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Advertising Service Functions Using IS-IS
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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.

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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].

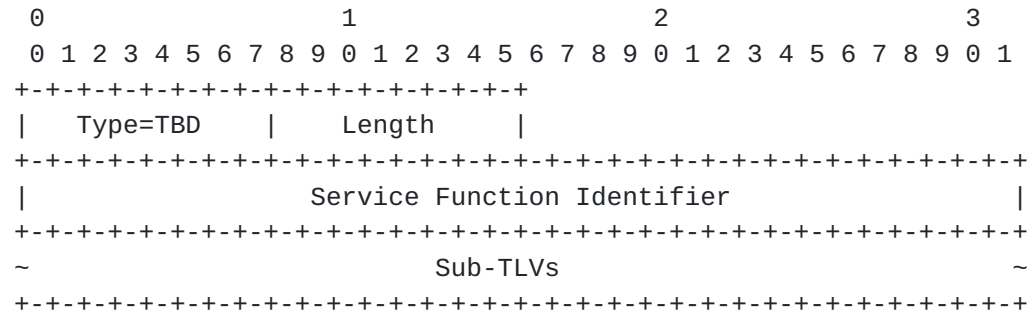
2. Terminology

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 wihin 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



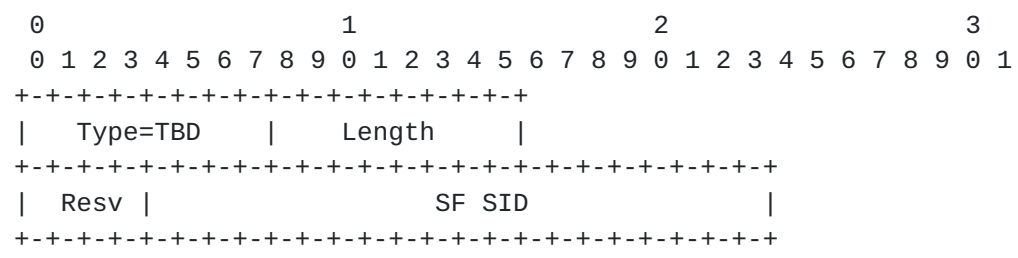
Type: TBD.

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 corrresponding SF SID. Other sub-TLVs are to be defined in the future.

3.2. SF SID Sub-TLV



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

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997.

[RFC4971] Vasseur, JP., Shen, N., and R. Aggarwal, "Intermediate System to Intermediate System (IS-IS) Extensions for Advertising Router Information", RFC 4971, July 2007.

7.2. Informative References

[I-D.ietf-sfc-architecture] Halpern, J. and C. Pignataro, "Service Function Chaining (SFC) Architecture", draft-ietf-sfc-architecture-08 (work in progress), May 2015.

[I-D.ietf-spring-segment-routing-mpls]
Filsfils, C., Previdi, S., Bashandy, A., Decraene, B., Litkowski, S., Horneffer, M., Shakir, R., Tantsura, J., and E. Crabbe, "Segment Routing with MPLS data plane", draft-ietf-spring-segment-routing-mpls-01 (work in progress), May 2015.

[I-D.xu-sfc-using-mpls-spring]
Xu, X., Li, Z., Shah, H., and L. Contreras, "Service Function Chaining Using MPLS-SPRING", draft-xu-sfc-using-mpls-spring-03 (work in progress), March 2015.

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