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IGP Extentions for Segment Routing Service Segment
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Abstract

This document defines extensions to the link-state routing protocols (IS-IS and OSPF) in order to carry service segment information via IGP.

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

Segments are introduced in the SR architecture [RFC8402]. Segment Routing (SR) allows for a flexible definition of end-to-end paths by encoding paths as sequences of topological sub-paths, called "segments".

Service Function Chaining (SFC) [RFC7665] provides support for the creation of composite services that consist of an ordered set of Service Functions (SF) that are to be applied to packets and/or frames selected as a result of classification.

[I-D.ietf-spring-sr-service-programming] describes how a service can be associated with a SID and how to achieve service funtion chaining in SR-enabled MPLS and IPv6 networks. It also defines SR-aware and SR-unaware services. For a SR-unaware service ,there has to be a SR proxy handling the SR processing on behalf of the service .

[I-D.dawra-idr-bgp-ls-sr-service-segments] propose extensions to BGP-LS for Service Chaining to distribute the service segment information to SR Controller.

We reuse the network topology and concepts in [I-D.dawra-idr-bgp-ls-sr-service-segments] . The network is shown in figure 1.

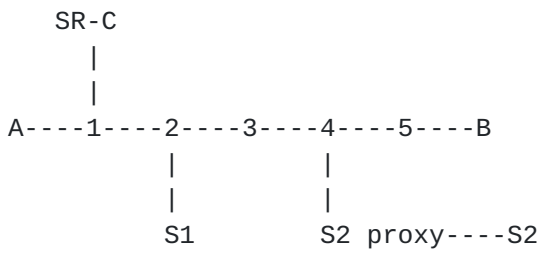


Figure 1: Network with Services

Node 1-5 are nodes capital of segment routing. A and B are two end hosts. S1 is an SR-aware Service. S2 is an SR-unaware Service.

SR Controller (SR-C) is connected to node 1, but may be attached to any node 1-5 in the network.

SR-C is capable of receiving BGP-LS updates to discover topology, and calculating constrained paths between 1 and 5.

If node 1 gets the service segment information, it can use the BGP-LS extensions [I-D.ietf-spring-sr-service-programming] to advertise it to the SR-C, but how can node 1 get it is a question.but node 1 must get the service segment information from other nodes at first.

This document proposes extensions for IGP to broadcastadvertise service segment information so that there is only one SR node needed per Autonomous System to be connected with the SR-C through BGP-LS to advertise the information to it.

This extension works for both SR-MPLS and SRv6.

2. IGP Extensions for Service Segments

After an SFF like node 2 or node 4 get the service segment information, it needs to advertise the information to other SR nodes in the domain through IGP.

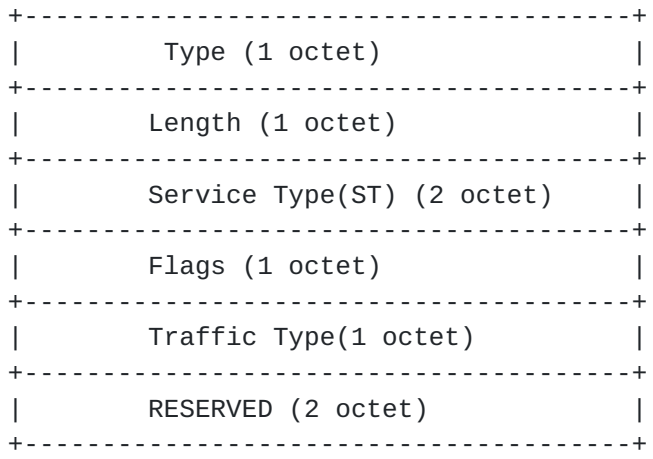
How can SFFs like node 2 and node 4 get the service segment information from S1 and S2 proxy will be discussed further.

There may be other alternate mechanisms and are outside of scope of this document.

2.1. IS-IS Extentions

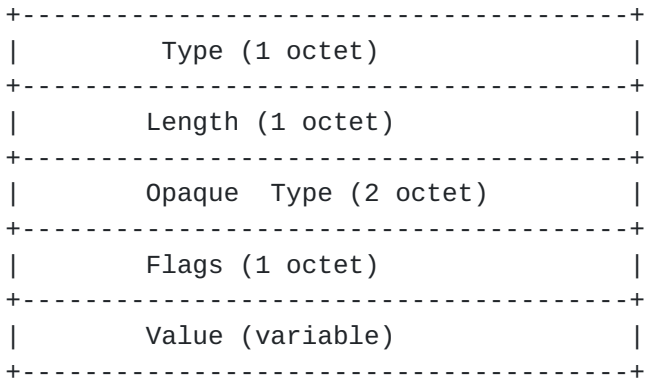
This document intrduces new TLVs for SRv6 End SID sub-TLV [I-D.ietf-lsr-isis-srv6-extensions] and SID/Label sub-TLV [RFC8666] for SR-MPLS to associate the Service SID Value with Service-related Information.

One of the new TLVs is Service Chaining (SC) TLV, the definition and structure is the same as the SC TLV defined in [I-D.dawra-idr-bgp-ls-sr-service-segments] chapter 2.



Service Chaining (SC) TLV

Another Optional Opaque Metadata(OM) TLV is defined in figure 3. The definition and structure is the same as the OM TLV defined in [I-D.dawra-idr-bgp-ls-sr-service-segments] chapter 2.

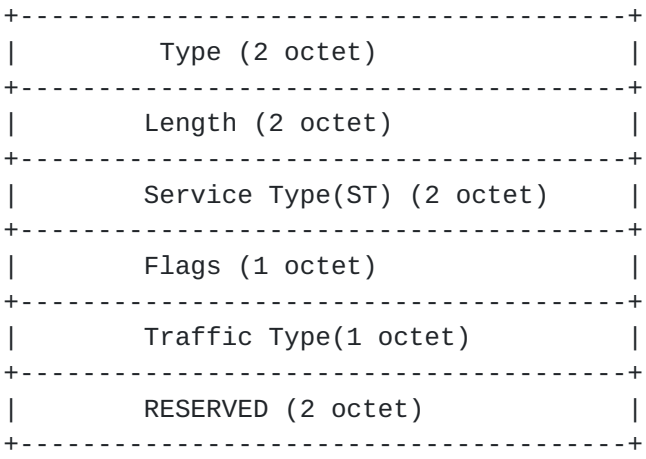


Opaque Metadata(OM) TLV

2.2. OSPF Extentions

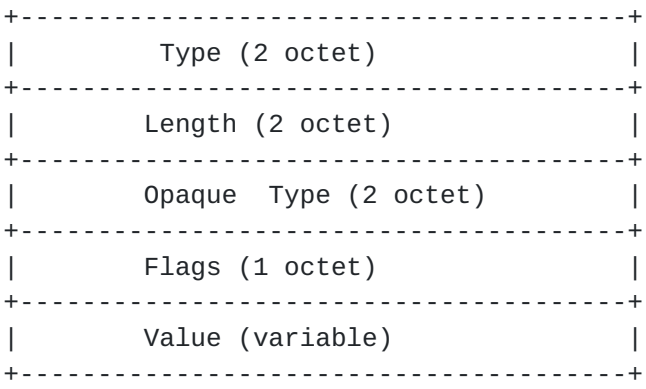
This document intrduces new TLVs for SRv6 End SID sub-TLV [I-D.li-ospf-ospfv3-srv6-extensions] and SID/Label sub-TLV [RFC8665]for SR-MPLS to associate the Service SID Value with Service-related Information.

One of the new TLVs is Service Chaining (SC) TLV, the definition and structure is the same as the SC TLV defined in [I-D.dawra-idr-bgp-ls-sr-service-segments] chapter 2.



Service Chaining (SC) TLV

Another Optional Opaque Metadata(OM) TLV is defined in figure 3. The definition and structure is the same as the OM TLV defined in [I-D.dawra-idr-bgp-ls-sr-service-segments] chapter 2.



Opaque Metadata(OM) TLV

3. Security Considerations

Procedures and protocol extensions defined in this document do not affect the IS-IS and OSPF security model

4. IANA Considerations

TBD

5. References

5.1. Normative References

[I-D.dawra-idr-bgp-ls-sr-service-segments]
Dawra, G., Filsfils, C., Talaulikar, K., Clad, F., daniel.bernier@bell.ca, d., Uttaro, J., Decraene, B., Elmalky, H., Xu, X., Guichard, J., and C. Li, "BGP-LS Advertisement of Segment Routing Service Segments", draft-dawra-idr-bgp-ls-sr-service-segments-03 (work in progress), January 2020.

[I-D.ietf-lsr-isis-srv6-extensions]
Psenak, P., Filsfils, C., Bashandy, A., Decraene, B., and Z. Hu, "IS-IS Extension to Support Segment Routing over IPv6 Dataplane", draft-ietf-lsr-isis-srv6-extensions-03 (work in progress), October 2019.

[I-D.ietf-spring-sr-service-programming]
Clad, F., Xu, X., Filsfils, C., daniel.bernier@bell.ca, d., Li, C., Decraene, B., Ma, S., Yadlapalli, C., Henderickx, W., and S. Salsano, "Service Programming with Segment Routing", draft-ietf-spring-sr-service-programming-01 (work in progress), November 2019.

[I-D.li-ospf-ospfv3-srv6-extensions]
Li, Z., Hu, Z., Cheng, D., Talaulikar, K., and P. Psenak, "OSPFv3 Extensions for SRv6", draft-li-ospf-ospfv3-srv6-extensions-07 (work in progress), November 2019.

[RFC7665] Halpern, J., Ed. and C. Pignataro, Ed., "Service Function Chaining (SFC) Architecture", RFC 7665, DOI 10.17487/RFC7665, October 2015, <https://www.rfc-editor.org/info/rfc7665>.

[RFC8665] Psenak, P., Ed., Previdi, S., Ed., Filsfils, C., Gredler, H., Shakir, R., Henderickx, W., and J. Tantsura, "OSPF Extensions for Segment Routing", RFC 8665, DOI 10.17487/RFC8665, December 2019, <https://www.rfc-editor.org/info/rfc8665>.

[RFC8666] Psenak, P., Ed. and S. Previdi, Ed., "OSPFv3 Extensions for Segment Routing", RFC 8666, DOI 10.17487/RFC8666, December 2019, <https://www.rfc-editor.org/info/rfc8666>.

5.2. Informative References

[RFC8402] Filsfils, C., Ed., Previdi, S., Ed., Ginsberg, L., Decraene, B., Litkowski, S., and R. Shakir, "Segment Routing Architecture", RFC 8402, DOI 10.17487/RFC8402, July 2018, <https://www.rfc-editor.org/info/rfc8402>.

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