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OSPFv3 CodePoint for MPLS LSP Ping

Abstract

IANA has created "Protocol in the Segment ID Sub-TLV" and "Protocol
in the Label Stack Sub-TLV of the Downstream Detailed Mapping TLV"
registries under the "Multi-Protocol Label Switching (MPLS) Label
Switched Paths (LSPs) Ping Parameters" registry. RFC8287 defines the
code points for Open Shortest Path First (OSPF) and Intermediate
System to Intermediate System (IS-IS) protocols.

This document specifies the code point to be used in the Segment ID
sub-TLV and Downstream Detailed Mapping TLV when the Interior
Gateway Protocol (IGP) is OSPFv3. This document also updates RFC8287
by clarifying that the existing "OSPF" code point is to be used only
to indicate OSPFv2, and by defining the behavior when the Segment ID
sub-TLV indicates the use of IPv6.

Status of This Memo

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1. **Introduction**

   IANA has created the "Protocol in the Segment ID Sub-TLV" registry
   and "Protocol in the Label Stack Sub-TLV of the Downstream Detailed
   Mapping TLV" registries under the "Multi-Protocol Label Switching
   (MPLS) Label Switched Paths (LSPs) Ping Parameters" registry [IANA-
   MPLS-LSP-PING]. [RFC8287] defines the code points for OSPF and IS-
   IS.

   "OSPF for IPv6" [RFC5340] describes OSPF version 3 (OSPFv3) to
   support IPv6. "Support of Address Families in OSPFv3" [RFC5838]
   describes the mechanism to support multiple address families (AFs)
   in OSPFv3. Accordingly, OSPFv3 may be used to advertise IPv6 and
   IPv4 prefixes.

This document specifies the code point to be used in the Segment ID sub-TLV (Type 34, 35 and 36) and in the Downstream Detailed Mapping (DDMAP) TLV when the IGP is OSPFv3.

This document also updates "Label Switched Path (LSP) Ping/ Traceroute for Segment Routing (SR) IGP-Prefix and IGP-Adjacency Segment Identifiers (SIDs) with MPLS Data Planes" [RFC8287] by clarifying that the existing "OSPF" code point is to be used only to indicate OSPFv2, and by defining the behavior when the Segment ID sub-TLV indicates the use of IPv6.

2. Terminology

This document uses the terminology defined in "Segment Routing Architecture" [RFC8402], "Detecting Multiprotocol Label Switched (MPLS) Data-Plane Failures" [RFC8029], [RFC8287] and so the readers are expected to be familiar with the same.

3. Requirements Notation

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

4. OSPFv3 protocol in Segment ID sub-TLVs

When the protocol field of the Segment ID sub-TLV of Type 34 (IPv4 IGP-Prefix Segment ID), Type 35 (IPv6 IGP-Prefix Segment ID) and Type 36 (IGP-Adjacency Segment ID) is set to 3, the responder MUST perform the Forwarding Equivalence Class (FEC) validation using OSPFv3 as the IGP.

The initiator MUST NOT set the protocol field of the Segment ID sub-TLV Type 35 and Type 36 as OSPF (value 1) as OSPFv2 is not compatible with the use of IPv6 addresses indicated by this sub-TLV.

When the protocol field in the received Segment ID sub-TLV Type 35 and Type 36 is OSPF (value 1), the responder MAY treat the protocol value as "Any IGP Protocol" (value 0) according to step 4a of Section 7.4 of [RFC8287]. This allows the responder to support legacy implementations that use value 1 to indicate OSPFv3.

5. OSPFv3 protocol in Downstream Detailed Mapping TLV

The protocol field of the Downstream Detailed Mapping (DDMAP) TLV in an echo reply is set to 7 when OSPFv3 is used to distribute the label carried in the Downstream Label field.

6. Update to RFC8287 - OSPFv2 Protocol in Segment ID and DDMAP sub-TLVs

   Section 5 of [RFC8287] defines the code point for OSPF to be used in
   the Protocol field of the Segment ID sub-TLV. Section 6 of [RFC8287]
   defines the code point for OSPF to be used in the Protocol field of
   the DDMAP TLV.

   This document updates [RFC8287], by specifying that the "OSPF" code
   points SHOULD be used only for OSPFv2.

7. IANA Considerations

7.1. Protocol in the Segment ID sub-TLV

   IANA is requested to assign a new code point from the "Protocol in
   the Segment ID sub-TLV" registry under the "Multi-Protocol Label
   Switching (MPLS) Label Switched Paths (LSPs) Ping Parameters"
   registry as follows:

Value	Meaning	Reference
3	OSPFv3	This document

   IANA is also requested to add a note for the existing entry for code
   point 1 (OSPF) to read: - "To be used for OSPFv2 only".

7.2. Protocol in Label Stack sub-TLV of Downstream Detailed Mapping TLV

   IANA is requested to assign a new code point for OSPFv3 from
   "Protocol in Label Stack Sub-TLV of Downstream Detailed Mapping TLV"
   registry under the "Multi-Protocol Label Switching (MPLS) Label
   Switched Paths (LSPs) Ping Parameters" registry as follows:

Value	Meaning	Reference
7	OSPFv3	This document

   IANA is also requested to add a note for the existing codepoint 5
   (OSPF) to read - "To be used for OSPFv2 only".

8. Security Considerations

   This document updates [RFC8287] and does not introduce any
   additional security considerations. See [RFC8029] to see generic
   security considerations about the MPLS LSP Ping.

9. Acknowledgement

10. Normative References

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