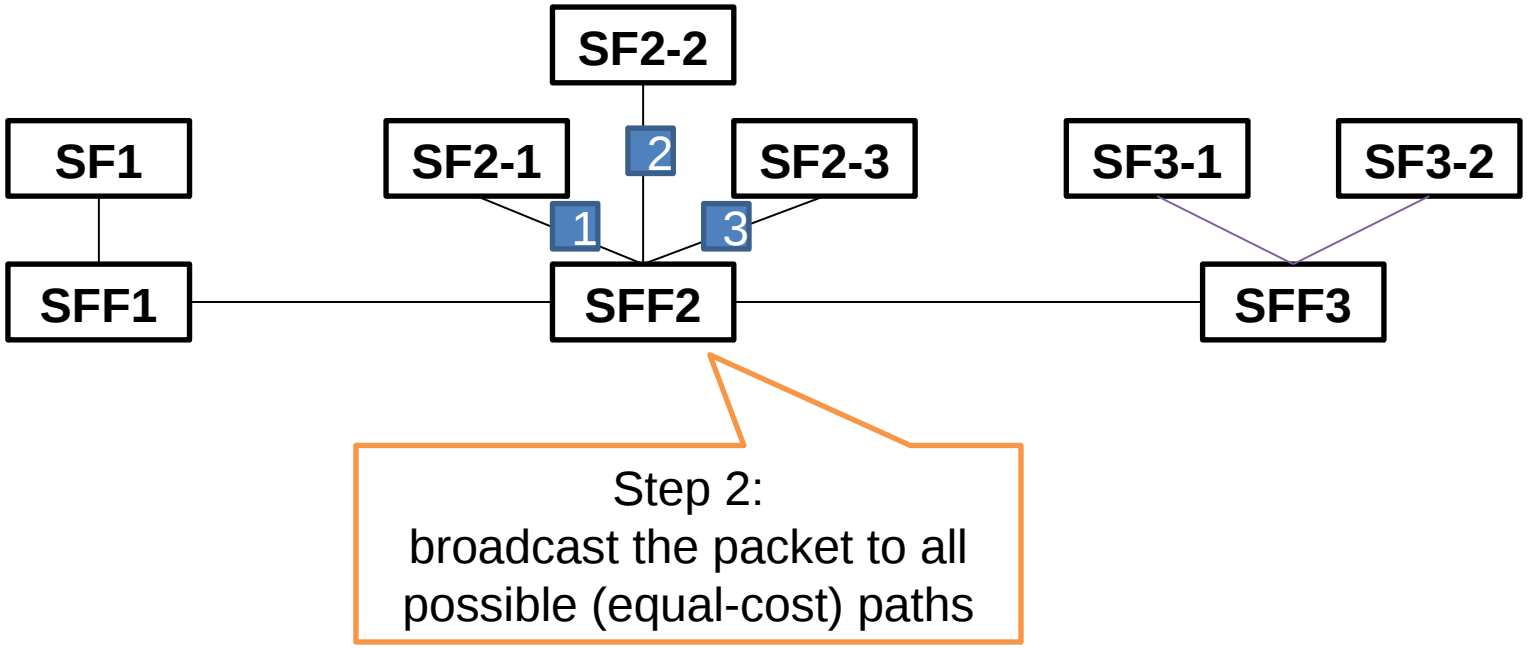
- SFF broadcasts the trace packet on all the possible (equal-cost) paths

- the trace packet needs to identify the exac t path the packet traversed

ECMP support



ECMP support



Send report to OAM controller

- the OAM control plane can be centralized or dis tributed
- centralized case:
  - the trace report packet can be forwarded to the con trol plane directly
- distributed case:
  - the OAM control entity may not be directly connect ed with the SFF
  - a dedicated control path or a reverse path is neede d

More command parameters

- The following parameters are worth to be take n into consideration:
  - report object: sending report of SF, SFF or both
  - ECMP support
  - number of queries to send per hop
  - time to wait for a response/report
  - number of queries that can be sent out simultaneo usly
  - time interval between sending queries

TTL-agnostic solution

- It’s not necessarily to use a TTL-like way t o conduct SFC trace since there’s no TTL field in the current NSH
- TTL-agnostic way: send only one trace pa cket, which will traverse the service path a nd trigger report on every SFF/SF it passe s.
- The controller will reorder the received rep orts and show the status of the SFP.

Thanks