Receive-Only Service Function and External Service in SFC

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Receive-Only External Service (RO ES)

Receive-only External Service –
- Receives packets from the SFF or an SF
- Does not forward packets back to the source
- Not part of the Service Function Chain: SF1, SF2, SF3
- Has many possible attach points
- Dynamically attached and detached without impacting the Service Function Path
- May require SFF support for replicating packets
Receive-Only Service Function (RO SF)

Receive-only Service Function [SF2] –
• Receives packets from the SFF
• Does not forward packets back to the SFF
• Is part of the Service Function Chain: SF1, [SF2], SF3
• Limited location options in the SFP
• Managed by the SFC policy
• Example: Intrusion Detection Service (IDS)
PACKET PLANE
Replication for External Service by SFF

SFC: SF1 -> SF2, External Service is not part of the service chain

Flexible insertion at multiple points in SFP, suitable for troubleshooting the service path (e.g. External service is packet capture, wireshark)

Packet replication function insertion/deletion does not affect SFP construction

Packet replication function collocated in SFF

No NSH SPID/SI is needed for External Service (which consumes packet only)

Example: Packet Capture use case for troubleshooting

SFF functions: Packet replication, packet forwarding to External Service (transport is NSH or other), discard packets from External Service, packet forwarding to next SF (w/SI decrement).

Note: Packet may contain NSH SPID/SI and metadata

Fwd Table Lookup

Rep function

Fwd Table Lookup

Rep function

Fwd Table Lookup

Rep function

Copy of packet

Copy of packet

Copy of packet

Copy of packet

10/255

10/254

10/253

10/254

10/253

10/255

SPID/SI shown
Sample SFF forwarding table with RO ES entries

<table>
<thead>
<tr>
<th>SPID</th>
<th>SI</th>
<th>Next Hop</th>
<th>Copy</th>
</tr>
</thead>
<tbody>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>254</td>
<td>SF-1</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>253</td>
<td>SF-2</td>
<td>x</td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>254</td>
<td>SF-1</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>253</td>
<td>SF-3</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>252</td>
<td>SF-4</td>
<td></td>
</tr>
<tr>
<td>...</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Extending SFC Proxy for Receive-Only SF

- SFC: SF1 -> SF2 (via Extended SFC Proxy) -> SF3
- Packet reaches SF2 via Extended SFC Proxy, which serves all SFs requiring receive-only support at a service hop
- Extended SFC Proxy performs *packet replication to send a copy* to associated SF (no SI decrement)
- Extended SFC Proxy *sends the packet out* (SI is decremented) to return the packet to SFF
- *NSH SPID/SI* is needed for receive-only SF (which consumes packet only)
- Example: IDS as SF in SFC

**Extended SFC Proxy functions:** Packet replication, packet forwarding to associated SF (no SI decrement), discard packets from associated SF, packet forwarding to next SF (w/SI decrement).
Extended SFC Proxy

• Extended SFC Proxy is a service that facilitates SFC by:
  o Extending the capability of SFC Proxy to serve SFC-aware SF
  o Supporting Receive-Only Service Function in the service chain
    ▪ Performs packet replication and sending a copy (with SFC encapsulation) to this type of SF
  o Supporting other use cases

• Extended SFC Proxy appears as:
  o Logical SF entity (associated with SF in SFC) in SFP from SFF’s perspective
  o Logical SFF entity from SF’s perspective
  o Invisible in the Service Function Chain from user perspective
CONTROL PLANE
Control flow for SFF replication for RO ES

- SFC Control Plane
  - RO-ES Policy Evaluation

- RO ES
  - Packet copy

- SFF

- Control Plane
- Packet Plane

IETF 97, SFC WG
Control flow for Extended SFC Proxy

- SFC Control Plane
- SFC Proxy Provisioning
- C4 (RO SF role)
- RO SF
- Packet copy
- Extended SFC Proxy
- SFF
Q&A

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Thank you!