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Define the Value 255 in Last Entry field of Segment Routing Header

Abstract

This document proposes to define the value 255 in Last Entry field
in Segment Routing Header (SRH) [RFC8754], to indicate an SRH
without any SID left.

Requirements Language

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.

Status of This Memo

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1. Introduction

This document proposes to define the value 255 in Last Entry field
in Segment Routing Header (SRH) [RFC8754], to indicate an SRH
without any SID present.

2. Terms and Abbreviations

The following abbreviations are used in this document.

  *SRH: Segment Routing Header

  *LE: Last Entry

  *SL: Segment Left

3. The Problem and the Proposal

Segment Routing Header (SRH) [RFC8754] is one type of Routing Header
(RH) [RFC8200]. A Segment Left field is defined in [RFC8200] as the
basic structure of any type of RH. A Last Entry field is defined in
[RFC8754] as the structure of SRH. The two fields are both related
to the segments, behaving as pointer to one of the segments in the
SRH. When the Segment Left field is set to one and the Last Entry
field is set to zero, there is one SID present in the SRH. However,
with current specification [RFC8754], there is no way to indicate an
SRH without any SID present. For example, there is no need for any
segment in the Segment List of SRH (the so-called SRv6-BE case), but
there is need for HMAC in SRH as the enhanced security mechanism.

This document proposes to use the value 255 of Last Entry field to represent that there is no SID in the Segment List part of the SRH. Accordingly, the Segment Left field MUST be zero in this case.

This has an impact that, the number of Segments allowed in an SRH shrinks, from maximum 256 to maximum 255. Practically this is not a big problem, because the number of segments bigger than 255 is very impossible. Thus, changing the meaning of Last Entry value 255 can support incremental development and deployment.

4. IANA Considerations

There is no relevant IANA codepoint

5. Acknowledgements

TBD.

6. Normative References

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