Advertising Service Functions Using IS-IS
draft-xu-isis-service-function-adv-03

Abstract

Source Packet Routing in Networking (SPRING) WG specifies a special MPLS-based source routing mechanism, called MPLS-SPRING. Such source routing mechanism can be leveraged to realize the service path layer functionality of service function chaining (i.e., steering traffic through a particular service function path) by encoding the service function path information as an explicit path information in the form of an MPLS label stack. This document describes how to advertise service functions and their corresponding attributes (e.g., segment ID) using IS-IS.

Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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1. Introduction

[I-D.xu-sfc-using-mpls-spring] describes how to leverage MPLS-SPRING
[I-D.ietf-spring-segment-routing-mpls]) (a.k.a., an MPLS-based source
routing mechanism) to realize the service path layer functionality of
the Service Function Chaining (SFC), i.e, steering traffic through
the Service Function Path (SFP). To allow a service classifier to
attach the segment list (i.e., an MPLS label stack) which represents
a particular SFP to the selected traffic, the service classifier
needs to know on which Service Function Forwarder (SFF) a given
Service Function (SF) is located and what segment ID (SID) is used to
indicate that SF. This document describes how to advertise Service
Functions (SFs) and their corresponding attributes (e.g.,SID) using
IS-IS.

1.1. Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT",
"SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this
document are to be interpreted as described in RFC 2119 [RFC2119].
2. Terminology

This memo makes use of the terms defined in [RFC4971],
[I-D.ietf-sfc-architecture] and [I-D.xu-sfc-using-mpls-spring].

3. Advertising Service Functions and Corresponding SIDs

SFFs within the SFC domain need to advertise each SF they are
offering by using a new sub-TLV of the IS-IS Router CAPABILITY TLV
[RFC4971]. This new sub-TLV is called as Service Function sub-TLV.
The Service Function sub-TLV could appear multiple times within a
given IS-IS Router CAPABILITY TLV when more than one SF needs to be
advertised. The scope of the advertisement depends on the
application but it is recommended that it SHOULD be domain-wide.
Furthermore, SFFs need to allocate a corresponding SID to each SF
they are offering and advertise it by using a sub-TLV of the above
Service Function sub-TLV, called SF SID sub-TLV. To support the
approach of encoding SFP information in the form of an MPLS label
stack as described in [I-D.xu-sfc-using-mpls-spring], SFFs SHOULD
allocate a locally significant MPLS label to each SF they are
offering.

3.1. Service Function Sub-TLV

<table>
<thead>
<tr>
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<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>Service Function Identifier</td>
<td></td>
</tr>
<tr>
<td>~ Sub-TLVs</td>
<td></td>
</tr>
<tr>
<td>~</td>
<td>~</td>
</tr>
</tbody>
</table>

Type: TBD.

Length: variable.

Service Function Identifier: A unique identifier that represents
an SF within an SFC-enabled domain.

Sub-TLVs: contains zero or more sub-TLVs corresponding to the
particular attributes of a given SF. The SF SID sub-TLV as
defined in Section 3.2 is one such sub-TLV which is used to
indicate the corresponding SF SID. Other sub-TLVs are to be
defined in the future.
3.2. SF SID Sub-TLV

```
   0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+--------------------------------------------------+
| Type=TBD | Length |
+--------------------------------------------------+
| Resv | SF SID |
+--------------------------------------------------+
```

Type: TBD.

Length: 3.

Value: The rightmost 20 bits represent an MPLS label which is the SF SID of the corresponding SF.

4. Acknowledgements

TBD.

5. IANA Considerations

This document includes a request to IANA for allocating type codes for the Service Function sub-TLV and the SF SID sub-TLV.

6. Security Considerations

This document does not introduce any new security risk.

7. References

7.1. Normative References


7.2. Informative References

[I-D.ietf-spring-segment-routing-mpls]

[I-D.xu-sfc-using-mpls-spring]

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